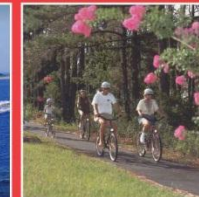
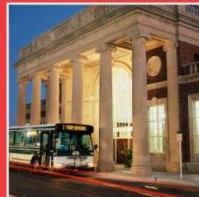
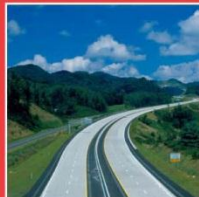




Prioritization 3.0/Strategic Transportation Investments

BOT Approved Highway Quantitative Scoring Criteria

September 10, 2013



How the STI Works

40% of Funds = \$6B

30% of Funds = \$4.5B

30% of Funds = \$4.5B

Estimated \$15B in Funds for SFY 2016-2025

Statewide Mobility

Focus → Address Significant Congestion and Bottlenecks

Eligible Projects

- Statewide-type projects (such as Interstates)
- Selection based on 100% data
- Projects programmed prior to local input ranking

Regional Impact

Focus → Improve Connectivity within Regions

Eligible Projects

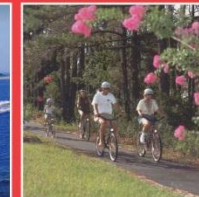
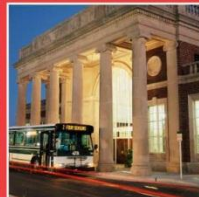
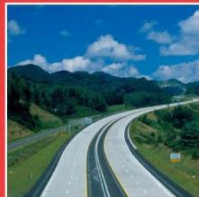
- Projects not selected in Statewide Mobility category
- Regional projects
- Selection based on 70% data & 30% local input
- Funding based on population within region

Division Needs

Focus → Address Local Needs

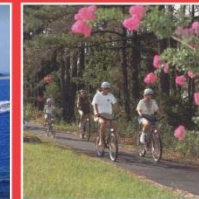
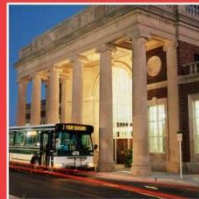
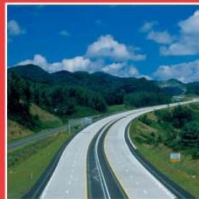
Eligible Projects

- Projects not selected in Statewide or Regional categories
- Division projects
- Selection based on 50% data & 50% local input
- Funding based on equal share for each Division = ~\$34M per year 2



Eligibility Definitions - Highways

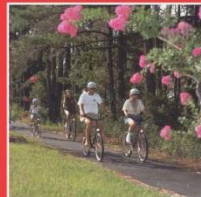
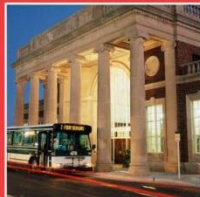
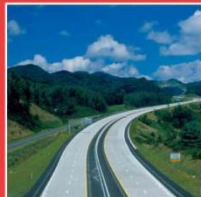
	Statewide	Regional	Division
Highway	<ul style="list-style-type: none"> • Interstates and Future Interstates • Routes on the NHS as of July 1, 2012 • Routes on Department of Defense Strategic Highway Network (STRAHNET) • Appalachian Development Highway System Routes • Uncompleted Intrastate projects • Designated Toll Facilities 	<ul style="list-style-type: none"> • Other US and NC Routes 	<ul style="list-style-type: none"> • All SR Routes



Eligibility Definitions - Highways

Types of Highway Trust Fund eligible projects evaluated in P3.0:

- Widening
- New Location
- Upgrade Roadway
- Intersection/Interchange
- Intelligent Transportation System (such as Signal System)
- Modernization (increasing lane and/or shoulder width)



Highway Project Scoring Overview

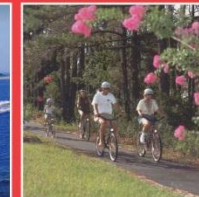
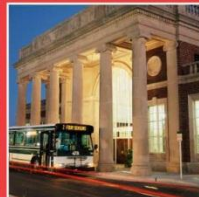
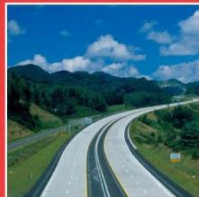
Statewide Mobility		Regional Impact	Division Needs
Eligible Projects:	<ul style="list-style-type: none"> Statewide 	<ul style="list-style-type: none"> Statewide Regional 	<ul style="list-style-type: none"> Statewide Regional Division
Overall Weights:	100% Quantitative Data	70% Quantitative Data / 30% Local Input	50% Quantitative Data / 50% Local Input
Quant. Criteria	<ul style="list-style-type: none"> Benefit-Cost Congestion Economic Comp. Safety Freight Multimodal Pavement Condition Lane Width Shoulder Width 	<ul style="list-style-type: none"> Benefit-Cost Congestion Safety Freight Multimodal Pavement Condition Lane Width Shoulder Width Accessibility and Connectivity to Employment Centers, Tourist Destinations, or Military Installations 	<ul style="list-style-type: none"> Benefit-Cost Congestion Safety Freight Multimodal Pavement Condition Lane Width Shoulder Width 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

<u>Criteria</u>	<u>Existing Conditions</u>	<u>Project Benefits (Future Conditions)</u>
- <u>Congestion</u> (Volume/Capacity Ratio + AADT)	✓	
- <u>Benefit/Cost</u> (Travel Time Savings/Project Cost)		✓
- <u>Safety Score</u> (Critical Crash Rates, Density, Severity)	✓	
- Pavement Score (Pavement Condition Rating)	✓	
- Lane Width (Existing Width vs. Standard Width)	✓	
- Shoulder Width (Existing Width vs. Standard Width)	✓	
- <u>Multimodal</u> (Military, Transportation Terminals & Trucks)	✓	
- <u>Economic Competitiveness</u> (Jobs + Value Added in \$)		✓
- Accessibility/Connectivity (TBD)	✓	

Note: Freight criteria is accounted for in the Multimodal criteria.



BOT Approved Highway Scoring Criteria and Weights

Funding Category	<u>QUANTITATIVE</u>	<u>LOCAL INPUT</u>	
	Data	Division Rank	MPO/RPO Rank
Statewide Mobility	[Travel Time] Benefit/Cost = 30% Congestion = 30% Economic Competitiveness = 10% Safety = 10% <u>Multimodal [& Freight + Military] = 20%</u> Total = 100%	--	--
Regional Impact	[Travel Time] Benefit/Cost = 30% Congestion = 30% <u>Safety = 10%</u> Total = 70%	15%	15%
Division Needs	[Travel Time] Benefit/Cost = 20% Congestion = 20% <u>Safety = 10%</u> Total = 50%	25%	25%

Note: Div. 1, 2, 3, & 4 have agreed to use different criteria for Regional Impact and Division Needs projects. 7



HIGHWAY Scoring

All projects scored on 0-100 point scale

For projects on new location, existing data comes from a “parallel route”

- Parallel Route defined as the roadway(s) motorists currently use to travel between the beginning and end of the project

All quantitative scores will be calculated automatically by application (SPOT On!ine) – user will be able to see preliminary scores shortly after project entry



Example Projects (Completed or Under Construction)

TIP	Route	From	To	Description	County	Div	Eligibility
R-2248E	I-485	NC 115	I-85 North	Construct Freeway on New Location	Mecklenburg	10	Statewide
I-4744	I-40	SR 1728 (Wade Ave)	I-440/US 1/64	Widen Roadway	Wake	5	Statewide
R-2554BA	US 70 (Goldsboro Bypass)	East of SR 1300 (Salem Church Rd)	East of SR 1556 (Wayne Memorial Dr)	Construct Freeway on New Location	Wayne	4	Statewide
R-4463B	NC 43 Connector	US 70	NC 43/55	Construct Roadway on New Location	Craven	2	Regional
R-2911B	US 70	Iredell County Line	SR 1001 (Old Amity Hill Road)	Widen Roadway	Rowan	9	Regional
R-2519A	US 19E	East of SR 1336 (Jacks Creek Rd)	NC 80	Widen Roadway	Yancey	13	Regional
U-3810	SR 1406 (Piney Green Rd)	NC 24	US 17	Widen Roadway	Onslow	3	Division
U-4909	SR 2643 (Union Cross Rd)	SR 2691 (Wallburg Rd)	SR 2632 (Sedge Garden Rd)	Widen Roadway	Forsyth	9	Division
R-3833A	SR 1100 (Brawley School Rd)	SR 1177 (Chuckwood Rd)	US 21	Widen Roadway	Iredell	12	Division

Note: Values shown for scoring on subsequent slides are based on 2010 data.



HIGHWAY – Congestion

Funding Category

Criteria Weight

Statewide Mobility

30%

Regional Impact

30%

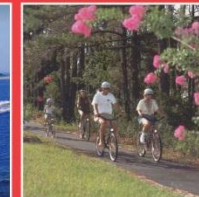
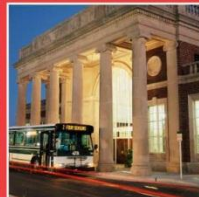
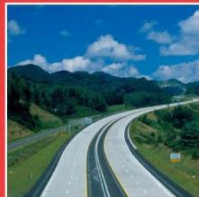
Division Needs

20%

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

$$((\text{Existing Vol./Capacity Ratio} \times 100) \times 60\%) + ((\text{Existing Vol./1,000}) \times 40\%)$$

Note: The use of Travel Time Index, which is a comparison of actual congested speeds from GPS devices to ideal travel speed, is continuing to be investigated for use in P3.0. Based on input from NCDOT's traffic engineers, this measure may replace the use of Volume/Capacity ratio in the above equation.



Example Projects – Congestion Score

TIP	Project	Existing Volume	Existing Capacity	Volume / Capacity Ratio	Congestion Score
R-2248E	I-485 New Location	117,000	140,000	0.84	90.40
I-4744	I-40 Widening	94,000	70,000	1.34	97.60
R-2554BA	US 70 (Goldsboro Bypass)	31,000	60,000	0.52	43.60
R-4463B	NC 43 Connector	24,000	40,000	0.60	45.60
R-2911B	US 70 Widening	9,000	16,000	0.56	37.20
R-2519A	US 19E Widening	14,000	16,000	0.88	58.40
U-3810	SR 1406 (Piney Green Rd) Widening	20,000	16,000	1.25	68.00
U-4909	SR 2643 (Union Cross Rd) Widening	16,000	16,000	1.00	66.40
R-3833A	SR 1100 (Brawley School Rd) Widening	18,000	16,000	1.13	67.20



HIGHWAY – [Travel Time] Benefit-Cost

Funding Category

Criteria Weight

Statewide Mobility

30%

Regional Impact

30%

Division Needs

20%

Purpose – Measure the expected travel time savings benefits of the project over a 30-year period against the estimated project cost to NCDOT

Travel Time Savings over 30 years in \$/Project Cost to NCDOT

- Travel Time Savings calculated using comparison if project was implemented today then multiplied by 30 years
- Project cost consists of construction, right of way, and utilities costs
- Cost can be lowered if other funds are committed to project by locals



Example Projects – [Travel Time] Benefit-Cost Score

TIP	Project	Travel Time Savings over 30 years (\$)	Project Cost	Other Funding	Cost to NCDOT	Benefit/Cost Score
R-2248E	I-485 New Location	\$4,859,808,000	\$206,836,000	\$0	\$206,836,000	23.50
I-4744	I-40 Widening	\$3,502,916,000	\$59,910,000	\$0	\$59,910,000	58.47
R-2554BA	US 70 (Goldsboro Bypass)	\$2,060,655,000*	\$335,731,000*	\$0	\$335,731,000*	6.14
R-4463B	NC 43 Connector	\$963,071,000*	\$67,415,000*	\$0	\$67,415,000*	14.29
R-2911B	US 70 Widening	\$108,246,000	\$23,544,000	\$0	\$23,544,000	4.60
R-2519A	US 19E Widening	\$457,696,000	\$72,288,000	\$0	\$72,288,000	6.33
U-3810	SR 1406 (Piney Green Rd) Widening	\$219,185,000	\$97,235,000	\$0	\$97,235,000	2.25
U-4909	SR 2643 (Union Cross Rd) Widening	\$81,080,000	\$90,308,000	\$0	\$90,308,000	0.90
R-3833A	SR 1100 (Brawley School Rd) Widening	\$106,009,000	\$64,347,000	\$0	\$64,347,000	1.65

*Full benefits of the project are not realized until entire new location roadway is complete. Travel Time Savings and Cost values are based on the entire project.



HIGHWAY – Safety

Funding Category

Criteria Weight

Statewide Mobility

10%

Regional Impact

10%

Division Needs

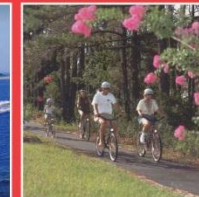
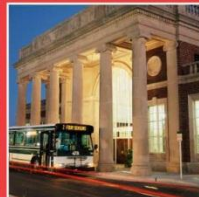
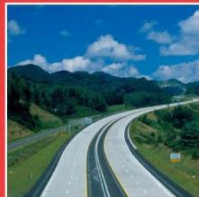
10%

Purpose – Measure existing safety conditions along / at the project

**Segments → (Crash Density x 33%) + (Severity Index x 33%) +
(Critical Crash Rate x 33%)**

Intersections → (Crash Frequency x 50%) + (Severity Index x 50%)

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



Example Projects – Safety Score

TIP	Project	Crash Density	Severity Index	Critical Crash Rate	Safety Score
R-2248E	I-485 New Location	78.80	61.60	71.70	70.69
I-4744	I-40 Widening	87.20	48.70	87.20	74.36
R-2554BA	US 70 (Goldsboro Bypass)	71.10	67.70	61.40	66.73
R-4463B	NC 43 Connector	73.10	56.90	48.80	59.59
R-2911B	US 70 Widening	91.50	91.50	33.80	72.26
R-2519A	US 19E Widening	58.80	62.70	23.50	48.33
U-3810	SR 1406 (Piney Green Rd) Widening	97.50	67.40	74.90	79.93
U-4909	SR 2643 (Union Cross Rd) Widening	100.00	81.50	48.10	76.53
R-3833A	SR 1100 (Brawley School Rd) Widening	100.00	59.30	55.60	71.63



HIGHWAY – Multimodal [& Freight + Military]

Funding Category

Criteria Weight

Statewide Mobility

20%

Regional Impact

--

Division Needs

--

Purpose – Measure existing congestion along key military and truck routes, and routes that provide connections to transportation terminals

25% - Volume/Capacity Ratio on projects on Non-Interstate STRAHNET Routes

25% - Volume/Capacity Ratio on projects on routes that provide direct connection (property line) to a transportation terminal along a roadway with an access point (airport, seaport, rail depot, ferry terminal, transit terminal, major military base, and freight intermodal terminal - includes air/truck/rail/pipeline terminals)

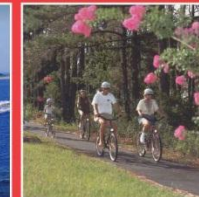
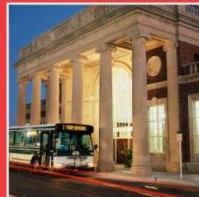
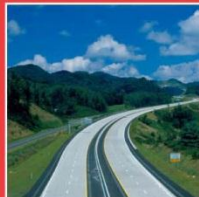
50% - Truck Volumes / 100

(V/C Ratio [Non-Interstate STRAHNET] x 25%) + (V/C Ratio [Route connecting to Transportation Terminal] x 25%) + (Truck Volumes / 100 x 50%)



Example Projects – Multimodal [& Freight + Military] Score

TIP	Project	Volume / Capacity Ratio	Non-Interstate STRAHNET Route?	Direct Connection to Trans. Terminal?	Truck Volume	Multimodal [& Freight + Military] Score
R-2248E	I-485 New Location	0.84	No	No	12,900	50.00
I-4744	I-40 Widening	1.34	No	No	10,300	50.00
R-2554BA	US 70 (Goldsboro Bypass)	0.52	Yes	No	3,100	28.50
R-4463B	NC 43 Connector	0.60	No	No	2,300	11.50
R-2911B	US 70 Widening	0.56	No	No	1,100	5.50
R-2519A	US 19E Widening	0.88	No	No	1,400	7.00
U-3810	SR 1406 (Piney Green Rd) Widening	1.25	No	Yes	600	28.00
U-4909	SR 2643 (Union Cross Rd) Widening	1.00	No	No	500	2.50
R-3833A	SR 1100 (Brawley School Rd) Widening	1.13	No	No	500	2.50



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 30 years

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

- Primary inputs are Travel Time Savings, Location, and Freight Traffic
- Output is # of long-term jobs created (50%) + Value added in \$ (50%) based on % change in NCDOT Division Economy
 - Includes wages increased, increased productivity
 - Accounts for current economic conditions (includes use of labor statistics)
 - Results based on 30-year forecast using Moody's Analytics data
- Does NOT include contingent development
- **Criteria is not intended to evaluate projects for recruiting purposes**



Example Projects – Economic Competitiveness Score

TIP	Project	Travel Time Savings (per yr)	Div	Long-term Employment	% Change in Economic Value Added	Economic Competitiveness Score
R-2248E	I-485 New Location	7,040,533	10	1,641	0.1072%	100.00
I-4744	I-40 Widening	5,074,767	5	1,278	0.0959%	97.93
R-2554BA	US 70 (Goldsboro Bypass)	2,995,867	4	971	0.2348%	98.55
R-4463B	NC 43 Connector	Criteria Not Applicable				
R-2911B	US 70 Widening	Criteria Not Applicable				
R-2519A	US 19E Widening	Criteria Not Applicable				
U-3810	SR 1406 (Piney Green Rd) Widening	Criteria Not Applicable				
U-4909	SR 2643 (Union Cross Rd) Widening	Criteria Not Applicable				
R-3833A	SR 1100 (Brawley School Rd) Widening	Criteria Not Applicable				



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 2012 Pavement Condition Survey
- Higher scores indicate poorer pavement condition



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 foot difference = 25 points
 - 2 foot difference = 50 points
 - 3 foot difference = 75 points
 - 4+ foot difference = 100 points
- 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 foot difference = 25 points
 - 2 foot difference = 50 points
 - 3 foot difference = 75 points
 - 4+ foot difference = 100 points
- Does NOT mean that project will be constructed to design standard



HIGHWAY – Accessibility / Connectivity

Funding Category

Criteria Weight

Statewide Mobility

N/A

Regional Impact

--

Division Needs

--

Purpose – Measure how to improve connections between rural areas and employment centers, tourist destinations, or military installations (connecting people and places)

3 options proposed:

1. Accessibility/Connectivity Index with rural areas defined as municipalities with population between 2,500 and 20,000 people
2. Accessibility/Connectivity Index with rural areas defined as municipalities with population between 1,500 and 20,000 people (new)
3. Evaluation of projects 20 minutes outside of employment centers (new)



HIGHWAY – Accessibility/Connectivity (cont.)

Option 1 – Accessibility/Connectivity Index with rural areas defined as municipalities with population between 2,500 and 20,000 people

Score based on Accessibility/Connectivity Index Map

- Activity Center and Census Block Groups with 5,000+ Jobs
 - Activity Centers include cities over 20,000 people, military bases, ports, UNC campuses, trauma centers, top tourist destinations
- Rural Area (Rural Population Center) = Municipality with population between 2,500 and 20,000
- Map illustrates overlap of drive times from Activity Centers/Block Groups and Rural Population Centers



HIGHWAY – Accessibility/Connectivity (cont.)

Option 2 – Accessibility/Connectivity Index with rural areas defined as municipalities with population between 1,500 and 20,000 people

Score based on Accessibility/Connectivity Index Map

- Activity Center and Census Block Groups with 5,000+ Jobs
 - Activity Centers includes cities over 20,000 people, military bases, ports, UNC campuses, trauma centers, top tourist destinations
- Rural Area (Rural Population Center) = Municipality with population between 1,500 and 20,000
- Map illustrates overlap of drive times from Activity Centers/Block Groups and Rural Population Centers
- New approach – not previously discussed with Workgroup



HIGHWAY – Accessibility/Connectivity (cont.)

Option 3 – Evaluation of projects 20 minutes outside of employment centers

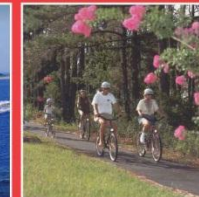
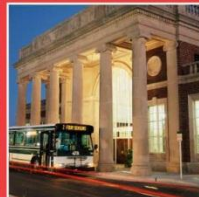
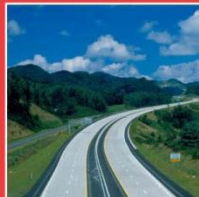
Score based on Existing Volume on eligible roadways → Volume/200

- Goal is to improve connections between rural areas and employment centers
- Employment centers defined as Census Block Groups with 2,500+ jobs
- Projects within 20-minute drive time likely to score well based on other criteria
- Existing freeways are not eligible as they already provide a high level of connectivity
- New approach – not previously discussed with Workgroup



Example Projects – Statewide Mobility Scores

TIP	Project	Congestion (30%)	[Travel Time] Benefit Cost (30%)	Safety (10%)	Econ. Comp. (10%)	Multimodal [& Freight + Military] (20%)	Total Quant. Score (100%)
R-2248E	I-485 New Location	90.40	23.50	70.69	100.00	50.00	61.24
I-4744	I-40 Widening	97.60	58.47	74.36	97.93	50.00	74.05
R-2554BA	US 70 (Goldsboro Bypass)	43.60	6.14	66.73	98.55	28.50	37.15
R-4463B	NC 43 Connector	--	--	--	--	--	--
R-2911B	US 70 Widening	--	--	--	--	--	--
R-2519A	US 19E Widening	--	--	--	--	--	--
U-3810	SR 1406 (Piney Green Rd) Widening	--	--	--	--	--	--
U-4909	SR 2643 (Union Cross Rd) Widening	--	--	--	--	--	--
R-3833A	SR 1100 (Brawley School Rd) Widening	--	--	--	--	--	--



Example Projects – Regional Impact Scores

TIP	Project	Congestion (30%)	[Travel Time] Benefit Cost (30%)	Safety (10%)	Total Quant. Score (70%)
R-2248E	I-485 New Location	90.40	23.50	70.69	41.24
I-4744	I-40 Widening	97.60	58.47	74.36	54.26
R-2554BA	US 70 (Goldsboro Bypass)	43.60	6.14	66.73	21.59
R-4463B	NC 43 Connector	45.60	14.29	59.59	23.93
R-2911B	US 70 Widening	37.20	4.60	72.26	19.77
R-2519A	US 19E Widening	58.40	6.33	48.33	24.25
U-3810	SR 1406 (Piney Green Rd) Widening	--	--	--	--
U-4909	SR 2643 (Union Cross Rd) Widening	--	--	--	--
R-3833A	SR 1100 (Brawley School Rd) Widening	--	--	--	--



Example Projects – Division Needs Scores

TIP	Project	Congestion (20%)	[Travel Time] Benefit Cost (20%)	Safety (10%)	Total Quant. Score (50%)
R-2248E	I-485 New Location	90.40	23.50	70.69	29.85
I-4744	I-40 Widening	97.60	58.47	74.36	38.65
R-2554BA	US 70 (Goldsboro Bypass)	43.60	6.14	66.73	16.62
R-4463B	NC 43 Connector	45.60	14.29	59.59	17.94
R-2911B	US 70 Widening	37.20	4.60	72.26	15.59
R-2519A	US 19E Widening	58.40	6.33	48.33	17.78
U-3810	SR 1406 (Piney Green Rd) Widening	68.00	2.25	79.93	22.04
U-4909	SR 2643 (Union Cross Rd) Widening	66.40	0.90	76.53	21.11
R-3833A	SR 1100 (Brawley School Rd) Widening	67.20	1.65	71.63	20.93