2050 MTP Appendix J: Complete Streets Assessment



Memorandum

August 28, 2024 To: Rachel Hatcher, AICP, RLA, LEED-AP Organization: RS&H From: Hillary Essig, Project Planner Project: MACORTS 2050 MTP

RE: EXISTING CONDITIONS REVIEW

This memo provides an existing condition assessment of the Madison Athens-Clarke Oconee Regional Transportation Study (MACORTS) Metropolitan Transportation Plan (MTP) 2050 with a focus on Complete Street initiatives. This includes a review of existing plans, policies, and programs along with a crash analysis. This memo will highlight elements to inform and leverage the final Complete Street recommendations.

Previous Plans, Policies, and Programs

ATHENS-CLARKE COUNTY

Athens-Clarke County Greenway Network Plan (2017)

The Greenway Network Plan includes some street-based trails in the 2020 Map Update. These trails would provide a multiuse path to expand the pedestrian and bicycle network while connecting to off street greenways. These paths include portions of Tallassee Road, Cleveland Road, the Georgia Square Mall area, Atlanta Highway, Epps Bridge Parkway, West Lake Drive, Baxter Street, Hawthorne Avenue, W Broad Street, Oglethorpe Avenue, Spring Valley Road, Lexington Road, and Old Lexington Road.

Athens In Motion (2018)

Athens Clarke-County's (ACC) Mayor and Commission approved the Athens in Motion bike/pedestrian master plan in October of 2018. Since its approval, Athens has been proactively pursuing projects that incorporate complete streets to build out a comprehensive multimodal network for all modes. **Figure 1** shows the Athens in Motion proposed network.

Athens in Motion includes design guidance, policy and program recommendations, and other elements to incorporate a Complete Street network on ACC's roads. The following projects are in various stages of design and construction:

- Barber Street Bike and Pedestrian Project
- Riverbend Road sidewalks
- Jefferson River Road sidewalks



- Cherokee Road sidewalks
- Lexington Road Sidewalk Extension Project

Figure 1: Athens in Motion proposed network



Athens-Clarke County Complete Streets Policy (2022)

The Athens in Motion Commission, created as part of the adoption of the Athens in Motion Plan, passed and defined "Complete Streets" in Athens-Clarke County in 2022. Per the policy, "Complete Streets" are roadways designed and operated to safely and comfortably accommodate users of all ages and abilities, including cyclists, pedestrians, transit riders, the elderly, wheelchair users, delivery and service personnel, emergency responders, and motorists.

Georgia Safe Sidewalks (2023)

Athens-Clarke County has a contract with Georgia Safe Sidewalks (GASS) to identify and remove potential trip and fall hazards from pedestrian walkways. As of June 2023, GASS removed 151 large vertical displacements in the area west of downtown. This contract provides important upgrades and ADA compliancy to existing sidewalks near Downtown Athens, one of Athen's most walkabout areas.



2023 Comprehensive Plan for the Athens-Clarke County Unified Government (2023)

Complete Streets are mentioned as priorities in ACC's 2023 Comprehensive Plan. The transportation the goal is to increase the range or transportation options – including walking, biking, transit, and driving – that provide efficient, safe, affordable, and equitable access throughout the community and connect to the region and the world (through rail and air service).

MADISON COUNTY

The City of Madison's Comprehensive Plan mentions sidewalks and bicycle paths within the infrastructure chapter. It focuses on extending and infilling sidewalks, ADA compliancy, and states to integrate multi-modal options as much as possible. Projects identified from the Comprehensive Plan include:

- Restoring the Norfolk Southern bridge and open for pedestrian and bicycle use.
- Infilling the western side of Eatonton Road sidewalks.

OCONEE COUNTY

Long-Range Transportation Plan (2019)

The plan highlights the bicycle and pedestrian needs in Oconee County, which are primarily driven by safety concerns, roadway characteristics, and stakeholder input gathered during the Long-Range Transportation Plan (LRTP) development process. It emphasizes that these needs should be considered at a planning level, with detailed traffic and corridor analyses necessary for specific recommendations. Key areas identified for improvement include several major corridors where bicycle and pedestrian enhancements are recommended. These improvements aim to address network deficiencies, enhance safety, and ensure that future transportation projects incorporate facilities that support nonmotorized travel.

The System-wide Infrastructure and Policy Recommendations for Oconee County focus on expanding bicycling and walking options across the county. Key suggestions include integrating appropriate bicycle and pedestrian facilities into all roadway improvement projects, constructing wider paved shoulders on rural roads, and upgrading intersections to enhance safety for nonmotorized users. The recommendations also advise updating subdivision and zoning regulations to require developers to build sidewalks, provide bicycle parking, and include bike paths or lanes in new developments. Additionally, inter-development walkways and pedestrian connections should be provided to improve access to major facilities and activity centers. **Figure 2** highlights the bike and pedestrian project recommendations from the LRTP.



Figure 2: LRTP Recommended Bicycle and Pedestrian Projects



Oconee County Joint Comprehensive Plan 2023 Update

The Oconee County Comprehensive Plan Update outlines several key recommendations for improving bicycle, pedestrian, and other network infrastructures. It highlights the need to address gaps in the sidewalk network, including crucial connections along Atlanta Highway, Spartan Lane, LaVista Road, and other major intersections. Enhancing connectivity and walkability between neighborhoods is emphasized, alongside exploring locations for Park & Ride facilities to support commuters to Atlanta. The plan also calls for safety improvements on both rural and urban roads to better accommodate cyclists. Additionally, developing a large-scale multi-use trail or a network of trails is recommended to boost recreational opportunities and foster a stronger sense of place in the community.



Existing Bicycle and Pedestrian Facilities

BICYCLE FACILITIES

The bicycle network within the MPO includes bike lanes, sharrows, multi-use paths and trails and offroad facilities. There are a total of 75 facilities, covering a combined length of 71.6 miles, with most located in Athens-Clarke County. Details of these facilities, including their respective lengths and other information, are presented in the Table 1 below and illustrated in the accompanying Figure 3.

Bike Facility Type	Number of Facilities	Total Length (in Miles)	Jurisdiction
Bike Lane	36	46.7	Athens-Clarke
Multi-use Path	7	3.2	Athens-Clarke
Multi-use Trail	18	14.5	Athens-Clarke
Off-Road Facility	4	2.3	Athens-Clarke
Sharrows	10	4.9	Athens-Clarke
Totals	75	71.6	

Table 1: Bicycle Facility Type and Length

SOURCE: ATHENS-CLARKE COUNTY



Figure 3: Bicycle Network





PEDESTRIAN FACILITIES

The pedestrian network within the MPO consists of sidewalks, multi-use paths, walking trails, and crosswalks. According to data from Athens and Clarke County, there are 240.19 miles of sidewalks, with the majority located in Athens. In addition to the sidewalks, there are 1,330 crosswalks. The existing sidewalks and crosswalks are illustrated in **Figure 4**.

Figure 4: Pedestrian Facilities





CRASH ANALYSIS

Crash data from 2017 to 2021 was analyzed to examine KSI (Killed or Seriously Injured) crashes, crash modes, crash types, and major crash hotspots in the study area. The analysis also compared bike and pedestrian crashes along the proposed bike and pedestrian network to determine what additional safety measures need to be considered for further development of these networks.

A total of 31,435 crashes were reported during this period, with the highest number occurring in 2017 and the lowest in 2020. There were 454 KSI crashes in total, with 2020 recording the highest number of KSI crashes at 114, accounting for 25% of the total KSI share. **Figure 5** shows the crash trends in the study area.



Figure 5: Crash Trend, All Modes, 2017-2021



Crash Severity by Mode

From **Table 2**, Approximately 1.08%, or 339 of the total crashes, involved a pedestrian (330) or a bicycle (9). Crashes involving pedestrians resulted in 22 fatalities and 46 serious injuries. There were no fatal bicycle crashes during this period, and only one bicycle crash resulted in a serious injury.

Pedestrian crashes in the area exhibit significant severity, with a notable portion resulting in serious outcomes. Although fatal pedestrian crashes account for only 6.7% of all pedestrian crashes, they represent 22% of all Fatal Injury crashes (22 out of 100), highlighting the vulnerability of pedestrians. Additionally, 13.9% of pedestrian crashes were Suspected Serious Injury crashes, and nearly a third of pedestrian crashes (31.8%) result in minor or visible pedestrian injuries.

Crash Severity	Total Crashes by Severity	Severity Crashes % of Total	Bike Crashes	% of Total Bike Crashes	Pedestrian Crashes	% of Total Pedestrian Crashes
(K) FATAL INJURY	100	0.3%	0	0.0%	22	6.7%
(A) SUSPECTED SERIOUS INJURY	354	1.1%	1	11.1%	46	13.9%
(B) SUSPECTED MINOR/VISIBLE INJURY	2,173	6.9%	6	66.7%	105	31.8%
(C) POSSIBLE INJURY / COMPLAINT	5,269	16.8%	0	0.0%	102	30.9%
(O) NO INJURY	23,523	74.9%	2	22.2%	55	16.7%
TOTAL	31,419	100.0%	9	100.0%	330	100.0%

Table 2: Crash Severity, All, Bicycle and Pedestrian Crashes, 2017-2021

Pedestrian and bicycle crash locations exhibiting one or more injury or fatality are shown in Table 3.

Table 3: Pedestrian and Bicycle Fatal Crash Locations

Intersection / Roadway Segment	# of Serious Injury	# of Fatalities	Crash Mode
Sanford Drive: Cedar Street to Field Street	1	0	Bicycle
E Broad Street: N Lumpkin Street to CG Railroad	1	1	Pedestrian
W Broad Street: Beach Haven Drive to Alps Road	4	3	Pedestrian
Atlanta Highway and George Square Mall intersection	0	1	Pedestrian
Hwy 78: Epps Bridge Pkwy to Timothy Road	0	1	Pedestrian
N Main Street (Watkinsville): Watkinsville Byp to Hwy 53	0	1	Pedestrian
Watkinsville Byp to Hog Mountain Road	0	1	Pedestrian
Riverbend Pkwy: Woodstone Drive to Riverbend Road	0	1	Pedestrian
Winterville Road: Hancock Road to Skelton Road	0	1	Pedestrian
Cherokee Road and Martins Hill Lane intersection	0	1	Pedestrian
Lexington Road: Winterville Road and Cherokee Road	2	1	Pedestrian
North Avenue: Dr MLK Pkwy to Strickland Avenue	1	1	Pedestrian



Intersection / Roadway Segment	# of Serious Injury	# of Fatalities	Crash Mode
Newton Bridge Road: Paradise Blvd to Fritz Mar Lane	0	1	Pedestrian
Hwy 441: Athens Perimeter to Old Commerce Road	0	3	Pedestrian
GA- 8, Exit 10B	0	1	Pedestrian
Athens Perimeter (129): N Chase Street to Jefferson Road	0	1	Pedestrian
Hwy 129: Lakeland Drive to Oak Grove Road	0	1	Pedestrian
Hwy 72: McCannon Morris Road to Timber Ridge Lane	0	1	Pedestrian
Hwy 106 S, Fortson Store Road: Norwood Road to Lake Circle Drive	0	1	Pedestrian
Total	91	22	

Crash Locations (Intersection vs Segment crashes)

Figure 6 depict percentage of all modes crashes by location. Intersection-related crashes make up more than 50% of total crashes, with approximately 1.3% resulting in a KSI. Conversely, segment-related crashes account for less than 50% of all crashes but have a higher share of KSI crashes at 53.3%.

Figure 6: Percentage of All Modes Crashes by Location



Percentage of All Mode Crashes by Location

¹ This total only includes corridors with fatal crashes. The remaining 36 serious injury crashes occurred in areas without any fatal bike or pedestrian crashes.



Intersection Crashes and Modes

Figure 7 summarize percentage of bike and pedestrian intersection-related crashes by severity. More than 56% of pedestrian crashes and 33% of bicycle crashes at intersections resulted in fatalities or serious injuries, highlighting that crashes involving pedestrians and cyclists at intersections are more likely to lead to severe outcomes.







Crash Hotspots

From **Figure 8**, the majority of fatal and serious injury crashes in the study area occurred on West Broad Street, South Milledge Avenue, Oak Street, Lexington Road, State Route 78, North Avenue, Gaines School Road, S Lumpkin Street and South and North Athens Perimeter Hwy. Downtown Athens experienced a high concentration of crashes, particularly along major corridors such as West Clayton Street, West Washington Street, West Hancock Avenue, and West Dougherty Street.







Figure 9 highlights the locations of bike and pedestrian crashes in relation to existing bike facilities. The map reveals that the majority of fatalities occurred away from existing facilities and along corridors that lack bike or pedestrian infrastructure. This suggests a critical need for expanding safe infrastructure in areas currently underserved.

Figure 9: Crash with Existing Bicycle Facilities





Conclusion

Previous plans and policies have laid a strong foundation for enhancing bicycle and pedestrian infrastructure in the region. Athens-Clarke County's "Athens In Motion" master plan, approved in 2018, and the 2022 Complete Streets Policy reflect a commitment to building a comprehensive multimodal network that accommodates all users. The Georgia Safe Sidewalks initiative further improves pedestrian safety by addressing trip hazards and ADA compliance. In Madison County, the Comprehensive Plan emphasizes extending sidewalks and integrating multi-modal options, with specific projects like restoring the Norfolk Southern bridge for pedestrian and bicycle use. Oconee County's Long-Range Transportation Plan and associated recommendations focus on expanding and improving bicycle and pedestrian facilities, including integrating these facilities into roadway projects and updating regulations to ensure new developments support nonmotorized travel. These efforts collectively aim to enhance safety, connectivity, and accessibility across the region.

The crash data analysis from 2017 to 2021 reveals critical safety issues for pedestrians and cyclists in the study area. Out of 31,435 reported crashes, 454 resulted in fatalities or serious injuries. Pedestrian crashes are particularly concerning, accounting for 22% of all fatal crashes, which highlights the high vulnerability of pedestrians. Additionally, 13% of KSI crashes involved pedestrians, and a significant number of these crashes occurred at intersections. Bicycle crashes, while less frequent, also showed patterns of concern, with a notable proportion occurring at intersections. The analysis identified several high-crash hotspots, including major corridors in Downtown Athens such as W Clayton Street and W Hancock Avenue, and other key areas like W Broad Street and S Milledge Avenue. Crucially, many fatal crashes took place in areas lacking existing bike or pedestrian infrastructure, underscoring the urgent need for expanding and enhancing these facilities. This highlights the necessity of developing a comprehensive and safer network for nonmotorized users across the region.





Memorandum

August 28, 2024 To: Rachel Hatcher, AICP, RLA, LEED-AP Organization: RS&H From: Hillary Essig, Project Planner Project: MACORTS 2050 MTP

RE: COMPLETE STREETS RECOMMENDATIONS

This memo summarizes Complete Streets program, policy, and project recommendations for the Madison Athens-Clarke Oconee Regional Transportation Study (MACORTS) Metropolitan Transportation Plan (MTP) 2050. It includes Safety Countermeasure tools and a Design Guide to provide recommendations towards the design of projects for a Complete Streets transportation network.

Complete Streets Assessment

A Complete Streets approach integrates people and place throughout the planning, design, construction, operation, and maintenance of transportation networks. This strategy ensures that streets are safe for individuals of all ages and abilities, balances the needs of various transportation modes, and supports local land uses, economies, cultures, and natural environments.

COMPLETE STREETS POLICY AND PROGRAM RECOMMENDATIONS

A Complete Streets policy is designed to create a safer, more inclusive, and accessible transportation network for all users, regardless of age, ability, or mode of transport. This policy emphasizes the integration of various transportation modes—walking, biking, transit, and driving— into roadway design to ensure that streets meet the needs of all community members. By shifting from car-centric design to a multimodal approach, Complete Streets policies aim to improve safety, promote healthy lifestyles, reduce traffic congestion, and support economic development. The policy also focuses on addressing transportation inequities, ensuring that improvements benefit underserved communities and enhance overall livability.

Athens-Clarke County Policy Review

Athens-Clarke County's Complete Streets policy serves as a notable example of a comprehensive approach to inclusive transportation design. This policy is committed to enhancing safety, livability, and equity for all users, including pedestrians, cyclists, transit riders, and drivers. It emphasizes the importance of integrating various transportation modes and prioritizing the needs of underserved communities.



Key elements of Athens-Clarke County's policy include:

- **Multimodal Integration:** Ensuring that all roadways accommodate diverse transportation needs, from walking and biking to driving and transit use.
- **Equity Focus:** Addressing historical transportation inequities by prioritizing investments in underserved neighborhoods and involving communities in project development.
- **Safety and Accessibility:** Implementing design standards that enhance safety for all users, including those with disabilities and the elderly.
- **Economic and Health Benefits**: Promoting healthy lifestyles, reducing traffic congestion, and supporting local economic growth through improved transportation infrastructure.
- Land Use and Context Sensitivity: Align with land use policies and encourage dense, mixeduse, and transit-oriented development.
- Jurisdiction, Implementation and Performance measures: Creating performance measures that contain actionable tasks that lead to accountability.

PROGRAM RECOMMENDATIONS

Based on insights from various Complete Streets policies and case reviews, the following recommendations are pivotal for the MPO to integrate into its projects. These strategies aim to enhance the effectiveness and impact of Complete Streets initiatives by focusing on key areas such as promoting active transportation, building robust partnerships, ensuring equitable development, and standardizing Complete Streets as the default approach.

Promote Active Transportation and Improve Network Design

Objective: Enhance the infrastructure to support and encourage walking, biking, and other forms of active transportation.

- **Expand and Integrate Networks:** Develop comprehensive networks that connect key destinations such as residential areas, schools, parks, and commercial centers. Ensure seamless integration between different modes of transport (e.g., bike lanes connecting to transit stops).
- **Design for All Users:** Incorporate features that accommodate a range of users, including people with disabilities, children, and the elderly. Use universal design principles to ensure accessibility and safety.
- **Implement Safety Features:** Introduce measures like protected bike lanes, raised crosswalks, pedestrian islands, and traffic-calming elements to enhance safety and comfort for all users.
- **Promote Connectivity:** Prioritize projects that close gaps in existing networks, reduce travel distances, and improve accessibility to essential services and amenities.

Build Partnerships to Support Complete Streets

Objective: Collaborate with various stakeholders to advance and sustain Complete Streets initiatives.

- Engage Community and Stakeholders: Involve local communities, advocacy groups, Schools and other educational institutions, businesses, and other stakeholders in the planning and implementation process. Gather input and build support for future Complete Streets projects.
- Collaborate with Agencies: Work with regional, state, and federal transportation agencies to align policies, secure funding, and integrate Complete Streets principles into broader future transportation plans.



Leverage Public-Private Partnerships: Foster partnerships with private developers, business
owners, and other organizations to support and invest in future Complete Streets improvements.

Adopt an Equitable Development Approach

Objective: Ensure that Complete Streets projects promote equitable and inclusive implementation and address historical inequities in transportation planning.

- **Prioritize Underserved Areas:** Focus on improving transportation infrastructure in historically neglected or underserved communities to address disparities and promote equitable access.
- Incorporate Equity Metrics: Use criteria such as income levels, minority populations, and accessibility needs to guide project prioritization and resource allocation.
- Engage with Affected Communities: Involve residents from affected neighborhoods in decision-making processes to ensure their needs and concerns are addressed.
- Monitor and Evaluate Impacts: Regularly assess the social and economic impacts of Complete Streets projects to ensure they benefit all segments of the population and adjust strategies as needed.

Make Complete Streets the Default Approach to Re-Envision Streets

Objective: Integrate Complete Streets principles into everyday planning and design practices to create a more inclusive and functional transportation system.

- Incorporate Flexibility: While Complete Streets should be the default, maintain flexibility to adapt designs to specific local contexts and constraints as necessary. Ensure that exceptions are carefully considered and well-documented.
- Re-Engineer Streets for Safety and Walkability: Implement Street redesigns that reduce travel speeds and prioritize safety. This can include adding traffic calming measures, enhancing crosswalks, and creating pedestrian-friendly intersections to ensure streets are safer and more accessible for all users.
- Focus on Key Suburban Corridors: Identify key areas such as transit nodes and potential community centers for targeted investment. Restructure land use in these areas to foster vibrant, walkable communities.
- Prioritize Clustered Development with Zoning Overlays: The MPO should encourage each local jurisdiction to use zoning overlays to promote concentrated development in targeted areas, enhancing walkability and connectivity through a well-planned street grid. This approach supports a more pedestrian-friendly environment and reduces reliance on automobiles.

Based on these recommendations, new projects have been identified and existing projects from the 2045 MTP are analyzed to incorporate Complete Streets components. Additionally, analyzing existing crash data and performing a multimodal gap analysis new projects are identified that meet Complete Streets principles. The updated projects and their descriptions are detailed in the following sections with design guidance provided at the end to be incorporated into concepts and final designs.



Complete Streets Roads and Intersections

There were three primary methodologies used for identifying projects with Complete Streets components for the 2050 MTP Update:

- Unfunded projects identified from the 2045 MTP.
- New safety projects identified from the existing conditions crash data analysis.
- Multimodal gaps identified from the Existing Conditions analysis that were not already identified from the previous two methodologies.

The following sections summarize the projects identified, and Attachment A includes a spreadsheet with all three types of projects and their supporting background information. All the projects identified are shown in **Figure 1**.



Figure 1: Recommended Complete Streets Projects

2045 MTP PROJECTS

There are 76 projects from the funded and unfunded list that were reviewed to find opportunities to include Complete Streets language. From that list 46 projects are identified to have overlap with Athens in Motion, safety concerns from the crash analysis, and/or other features identified that having Complete Streets language included is beneficial to the community. A summary of projects is shown in **Table 1**. The table includes the Project ID, Project Name, and the Description from the



2045 MTP. Additional descriptive language for the 2050 MTP is included in the Proposed Complete Streets Details column.

Table 1: Projects from the 2045 MTP

Project ID	Project Name	2045 MTP Project Description	Proposed Complete Streets Details (2050 MTP)
P-2	SR 10 Loop over Middle Oconee	Replace the existing bridge over the Middle Oconee River at the SR 10 Loop.	Include clearance, grading, and drainage improvements underneath new bridge to allow for the proposed, high priority Middle Oconee River Trail.
P-8	Atlanta Highway Safety and Access Management	Convert existing 5-lane section from Monroe Highway to Marilyn Farmer Way to median divided for access management between signalized intersections and safety improvements at key intersections; bicycle and pedestrian facilities included.	Safety improvements to include improving lighting conditions along the roadway for vehicles and pedestrians. Pedestrian facilities will be upgraded to meet ADA standards and a separated bicycle facility (multiuse path or protected bike lanes) included. All signalized intersections will include upgraded pedestrian and bicycle crossings.
P-9	Alps Road Widening	Convert center turn from SR 10/US 78/Broad St to Baxter Street to median for 4-lane divided roadway with intersection improvements at SR10/US78 and Baxter Street.	Roadway construction will include upgrading the existing bicycle lane on Alps Road to a protected facility as outlined in the Connect Athens Reconnecting Communities Grant. Intersection improvements will include prioritized pedestrian and bicycle crossings to continue the bicycle facility across US-78 to Hawthorne Avenue's proposed protected bicycle facility. All signalized intersections will include prioritized pedestrian and bicycle crossings.



Project ID	Project Name	2045 MTP Project Description	Proposed Complete Streets Details (2050 MTP)
P-10	SR10 / W Broad Street Safety and Access Management - Phase 1	Convert existing 7-lane section from the Middle Oconee River to Hancock Avenue to median divided for access management between signalized intersections and safety improvements at key intersections; bicycle and pedestrian facilities are included.	Bicycle facilities should be protected and separated from vehicular traffic. Signalized intersections will be improved to prioritize pedestrian and bicycle crossings. Medians will be used to create pedestrian refuge islands to shorten crossing distances for pedestrians and bicyclists at any mid-block crossing locations identified. Improvements to include pedestrian scale lighting, especially at crossings and driveways.
P-14	Hawthorne Avenue Widening - Phase I	Widen to a 5-lane roadway from Broad St. to Oglethorpe Avenue. Pedestrian and bicycle facilities are included in this project.	Athens-Clarke County has been awarded a Reconnecting Communities grant for the Alps and Hawthorne corridor. The overall goal of the grant is to increase safety and advance connectivity through Complete Streets: including protected bike lanes, improved bus infrastructure, enhancing pedestrian safety, reducing crossing distances, optimize signals with the latest technology to reduce congestion during peak times, and implementing raised intersections. Improvements to the corridor and intersections along the corridor should reflect the improvements identified in the planning process.
P-15	Mitchell Bridge Rd / Timothy Rd Realignment	Realign Michell Bridge Road, Timothy Road, and Atlanta Hwy to create a 90-degree signalized intersection.	The realignment of the intersection will include pedestrian and bicycle prioritization at the signal for the Timothy Road multiuse path and the future Mitchell Bridge Road multiuse path.



Project ID	Project Name	2045 MTP Project Description	Proposed Complete Streets Details (2050 MTP)
P-16	Milledge Avenue Safety Improvements	Widen/reconstruct Milledge Ave to 2-lane typical section from Whitehall Rd. to E Campus Rd with 2-way center left turn lane and dedicated left turn lanes at key intersections. Included in the project are bicycle and pedestrian facilities. The 4-lane typical section in the vicinity of the SR 10 Loop will be retained.	The roadway widening will include a multiuse path from Riverbend Road to E Campus Road. The intersection of Riverbend Road will include upgrades to accommodate a bicycle facility transitioning from S Milledge to Riverbend Road. There will also be accommodations made at Macon Highway for the proposed separated bicycle facility connecting east. The intersection of Milledge and E Campus Road will include upgrades to safely accommodate bicycles to the shared use path on E Campus Road. Midblock pedestrian refuge and prioritized crossing features.
P-17	SR 10 Loop at College Station Road Interchange Improvements	Extend left-turn lanes on College Station Rd onto the SR 10 Loop entrance ramps; extend southbound receiving lanes for SB on-ramp; Install channelized right turn lane for westbound approach.	Upgrades to the intersection will include prioritized pedestrian and bicycle crossings. Pedestrian refuge islands will be built. Any extensions to the medians will include pedestrian refuge areas to shorten crossing distances.
P-18	Tallassee Road at Lavender Road Realignment	Realign the intersection to a typical 90-degree intersection with turn lanes as warranted.	Realigning the intersection will include a multiuse path along Tallassee and prioritized pedestrian/bicycle crossings.



Project ID	Project Name	2045 MTP Project Description	Proposed Complete Streets Details (2050 MTP)
P-19	Lexington Road Safety and Access Management	Convert existing 5-lane section (4 travel lanes with center turn lane) from Winterville Rd to Whit Davis Rd to median divided for access management between signalized intersections and safety improvements at key intersections; bicycle and pedestrian facilities - multiuse path will be included.	Improved bicycle/pedestrian crossings and pedestrian scale lighting, especially at midblock locations near neighborhoods, social services, and transit stops within new medians. Pedestrian crossings at medians with pedestrian refuge areas. A multiuse path at the intersection of Cherokee Road/Gaines School Road for North/South connectivity at the intersection. The intersection of Atlas Way with pedestrian and bicycle crossings to access the Firefly Trail connection.
P-20	SR10 Loop at Tallassee Road Interchange Improvement	Reconstruct existing interchange with extension of entrance ramps, add turn lanes to ramp intersections, and install traffic signal at outer loop ramp; bicycle and pedestrian facilities included.	Intersection reconstruction will tie together improvements from the Oglethorpe Connect Athens Reconnecting Communities Grant and the Tallassee Road Multiuse Path. The intersections will prioritize pedestrian and bicycle crossings through protected intersections. Any construction near the Mitchell Bridge Road intersection will include tying the Tallassee Road Multiuse Path and the Mitchell Bridge Road multiuse path together.
P-21	SR10 Loop at Chase Street Interchange Improvement	Reconstruct existing interchange with extension of entrance ramps and roundabouts at the ramp intersections.	Currently in design with multiuse path to Barber Street.
P-22	Timothy Road Corridor and Safety Improvements - Phase I	Reconstruct Timothy Road from Epps Bridge Parkway to Atlanta Highway to 2 standard travel lanes plus turn lanes at key intersections along the corridor. Bicycle and pedestrian improvements included in project.	Bicycle improvements include a 10-foot shared use path on one side and a sidewalk on the other. The intersections of Timothy Road/Mitchell Bridge Road and Timothy Road/Epps Bridge Parkway will include prioritized pedestrian crossings at the intersection and transitions to the shared use paths they will connect to.



Project ID	Project Name	2045 MTP Project Description	Proposed Complete Streets Details (2050 MTP)
P-23	SR10/ W Broad Street Safety and Access Management - Phase 2	Convert existing 4-lane section from Hancock Avenue to Pulaski Street to median divided for access management between signalized intersections and safety improvements at key intersections, including roundabout at Hancock and W. Broad; bicycle and pedestrian facilities are included.	Bicycle and pedestrian improvements include a multiuse path or other protected bicycle facility. All signalized intersections along the corridor will prioritize bicycle and pedestrian crossings. Unsignalized bicycle and pedestrian refuge islands in the new median to shorten crossing distances. Pedestrian scale lighting is included.
P-24	US129 / SR15 / Jefferson Road Safety Improvements	Install median and turn lanes at key intersections from SR 10 Loop to Lavendar Road.	Recommend extending project to County line due to fatality at Oak Grove Road. Any vehicular crossing improvements at railroads will include bicycle and pedestrian prioritized crossings. The intersections at Jefferson River Road will include transitions to the multiuse path currently in design. Intersection improvements at Whitehead Road and Lavendar Road, will include connections to the bicycle facility identified by Athens in Motion. Improved pedestrian lighting recommended. Sidewalk to be built and a multiuse path to be considered.
P-26	Whitehall Rd/Simonton Bridge Road Bridge Project	Reconstruct/improve bridge over Middle Oconee River	Include clearance, grading, and drainage improvements underneath new bridge to allow for the proposed North Oconee River Trail - South.
P-27	Fowler Drive Safety Improvements	Reconstruct Fowler Dr. to 2 standard travel lanes from Freeman Dr. to Danielsville Rd. Pedestrian improvements are included.	Sidewalk will be reconstructed to 6' wide with a new pedestrian crossing at Fowler Drive elementary school.



Project ID	Project Name	2045 MTP Project Description	Proposed Complete Streets Details (2050 MTP)
P-28	Hog Mountain Road Widening	Widen to 2-12 ft. lanes with turn lanes and bicycle and pedestrian facilities from Mars Hill Road to US 441.	Due to the high posted speeds, nearby Schools, and the suburban/rural nature of the roadway a separated multiuse path on one side of the road is recommended and a sidewalk on the other side. RRFB pedestrian crossings at Stonebridge Parkway and Government Station Road are recommended to be studied. Prioritized bicycle and pedestrian crossing at Mars Hill Road and Hog Mountain Road are recommended to access the schools.
P-29	Gaines School Road Safety and Access Management	Widen and convert to a 4-lane median divided for access management between signalized intersections and safety improvements at key intersections; bicycle and pedestrian facilities are included.	A separated facility, preferably a multiuse path, will be built on one side of the street. Transitioning from the multiuse path on Gaines School to Barnett Shoals will be included. Prioritized pedestrian and bicycle intersection improvements will be included at Cedar Shoals Drive to transition from multiuse path to buffered bicycle facilities. Crosswalk at McDonalds and Citgo will need pedestrian refuge at new median and RRFB's upgraded with pedestrian scale lighting since two pedestrian serious injuries have occurred at this crosswalk during dark lit conditions.



Project ID	Project Name	2045 MTP Project Description	Proposed Complete Streets Details (2050 MTP)
P-30	Daniels Bridge Rd Widening	Widen Daniels Bridge Road to add additional turn lanes and bicycle and pedestrian facilities from south of Mars Hill Road to Hog Mountain Road.	Due to the high posted speeds and the suburban/rural nature of the roadway a separated multiuse path on one side of the road is recommended and a sidewalk on the other side. RRFB pedestrian crossings at neighborhood entrances should be analyzed. The intersection of Hogs Mountain Road will include prioritized pedestrian and bicycle crossings to connect to the multiuse path and sidewalks recommended there.
P-32	SR 53/Mars Hill Rd. from SR 24/US 441 to SR 15 - Phase III	Widen to 4 lanes and construct turn lanes from the US 441 / Watkinsville Bypass to US 441 Business in Watkinsville. Sidewalks and bicycle lanes are included.	With the proximity to community facilities, proposed 4 travel lanes, and high speeds it is recommended that a multiuse path on the south side of the street and sidewalks on the north be built.
P-33	Spring Valley Rd. Safety Improvements	Improve Spring Valley Rd. From south of Indian Hills Rd to Voyles Rd to include turn lanes at key intersections. Sidewalks and bicycle facilities are included.	The Firefly trail funded by TSPLOST 2023 will provide a multiuse path along Spring Valley Road from Hancock Road to downtown Winterville. The remaining portion to Moores Grove Road is recommended to be a buffered bicycle lane. All intersections along the trail should be upgraded to prioritize bicycle and pedestrian crossings.



Project ID	Project Name	2045 MTP Project Description	Proposed Complete Streets Details (2050 MTP)
P-34	Hawthorne Avenue Widening - Phase 2	Widen to 5 lane roadways from Oglethorpe Avenue to Prince Avenue. Pedestrian and bicycle facilities will be included.	Athens-Clarke County has been awarded a Reconnecting Communities grant for the Alps and Hawthorne corridor. The overall goal of the grant is to increase safety and advance connectivity through Complete Streets: including protected bike lanes, improved bus infrastructure, enhancing pedestrian safety, reducing crossing distances, optimize signals with the latest technology to reduce congestion during peak times, and implementing raised intersections. Improvements to the corridor and intersections along the corridor should reflect the improvements identified in the planning process.
P-35	Jefferson River Rd. Safety Improvements	Widen Jefferson River Rd. to 2 standard lanes from Jefferson Rd. to Jackson County line. Bicycle and pedestrian facilities will be included.	TSPLOST 2018 is funding a 10- foot shared use path from Jefferson Road to Vincent Drive. The intersection of Vincent Drive and Jefferson River Road will include prioritized pedestrian and bicycle crossing for the neighborhood on W Vincent Drive. Sidewalks will continue north of Vincent Drive to the end of the project. A multiuse path can be considered continuing north of Vincent Drive. Coordination with the railroad to prioritize pedestrian and bicycle crossings should be included with the widening.
P-36	SR10 Loop at US441	Reconstruct existing interchange with extension of entrance ramps, add turn lanes to ramp intersections, and install traffic signal at outer loop ramp	Interchange reconstruction will include prioritized pedestrian and bicycle crossings, especially at on/off ramps due to pedestrian fatality



Project ID	Project Name	2045 MTP Project Description	Proposed Complete Streets Details (2050 MTP)
P-37	Timothy Road Corridor and Safety Improvements - Phase II	Reconstruct Timothy Road to 2 standard travel lanes with 2-way center turn lane plus turn lanes at key intersections along the corridor. Bicycle and pedestrian improvements included in project.	Bicycle improvements include a 10-foot shared use path on one side and a sidewalk on the other. The intersections of Timothy Road/Epps Bridge Parkway and Timothy Road/Timothy Road will include prioritized pedestrian crossings at the intersection and transitions to the shared use paths they will connect to.
P-41	SR 53 at Hog Mountain Road Intersection Improvements	Intersection improvement to include a signal or roundabout, turn lanes and lane widening.	Intersection reconstruction will include prioritized pedestrian and bicycle crossings from the Hog Mountain Road bicycle improvements to accommodate access for the schools.
P-42	Barnett Shoals Road	Widen/reconstruct Barnett Shoals Rd to 2 standard travel lanes plus turn lanes at key intersections along the corridor from Whitehall Rd. to Bob Godfrey Rd. Bicycle and Pedestrian improvements included in project.	Bicycle and pedestrian improvements include either a multiuse path or buffered facility. The intersections of Barnett Shoals/Whit Davis Rd and Belmont Rd will include pedestrian and bicycle crossings for the proposed buffered facilities on those roads. Intermittent pedestrian crossings with RRFB's will be studied and included with construction.
P-43	South Lumpkin Street at West Lake Drive Roundabout	Install roundabout at existing intersection with West Lake Drive.	Roundabout will include multiuse path for proposed bicycle facilities on Lumpkin and W Lake Drive.
P-46	Whitehall Road Widening	Widen to 2 standard travel lanes with turn lanes at key intersections from Barnett Shoals Rd. to Milledge Ave, widen to 4 lanes from Milledge Ave to the Oconee County line. Pedestrian and bicycle improvements included.	Bicycle facilities in four lane section should be separated from vehicular traffic through protected bike lanes or a multiuse path on one side of the street.



Project ID	Project Name	2045 MTP Project Description	Proposed Complete Streets Details (2050 MTP)
P-47	Lexington Highway Widening	NA	Any roadway widening will include continuing the shared use path along Whit Davis to Morton Road. If a median is recommended, crossings with pedestrian refuge islands near Southeast Clarke Park are recommended for neighborhoods to the North.
P-48	Simonton Bridge Road Widening	NA	Bicycle and pedestrian facilities are recommended, if widening is to four lanes, bicycle facilities should be separated from vehicular traffic through protected bike lanes or a multiuse path on one side of the street. The other side of the street should have a sidewalk.
P-52	Tallassee Road Widening	NA	Any roadway widening will include the multiuse path proposed for Tallassee Road that is currently in concept with SPLOST 2020. Intersections at Lavendar Road/Tallassee Road and Whitehead Road/Tallassee Road will include intersection connections to the proposed bicycle facilities for those roadways, currently identified as a buffered facility from Athens in Motion. Mid-block crossings for neighborhoods will be analyzed with any proposed medians to provide pedestrian refuge islands.
P-53	Olympic Drive / Indian Hills Road Widening	NA	Extents are incorrect, Olympic Drive/Indian Hills does not intersect with Beaverdam Road. Olympic Drive will include a separated bicycle facility, either a protected bicycle lane or multiuse path. The intersection of Athena Drive will include prioritized pedestrian and bicycle crossings to connect to proposed bicycle facility on Athena Drive.



Project ID	Project Name	2045 MTP Project Description	Proposed Complete Streets Details (2050 MTP)
P-54	SR 15/US 441 / Commerce Road from Loop 10 North to Clarke County Line	NA	Any roadway widening should include a multiuse path on one side of the street that connects neighborhoods to the North Oconee River Greenway, Sandy Creek Park, and Sandy Creek Nature Center. Intersections should include prioritized pedestrian and bicycle crossings at points of interest along the corridor.
P-55	Glenn Carrie Road Widening	NA	Any road widening will include sidewalks and examine the applicability of a multiuse path due to rural nature and speeding behavior on road. Road widenings with median will look at mid-block pedestrian crossings with pedestrian refuge islands.
P-56	Hodges Mill Road Widening	NA	Any road widening will include sidewalks and examine the applicability of a multiuse path due to rural nature and speeding behavior on road. Road widenings with median will look at mid-block pedestrian crossings with pedestrian refuge islands.
P-57	Union Church Road Improvement Project	NA	Any road widening will include sidewalks and examine the applicability of a multiuse path due to rural nature and speeding behavior on road. Road widenings with median will look at mid-block pedestrian crossings with pedestrian refuge islands. Prioritizing safe pedestrian/bicycle crossings near high school and from nearby neighborhoods is a priority.





Project ID	Project Name	2045 MTP Project Description	Proposed Complete Streets Details (2050 MTP)
P-59	Jimmie Daniel / Jimmy Daniell Road Widening	NA	Any road widening will include sidewalks and examine the applicability of bicycle facilities. Road widenings with median will look at mid-block pedestrian crossings with pedestrian refuge islands. Any bridge replacement at McNutt Creek will include drainage, grading, and room for the future McNutt Creek Trail.
P-60	Virgil Langford Road / Rocky Branch Road Widening	NA	Any road widening will include sidewalks and examine the applicability of bicycle facilities continuing from the Oconee Connector. Road widenings with median will look at mid-block pedestrian crossings with pedestrian refuge islands.
P-64	Clotfelter Road Widening	NA	Any road widening will include sidewalks and examine the applicability of bicycle facilities. A multiuse path should be considered to connect to elementary school and high school at the corner of Hog Mountain Road/Rocky Brand Road. Road widenings with median will look at mid-block pedestrian crossings with pedestrian refuge islands.
P-65	Macon Highway Bridge over Middle Oconee River	NA	Bridge replacement will include multiuse path or separate bicycle facility recommended from Athens in Motion. Include clearance, grading, and drainage improvements underneath new bridge to allow for the proposed, Middle Oconee River Trail.
P-69	SR 53 / Clotfelter Road Roundabout	NA	Roundabout will include pedestrian and bicycle facilities to connect to schools on SR 53.



Project ID	Project Name	2045 MTP Project Description	Proposed Complete Streets Details (2050 MTP)
P-70	Newton Bridge Rd Safety Improvements	NA	Any roadway widening will include a sidewalk and separated bicycle facility, a multiuse path or protected bicycle lane. The Paradise Blvd/Newton Bridge Road will include transition and build out to proposed high-priority North Oconee River Greenway. The Vincent Drive and Newton Bridge Road intersection will include prioritized pedestrian and bicycle crossings to connect to bicycle facility proposed on Vincent Drive. Well-lit pedestrian crossings are proposed to be studied along the corridor. If a median is proposed, pedestrian refuge areas are recommended at crossing locations. Any crossings at the railroad will include bicycle/pedestrian crossings.
P-72	Spratlin Mill Road Widening	NA	Any road widening will include sidewalks and examine the applicability of a multiuse path due to rural nature and speeding behavior on road. Road widenings with median will look at mid-block pedestrian crossings with pedestrian refuge islands.
P-74	Diamond Hill - Colbert Road Widening	NA	Any road widening will include sidewalks and examine the applicability of a multiuse path due to rural nature and speeding behavior on road. Road widenings with median will look at mid-block pedestrian crossings with pedestrian refuge islands.



SAFETY PROJECTS

Projects in **Table 2** are projects from the safety assessment that were not already included in the 2045 MTP. These are proposed to be new projects added into the 2050 MTP. These projects were identified as having safety concerns through being a location that a bicycle or pedestrian fatality or serious injury (KSI) occurred. The existing conditions assessment identified 65 bicycle and pedestrian KSI crashes in the MACORTS study area. The 2045 MTP project list already included 23 of those crash locations. There were 35 crashes identified for further analysis in the ongoing Athens-Clarke County's Safety Action Plan (SAP) efforts to define specific treatments and countermeasures to be included as projects in the future. There are seven total projects identified from the assessment to be included in the 2050 MTP.

Project Name	From	То	Description
Cleveland Road Connector	SR 8	Georgia Square Mall	A multiuse path connection for Cleveland Road Elementary School and Georgia Square Mall. Pedestrian/Bicycle crossings to be studied as part of the project.
College Station Road Safety Upgrades	Riverbend Road	Barnett Shoals Road	Upgrades to the existing bicycle facilities to make them protected on both sides of the street. Upgrade intersections to prioritize pedestrian and bicycle crossings with lighting and raised intersections. Build concrete/landscape medians for access management where existing painted medians are. Improve pedestrian and bicycle prioritization at Riverbend Road intersection and connect to proposed multiuse path.
Cherokee Road Safety Improvements	Beaverdam Road	Athens Road	Continue multiuse path from Beaverdam Road to the Firefly Trail on Main Street in Winterville. Study midblock pedestrian crossings and include pedestrian scale lighting. Provide crossings at Winterville Elementary School. Athens Road intersection to include prioritized pedestrian and bicycle crossings to the Firefly Trail.
N Main Street Safety Improvements	Watkinsville Bypass	Highway 53	A sidewalk is recommended to connect neighborhoods along N Main Street to downtown Watkinsville. A multiuse path should be studied. Prioritized pedestrian crossings at Fuller Road are recommended.
Old Lexington Road Safety Improvements	Whit Davis Road	Morton Road	Build sidewalk on south side of street and prioritized pedestrian crossings at Homestead Drive. Build bicycle facility recommended from Athens in Motion. Project will connect to Whit Davis Elementary School.
SR 53 Safety Improvements	Hog Mountain Road	Bishop Farms Parkway	Build a multiuse path on one side of the street and a sidewalk on the other to connect schools and the library. Include prioritized pedestrian crossings for neighborhoods. Tie into intersection improvements at Mars Hill and Hog Mountain Road.

Table 2: Safety Projects



Atlanta Highway Safety Improvements	Georgia Square Mall Drive	Epps Bridge Parkway	Athens-Clarke County has been awarded a Reconnecting Communities grant for the Alps and Hawthorne corridor. The overall goal of the grant is to increase safety and advance connectivity through Complete Streets: including protected bike lanes, improved bus infrastructure, enhancing pedestrian safety, reducing crossing distances, optimize signals with the latest technology to reduce congestion during peak times, and implementing raised intersections. Improvements to the corridor and intersections along the corridor should reflect the improvements identified in the planning process.

MULTIMODAL GAPS

The final methodology identified key gaps through planned/proposed bicycle or pedestrian facilities from Athens in Motion, key points of interests, and staff identified priorities that would improve multimodal connectivity throughout the transportation network. These included four new projects to be included in the 2050 MTP.

Table 3: Multimodal Gap Projects

Project Name	From	То	Description
Tallassee Road Safety Improvements	Lavendar Road	SR 10	A multiuse path on one side of the street with enhanced pedestrian and bicycle crossings to be studied. This would tie into the improvements coming in from the Reconnecting Connecting Communities grant for Hawthorne Ave.
Vincent Drive Safety Improvements	Jefferson River Road	Newton Bridge Road	A multiuse path on one side of the street with enhanced pedestrian and bicycle crossings. This will connect the Jefferson River Road multiuse path and Newton Bridge Road multiuse path.
Barber Street Safety Improvements	Prince Avenue	Chase Street	New sidewalks, multiuse paths, bike lanes, and separated bike lanes. The intersections of Prince Avenue/Barber Street and Chase Street/Barber Street will have prioritized pedestrian and bicycle crossings.
Oglethorpe Avenue Safety Improvements	Prince Avenue	Mitchell Bridge Road	Athens-Clarke County has been awarded a Reconnecting Communities grant for the Alps and Hawthorne corridor. The overall goal of the grant is to increase safety and advance connectivity through Complete Streets: including protected bike lanes, improved bus infrastructure, enhancing pedestrian safety, reducing crossing distances, optimize signals with the latest technology to reduce congestion during peak times, and implementing raised intersections. Improvements to the corridor and intersections along the corridor should reflect the improvements identified in the planning process.



Safety Countermeasures

The Federal Highway Administration (FHWA) has a collection of 28 Proven Safety Countermeasures (PSCi)¹ and strategies that are effective in reducing roadway fatalities and serious injuries. These strategies align with the goals of Complete Streets by being designed for all road users of all kinds of roads. **Table 4** shows the safety countermeasures identified to tackle safety issues at crashes impacting pedestrians, bicyclists, and intersections.

Safety Countermeasure	Pedestrian	Bicyclists	Intersections
Appropriate Speed Limits for All Road Users	Х	Х	Х
Backplates with Retroflective Borders			Х
Bicycle Lanes		Х	
Corridor Access Management	Х	Х	Х
Crosswalk Visibility Enhancement	Х	Х	Х
Dedicated Left- and Right-Turn Lanes at Intersections	Х	Х	Х
Leading Pedestrian Interval	Х		Х
Lighting	Х	Х	Х
Local Road Safety Plans	Х	Х	Х
Longitudinal Rumble Strips and Stripes on Two-Lane		Х	
Roads			
Medians and Pedestrian Refuge Island in Urban and	X		X
Pavement Friction Management	X		X
Pedestrian Hybrid Beacons	X		
Rectangular Flashing Beacons (RRFB)	X		
Reduced Left-Turn Conflict Intersections	Х	Х	Х
Road Diets (Roadway Reconfiguration)	Х	Х	Х
Road Safety Audit	Х	Х	Х
Roadside Design Improvements at Curves	Х		
Roundabouts	Х	Х	Х
Speed Safety Cameras	Х	Х	Х
Systemic Application of Multiple Low-Cost	Х	Х	Х
Countermeasures at Stop-Controlled Intersections			
Walkways	X	Х	Х
Yellow Change Intervals			Х

Table 4: Proven Safety Countermeasures

Of the 28 PSCi, 24 are recommended within the toolbox when focusing on pedestrian, bicycle, and intersection safety. The four excluded are: Enhanced Delineation for Horizontal Curves, Median Barriers, SafetyEdgeSM, and Wider Edge Lines. The 24 PSCi's should be used as part of the design process to identify design options to combat safety concerns identified from the 2050 MTP crash analysis and Athens-Clarke County's ongoing Safety Action Plan. Design guidance for these items can be found in the Design Guidance section.

¹USDOT Proven Safety Countermeasures https://highways.dot.gov/safety/proven-safety-countermeasures

Design Guidance

Athens in Motion has guidance on design standards for bicycles and pedestrians. The following pages summarize some of the key design principles applicable for the Complete Streets recommendations made in the 2050 MTP. For full design guidance, it is recommended to reference Athens in Motion's Appendix D. For the purposes of this memo, bicycle facilities, pedestrian facilities, and speed management are focused here due to their impact on safety and Complete Streets.

BICYCLE USERS AND DEFINING ALL AGES ALL ABILITIES

In the context of Complete Streets, bicycle users encompass a diverse range of individuals with varying levels of skill, experience, and comfort. This includes everyone from confident cyclists who are comfortable navigating busy streets to more cautious riders, such as children, seniors, and those using mobility assistance devices.

The "All Ages and Abilities" approach aims to design streets that are safe, comfortable, and accessible for all potential users, regardless of their age or physical ability. This philosophy ensures that bicycle facilities are designed to accommodate the most vulnerable users, promoting inclusivity and encouraging a broader spectrum of people to use bicycles as a mode of transportation. By prioritizing safety and comfort, Complete Streets create environments where cycling is a viable and appealing option for everyone, contributing to a more equitable and sustainable transportation network.



BICYCLE FACILITY OVERVIEW



TYPICAL APPLICATION²

Shared use paths will generally be considered on any road with one or more of the following characteristics:

- Total traffic lanes: Three lanes or greater.
- Posted speed limit: 30 mph or greater.
- Average Daily Traffic: 9,000 vehicles or greater
- Parking turnover: frequent
- Bike lane obstruction: likely to be frequent.
- Streets that are designated as truck or bus routes.

Shared use paths may be preferable to separated bike lanes in low density areas where pedestrian volumes are anticipated to be fewer than 200 people per hour on the path. Separated bike lanes will generally be considered on any road with one or more of the following characteristics:

- Total traffic lanes: 3 lanes or greater.
- Posted speed limit: 30 mph or more.
- Average Daily Traffic: 9,000 vehicles or greater.
- Parking turnover: frequent
- Bike lane obstruction: likely to be frequent.
- Streets that are designated as truck or bus routes.

Preferred in higher density areas, adjacent to commercial and mixed-use development, and near major transit stations or locations where observed or anticipated pedestrian volumes will be higher. Buffered bike lanes will be considered on any road with one or more of the following characteristics:

- Total traffic lanes: three lanes or fewer.
- Posted speed limit: 30 mph or lower.
- Average Daily Traffic: 9,000 vehicles or fewer
- Parking turnover: infrequent.
- Bike lane obstruction: likely to be infrequent.
- Where a separated bike lane or sidepath is infeasible or not desirable.

² Athens-in-Motion-Plan---Appendix-D---Design-Guidance





TYPICAL APPLICATION³

Conventional bike lanes will be considered on any road with one or more of the following characteristics:

- Total traffic lanes: three lanes or fewer.
- Posted speed limit: 30 mph or lower.
- Average Daily Traffic: 9,000 vehicles or fewer
- Parking turnover: infrequent
- Bike lane obstruction: likely to be infrequent.
- Where a separated bike lane or sidepath is infeasible or not desirable

Shoulder bike lanes can be considered on any road without on-street parking and one or more of the following characteristics:

- Total traffic lanes: three lanes or fewer.
- Average Daily Traffic: Up to 8,000 vehicles
- Shoulder obstruction: likely to be infrequent.
- Where a separated bike lane or sidepath is infeasible or not desirable

The minimum width of a shoulder bikeway is 4 feet (exclusive of the gutter if one exists). Wider shoulders should be provided on streets or roads with average daily traffic higher than 3,500 vehicles. Shared roadways can be considered on any road with one or more of the following characteristics:

- Total traffic lanes: three lanes or fewer.
- Posted speed limit: 25 mph or lower.
- Average Daily Traffic: Up to 3,000 vehicles
- Where a separated bike lane or sidepath is infeasible or not desirable

³ Athens-in-Motion-Plan---Appendix-D---Design-Guidance



NATIONAL STANDARDS AND RESOURCES

The publications listed here are valuable resources for planning and designing safe, comfortable accommodations for pedestrians and bicyclists in various environments.





BICYCLE FACILITY SELECTION

The type of bicycle facility for a street is crucial to creating an effective multimodal transportation network. Even with extensive bicycle infrastructure, if the facilities are poorly matched to the type of streets, they may see little use and be considered unsuccessful. It is essential to align the facility type with the street to ensure comfort, safety, and mobility for all users. This selection process involves balancing community priorities, local land use, engineering judgment, funding, and the physical constraints of the street. Facility selection is an ongoing process; as more data and context become available, the chosen facility type may evolve. The FHWA Bikeway Selection Guide is a useful resource, offering guidance based on vehicle speed and traffic volumes, but these factors should be considered alongside physical constraints, community preferences, and budgetary considerations.

Preferred Bikeway Type: FHWA Bikeway Selection Guide



Notes

- 1 Chart assumes operating speeds are similar to posted speeds. If they differ, use operating speed rather than posted speed.
- 2 Advisory bike lanes may be an option where traffic volume is <3K ADT.
- 3 See page 32 for a discussion of alternatives if the preferred bikeway type is not feasible.



Bike Lanes

Bicycle lanes designate exclusive spaces for one-way bicycle travel, marked by lines and symbols on the roadway. These lanes are typically found on both sides of two-way streets or one side of one-way streets. Cyclists can leave the bike lane when necessary for turns, passing, or other maneuvers. Vehicles may only enter bike lanes temporarily to access parking, driveways, or alleys, but stopping, standing, and parking in bike lanes are prohibited.



Bike Lane Adjacent to a Curb

Bike Lane Adjacent to Parking

Bike Lane with Door Zone Marking

GUIDANCE

- CONSIDERATIONS
 Typically installed by reallocating existing street space.
- Can be used on one-way or two-way streets.
- Contra-flow bicycle lanes may be used to allow two-way bicycle travel on streets designated for one-way travel for motorists to improve bicycle network connectivity.
- Stopping, standing, and parking in bike lanes may be problematic in areas of high parking demand and deliveries, especially in commercial areas.
- Wider bike lanes or buffered bike lanes are preferable at locations with high parking turnover.

- The minimum width of a bike lane adjacent to a curb is five feet exclusive of a gutter, a desirable width is 6 feet. (1)
- The minimum width of a bike lane adjacent to parking is 5 feet, a desirable width is 6 feet. (2)
- Parking T's or hatch marks can highlight the door zone on constrained corridors with high parking turnover to guide bicyclists away from doors. (3)

REFERENCE: AASHTO. GUIDE FOR THE DEVELOPMENT OF BICYCLE FACILITIES. 2012. NACTO. URBAN BIKEWAY DESIGN GUIDE. 2ND EDITION.

Buffered Bike Lanes

Buffered bicycle lanes are created by adding a buffer zone between the bicycle lane and the adjacent travel lane. This buffer enhances bicyclist comfort by separating them from motor vehicle traffic. In areas with high parking turnover, buffers can also be placed between the bicycle lane and parking lanes to keep cyclists safely away from parked vehicles.



Buffered Bike Lane Adjacent to a Curb

CONSIDERATIONS

- Preferable to a conventional bicycle lane when used as a contra-flow bike lane on one-way streets.
- Typically installed by reallocating existing street space.
- Can be used on one-way or two-way streets.
- Consider placing buffer next to parking lane where there is commercial or metered parking.
- Consider placing buffer next to travel lane where speeds are 30 mph or greater or when traffic volume exceeds 6,000 vehicles per day.
- Where there is 7 feet of roadway width available for a bicycle lane, a buffered bike lane should be installed instead of a conventional bike lane.



Buffered Bike Lane Adjacent to Parking

GUIDANCE

- The minimum width of a buffered bike lane adjacent to parking is 4 feet, a desirable width is 6 feet. (1)
- Buffers are to be broken where curbside parking is present to allow cars to cross the bike lane. (2)
- The minimum buffer width is 18 inches. There is no maximum. Diagonal cross hatching should be used for buffers <3 feet in width. Chevron cross hatching should be used for buffers >3 feet in width. (3)

REFERENCE: AASHTO. GUIDE FOR THE DEVELOPMENT OF BICYCLE FACILITIES. 2012. NACTO. URBAN BIKEWAY DESIGN GUIDE. 2ND EDITION. PORTLAND STATE UNIVERSITY, CENTER FOR TRANSPORTATION STUDIES. EVALUATION OF INNOVATIVE BICYCLE FACILITIES: SW

BROADWAY CYCLE TRACK & SW STARK/OAK STREET BUFFERED BIKE LANES FINAL REPORT. 2011.

Separated Bike Lanes

Separated Bike Lanes are an exclusive bikeway facility type that combines the user experience of a sidepath with the on-street infrastructure of a conventional bike lane. They are physically separated from motor vehicle traffic and distinct from the sidewalk.





CONSIDERATIONS

Separated bike lanes can provide distinct levels of separation:

- Separated bike lanes with flexible delineator posts ("flex posts") alone offer the least separation from traffic and are appropriate as interim solution.
- Separated bike lanes that are raised with a wider buffer from traffic provide the greatest level of separation from traffic but will often require road reconstruction.
- Separated bike lanes that are protected from traffic by a row of on-street parking offer a high-degree of separation.



GUIDANCE

Separated bike lanes can generally be considered on any road with one or more of the following characteristics:

- Traffic lanes: 3 lanes or more.
- Posted speed limit: 30 mph or more.
- Traffic: 9,000 vehicles per day or more.
- On-Street parking turnover: frequent.
- Bike lane obstruction: likely to be frequent.
- Streets that are designated as truck or bus routes.

Separated bike lanes are preferred over sidepaths in higher density areas, commercial and mixed-use development, and near major transit stations or locations where pedestrian volumes are anticipated to exceed 200 people per hour on a shared use path.

REFERENCE: NACTO. URBAN BIKEWAY DESIGN GUIDE. 2ND EDITION. MASSDOT. SEPARATED BIKE LANE PLANNING AND DESIGN GUIDE. 2015

Determining Widths in Constrained Corridors

When designing separated bike lanes in constrained corridors, designers may need to minimize some portions of the cross section, including separated bike lane zones, to achieve a context-sensitive design that safely and comfortably accommodates all users.



CONSIDERATIONS

- Space allocation can vary between midblock locations and intersection approaches. Narrowing midblock street buffers may allow for wider sidewalk buffers or bike lanes. At intersection approaches, eliminating the midblock sidewalk buffer can create a wider street buffer, enhancing intersection safety.
- The street buffer is essential for the safety of separated bike lanes and should be maintained whenever possible, especially at intersections. To create a larger street buffer at intersections, the bike lane can be tapered toward the sidewalk, or the sidewalk buffer can be narrowed or eliminated.
- In areas with high pedestrian demand, such as commercial zones, raised separation between the sidewalk buffer and bike lane is ideal to prevent pedestrians from walking in the bike lane and cyclists from riding on the sidewalk. If raised separation is not feasible, using stained surfaces or surface colorization materials with high visual contrast is necessary to clearly distinguish the bike lane from the sidewalk.

GUIDANCE

Zone spatial tradeoff prioritization (1 is lowest-priority use, 5 is highest-priority use):

- Designers should prioritize reduction of the space allocated to the street before narrowing other spaces. This reduction can include decreasing the number of travel lanes, narrowing existing lanes or adjusting on-street parking. (1)
- The sidewalk should not be narrowed beyond the minimum necessary to accommodate pedestrian demand. (2)
- The sidewalk buffer can be eliminated in areas with low pedestrian volume. However, in areas with higher pedestrian traffic, it's important to provide vertical separation or clear delineation between the bike lane and sidewalk. (3)
- The street buffer is essential for the safety of separated bike lanes and should not be narrowed or eliminated whenever possible. At midblock locations, the buffer should be at least 2 feet wide, while at intersections, it should range between 6 and 20 feet to maximize safety. If the buffer is reduced to less than 6 feet, consider implementing a raised bicycle crossing or signal phase separation. (4)
- The bike lane width should not be reduced below 6.5 feet.
- for one-way bike lanes and 8 feet for two-way bikeways, to ensure bicyclists can safely pass other bicyclists. (5)

REFERENCE: NACTO. URBAN BIKEWAY DESIGN GUIDE. 2ND EDITION. MASSDOT. SEPARATED BIKE LANE PLANNING AND DESIGN GUIDE. 2015

Separated Bike Lane - Two-way Sidewalk Level

This treatment provides an exclusive, bi-directional operating space for bicyclists between the street and sidewalk that is at the same elevation as the sidewalk. It is physically separated from motor vehicles and pedestrians by vertical and horizontal elements.



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CONSIDERATIONS

Sidewalk-level bike lanes:

- May encourage pedestrian and bicyclist encroachment unless discouraged with a continuous sidewalk buffer.
- Requires no transition for raised bicycle crossings at driveways, alleys or streets.
- May provide level landing areas for parking, loading or bus stops along the street buffer.
- May reduce maintenance needs by prohibiting debris build up from roadway runoff.
- May simplify snow plowing operations.
- Allow bicyclists to use a portion of the sidewalk or street buffer to pass other bicyclists in constrained corridors where sidewalk buffers are eliminated.

Two-way separated bike lanes require careful design to transition contra-flow cyclists into existing bike lanes and shared travel lanes. Since motorists might not anticipate cyclists approaching from both directions, it's crucial to implement detailed safety treatments at alley, driveway, and cross street crossings to enhance safety in these areas.

REFERENCE: NACTO. URBAN BIKEWAY DESIGN GUIDE. 2ND EDITION. MASSDOT. SEPARATED BIKE LANE PLANNING AND DESIGN GUIDE. 2015. FHWA. SEPARATED BIKE LANE PLANNING AND DESIGN GUIDE. 2015.

GUIDANCE

The recommended minimum width of the bicycle lane is:



at least 10 ft. recommended to enable passing movements

Bidirectional	Bike Lane Width (ft.)		
Peak Hour	Rec.	Min.*	
<150	10.0	8.0	
150-400	11.0	10.0	
>400	14.0	11.0	

Separated Bike Lane – Two-way Street Level

This treatment provides an exclusive, bi-directional operating space for bicyclists between the street and sidewalk that is located at the same elevation as the street. It is physically separated from motor vehicles and pedestrians by vertical and horizontal elements.



CONSIDERATIONS

Sidewalk-level bike lanes:

- Preserve separation between bicyclists and pedestrians where sidewalk buffers are eliminated.
- Ensures a detectable edge is provided for people with vision disabilities.
- May increase maintenance needs to remove debris from roadway runoff unless street buffer is raised.
- May complicate snow plowing operations.
- May require careful consideration of drainage design and in some cases may require catch basins to manage bike lane runoff.

Two-way separated bike lanes will require special attention to transition the contra-flow bicyclist into existing bike lanes and shared travel lanes.

Depending on context, motorists may not expect bicyclists to approach crossings from both directions. For this reason, two way separated bike lanes may require detailed treatments at alley, driveway, and cross street crossings to enhance the safety of these crossings.

REFERENCE: NACTO. URBAN BIKEWAY DESIGN GUIDE. 2ND EDITION. MASSDOT. SEPARATED BIKE LANE PLANNING AND DESIGN GUIDE. 2015. FHWA. SEPARATED BIKE LANE PLANNING AND DESIGN GUIDE. 2015.

GUIDANCE

 The recommended minimum width of the bicycle lane is:



at least 10 ft. recommended to enable passing movements

Bidirectional Bicyclists/ Peak Hour	Bike Lane	Bike Lane Width (ft.)		
	Rec.	Min.*		
<150	10.0	8.0		
150-400	11.0	10.0		
>400	14.0	11.0		



PEDESTRIAN FACILITY TYPES

Sidewalks

Sidewalks are essential to the character, function, enjoyment, and accessibility of neighborhoods, main streets, and community destinations. Typically located within the public right-of-way, next to property lines or building faces, sidewalks provide a designated space for pedestrians. They also create separation from vehicles and accommodate street trees, stormwater infrastructure, streetlights, and bicycle racks in the space between sidewalks and roadways.

Frontage Zone: The Frontage Zone is the portion of the sidewalk that directly borders buildings along the street. In residential areas, it might include front porches, stoops, lawns, or landscaping that extends from the front door to the sidewalk. In commercial areas, the Frontage Zone may feature architectural elements, outdoor retail displays, café seating, awnings, signage, or other uses of the public right-of-way. The width of Frontage Zones can range from a few feet to several yards.

Pedestrian Zone: Also called the "walking zone," this part of the sidewalk is dedicated to active travel. It must remain free of obstacles and be wide enough to comfortably accommodate expected pedestrian volumes, including those using mobility devices, pushing strollers, or pulling carts. To support the social aspect of the street, the width should allow pedestrians to pass singly, in pairs, or in small groups, depending on the area's density and land use.

Amenity Zone: The Amenity Zone, also known as the "landscape zone," is situated between the curb and the Pedestrian Zone. This area contains various street fixtures such as streetlights, trees, bicycle racks, parking meters, signposts, signal boxes, benches, trash and recycling bins, and other amenities. In commercial areas, the zone typically features hardscape pavement, pavers, or tree grates, while in residential or lower-intensity areas, it often consists of a planted strip. The Amenity Zone can also serve as a temporary snow storage area during emergencies, though snow should not obstruct access to key mobility fixtures like parking meters, bus stops, and curb ramps. Additionally, Stormwater Best Management Practices (BMPs) are often located in this zone.

The Curb: While not a zone, the curb is a crucial element of the street. It serves as the boundary between the pedestrian and vehicular domains, providing a physical barrier that creates vertical separation between the street and sidewalk. In combination with the gutter and stormwater inlets, the curb also plays a key role in draining water from the sidewalk, roadway, and sometimes adjacent properties.

REFERENCE:

NACTO Urban Street Design Guide (2013) Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG; 2011)

Curb Extensions

Curb extensions, also known as neckdowns, bulb-outs, or bump-outs, are created by extending the sidewalk at corners or mid-block. They are designed to enhance safety, calm traffic, and provide additional space along sidewalks for pedestrians and amenities.



GUIDANCE

- The turning needs of emergency and larger vehicles should be considered in curb extension design.
- Care should be taken to maintain direct routes across intersections aligning pedestrian desire lines on either side of the sidewalk. Curb extensions often make this possible as they provide extra space for grade transitions.
- Consider providing a 20' long curb extension to restrict parking within 20' of an intersection.
- When curb extensions conflict with turning movements, the reduction of width and/or length should be prioritized over elimination.
- Emergency access is often improved through the use of curb extensions as intersections are kept clear of parked cars.
- Curb extensions should be considered only where parking is present or where motor vehicle traffic deflection is provided through other curbside uses such as bicycle share stations or parklets.

- Curb extensions are particularly valuable in locations with high volumes of pedestrian traffic, near schools, at unsignalized pedestrian crossings, or where there are demonstrated pedestrian safety issues.
- A typical curb extension extends the approximate width of a parked car (or about 6' from the curb).
- The minimum length of a curb extension is the width of the crosswalk, allowing the curvature of the curb extension to start after the crosswalk, which should deter parking; NO STOPPING signs should also be used to discourage parking. The length of a curb extension can vary depending on the intended use (i.e., stormwater management, transit stop waiting areas, restrict parking).
- Curb extensions should not reduce a travel lane or a bicycle lane to an unsafe width.

REFERENCE: AASHTO GUIDE FOR THE DEVELOPMENT OF BICYCLE FACILITIES (2012) NACTO URBAN STREETS DESIGN GUIDE (2012) - CURB EXTENSIONS

Marked Crosswalks

Legal crosswalks exist wherever sidewalks meet the roadway, even without pavement markings. Drivers are required to yield to pedestrians at intersections, regardless of markings. Marked crosswalks signal to drivers that pedestrians might be present and guide pedestrians to safe crossing locations. In addition to pavement markings, crosswalks can include signals, beacons, warning signs, and raised platforms.



GUIDANCE

- Place on all legs of signalized intersections, in school zones, and across streets with more than minor levels of traffic.
- Crosswalks should be at least 10 feet wide or the width of the approaching sidewalk if it is greater. In areas of heavy pedestrian volumes, crosswalks can be up to 25 feet wide.
- Stop lines at stop-controlled and signalized intersections should be striped no less than 4 feet and no more than 30 feet from the approach of crosswalks.
- Add rapid-flash beacons, signals, crossing islands, curb extensions, and/or other traffic-calming measures when ADT exceeds 12,000 on 4-lane roads or speeds exceed 40 mph on any road.
- Designs should balance the need to reflect the desired pedestrian walking path with orienting the crosswalk perpendicular to the curb; perpendicular crosswalks minimize crossing distances and therefore limit the time that pedestrians are exposed.

REFERENCE: NACTO URBAN STREET DESIGN GUIDE (2013)

SAFETY EFFECTS OF MARKED VERSUS UNMARKED CROSSWALKS AT UNCONTROLLED LOCATIONS: FINAL REPORT AND RECOMMENDED GUIDELINES (2005)

PROPOSED GUIDELINES FOR PEDESTRIAN FACILITIES IN THE PUBLIC RIGHT-OF WAY (PROWAG; 2011)

ADA ACCESSIBILITY GUIDELINES (2004)

MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (2009)

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Crossing/Refuge Island

Crossing islands are raised islands that provide a pedestrian refuge and allow multi-stage crossings of wide streets. They can be located along the centerline of a street, as roundabout splitter islands, or as "pork chop" islands where right-turn slip lanes are present.



	CONSIDERATIONS		GUIDANCE
•	Install Crossing Islands where crossing	-	Minimum width: 6 feet
	distances exceed 50 feet to facilitate	•	Preferred width: 8 feet (to accommodate
	multi-stage crossings and shorter		bicyclists and wheelchair users)
	signal phases.		Curb ramps with truncated dome detectable
•	Cut-Through Widths should match the		warnings and 5' by 5' landing areas are
	width of the crosswalk but can be wider		required.
	for debris and snow clearance. Avoid		A "nose" that extends past the crosswalk is
	designs that encourage U-turns.		not required but is recommended to protect
			people waiting on the crossing island and to
			slow turning drivers.

 Vegetation and other aesthetic treatments may be incorporated but must not obscure visibility.

REFERENCE: NACTO URBAN STREET DESIGN GUIDE (2013) MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (2009)

Signal Timing for Pedestrians

Pedestrian signal heads manage crossing times with three key intervals: the Walk Interval (WALK symbol) signals pedestrians to start crossing; the Pedestrian Change Interval (flashing DON'T WALK symbol with a countdown) advises not to begin crossing but allows those already in the crosswalk to finish; and the Don't Walk Interval (steady DON'T WALK symbol) indicates that pedestrians should not cross.

GUIDANCE

- Pedestrian signals should allocate enough time for pedestrians of all abilities to safely cross the roadway. The MUTCD specifies a pedestrian walking speed of 3.5 feet per second to account for an aging population. The minimum pedestrian clearance time, which is the total time for the pedestrian change interval plus the buffer interval, is calculated using the pedestrian walking speed and the distance a pedestrian has to cross the street. To the extent feasible, pedestrian clearance time should be maximized.
- Countdown pedestrian displays inform pedestrians the amount of time in seconds available to safely cross during the flashing DON'T WALK (or upraised hand) interval. All pedestrian signal heads should contain a countdown display provided with the DON'T WALK indication.
- In areas with higher pedestrian activity, such as near transit stations, and main streets, push button actuators may not be appropriate. People should expect to get a pedestrian cycle at every signal phase, rather than having to push a button to call for a pedestrian phase.

Leading Pedestrian Interval

The Leading Pedestrian Interval initiates the pedestrian WALK indication three to seven seconds before motor vehicles traveling in the same direction are given the green indication. This signal timing technique allows pedestrians to enter the intersection prior to turning vehicles, increasing visibility between all modes.

- The LPI should be used at intersections with high volumes of pedestrians and conflicting turning vehicles and at locations with a large population of older adults or school children who tend to walk slower.
- A lagging protected left arrow for vehicles should be provided to accommodate the LPI.

Reference: NACTO Urban Street Design Guide (2013) Manual on Uniform Traffic Control Devices (2009)



Pedestrian Hybrid Beacon

The pedestrian hybrid beacon (PHB) is a traffic control device designed to help pedestrians safely cross higher-speed roadways at midblock crossings and uncontrolled intersections. The beacon head consists of two red lenses above a single yellow lens. The lenses remain "dark" until a pedestrian desiring to cross the street pushes the call button to activate the beacon, which then initiates a yellow to red lighting sequence consisting of flashing and steady lights that directs motorists to slow and come to a stop, and provides the right of-way to the pedestrian to safely cross the roadway before going dark again.



Sequence for a PHB. Source: MUTCD 2023 Edition, Chapter 4J, FHWA

GUIDANCE

- PHBs are used where it is difficult for pedestrians to cross a roadway, such as when gaps in traffic are not sufficient or speed limits exceed 35 miles per hour.
- Locations where three or more lanes will be crossed, or traffic volumes are above 9,000 annual average daily traffic.
- PHB must also include a marked crosswalk and pedestrian countdown signal.
- If PHBs are not already familiar to a community, agencies should conduct appropriate education and outreach as part of implementation.

Reference: Manual on Uniform Traffic Control Devices, Chapter 4J. FHWA, (2023).

Pedestrian Scramble

Pedestrian crossings in all directions, including diagonally across the intersection, is often called a pedestrian scramble. These facilities include painted crosswalks at all four legs of the intersection and diagonally, and they are usually supplemented with pedestrian-only phasing.



CONSIDERATIONS

- "Pedestrian scrambles" should be considered at intersections where there are high volumes of pedestrians in all directions. Intersections near schools, senior housing, recreation areas, medical facilities, or other major vulnerable pedestrian attractors are potential locations for scramble designs and signaling.
- Removing permissive turning movements can have added safety benefits during a pedestrian-only phase.
- Typically, these designs increase waittimes for all users— including pedestrians—so scrambles should be considered in places where there is necessity for pedestrian only movements.

GUIDANCE

- These designs are suitable at intersections with significant pedestrian use and high conflicting vehicular movements (greater than 250 per hour or meeting other local/state requirements).
- Use 3.5 feet per second as a measure of pedestrian travel time to determine timing for pedestrians crossing intersections diagonally.
- All bicycle movements must yield to pedestrian movements at these intersections.
- Designated crossing areas in all directions should be striped (as specified in this guide) and equipped ADA ramps.

REFERENCE: http://streetsillustrated.seattle.gov/design-standards/intersections/its/ http://streetsillustrated.seattle.gov/design-standards/bicycle/bike-intersection-design/ exclusive pedestrian phase design element, ladot complete streets committee, Jan 2017.

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Raised Crosswalks

Raised crosswalks enhance pedestrian visibility, calm traffic, and increase motorist yielding to those walking, wheeling, biking, or using micromobility devices at intersections and midblock crossings. By elevating the crosswalk, transitions from the sidewalk to the street are minimized or eliminated. Transition aprons on each approach are marked with pavement markings to alert drivers of the grade change.



CONSIDERATIONS	GUIDANCE
 Intersections where the speed of left turn 	 Install a narrow (1' to 2' in width) raised
movements need to be slowed.	median along the path of the centerline;
 Consider the turning movements of 	precast concrete or modular medians work
larger vehicles, like trucks and buses,	well.
when determining how much of the	 Add flex-posts or other vertical delineators
centerline to harden.	for additional deterrence
 While hardened centerlines provide a 	
significant enough obstacle to keep	
motor vehicles from "cutting the corner,"	
they are also low-profile enough to allow	
for emergency vehicle access.	

REFERENCE: NACTO DON'T GIVE UP AT THE INTERSECTION

SPEED MANAGEMENT

Lane Narrowing

Lane narrowing can improve comfort and safety for vulnerable road users. Narrowing lanes creates space that can be reallocated to other modes, in the form of wider sidewalks, bike lanes, and buffers between cyclists, pedestrians and motor vehicles. Space can also be dedicated to plantings and amenity zones and reduces crossing distances at intersections.





ROADWAY BEFORE NARROWING

NARROWING MOTOR VEHICLE LANES TO INCREASE SIDEWALK AND AMENITY ZONES



NARROWING MOTOR VEHICLE LANES TO INCREASE AMENITY ZONE AND ADD BICYCLE LANES

CONSIDERATION	GUIDANCE
Narrowing existing motor vehicle lanes may	 Motor vehicle travel lanes as narrow as 10
result in enough space to create separated bicycle lanes, widened sidewalks and buffers, or a combination of on-street bike lanes and enhancements to the pedestrian corridor. Narrower lanes can contribute to lower operating speeds along the roadway, which may	 feet are allowed in low-speed environments (45 mph or less) according to the AASHTO Green Book. 10-foot travel lanes are not appropriate on 4- lane undivided arterial roadways.

be appropriate in dense, walkable corridors. **REFERENCE:** *FHWA ACHIEVING MULTIMODAL NETWORKS*

Lane Reconfiguration

Road Diets are the reconfiguration of one or more travel lanes to calm traffic and provide space for bicycle lanes, turn lanes, streetscapes, wider sidewalks, and other purposes. Four- to three-lane conversions are the most common Road Diet, but there are numerous types (e.g., three to two lanes, or five to three lanes).



TYPICAL 4-LANE ROAD WITH ON-STREET PARKING



THREE-LANE ROAD DIET (WITH CENTER TWO-WAY LEFT-TURN LANE), WITH ON-STREET PARKING AND SEPARATED BICYCLE LANE

CONSIDERATION

The most common road diet involves converting a four-lane road into three lanes: two travel lanes and a center turn lane. This configuration often reduces traffic congestion by providing a dedicated turn lane at intersections. A threelane setup with one lane in each direction and a center turn lane can be as, or more, efficient than a four-lane road without a turn lane. The space gained can be enhanced with painted, textured, or raised center islands. During reconstruction, raised islands between intersections can improve pedestrian crossings, incorporate landscaping, and reduce travel speeds.

REFERENCE: FHWA ROAD DIET GUIDE (2014) NACTO URBAN STREET DESIGN GUIDE (2013) MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (2009)

GUIDANCE

- Four-lane streets with volumes less than 15,000 vehicles per day are generally good candidates for four- to three lane conversions.
- Four-lane streets with volumes between 15,000 to 20,000 vehicles per day may be good candidates for four- to three lane conversions. A traffic analysis is needed to determine feasibility.
- Six-lane streets with volumes less than 35,000 vehicles per day may be good candidates for six- to five-lane (including two-way center turn lane) conversions. A traffic analysis is needed to determine feasibility.