Complete Streets

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Complete Streets are planned, designed and operated to enable safe, attractive, and comfortable access and travel for individuals of all ages and abilities, including pedestrians, bicyclists, transit users, and motorists.
Complete Streets Implementation

1) Change Procedures

(Develop planning and design guidelines to support the Complete Streets Policy adopted in July 2009)

Complete Streets Advisory Group

Jay Bennett – Roadway Design Unit (Co-Chair)
Tracy Newsome - Charlotte Department of Transportation (Co-Chair)
Kumar Trivedi – Bicycle and Pedestrian Division
Joey Hopkins – Deputy Division Engineer, Division 5
Andy Bailey – Senior Planner, Transportation Planning Branch
Kevin Lacy – Transportation Mobility and Safety
Eric Midkiff – Project Development Unit Head, Central Region, PDEA
Miriam Perry – Public Transportation Division
Hanna Cockburn - Piedmont Triad Council of Governments
John Tippett - Western Piedmont Council of Governments
Mike Kozlosky - Wilmington MPO
Carrie Reeves - City of Greensboro DOT
Margaret Bessette - City of Winston-Salem
John Tallmadge – Triangle Transit
Rick Heicksen - Fayetteville Area MPO
Odessa McGlown – Quality Enhancement Unit
Jerry Higgins - Communications Office
Joseph Geigle - Federal Highway Administration
Complete Streets Implementation Steps

2) Training
(Training will be developed for various internal and external stakeholders after the guidelines are completed – early spring 2012)

Complete Streets Implementation Steps

3) Re-writing Manuals
(summer 2012)
Complete Streets Implementation Steps

4) Create New Performance Measures
(Number of projects incorporating complete streets elements,
Number of intersections incorporating complete streets elements,
Effectiveness of complete streets training)

Creating a Better Street Network (combining the planning and design process)

- Follow a series of steps for all street projects to help establish a shared solution for the transportation facility
- The key = evaluate the existing and future users of the street and determine how to make the facility safe and accessible for these users
Creating a Better Street Network (The Process)

• Existing and Future Conditions (define land use context, define transportation context)
• Goals and Objectives (identify issues and opportunities, define objectives)
• Decision-Making (define contextual solutions, define trade-offs, alternatives)
• Groups of individuals establishing a recommended alternative

Guideline Development
(what do we hear?)

Held stakeholder interviews in the summer of 2010

• Complete Street Guidelines should be flexible
• Complete Street Guidelines should be based on context, in terms of location (urban and rural)
• How are projects going to be funded? (Cost sharing and spatial constraints for future transportation improvement projects have to be addressed)
• Streets should be multi-modal
• Public input for design often happens too late in the plan development process
• Project planning and design process needs to be more balanced and collaborative
Guideline Development
(where are we now?)

April 2011:
Providing the content for the planning and design guidelines to stakeholders (coming soon)

• Reviewing draft content and framework in summer 2011 (out for comment May 27, 2011)
• Finalize guidelines by spring 2012

Functional Classification and Street Type

- Street Design Type:
  - Freeway
  - Expressway
  - Main Street
  - Avenue
  - Boulevard
  - Parkway
  - Local/Subdivision Street
  - Rural Road
  - Collector
  - Arterial
  - Local
  - Collector
  - Arterial
  - Pedestrian/Bicycle-Oriented
  - Auto/Truck-Oriented
Interstate I-277 Charlotte
(Functional Classification -- Interstate/Freeway)

Dawson McDowell Connector - Raleigh
(Complete Street -- street type Parkway)
Prosperity Church Road Charlotte
(Complete Street -- street type Boulevard)

South Boulevard Charlotte
(Complete Street -- street type Boulevard)
Old Pineville Road Charlotte
(Complete Street -- street type Avenue)

Hillsborough Street Raleigh
(Complete Street -- street type Avenue)
Davidson
(Complete Street -- street type Main Street)

Front Street Wilmington
(Complete Street -- street type Main Street)
Residential Street
(Complete Street -- street type Local/Subdivision Street)

Residential Street
(Complete Street -- street type Local/Subdivision Street)
Chapter 1 – “Implementing Complete Streets in North Carolina”
Chapter 2 – “Process”
Complete Streets guidelines establish a process for incorporating all modes into both existing and future transportation improvement projects.

Chapter 3 – “Understanding Context and Designing for all Users”
Central Business District
CBD’s are the most developed areas of a city
As a downtown development is typically commercial or mixed use and vertically dense.
Chapter 3 – “Understanding Context and Designing for all Users”

Urban Center
Areas that are developed at moderate to high levels of intensity
Typically contain a mix land uses
Buildings lot sizes will vary, but are usually narrow

Chapter 3 – “Understanding Context and Designing for all Users”

Urban Residential
Districts typically consist of single family residential developments at a common scale
Sidewalks are present and on street parking is common
Chapter 3 – “Understanding Context and Designing for all Users”
Suburban Center – Suburban Corridor – Suburban Residential

Chapter 3 – “Quality of Service”

Quality of service is based on street design elements that improve street functionality for bicyclists, pedestrians and transit users.

Quality of service considers the ways in which buildings, parking and landscape are arranged on an adjacent site and the effect it has on where the street and its context fall in the continuum of street networks.

For walking, biking and transit to be attractive travel options, the experience of using non-motorized transportation must feel comfortable and safe.
Chapter 4 – “Planning and Design Elements”

Erwin Road – Durham -Before

Erwin Road – Durham -After

**URBAN/SUBURBAN MAIN STREET**

**PLAN VIEW**
- With Island
- With Bicycle Zone

**KEY ELEMENTS**
- May function as an arterial, collector, or local street.
- May function as a collector serving as a primary thoroughfare for traffic circulation in a limited area.
- May function as a local street for an existing business district.
- Designed to carry vehicles at low speeds.
- A destination street for a city or town, serving as a center of activity, social and economic activity.
- Serves substantial pedestrian traffic as well as transit and bicycles.
- Characterized by wide sidewalks, crosswalks, and pedestrian amenities, due to emphasis on pedestrian travel.
- Bicycle lanes are standard, but typically not necessary on these streets, due to lower speeds and volumes and the desire to keep pedestrian crossing distances to a minimum.

**STREET CROSS-SECTION ZONES**
- **Development Zone:** Development should be pedestrian-oriented with narrow setbacks and an active street environment.
- **Sidewalk Zone:** The pedestrian path area is of sufficient width to allow pedestrians to walk safely and comfortably. Pedestrians are the priority on a main street.
- **Bicycle Zone:** A zone for bicyclists separate from vehicular traffic.
- **Parking/Roadside Stop Zones:** Accommodates on-street parking and transit stops. Width and layout may vary.
- **Green Zones:** Consist of the area between the sidewalk curb and curb. Includes street trees and other landscaping, as well as interlaminated street furnishings and pedestrian-scale lighting in a landscaped amenity zone.
- **Sidewalk Vehicle Zones:** The primary travel way for vehicles. A shared vehicle zone has mixed traffic (cars, trucks, buses, and bicycles).

North-Carolina Complete Streets Planning and Design Guideline Framework
**URBAN/SUBURBAN MAIN STREET**

**ILLUSTRATIVE STREET CROSS-SECTION**

**STREET COMPONENT DIMENSIONAL GUIDELINES**

<table>
<thead>
<tr>
<th>Sidewalk Zone (Feet)</th>
<th>Green Zone (Feet)</th>
<th>Parking/Truck Zone (Feet)</th>
<th>Motor Vehicle Zone (Zone width: Feet)</th>
<th>Bicycle Zone (Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Business District</td>
<td>5' - 15'</td>
<td>0' - 12'</td>
<td>0' - 13'</td>
<td>6' lanes (see note 4)</td>
</tr>
<tr>
<td>Urban Center/Suburban Center</td>
<td>3' - 10'</td>
<td>0' - 12'</td>
<td>0' - 13'</td>
<td>6' lanes (see note 4)</td>
</tr>
<tr>
<td>Suburban Greenbelt/Suburban Residential</td>
<td>3' - 10'</td>
<td>0' - 12'</td>
<td>16' - 21'</td>
<td>6' lanes (see note 4)</td>
</tr>
</tbody>
</table>

1. Sidewalk zone should typically extend from the front of buildings. Sidewalks are the most important element on a main street, because pedestrians are the priority.
2. Green zone may include landscaping, tree groves, traffic trees, lighting, and related pedestrian/bike/transit amenities. Landscaping and street trees in appropriately-designed planters is typical, for access to on-street parking and transit.
3. Parking/Truck zone is the remaining area type of parking provided. Angle parking with ample space dimension than shown.
4. Bicycle lanes are the preferred treatment, due to the low speeds. In this case, travel lanes should be 12' to allow for maneuvering and opening car doors. Shoulders can be used on streets < 80 mph. If bicycle lanes are provided, it should be 8' wide, and motor vehicle lane should be narrowed to 10'.

North Carolina Complete Streets Planning and Design Guidelines Framework

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**URBAN / SUBURBAN AVENUE**

**PLAN VIEW**

**KEY ELEMENTS**

- May function as an arterial or collector, but generally at low to moderate speeds.
- An urban street serving a range of traffic levels within and between various area types.
- Characterized by wide sidewalks (usually) bordered by the outstanding landscaping and pedestrian facilities.
- May have on-street parking.
- Transit stops, shelters, and other amenities are located along the roadway, preferably within the right of way.

**STREET CROSS-SECTION ZONES**

- Development Zone: Development should be oriented toward the street with good functional and visual connection to the street.
- Sidewalk Zone: The pedestrian walk area is of sufficient width to allow pedestrians to walk safely and comfortably.
- Green Zone: The landscaped or landscaped area along the edge of the street. On avenues, this zone should include grass, landscaping, and shade trees in planting strips in, in some cases, hardened pedestrian zones. Permeable or decorative lighting may be provided when appropriate for adjacent land uses.
- Parking/Truck Zone: On-street parking is optional and should be considered in relation to providing adequate access to adjacent land uses. Parking zone width and layout may vary.
- Bicycle Zone: Accommodation for bicyclists in a zone separate from the motor vehicle zone.
- Motor Vehicle Zones/Shared Vehicle Zone: The primary travel way for through vehicles. A shared vehicle zone has mixed traffic lanes (cars, trucks, buses and bicycles).
- Access Zone: A landscaped zone or turning zone located between the travel lanes as a center median or turn lane. Access zones typically do not include a continuous median.

North Carolina Complete Streets Planning and Design Guidelines Framework

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### Urban/Suburban Avenue: Illustrative Street Cross-Section

- **Sideshore Zone:**
  - **Green Zone:** 8'-0" (see note 6)
  - **Parking/Transit/Stop Zone:** 8'-10"
  - **Motor Vehicle Zone:**
    - 8'-0" (see note 4)
    - 10'-11" (see note 4)
  - **Shared Vehicle Zone:** 6'-0" (see note 5)
  - **Bicycle Zone:** 4'-0" (see note 6)

- **Before Zone:**
  - **Green Zone:** 8'-0" (see note 6)
  - **Parking/Transit/Stop Zone:** 8'-10"
  - **Motor Vehicle Zone:**
    - 8'-0" (see note 4)
    - 10'-11" (see note 4)
  - **Shared Vehicle Zone:** 6'-0" (see note 5)
  - **Bicycle Zone:** 4'-0" (see note 6)

### Street Component Dimensional Guidelines

1. Sideshore zone should typically be a minimum unobstructed width of 8' in areas that are currently or are planned to be pedestrian-oriented or mixed-use development. Minimum 8' - 10' wide stormwater swales should be provided to allow for higher pedestrian priority and potential extensions to the development zone.

2. Green zone may include landscaping, street trees, lighting, street furnishings, hardpaving in some circumstances, and various planters/tanks/bikeway and transit amenities. All minimum green zone is preferred, to allow for separation between pedestrians and vehicles and space for street trees.

3. Parking is an option on accesses. Parking zone dimension may vary depending upon type of parking provided. Angle parking will require a wider dimension than parallel.

4. Bicycle lanes are on the preferred treatment. If bicycle lanes are not possible, shared lanes may be allowed. For a shared lane, the available lane should be a minimum of 14" wide.

5. In the shared vehicle zone and the bicycle zone, the gutter is not considered part of the lane width or the bicycle lane width.

6. Bicycle lanes located next to on-street parking should be a minimum of 5' wide (generally). The combined dimension for parking and bicycle lane should be at least 13' from the edge of curbs.

7. Bicycle lanes may not include a center turn lane with intermittent landscaped islands. Avenues typically do not include a continuous median, but it may be allowed in some circumstances.

8. Pedestrian lighting should be considered adjacent to developments.

### Urban/Suburban Boulevard

#### Plan View

<table>
<thead>
<tr>
<th>Without Side Median and On-Street Parking</th>
<th>With Side Median and On-Street Parking</th>
</tr>
</thead>
</table>

#### Key Elements

- **Most often functions as an arterial designed to carry vehicles at moderate speeds.**
- **Throughfare characterized by multiple lanes and including a street median.**
- **Swale and onstreet bicycle lanes are necessary to accommodate pedestrians and bicyclists, due to higher speeds and higher traffic volumes for motor vehicles.**
- **Transit stops and shelters may be located within the right of way, requiring connections to sideshore.**
- **On-street parking is not required.** It is allowed where appropriate, but care due to the nature of the street. If provided, parking should typically be placed on a separate, parallel hardpaving strip separated by a sideshore median.

#### Street Cross-Section Zones

- **Development Zone:** Sideshore swales vary but are typically shorter than on avenues. Sideshore footprint may not always be directed to the sideshore. The footprint width at building entrances is important.
- **Swale Zone:** The pedestrian walk area is of sufficient width to allow pedestrians to walk safely and comfortably.
- **Green Zone:** This zone serves as a transition to pedestrian traffic. The zone contains landscaping and trees or, in some circumstances, hardpaving treatments.
- **Parking/Transit Stop Zone:** Accommodates on-street parking and transit pull-outs. Parking on the street is rare, but it may be separated from the motor vehicle lane by a median. Where flat on the street is rare, it may be separated from the motor vehicle lane by a median. Median zone should generally be 10'-12' and separated by a single-way parallel lane. Median zone should generally be 10'-12' and separated by a single-way parallel lane. Median zone should generally be 10'-12' and separated by a single-way parallel lane.
- **Bicycle Zone:** A lane for bicyclists separate from vehicular traffic.
- **Motor Vehicle Zone:** The primary travel way for through vehicles.
- **Median Zone:** A landscaped zone located between the travel lanes as a median or as a median that separate one-way parallel lanes. Median zone should generally be 10'-12' and separated by a single-way parallel lane. Median zone should generally be 10'-12' and separated by a single-way parallel lane.
**URBAN / SUBURBAN BOULEVARD**

**ILLUSTRATIVE STREET CROSS-SECTION**

Without Side Medians

With Side Medians and On-Street Parking

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**STREET COMPONENT DIMENSIONAL GUIDELINES**

<table>
<thead>
<tr>
<th>Component Description</th>
<th>Sidewalk Zone (ft)</th>
<th>Green Zone (ft)</th>
<th>Parking / Transit Zone (ft)</th>
<th>Bike Lane Zone (ft)</th>
<th>Motor Vehicle Zone (lane width: ft)</th>
<th>Center Median Zone (ft)</th>
<th>Side Median Zone (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Business District</td>
<td>12'-10&quot; to 20'</td>
<td>6'-8&quot;</td>
<td>8'-10&quot;</td>
<td>4'-6&quot; lanes</td>
<td>10' to 12'</td>
<td>6'-30'</td>
<td>9'</td>
</tr>
<tr>
<td>Urban Center / Suburban Center</td>
<td>20'-30' to 40' High Volume Pedestrian Areas</td>
<td>8'-10&quot;</td>
<td>8'-10&quot;</td>
<td>4'-6&quot; lanes</td>
<td>10' to 12'</td>
<td>6'-30'</td>
<td>9'-15'</td>
</tr>
<tr>
<td>Suburban Commercial / Urban Residential</td>
<td>30'-40' to 50' High Volume Pedestrian Areas</td>
<td>8'-10&quot;</td>
<td>8'-10&quot;</td>
<td>4'-6&quot; lanes</td>
<td>10' to 12'</td>
<td>6'-30'</td>
<td>9'-15'</td>
</tr>
</tbody>
</table>

1. Sidewalk zone should typically be a minimum of 4 feet wide. In areas that are currently or are planned to be pedestrian-oriented or mixed-use development, minimum 6' wide sidewalk should be provided.
2. Green zone may include landscaping, street trees, lighting, street furniture, and related pedestrian/transit amenities. A minimum 3' wide green zone is preferred, to allow for separation between pedestrian and vehicles, and rooms for street trees.
3. Parking / transit zone is to be used for on-street parking and transit stops. When shared lanes are not allowed, shared lanes may be allowed. For a shared lane, the vehicle lane should be a minimum of 12' wide. Shoulder zones can be used for a minimum 6' wide, with a maximum 8' wide and standard lane dimensions.
4. The median is a natural extension of the sidewalk width. A minimum 5' wide median is recommended. The minimum 9' wide median will allow for pedestrian and transit stop at appropriate locations.
5. The gutter can be an integral part of the median width. A minimum 4' wide gutter is recommended. The 9'-15' wide median will allow for pedestrian and transit stop at appropriate locations.

**URBAN / SUBURBAN PARKWAY**

**PLAN VIEW**

With Curb and Gutters

With Shoulder

**KEY ELEMENTS**

- Most often function as an arterial designed with control of access to carry vehicles at moderate to high speeds.
- Urban or suburban thoroughfares are often characterized by landscaping and natural vegetation along medians and shoulders.
- Laid lines are set back from the street and are typically not oriented toward the pathway.
- Paved bicycle and bicycle paths usually provide separate multi-use paths located adjacent to the facility.
- Convenient access to one-way transit facilities and off-street stations and park and ride lots.
- Large truck traffic may be present.

**STREET CROSS - SECTION ZONES**

- Development Zone: Deep setbacks due to the typically urban-oriented nature of the street. Access to this zone is limited and controlled.
- Multi-Use Path Zone: A zone for pedestrians and bicyclists to a multi-use path separate from the motor vehicle zone. Please see Multi-Use Path Zone guidelines for more details.
- Green Zone: Consists of a planting strip with trees to separate the multi-use path zone from the motor vehicle zone. On pathways, typically includes a grass zone.
- Motor Vehicle Zone: The primary travel way for through vehicles.
- Median Zone: A landscaped zone located between the travel lanes as a center median.

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North Carolina Complete Streets Planning and Design Guidelines Framework.
Local Street Residential
Intersections

Structures
What does the implementation of complete streets mean to NCDOT?

• Complete streets guidelines provide effective direction with maximum flexibility to NCDOT and its partners to implement complete streets
• Complete streets will affect all streets (interstates, and freeways/expressways are not considered streets) (complete streets will only affect these types of facilities at their intersection with streets)

What does the implementation of complete streets mean to NCDOT?

• Complete streets features may be considered on NCDOT improvements if they are part of a local regional plan
• Complete streets features may be included in maintenance and construction projects when requested and where the division engineer determines they can be included in the original scope of the project
• If improvements are not possible now, a separate project may need to be considered as a new or future request
What does the implementation of complete streets mean to NCDOT?

- Complete streets are funded in the same manner as other NCDOT infrastructure improvements
- NCDOT is seeking partners and effective ways to mutually fund, implement and operate each complete street project

Examples for when features are included in the scope of work for maintenance and construction projects

- Re-stripe lanes to provide bike lane, wide outside lane or paved shoulder
- Re-stripe lanes to implement road diet (lane reassignment)
- Widen or pave shoulders to provide bike lane, wide outside lane or paved shoulder
  (These features could be a safety benefit for “run off road” type crashes)
Example of Lane Reassignment

Examples for when features are included in the scope of work
Key Issues for NCDOT to Address as Policy and Guideline Implementation moves Forward

• Need to give stakeholders the opportunity to provide input on the guidelines
• Need staffs support with flexibility in application of the concepts and the enhanced importance of local participation in:
  - land use and infrastructure improvements
  - early communication, coordination, collaboration and win-win decisions
• Moving beyond the complete streets planning and design guidelines and moving toward implementation and policy updates relative to project funding, maintenance, cost sharing and project prioritization

North Carolina’s Complete Streets Web Page
http://www.nccompletestreets.org
Planning and Design Guideline Schedule

• Chapters 1 – 4 to posted for review by stakeholders May 27, 2011 (60 day comment period)
• Chapters 1 – 7 NCDOT posted for review by stakeholders October 31, 2011 (60 day comment period)
• Fall/Winter 2011 develop basic complete streets planning and design training
• Spring 2012 complete guidelines and training sessions begin

Implementation of Complete Streets

Delivering a program that builds on current initiatives, creates trust, partnerships, and is embraced by the community, leadership and governmental staff.
Complete Streets

NCDOT becoming more than just a Highway Department

Complete Streets – Co-Chairs
Jay A. Bennett, PE, NCDOT – Roadway Design, jbennett@ncdot.gov
Tracy Newsome, Ph.D., Transportation Planning and Design Division, City of Charlotte, tnewsome@ci.charlotte.nc.us
Marsha Kaiser, AICP, Project Manager, Parsons Brinckerhoff
Experience with Contextually Complete Streets

Questions?