

THE STRATEGIC TRANSPORTATION INITIATIVES (STI) LAW

What's In It...and What's Not

Levels of Funding and Authority

- Federal
- State (STI)
- North Carolina Department of Transportation (NCDOT) Policy

Like it or not, Congress holds the purse strings



*A second flood,
A simple famine,
Plagues of locusts everywhere,
Or a cataclysmic earthquake,
I'd accept with some despair,
But, no, you sent us Congress,
Good God Sir, was that fair?*

Fixing America's Surface Transportation (FAST Act)

- Authorizes funding levels and programs (i.e. federal gas tax)
- Continues many policies of its predecessor (MAP-21)
- Continues and funds many federal programs
 - NHPP
 - CMAQ
 - STBG (TAP incorporated into STBG)
 - HSIP
 - TIFIA
 - NHFP (new to FAST Act)
- Continues use of MPOs and TIPs
- Most federal transportation dollars allocated through the Strategic Transportation Investments (STI) law

Strategic Transportation Investments (STI)

- Law passed in 2013
- Establishes formulas and procedures for distributing transportation funding throughout the state (SPOT)
- Replaced equity formula



Strategic Mobility Formula

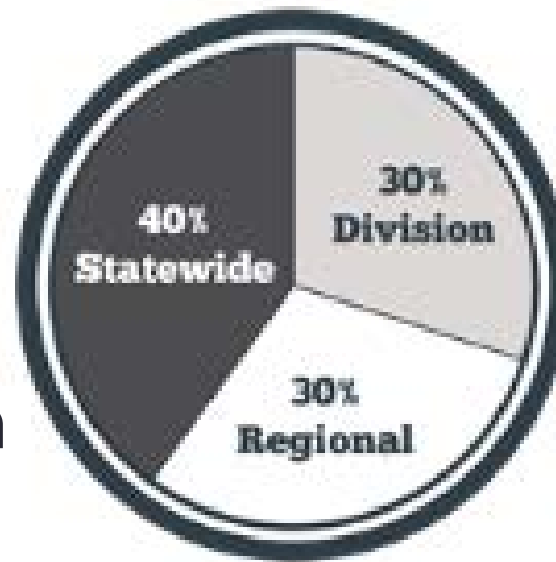
- Funds subject to formula:
 - Federal Aid Funds
 - State Highway Trust Funds
- Not subject to formula:
 - CMAQ
 - STBGDA
 - Bond Funds
 - Toll Collections
 - Planning Funds

$$= w_0 + w_1 \sum_{j=1}^t \gamma^{t-j} \mathbf{CR}_j + w_2 \sum_{j=1}^t \gamma^{t-j} \mathbf{EV}_j + 1 - w_4 \sum_{j=1}^t \gamma^{t-j} \max(\mathbf{R}_j - \mathbf{O}_j, 0) + w_5 \sum_{j=1}^t \gamma^{t-j} \mathbf{I}$$

This is the updated equation to predict happiness, where t is the trial number, w_0 is a constant term, other weights w capture the influence of different event types, $0 < \gamma < 1$ is a forgetting factor that makes events in more recent trials more influential than those in earlier trials, \mathbf{CR}_j is the certain reward if chosen instead of a gamble on trial j , \mathbf{EV}_j is the average reward for the gamble if chosen on trial j , and \mathbf{RPE}_j is the RPE (reinforcement prediction error) on trial j contingent on choice of the gamble. The RPE is equal to the reward received minus the expectation in that trial \mathbf{EV}_j . If the CR was chosen, then $\mathbf{EV}_j = 0$ and $\mathbf{RPE}_j = 0$; if the gamble was chosen, then $\mathbf{CR}_j = 0$. The variables in the equation are quantities that the neuromodulator dopamine has been associated with in previous neuroscience studies. The additional term w_4 relates to advantageous inequality (guilt) when the reward received by the subject \mathbf{R}_j exceeds the reward received by the other player \mathbf{O}_j , and w_5 relates to disadvantageous inequality (envy) when \mathbf{O}_j exceeds \mathbf{R}_j . Credit: Robb Rutledge, UCL.

Strategic Mobility Formula

- Three categories of projects
 - Statewide Mobility
 - Regional Impact
 - Division Needs
- Revenue distribution set in state law

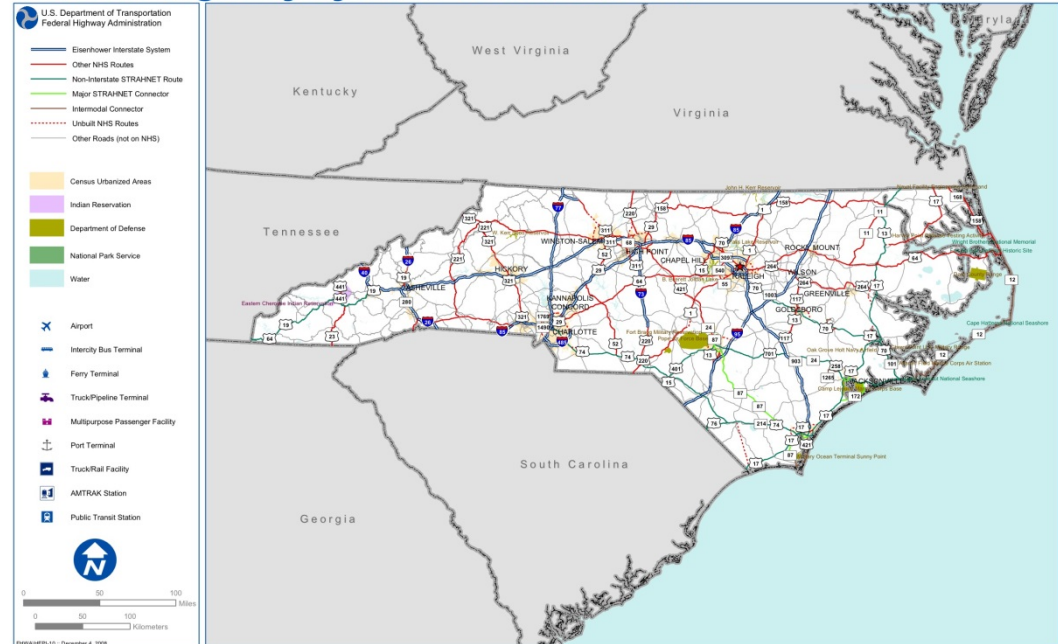


Revenue Distribution

Statewide Mobility

- Interstate Highways
- Toll Roads
- Commercial Airports
>375,000 passengers
- Class I freight rail
(NCRR)

National Highway System: North Carolina



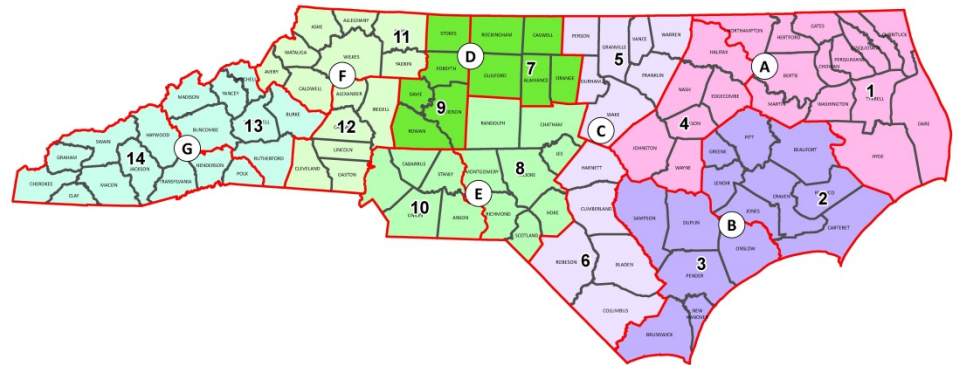
Regional Impact

- US and NC Highways
- Public transit
 - Two or more counties
 - More than one municipality
 - No more than 10% of project cost, or
 - No more than 10% of all regional funds, whichever is smaller



Regional Impact

- Region C
 - Divisions 5 & 6
 - Includes Durham County
- Region D
 - Divisions 7 & 9
 - Includes Orange County
- Region E
 - Divisions 8 & 10
 - Includes Chatham County



Division Needs

- Non-shielded state routes (SR)
- All other public transit
- Non-commercial airports
- All stand-alone bike/ped projects
- All municipal projects



Division Funding

- Each of the 14 divisions funded equally
 - Direct MPO funding subtracted from division allocation
- No state funds for stand-alone bike/ped projects



Strategic Prioritization of Transportation (SPOT)

- Every two years
- Determines what is funded in Transportation Improvement Plan
- Enshrined in STI law
- Quantitative score for each mode



SPOT's Modes



Highway



Bike/Ped



Transit



Rail



Aviation



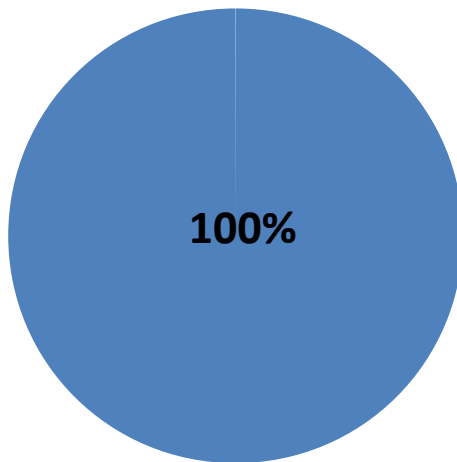
Ocracoke Express Ferry

See SPOT Score

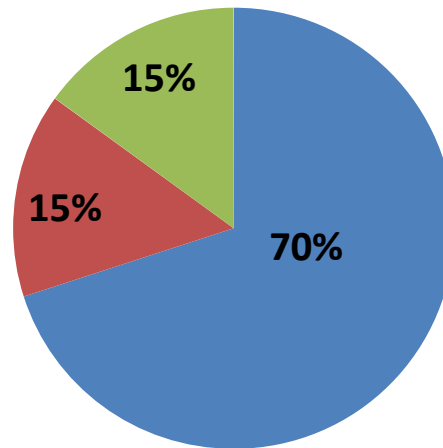
- SPOT workgroup provides guidance on criteria, formulas, and weights
- STI law defines what criteria can be used for highway projects
- STI law gives NCDOT power to determine scoring criteria for non-highway projects
- Highest scoring projects get funded

Scoring Allocations

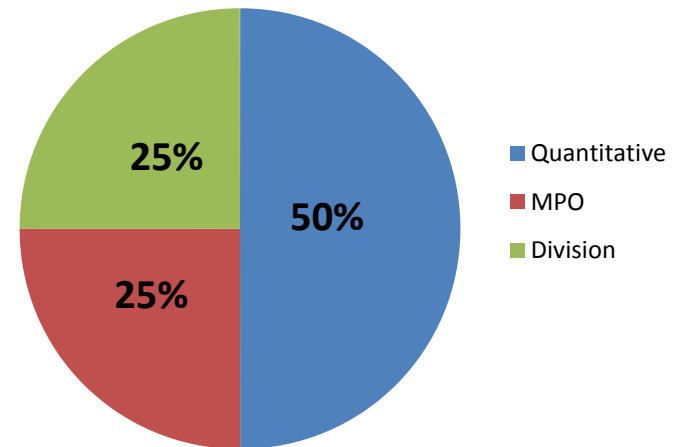
Statewide Mobility



Regional Impact



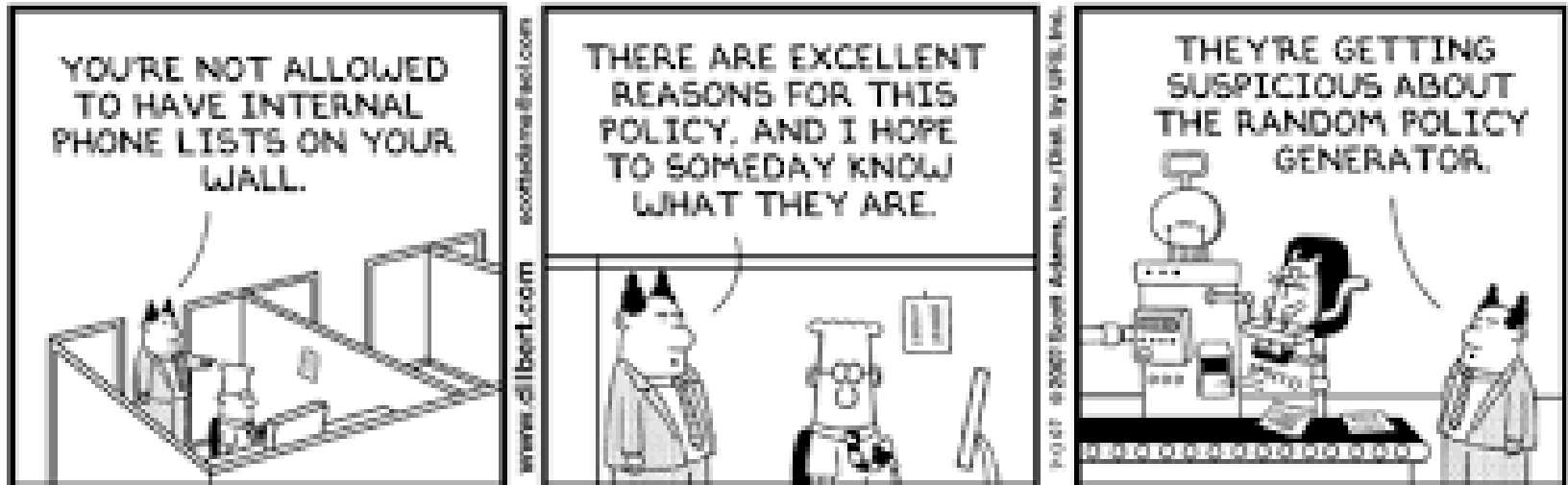
Division Needs



■ Quantitative
■ MPO
■ Division

NCDOT Policies

- Not included in STI law
- At discretion of NCDOT
- Changes to any of these policies may require Board of Transportation approval



Law vs. Policy

- STI Requirements
 - Statewide/Regional/Division definitions and allocations
 - Regions and Divisions
 - Quantitative scoring method and local input points
 - Available criteria for highway projects
 - Reduction of division funding due to MPO funding
- NCDOT Policies
 - Normalization
 - Criteria, formulas, and weighting for scoring
 - Bike/Ped Policies

Normalization

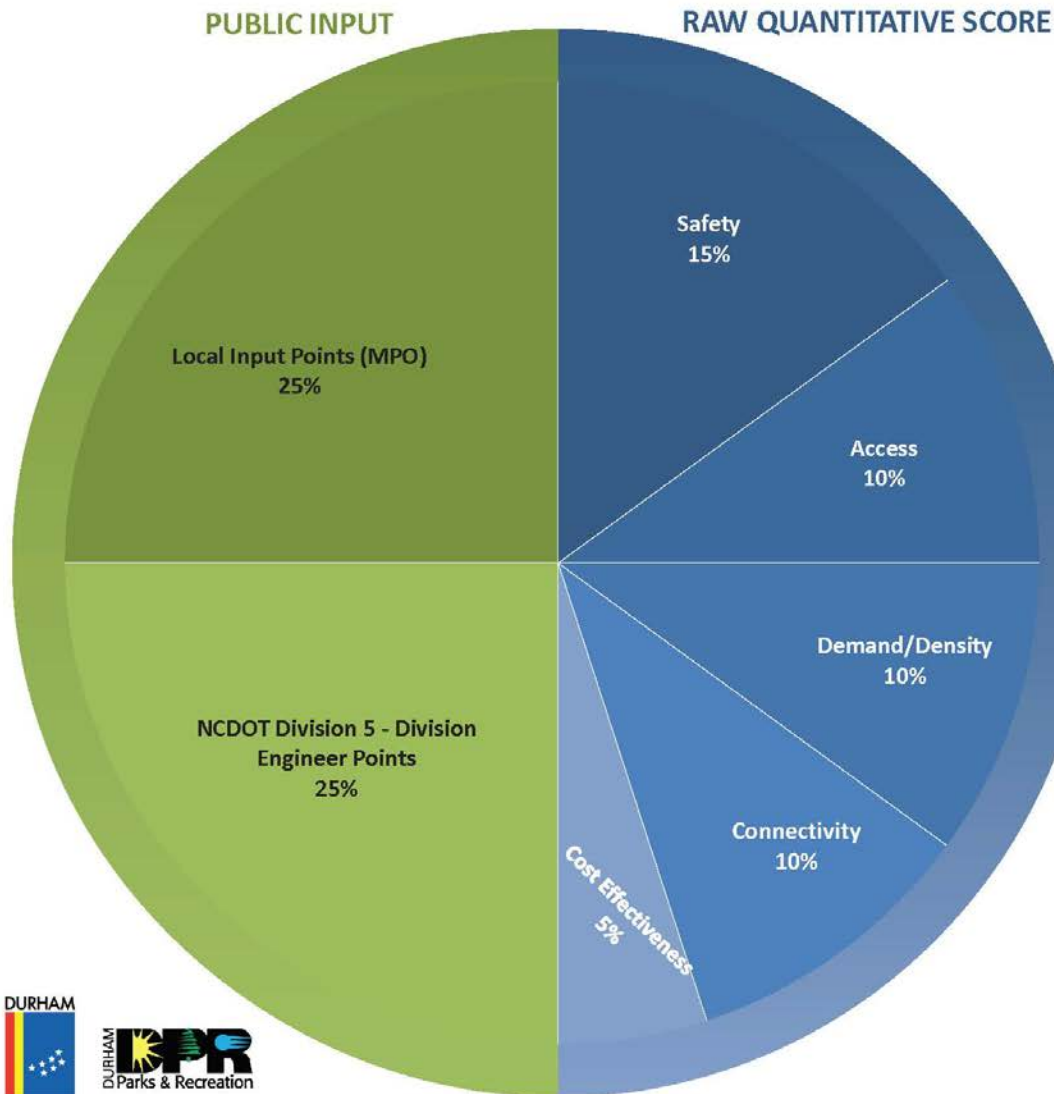
- Percentage of funds directed to highway vs. non-highway projects
- Highway and non-highway funds are exhausted, then flex funds are assigned to the highest scoring project regardless of mode

Mode	Regional Impact	Division Needs
Highway	90% (Region competition)	90% (Division competition)
Non-Highway	4% (Statewide competition)	4% (2% Statewide competition, 2% Division competition)
Flex	6% (Region competition)	6% (Division competition)

SPOT Criteria, Formulas, and Weights

- STI outlines highway scoring criteria
 - NCDOT does not have to use all listed criteria (and doesn't)
 - SPOT workgroup proposes criteria and scoring formulas to Board of Transportation for adoption
 - Criteria weights not in STI law
- STI directs NCDOT to develop non-highway criteria
 - SPOT workgroup proposes criteria and scoring formulas to Board of Transportation for adoption
 - Alternate criteria and weights not allowed for non-highway modes

NCDOT SPOT P5.0 Scoring Model - Division Needs: Bicycle-Pedestrian Projects



DEFINITIONS

Safety:

$(\text{Number of crashes} \times 40\%) + (\text{Posted speed limit} \times 20\%) + (\text{Crash severity} \times 20\%) + (\text{Project safety benefit} \times 20\%)$

Access:

$(\text{Destination Type} \times 50\%) + (\text{Distance to Prime Destination} \times 50\%)$

Demand/Density:

of households and employees per square mile near facility

Connectivity:

Degree of bike/ped separation from roadway, connectivity to a similar or better project type, part of/ connection to a national/state/regional bike route

Cost Effectiveness:

$(\text{Safety} + \text{Access} + \text{Demand} + \text{Connectivity}) / \text{Cost to NCDOT}$

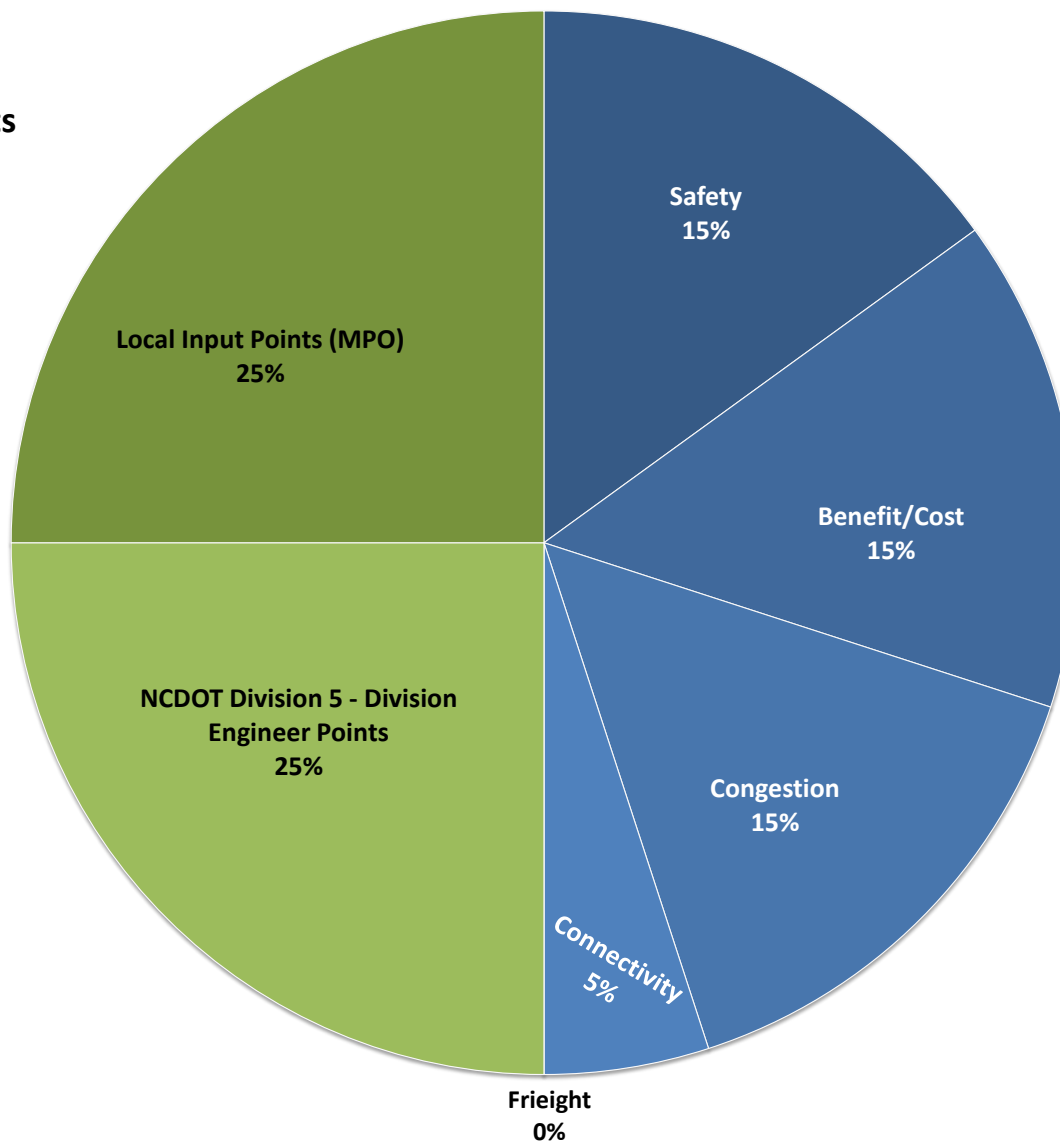
Local Input Points:

Points that the MPO assigns to a project to reflect local priorities and public input received by the MPO during the SPOT process.

NCDOT Division Engineer Points:

Points that the NCDOT assigns to a project to reflect local priorities and public input received by NCDOT during the SPOT process.

**NCDOT SPOT P5.0
Scoring Model
for Highway Projects
(Divisions 7 & 8)**



DEFINITIONS

Safety:

(Crash Density x 20%) +
(Critical Crash Rate x 20%)
+ (Crash severity x 20%) +
(Project safety benefit x
40%)

Benefit/Cost:

((Travel Time Savings +
Safety Benefits)/NCDOT
Project Cost)) + ((Other
Funds/Total Project
Cost)*100)

Congestion:

% of Volume/Capacity
Ratio + % Existing Volume

Connectivity:

(County Economic Indicator
x 50%) + (Travel Time
Savings/Improve Mobility x
50%)

Bike/Ped Policies

- Local governments must contribute to pedestrian “enhancements” on highway projects (for sidewalks and trails)
- NCDOT Complete Streets guidelines not always followed as policy
- Local governments usually manage design, r/w acquisition, and construction of bike/ped projects



Bike/Ped Issues for Discussion

Three categories of issues:

- Funding Policies
- Design Standards
- Other NCDOT Policies (e.g., Bridge Policy, Bicycle Policy, Pedestrian Policy)

Discussion / Additions / Deletions