North Carolina
DEPARTMENT OF TRANSPORTATION

# P4.0 Highway Quantitative Scoring – Workgroup Recommendations

May 18, 2015

# Highway Project Scoring Overview

| | Statewide Mobility | Regional Impact | Division Needs |
|---|---|---|---|
| **Eligible Projects:** | • Statewide | • Statewide<br>• Regional | • Statewide<br>• Regional<br>• Division |
| **Overall Weights:** | 100% Quantitative Data | 70% Quantitative Data /<br>30% Local Input | 50% Quantitative Data /<br>50% Local Input |
| **Quant. Criteria** | • Benefit-Cost<br>• Congestion<br>• Economic Comp.<br>• Safety<br>• Freight<br>• Multimodal<br>• Pavement Condition<br>• Lane Width<br>• Shoulder Width | • Benefit-cost<br>• Congestion<br>• Safety<br>• Freight<br>• Multimodal<br>• Pavement Condition<br>• Lane Width<br>• Shoulder Width<br>• Accessibility and connectivity to employment centers, tourist destinations, or military installations | • Benefit-cost<br>• Congestion.<br>• Safety<br>• Freight<br>• Multimodal<br>• Pavement Condition<br>• Lane Width<br>• Shoulder Width<br>• Accessibility and connectivity to employment centers, tourist destinations, or military installations |
| **Notes:** | Projects Selected Prior to Local Input | Quant. Criteria can be different for each Region | Quant. Criteria can be different for each Division |

# Highway Scoring – Eligible Quantitative Criteria

| Criteria | Existing Conditions | Project Benefits (Future Conditions) |
|---|---|---|
| - **Congestion** (Volume/Capacity + Volume) | ✓ | |
| - **Benefit/Cost** (Travel Time Savings + Safety Benefits / Cost to NCDOT) | | ✓ |
| - **Safety Score** (Critical Crash Rates, Density, Severity) | ✓ | |
| - **Economic Competitiveness** (Jobs + Value Added in $) | | ✓ |
| - **Accessibility / Connectivity** (County Economic Indicator, Upgrade Roadway) | ✓ | ✓ |
| - **Freight** (Truck Volumes, STRAHNet/Future Interstate, Freight Terminals) | ✓ | |
| - **Multimodal** (Passenger Terminals) | ✓ | |
| - **Lane Width** (Existing Width vs. Standard Width) | ✓ | |
| - **Shoulder Width** (Existing Width vs. Standard Width) | ✓ | |
| - **Pavement Score** (Pavement Condition Rating) | ✓ | |

# P4.0 Highway Scoring Criteria and Weights

| Funding Category | QUANTITATIVE | LOCAL INPUT | |
|---|---|---|---|
| | Data | Division Rank | MPO/RPO Rank |
| **Statewide Mobility** | Congestion = 30%<br>Benefit-Cost = 25%<br>Safety = 15%<br>Economic Competitiveness = 10%<br>Freight = 15%<br>Multimodal = 5%<br>**Total = 100%** | -- | -- |
| **Regional Impact** | Congestion = 20%<br>Benefit-Cost = 20%<br>Safety = 10%<br>Accessibility/Connectivity = 10%<br>Freight = 10%<br>**Total = 70%** | **15%** | **15%** |
| **Division Needs** | Congestion = 15%<br>Benefit-Cost = 15%<br>Safety = 10%<br>Accessibility/Connectivity = 5%<br>Freight = 5%<br>**Total = 50%** | **25%** | **25%** |

Note: Div. ____ have agreed to use different criteria for Regional Impact and/or Division Needs projects.

# Highway – Congestion

| Funding Category | Criteria Weight |
|---|---|
| Statewide Mobility | 30% |
| Regional Impact | 20% |
| Division Needs | 15% |

**Purpose – Measure existing level of mobility along roadways by indicating congested locations and bottlenecks**

| | |
|---|---|
| Statewide Mobility | 60% - Existing Volume/Capacity Ratio<br>40% - Existing Volume |
| Regional Impact | 80% - Existing Volume/Capacity Ratio<br>20% - Existing Volume |
| Division Needs | 100% - Existing Volume/Capacity Ratio |

**Peak ADT will be used as the Existing Volume**

# Highway – Benefit-Cost

| Funding Category | Criteria Weight |
|---|---|
| Statewide Mobility | 25% |
| Regional Impact | 20% |
| Division Needs | 15% |

**Purpose – measure the expected benefits of the project over a 10 year period against the estimated project cost to NCDOT**

**((Travel Time Savings over 10 years in $ + Safety Benefits over 10 years in $) / Project Cost to NCDOT) + ((Other Funds) / Total Project Cost) x 100)**

- Travel Time Savings:
  - Statewide Mobility and Regional Impact projects calculated using Statewide Travel Model (NCSTM)
  - Division Needs projects calculated using before & after project accounting for growth from NCSTM
- Safety benefits calculated using crash reduction factors multiplied by existing crashes
- Project Cost to consists of Construction, Right-of-Way, and Utilities costs
- Cost can be lowered and score increased if other funds (non-federal or non-state funds) are committed to project by locals

# Highway – Safety

| Funding Category | Criteria Weight |
|---|---|
| Statewide Mobility | 15% |
| Regional Impact | 10% |
| Division Needs | 10% |

**Purpose – measure existing crashes along/at the project**

| | |
|---|---|
| Segments | 33% - Crash Density<br>33% - Crash Severity<br>33% - Critical Crash Rate |
| Intersections | 50% - Crash Frequency<br>50% - Severity Index |

- All data provided by Mobility & Safety Division (3 year moving average)
- Higher scores indicate poorer performance

# Highway – Economic Competitiveness

| Funding Category | Criteria Weight |
|---|---|
| Statewide Mobility | 10% |
| Regional Impact | N/A |
| Division Needs | N/A |

**Purpose – measure the economic benefits the transportation project is expected to provide in economic activity (GDP) and jobs over 10 yrs**

**Score based on Output from TREDIS® (Economic Impact Model)**

- Primary input is Travel Time Savings
- Output is # of **long-term jobs created** (50%) + Value added in $ (50%) based on **% change in County Economy**
  - Includes wages increased, increased productivity
  - Accounts for current economic conditions (includes use of labor statistics)
  - Results based on 10 year forecast using Moody's Analytics data
- Does NOT include contingent (prospective) development
- **Criteria is not intended to evaluate projects for recruiting purposes**

# Highway – Accessibility / Connectivity

| Funding Category | Criteria Weight |
|---|---|
| Statewide Mobility | N/A |
| Regional Impact | 10% |
| Division Needs | 5% |

**Purpose – Improve access to opportunity in rural and less-affluent areas and improve interconnectivity of the transportation network.**

50% - County Tier Designation – Points are based on economic distress indicators from Dept. of Commerce (includes rankings of: property tax base per capita, population growth, median household income, unemployment rate)

50% - Does project upgrade how the roadway functions? – Points are based on whether the project upgrades the roadway to one which provides a higher level of mobility by enhancing traffic flow, eliminating/bypassing signalized sections, increasing control of access, and accounting for the travel time savings per user

# Highway – Accessibility / Connectivity

## Facility Type Upgrade (Does project upgrade the roadway)

- Focus on improving how the roadway functions, with emphasis on enhancing traffic flow, removing/bypassing traffic signals, and increasing access control
- Eligibility based on combination of Existing Facility Type and Project Facility Type (see below)

| Existing Facility Type (From) | Project Facility Type (To) |
|---|---|
| Two Lane Highway | Freeway |
| Two Lane Highway | Multilane Highway |
| Two Lane Highway | Superstreet |
| Multilane Highway | Freeway |
| Arterial (Signalized Roadway) | Freeway |
| Arterial (Signalized Roadway) | Multilane Highway |
| Arterial (Signalized Roadway) | Superstreet |
| Superstreet | Freeway |
| Superstreet | Multilane Highway |

New Location (Freeway, Multilane Highway, Superstreet) and Upgrade Intersection to Interchange/Grade separation projects also eligible)

- If project is eligible, use travel time savings per user

# Highway – Freight [+ Military]

| Funding Category | Criteria Weight |
|---|---|
| Statewide Mobility | 15% |
| Regional Impact | 10% |
| Division Needs | 5% |

**Purpose – measure congestion along routes that provide connection to freight intermodal terminals and that have high truck volumes**

50% - Truck volumes along route

30% - Volume [Peak ADT] /capacity if project is on non-Interstate STRAHNET route or designated future Interstate

20% - (20 miles – distance project is to nearest freight intermodal terminal)

**Freight terminals (includes facilities within 20 miles of NC):**

- Public freight intermodal terminals (truck/rail/pipeline) – as defined in NHS
- Seaports and inland ports
- Statewide Mobility eligible airports which handle large movement of freight (CLT, RDU, GSO, ILM?)
- Major military bases
- Large private freight intermodal terminals defined as (truck to another mode) → TBD

# Highway – Multimodal [+ Military]

| Funding Category | Criteria Weight |
|---|---|
| Statewide Mobility | 5% |
| Regional Impact | - |
| Division Needs | - |

**Purpose – measure congestion along routes that provide a connection to multimodal passenger terminals**

40% - Volume [Peak ADT] / Capacity ratio along route if project is within 5 miles of a multimodal passenger terminal

60% - (5 miles – distance project is to nearest multimodal passenger terminal)

**Multimodal passenger terminals:**

- Amtrak stations (bus and rail stations run by Amtrak)
- Major transit terminals
- Commercial service airports
- Red & blue general aviation airports
- Major military bases
- Ferry terminals

# Highway – Lane Width

| Funding Category | Criteria Weight |
|---|---|
| Statewide Mobility | - |
| Regional Impact | - |
| Division Needs | - |

**Purpose – measure the existing lane width vs. DOT design standard**

**Existing Lane Width – DOT design standard Lane Width**

- Greater the difference, the higher points the project receives
  - 1 ft difference = 25 pts
  - 2 ft difference = 50 pts
  - 3 ft difference = 75 pts
  - 4+ ft difference = 100 pts
- Does NOT mean that project will be constructed to design standard

# Highway – [Paved] Shoulder Width

| Funding Category | Criteria Weight |
|---|---|
| Statewide Mobility | - |
| Regional Impact | - |
| Division Needs | - |

**Purpose – measure the existing paved shoulder width vs. DOT design standard**

**Existing Paved Shoulder Width – DOT design standard Paved Shoulder Width**

- Greater the difference, the higher points the project receives
  - 1 ft difference = 25 pts
  - 2 ft difference = 50 pts
  - 3 ft difference = 75 pts
  - 4+ ft difference = 100 pts
- Does NOT mean that project will be constructed to design standard

# Highway – Pavement Condition

| Funding Category | Criteria Weight |
|---|---|
| Statewide Mobility | - |
| Regional Impact | - |
| Division Needs | - |

**Purpose – measure the existing pavement condition along the project**

**100 – Pavement Condition Rating**

- Based on 2014 Pavement Condition Survey
- Higher scores indicate poorer pavement condition