

## TRANSIT STRATEGIES COMPLETE STREETS

“Complete Streets” are designed and operated to safely accommodate all users, including people of all ages and abilities walking, bicycling, or riding public transit; passengers and drivers of motor vehicles, including taxis; and operators of freight and delivery vehicles. Complete Streets support transit access and operations, as every transit trip starts with a trip by some other mode. Most transit passengers are pedestrians first, others access transit by bike, and others park a car or are dropped off at a transit stop or station. Complete Streets provide safe walking and bicycling facilities and support the safe and efficient operation of transit, including high quality bus stops and passenger facilities, transit priority treatments, and other design elements that prioritize moving people over moving cars.

The National Complete Streets Coalition describes incomplete streets as “a hindrance to [transit] riders” and to “good service.” Poor design slows transit service and discourages people from riding transit. Even though most transit riders begin their trips on foot, there is often a disconnect between road planning and transit planning. In many cases, this leaves transit riders waiting next to a bus stop sign on a dirt path, and often along a high traffic street with no sidewalks or safe crossings.

In contrast to these “incomplete” streets, Complete Streets make transit safe, convenient, and comfortable. The Coalition notes, “Complete Streets policies help create the safe and comfortable bus stops and smooth predictable transit trips that help make public transportation an attractive option.”

### PLANNED COMPLETE STREET PROJECT IN LEE COUNTY, FL



When constructed, the LCCSI will transform auto-oriented roads into complete streets that serve all users, as in this rendering of one of the LCCSI projects on Colonial Boulevard, providing new walking and bicycling infrastructure, transit amenities, and wayfinding.

## BENEFITS OF COMPLETE STREETS

Complete Streets ensure safe and convenient access to public transit for all people. Complete Streets include safe and comfortable bus stops and smooth, predictable transit trips that help make transit an attractive travel option. Although the addition or improvement of sidewalks and bikeways are often the biggest physical changes necessary to build a Complete Street, true Complete Streets projects also enhance transit service. The major benefits of Complete Streets for transit are that they:

- Improve transit speed and **on-time performance** by reducing the amount of time buses are stuck in traffic
- Improve access and safety for riders by **enhancing first mile/last mile connections** to transit services
- Provide space along the street for **comfortable transit stops** or stations with amenities

- Encourage mixed-use, transit-oriented development that can **increase the demand for transit**
- Promote **economic development** by making it easy to cross the street, walk to shops, and bicycle to work
- Improve **safety for all people** by reducing motor vehicle speeds, intersection crossing distances, and potential conflicts and collisions

#### **GUADALUPE STREET “COMPLETE STREET” IN AUSTIN, TX**



## **TRANSIT OPERATIONS**

Complete Streets approaches can increase the speed and reliability of public transportation operations. In Boulder, CO, accommodating and encouraging public transportation use has been a major tool in achieving their transportation master plan complete streets goals. The city's Community Transit Network features bus routes with well-designed and conveniently sited stops on several major corridors.

Transit agencies that get involved in street design decisions from the very beginning can ensure better bus stop placement; space along the street for shelters, benches, and signs; and consistent street crossings for riders to access transit stops. In Roanoke, VA and Seattle, the transit agency is involved in street design review from the very first meetings. Louisville's transit agency participated actively in the rewrite of the city's street manual. The transit agency in Colorado Springs is part of the city government and works closely with the planning and engineering departments to ensure that project designs support transit.

## **RIDERSHIP INCREASES**

Streets that are well designed for transit can encourage more people to get out of their cars and onto the bus. Such streets provide accessible bus stops and assist buses in moving through traffic. Since 2000, rapid bus service in Los Angeles has used a priority signal system that allows buses to extend green lights or shorten red ones. Within the first year of operation, travel time decreased by 25% and ridership increased by more than 30%.

## ECONOMIC DEVELOPMENT

In San Francisco, one year after the city reconfigured Valencia Street with bike lanes, bicycle volume increased by over 140% during the afternoon peak, and collisions involving pedestrians decreased by 36%. Driving times for transit and vehicles were not significantly affected. However, nearby businesses reported an increase in sales of 60%, which they attributed to higher levels of pedestrian and bicycle activity, reduced travel time, and greater convenience for shoppers. The city has since widened sidewalks, added parklets, and re-timed signals to increase the efficiency of the street for people traveling by all modes.

REDESIGNED VALENCIA ST SUPPORTS BUSINESSES (SAN FRANCISCO)



REDESIGNED DEXTER AVE IMPROVES TRANSIT OPERATIONS (SEATTLE)

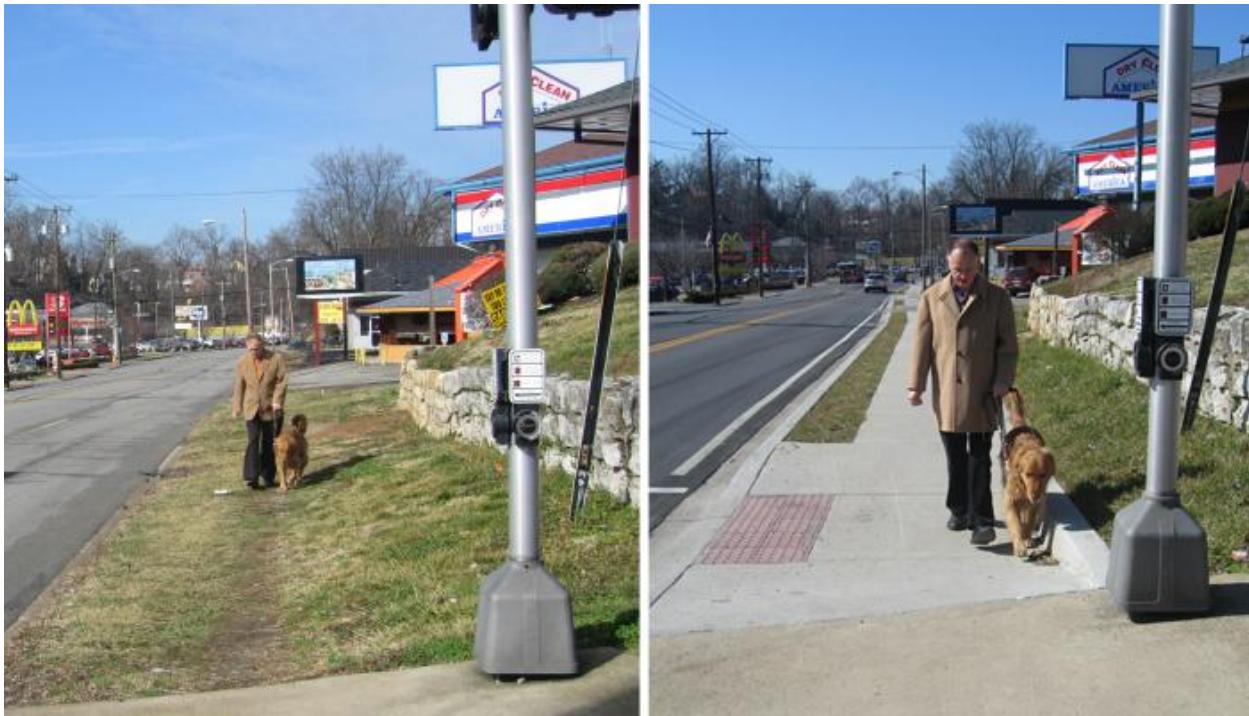


## EXAMPLES OF COMPLETE STREETS

A truly “complete” street must accommodate the access, mobility, and safety needs of all travelers. For example, a bus stop located far from a safe crossing can put transit riders in danger. Similarly, a sidewalk without curb ramps is useless to someone in a wheelchair. A road with heavy freight traffic must have sufficiently wide lanes and intersections designed to accommodate turning trucks. Accessibility and mobility for automobile drivers and passengers must also be considered in planning for Complete Streets, as many changes made to better accommodate non-auto modes of transportation—including for transit—will also improve conditions for personal vehicles. Ensuring that streets are designed and operated to safely accommodate all these interests requires that multiple agencies and stakeholders work together, with a clear and consistent set of priorities.

Cities around the country—small and large, rural and urban—have been building Complete Streets to improve comfort, convenience, and safety and increase people’s ability to travel by a variety of modes. The photos below illustrate Complete Streets projects in various contexts.

LOUISVILLE, KY COMPLETE STREET BEFORE (LEFT) AND AFTER (RIGHT)



NEW YORK CITY COMPLETE STREET AND TRANSIT PROJECT BEFORE (LEFT) AND AFTER (RIGHT)



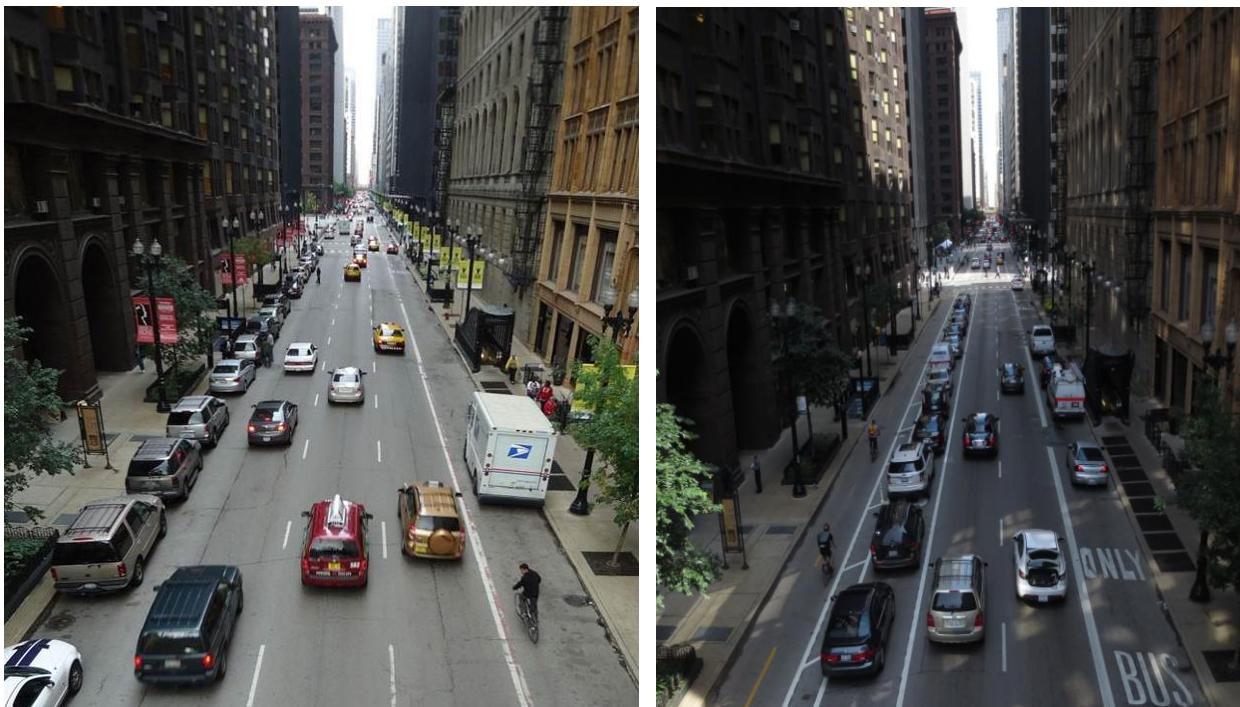
RURAL AREA COMPLETE STREET PROJECT BEFORE (LEFT) AND AFTER (RIGHT)



#### UNIVERSITY PLACE, WA COMPLETE STREET BEFORE (LEFT) AND AFTER (RIGHT)



#### CHICAGO'S DEARBORN AVENUE COMPLETE STREET BEFORE (LEFT) AND AFTER (RIGHT)



## PROCESS FOR DEVELOPING COMPLETE STREETS

There are four steps to ensure the successful implementation of Complete Streets:

1. Adopt a Complete Streets policy
2. Change your practices to implement the policy
3. Follow those new practices and design context-sensitive Complete Streets
4. Monitor the performance of Complete Streets projects to ensure they work

## STEP 1: POLICY DEVELOPMENT

Complete Streets start with a strong, locally-driven policy statement, making explicit the intent to safely accommodate all people in decisions related to street design and operation. A clear policy statement provides guidance for planners, engineers, and community members and can also provide necessary political and institutional momentum for implementation. According to the National Complete Streets Coalition, a comprehensive Complete Streets policy incorporates the following elements:

- Specifies that “**all users**” includes pedestrians, bicyclists, and transit passengers of all ages and abilities, as well as trucks, buses, and automobiles
- Applies to **new and retrofit projects**, including design, planning, maintenance, and operations, for **all roads**
- Makes **any exceptions specific** with clear procedures requiring high-level approval
- Encourages **street connectivity** and aims to create a comprehensive, integrated, connected network for all modes
- Directs the use of the **latest and best design criteria** and guidelines while recognizing the need for **flexibility**
- Directs that solutions will **complement the context** of the community
- Establishes **performance standards**
- Includes specific next steps for **implementation** of the policy

## STEP 2: IMPLEMENTATION

Once a strong Complete Streets policy is in place, the next step is to ensure it moves from paper into practice. An implementation plan is necessary to identify documents and processes that must be changed, assign responsibility for making such changes, and define specific desired outcomes of policy implementation.

One of the biggest challenges is changing “business as usual” practices in transportation budgeting, programming, and street planning, design, and operations. Implementation plans can help guide planners and engineers through new procedures and ways of thinking. Some communities have used procedural training to empower agency staff and ensure they understand how to apply the new policies, practices, and procedures in their work.

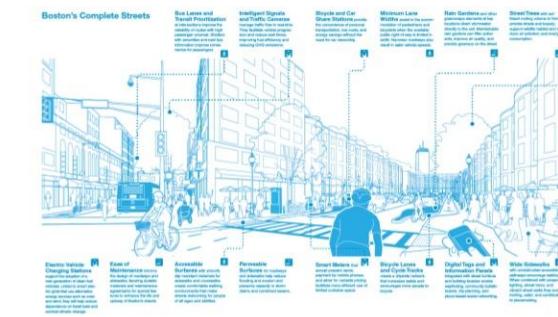
### Best Practice: Training and Implementation Chicago, IL

The City of Chicago adopted a Complete Streets policy in October 2006. To help staff understand and implement the policy, the Chicago Department of Transportation worked with the Chicago Metropolitan Agency for Planning to sponsor a series of training sessions for city planners, engineers, and project managers. Several hundred people participated in four two-day workshops, resulting in a greater awareness of Complete Streets issues and increasing understanding of potential design considerations.



### Phase I Priority Focus = Guidelines

*Complete Streets Guidelines* focus on the physical design of streets modal choice, priority-setting, space allocation, design standards, context-sensitive options and decision-making protocol



In 2013, Chicago published its Complete Streets Design Guidelines, another implementation tool to help staff operationalize Complete Streets in all phases of a project including planning, design, construction, and maintenance.

*Source: Complete Streets: Best Policy and Implementation Practices, Chapter 5, 2013.*

## STEP 3: DESIGNING COMPLETE STREETS

Accommodating safe access along and across all streets for people traveling by all modes of transportation can be achieved with a variety of different types of design treatments and street operations. An effective Complete Streets design is sensitive to community context. Clear guidance for context-appropriate application of Complete Streets principles can allay fears that “complete streets” will mean inappropriately wide roads in quiet neighborhoods or miles of costly, little-used sidewalks in rural areas. The table below highlights a selection of Complete Streets treatments that can facilitate access and mobility for people walking, cycling, or riding transit.

Transit-Supportive Complete Streets Design Treatments		
 <b>Right Sizing Streets</b> <ul style="list-style-type: none"> <li>Conversion from 4 to 3 lanes; allows addition of center turn lane, bikeways</li> <li>Improves safety by reducing pedestrian crossing distance and reducing potential conflicts</li> <li>Appropriate and can maintain vehicle capacity on streets up to 25,000 vehicles per day</li> </ul>	 <b>Median Refuge</b> <ul style="list-style-type: none"> <li>Enables safer pedestrian crossing, with shorter crossing distances</li> </ul>	 <b>Curb Extensions</b> <ul style="list-style-type: none"> <li>Supports safer pedestrian crossings</li> <li>Provides space for high capacity bus stops/shelters</li> <li>Enables more efficient in-lane bus stops</li> </ul>
 <b>High Quality Bus Stops and Stations</b> <ul style="list-style-type: none"> <li>Spacious and set back from sidewalks to maintain pedestrian walkway</li> <li>Amenities, including shelters, benches, line and system maps, trash bins, and real-time bus arrival information</li> </ul>	 <b>Transit-Only/BAT/HOV Lanes</b> <ul style="list-style-type: none"> <li>Maintains speed and reliability on corridors with high frequency service and transit priority</li> <li>Business Access and Transit (BAT) lanes are dedicated to buses and right-turning traffic</li> <li>High Occupancy Vehicle (HOV) lanes are viable on some arterials</li> </ul>	 <b>Transit Stop Islands</b> <ul style="list-style-type: none"> <li>Transit stop/waiting area located in travelway, with bikeway located between transit stop and the curb</li> <li>Completes the street on corridors with separated bikeways and frequent transit service</li> <li>Eliminates bus/bike conflict near stops</li> </ul>

Ultimately, a context-sensitive approach to complete streets planning and design can create a comprehensive, integrated, connected network for all modes that recognizes the need for flexibility in balancing people's and communities' needs.

## STEP 4: MONITORING PROGRESS

Progress monitoring and adaptation are necessary to ensure effective and consistent implementation of Complete Streets policies across all agencies and all types of streets. Some communities use quantitative and qualitative performance indicators to gauge how a particular street, street segment, or the entire street system is working. There are several approaches:

Performance measures can be used for **needs assessment** to identify problems in the system and to assess their relative severity. For example, in Roanoke, VA, planners developed a scoring system for major streets that takes into account safety, connectivity, and design, as well as the presence of street trees, stormwater and drainage issues, and the availability of sufficient right-of-way to accommodate all modes.

A related approach is to **develop a classification system** that assesses a street's appropriateness for complete streets treatments. Decatur, GA, modified their traditional street typology to account for the relationship of the street to land use, so that each new street type caters to different levels of need for various travelers, by foot, bike, or car.

Finally, some places have developed a **comprehensive monitoring system** that tracks a suite of performance indicators for the transportation system on a regular basis. For example, Redmond, WA, uses a Mobility Report Card with over 15 indicators to spot trends and track progress toward goals.

### Best Practice: Complete Streets Standards and Indicators

Redmond, WA

In September 2007, Redmond became the third community in the Central Puget Sound Region to adopt a Complete Streets ordinance. The ordinance codified the steps Redmond had already taken in its comprehensive plan and transportation master plan (TMP) to create a balanced, multimodal transportation network. Redmond is a suburban-style community that is using Complete Streets to build support among constituents and elected officials.



**Provide convenient, safe and environmentally friendly transportation connections within Redmond, and between Redmond and other communities, for people and goods**



**No apparent overall positive or negative trend.**

### GO figure

*Numbers at your fingertips*

How Much/Many?	Of What?	Trend
9,200	Students riding the bus to school (2009)	↔
767	Traffic collisions not involving pedestrians or bicyclists	↔
22	Collisions involving pedestrians or bicyclists <small>(Improving: fewer collisions)</small>	↓
7.6%	Traffic growth for selected intersections since 1996 (2008) <small>(Worsening: more traffic)</small>	↑
36%	AM commuters traveling by non-single occupancy vehicle (2009)	↑

In the TMP, Redmond created a mobility report card measuring a variety of indicators: concurrency (between land development and transportation system capacity); a.m. mode share; school bus ridership; public transportation travel time and service frequency; average weekday boardings on public transportation; service hour targets for local public transportation; p.m. peak-hour vehicle miles traveled; average traffic growth by transportation management district; percentage of pedestrian environment designed to “supportive” standards; completion of the bicycle network; number of vehicle, pedestrian, and bicyclist collisions; and status of the Three-Year Priority Action Plan. This information is used to evaluate the performance of each mode, including transit.

*Source: Chapter 5 of Complete Streets: Best Policy and Implementation Practices, 2013.*

## COMPLETE STREETS IN NASHVILLE AND MIDDLE TENNESSEE

Today, there are many streets in Nashville and Middle Tennessee that are “incomplete.” This is due to a variety of factors, including the point in time at which many of the streets were built. As the region continues to grow and undertakes new transportation and transit projects, building new streets that are complete and retrofitting existing streets must be a top priority to improve access and mobility for residents and visitors traveling by all modes.

### INCOMPLETE STREETS IN NASHVILLE MAKE IT DIFFICULT FOR PEOPLE TO USE TRANSIT



### NASHVILLE COMPLETE STREETS

Transportation planning and street design in Nashville have been influenced by the Complete Streets Executive Order issued by former Mayor Karl Dean on October 6, 2010. The Executive Order directs city departments to “give full consideration to the accommodation of the transportation needs of all users, regardless of age or ability, including those traveling by private vehicle, mass transit, foot, and bicycle,” and to “review all current Public Way plans, guides, regulations and standard drawings to comply with this Executive Order.”

Nashville’s manual for implementing Complete Streets is the Major and Collector Street Plan. The plan was overhauled in 2011 to comply with the Complete Streets Executive Order, and updated again in 2015 to incorporate innovations in urban street design like protected bike lanes. New developments and major redevelopments along collector and arterial streets in Nashville must bring the street up to the standards set out in the Major and Collector Street Plan. As a result, sites along many of Nashville’s prominent corridors have been transformed with appropriate sidewalks, planting strips, and bicycle facilities that were overlooked in the past.

Work has also been done to ensure that public investments in the transportation network implement Complete Streets principles. The Nashville-Davidson County Strategic Plan for Sidewalks and Bikeways (2008) adopted Complete Streets design principles (Chapter 6.5.2), while the Public Works Subdivision’s Street Design Standards and Specifications (Chapters 1.1 and 3.5) provides specific guidance for application of Complete Streets principles in the construction, rehabilitation, or reconstruction of streets.

The Nashville Area Metropolitan Planning Organization (MPO) and its member jurisdictions have identified Complete Streets as a primary tool to implement the 2040 Regional Transportation Plan, with members adopting local Complete Streets policies as part of their planning efforts. The MPO identified four basic realms in which Complete Streets can be viewed: the context realm, pedestrian realm, travelway realm, and intersection realm. Together these realms help in the design of Complete Streets and ensure the needs of all users are accommodated.

As depicted on the following pages, several major Complete Streets projects have been implemented or are planned in Nashville.

## Deaderick Street

This key downtown street—connecting the State Capitol and the Metro Courthouse—was primarily a transit and auto-oriented street, affected by frequent stormwater and sewage overflow issues. In 2009, Deaderick was redesigned (see photo at right), with a strong emphasis on pedestrian accommodation, with ample sidewalks, street trees, a planted median and streetside buffers, on-street parking, extended curbs at intersections, pedestrian-oriented LED streetlights, and pedestrian wayfinding kiosks.



## Belmont Boulevard

Belmont Boulevard is a primarily residential area with a bustling commercial strip located next to Belmont University. Near Ashwood Avenue, Belmont incorporates on-street bike lanes, parking, a planter strip, and sidewalks within an 80-foot public right-of-way.



## 11th Avenue

Completed in fall 2015, the 11th Avenue Complete Street project was designed to improve multimodal accessibility between Laurel Street and the Church Street Viaduct. It includes a multi-use path with separated bicycle lanes and wide sidewalks, signalized crossings, a greenway and mini-park with a fitness station, bioretention to treat stormwater, trees and landscaping, and bike racks and street furniture. The photo to the right shows an “open streets” event on 11th Avenue during summer 2015, when the project was substantially complete.



## MIDDLE TENNESSEE COMPLETE STREETS

Outside of Nashville and Davidson County, few communities have formally adopted Complete Streets policies, although interest in Complete Streets principles is growing. The MPO provides information and occasional trainings on Complete Streets and connects member communities to resources. Moving forward, there are opportunities for all Middle Tennessee communities to adopt Complete Streets policies and design guidelines and to provide additional support for local and regional transit services.

### Complete Streets in Hendersonville

As an integral element of its Land Use and Transportation Plan, the City of Hendersonville, TN, adopted Complete Streets policies in 2009. The Complete Streets chapter (Ch. 6) of the plan provides helpful guidance applicable for communities across Middle Tennessee to address the common challenge of “transforming major arterials into Complete Streets,” and “shift[ing] from an automobile dominated roadway to a balanced, multimodal transportation system.”

#### HENDERSONVILLE, TN COMPLETE STREETS GUIDANCE

TRAVEL REALM	Table 4-5 - Benefits of Corridor Access Management							
	Old Town	Neighborhood Mixed Use Center	Employment Center	Regional Activity Center	Suburban Center	Suburban Neighborhood	Rural Living	Waterfront Living
Number and width of travel lanes								
Intersection vehicular capacity								
Design for large vehicles								
Medians								
Bicycle lanes								
Multimodal intersection design	Yellow	Purple	Purple	Purple	Grey	Grey	Grey	Grey
<b>PEDESTRIAN REALM</b>								
Wide sidewalks with amenities	Yellow	Purple	Grey	Grey	Grey	Grey	Grey	Grey
Standard sidewalks with verge		Yellow	Yellow	Yellow		Yellow	Purple	Purple
Multi-use paths	Purple	Purple	Purple	Purple	Yellow	Purple	Yellow	Yellow
On-Street parking	Yellow	Purple	Grey	Purple	Grey	Grey	Grey	Grey
Urban design features	Yellow	Purple	Grey	Purple	Grey	Grey	Grey	Grey
<b>OTHER ELEMENTS</b>								
Interconnected street system	Yellow	Purple	Purple	Yellow	Purple	Purple	Grey	Purple
Access Management		Purple	Yellow	Yellow	Yellow	Purple	Grey	Grey
Curb and Gutter	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Purple	Yellow
Ditch Swale Section							Yellow	
RELATIVE STREET SPACING (FT)	600-800	600-1500	1200-1500	800-1500	1200-1500	1500-3000	2,500-5000+	Varies
High Priority	Yellow							
Medium Priority	Purple							
Low Priority	Grey							
N/A								

As an integrated plan, addressing both land use and transportation, Hendersonville's Complete Streets Chapter provides important guidance for both streetscape and urban design, including transit integration, building form and size, the pedestrian realm, the roadway, median treatments, and street operations. The plan includes a street design priority matrix providing guidance on appropriate complete streets treatments for each corridor segment, based on local land use context, and needs for access and connectivity.