NORTH CAROLINA
Department of Transportation

Connecting people, products and places safely and efficiently

SPOT November BOT Update

Strategic Prioritization Office of Transportation (SPOT)
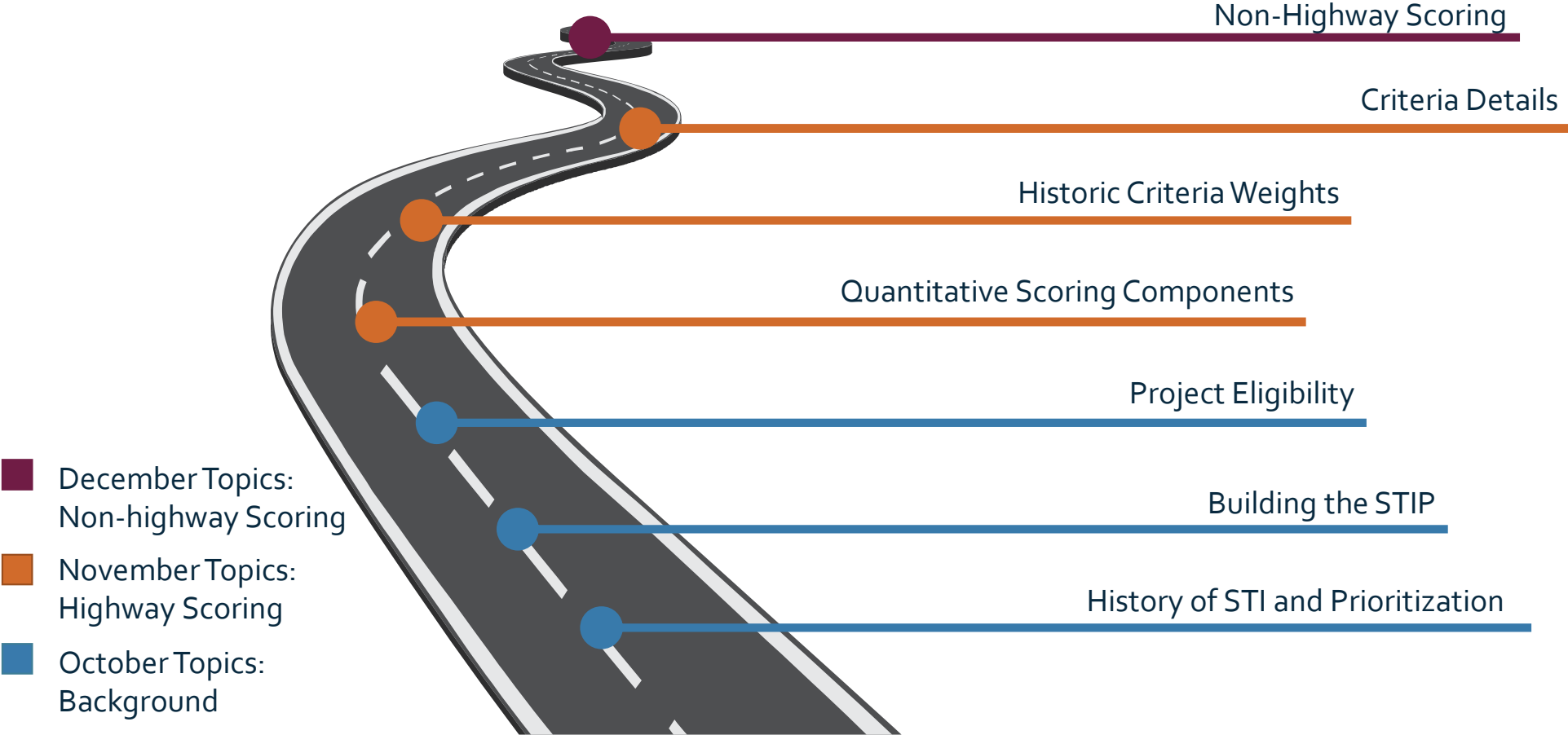
November 2, 2022

Today's Topics

- Review Roadmap of Topics

- Workgroup Update

- Quantitative Scoring Components
- Historic Criteria Weights
- Criteria Details

- Questions & Open Discussion

Roadmap of Topics

Road Map of Upcoming Topics

Non-Highway Scoring

Criteria Details

Historic Criteria Weights

Quantitative Scoring Components

Project Eligibility

Building the STIP

History of STI and Prioritization

December Topics: Non-highway Scoring

November Topics: Highway Scoring

October Topics: Background

Workgroup Update

Workgroup Update

Recent and Upcoming Activities

Recent Activities:

- In-Person Meeting October 11
- Virtual Session October 18

Upcoming Activities:

- In-Person Meeting November 9
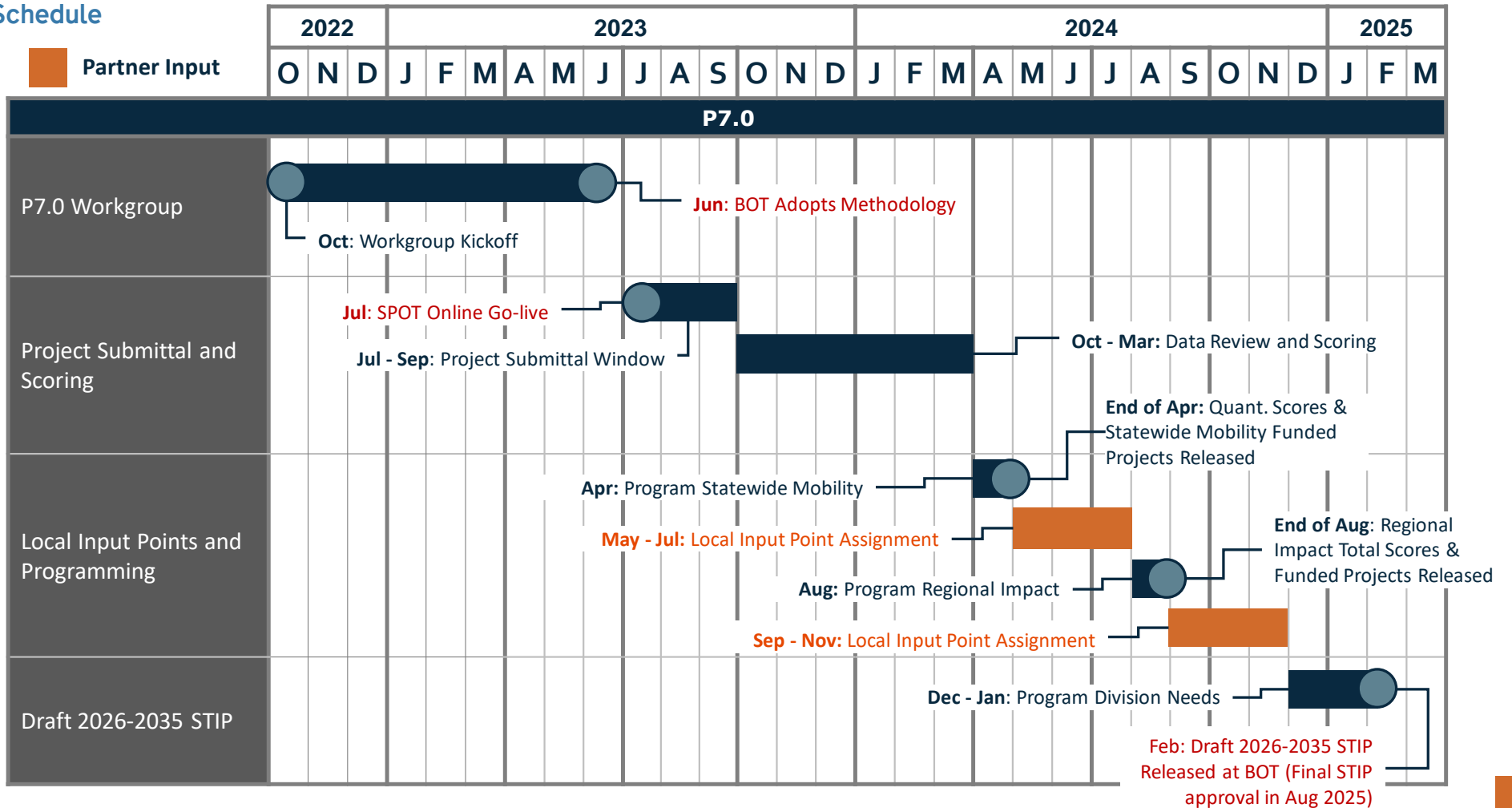- Virtual Meeting November 30

Workgroup Update

Consensus Points

Topic	Last Workgroup Action / Date	Consensus Topic?	Consensus Date	Notes
Workgroup Approach	10/11/22: Discussed	Yes	10/11	
Workgroup Meeting Calendar	10/11/22: Discussed	Yes	10/11	
P7 Cycle Schedule	10/11/22: Discussed	Yes	10/11	
Interstate and Primary Route Designation	10/11/22: Discussed	No	-	
COVID Impacts to Highway Data - Safety	10/11/22: Discussed	Yes	10/11	Use the 5 most recent years
COVID Impacts to Highway Data - Volume	10/18/22: Discussed	Yes	-	Anticipated Consensus 11/9

Workgroup Update

P7 Schedule

Partner Input

	2022	2023	2024	2025
	O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M

P7.0

P7.0 Workgroup

Jun: BOT Adopts Methodology

Oct: Workgroup Kickoff

Project Submittal and Scoring

Jul: SPOT Online Go-live

Jul - Sep: Project Submittal Window

Oct - Mar: Data Review and Scoring

Local Input Points and Programming

End of Apr: Quant. Scores & Statewide Mobility Funded Projects Released

Apr: Program Statewide Mobility

May - Jul: Local Input Point Assignment

End of Aug: Regional Impact Total Scores & Funded Projects Released

Aug: Program Regional Impact

Sep - Nov: Local Input Point Assignment

Draft 2026-2035 STIP

Dec - Jan: Program Division Needs

Feb: Draft 2026-2035 STIP Released at BOT (Final STIP approval in Aug 2025)

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Workgroup Update

P7 Schedule

Partner Input

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O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M

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Workgroup Update

Tentative Meeting Topics

November 9

- Highway Volume Data
- Rail Modernization
- Goal Setting for P7 Workgroup
- Integration of Complete Streets
- Review Research and Identify Potential Scoring Changes
- Transit Project Submittal Process Improvements
- Transit Facility Scoring Refinements

November 30

- Safety Data and Benefit Factors
- Cost Estimation Process
- Rail Modal Update
- Aviation Modal Update
- Ferry Modal Update

December 13

- Safety Data and Benefit Factors
- Review P7.0 Workgroup Goals
- Integration of Complete Streets
- Rail/Transit Follow-up
- Non-Highway Criteria Review
- Cost Estimation Process Follow-up
- Highway Criteria: Multi-Modal and Accessibility/Connectivity

January 12

- SPOT Online Updates
- Complete Streets Integration Follow-up
- Census Data and Impacts to Local Input Points
- Project Carryover Definition and Number of Project Submittals

Quantitative Scoring Components

Key Definitions

Criteria – Names of scoring components identified in law.

Measure – a data driven way to evaluate a criteria. A specific criteria may have one or multiple measures.

> **Scaling** – The process by which raw measures are converted to a 0-to-100-point scale. Scaling occurs at the measure level.
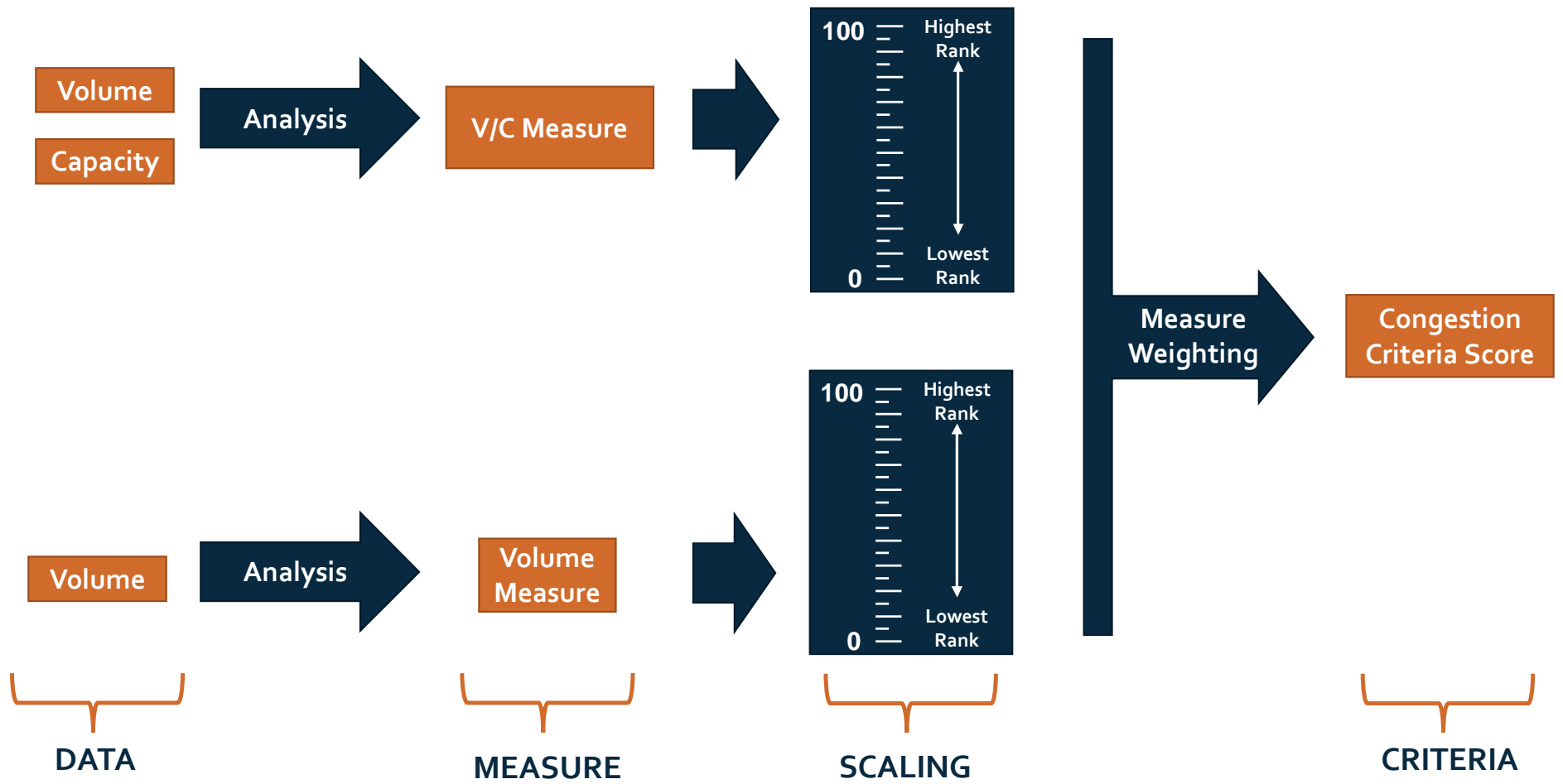
> **Measure Weight** - The percent of the criteria score accounted for by a single measure. Different measures for the same criteria may have different measure weights.

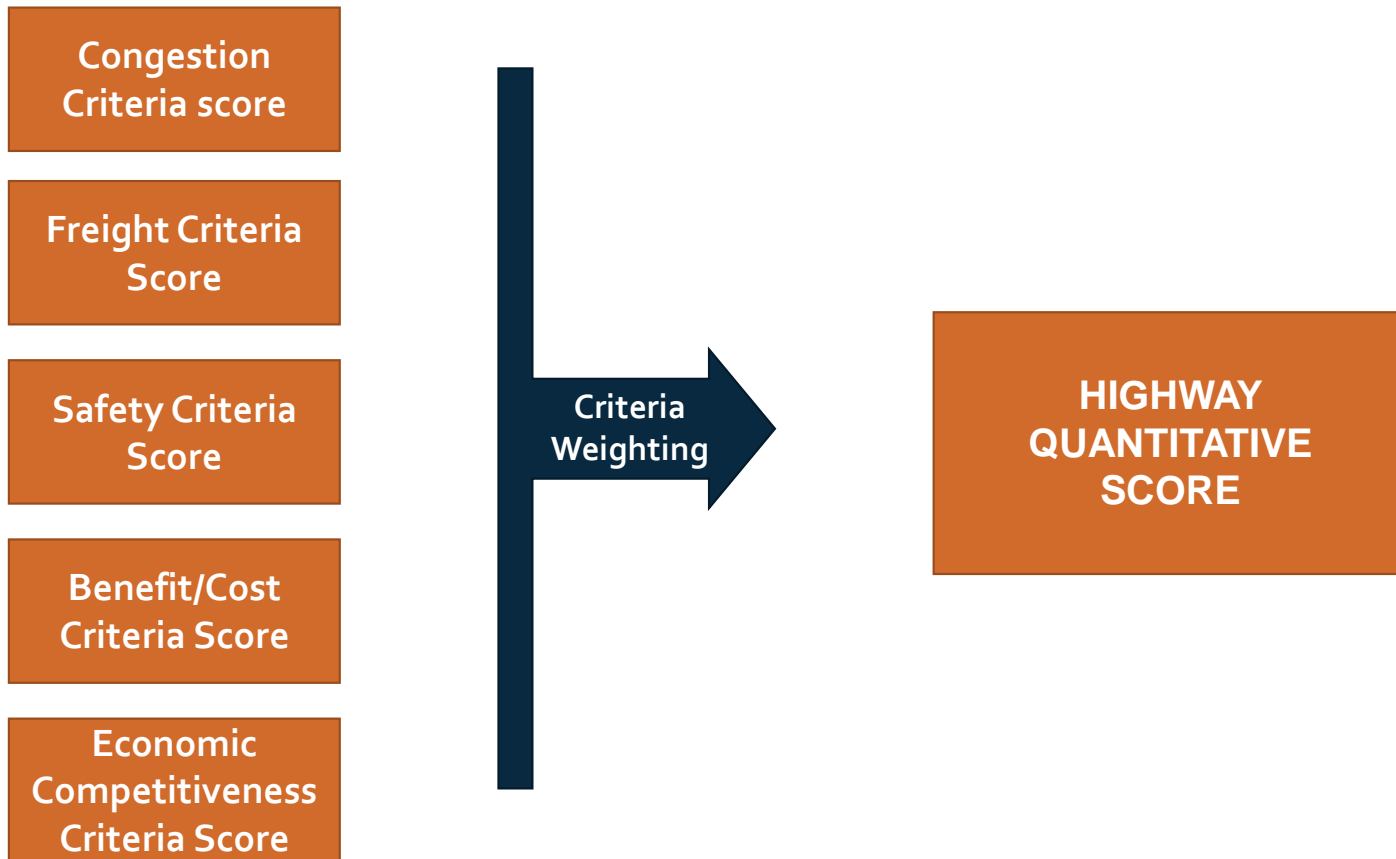**Criteria Score** – The sum of multiplying each scaled measure by the measure weight.

> **Criteria Weight** – The percent of the total quantitative score accounted for by a single criteria. Different criteria may have different criteria weights.

Quantitative Score – The sum of multiplying each criteria score by the criteria weight.

Building a Highway Criteria Score

DATA
- Volume
- Capacity
- Volume

MEASURE
- V/C Measure
- Volume Measure

SCALING
- 100 — Highest Rank
- 0 — Lowest Rank

CRITERIA
- Congestion Criteria Score

Analysis → Measure Weighting

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Building a Highway Quantitative Score

Congestion Criteria score

Freight Criteria Score

Safety Criteria Score

Benefit/Cost Criteria Score

Economic Competitiveness Criteria Score

Criteria Weighting

HIGHWAY QUANTITATIVE SCORE

Historic Default Criteria Weights

Historic Default Criteria Weights

Statewide Mobility

Statewide Mobility (Out of 100 Pts)	P3.0	P4.0	P5.0	P6.0 Mobility	P6.0 Modernization
Congestion	30%	30%	30%	30%	10%
Benefit/Cost	30%	25%	25%	25%	
Safety	10%	15%	10%	10%	25%
Economic Competitiveness	10%	10%	10%	10%	
Freight		15%	25%	25%	25%
Multimodal	20%	5%			
Lane Width					10%
Shoulder Width					20%
Pavement Condition					10%

Historic Default Criteria Weights

Regional Impact

Regional Impact (Out of 70 Pts)	P3.0	P4.0	P5.0	P6.0 Mobility	P6.0 Modernization
Congestion	30%	20%	20%	20%	5%
Benefit/Cost	30%	20%	20%	20%	
Safety	10%	10%	10%	10%	25%
Access/Connectivity		10%	10%	10%	
Freight		10%	10%	10%	10%
Multimodal					
Lane Width					10%
Shoulder Width					10%
Pavement Condition					10%

Historic Default Criteria Weights

Division Needs

Division Needs (Out of 50 Pts)	P3.0	P4.0	P5.0	P6.0 Mobility	P6.0 Modernization
Congestion	20%	15%	15%	15%	
Benefit/Cost	20%	15%	15%	15%	
Safety	10%	10%	10%	10%	20%
Access/Connectivity		5%	5%	5%	
Freight		5%	5%	5%	5%
Multimodal					
Lane Width					5%
Shoulder Width					10%
Pavement Condition					10%

P6.0 Highway Criteria Details

Example Highway Mobility Project Scoring – Statewide Mobility
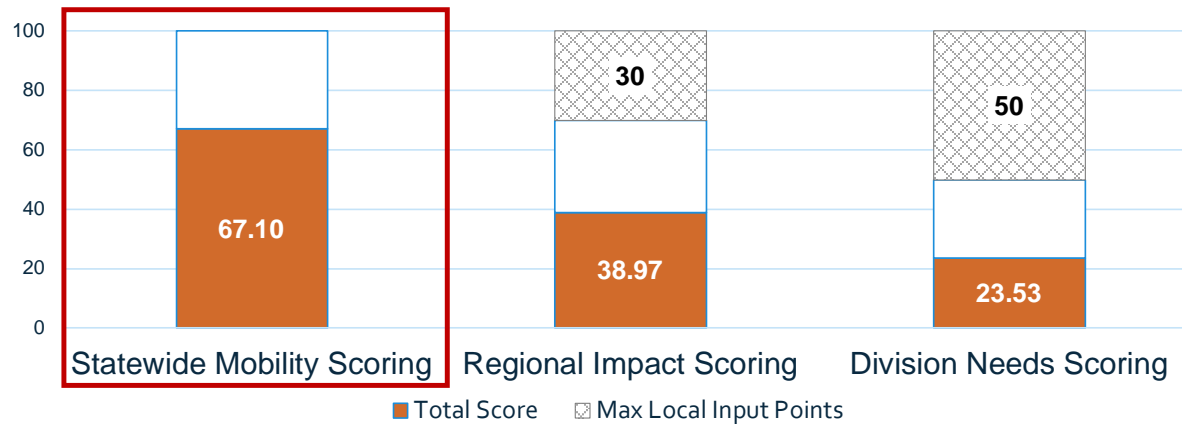
Criteria	Percentage	Scaled Value	Score
Congestion	30%	67.76	20.33
Benefit-Cost	25%	29.85	7.46
Safety	10%	60.84	6.08
Economic Competiveness	10%	85.50	8.55
Freight	25%	98.70	24.68
Statewide Mobility Score TOTAL			**67.10**

Highway Criteria - Congestion

Purpose – Measure <u>existing</u> level of mobility along roadways by indicating congested locations and bottlenecks

CALCULATIONS		Statewide Mobility	Regional Impact	Division Need
	Score Equation	= 60%*[V/C]+40%*[V]	= 80%*[V/C]+20%*[V]	= 100%*[V/C]

MEASURES & DATA		Description	Units	Data Source
	[V]	Existing Volume	Vehicles per day	Traffic Counts
	[C]	Existing Capacity	Vehicles per day	Highway Capacity Manual
	[V/C]	Existing Volume/Capacity Ratio	-	Calculated

EXAMPLE PROJECT CALCULATIONS	Measure	Scaled Measure	Criteria Score
	[V] = 47,500	89.80	= 60%*[V/C]+40%*[V]
	[V/C] = 47,500/63,000 = 0.73	53.06	60%*53.06 + 40%*89.80 = **67.76**

Highway Criteria - Benefit-Cost

Purpose – Measure the expected benefits of the project in comparison to the cost to NCDOT

CALCULATIONS	Statewide Mobility	Regional Impact	Division Need
	Score Equation	$\dfrac{[Benefit\ TTS] + [Benefit\ Safety]}{[Project\ Cost]} + \dfrac{[Other\ Funds]}{[Project\ Cost]}$	

MEASURES & DATA		Description	Units	Data Source
	[Benefit TTS]	Travel Time Savings Over 10 Years	Dollars ($)	Calculation varies based on project type
	[Benefit Safety]	Safety Benefits Over 10 Years	Dollars ($)	Traffic Safety data
	[Project Cost]	Estimated Project Cost at time of submittal	Dollars ($)	Best available cost
	[Other Funds]	Non-federal or non-state funds that are committed to project	Dollars ($)	Submitting organization

EXAMPLE PROJECT CALCULATIONS	Data	Measure	Scaled Measure/Criteria Score
	[Benefit TTS] = $35,900,000 [Benefit Safety] = $15,300,000 [Project Cost] = $400,000,000 [Other Funds] = $0	$\dfrac{[Benefit\ TTS] + [Benefit\ Safety]}{[Project\ Cost]} + \dfrac{[Other\ Funds]}{[Project\ Cost]}$ $\dfrac{\$35,900,000 + \$15,300,000}{\$400,000,000} + \dfrac{\$0}{\$400,000,000} = 0.13$	**29.85**

Highway Criteria - Freight

Purpose – Account for key indicators of freight movement

		Statewide Mobility	Regional Impact	Division Need
CALCULATIONS	Score Equation	$50\% * [Truck\ Volume] + 50\% * [Truck\ \%] + [Future\ Interstate\ CF]$		

		Description	Units	Data Source
MEASURES & DATA	[Truck Volume]		Vehicles	Traffic Volume data
	[Truck %]		-	Traffic Volume data
	[Future Interstate CF]	Future Interstate Completion Factor- ratio of Project Length to Miles Needed to Complete Future Interstate Corridor between NHS Routes	-	Future Interstate data

	Measure	Scaled Measure	Criteria Score
EXAMPLE PROJECT CALCULATIONS	[Truck Volume] = 8,300	97.88	$50\% * [Truck\ Volume] + 50\% * [Truck\ \%] + [Future\ Interstate\ CF]$
	[Truck %] = 19.49	99.51	
	[Future Interstate CF] = 0	0	50%*97.88 + 50%*99.51 + 0 = **98.70**

Highway Criteria - Safety

Purpose – Measure existing crashes along/at the project and calculate future safety benefits

CALCULATIONS	Statewide Mobility	Regional Impact	Division Need
	Score Equation	$40\% * [Crash\ Data] + 60\% * [Benefit\ Safety]$	

MEASURES & DATA		Description	Units	Data Source
	[Crash Data]	Crash data along/at project, including crash density, crash severity, critical crash rate, crash frequency and/or severity index	Crashes	Traffic Safety Data
	[Benefit Safety]	Safety Benefits Over 10 Years	Dollars ($)	Traffic Safety Data

Highway Criteria - Economic Competitiveness

Purpose – Measure the economic benefits the transportation project is expected to provide in economic activity Gross Domestic Product (GDP) and jobs over 10 years

CALCULATIONS		Statewide Mobility	Regional Impact	Division Need
	Score Equation	$50\% * [\% \, County \, Econ] + 50\% * [\% \, Jobs]$		

MEASURES & DATA		Description	Units	Data Source
	[% County Econ]	% Change in county economy over 10 Years	-	TREDIS Economic Impact Model
	[% Jobs]	% Change in long term jobs	-	TREDIS Economic Impact Model

Highway Criteria - Accessibility / Connectivity

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

CALCULATIONS		Statewide Mobility	Regional Impact	Division Need
	Score Equation	$50\% * [County\ Economic\ Indicator] + 50\% * \dfrac{[Benefit\ TTS] * [Improve\ Mobility]}{[V]}$		

MEASURES & DATA		Description	Units	Data Source
	[County Economic Indicator]	Points based on economic distress indicators of property tax per capita, population growth, median income, and unemployment rate	-	Department of Commerce
	[Improve Mobility Factor]	Value is 1 if project upgrades facility type to higher mobility. Value is 0 if project does not upgrade facility type to higher mobility	-	Look up table
	[Benefit TTS]	Travel Time Savings Over 10 Years	Dollars ($)	Calculation varies based on project type
	[V]	Existing Volume	Vehicles	Traffic Counts

Highway Criteria - Lane Width

Purpose – Measure the existing lane width vs. DOT design standard

CALCULATIONS		Statewide Mobility	Regional Impact	Division Need
	Score Equation	$[Lane\ Width] - [DOT\ Design\ Standard\ Lane\ Width]$		

MEASURES & DATA		Description	Units	Data Source
	[Lane Width]	Existing Lane Width	Feet	Pavement Condition Survey
	[Design Standard Lane Width]	NCDOT design standard lane width for facility	Feet	NCDOT Roadway Design Standards

Highway Criteria - Shoulder Width [Paved]

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

CALCULATIONS		Statewide Mobility	Regional Impact	Division Need
	Score Equation	$[Paved\ Shoulder\ Width] - [DOT\ Design\ Standard\ Paved\ Shoulder\ Width]$		

MEASURES & DATA		Description	Units	Data Source
	[Paved Shoulder Width]	Existing Paved Shoulder Width	Feet	Pavement Condition Survey
	[Design Standard Paved Shoulder Width]	NCDOT design standard paved shoulder width for facility	Feet	NCDOT Roadway Design Standards

Highway Criteria - Pavement Condition

Purpose – Measure the existing pavement condition along the project

CALCULATIONS		Statewide Mobility	Regional Impact	Division Need
	Score Equation	$100 - [Pavement\ Condition\ Rating]$		

MEASURES & DATA		Description	Units	Data Source
	[Pavement Condition Rating]	Pavement Condition Rating; Higher scores indicate poorer pavement condition	-	Pavement Condition Survey

Highway Criteria - Multimodal

Purpose – Measure degree the highway project benefits other modes

CALCULATIONS	Statewide Mobility	Regional Impact	Division Need
Score Equation	$[Proximity\ Points] + [Other\ Benefit\ Points]$		

MEASURES & DATA		Description and Data	Data Source
	[Proximity Points]	Points based on proximity to airports, ferry terminals, ports, intermodal terminals, passenger bus or rail stations, park & ride lots, military bases	GIS proximity layer
	[Other Benefit Points]	Points if project includes bicycle and/or pedestrian accommodations, transit roadway components, managed lanes	From project submittal

Questions & Open Discussion

Strategic Prioritization Office of Transportation (SPOT)

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