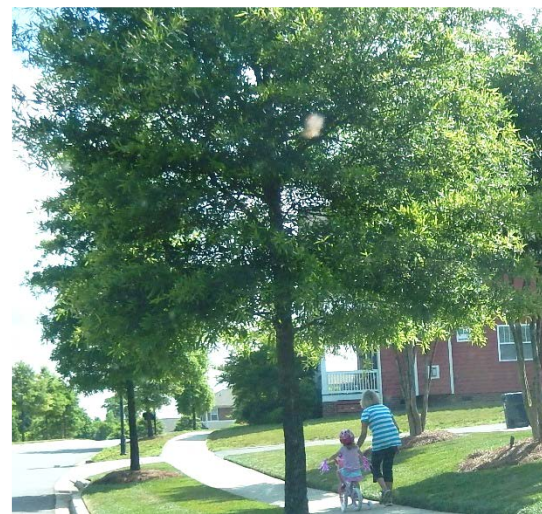


NCDOT Complete Streets Evaluation



Prepared for
North Carolina Department of Transportation

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EXECUTIVE SUMMARY

At the request of Transportation Secretary James H. Trogon, the North Carolina Department of Transportation (NCDOT) Bicycle and Pedestrian Transportation (DBPT) Division is completing an evaluation of its Complete Streets Policy and *Complete Streets Planning and Design Guidelines*, completed in 2009 and 2012 respectively. The Secretary expressed the need to prioritize Complete Streets implementation throughout the State and to evaluate the success of the policy. The goals of the evaluation are to assess how the policy is being utilized across NCDOT business units, assess how NCDOT's policies work in relation to other related state policies, to conduct a best practices review and make recommendations about implementation and tracking.

Interview Process

The project team conducted 45 interviews with stakeholders representing municipalities, metropolitan planning organizations (MPOs), rural planning organizations (RPOs), councils of government (COGs), grassroots advocacy organizations, NCDOT staff and leadership.

Interviewees noted the obstacles for Complete Streets were primarily with implementation rather than with the policy. Most interviewees noted there is not a formal place for Complete Streets in the project planning and development process. Decisions on Complete Streets elements are not typically decided until late in project development and that can lead to project delays or even removal of these elements from the project. Interviewees also noted there is a lack of ownership and accountability of Complete Streets within NCDOT and confusion about who municipalities should work with during the process.

Funding was the most widely cited impediment to implementing Complete Streets by interviewees. Strategic Transportation Investments (Prioritization or SPOT) can act as a barrier, as interviewees shared instances of Complete Streets projects not scoring high enough to receive funding. Cost-share requirements for beyond-the-curb facilities were a widely cited barrier. Municipalities, especially smaller municipalities, often do not have the financial resources to contribute to cost-share requirements. This can lead to an inequitable allocation of Complete Streets projects.

Interviewees noted NCDOT design guidelines, manuals, and other documents have not been updated to reflect the Complete Streets policy or the cross sections provided in the *Complete Streets Planning and Design Guidelines*. This inconsistency can limit implementation of Complete Streets as current design guidelines are largely organized around automobile transportation rather than multimodal options. In addition, strict adherence to the AASHTO design manual or "Green Book" can lead to projects not being context sensitive.

Evaluation of Supporting NCDOT Policies

A review of NCDOT policies, manuals, and documents revealed that none had been updated to reflect the Complete Streets Policy and *Planning and Design Guidelines*. Some include language related to bicycle and pedestrian facilities but there is not a consolidated source for bicycle and pedestrian design guidelines within NCDOT. This information is often disseminated through memoranda within the roadway design group but there is no Complete Streets section in the *NCDOT Roadway Design Manual*.

Best Practices

The evaluation team reviewed the Complete Streets policies and supporting documents of California, Florida, New Jersey, Tennessee, and Virginia. Notable best practices include: a clearly defined implementation process with designated responsible parties; consideration of land use when determining appropriate transportation elements; regular updates to design and related guidelines; development of supporting documents and guidance; clearly defined exemptions processes; and clearly defined funding incentives and options.

Performance Metrics

Providing before and after comparisons of Complete Streets projects can help evaluate the effectiveness of the Complete Streets initiative, as well as serve as a reporting tool to provide accountability. Based on interviews and the best practices review, the following performance metrics are proposed for NCDOT:

- **Safety:** in addition to motor vehicle crash data, data for stand-alone bicycle and pedestrian crashes can be centrally collected and managed to provide a more complete understanding of roadway safety.
- **Congestion:** utilizing multimodal level of service (MMLOS), a metric included in the 2010 Highway Capacity, to measure how Complete Streets affects congestion of all modes present on a roadway.
- **Inventory:** while existing and proposed facilities are collected in the Pedestrian and Bicycle Infrastructure Network geodatabase, this resource can be updated to include more comprehensive sets of data and data from more municipalities throughout the state.
- **Economic Development:** project proximity to commercial areas and low-income Census Block Groups can be measured to ensure projects serve trip purposes beyond recreation and communities at all income levels.

Implementation and Tracking

Based on the interviews, it is apparent that there is a need to standardize the Complete Streets implementation process, clearly incorporate it into the project development lifecycle, and assign responsibility to persons at critical milestones throughout the process. A tracking system would allow the Department to clearly see how and where Complete Streets elements are being implemented throughout the State.

Next Step Recommendations

The next phase of the project will involve a detailed review of the design guidelines with recommendations for improvements, recommendations for process improvements, and development of a training and outreach strategy.

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1. INTRODUCTION

At the request of Transportation Secretary James H. Trogdon, the North Carolina Department of Transportation (NCDOT) Bicycle and Pedestrian Transportation (DBPT) Division is completing an evaluation of its Complete Streets Policy (adopted in 2009) and *Complete Streets Planning and Design Guidelines* (2012). The Transportation Secretary expressed the need to prioritize Complete Streets implementation throughout the state and to evaluate how much progress has been made thus far. The goals of the evaluation are to assess how the policy is being utilized across NCDOT business units, assess how NCDOT's policies work in relation to other related state policies, to review best practices for measuring performance, and to make recommendations for an implementation and tracking system.

2. COMPLETE STREETS POLICY



The North Carolina Board of Transportation adopted a Complete Streets policy in 2009. The policy states NCDOT planners and engineers are to “consider and incorporate multimodal alternatives” when designing new projects or making improvements to existing infrastructure. NCDOT is to collaborate with cities, towns, and communities to ensure multimodal facilities are planned, funded, designed,

constructed and maintained. Complete Streets facilities are to be integrated into all projects within a growth area of a town or city given the surrounding land use and transportation infrastructure compliments multimodal transportation. Multimodal facilities can be included on rural transportation projects if there is an existing need and network. Exemptions to the policy are to be made on a case-by-case basis and must be approved by the Chief Deputy Secretary. The policy states planning and design guidelines are to be developed to facilitate the implementation of the policy.

3. COMPLETE STREETS PLANNING AND DESIGN GUIDELINES

The *Complete Streets Planning and Design Guidelines* were developed to provide direction in the “decision-making and design processes to ensure that all users are considered during the planning, design, construction, funding, and operations of the state’s transportation system.” The document details processes, street types and recommendations intended to support a collaboratively-designed and context-based complete streets approach.

This report reviews how successful NCDOT has been at implementing its Complete Streets policy and guidelines into the project development process.

4. STAKEHOLDER INTERVIEWS

4.1 Interview Process

The first stage of the evaluation consisted of interviewing individuals within various business units of NCDOT and individuals external to NCDOT who participate in Complete Streets planning, implementation, and advocacy. This group includes individuals representing municipalities, metropolitan planning organizations (MPOs), rural planning organizations (RPOs), councils of government (COGs), and

grassroots advocacy organizations. Interview questions focused on when and how Complete Streets principles are incorporated into project timelines, collaboration and communication, utilization of the *Complete Streets Planning and Design Guidelines*, design standards, funding, and possible changes to existing practices. A total of 43 interviews were conducted over an approximately three-week period in January 2018. Most interviews occurred over the phone, though some interviews took place in person and a few interviewees provided written responses to the interview questions. Interview questions and a list of those interviewed are included in the Appendix.

4.2 Summary of Responses

The responses have been grouped into categories based on themes identified by the interview team. These include:

- Policy
- Planning and Project Development
- Accountability
- Strategic Transportation Investments (referred to as SPOT or Prioritization)
- Funding
- Performance Measures
- Design Guidelines
- Institutional Barriers/Paradigm Shift
- Safe Routes to School
- Equity
- Public Awareness and Education

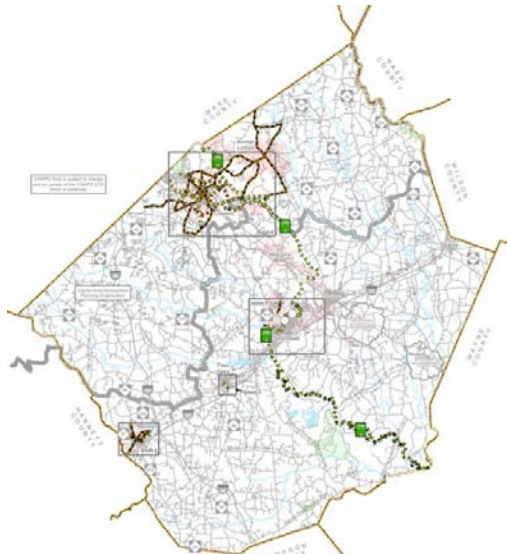
4.2.1 Policy

Many interviewees were satisfied with the policy as it is currently written. Some interviewees, mainly external to NCDOT, noted the policy is written more as an advisory document and does not include enforcement measures and language needed for implementation. A sentiment echoed in multiple external interviews was that Complete Streets elements are typically viewed as an enhancement, as opposed to a necessary component, of a project. The way the policy is framed leaves Complete Streets inclusion open to interpretation, which poses a barrier to its implementation. There is less incentive to include Complete Streets elements in the design. If these elements are not considered essential, it is more difficult to include them, particularly when funding is limited. For this reason, many interviewees noted the importance of a funding policy to parallel the existing Complete Streets policy, which could help ensure implementation.

The policy is also written to address future transportation projects and does not provide direction regarding retrofitting Complete Streets elements into existing transportation infrastructure. One interviewee pointed out the importance of keeping the policy and implementation and design guidelines separate to allow implementation procedures to be adaptable. Doing so would allow for greater flexibility in the *Planning and Design Guidelines*. Other interviewees noted that other NCDOT policies have not been updated to reflect the Complete Streets policy. Interviewees also indicated that the Complete Streets policy has not been updated to incorporate new and updated bicycle, pedestrian, and

landscaping policies or related policies such as Vision Zero or the Policy on Street and Driveway Access. This can create inconsistencies and conflicts between the policies.

4.2.2 Planning and Project Development



Example of a Bicycle Map in a CTP

A common observation noted throughout the interviews was the lack of an official “place” for Complete Streets in the planning process and project development. To be successful, Complete Streets needs to be considered early in project planning and development. Many interviewees noted the importance of Complete Streets being included in the planning phase prior to Prioritization. Comprehensive Transportation Plans (CTP) include bicycle, pedestrian, and transit modes, but Complete Streets does not play a formal role in highway planning. While CTPs have recommended cross sections with Complete Streets elements, CTPs do not reference the *Complete Streets Planning and Design Guidelines* for these cross sections. Ensuring CTPs are regularly updated and outreach is conducted with local stakeholders and the public is key for ensuring these long-range plans reflect the planning goals of local communities

and Complete Streets can be considered before NCDOT’s Prioritization process. Interviewees also noted the lack of transparency on project progress from the conclusion of the CTP and Metropolitan Transportation Plans (MTP) process to the decision to submit projects for scoring in Prioritization. Once projects are included in the State Transportation Improvement Program (STIP) and enter project development, most interviewees noted Complete Streets elements are considered almost exclusively during NCDOT’s external scoping process, when input is sought from local and agency stakeholders. There seemed to be consensus that external scoping is too late in project development to begin the discussion of including Complete Streets elements in the project. Some NCDOT staff commented that these decisions are sometimes not finalized even while alternatives are being developed, and the back and forth between NCDOT and municipalities sometimes leads to project delays or to the Complete Streets elements being left out completely. These issues seem to be a result of a misalignment of municipalities’ expectations and NCDOT’s project development process. They could also stem from the lack of clarity in how Complete Streets is integrated into project development.

4.2.3 Accountability

Multiple interviewees noted they do not know who to contact within NCDOT for information about project development, design or cost-sharing. They indicated it would be helpful to have a designated point of contact within NCDOT for Complete Streets inquiries. There should be a clear understanding within NCDOT business units about who can be contacted regarding Complete Streets concerns.

The lack of ownership for the Complete Streets process results in issues of accountability for its application. Unless there is a person or unit who is responsible for Complete Streets application at various points throughout project development, there will continue to be inconsistent interpretation

and implementation of the policy across the State. Some interviewees suggested that Complete Streets elements be included on project development checklists (Preliminary, R/W and Final Design), field inspection forms and the project commitment (green) sheets for a project. This could allow for greater accountability and better tracking in the implementation process.

4.2.4 Strategic Transportation Investments (SPOT/Prioritization)

Another theme heard during interviews was the lack of compatibility between Complete Streets projects and Prioritization. Some noted that a project that incorporates Complete Streets components seems to score lower than a project without these components. A project with Complete Streets elements may score higher on safety criteria, but the project will have lower scores on cost-benefit and congestion, which brings its overall score down. Interviewees also commented on the importance of choosing the appropriate cross section for a project as this will affect the project's benefit-cost score. The criteria used in Prioritization should reflect the priority NCDOT places on Complete Streets.

4.2.5 Funding

Funding was the most commonly cited challenge to implementing Complete Streets by external and internal interviewees. Many expressed frustration over the fact that roadway projects receive an overwhelming amount of funding relative to other transportation modes, and the focus of these projects is almost exclusively motor vehicles. While roadway projects should include Complete Streets elements, that is not generally the case.

MUNICIPAL POPULATION	PARTICIPATION	
	DOT	LOCAL
> 100,000	50%	50%
50,000 to 100,000	60%	40%
10,000 to 50,000	70%	30%
< 10,000	80%	20%

Cost-share requirements based on population from the
Pedestrian Policy

Additionally, funding is generally less attainable for pedestrian facilities (primarily sidewalks) compared to bicycle facilities. This disparity is because of the local match that is required for facilities beyond the curb. This means municipalities are responsible for providing part of the costs for facilities such as sidewalks and multi-use paths. Many interviewees commented that local governments with a smaller

tax base – and thus, less available funding – often face insurmountable obstacles in their attempt to implement Complete Streets elements. Several individuals representing smaller municipalities explained that in their experience, if their communities are unable to provide the local match, this constraint usually prevents inclusion of Complete Streets elements. They noted if smaller municipalities receive federal funding for Complete Streets projects, municipal staff often do not have the experience or knowledge to manage federally-funded projects.

Some suggested that NCDOT allocate more funding to Complete Streets projects and help municipalities identify alternative funding sources (discussed in Section 5.2.2). This type of assistance could be particularly beneficial for economically distressed municipalities that want to incorporate Complete Streets elements but often lack the staff to identify and secure funding options.

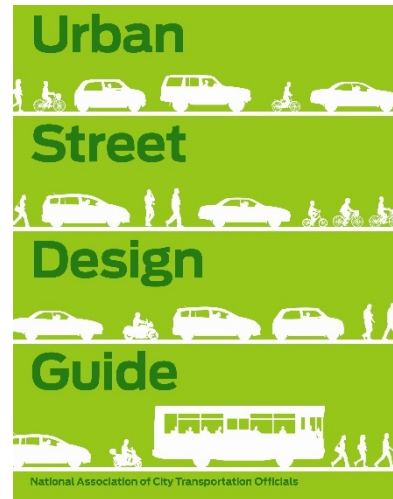
4.2.6 Performance Measures

A recurring theme among interviewees is the lack of performance metrics associated with the Complete Streets policy and bicycle and pedestrian transportation in general. The lack of metrics does not allow

for quantitative evaluations of the Complete Streets Policy and the *Complete Streets Planning and Design Guidelines*. Other interviewees commented on the limited availability of data on bicycle and pedestrian usage and bicycle and pedestrian crashes not involving motor vehicles. The absence of data leads to less precise bicycle and pedestrian planning, especially compared to highway traffic where there is an abundance of data due to both industry and NCDOT standards. The availability of bicycle and pedestrian data will be important for Complete Streets implementation as NCDOT begins to use a more data-driven approach to project planning, funding and implementation. This lack of data, as one interviewee noted, can be seen in Prioritization where bicycle and pedestrian projects are unable to use existing usage data for scoring.

4.2.7 Design Guidelines

It was apparent that most of those interviewed rarely, if ever, consult the Complete Streets Design and Planning Guidelines for design standards. Some NCDOT roadway staff noted they have occasionally consulted the Guidelines as an alternative resource for cross sections but most NCDOT staff noted they consult the design manuals in the NCDOT design library or the cross sections that are disseminated in memoranda by senior staff. There does not appear to be a consolidated reference for designing Complete Streets and its bicycle, pedestrian and transit components. The roadway designers interviewed generally agreed they would find it helpful if the *Complete Streets Planning and Design Guidelines* were incorporated into the Roadway Design Manual. Representatives of local jurisdictions noted these design manuals and memoranda often do not provide flexibility or feature updated design standards found in other design guidelines such as the National Association of City Transportation Officials (NACTO) Urban Street Design Guide. Interviewees also commented *the Complete Streets Planning and Design Guidelines* only provide three land use contexts (urban, suburban, and rural) when providing guidance on facility selection. They noted that many projects are in areas not reflected in these contexts, which can lead to situations where there is insufficient guidance for the selection of the safest and most appropriate facility type.



Interviewees also noted the lack of consistency in cross sections developed in the planning and design stages of projects. For example, cross sections often vary between CTPs, Prioritization, and cross sections referenced in design manuals. This lack of uniformity is an obstacle to having a consistent Complete Streets cross section throughout a project's planning and development process. The lack of consistency may require new decision-making as a project progresses through planning and implementation. For example, cross sections put forth in the CTP may not correspond to what is in the Roadway Design Manual.

There was also a desire among interviewees to emphasize Context Sensitive Design within the *Complete Streets Planning and Design Guidelines*. An urban typical section might not work in a rural or suburban area and might be met with resistance by a Division Engineer, local officials or the public if it is proposed as the only cross-section. It is necessary to take a place-based approach in the development of the Complete Streets guidelines and not be rigid when it comes to designs.

4.2.8 Institutional Barriers/Paradigm Shift

Several interviewees both within and outside of NCDOT noted a major barrier to implementing Complete Streets policies is institutional. Some local officials noted that Division Engineers have tried to help them get Complete Streets elements included in transportation projects but their “hands have been tied” by bureaucratic processes. Some external constituents felt that the rigid guidelines of the Roadway Design Manual can act as a constraint to including Complete Streets elements in projects.

Opinions of external constituents towards Complete Streets varied considerably from one Division to the next. It was noted that certain Divisions seem motivated to incorporate Complete Streets elements into projects, while other Divisions seem to resist the inclusion of such elements, particularly when doing so is perceived to complicate project development and delivery. These complications are mainly funding challenges or right of way limitations. However, several interviewees expressed that the reluctance to incorporate Complete Streets elements could result from a perceived lack of priority within NCDOT.

Another institutional barrier discussed by interviewees is NCDOT’s highway/auto-centric focus. As we become a more multimodal society, it is important for NCDOT to have a paradigm shift. One interviewee said, “Think people, not cars.” Interviewees suggested it is difficult to think of Complete Streets as integral to a project when so much right of way is allocated to cars. As another interviewee noted, NCDOT Divisions are referred to as the Divisions of Highways. This naming implies an auto-oriented rather than multi-modal focus. Some respondents suggested that NCDOT take a close look at the context of the project. How are people moving around? Match the facility to the context rather than forcing a community to adjust to a roadway that might not be appropriate. This shift would allow NCDOT to be more forward thinking and proactive. As one interviewee stated, “NCDOT is not in the fire prevention business. They put out fires instead.”

4.2.9 Safe Routes to Schools

One interviewer whose organization focuses primarily on Safe Routes to School discussed the challenges of incorporating Complete Streets elements on school property or the surrounding network of local and NCDOT-maintained streets. Some of the challenges cited echo what was heard from other interviewees, namely that there is a lack of understanding regarding who is responsible for Complete Streets design and implementation within NCDOT and how to coordinate with NCDOT to get Complete Streets elements implemented. There is confusion between the schools and municipalities about which entity should initiate the process of requesting these elements. Additionally, there is reluctance on the part of the schools because of perceived liability issues.

Other barriers include funding and lack of a designated person within schools to oversee the process. While the issue is important to principals, they are often too busy to take on the responsibility of Safe Routes to Schools. These create many missed opportunities to incorporate the Complete Streets design guidelines into new school construction projects.



An important issue raised by the interviewee is NCDOT’s requirements for carpool lanes. This requirement is to prevent cars from queueing on state-maintained roads, but the consequence is too many vehicles on school grounds creating hazards for pedestrians and cyclists.

4.2.10 Equity

Because of the growing conversation on transportation and equity, our team sought to interview people who were knowledgeable about transportation, Complete Streets and equity. We heard two general



themes regarding equity and Complete Streets. First, Complete Streets projects tend to be focused more in urban centers. There is often a perception that Complete Streets is a precursor to gentrification. While the two might be related, data shows there is not a direct, causal relationship between the two. NCDOT and municipalities might cite research or conduct their own to better explain this relationship to the public.

The cost-share requirement has serious implications for lower wealth municipalities. As was mentioned in the funding section, these communities often cannot afford their share for Complete Streets enhancements so those are often removed from projects. This can exacerbate equity issues as the areas most in need of bicycle and pedestrian facilities, because of a lack of vehicle ownership, are often the ones least likely to have them.

The lack of Complete Streets projects in lower wealth communities can also have equity implications from a public health perspective, as poorer areas tend to have less access to greenways, sidewalks, bike lanes. Some interviewees noted these facilities can encourage a more active, healthier lifestyle and public health professionals are advocating for Complete Streets policies and designs. It was suggested that NCDOT might collaborate more with hospitals, foundations and universities to help build metrics to show the benefits of Complete Streets designs and how they could help reduce inequities in access and public health.

4.2.11 Public Awareness and Education

Several people interviewed discussed the need for more education and public awareness about Complete Streets. While the concept is widely accepted in some areas, in other areas, there is skepticism and NIMBYism. Concerns range from a perception of increased criminal activity to gentrification (as mentioned in the equity discussion). Metrics showing the positive impacts of Complete Streets could help garner more support for the policy and even create additional advocates.

There was also discussion from Safe Routes to School advocates about NCDOT preparing a brochure or educational pamphlet specifically for schools that could be distributed to parents and students. This type of awareness campaign could be a short-term solution until more long-term policy changes can be implemented.

5. EVALUATION

5.1 Evaluation of NCDOT Complete Streets Policy Guidelines

The Complete Streets Policy and *Planning and Design Guidelines* were evaluated to identify deficiencies and areas for improvement or update.

5.1.1 Policy Language

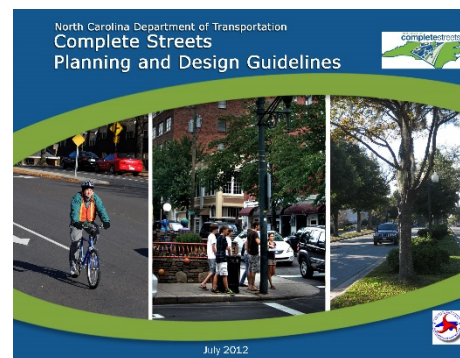
There is a disconnect between the Complete Streets policy and policy implementation. As currently written, the NCDOT Complete Streets policy is a blanket policy for all new NCDOT roadway projects that are located within growth areas of towns and cities. Policy language indicates that Complete Streets improvements in higher density, growth areas should be the expected practice and that the decision to not implement Complete Streets elements should be made on a case-by-case basis. The mandate to consider Complete Streets approaches and provide a justification if Complete Streets elements are not implemented establishes the need for projects to have an evaluation and documentation protocol. It also establishes the expectation that decisions not to implement Complete Streets elements need to be 'documented out' of consideration.

The policy outlines two exceptions: (1) facilities where specific modes are prohibited by law (such as bicycles and pedestrians along controlled access highways) and (2) areas where population, employment density and modal demand do not justify Complete Streets facilities. With the expectation that exceptions to the policy would be issued on a case-by-case basis, the policy requires each exception to be approved by the Chief Deputy Secretary. With little protocol guiding the documentation of this evaluation and justifying the rationale for an exception, the policy lacks the mechanism to hold project teams accountable for this evaluation.

The opportunity exists to bridge the disconnect between policy and implementation by establishing an explicit protocol for project evaluation and guidance for documenting this exception.

5.1.2 Implementation Process

The *Complete Streets Planning and Design Guidelines* is a broad comprehensive document that serves as both primer for local officials and members of the public that are not familiar with Complete Streets and detailed technical guidance for practitioners (engineers, planners, landscape architects, and allied professionals). While the policy requires Complete Streets to be considered and implemented in growth areas of towns and cities, there is no clear guidance to situate this evaluation within the project timeline. A review of policy guidance and stakeholder feedback indicate the current practice considers Complete Streets elements too late in the process to properly evaluate and implement these approaches into many projects. The *Complete Streets Planning and Design Guidelines* do not indicate the step in the project development process when Complete Streets evaluation should be conducted.



The Guidelines document implies that the Complete Streets evaluation could occur within the NEPA process, as alternatives and designs are evaluated. However, waiting to assess the appropriateness of Complete Streets elements at the NEPA stage presents issues for programming the accurate level of project funding. To effectively assess and implement Complete Streets approaches, an evaluation should occur prior to SPOT. This would allow the appropriate level of funding to be programmed for each project, including Complete Streets elements.



There is an opportunity to establish Complete Streets evaluation and documentation prior to Prioritization and incorporate this documentation into the SPOT scoring process.

5.1.3 Policy Guidance

The *Complete Streets Planning and Design Guidelines* document provides a small, open-ended worksheet to help situate the project context. However, there is no formal set of Complete

Streets assessment evaluation tools associated with the policy guidelines.

As noted in the implementation process section, the guidance does not situate Complete Streets evaluations into the larger planning process. A thorough description of the planning process is provided and the document lays out the expectation that Complete Streets elements should be included throughout the process. However, the policy guidance does not establish a specific point to evaluate the appropriateness of Complete Streets elements for a specific project. An opportunity exists to address both issues. The establishment of a formal Complete Streets assessment checklist embedded in a user-friendly quick reference guide for practitioners could provide a means for assessing Complete Streets elements at a specific point in the planning process. New Jersey DOT developed a Complete Streets checklist (included in the Appendix) to be used throughout concept development and preliminary engineering to ensure that all alternatives comply with the Complete Streets policy. The checklist would be signed and filed by the project manager.

5.2 Potential Opportunities and Barriers

The interviews conducted in the first task revealed several opportunities to improve the Complete Streets Policy and the *Complete Streets Planning and Design Guidelines* document. Additional opportunities were identified in the review of policies and guidelines documents from other states.

5.2.1 Planning and Development Process

One of the most cited challenges to implementing Complete Streets is confusion over the appropriate time to include Complete Streets elements in project development. While the policy states that Complete Streets elements should be included in all phases of project development, it might be beneficial for the policy to stipulate a specific point when inclusion should begin. Interview responses showed that inclusion of Complete Streets elements often occurs too late in project development, after funding for the project has been determined, and this limits Complete Streets development.

5.2.2 Funding

SPOT was viewed as a challenge to Complete Streets inclusion in projects. This is partially due to the lack

of performance metrics for bicycle and pedestrian facilities, which makes it difficult to quantify any improvements achieved through these elements. Instead, current performance metrics tend to focus on the level of service of motor vehicles exclusively. There is an opportunity to shift this focus and to prioritize the level of service for all modes. In doing so, it would be easier to justify inclusion of Complete Streets elements, and to receive funding for them.

Cost-share requirements and long-term maintenance requirements act as a major obstacle in building Complete Streets. There is an opportunity for NCDOT to explore ways to reduce cost-share requirements or help municipalities find alternative funding sources to reduce or eliminate cost-share requirements. However, how financial assistance would factor into SPOT remains a challenge.

Various state and federal funding sources are available for Complete Streets projects. These are listed below along with a description of each.

- Powell Bill funds are permitted for the planning, construction, and maintenance of bicycle, greenway, and pedestrian facilities.
- The North Carolina Highway Safety Improvement Program (HSIP) offers funding for low-impact safety improvement projects. Bicycle and pedestrian crash data is one of the criteria used to identify potential bicycle and pedestrian improvements projects.
- The SPOT Safety program offers up to \$250,000 of funding per project for quick-fix safety and operational improvements.
- Contingency Funds are available for projects located near schools if the project is part of the Safe Routes to Schools program.
- Congestion Mitigation and Air Quality (CMAQ) funds can be used for some Complete Streets projects but only if they are in nonattainment and maintenance areas (areas that either currently or have previously not met the National Ambient Air Quality Standards for ozone, carbon monoxide, or particulate matter).
- Surface Transportation Block Grant-Direct Allocation (STBG-DA) funds are available to urban areas with populations greater than 200,000. Municipalities are generally responsible for providing 20 percent of project costs when STBG-DA funds are used.
- Federal Transportation Alternatives Program funds are available to municipalities with populations under 5,000. Some stakeholders mentioned that these funds sometimes are unused because these small communities generally have few, if any, staff experienced in securing the funds. Some NCDOT highway divisions have assisted municipalities in obtaining these funds, particularly in the case of building ADA ramps.



5.3 Relationship of Complete Streets Policy to Other Programs, Units, and Procedures

A review of the main policies and manuals for NCDOT Divisions and Units found little mention of pedestrians, sidewalks, walking, bike lanes or bicycling, or the Complete Streets policy.



NCDOT's Public Transportation Division documents note that a lack of sidewalks and the poor condition of some existing sidewalks limits mobility of transit riders. The Construction Unit, Materials and Tests Unit, Roadside Environmental Unit, Right of Way Branch, Structures Management, Utilities Section, Geotechnical Engineering Unit, Location and Surveys Unit and Photogrammetry Unit do not refer to any pedestrian or bicycling related concepts in their documents. Within the Hydraulics Unit Guidelines for Drainage Studies and Hydraulic Design, sidewalks are mentioned but not within the context of the

existing Complete Streets Policy. The absence of bicycle and pedestrian considerations in a Complete Streets context in guidance and policy documents demonstrates the inconsistency in applying and implementing Complete Streets elements across the State.

5.3.1 NCDOT Bicycle and Pedestrian Laws and Policies

The Division of Bicycle and Pedestrian Transportation website lists laws and policies related to bicyclists and pedestrians. It includes the Complete Streets Policy, although the Policy is not mentioned in these other laws and policies. The contents of the webpage are summarized in this section.

House Bill 232 – Bicycle Safety Laws Study and The Bicycle and Bikeway Act are the main laws related to cyclists. There are also specific laws on lamps on bicycles, impaired bicycle driving, vehicle and bicycle operation on roadways, passing distances, bicycle racing, the Child Bicycle Safety Act, pedestrians and traffic signals, pedestrian rights of way at crosswalks, pedestrians at unmarked crossings and trespassing on railroad rights of way.

Multiple policies mention bicycle and pedestrian transportation. However, these policies are generally outdated and have not been integrated into the Complete Streets Policy and *Planning and Design Guidelines*. These include:

- Pedestrian Policy (established 1976, last revised in 2001): The pedestrian policy provides guidance on the inclusion of sidewalks in TIP projects and as standalone projects. NCDOT is to replace and pay the full cost of sidewalks that are disrupted because of TIP projects such as a widening. Pedestrian hazards resulting from TIP projects are to be avoided as much as possible to preserve pathways for sidewalks municipalities may wish to add in the future. In situations where sidewalks are “incidental” to TIP projects, the policy states it is the municipality’s responsibility to inform NCDOT of this request. Municipalities are responsible for evaluating the need of sidewalks based on the following criteria: local pedestrian policy, local government commitment, continuity and integration, location, generators, safety, and existing or projected pedestrian traffic. The policy also lists cost-share requirements for municipalities based on population size.
- Bicycle Policy (established 1978, last revised 1991): The Bicycle Policy states that bicycle transportation is to be integrated in the operations of NCDOT with bicycle facilities to be included in long-range planning, environmental documents, and on projects where there is

“significant” bicycle usage and when facilities would be cost-effective. Bicycle facilities are highly encouraged to be included within highway right-of-way and designed to the standards included in the *Design Guidelines for Bicycle Facilities* and to AASHTO guidelines on federal aid projects. The policy also states NCDOT holds the responsibility of maintenance when bicycle facilities are within state right-of-way.

- Bridge Policy (established 1981, last revised 1994): The policy states sidewalks are to be included on bridge projects with curb and gutter approach and where there is no control of access. Including sidewalks on one or both sides of the bridge is to be determined during project planning. Bikeways are to be designed to AASHTO standards when a bikeway is “required.” However, the policy does not specify when a bikeway is required.
- Administrative Action to Include Local Adopted Greenways Plans in the NCDOT Highway Planning Process and Guidelines (1994): These guidelines state NCDOT will include local greenway plans in long-range planning and during environmental analysis if localities have shown a commitment to building the planned greenways. It is the locality’s responsibility to inform NCDOT of adopted and changed plans, demonstrate greenways perform a primarily transportation rather than recreational function, and demonstrate a commitment to constructing greenway segments surrounding a proposed highway project. Other greenway crossings and elements may be constructed only if the locality pays for the construction and NCDOT design standards are met. Localities are responsible for the maintenance of the greenway facilities regardless of whether NCDOT or the locality funded the construction costs.
- NC Board of Transportation Resolution on Mainstreaming (2000): This resolution states that NCDOT will consider bicycle and pedestrian transportation “a routine part” of its “planning, design, construction, and operations activities” and encourages cities and towns to integrate bicycle and pedestrian transportation in their transportation planning and projects.
- Guidelines for Inclusion of Greenway Accommodations Underneath a Bridge as Part of a NCDOT Project (2015): These guidelines establish criteria and cost-share structures for greenway accommodations underneath bridge replacement projects. When a municipality requests a greenway accommodation, the NCDOT project team uses these criteria to determine if the accommodation is justified. Criteria include: if the accommodation is included in state and/or local plans, if the accommodation serves a transportation rather than recreation function, if the accommodation is the best crossing of the site situation, if the locality requested the accommodation, and if the accommodation would result in excessively high impacts. If the NCDOT project team and management consider the accommodation justified, NCDOT will fund the lesser of \$50,000 or 5 percent of the cost of the bridge replacement cost. Additional costs are to be covered through a cost-share determined by population for municipal or county partners. If the accommodation is not considered justified, the locality is responsible for all costs assuming the accommodation meets NCDOT design standards. Localities are responsible for maintenance of the accommodation regardless of whether NCDOT participated in funding of construction.

A review of these policies and feedback from stakeholders made clear that most pedestrian, bicycle and greenway policies offer limited guidance in how policy is to be implemented and who is responsible for

its implementation. In addition, none of the policies have been updated since the Complete Streets Planning and Design Guidelines were developed. The guidelines for accommodating a greenway underneath a bridge are the only policy developed since the Complete Streets guidelines. The wording of many of the guidance documents creates opportunities for interpretation, which can lead to an inconsistent approach to implementing Complete Streets.

In addition, there is a lack of clarity in the guidance documents about who can participate in cost-sharing. The *Pedestrian Policy* lists cost-share guidance for municipalities only, while *the Guidelines for Inclusion of Greenway Accommodations Underneath a Bridge as Part of a NCDOT Project* offers cost-share guidance for municipalities and “counties or other interested parties.” Many stakeholders cited confusion about who qualifies as an “other interested party.”

5.3.2 Traffic Engineering Policies, Practices, and Legal Authority (TEPPL)

NCDOT *Traffic Engineering Policies, Practices, and Legal Authority (TEPPL)* documents contain references to pedestrians and bicyclists, though not necessarily from the perspective on implementing Complete Streets.

In [MU-7] Exceptions to Maintenance Responsibilities on State Highway System Streets in Municipalities, it states, “*Sidewalks - The construction and maintenance and all financial liability for accidents on sidewalks are the complete responsibility of the municipality. Similarly, that section of ground between the curb and gutter and the sidewalk and from the sidewalk to the edge of the right of way is considered a municipal responsibility from a maintenance standpoint.*” This language leaves room for debate of whose responsibility it is to pay for and maintain non-motorized facilities.

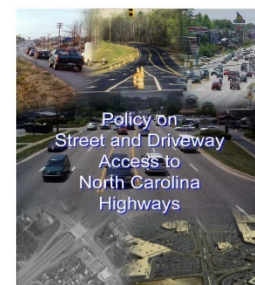
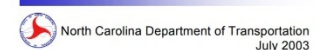
In Article 15. Streets, Traffic and Parking (G.S. 160A-296 Establishment and control of streets; center and edge lines), it states that, “*cities shall have general authority and control over all sidewalks... within its corporate limits...*” It further states that this includes keeping such facilities in proper repair. As local governments often have limited transportation dollars, building and maintaining sidewalks and bicycle lanes can be daunting. In G.S. 160A-217 Petition for Street or Sidewalk Improvements, there are further details of city’s powers and responsibilities as well.

19A NCAC 02D .0406 Construction and Maintenance of Sidewalks, makes clear the Department of Transportation’s responsibilities regarding sidewalks. NCDOT is responsible for replacing any sidewalks that are disturbed by construction of a new roadway. Also, it is the Department’s responsibility to evaluate the need for sidewalks in the planning process, analyze the existing and projected future needs for pedestrian facilities, and draft a pedestrian facilities maintenance agreement.

5.3.3 NCDOT Policy on Street and Driveway Access to North Carolina Highways

The NCDOT Policy on Street and Driveway Access to North Carolina Highways was established before the Complete Streets policy, and it has not been updated to incorporate the policy or design guidelines.

The policy references NCDOT Traditional Neighborhood Development (TND) Guidelines. The TND Guidelines were developed prior to the Complete Streets Policy; however, the document champions many of the principles of



Complete Streets – such as walking and biking, enhancing access to transit, improving safety for all roadway users through traffic calming measures and other techniques. The TND Guidelines are not referenced in the CS policy or guidelines document.

5.3.4 NCDOT Roadway Design Manual



The *NCDOT Roadway Design Manual* is the guiding document used by all roadway designers at NCDOT in developing alternatives for projects. While the Complete Streets policy is not cited within the manual, there is guidance for designing sidewalks and discussion about accommodating bicycle facilities within the roadway design. Design guidance for bicycle facilities is scattered throughout the manual and generally follows guidance set by FHWA. The Roadway Design Manual also refers to guidance contained in AASHTO's *A Policy on Geometric Design of Highways and Streets*, commonly referred to as the

"Green Book." There is limited discussion in this nearly 1,000-page document about bicycle and pedestrian facilities. The guidance included is more from the perspective of designing for automobiles and accommodating these alternative modes than from a "complete streets" view. Updating the *NCDOT Roadway Design Manual* to include Complete Streets language would allow for a more consistent application of Complete Streets principles across the State.

5.3.5 Summary of Related Policies Review

The above discussion shows the numerous policies and guidance documents must be consulted for successful implementation of Complete Streets elements. Some units have no language at all that pertains to Complete Streets elements. None of the documents reviewed presented a clear, coordinated process for implementing Complete Streets in projects. The language of many of the policies underscores the perception that non-automobile transportation elements are viewed as amenities, not critical to the overall project. In many of the policies cited, NCDOT makes localities responsible for requesting, justifying and, in some cases, partially funding sidewalks, bicycle facilities, and greenways. Small communities with limited staff and limited expertise about NCDOT's project development process and funding options might not know when to contact NCDOT or who to contact. While the language of the policies generally supports Complete Streets elements, as one interviewees noted, they are not written in a way that promotes greater inclusion of their respective modes into projects.

The policies might also be streamlined to minimize confusion during project development. In talking to roadway design engineers, it became clear that it is critical to integrate the Complete Streets planning and design guidelines into the Roadway Design Manual.

5.4 Best Practices Review of Complete Streets Policies and Guidelines

A review of several other states' Complete Streets policies and guidelines documents was conducted to determine those elements that are vital for a successful Complete Streets policy, and to understand how NCDOT's Policy and *Planning and Design Guidelines* compare to those in other states. States were selected (1) because they are known for excelling in Complete Streets implementation or (2) to gain a better understanding of what other states in the Southeast are doing to implement Complete Streets.

The following section details strengths identified within each of the reviewed state policies and supporting documents.

5.4.1 California

The State of California passed the Complete Streets Act (AB 1358) and the California Department of Transportation (Caltrans) passed Deputy Directive 64-R1 in 2008.

Policy

Caltrans' Deputy Directive clearly delineates who is responsible for overseeing inclusion of Complete Streets elements, throughout every step of project development. In addition, the policy specifies that a bicycle and pedestrian coordinator must be designated and serve as advisor and external liaison for issues involving district, local agencies and stakeholders. These elements of the policy are particularly important as they bring a sense of accountability.

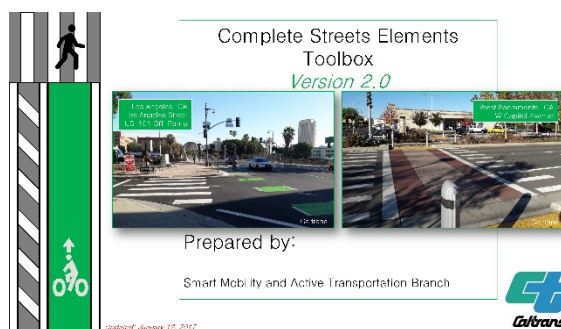
The Deputy Directive ties in Complete Streets with other policies that are important to the state, namely California's Global Warming Solutions Act of 2006. By drawing a connection between the two, there is additional incentive to support Complete Streets. Additionally, it establishes one of the many benefits that come from including multimodal elements in roadway design.

Localities are required to match federal funding for transportation projects. Transportation funding in California allows use of Toll Road revenue to be used for federal matching.

Supporting Documents

Complete Streets Elements Toolbox

The *Complete Streets Elements Toolbox* provides design guidance and walks the user through the logistics of how to implement Complete Streets, in terms of project development and funding. The Toolbox is intended to be used as an electronic document that is continually updated, to reflect adopted Caltrans guidance and new elements appropriate for use of the State Highway system, and to provide links to additional resources. For each bicycle and pedestrian element in the Toolbox, there are resources, illustrations of what the element looks like, and an explanation of how it is included in the State Highway Operations Protection Program (SHOPP). SHOPP is California's 4-year funding program dedicated to repair and maintenance of various types of roadside facilities. These maintenance projects receive prioritized funding over transportation improvement projects that are included in the STIP.



Update to the General Plan Guidelines: Complete Streets and the Circulation Element

The *General Plan Guidelines: Complete Streets and the Circulation Element* document provides support for cities and counties in their compliance with the California Complete Streets Act. It includes guidance to update general plan circulation element goals, policies, data collection techniques, and implementation measures related to multimodal transportation networks.

Complete Streets Implementation Action Plan

The *Complete Streets Implementation Action Plan*, created as a direct result of Deputy Directive 63-R1, sets forth priority actions necessary to ensure Complete Streets implementation and establishes responsible units to complete certain actions within a specified time frame.

5.4.2 Florida

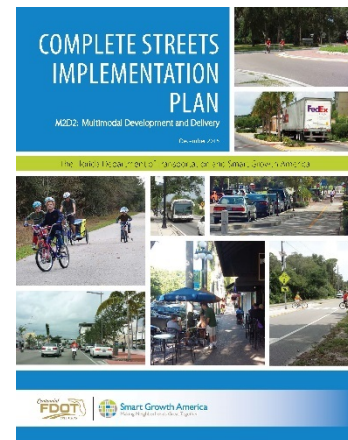
Policy

FDOT's Complete Streets Policy provides clear language that the department is to incorporate Complete Streets into project planning, design and construction. The department's Complete Streets program parallels a shift with FDOT to evaluate land use and development patterns in determining facility type. Complete Streets are to be evaluated and incorporated into all projects, whereas NCDOT's policy specifies projects in urban and suburban areas. The policy does not specify any exceptions than could be made to the policy. There is also a directive within the policy to integrate Complete Streets into existing and future FDOT manuals, guidelines and documents.

Supporting Documents

Complete Streets Implementation Plan

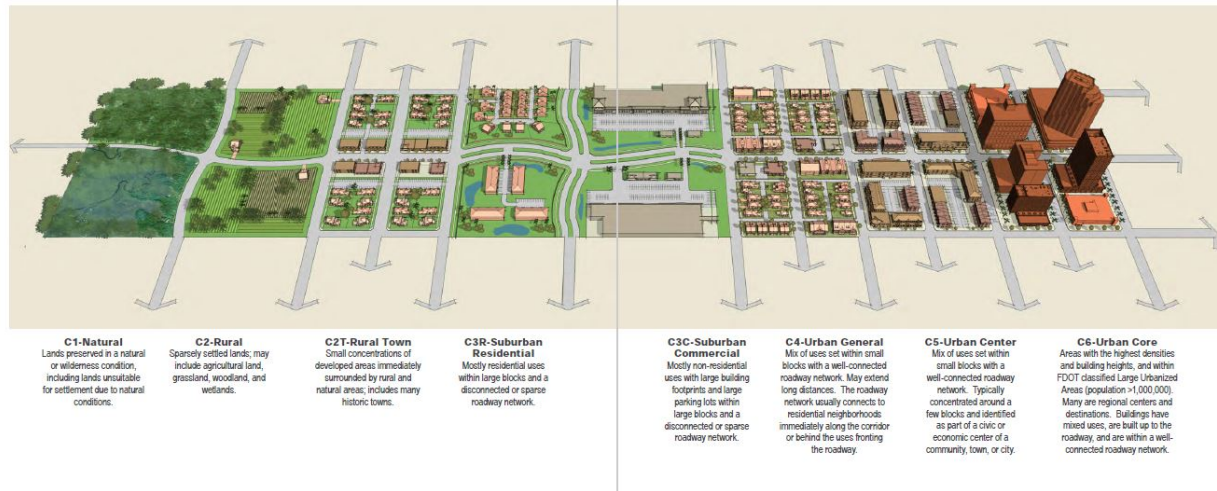
FDOT developed a *Complete Streets Implementation Plan* in partnership with Smart Growth America that outlines a five-year timeline for implementation with five focus areas: 1-Revising guidance, standards, manuals, policies and other documents; 2- Updating Decision Making; 3- Modifying Approaches for Measuring Performance; 4- Managing Internal and External Communication and Collaboration during Implementation; 5- Providing Ongoing Education and Training. The plan identifies FDOT manuals, guidelines, and documents to be updated to incorporate Complete Streets considerations and specifies how the documents are to be updated and lists specific timelines. The plan also provides actions items to adapt the Florida Transportation Plan (the state's long-range transportation plan) and the Strategic Intermodal System Policy Plan (similar to NCDOT's SPOT program) to be compatible with the Complete Streets Policy. The Implementation Plan also provides recommendations and action items to initiate a cultural shift within FDOT to more include a greater FDOT focus.



FDOT Context Classification

As FDOT shifts to reviewing land use and development patterns for facility selection, the Context Classification document assists project developers in identifying and selecting appropriate context classifications for projects. Eight context classifications, and one Special District classification, are listed. The document provides Primary and Secondary measures relating to land use, building dimensions, block dimensions, and population and employment density to distinguish between the context classifications. Guidance is provided on transportation and environmental characteristics to provide clarity on facility selection. Case studies are also provided for each context classification in the appendix.

FIGURE 2 FDOT CONTEXT CLASSIFICATIONS



A transect view of the eight context classifications listed in the document

Draft FDOT Design Manual

FDOT began utilizing a new design manual beginning January 1, 2018. The design manual has been updated to become compatible with FDOT's Complete Streets policy to include information on context classification, updated cross sections, and updated design standards for bicycle and pedestrian facilities.

5.4.3 New Jersey

New Jersey Department of Transportation (NJDOT) passed Policy No. 703 in 2009.

Policy

NJDOT offers several examples of how incentives can help reinforce Complete Streets. NJDOT's policy states that there should be an incentive within the Local Aid Program for municipalities and counties to implement the Complete Streets policy. All NJDOT projects that undergo the Capital Project Delivery process are required to include a Complete Streets checklist, which documents how bicycle/pedestrian elements are included in the project. An explanation must be provided for projects that do not include bicycle/pedestrian elements. An extra point (out of 25 possible points) is awarded to projects that do include Complete Streets elements.

Since NJDOT enacted its Complete Streets policy, other supporting policies have been put in place. NJDOT policy #705 provides that there should be provisions for bicyclists and pedestrians in the event of roadway closures for construction. As states begin to acknowledge the importance of Complete Streets it is necessary to update protocol that affects all roadway users, not just drivers.

There are ethical reasons to design Complete Streets as well. While certain people elect not to drive out of personal preference, others do not drive due to a lack of options. This can be due to mobility constraints, financial reasons, among others. Complete Streets policies should include the need for consideration of these populations. NJDOT's Complete Streets policy acknowledges this and stipulates that improvements must comply with Title VI/Environmental Justice, and Americans with Disabilities Act (ADA).

NJDOT has a detailed process for how such exemptions are to be handled. Anything that does not fall within the exemptions must be documented and approved by the Capital Program Committee and receive written approval by the Commissioner of Transportation.

Localities are required to meet a 20 percent match to federal funds. Under Transportation Equity Act for the 21st Century (TEA-21) toll credits were created and allowed to be used toward the non-federal matching share.

Supporting Documents

NJ Complete Streets Design Guide

The *Complete Streets Design Guide* provides technical guidance for Complete Streets facility design. A section within the guide provides aid to policy makers, government officials, and local citizens with addressing multimodal elements. The guidance provides logical updates to steps within the project development process. For example, the guide recommends that Complete Streets principles are to be integrated from project inception, to avoid costly rework further down the line and to achieve a cohesive overall design. The guide also addresses limited scope projects (i.e. pavement resurfacing or bridge deck/superstructure replacement) which do not follow the typical project development process, due to a tighter timeline and special constraints. In short, the guide identifies which steps should be completed along different phases of project development to incorporate Complete Streets, and it does so for projects of varying nature.



The guide also details what can be done to ensure Complete Streets projects score favorably in NJDOT's project prioritization process. Given that the prioritization process is largely driven by quantitative data, the guide emphasizes the need to develop metrics for modes other than motor vehicles. There are suggestions for how to develop such metrics.

Guidance for localities includes recommendations for how to: develop an effective Complete Streets Policy, go beyond the policy and change every day processes that guide decision-making, involve stakeholders and community members, and redefine how to measure success for transportation projects.

Making Complete Streets a Reality: A Guide to Policy Development

Making Complete Streets a Reality: A Guide to Policy Development provides a model policy template, and describes the policy process of writing and adopting a Complete Streets policy that responds to local context, issues and needs.

A Guide to Creating a Complete Streets Implementation Plan

Once a Complete Streets policy has been adopted, *A Guide to Creating a Complete Streets Implementation Plan* can be used to help translate policy into action. The document details implementing strategies, procedures, plans and projects to help decision makers and professionals with implementation.

5.4.4 Tennessee

Tennessee Department of Transportation (TDOT) passed the Bicycle and Pedestrian Policy in 2010 and the Multimodal Access Policy (TCA 4-3-2303) in 2015.



Tennessee Long-Range Transportation Plan

Bicycle and Pedestrian Element

December 2005

Policy

TDOT's Complete Streets policy addresses the need to look beyond existing conditions and to consider improvements for future demand. This is an important consideration to include in project development because it is easier to include Complete Streets elements with other improvements and to avoid retrofits further in project implementation.

The policy states that if all feasible roadway alternatives have been explored and suitable multimodal facilities cannot be included due to environmental constraints or if facilities cannot be included in the right of way, an alternate route that provides continuity and enhances accessibility of multimodal travel should be considered.

TDOT funding requires a 25 percent local match for highway construction projects and 20 percent local match for bridge construction projects. TDOT also offers multimodal access grants, limited to multimodal access projects that are under \$1 million, which matches up to 95 percent in state grant funds and requires a 5 percent local match.

Supporting Documents

Tennessee Long-Range Transportation Plan, Bicycle and Pedestrian Element

The *Tennessee Long-Range Transportation Plan, Bicycle and Pedestrian Element* was created prior to adoption of the Complete Streets policy. The document serves as a guide for development and maintenance of the bicycle and pedestrian network, as well as specific programs, implementation, maintenance and funding.

5.4.5 Virginia

Virginia Department of Transportation (VDOT) passed the Policy for Integrating Bicycle and Pedestrian Accommodations in 2004.

Policy

The policy states that VDOT encourages "participation of localities in concurrent engineering activities that guide the project development" for bicycle and pedestrian accommodations. Independent construction projects are identified as an opportunity to allow development of bicycle/pedestrian accommodations, outside of highway construction. These projects can be utilized to retrofit facilities along existing roadways, improve existing facilities, and install facilities to provide continuity within the bicycle and pedestrian network.

VDOT's policy identifies additional opportunities where bicycle and pedestrian elements can be included, outside of standard roadway projects. This includes operation and maintenance activities, long

distance bicycle routes, and tourism and economic development. Complete Streets element inclusion is not limited to roadway projects, increasing the opportunity to advance multimodal networks.

In the event VDOT decides not to include bicycle/pedestrian accommodations in a project, there is a process for localities to counter. There is a formal appeals process where the locality provides the district administrator with documentation (resolution or plan documents) justifying inclusion of Complete Streets elements. This process must be completed prior to the submission of design approval recommendation to the chief engineer for program development.

Transportation funding in Virginia requires a 20 percent funding match to obtain federal funds for allowable construction projects. Highway construction funds can be allocated towards bicycle and pedestrian accommodations in conjunction with highway construction or as independent transportation projects. Bicycle and pedestrian accommodation projects are to be funded in the same manner as other highway construction projects along interstate, primary, secondary, or urban systems. If the project is located elsewhere, it will be determined through a negotiated agreement with the locality/localities involved. The policy lists additional funding sources, including programs for highway safety, enhancement, air quality, congestion relief and special access.

Supporting Documents

State Bicycle Policy Plan

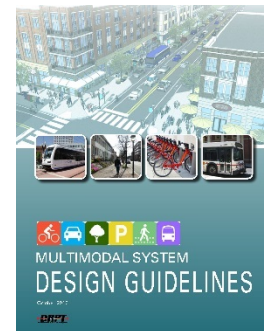
The *State Bicycle Policy Plan* provides bicycle policy recommendations, meant to guide the planning, design, construction, operation and maintenance of bicycle accommodations.

State Pedestrian Policy Plan

The *State Pedestrian Policy Plan* addresses the implementation of both the Bicycle and Pedestrian Policy Plans but focuses on the walking element of the Policy for Integrating Bicycle and Pedestrian Accommodations. The Plan focuses on policy implementation, procedures, and programs within VDOT's authority.

Multimodal System Design Guidelines

The *Multimodal System Design Guidelines* document was developed, by the Virginia Department of Rail and Public Transportation, to assist in the implementation of Complete Streets, with the goal of providing a better multimodal and intermodal transportation system. The Guidelines provide a holistic framework for multimodal planning, for varying contexts, by identifying how to develop connected networks for all travel modes that fit the surrounding context.



5.4.5 Summary of Best Practices Review

The review of Complete Streets initiatives in other states revealed that a clear, concise and actionable policy is an important first step to ensuring implementation. Strong policy elements include: a thorough but succinct exceptions section, with a reasonable procedure for processing exemptions; consideration of future land use context; designation of responsible parties for implementation throughout project development; a plan to update guidelines and relevant policies; and clearly explained funding options.

The evaluation task also made it clear that adopting a Complete Streets policy does not guarantee implementation. Given that the Complete Streets approach is a shift from an historical focus on motor vehicles to a broader focus that takes all roadway users into consideration, it is important to update the project development process, including a thoughtful review of prioritization and funding mechanisms. Thus, it is necessary to have supporting documents and updates to institutional mechanisms that integrate the Complete Streets policy in all project development processes.

6. PERFORMANCE METRICS

Performance measures support policy objectives and help evaluate performance over time. Several interviewees commented that the DBPT has not tracked Complete Streets implementation and thus has not been able to assess performance within the State. There are numerous performance measures DBPT can utilize to evaluate the performance of the Complete Streets Policy and *Planning and Design Guidelines*. Performance measures can include metrics that serve varying purposes.

The performance metrics outlined in this section can be utilized for the purposes of evaluating the effectiveness of Complete Street strategies, specifically, in terms of improving safety, congestion, accessibility and economic development. NCDOT could perform “before and after” comparisons for Complete Streets projects, and evaluate the effectiveness of certain applications of Complete Streets elements. While DBPT has previously been the primary unit within NCDOT tracking performance, it could be beneficial to have another NCDOT unit co-manage this task and other tasks associated with Complete Streets implementation. The next phase of this process will look more at process improvements and make recommendations about responsibilities and accountability within NCDOT.

6.1 Metrics

6.1.1 Safety

Complete Streets elements offer safety benefits and they should play a key role in North Carolina’s Vision Zero policy, the state’s initiative to eliminate roadway deaths and injuries. Crash data is one metric that can help identify whether safety has improved due to the introduction of Complete Streets elements. Bicycle and pedestrian crash data should be readily accessible and should be available independent of motor vehicle crash data. Currently, crash data is only reported and documented when a motor vehicle is involved, meaning crashes only involving bicycles and pedestrians are probably underreported. DBPT could partner with the Mobility & Safety Unit and the Vision Zero task force, run out of the Institute for Transportation Research and Education (ITRE), to begin this collection effort. Once data has been collected, it can be analyzed and used to evaluate Complete Streets performance. This data could also be made available online to the public, as is the case with crash data associated with motor vehicles.



6.1.2 Congestion

Level of service (LOS) is a metric used to quantify the quality of transportation service. It has traditionally focused on conditions for motor vehicles. However, this narrow focus overlooks the necessity to address other modes. Multimodal LOS (MMLOS) provides a broader overview of the quality

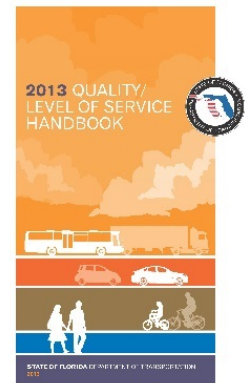
of the transportation system. MMLOS generates a separate LOS for four modes of travel – automobile drivers, bus passengers, pedestrians and bicyclists. This allows planners and engineers to gauge how a design will affect each mode and weigh potential trade-offs in performance. This metric is included in the 2010 Highway Capacity Manual and was intended for urban settings, though the Congestion Management Guidelines states MMLOS is only required as requested. DBPT can partner with the Mobility & Safety Unit to identify ways MMLOS can have greater inclusion in traffic analyses and to be used as a metric in facility selection. Part of this effort would also require creating a process to collect more comprehensive data for bicycle, pedestrian and transit use.

Florida’s Department of Transportation (FDOT) developed a quality level of service handbook (Q/LOS), which is comparable to MMLOS. However, FDOT’s Q/LOS metric addresses all contexts, not just urban settings. Like the MMLOS, it takes multiple modes into account and provides a broader picture about how well the roadway network is performing. The City of Raleigh references FDOT’s Q/LOS in its street design manual and utilizes its software.

6.1.3 Inventory

There are several metrics that could be utilized to track improvements in accessibility. An inventory of existing and proposed bicycle and pedestrian facilities is already kept by DBPT through its Pedestrian and Bicycle Infrastructure Network (PBIN) geodatabase. As DBPT’s website states, however, this is not a comprehensive list of all existing and proposed facilities in North Carolina. DBPT should build on this existing effort and update this geodatabase so it will be a more useful and effective tool.

Examples of data that should be collected include: planned facilities from NCDOT and local plans, funded projects, projects under development/construction, miles of existing Complete Streets facilities, transit stops with ADA accommodations, and existing and planned transit routes. Cataloging transit facilities is especially key to ensuring Complete Streets infrastructure encompasses all modes of travel.



6.1.4 Economic Development and Equity

Complete Streets generally have a positive impact on economic vitality and quality of life. Making streets more accommodating to walking, biking, or riding transit can help stimulate local economic activity. At the other end of the spectrum, a lack of bicycle, pedestrian and transit accommodations disproportionately impacts low-income populations who often are in zero car households and need access to alternative modes of travel.

Complete Streets projects should be tracked based on their proximity to commercial and employment centers and to low-income Census Block Groups. This can provide insight to ensure Complete Streets projects serve the trip purposes beyond recreation and communities at all income levels. The Community Studies Group (now part of the Environmental Analysis Unit) has procedures for identifying low-income communities.

6.2 Reporting

Performance measures can be used to ensure accountability in the implementation of Complete Streets statewide and the effectiveness of NCDOT's execution of the initiative. Progress reports could be produced that summarize the percentage of total projects submitted to SPOT that include Complete Streets facilities, the percentage of projects included in the STIP with Complete Street facilities, and the percentage of total projects that are constructed that include Complete Streets facilities. For the purposes of the progress report, Complete Streets facilities would be defined as any bicycle, pedestrian or transit accommodation. The progress reports could be prepared with input from the Transportation Planning Division, MPOs, RPOs, Roadway Design Unit, and Highway Divisions. This would provide insight into how many proposed Complete Streets facilities are constructed and would help quantify the number of such facilities. The NCDOT unit responsible for Complete Streets, to be identified in later phases of this study, would be responsible for producing and submitting the progress reports to the Chief Deputy Secretary and/or the Board of Transportation. The progress reports could also be published online to communicate the performance of Complete Streets to NCDOT's partners and the public.

7. IMPLEMENTATION AND TRACKING

As discussed previously, there are multiple stages in the project lifecycle where decisions about Complete Streets are made. These include Comprehensive Transportation Plans, Prioritization, design and implementation. As discovered in the interview stage, ensuring Complete Streets is incorporated in these stages is essential for statewide Complete Streets implementation. Tracking these decisions as they progress can ensure that a record is kept to inform NCDOT staff and external stakeholders as projects progress through NCDOT business units. This approach can also provide a record of the "break points" where Complete Streets elements are no longer being considered in project development, determine why and develop mechanisms to ensure their inclusion throughout the process when local context indicates these elements are appropriate.

The Governance Office within NCDOT has created a tracking document, External Stakeholder Coordination Plan, that is intended to track external coordination and design decisions. These decisions include amenity type, costs and cost-share agreements. DBPT can build on this effort and work with the Governance group to create a tracking mechanism for Complete Streets that tracks projects as they emerge in planning through project development and design. DBPT is currently developing a more formal tracking process for its projects using the Smartsheets tool to assist in project management and project delivery for bicycle and pedestrian projects. The tool allows for detailed project tracking and a comprehensive record of decisions that can actively alert project members to action items and project updates. However, this tool is not currently used across all NCDOT modal divisions. If DBPT finds this tool to be useful, DBPT could consider partnering with the Roadway Design Unit or a Highway Division for a trial of this tracking approach on Complete Streets projects to determine if it allows for greater clarity in communication and design consistency, both identified as issues during stakeholder interviews. Alternatively, DBPT may consider working with the Governance group to incorporate Complete Streets into this effort if the External Stakeholder Coordination Plan is implemented across all NCDOT projects. Phase 2 of this process will examine these questions in detail and will make recommendations about how DBPT should proceed and what its role should be in the Complete Streets process.

8. PUBLIC INVOLVEMENT STRATEGY

Educating and communicating with internal and external stakeholders is vital to ensuring consistent, equitable implementation of Complete Streets. Following the publication of the *Complete Streets Planning and Design Guidelines* in 2012, a series of trainings was held to educate stakeholders, both within and outside of NCDOT. Many of the stakeholders interviewed during this evaluation mentioned they had attended one of those trainings and found them to be informative and useful. They indicated they would be interested in participating in annual Complete Streets trainings and workshops to help them and their agencies stay informed of current policy and guidelines.

In 2017, NCDOT created a 25-person Bicycle and Pedestrian Stakeholder committee to review and advise the Department on bicycle and pedestrian policies. The committee includes representatives from DBPT, other divisions within NCDOT, MPOs, RPOs, municipal planning departments, and various advocacy organizations.

DBPT plans to conduct a new round of training exercises to educate non-traditional stakeholders (i.e. public health advocates and economic development organizations) about the revised Complete Streets policy and guidelines. This training will explain to stakeholders the process for getting Complete Streets projects included in local plans, the STIP and, ultimately, funded and constructed. The trainings will occur at multiple locations throughout the State after process improvements have been approved.

9. NEXT STEPS

The second phase of this study will involve recommending specific revisions to the Complete Streets policy and planning and design guidelines. In addition, process improvements will be recommended to better integrate Complete Streets into NCDOT's project delivery process. Finally, an outreach strategy will be developed to communicate and educate internal and external stakeholders about these changes and to explain roles and responsibilities for Complete Streets implementation.

10. CONCLUSION

This evaluation indicated few problems with the Complete Streets Policy. There are opportunities to strengthen and clarify the language (e.g., exceptions process) but, in general, stakeholders indicated no major concerns with the policy itself. The 2012 planning and design guidelines were an important first step in successfully integrating a comprehensive multimodal approach into NCDOT's project development process. A review of other states' planning and design guidelines reveals the Department's



guidelines are not substantially different from other states that have success with Complete Streets. The primary concern is with the process. This evaluation indicates the following opportunities for improving the planning and design guidelines: (1) clearly establishing roles and responsibilities for better accountability (2) improving the process by which Complete Streets elements are integrated into project development, including Prioritization, funding and tracking (3) regularly updating the design guidelines and

(4) better communication with internal and external stakeholders. In addition, it is important for NCDOT to update institutional mechanisms and procedures to help facilitate a paradigm shift from automobile transportation planning to a multimodal focus. Phase 2 will provide detailed recommendations that address each of these opportunities and lay out a process for achieving desired goals. The overall goal is to develop a clear, comprehensive and standardized approach for implementing Complete Streets that allows NCDOT to provide a safe and equitable multimodal transportation network.