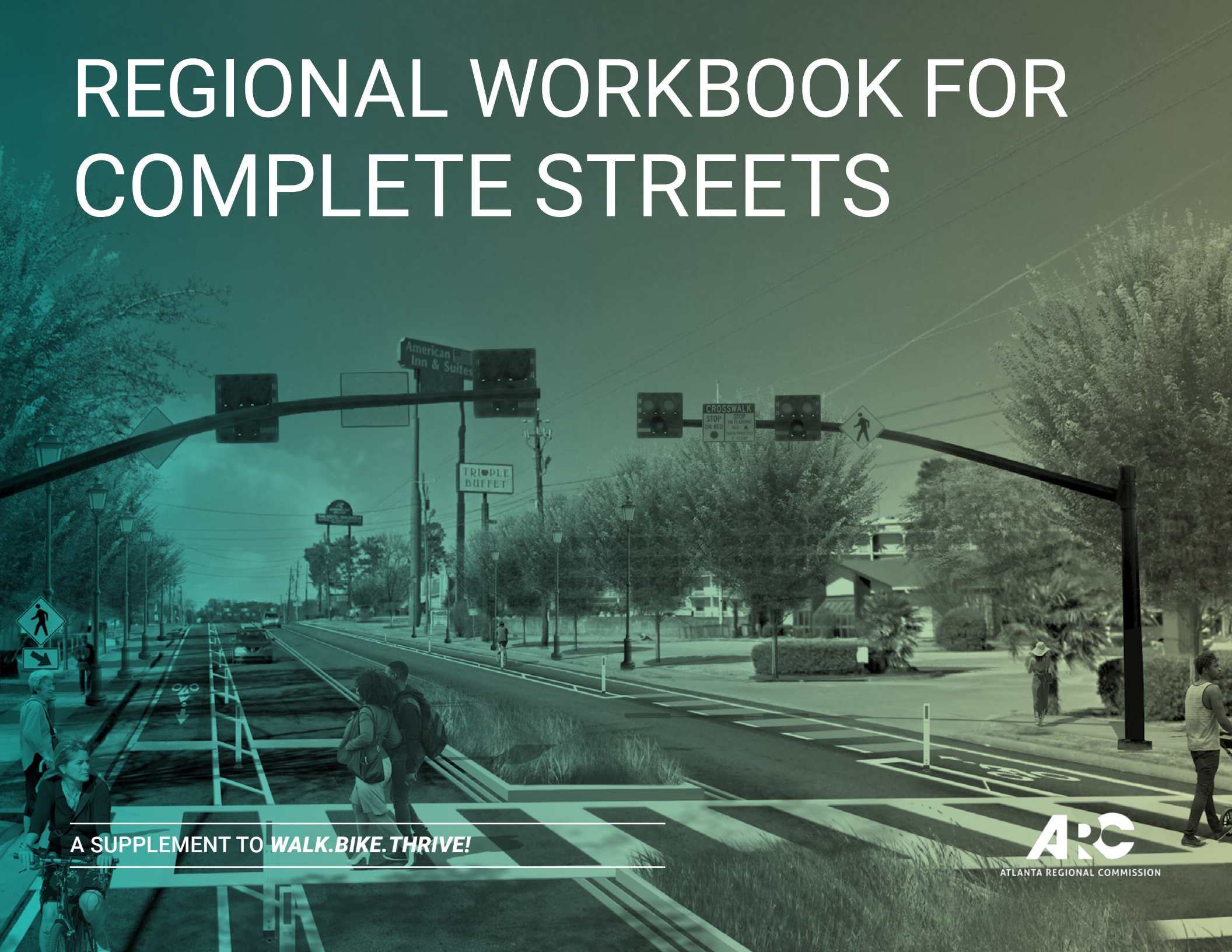


REGIONAL WORKBOOK FOR COMPLETE STREETS



A SUPPLEMENT TO *WALK.BIKE.THRIVE!*



ATLANTA REGIONAL COMMISSION

TABLE OF CONTENTS

Introduction	3
Section 1. Understanding Complete Streets	4
What are Streets?	
What are Complete Streets?	
What do Complete Streets do?	
Why are Complete Streets Important on Major Roads?	
Why are Complete Streets Regionally Important?	
Section 2. Making Decisions About Complete Streets	10
How Can Data and Policy Inform Complete Streets?	
What is The Regional Strategy for Complete Streets?	
What are the Components of a Complete Street?	
Do Complete Streets All Look Alike?	
Section 3. Critical Questions About Walking & Bicycling on Suburban Roads	22
Critical Questions About Walking and Biking on Suburban Roads	
How to Make 4- and 5-lane Suburban Roads More Complete?	
Bikes on Suburban Arterials: On-street or Off-street?	
Where Do We Put a Crosswalk?	
How do Complete Streets Support Regional Transit?	
Design & Planning Resources	39
Conclusion: Time to Start Building Complete Streets	40

Credits

“How are we to tame this force unless we understand it and even develop a kind of love for it?” - J.B. Jackson

This document is a supplement to the Atlanta Regional Commission’s *Walk. Bike. Thrive!* plan and is written to support and should be considered part of *The Atlanta Region’s Plan*. This document does not constitute a standard specification or regulation.

More broadly, this document draws from many sources of inspiration that transportation policies better achieve community purposes when they balance aesthetic, ecological, communal, and civic interests. Not everybody likes the smell of gasoline.

The Atlanta Regional Commission and project staff would like to thank the elected officials, professional staffs, and citizens of the region who supported or laid the foundation for this work.

ADOPTED NOVEMBER 2019

Introduction

The Atlanta region will be a cleaner, healthier, more competitive, and happier region when people make more trips by foot, bike, micromodes, or transit. However, today most trips are made by car due to long distances or lack of safe and comfortable infrastructure.

The Atlanta Regional Commission supports active transportation and uses regional strategies to increase walking, biking, micromobility, and transit for everyday travel. ARC's active transportation planning is based on two organizing principles:

- **Supporting compact, well-connected, and diverse communities**, where the potential is greatest to enable more active transportation.
- **Increasing safety, access, and connectivity along corridors** to incrementally but systematically eliminate barriers to active transportation

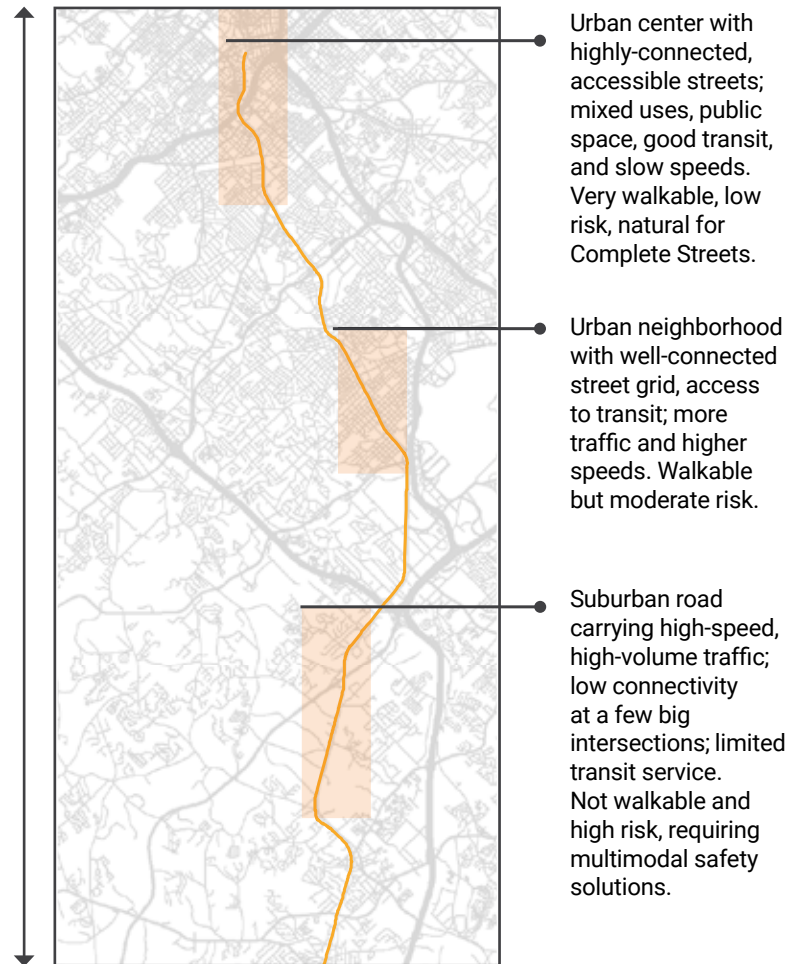
ARC's **Walk. Bike. Thrive!** regional vision identifies lack of safety and comfort as significant reasons why people don't walk and bike more often. ARC's **Safe Streets for Walking and Biking** highlights common roadway design elements that cause widespread safety problems: high speeds; multi-lane roadways with poor lighting; missing or poor-quality sidewalks; few or no safe places to cross; and inadequate bike infrastructure.

Complete Streets are roadways that help provide a safe, comfortable, and accessible transportation system for everyone. Designs vary, but all incorporate context-sensitive roadway elements to proactively decrease risk and increase active transportation. While Complete Streets are natural for walkable urban areas, they also provide a set of multimodal tools for addressing safety and access along regional thoroughfares.

Many national publications address walkable urban areas, but much less guidance is available for metropolitan Atlanta's major challenge: making suburban roadways safer for people on foot and bike. Most people here live in low-density suburban communities and travel along auto-oriented corridors. Regional strategies for Complete Streets must concurrently address several scales: corridor-based multimodal planning, place-based community development, and regional growth strategies.

This **Regional Workbook for Complete Streets** is a supplement to ARC's plans. It is a resource for ARC and local governments to reference for project prioritization, funding, and design decisions. Each section frames common planning questions and provides research-based strategies to help build a region where it is easier for everyone to travel.

Traditional Planning Prioritizing Access & Connections



Prioritizing Speed & Mobility Conventional Modern Planning

Complete Streets are needed throughout the Atlanta region even though regional contexts vary widely. Roadway factors and locality should inform designs that support walkable communities, make regional connections along thoroughfares, and build a safer transportation system.

SECTION 1.

UNDERSTANDING COMPLETE STREETS



What are Streets?

We have come to think of streets as infrastructure for moving cars. But traditionally, streets allowed local access and provided the largest public space within cities. Roads and highways provided travel between cities. This distinction has blurred in recent times, but the design of streets and roads remains vital to providing safe transportation and supporting great communities.

Roles of Streets

Streets and roads perform several fundamental roles in communities:

- **Form:** Streets networks determine community form by shaping how development is distributed and reinforcing patterns of travel. Connected grids of smaller streets make active transportation easier by providing walkable blocks, shortening travel distances, reducing congestion, and increasing route choices. Dendritic road networks and corridors with few crossings encourage long automobile trips, are susceptible to congestion, and create barriers.
- **Function:** The designs of streets dictate how people can travel. Comfortable facilities for walking, bicycling, micromobility, and transit access encourage those modes. Automobile-oriented designs discourage active transportation by increasing risk, decreasing comfort, and creating barriers. Elements of street designs are guided by regulations but should also be determined by community vision, data analysis, long-range planning, and public input.

Conventional transportation planning places roadways within a hierarchy that determines their transportation function. While this functional classification is useful for managing road networks, it is inadequate for design decisions as it does not indicate needs for context-sensitive elements and fails incorporate multimodal access to many destinations along major streets and arterial roads.

Streets in a Network

Network connectivity determines the utility of the transportation system. Connected streets distribute traffic and reduce congestion. Connected walkways and bikeways increase active transportation. In urban areas, intersections should be frequent and walkways and bikeways should form complete networks.

Modal plans are useful for determining design priorities, but every major roadway should provide multimodal options to meet travel needs and provide safety and dignity for people on foot, on bikes, using assistive devices, and in cars.



A traditional connected street grid (left) compared to a modern, conventional road hierarchy (right).

“The street is the primary structural unit of the city. Streets allow us to communicate and to move about. They constitute the order within the collective whole. Streets are complex institutions with great social, political, and economic depth. Giving them over to the single function of traffic movement, as we have done over the last 100 years, depletes them of their historical depth and role.”

– Doug Allen

Transportation and Land Use Connections

Transportation facilities and adjacent land uses interact in constant feedback loops. Compact development patterns support walkable streets, bicycling facilities, and more transportation choices. Widening roads provides an incentive for dispersed commercial and residential development which strains the road network and spurs continual investment in a few major corridors. These feedback loops foster political and socioeconomic systems invested in their continued success.

Complete Street decisions should consider communities and transportation as a whole and challenge established political, economic, and cultural expectations. To support more walkable places we must build new systems.

Streets make communities. Street networks should provide connectivity and be planned as a multi-century investment. Street elements should provide comfort and safety for everyone and be made multimodal at every opportunity.

? What are Complete Streets?

Complete Streets are multimodal roadways designed and operated to provide safe and comfortable access for all roadway users regardless of their age, ability, or choice of transportation mode. People on foot or bike, motorists, and transit or micromobility users should be able to safely use every street and roadway, even if one mode has priority over another on a particular corridor (e.g. a bus priority lane; bike route; or high occupancy vehicle lane). Complete Streets may be local streets or regional thoroughfares, but each features context-sensitive designs, is rooted in community vision and values, and enables communities and the region to thrive.

United States Department of Transportation

The U.S. Department of Transportation states that **“every transportation agency ... has the responsibility to improve conditions and opportunities for walking and bicycling”** and recognizes Complete Streets as a context-sensitive approach to building an accessible transportation system for all.¹

USDOT defines Complete Streets as “... streets designed and operated to enable safe use and support mobility for all users. Those include people of all ages and abilities, regardless of whether they are travelling as drivers, pedestrians, bicyclists, or public transportation riders. The concept of Complete Streets encompasses many approaches to planning, designing, and operating roadways and rights of way with all users in mind to make the transportation network safer and more efficient.”

Sources: 1. USDOT (2010); 2. Georgia DOT (2019); 3. ARC (2015);
4. U.S.C. § 450.306. Scope of the metropolitan transportation planning process.

Regional strategies should consistently and routinely encourage context-sensitive roadway designs that enable safe access for all users, including people of all ages and abilities regardless of mode.

Georgia Department of Transportation

The Georgia Department of Transportation (GDOT) policy is to **“routinely incorporate bicycle, pedestrian, and transit accommodations into transportation infrastructure projects as a means for improving mobility, access, and safety for the traveling public.”**

“GDOT coordinates with local governments and planning organizations to ensure that bicycle, pedestrian, and transit needs are addressed beginning with system planning and continuing through design, construction, maintenance and operations.”²

GDOT’s policies for Complete Streets are detailed in Chapter 9 of the *Design Policy Manual* and support complete streets in urbanized areas statewide. Projects and design elements are informed by a range of safety, context, and demand warrants and community input.

Atlanta Regional Commission

ARC uses Complete Streets to relentlessly and incrementally address uncomfortable conditions for walking and biking wherever the opportunity arises. **ARC supports the implementation of Complete Street principles on every roadway and with any project receiving federal funds.**³

As a metropolitan transportation planning agency, ARC must “provide for consideration of projects and strategies that will ... increase the safety of the transportation system for motorized and nonmotorized users.”⁴

ARC’s uses a strategic approach for context-sensitive Complete Street investments on the existing roadway network. ARC utilizes or re-orientes existing funding and programs to support communities and create a safer, more equitable transportation system for all.

For several decades now, movement has taken precedence over place. The form and content of urban development is now shaped largely by transportation policies. These policies can regain proper civic purpose and meaning only when they are subordinated to a larger ecological and communal project.

— Leon Krier



What do Complete Streets do?

Enabling travel and eliminating crashes involving people on foot and bike in the Atlanta region is a daunting prospect. Investments should be strategic to maximize opportunities while being relentless in implementing safe transportation options for everyone in every community. Though the Atlanta region is enormous and diverse, Complete Street projects can:

Support Communities & Improve Access:

- **Support Walkable Communities:** Urban centers are compact places that can support short trips better accomplished by walking, bicycling, and micromobility. Dense destinations and mixed land uses tend to encourage more walking and biking. Urban centers are enhanced by prioritizing Complete Streets that provide comfortable infrastructure for walking, bicycling, or using assistive devices or micromobility vehicles. ARC's Unified Growth Policy Map (UGPM) and Livable Center Initiative (LCI) program help identify centers and focus Complete Streets in conjunction with supportive development.
- **Serve High-Demand Locations:** Pockets of bicycling and walking activity occur outside of busy city and town centers throughout the Atlanta region. Complete Street projects should be prioritized for streets that are proximate to schools, parks, commercial centers, dense residential housing (e.g. multi-family or student housing), transit stops and stations, and areas with low car ownership.
- **Provide Accessibility:** Many people choose to walk or bike to save money, increase fitness, or have fun. However, at least one-in-three people are unable to drive due age, disability, or lack of financial resources and rely on other transportation options. Complete Streets provide transportation options to help people of all ages and abilities travel safely and maintain a high quality of life.

"Most Americans today do not live in towns or even in cities in the traditional sense that we think of those terms. Instead, most of us are citizens of the region — a large and multi-faceted metropolitan area encompassing hundreds of places that we would traditionally think of as distinct and separate communities."

—Peter Calthorpe

Reduce Transportation Risk:

- **Eliminate High-Crash Locations:** In communities with high levels of walking and biking, there are often a number of locations that have a concentration of fatal and serious bicyclist and pedestrian crashes locations. A crash hotspot analysis can help identify significant locations with reoccurring crashes. These are critical locations to take measures to increase safety and begin reducing fatalities and serious injuries.
- **Reduce High-Risk Corridors:** In areas where walking, bicycling, or micromobility are less common, pedestrian and bicyclist fatalities are typically widely distributed and occur at low frequencies at any single location. Past crash locations may not be good predictors of future crash sites. Systemic analysis can show where dangerous roadway features and higher demand intersect in order to identify corridors with higher transportation risks. These roads should be higher priorities for Complete Streets.

Make Connections:

- **Connect Networks:** Complete Streets projects can provide the missing link that connects existing sidewalks and bikeways, mitigates a high-risk segment of roadway, or connects a severed street grid. Bikeway or walkway plans may help identify dangerous locations, missing network links, and priority destinations for people on foot and bike.
- **Enhance Transit Stations and Stops:** Walking, bicycling, and micromobility trips are typically short and concentrated within a community. Connections to transit services can expand walking, bicycling, and micromobility travel to encompass many regional trips. Ensuring bus stops and train stations can be safely accessed by foot and bike, particularly where busy roads must be crossed to reach a bus stop, should be a priority for Complete Streets.

Regional strategies should use Complete Street investments to achieve regional and community goals. Complete Streets provide mobility, safety, and access for people and are economically beneficial for communities.

Why are Complete Streets Important on Major Roads?

Modern metropolitan areas have largely developed along higher-traffic arterials. These roads are where regional priorities converge and often conflict: safety, speed, access, and regional movement. Major roads are critical to build as multimodal corridors and should balance both local and regional needs.

- Arterials and thoroughfares roads frequently provide the only access to a large portion of the Atlanta region's retail, commercial, and residential areas as well as many regional transit routes.
- Arterial roads account for a high percentage of crashes in the region, especially those resulting in fatalities or serious injuries.
- Conventional modern arterial designs rarely included places to walk or ride a bike and make many trips infeasible outside of a car.
- As the Atlanta region continues to grow, major roads will continue to develop or be redeveloped and provide opportunities for incremental change.

Table 1. Conventional vs. Traditional Roadway Design Values*

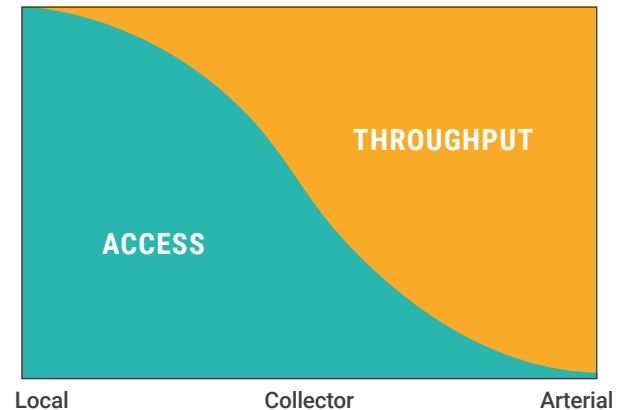
CONVENTIONAL	TRADITIONAL
Prioritize mobility	Prioritize access
Reward long trips	Promote short trips
Build dendritic street hierarchy	Build connected streets
Design for higher speeds	Design for slower speeds
Encourage single land uses	Encourage mixed land uses
Serve automobiles	Serve all roadway users
Assume no walking	Assume people walking

** conventional in the modern automobile-priority era; traditional for pre-automobile eras*

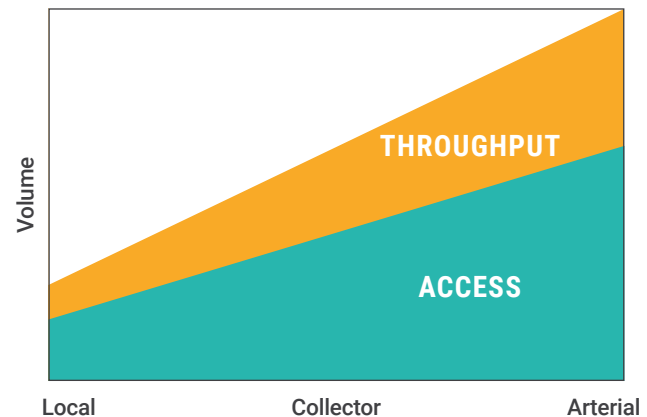
Regional strategies should encourage traditional roadway design values and context-sensitive roadway designs to improve safety, connectivity, and access along major corridors.

Figure 1. Restoring Streets to their Traditional Purpose

Conventional Purpose of Arterial Streets: Single-Purpose Mobility



Traditional Purpose of Arterial Streets: Multi-Modal Access



Arterial roadways often blur the distinction between mobility and access. Many modern arterials are designed only for automobile throughput, though major roads have always attracted development and served as destinations for goods and services. This tension causes safety and mobility conflicts.

Why are Complete Streets Regionally Important?

Complete Streets support walkable communities and contribute to a more walkable region. Walkable communities are small in land area, but cumulatively help shape regional growth and achieve regional goals:

- **Sustainable Environment:** Large cities often support multimodal transportation and lower per capita carbon emissions, but only above densities that support shorter trips and increased travel by low-emission transportation modes.¹ For many large urban areas, metropolitan-wide travel patterns and suburban commute trips significantly outweigh center-city efficiencies.²

Reducing emissions requires investment in existing urban areas, but also regional changes in transportation and development patterns: more walkable urban centers; denser, mixed-use suburbs; and more regional transit and active transportation options.³

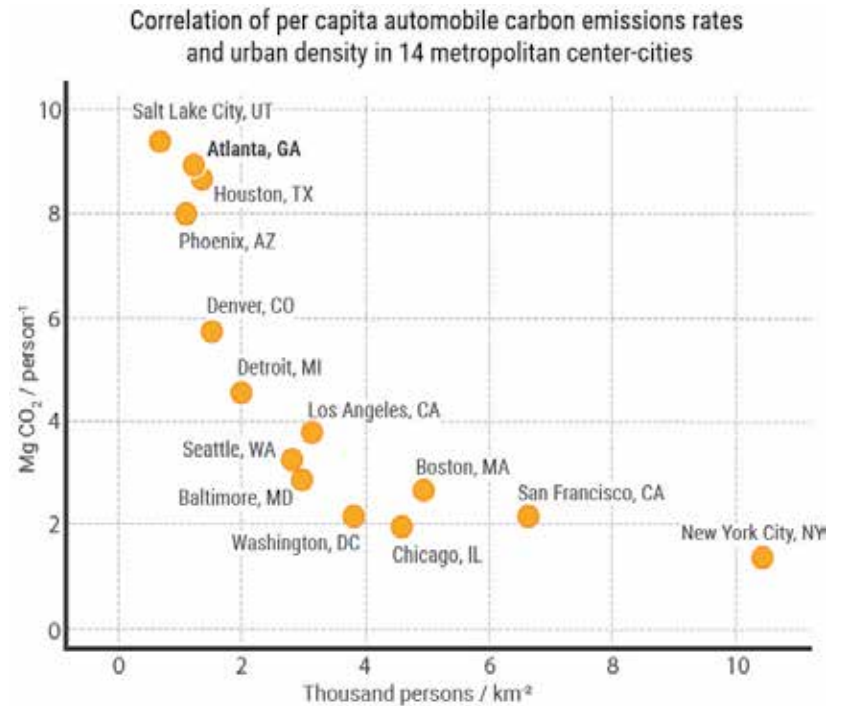
- **Social Equity:** Commuting times are the best predictor of economic opportunities and are strongly influenced by regional growth patterns. The impact of transportation on the ability of low-income families to escape poverty is most striking in areas with high degrees of segregation, income inequality, and sprawling development.⁴

Equity solutions are complex, but intentional strategies must: create affordable and workforce housing; provide transportation options; improve education; and increase regional accessibility via increased transit, increased last-mile connectivity, and increased affordable housing within walkable communities.

- **Competitive Economy:** Walkable urban places occupy less than 1% of the Atlanta region’s land area, but contain nearly 20% of the region’s jobs. They generate higher values with lower long-term costs than driving-only areas.⁵

Building walkable centers (along with improving education) is the most effective economic development strategy that the region can pursue.

Regional strategies should encourage compact, walkable, and transit-accessible communities. Compact communities provide the proper context for Complete Streets, while safe and multimodal streets better support community-scale travel.



Per-capita emissions correlate with urban densities with, but are especially reduced when densities are high enough to support low-emission travel modes. City emissions are heavily influenced by regional commuting patterns, which outweigh urban efficiencies.

Adapted from: Gately, Conor, K. et al. (2015) "Cities, traffic, and CO₂: A multi-decadal assessment of trends, drivers, and scaling relationships"

INDICATORS OF LOWER CO ₂ EMISSIONS (IN RANKED ORDER):	
Residential:	Transportation:
More presence of multifamily housing	More multimodal accessibility
Decreased size of residences	Increased transit share
Increased density of housing	Shorter distance to regional activity centers
Increased number of people per household	Higher population density
	More neighborhood walkability

Source: Atlanta Regional Commission. (2014) "Impact of Community Design on Greenhouse Gas Emissions".

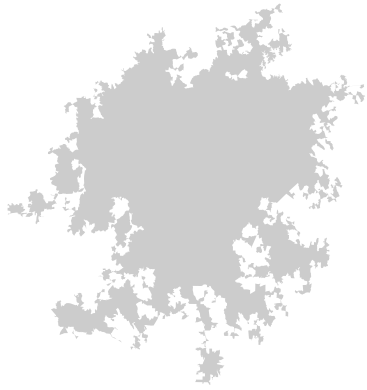
Sources: 1. Gately (2015); 2. Jones (2014); 3. Goldberg (2007); 4. Chetty (2015); 5. Leinberger (2013).

SECTION 2.

MAKING DECISIONS ABOUT COMPLETE STREETS

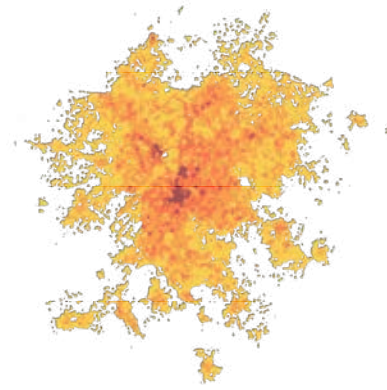


How Can Data and Policy Inform Complete Streets?



Regional Scale & Urbanized Areas

Urbanized areas are the scale at which modern communities function. Census-designated urban areas (including the majority of the Atlanta MPO area) represent relatively dense developed territories and determine regional travel patterns. Complete Streets should be considered anywhere within an urbanized area, though specific elements should be context-sensitive and assessed at the corridor or local level.



Walking and Bicycling Demand & Propensity

Propensity for walking and biking in the region is not evenly distributed. Density, proximity to certain destinations (such as schools or stores), and other place-based factors contribute to areas with higher opportunities for walking and biking. This data can help determine destination density along a corridor, anticipate demand for facilities, and help prioritize walking, bicycling, and micromobility infrastructure.



Regional Corridors: Multimodal Thoroughfares

Thoroughfares are locations where many regional demands converge. Major roads support a range of communities, transit service, and both local and regional trips. Many thoroughfares in metro Atlanta are high risk for people on foot and bike; building multi-modal corridors is important for regional travel or local access in challenging locations. ARC's designated Strategic Regional Thoroughfare Network and other arterials provide regional mobility and connect major activity centers.



Regional Development: Centers & Places

Regional centers and places are compact areas that are naturally (or aspirationally) appropriate for walking, bicycling, and micromobility. These areas encompass a wide range of contexts and densities, but within each center planning for pedestrians and bicyclists is of equal importance to the automobile. ARC's Regional Development Guide and Unified Growth Policy Map identify centers in neighborhoods, business districts, and small towns across the region.



What is the Regional Strategy for Complete Streets?

Use Regional Policies to Prioritize Complete Streets

Complete Streets should be considered everywhere in the metro Atlanta region. Incremental investments help build a safe and accessible transportation network by supporting walkable communities or accommodate walking, bicycling, micromobility, and transit access along suburban arterials.¹

Walkable Communities: Complete Streets help make towns and regional centers walkable and bikeable. Investments in regional centers support walking, bicycling, micromobility, and transit as well as better long-term growth for the region. Transportation and development investments should focus on communities:

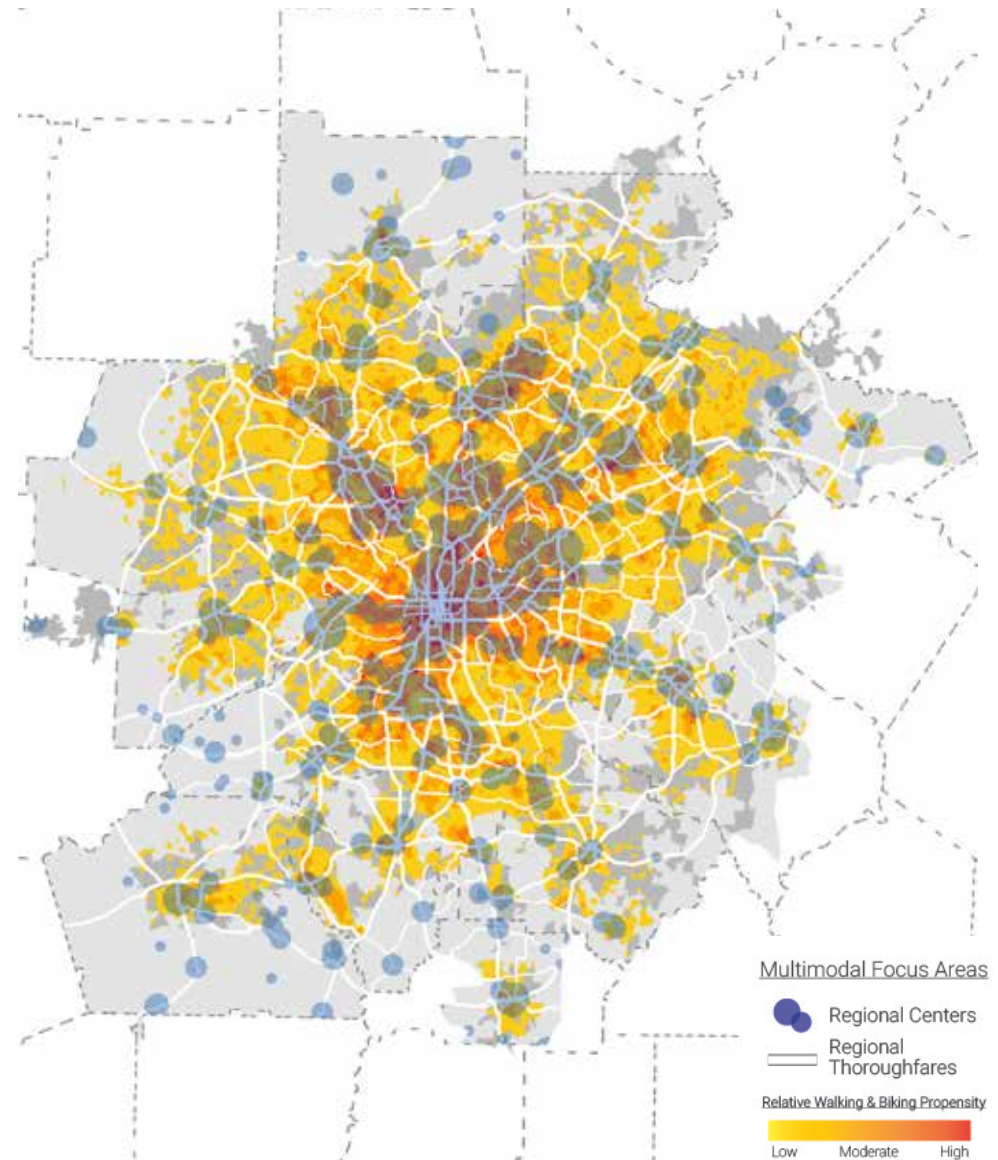
- Existing urban & town centers – use Complete Streets to increase travel options, meet demand, and support existing multimodal character.
- Aspirational centers – use Complete Streets and dense street networks to support multimodal options and short trips in new developments.

Multi-Modal Thoroughfares: Complete Street elements should be used strategically on regional corridors where many priorities converge – businesses, services, residences, transit routes, and traffic – in order to:

- Reduce risk and improve safety for everyone – both people walking, bicycling, or using assistive or micromobility devices as well as those driving.
- Provide access to high-priority destinations, including: schools, parks, commercial areas, residential neighborhoods, grocery stores, or community activities.
- Support existing or latent demand, especially along corridors with evidence of people walking or bicycling (i.e. a worn path along the roadside).
- Support regional transit routes.
- Connect neighborhoods and cities via walkways, bikeways, and paths.

Regional strategies should support context-sensitive Complete Streets throughout metropolitan Atlanta. Urban centers should feature Complete Streets. Regional thoroughfares should be multimodal. Complete Streets within communities are complimented by connections along thoroughfares, as well as regional transit and greenway trails for longer trips.

Sources: 1. adapted from ITE (2010).



Sources: ARC UOPM, Regional Thoroughfare Network, WBT



What is the Regional Strategy for Complete Streets?

Use Complete Streets to Reduce Risk

Complete Street elements should be considered on every roadway in the metro Atlanta region. Incremental investments help build a safe transportation network, increase connections within and between communities, and accommodate walking, bicycling, and transit access to high-priority destinations.

Safety can be determined by crash rates or the risks that people are exposed to when traveling. Assessing risk can help communities be more proactive in preventing crashes and eliminating serious injuries and fatalities.

Factors that contribute to risk along a corridor include:

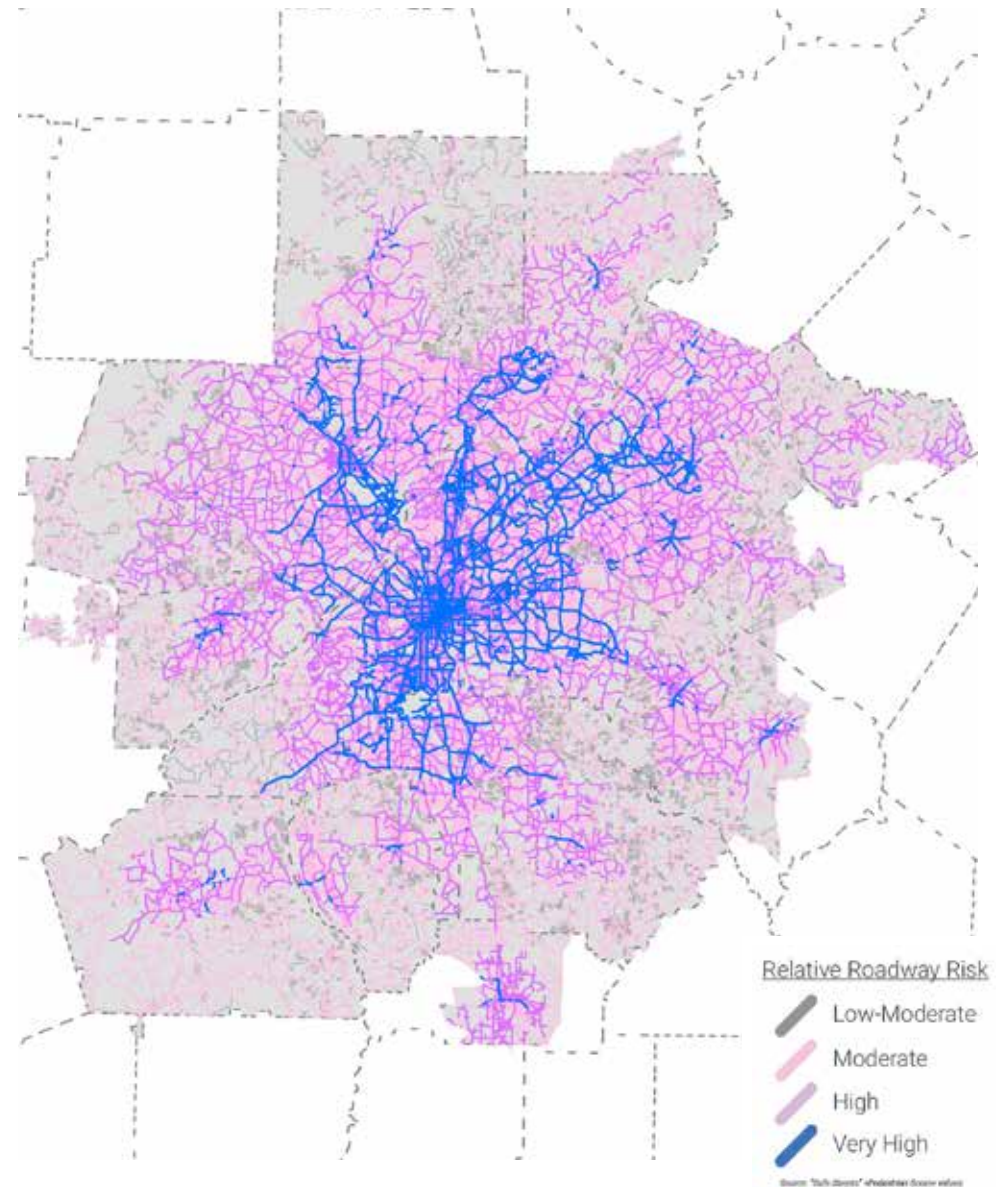
- **Roadway Characteristics:** Some roadway features are associated with higher risks for serious crashes, including: vehicle speeds, lighting, presence of crosswalks, number of lanes, and roadway classifications.
- **Travel Demand:** Walking and bicycling trip estimates and transit service indicate relative levels of travel, exposure, and risk.

Roadway design is the foundation of traffic safety, but safer elements are unevenly distributed in the region – especially for vulnerable populations and underserved communities. Community-wide exposure to risk must be assessed to determine Complete Street needs:

- **Equity & Policy Priorities:** Regional distribution of risk factors can indicate disproportionate exposure for specific geographies or populations.

Every transportation investment should incorporate proven safety measures to address risk factors. The map at right illustrates regional risk factors and travel demand for walking, bicycling, or micromobility. This data can help identify priority needs for Complete Streets.

Regional strategies should support safer roadway designs throughout metropolitan Atlanta. Every transportation investment should reduce risks for people walking, bicycling, and driving. Complete Street elements and facilities should be considered intrinsic and immutable in every project.



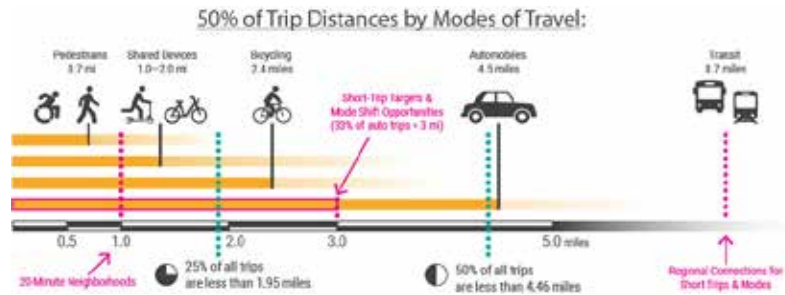
For more information, see ARC's "Safe Streets for Walking & Bicycling" (2018) report.



What is the Regional Strategy for Complete Streets?

Use Complete Streets to Support Short Trips

Metro Atlanta's development patterns often require long trips. Reliance on cars for long trips increases congestion, limits economic mobility, and creates stress and poor health outcomes. Walking, bicycling, and micromobility are well suited for short trips, but too many short trips still require driving due to lack of comfortable walkways or bikeways. Reducing trip distances and shifting modes requires combining compact development practices and Complete Streets.

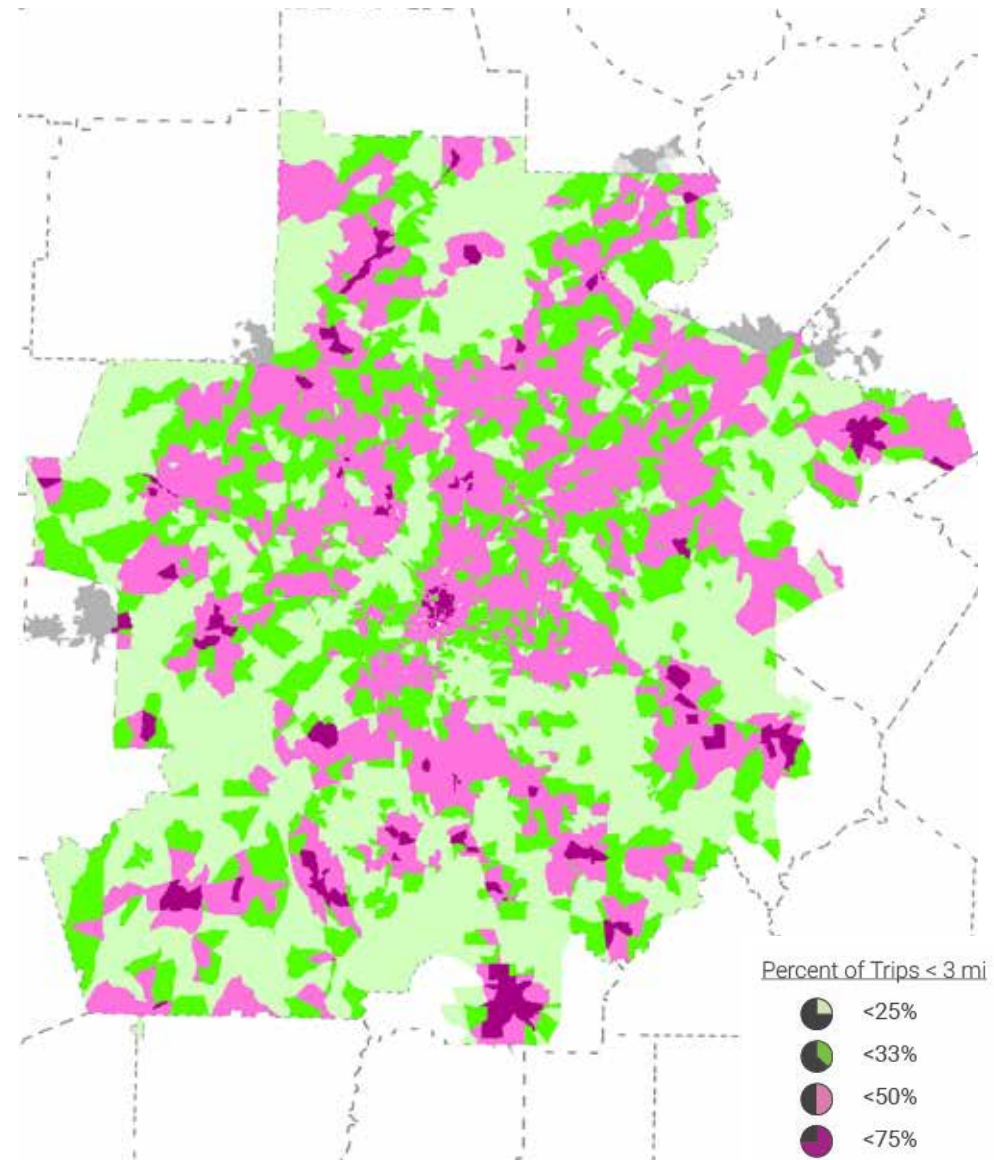


Regional travel is complex, but areas with shorter trips often have:¹

- **Higher Street Connectivity:** A grid of smaller streets shortens travel distances and increases route choices.
- **Higher Density:** Concentrations of residential and commercial uses enable more proximity, more walking and cycling, higher economic activity, lower infrastructure costs, lower cost of living, and environmental conservation.
- **Mixed Zoning:** Increased mixed-use zoning enables trips to be shorter and increases the number of destinations that can be accessed without driving.
- **Less Parking:** Reduced parking minimums plus market-based price strategies incentivize different travel decisions and reduce public costs of parking.

Regional strategies should prioritize short trips. Community development efforts should create compact communities and concentrate destinations. Transportation investments should support Complete Streets that provide comfortable facilities to increase walking, biking, microbility, and transit.

Source: 1. Georgia Tech CQGRD (2012); SMARTRAQ (2007).



Source: ARC Travel Demand Model



What Are the Elements of a Complete Street?

The foundation of Complete Streets are engineering elements that reduce conflicts and increase safety, including:

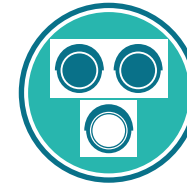
- Safe places to walk, travel by bicycle, or cross the street.
- Better access to high-priority destinations.
- Context-sensitive designs that support adjacent land patterns.
- Intentional strategies to manage curb-side locations and transit operations.
- Facilities that either slow speeds or separate users.

Safe Streets identified a set of twelve safety measures that address common high-risk conditions in the region (right) and should be included in roadway projects. Detailed design information for each safety measure is available from the Federal Highway Administration¹ and Georgia Department of Transportation². FHWA’s “Proven Safety Countermeasures” are marked with an asterisk (*).

The following pages explore general elements of Complete Streets.



Medians and Pedestrian Crossing Islands*



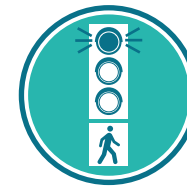
Pedestrian Hybrid Beacon*



Road Diet*



Changing Speed Limits*



Leading Pedestrian Interval*



Rectangular Rapid Flashing Beacons



Street Lighting



Separated Bike Lanes



Neighborhood Greenway / Bike Boulevard



Sidewalks*



Crosswalk Visibility Enhancements



Traffic Calming

Sources: 1. FHWA Proven Safety Countermeasures (2017); 2. GDOT Design Policy Manual (2019).



Safer Places to Walk

This suburban road has been reconstructed with wide sidewalks, pedestrian-scale lighting, a median and narrow travel lanes to help control speed, and controlled crosswalks (Pedestrian Hybrid Beacon) at intersections.

Potential funding sources:

- Highway Safety Improvement Program
- Surface Transportation Program Block Grant



Safer Places to Cross

Sidewalks and highly visible and accessible crosswalks at all driveways and intersections have been added to this urban/suburban thoroughfare. Pedestrian Hybrid Beacon signals are provided at intersections and mid-block locations.

Potential funding sources:

- Highway Safety Improvement Program
- National Highway System construction



Improved Access

An old, narrow bridge has been transformed by the addition of wide sidewalks, a median, and landscaping; it is still a two-lane road.

Potential funding sources:

- Bridge program
- Surface Transportation Program Block Grant



Accessibility & Streetscaping

Downtown main streets benefit from well-marked, accessible crosswalks; bulb-outs and tight corners; wide sidewalks with lighting, shade, places to sit; a buffer from traffic.

Potential funding sources:

- Livable Centers Initiative
- Transportation Alternatives program
- Local transportation funds



Safer Streets for Bikes

Reconstruction of this downtown street incorporated separated bike lanes, sidewalks, pedestrian-scale lighting, and streetscaping; parking and stormwater management are improved.

Potential funding sources:

- Livable Centers Initiative
- Surface Transportation Program Block Grant



Safer Intersections for Bikes

Buffered bike lanes leading to a highly visible bike box on this suburban road provide more clarity and definition for both motorists and people on bikes, without losing parking.

Potential funding sources:

- Resurfacing projects
- Local transportation funds



Lane & Speed Reductions

This previously overbuilt street has been rebalanced to include a sidewalk, a multi-use path, onstreet parking, and one lane of low speed car traffic in each direction.

Potential funding sources:

- New development/developers
- Local transportation funds



Multi-Use Paths

This new suburban road was built with a sidepath to accommodate bicyclists and pedestrians; it also has a median and narrow travel lanes to manage speed. Note: Mixing pedestrian and bicycle traffic should be examined carefully and separation introduced in moderate-high traffic areas or where conflicts arise.

Potential funding sources:

- New development/developers
- Local transportation funds

? Do Complete Streets All Look Alike?

No. The different components of a Complete Street may vary as much as the context in which they are applied. Two parallel streets just a block away from each other in the same community may look very different because of changing land uses and differing purposes of the street. However, both streets need to provide basic levels of safety, comfort, and access for all users while responding to the needs of the street network and vision and goals of the community.

In the Atlanta region, the same road may transition from rural to suburban to urban core and back again in the space of a few miles. The American Association of State Highway and Transportation Officials (AASHTO) broadly identifies five land use types, often called an urban design transect, that a road may traverse and connect. Each zone along the transect has a different context, a different function, and thus different design needs and different community priorities even though it's still the same road. The examples that follow are from a single corridor in the region.

Measuring Walkable Communities

Density is needed to support walking, bicycling, and transit service. Walkable densities are seldom clearly defined and rarely follow boundaries – driveable suburban areas exist within cities and denser suburbs can support walking, bicycling, and micromobility.ⁱ

General metrics can help assess walkable communities:

- **300-600 feet** average intersection spacing creates walkable blocks and convenient crossings.
- **20-35 dwelling units per acre** provides densities for highly walkable districts.
- **100 blocks per square mile** indicate favorable densities for walkable areas.
- **Greater than 8 dwelling units per acre** supports both walking and transit service.
- **4,200 people per square mile (1,650/km²)** indicate densities for declining per capita emissions.
- **70 or greater Walk Score** indicates good accessibility.

“The key elements needed for an active community are highly mixed land uses, short connected blocks, and high-quality infrastructure for pedestrian and bicycle traffic. Sidewalks, convenient crosswalks, bicycle lanes, quality transit service, traffic calming measures, mixed-use zoning, and connected street networks facilitate active transportation and save lives.

However, these design elements are lacking in many parts of the region. Major changes are needed in both land use and transportation practices in order to design active communities and fund adequate multimodal infrastructure.”

– “Plan 2040 Health Impact Assessment,” Georgia Tech Center for Quality Growth & Regional Development



ⁱ Adapted from: ITE Walkable Thoroughfares (2010); FDOT Context Classification Guide (2017); Plan 2040 Health Impact Assessment (2012); “WalkUP Wake-Up Call” (2013); Gately et al (2015); and Reid Ewing (2002).



Urban Core – Central Districts

Urban cores are the densest contexts with a variety of land uses (e.g. retail, office, multi-family residential etc.), defined city blocks, short distances between signalized intersections, and minimal setbacks or build-to requirements to frame the public space.

Short, well-defined city blocks with office, retail, and other mixed uses generate intense pedestrian use, particularly around transit stops. Bicycle use (including bike share riders) is high. The traffic mix includes frequent buses, streetcars, scooters, shared ride services, and taxis. Short travel distances and limited parking options also encourage walking and biking. The Downtown and Midtown districts of Atlanta reflect the urban core.

Urban – Cities, Towns, & Neighborhood Centers

Urban contexts are diverse areas of dense development that offer multiple amenities and destinations, as well as a variety of mobility choices (e.g. walking, biking, transit, and personal vehicles). Shorter travel distances between destinations and signalized crossings encourage biking and walking if infrastructure is safe and comfortable. The mix of land uses support and encourage a wide range of mobility choices.

Neighborhoods adjacent to downtown Atlanta (e.g. Virginia-Highland, Buckhead, and West End), the downtowns of smaller cities such as College Park and Marietta, and new town centers including Sandy Springs and Suwanee have an urban context.

“Streets moderate the form and structure and comfort of urban communities. In a very elemental way, streets allow people to be outside.”

- Allan Jacobs

Complete Streets in Urban Contexts

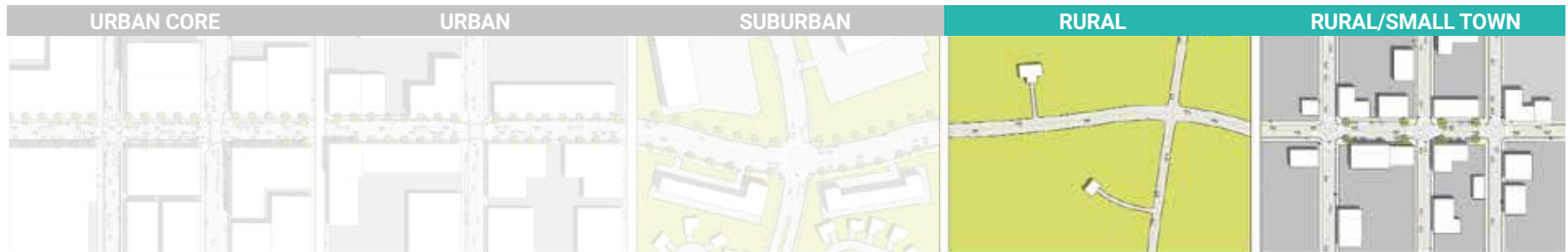
Complete Streets in the urban core and urban centers may have:

- Wide, well-lit sidewalks to accommodate many people and a range of activities.
- Short blocks with highly visible, signalized intersections.
- Walk signals called automatically, often with leading pedestrian intervals.
- Protected crossings, including bulb-outs, curb extensions, mid-block crossings, landscaping to protect pedestrians from turning vehicles.
- Slow vehicle speeds, with traffic calming where necessary.
- On busier streets, separated bike lanes and protected intersections.
- Curbside lanes managed to balance the demand for transit service, delivery vehicles, on-street parking, and bicycle use.
- Extensive bicycle parking, including on-street corrals.

Design Information and Resources

Many urban areas should be planned as a livable center or “20-minute neighborhoods” where a high percentage of short trips can be made by foot and bike within 20 minutes. General features include short block lengths, connected street and bikeway networks, a fine-grained mix of land uses, a variety of housing types, and connections to regional transit.

- MassDOT Separated Bike Lane Planning & Design Guide (2015)
- NJDOT Complete Streets Design Guide (2017)
- Washington State DOT Design Manual (2018)
- American Association of State Highway and Transportation Officials (AAHSTO) Guide for the Development of Bicycle Facilities (currently being updated)
- National Association of City Transportation Officials (NACTO) Urban Street Design Guide (2013)



Rural – Highways & Countryside

Rural areas are characterized by large parcels used for single-family residential and/or agricultural purposes. Buildings are set back significantly from roadways. Mobility choices are limited primarily to personal vehicles because of long travel distances. Rural roadways may have paved shoulders where walking and biking can occur.

Areas of the metro Atlanta region are still quite rural, with narrow two-lane roads connecting very low-density housing, infrequent commercial locations, and farms. These roads may see little pedestrian traffic but are often popular bicycling routes.

Rural – Small Towns

A small town in rural areas is a node of compact, somewhat dense development surrounded by farms or open land. Compact development, low traffic volumes, slow speeds, on-street parking, and sidewalks may allow for enhanced walkability and bikeability. Due to the surrounding low density rural context, the rural town may be connected to a less dense road network with few signalized intersections and limited pedestrian infrastructure outside the immediate town center.

Communities such as Flowery Branch, Auburn, Palmetto, and Canton display typical rural town characteristics. They generally have a walkable street grid with low traffic volumes in the center of the town. There are usually few bicycle facilities and very limited transit service.

“The experiential quality of the environment must be planned for at a regional scale, since thoroughfares occur for regional reasons, and people now live their lives at that scale.”

– Kevin Lynch

Complete Streets in Rural and Small Town Contexts

Complete Streets in small towns may have:

- Gateways or transitions into communities, from higher to slower speeds.
- Sidewalks and lower-speed street designs.
- Main streets featuring wide sidewalks, angle parking, high-contrast and decorative crosswalks, bulb-outs, and traffic calming measures.

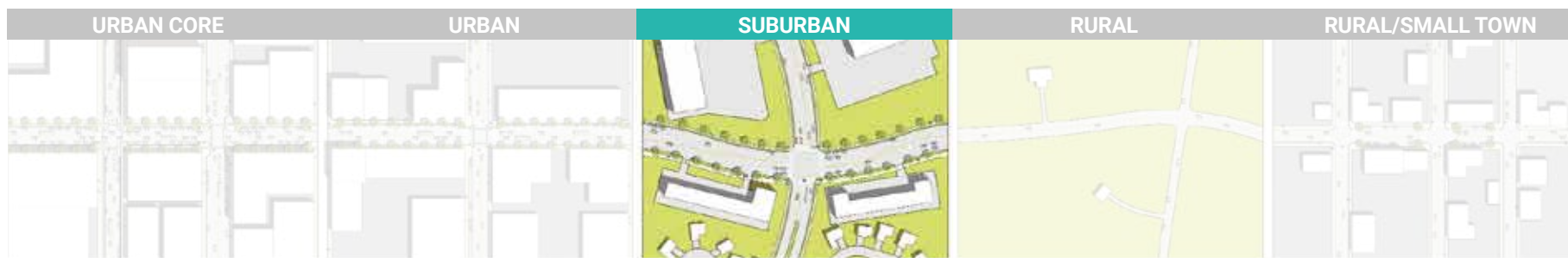
Multimodal Roads in rural areas may have:

- An adjacent multi-use path or parallel greenway trail, especially in order to connect regional destinations.
- A paved shoulder of four or more feet of rideable space (i.e. unobstructed by rumble strips or obstacles), depending on motor vehicle and bicycle volumes.
- Motor vehicle speeds managed in areas where visibility is limited.

Design Information and Resources

Although rural town centers may be smaller and less compact than their urban counterparts, they are still similar to a livable center or “20-minute neighborhood” when looking for design guidance. Most, if not all, of the population of a small rural community will live within a short walk or bike ride of the center; the emphasis for complete streets is on sidewalks, crosswalks, traffic calming, and streetscaping consistent with a more urban center.

- Federal Highway Administration (FHWA) Small Town and Rural Multimodal Networks (2016)
- MassDOT Separated Bike Lane Planning & Design Guide (2015)
- NJDOT Complete Streets Design Guide (2017)
- Washington State DOT Design Manual (2018)
- American Association of State Highway and Transportation Officials (AAHSTO) Guide for the Development of Bicycle Facilities (currently being updated)



Suburban

Suburban areas provide a variety of land use types (e.g. residential, retail, office etc.) that are rarely mixed on a single site but are connected by a network of arterial and collector streets. Commercial and industrial development is spread out on medium to large parcels with greater minimum setbacks and large surface parking lots. Suburban transportation corridors allow motorists to travel from suburban areas into more dense contexts for employment, services and/or entertainment. Biking and walking opportunities may be available through limited on-street facilities and the development of off-street trails; however, connectivity may be challenging due to increased distances between signalized intersections along arterial and collector streets.

Post-war growth in the Atlanta region has generated extensive suburban development covering most unincorporated counties and areas outside of city cores or urban centers.

Design Information and Resources

Multimodal suburban corridors are difficult to design and have challenging trade-offs between existing and needed travel modes.

The following pages of this workbook are focused on complete street elements that can be incorporated, or potentially paired with new development strategies, to introduce safer places to walk or cross the street, support regional transit, anticipate changing land uses, or reduce congestion.

Complete Streets in the Suburban Context

Multimodal thoroughfares are the great challenge of the Atlanta region. Suburban roadways are built primarily for the rapid throughput of large volumes of motor vehicle traffic over relatively long distances; the land use pattern they serve is also predominantly auto-centric. The result is an environment that is hostile to walking, biking, and transit. This is made worse by specific roadway design features (identified in *Safe Streets*) that increase risk for people on foot and on bike. Where facilities for pedestrians and bicyclists do exist, they are often inadequate and poorly maintained.

Increasingly, this development pattern is breaking down for people in motor vehicles as well. Congestion is worsening and a reliance upon driving for every trip is costly in terms of time, money, environmental degradation, and quality of life. As the region continues to add population, multimodal travel options in suburban areas are critical to increasing sustainability, efficiency, and safety.

“Roads no longer merely lead to places; they are places. And as always, they serve two important roles: as promoters of growth and dispersion, and as magnets around which new kinds of development can cluster.

In the modern landscape, no other space has been so versatile.”

— J.B. Jackson

SECTION 3.

CRITICAL QUESTIONS ABOUT WALKING & BICYCLING ON SUBURBAN ROADS



Critical Questions About Walking and Biking on Suburban Roads

There are design solutions to make suburban roads better for walking, bicycling, micromobility, and accessibility. Designs include the safety measures and components of a Complete Street shown earlier (see pages 10-11). However, these designs can seem insignificant within an extensive suburban roadway network that routinely includes design features known to increase risk. Further, application of Complete Street elements may not be clearcut and may require nuanced or subjective decisions.

In the pages that follow, this Complete Streets workbook demonstrates the value of incremental change to bringing basic dignity and inclusiveness to the harshest road environments while beginning a successful transformation to more Complete Streets and walkable communities in the medium- and long-term. This workbook also tackles several critical questions that are frequently raised by planners and designers faced with making suburban roadways more hospitable and safe for people on foot and bike.



1. How To Make 4- and 5-lane Suburban Roads More Complete?

Four- and five-lane arterials are pervasive across the entire region and often provide the backbone of regional transit services, connect communities across major barriers (e.g. railways, rivers, and highways), and provide access to the majority of the destinations for every aspect of our daily lives. However, they feature many of the most dangerous design elements identified in **Safe Streets** and are critical priorities for safety and mobility improvements.



2. Bikes on Suburban Arterials: On-street or Off-street?

Selecting the appropriate facility to serve people on bikes is a particular challenge on suburban arterials. The workbook provides guidance on how to choose between on- and off-street options, and identifies several planning and design factors to address before making a decision.



3. Where To Put a Crosswalk?

Safe pedestrian crossings are an essential element of Complete Streets. The workbook reviews a wide variety of potential crosswalk locations and types to choose from, depending on context, demand, and risk.



4. How Do Complete Streets Support Regional Transit?

Transit trips typically start and finish on foot or bike and yet many suburban arterials, where transit services are located, have no sidewalks, bike facilities, or crosswalks to access the transit stops. The workbook highlights the problems this can cause, and identifies several solutions to increase safety around transit stops.



How to Make 4- and 5-lane Suburban Roads More Complete?

Four-lane Arterial Road

Four-lane arterial streets are among the most common types of street in the Atlanta region, particularly in urban and suburban contexts. These through streets connect communities, carry a lot of local traffic, and are often transit corridors. Four-lane arterials are frequently congested in peak hours because of busy intersections, but speeding and weaving are significant safety issues the rest of the time.

In more urban areas, where speed limits are typically 35 MPH, four-lane arterials provide access to a myriad of destinations. They may have sidewalks (at least on one side), but are often constrained by immediately-adjacent property lines. Many residential or business parcels are not connected, limiting travel between adjacent destinations and pushing more traffic onto the roadway.

In more recently developed suburban areas, where speed limits are typically 45 MPH, there are frequently no sidewalks and the adjacent land uses are larger strip retail and commercial lots with driveways and parking lots that encourage high-speed turning movements. If there are sidewalks, they often lack curb cuts and crossings that reflect best practices.

The priority given to motor vehicles on these roadways typically means there is no space for pedestrian and bicycle infrastructure; few signalized crossings are provided, even at intersections and bus stops; vehicle speeds discourage stopping and yielding for pedestrians, and speeds are high enough that crashes involving vulnerable road users are likely to result in death or serious injury.

Crash Risk Factors Present:

- Vehicle speeds of 35 MPH and over
- Limited bicycle and pedestrian infrastructure
- Missing or inadequate crosswalks, especially at transit stops
- Frequent turning vehicles at driveways and intersections

Area examples

- Northside Drive, Atlanta, GA
- Church Street, Decatur, GA
- South Cobb Drive, Cobb County, GA
- Covington Highway, Avondale Estates and DeKalb County, GA



Four-Lane Existing Conditions



Four-Lane Short-Term Solution: Deliver Dignity, Comfort, and Safety

At a minimum, four-lane arterial streets should have a sidewalk on both sides and safe crosswalks at frequent intervals along the length of the corridor. Signalized crossings should be provided at all major intersections; mid-block Pedestrian Hybrid Beacon crossings may be appropriate where signalized intersections are spaced widely apart (e.g. more than a quarter of a mile).



SIDEWALKS provide safe places for people traveling by foot and by wheelchair. GDOT recommends a minimum of 5-foot-wide sidewalks, while NACTO recommends a minimum of 6 feet. AASHTO also recommends a minimum 5-6ft buffer between the sidewalk and travel lane. However, the land use context, transit, and pedestrian activity should always be considered.



CROSSWALKS provide an indication to pedestrians on where they should cross the street. They also provide motorists with an indication of where pedestrians are likely to be.



PEDESTRIAN HYBRID BEACON (PHB) is a pedestrian-activated signal that alerts drivers to pedestrians crossing the road.

Four-Lane Mid-Term Solution: Safety, Comfort, and Access for All

Many four lane roads can be reduced to three lanes – with a center turn lane and bicycle lanes and/or wide sidewalks – without affecting motor vehicle capacity (Rule of thumb: 4 lane roads with 20,000 ADT or less can very often be reduced to 3 lanes). This change makes the street safer for all by reducing vehicle speeds and speed differentials; eliminating weaving and lane changing; protecting turning traffic from rear-end collisions; providing a crossing refuge for pedestrians; and adding bike infrastructure. Lighting and landscaping can also contribute to a more walkable environment.



SEPARATED BIKE LANES create a safer space for bicyclists of all ages and abilities. Implementation of a bicycle facility should be conducted as an overall bicycle master plan.



STREET LEVEL LIGHTING improves visibility for all users along a corridor, but is particularly effective in high-trafficked areas.



MEDIAN AND PEDESTRIAN CROSSING ISLANDS reduce head-on motor vehicle collisions and provide a protected refuge at intersections and midblock crossings for pedestrians. They narrow the motorist's field of vision and reduce vehicle speeds.

Five-lane Arterial Road

Five-lane arterials – two travel lanes in each direction with a center turn lane – are very common throughout the Atlanta region. They are important corridors for connecting communities, providing access to adjacent properties, providing transit services, and carrying high volumes of traffic throughout the day. They are often the only through streets that cross major barriers such as Interstates, railroads, rivers and stream valleys, and major developments.

Speed limits on these roadways are typically 45 MPH and up; they rarely have sidewalks or any pedestrian and bicycle infrastructure. Signalized pedestrian crossings are rare, even at major intersections, even though these roads may serve regional and local transit routes. Adjacent parcels tend to be connected only to the road and not to adjacent properties or side streets. Many residential, commercial, retail land uses are comprised of campus-style developments with large expanses of fully subsidized parking.

Major intersections and frequent driveways are designed for high-speed turning and the presence of pedestrians and bicyclists is not anticipated or accommodated. However, people still walk and bike on these corridors to access jobs, goods, and services. In addition, they are often the only through-streets available. The absence of sidewalks and bike infrastructure increases the likelihood that pedestrian and bicyclists will walk in the road, cross mid-block, and/or ride against traffic – all of which are known contributors to pedestrian and bicyclists crashes with motor vehicles.

Crash Risk Factors Present

- High vehicle speeds for through and turning traffic
- No sidewalks or safe crossings for pedestrians
- Long distances between signalized intersections
- No pedestrian-scale lighting
- No bicycling infrastructure

Area Examples

- Cobb Parkway, Cobb County, GA
- Moreland Avenue, Atlanta, GA



Five-Lane Existing Conditions

FEW OR NO BUS STOPS OR SHELTERS

NO BICYCLE FACILITIES



AUTO-DEPENDENT LAND USES

NO PEDESTRIAN REFUGE/CROSSING ISLANDS

LACK OF PEDESTRIAN AMENITIES INCLUDING SIDEWALKS, CROSSWALKS, PEDESTRIAN-SCALED LIGHTING, AND STREET TREES.

Five-Lane Short-Term Solution: Deliver Dignity, Comfort, and Safety

The foundation of a complete street is a safe and comfortable place for people to travel whatever their chosen mode. A continuous, accessible sidewalk on both sides of five-lane suburban arterials is essential for a basic level of safety and access. The sidewalk should be highly visible as it crosses side streets and driveways. Where possible, curb radii should be tightened to reduce vehicle turning speeds, and refuge islands should be provided in the center turn lane where there are bus stops.



SIDEWALKS provide safe places for people to traveling by foot and those in wheelchairs. GDOT recommends a minimum of 5-foot-wide sidewalks. AASHTO also recommends a minimum 5-6ft buffer between the sidewalk and travel lane. However, the land use context, transit, and pedestrian activity should always be considered.



CROSSWALKS provide an indication to pedestrians on where they should cross the street. They also provide motorists with an indication of where pedestrians are likely to be.

Five-Lane Mid-Term Solution: Safety, Comfort, and Access for All

More substantial changes may be possible when roadways are reconstructed or adjacent land uses change. Reducing lane widths can often make room for on-road bicycling infrastructure while also reducing excessive speeds; sidewalks, crosswalks and pedestrian-scale lighting can transform the walking experience. Moving the curb makes wider sidewalks and raised cycle tracks an option. Crosswalks should be signalized if motor vehicle speeds exceed 25mph in this location.



SEPARATED BIKE LANES create a safer space for bicyclists of all ages and abilities. Implementation of a bicycle facility should be conducted as an overall bicycle master plan.



STREET LEVEL LIGHTING improves visibility for all users along a corridor, but is particularly effective in high-trafficked areas.

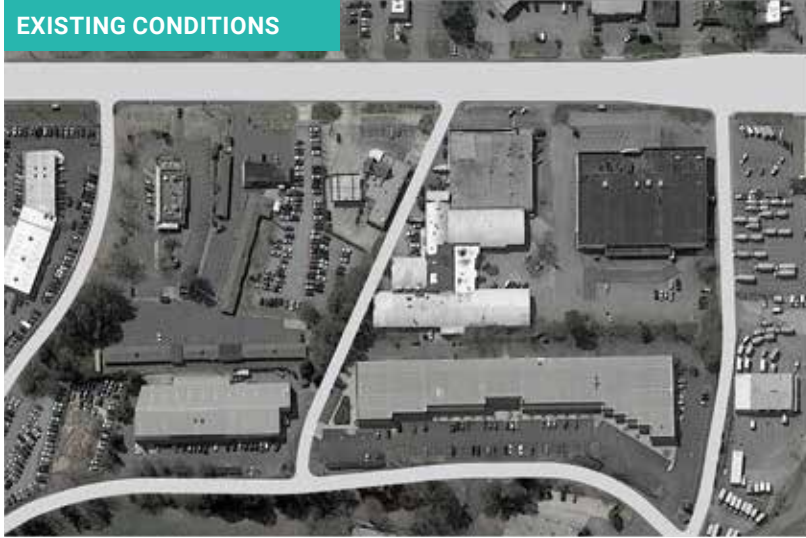


MEDIAN AND PEDESTRIAN CROSSING ISLANDS reduce head-on motor vehicle collisions and provide a protected refuge at intersections and midblock crossings for pedestrians. They narrow the motorist's field of vision and reduce vehicle speeds.

Long-Term: Redevelopment and Land Use Changes

Increasing density in suburban areas creates opportunities for more connected and safer Complete Streets. New urban centers or land uses patterns may emerge through changing market demands or be retrofitted in existing areas where appropriate. Adding new streets and creating street grids provides more connections and will enhance access and travel choices, thereby increasing the people-carrying capacity of the overall network.

EXISTING CONDITIONS



FUTURE REDEVELOPMENT





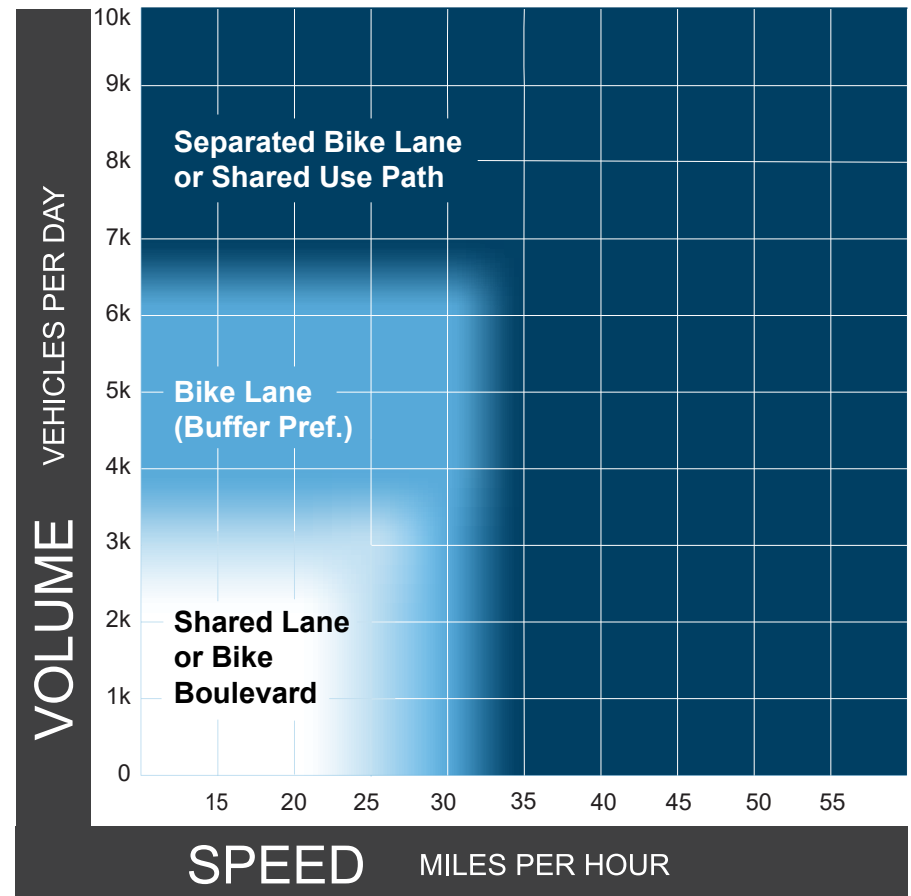
Bikes on Suburban Arterials: On-street or Off-street?

One of the most challenging questions planners and designers face is how to accommodate people riding bikes on suburban arterial roadways.

Cyclists should not be expected to share lanes with cars, buses, and trucks traveling over 35 MPH. Sidewalks that are narrow and only on one-side of the road are likely dangerous for people on bikes – national crash data identifies “riding on the sidewalk” and “wrong way riding” (as necessary on one-sided facilities) as significant contributing causes to bicyclist crashes. Sidepaths (shared-use paths adjacent to the roadway) have a poor reputation amongst bicyclists when they are designed as little more than glorified sidewalks.

Given the challenges of balancing risks and demand, recent advances in bike facility design enable a more pragmatic approach to selecting appropriate bicycle facilities on suburban arterial streets. Basic bike lanes may suffice in low-speed locations or protected lanes to separate bicyclists from higher speeds. When current or projected demand does not warrant the cost of fully-separated bike lanes, shared-use paths may be more appropriate.

Road characteristics, land use context, high-priority destinations, and anticipated or target riders should be examined to determine whether on-street lanes or off-street paths are most appropriate.^{i,ii}



Notes

- Chart assumes operating speeds are similar to posted speeds. If they differ, use operating speed rather than posted speed.
- Advisory bike lanes may be an option where traffic volume is <3K ADT.

i FHWA. *Bikeway Selection Guide*. (2019). Retrieved September 2019 from: https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf

ii Michigan Department of Transportation. "Sidepath Application Criteria Development for Bicycle Use". (2018). Retrieved September 2019 from: https://www.michigan.gov/documents/mdot/SPR-1675_Sidepath_Application_Criteria_Development_for_Bicycle_Use_Final_Report_2018-07-09_628346_7.pdf

Planning factors include:

- **Context.** Sidepaths are generally not appropriate in dense urban areas and should be used primarily in suburban or rural locations with moderate to high pedestrian activity.
- **Demand.** Higher anticipated bicycle and/or pedestrian use indicates a need for a separated bike lane rather than a shared use path or sidepath. AASHTO recommends that pedestrians and bicyclists be separated from each other when pedestrians are more than 30% of path users, or where there are more than 300 path users an hour in the peak hour.
- **Interruptions.** The lower the number of driveways, intersections, and other interruptions the more likely it is that a sidepath will be appropriate, especially if the path will be two-way on one side of the road.
- **Connectivity.** Consistency with connecting infrastructure can help determine the best design solution. Connecting trails along on a suburban roadway might best be accomplished with a two-way sidepath. Continuing an on-street bikeway network indicates an on-street, one-way separated design solution.

Design decisions should include:

- **One-way or two?** Two-way use requires greater width (min 10ft); more careful design at intersections; and a safe, intuitive transition back to one-way, on-street operation.
- **Width.** Basic design principles require a minimum of 5 feet for one-way and 10ft for two-way bicycle-only operation; more sidepath width may be necessary if pedestrian use is frequent.
- **Separation.** Separation from traffic is the primary benefit of a sidepath and a separated bike lane. The separation needs to be a minimum of 5 feet or be achieved with a barrier or curb.
- **Intersections.** Every driveway and cross-street must be treated as an intersection with appropriate crosswalks, signals, warnings and markings to eliminate potential conflicts and encourage motorist yielding.
- **Transitions.** Whatever facility is chosen should be easy and safe to access from the existing street or trail network – i.e. there should be no sudden “End” or “Dismount” signs at point of transition.



Sidepaths on two-lane, four-lane and four-lane divided highways in Northwest Arkansas.



Where To Put a Crosswalk?

Safe pedestrian crossings are an essential element of Complete Streets. Many streets in the Atlanta region, especially outside the urban core and town centers, provide too few safe places to cross street. According to FHWA:

“Pedestrians have a right to cross roads safely, and planners and engineers have a professional responsibility to plan, design, and install safe and convenient crossing facilities.”ⁱⁱⁱ

What Factors Influence Street Crossings?

- **Legality:** Crosswalks exist at nearly every intersection in Georgia whether they are marked or not.^{iv} Crossing the street outside of an intersection is legal in most places (as long as pedestrians yield to vehicles) except “between adjacent intersections at which traffic-control signals are in operation.”^v
- **Destinations:** People cross where they need to and often in the most direct line possible. Crosswalks should be closely spaced in dense urban areas or strategically located between destinations elsewhere, including transit stops.
- **Crossing Distance:** The width of the street influences how long it takes to cross. Longer distances need greater time, more protection, and higher visibility. Urban areas should reduce lanes to minimize crossing distances.

Should Crosswalks Be Marked?

Yes. Crosswalks should be marked at all intersections, especially where pedestrians are expected or desired to cross the street. The Georgia DOT’s adopted crosswalk marking pattern is highly visible, lower maintenance than alternate styles or materials, and should be the default pattern for all locations. In the urban core, urban areas, and town centers, therefore, most intersections should have marked crosswalks.

iii US DOT, Federal Highway Administration. *Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations*. (2005). Retrieved December 2018 from: <https://www.fhwa.dot.gov/publications/research/safety/04100/01.cfm>

iv Georgia Code: **§ 40-1-1.(10) Definition of a Crosswalk:** “Crosswalk” means (A) That part of a roadway at an intersection included within the connections of the lateral lines of the sidewalks on opposite sides of the highway measured from the curbs or in the absence of curbs, from the edges of the traversable roadway, or (B) Any portion of a roadway at an intersection or elsewhere distinctly indicated for pedestrian crossing by lines or other markings on the surface.

v <https://www.gahighwaysafety.org/campaigns/pedestrian-safety/pedestrian-safety/what-the-ga-codes-says-about-pedestrians/>

Street Connectivity & Walkability Measures

Character Areas	Intersection Density per Sq Mi	Block Perimeters	Block Length
Walkable areas	Greater than 100	2500-3000 ft (or less)	300-600 ft
Suburban corridors	Less than 100	Greater than 3000 ft	Greater than 600 ft



A long but accessible, marked, and signaled intersection.

Is marking crosswalks enough?

It depends. Determining appropriate crossing treatments requires careful consideration of road width, vehicle speeds and volume of vehicles and pedestrians. The higher the speed and volume of traffic, the greater the need to mark crosswalks and use signals to control traffic. In urban areas and town centers with a tight grid network of busy streets, crosswalks should be marked on all legs of most intersections. On lower volume side streets outside the immediate urban core, markings alone will sometimes be sufficient.

On suburban arterial roadways, every major intersection should have marked and signalized crosswalks to enable pedestrians to safely cross each roadway. Crossings of side streets and large commercial driveways should always be marked as crosswalks, whether there are signals or not.

It is not acceptable to avoid marking a crosswalk due to safety concerns. Where crosswalk markings are insufficient, additional safety measures should be used.

Locations where crosswalk markings alone are insufficient to address pedestrian safety include any street where any of the following conditions exist:

- The roadway has four or more lanes of travel *without* a raised median or pedestrian crossing island and an ADT of 12,000 vehicles per day or greater.
- The roadway has four or more lanes of travel *with* a raised median or pedestrian refuge island and an ADT of 15,000 vehicles per day or greater.
- The speed limit exceeds 35 MPH^{vi}

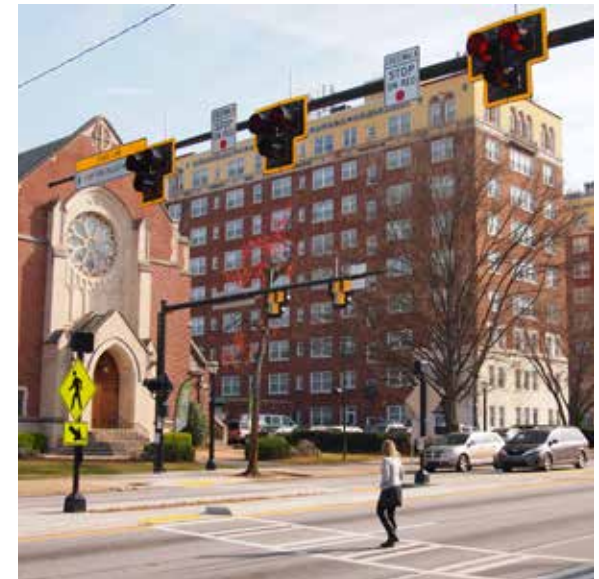
Rectangular Rapid Flashing Beacons might be appropriate at lower speeds (35 MPH or lower) and on two-lane roads (or on three-lane roads with a median island to provide one RRFB per lane); Pedestrian Hybrid Beacons are recommended for higher-speed, multi-lane conditions. Full signals may be warranted at higher volume locations. Medians or pedestrian refuge islands are an essential element of safe pedestrian crossings on all multi-lane roads.^{vii}



Marked, raised crosswalk.



Marked crosswalk with RRFB and refuge island.



Marked mid-block crosswalk with Pedestrian Hybrid Beacon

vi NCHRP Report 562, *Improving Pedestrian Safety at Unsignalized Intersections*

vii GDOT Pedestrian and Streetscape Guide

Where Should Crosswalks Be Located On Suburban Arterials?

Installing a marked and controlled intersection on a suburban arterial is a significant decision affecting safety and mobility^{viii}. High-visibility crossings help direct pedestrians to safer locations to cross, help alert motorists to expect pedestrians, fill missing links in a disconnected street network, and reinforce desire lines. Crossings should be considered for both specific locations and as elements of a bigger community walking network.

Ideally, crossing opportunities should be provided every 400-600 feet or prioritized at specific locations along suburban arterials:

- Major intersections
- Bus stops and transit stations
- Major desire lines such as the entrance to a school, park, shops, or library
- High pedestrian crash locations
- Trail intersections and access points



These locations may be at intersections or between intersections (mid-block) depending on the land use context and observed pedestrian behavior. At specific high-demand locations such as bus stops, crosswalks should be within 150ft of the activity generator. The overall goal is to provide a complete pedestrian system that is safe, direct, intuitive, and accessible.

What About Mid-Block Crossings?

Mid-block crossings are marked pedestrian crossings located between roadway intersections. They increase connectivity and shorten walking distances. They do not have to be precisely in the mid-point, but if they are signalized they should be at least 100ft from the nearest intersection that has a stop sign or signal.

In the context of four- and five-lane suburban roadways, mid-block crossings are appropriate in places where pedestrian activity can be expected (e.g. bus stops) and there are long distances between other signalized intersection. Traffic speed and volume on multi-lane suburban roadways (with speeds of 35 MPH and above) means that mid-block crossings should be assessed for warrants for Pedestrian Hybrid Beacons, full pedestrian signals, medians, or refuge islands.



viii FHWA Field Guide for Selecting Countermeasures at Uncontrolled Pedestrian Crossing Locations



How do Complete Streets Support Regional Transit?

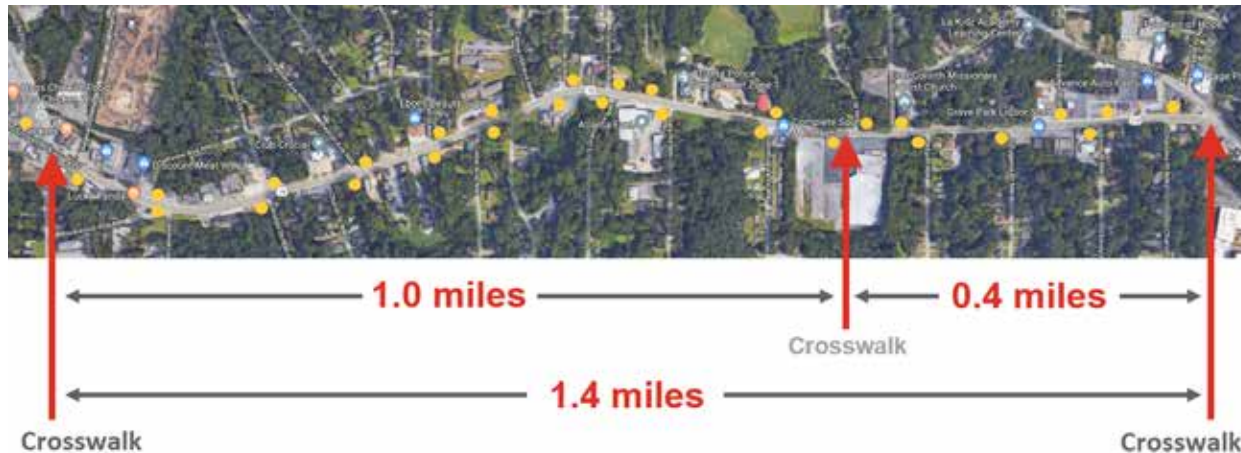
Across metropolitan Atlanta, transit service is a key resource in expanding mobility options and serving a full range of travel needs while reducing reliance on driving. Nearly three quarters of transit trips in metro Atlanta begin with a walk to a bus stop, train station, or park-and-ride lot.

- Most transit trips include walking, making sidewalks a critical piece of transit infrastructure.
- Bus access almost always involves crossing a street on foot.
- Walking, bicycling, and micromobility expand the service area and customer base of transit routes.
- Investments in pedestrian infrastructure can reduce demands on paratransit operators.
- Complete Street designs can provide dedicated spaces within roadways that improve transit operations.

Improving walking, bicycling, and micromobility conditions along the streets used to access transit stops and stations is key to making transit more attractive and convenient for more people. Complete Streets components should be used to ensure comfortable and convenient access to transit stops and stations:

- Make transit routes priorities for Complete Street investments
- Ensure every sidewalk and bus stop is ADA-compliant.
- Create mid-block crossings, especially with high-visibility features: RRFBs, warning beacons, median islands, and other safety measures.
- Consolidate bus stops (within reason) to balance higher use and convenient spacing.
- Manage driveways and other curb cuts.
- Make stations easy and convenient to access.

How far would you walk for a crosswalk?



Design Information and Resources

This 1.4 mile stretch of suburban road has more than a dozen bus stops (shown by the yellow dots) but only one marked crosswalk between major intersections. There are no sidewalks. Installing a crosswalk at each bus stop or local intersection would meet the recommendation on page 34.

More detailed design guidance and information can be found in the [PEDS' Safe Routes to Transit guide](#).

Design & Planning Resources

Georgia Department of Transportation (GDOT)

- GDOT (2003). "Pedestrian and Streetscape Guide". [Currently being updated]
- GDOT. (2016). "Context Sensitive Design Online Manual".
- GDOT. (2018). "Design Policy Manual, Chapter 9 Complete Streets Design Policy".
- Georgia Highway Safety. <https://www.gahighwaysafety.org/campaigns/pedestrian-safety/pedestrian-safety/what-the-ga-codes-says-about-pedestrians>

National

- American Association of State Highway and Transportation Officials (AAHSTO). (2012). "Guide for the Development of Bicycle Facilities". [Currently being updated]
- National Association of City Transportation Officials (NACTO). (2013). "Urban Street Design Guide".
- Institute of Transportation Engineers (ITE). (2010). "Designing Walkable Urban Thoroughfares: A Context Sensitive Approach".
- Federal Highway Administration (FHWA) (2016). "Small Town and Rural Multimodal Networks"
- FHWA. (2016). "Guidebook for Developing Pedestrian & Bicycle Performance Measures".
- FHWA. (2018). "Guidebook for Measuring Multimodal Network Connectivity".
- FHWA. (2016). "Achieving Multimodal Networks Applying Design Flexibility & Reducing Conflicts".
- FHWA. (2017). "Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations".
- FHWA. (2018). "Field Guide for Selecting Countermeasures at Uncontrolled Pedestrian Crossing Locations".
- FHWA. (2019). "Bikeway Selection Guide".
- USDOT. "Complete Streets". <https://www.transportation.gov/mission/health/complete-streets>
- FHWA. "Safety Page". <https://safety.fhwa.dot.gov/>
- NCHRP. (2006). "Improving Pedestrian Safety at Unsignalized Intersections". Report 562.
- Smart Growth America. (2019). "Dangerous by Design".
- King, Michael, et al. (2014). "To Cross or Not to Cross: Examining the Practice of Determining Crosswalks". ITE Journal.

State, Regional, and Local

- Florida DOT (FDOT). (2017). "Context Classification".
- Massachusetts DOT. (2015). "Separated Bike Lane Planning and Design Manual". <https://www.mass.gov/lists/separated-bike-lane-planning-design-guide>
- Michigan DOT. (2018). "Sidepath Application Criteria Development for Bicycle Use".
- Jones, Ellen Dunham, and June Williamson. (2011). "Retrofitting Suburbia: Urban Design Solutions for Redesigning Suburbs".
- PEDS (2014). "Safe Routes to Transit: Toolkits for Safe Crossings in Metro Atlanta" Retrieved 2019 from: https://peds.org/wp-content/uploads/2014/06/4729-SR2T-toolkits_Final.pdf

Citations

- Allen, Doug. (2017). "The History of Urban Form", *Otium* Issue 1. Retrieved 2019 from <https://www.dougalleninstitute.org/otium/>
- Atlanta Regional Commission. (2016). "Walk. Bike. Thrive!" Retrieved 2019 from <https://atlantaregional.org/plans-reports/bike-pedestrian-plan-walk-bike-thrive/>
- Atlanta Regional Commission. (2018). "Safe Streets for Walking & Bicycling" Retrieved 2019 from <https://cdn.atlantaregional.org/wp-content/uploads/arc-safe-streets-webview-revmar19-1.pdf>
- Atlanta Regional Commission. (2014) "Impact of Community Design on Greenhouse Gas Emissions". Retrieved 2019 from: http://documents.atlantaregional.com/taqc/2014/2014-10-09/Community_Design_Greenhouse_Gas.pdf
- Basmajian, CW. (2013). "Atlanta Unbound: Enabling Sprawl through Policy and Planning". Temple University Press.
- Calthorp, Peter and William Fulton. (2001). "The Regional City". Washington, DC: Island Press.
- Chetty, R. & Hendren, N. (2015). "The Impacts of Neighborhoods on Intergenerational Mobility: Childhood Exposure Effects and County-Level Estimates".
- Ewing, Reid, Rolf Pendall, and Don Chen. (2002). "Measuring Sprawl and its Impact". Smart Growth America. Retrieved 2019 from: <https://www.smartgrowthamerica.org/app/legacy/documents/MeasuringSprawl.PDF>
- Gately, Conor et al (2015). "Cities, traffic, and CO2: A multi-decadal assessment of trends, drivers, and scaling relationships". PNAS. 112 (16) 4999-5004.
- Georgia Department of Transportation (GDOT). (2019). "Design Policy Manual, Chapter 9, Complete Streets". Retrieved 2019 from <http://www.dot.ga.gov/PartnerSmart/DesignManuals/DesignPolicy/GDOT-DPM.pdf>
- Georgia Tech Center for Quality Growth & Regional Development (CQGRD). (2012) "Health Impact Assessment of Atlanta Regional Plan 2040".
- Goldberg, David et al. (2007) "New Data for A New Era: A Summary of the SMARTRAQ Findings Linking Land Use, Transportation, Air Quality, and Health in the Atlanta Region."
- Institute of Transportation Engineers (ITE). (2010). "Designing Walkable Urban Thoroughfares: A Context Sensitive Approach."
- Jackson, JB. (1994). "Other-Directed Houses". In *Landscape in Sight: Looking at America*. Ed Helen L. Horowitz. New Haven, CT: Yale University Press.
- Jacobs, Allan. (1995). "Great Streets". Cambridge, MA: The MIT Press.
- Jones, C., Kammen, D. (2014). "Spatial Distribution of U.S. Household Carbon Footprints Reveals Suburbanization Undermines Greenhouse Gas Benefits of Urban Population Density". *Environmental Science & Technology*. 2014, 48, 2, 895-902.
- Krier, Leon. (1991). "Afterword." in *Towns and Town-Making Principles*, Andres Duany and Elizabeth Plater-Zyberk, pg 117. New York, NY: Rizzoli.
- Leinberger, Christopher B. (2013). "The WalkUp Wake-Up Call: Atlanta".
- Lynch, Kevin. (1981). "Managing the Sense of a Region". Cambridge, MA: MIT Press.
- US Department of Transportation (USDOT). (2010). "Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations." Retrieved 2019 from https://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/policy_accom.cfm

Conclusion: It is Time to Start Building Complete Streets

Complete Streets are an essential tool to help solve regional safety, access, and mobility challenges. The Atlanta metropolitan area must break the vicious cycle of road widening, development, sprawl, and congestion by embracing walkable centers, advancing regional transit, and building safe, comfortable, and convenient streets that improve the quality of life for everyone. Building Complete Streets in walkable communities will enable sustainable future growth and economic activity.

Now is the time to start prioritizing Complete Streets in order to:

Prevent Further Problems

The first step in achieving Complete Streets is to stop building and widening roads with dangerous designs that discourage walking, biking and transit.

- **Avoid roadway widenings.** Congestion should be addressed through new roadway connections, roadway pricing, multimodal corridors, diverse travel options, and public transportation.
- **Eliminate dangerous roadway designs from projects.** Planned and programmed projects should be modified to add sidewalks, crosswalks, bicycling facilities, and traffic calming to reduce auto speeds.
- **Align funding to desired outcomes.** Assess capital project lists determine if programmed funds provide multimodal alternatives, shorten trips, support public transportation, and/or reduce vehicle miles traveled. Eliminate projects that will not support these outcomes.
- **Coordinate efforts.** Complete Streets principles should be routine at the local, regional, and state levels. Agencies and communities should coordinate in visioning, planning, funding, designing, and building Complete Streets.
- **Use land frugally.** Land is a limited, valuable resource that should be conserved where possible and maximized where developed. Compact urban communities and rural conservation balance a livable region. Investments in streets and roads determine a regional pattern that will persist for decades or centuries.



Address Current Issues

Many changes to both land use and transportation will take years if not decades to implement. However, current known issues should be addressed immediately.

- **Reduce transportation risk.** Identify high-crash locations and high-risk corridors for immediate retrofitting with proven safety measures. Small locations may warrant spot treatments, such as crossing islands or high-visibility crossings, while corridors or area-wide issues may warrant systemic treatments, such as medians or traffic calming. Safety plans should be developed with a community-scale strategy.
- **Slow speeds.** Conduct studies to determine where speeds can be slowed immediately. Adopt city-wide slower speed limits: 25 MPH for neighborhood streets and 35 MPH for arterial roads. Establish slower design speeds for all future projects.
- **Be opportunistic with current funding.** Every capital and resurfacing project is an opportunity to make a street safer and more comfortable for people on foot and bike. Lane and road diets can redistribute space in favor of bicyclists and pedestrians, simultaneously calming traffic without necessarily increasing congestion or delay. Systemic safety measures can be cost-effective approaches that take advantage of ongoing investments in community infrastructure and benefit all road users.



Anticipate Future Needs

A balanced perspective is important to determine changing needs and equitable outcomes. Data can provide clarity, but listening and facilitation are needed to ensure communities have meaningful input into the decision-making process.

- **Establish a community vision.** Base street designs on community visions and goals. Safe routes to schools and transit, future development patterns, and a modal hierarchy should all be determined through a community vision and advanced via Complete Street projects.
- **Perform quantitative analysis.** Use data and analysis to highlight priorities for Complete Street projects. Inventory community facilities and identify gaps or deficiencies. Calculate Levels of Traffic Stress (LTS) and Latent Demand Scores (LDS) for networks and major corridors. Use priority scores – either high demand or low quality – to identify gaps within the multimodal street network.
- **Embrace qualitative input.** Listen to the community. Residents' concerns and the community's vision should balance professional expertise, inform plans, and validate (or challenge) quantitative assessments. Roadway Safety Audits (RSA), Walkability or Bikeability Audits, community visualizations, design charrettes, Health Impact Assessments (HIA), and meaningful public engagement help determine equitable strategies for an area.



Ensure Better Outcomes

New projects – both transportation and land development – should be focused around supporting communities and improving regional corridors, providing multimodal options, enabling shorter trips, and reducing vehicle miles traveled.

- **Align community policies to support Complete Streets.** Use plans and policies to support better land use and transportation decisions: Vision Zero strategies; Complete Streets ordinances; master street plans, compact community zoning, form-based codes, and development ordinances; Context Sensitive Solutions (CSS) and multi-modal design guidelines; and market-oriented parking reform.
- **Increase network connectivity.** Provide new multi-modal roads that help complete the road network and reduce the need for increasingly wider roads. Use new roads to help improve transit and active transportation.
- **Support more transit.** Provide local transit and connect to regional transit. Aggressively pursue new sources of transit operating revenue.
- **Build compact, walkable communities.** Build within existing communities and promote conservation to limit future greenfield expansion. Focus new development in urban centers or denser suburban districts. Plan every new development around connected streets with multimodal facilities. Coordinate transportation investments with both existing and future land uses.



229 PEACHTREE ST NE, STE 100 | ATLANTA, GEORGIA 30303
404.463.3100
ATLANTAREGIONAL.COM