



**NORTH CAROLINA**  
Department of Transportation

# Prioritization 7.0

Strategic Prioritization Office of Transportation (SPOT)

September 7, 2022

# Today's Topics

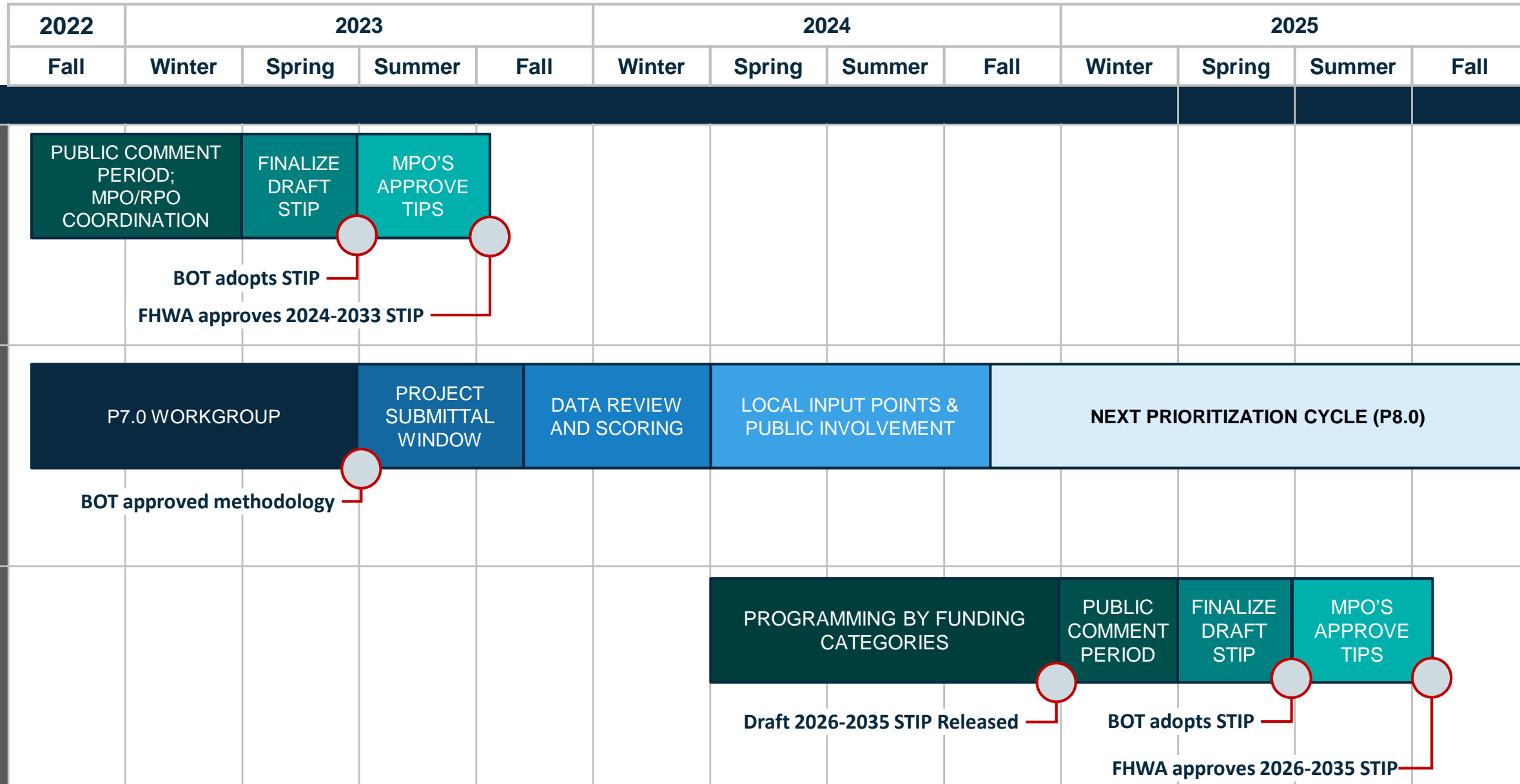
- Prioritization and STIP Timelines
- Prioritization Overview
- Workgroup Process and Structure
- Scoring Overview
- Cost Impacts in Scoring
- Handouts and Discussion



# Prioritization and STIP Timelines

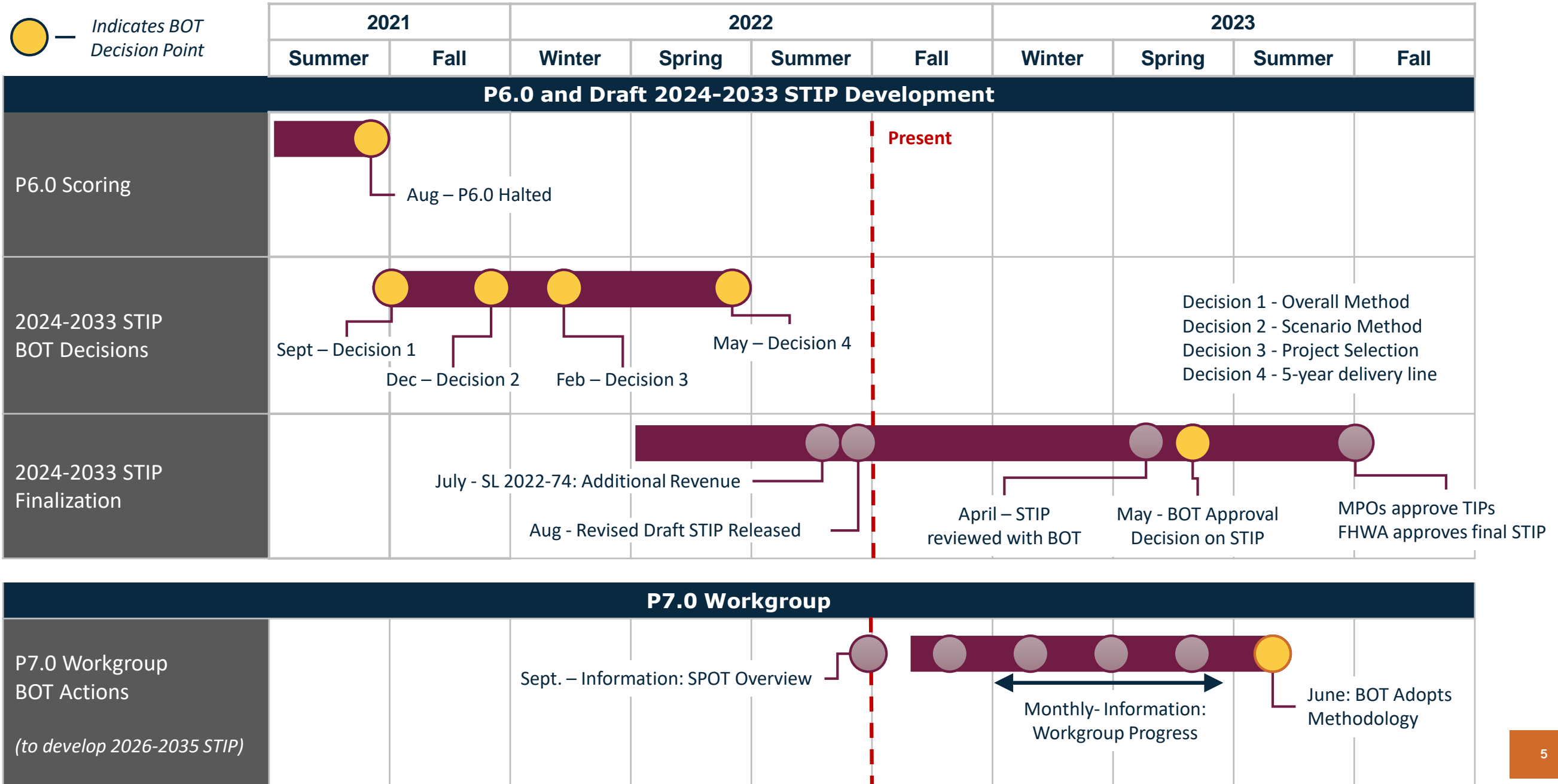
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# Prioritization and STIP Schedule Overlaps (anticipated)



# Prioritization and STIP Development Timeline – BOT Involvement

 Indicates BOT Decision Point



# Prioritization Overview

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Bicycle &  
Pedestrian



Rail



Public  
Transportation



Aviation

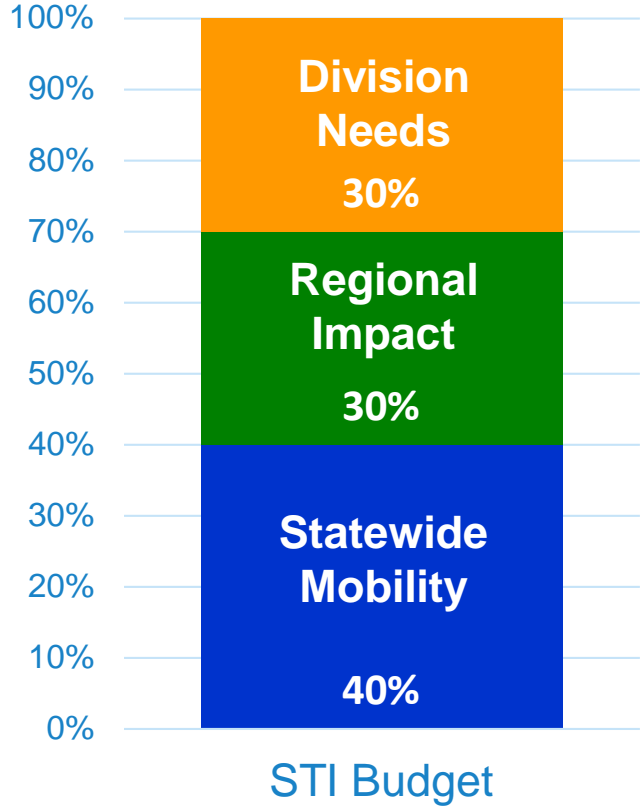


Ferry



Highway

# STI Categories



Mode	Statewide Mobility	Regional Impact	Division Needs
Highway	<ul style="list-style-type: none"> <li>Interstates (existing &amp; future)</li> <li>National Highway System routes (as of 2013)</li> <li>STRAHNET<sup>1</sup></li> <li>Designated Toll Facilities</li> </ul>	Other US and NC Routes	<ul style="list-style-type: none"> <li>All Secondary Roads (SR)</li> <li>Federal-Aid Eligible Local Roads</li> </ul>
Aviation	Large Commercial Service Airports <i>cap - \$500K / project / year</i>	Other Commercial Service Airports not in Statewide <i>cap - \$300K / project / year</i>	All Airports without Commercial Service (General Aviation) <i>cap - \$18.5M annual program</i>
Bicycle-Pedestrian	N/A	N/A	All projects (\$0 state highway trust funds)
Public Transportation	N/A	Service spanning two or more counties (10% cap)	All other service, including terminals and stations
Ferry	N/A	Vessel or infrastructure expansion	Replacement vessels
Rail	Freight Service on Class-I Railroad Corridors	Rail service spanning two or more counties not in Statewide	All other service, including terminals and stations (no short lines)

<sup>1</sup> STRAHNET – Strategic Highway Network, system of roads deemed necessary for emergency mobilization and peacetime movement of personnel and equipment to support U.S. military operations

# Scoring Process

**Projects Submitted** by MPOs, RPOs, & Divisions

**SPOT Review**

1. Reviewed for category eligibility
2. Data screened
3. Quantitative scores calculated

**Statewide Mobility**  
40% of Funds

1. Total scores calculated
2. Projects programmed
3. Projects not programmed cascaded to next category

**Regional Impact**  
30% of Funds

1. Local input points assigned
2. Total scores calculated
3. Projects programmed
4. Projects not programmed cascaded to next category

**Division Needs**  
30% of Funds

1. Local input points assigned
2. Total scores calculated
3. Projects programmed

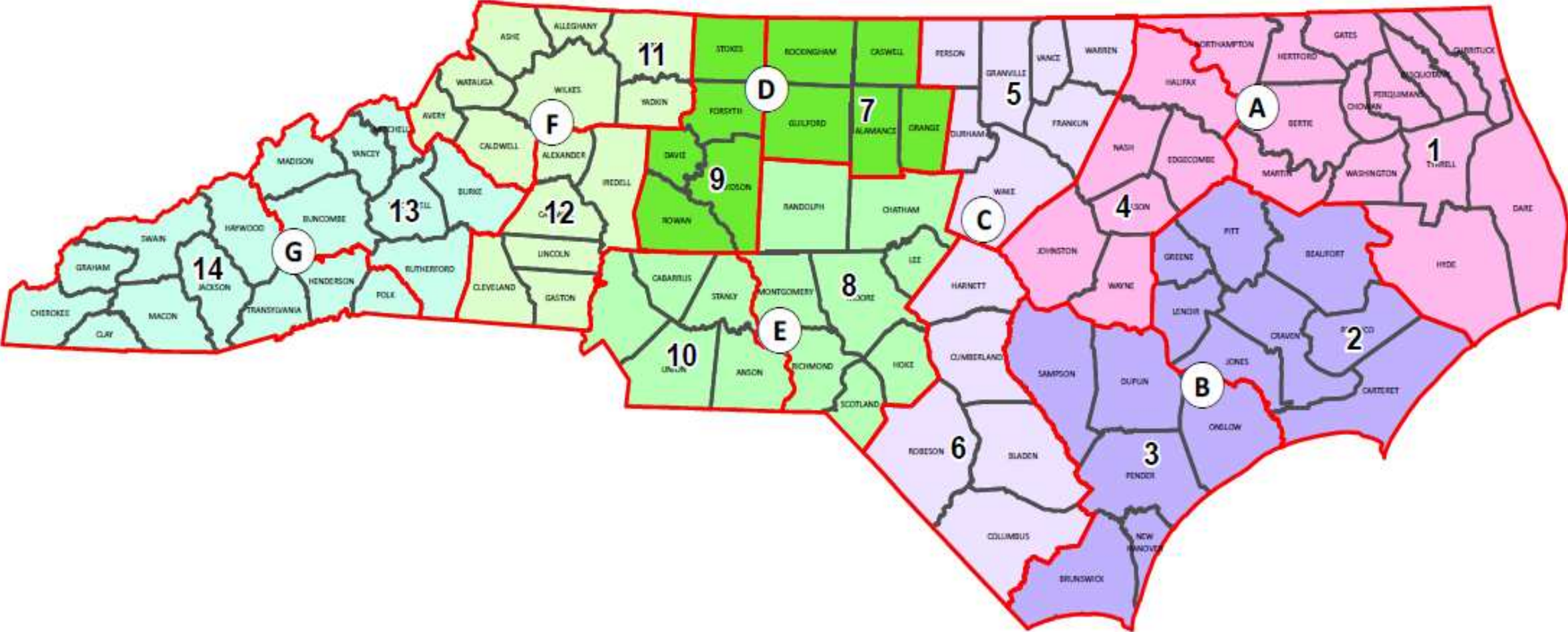
**Statewide Mobility Score =**  
100% Quantitative

**Regional Impact Score =**  
70% Quantitative +  
30% Local Input

**Division Needs Score =**  
50% Quantitative +  
50% Local Input



# Regions and Divisions



# STI Law Definitions

STI Law (§ 136-189.11) defines:

- Funding Categories and Percentages
- Project Eligibility
- Highway Scoring Criteria Names
- Funding Constraints

Recommendations developed by Workgroup and NCDOT BOT adopts:

- Scoring Process (timeframe, submittals, carryovers, etc.)
- Highway Measures and Weights
- Non-Highway Criteria, Measures, and Weights
- Normalization (funding allocation between modes)
- Local Input Points

# STI Legislation Funding Caps and Restrictions Impacting Programming



Statewide Mobility  
Corridor Cap



Funding limits:  
Light rail and commuter  
rail projects



Funding limits:  
Regional Impact  
transit projects



Funding limits:  
Airport projects in all  
categories



Prohibition:  
using state funds to match federal-aid for  
independent bicycle and pedestrian projects

# Workgroup Process and Structure

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## Legislation - Workgroup

§ 136-189.11. Transportation Investment Strategy Formula.

(h) Improvement of Prioritization Process. –

The Department shall endeavor **to continually improve the methodology and criteria** used to score highway and non-highway projects pursuant to this Article, including the use of normalization techniques, and methods to strengthen the data collection process.

The Department is directed to continue the **use of a workgroup process** to develop improvements to the prioritization process.

# Workgroup Structure

Members (26*)			
MPO Representatives	x4	RPO Representatives	x4
Metro Mayors Coalition	x1	League of Municipalities	x1
Regional Council of Governments	x1	Association of County Commissioners	x1
NC Rural Center	x1	NCDOT Division Engineers	x4
NCDOT Multi-Modal	x1	NCDOT Subject Matter Experts	x8

Advisory / SME
Modal Directors
Legislative Staff
FHWA
Technical Experts
Support Staff

\* Department participants in the workgroup shall not exceed half of the total group

## P7.0 Workgroup Meeting Frequency

- **In-person:** monthly, anticipated through May 2023 – for purpose of discussion and consensus
- **Virtual:** in between in-person meetings – for purpose of information and technical breakouts

# Workgroup Process

## Proposed Approach

- Update scoring methodology in areas identified by the Board of Transportation and Workgroup survey feedback. Maintain remaining portions of the methodology unless there is Workgroup consensus to refine.

## First Workgroup Meeting Topics

*Orientation for new members to be held in advance*

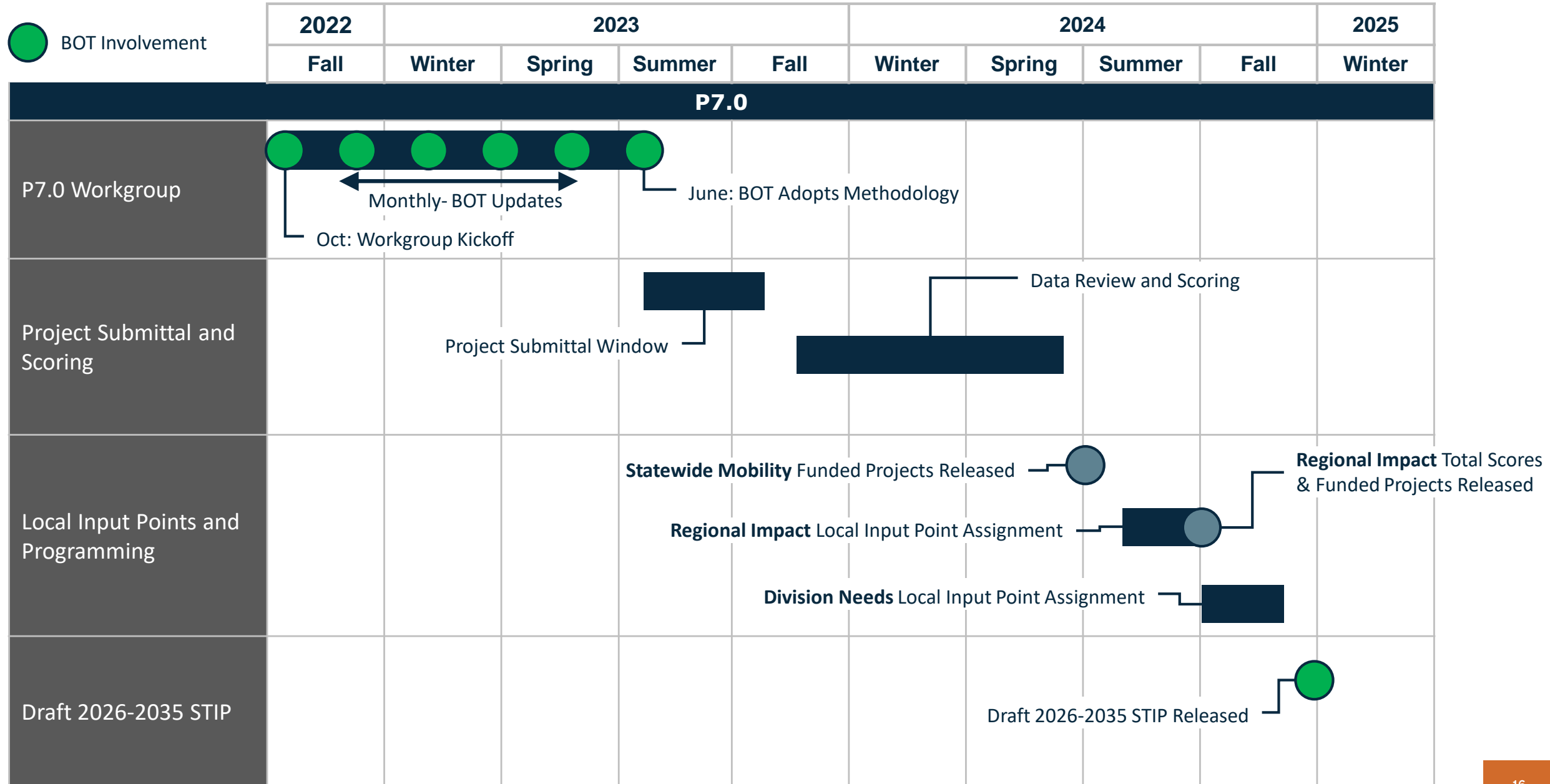
- Proposed Approach
- COVID impacts to Data
- Number of Submittals

## BOT Input

- Solicitation of Topics and Scoring Methodology Feedback – now through November 2022
- Adoption of P7.0 Methodology – anticipated June 2023

*BOT will receive monthly updates on workgroup progress*

# P7.0 Timeline (anticipated)





# Scoring Overview

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# Legislation - Scoring

§ 136-189.11. Transportation Investment Strategy Formula.

*“A combination of transportation-related [. . .] criteria, and local input shall be used to rank [. . .] Projects involving highways that address [. . .] needs [. . .]. Local input is defined as the rankings identified by the Department's Transportation Division Engineers, Metropolitan Planning Organizations, and Rural Transportation Planning Organizations.”*

Legislation prescribes the highway criteria as:

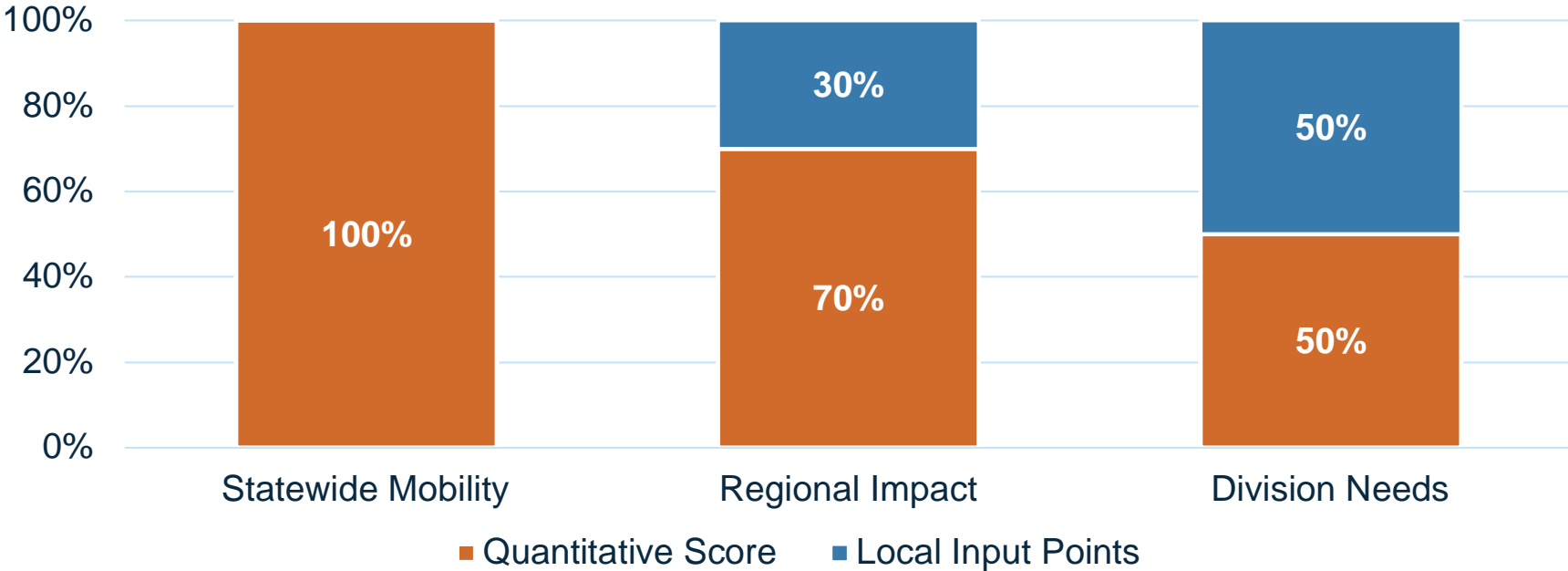
Congestion	Benefit/Cost	Safety	Freight	Economic Competitiveness
Accessibility/ Connectivity	Multimodal	Lane Width	Shoulder Width	Pavement Score



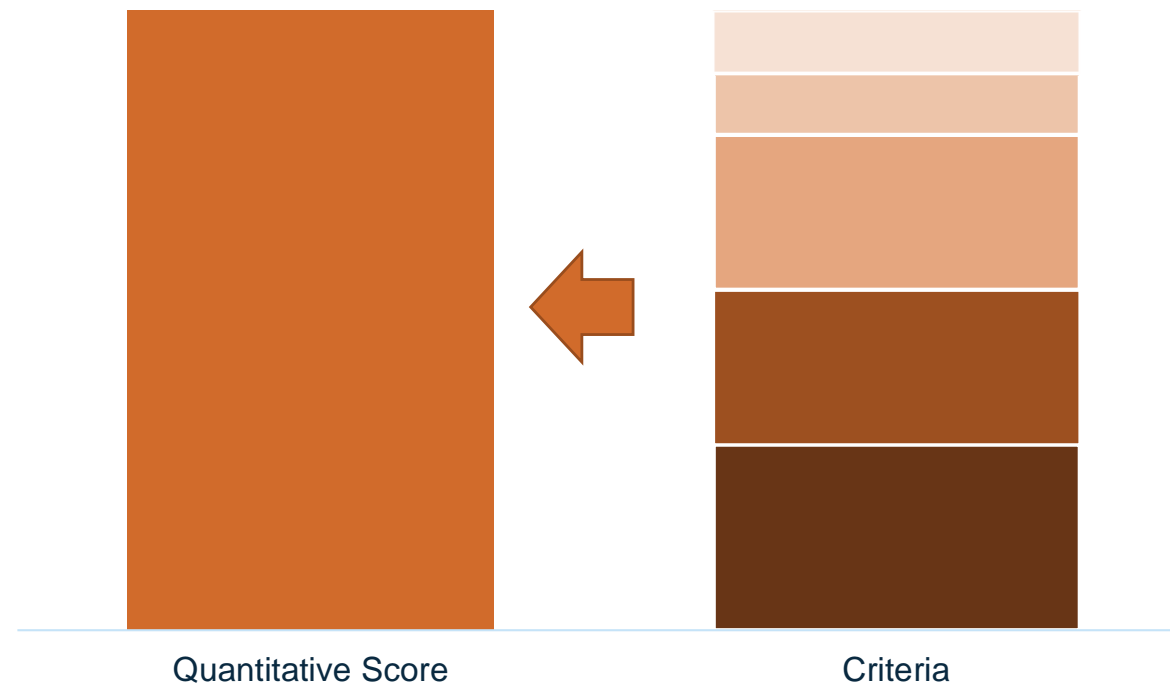
## P6.0 Highway Specific Improvement Types (SIT)

1 - Widen Existing Roadway	14 - Closed Loop Signal System
2 - Upgrade Arterial to Freeway/Expressway	15 - Install Cameras and DMS
3 - Upgrade Expressway to Freeway	16 - Modernize Roadway
4 - Upgrade Arterial to Reduced Conflict Intersection	17 - Upgrade Freeway to Interstate Standards
5 - Construct Roadway on New Location	18 – Widen Existing or Construct New Local (Non-State) Roadway
6 - Widen Existing Roadway and Construct Part on New Location	19 – Improve Intersection on Local (Non-State) Roadway-
7 - Upgrade At-grade Intersection to Interchange or Grade Separation	20 – Convert Grade Separation to Interchange to Relieve Existing Congested Interchange
8 - Improve Interchange	21 – Realign Multiple Intersections
9 - Convert Grade Separation to Interchange	22 – Construct Auxiliary Lanes or Other Operational Improvements
10 - Improve Intersection	23 - Construct Grade Separation at Highway / Railroad Crossing
11 - Access Management	24 – Implement Road Diet to Improve Safety
12 - Ramp Metering	25 – Upgrade Multiple Intersections
13 - Citywide Signal System	26 – Upgrade Roadway

# Components of a Score: Total Score



# Components of a Score: Quantitative Score





# Highway Mobility Scoring (P6.0)

Criteria	Measure	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
Congestion	Existing level of mobility along roadways by indicating congested locations and bottlenecks	30%	20%	15%
Benefit/Cost	Expected benefits of the project over a 10-year period against the estimated project cost to NCDOT	25%	20%	15%
Safety	Existing crashes along/at the project and calculate future safety benefits	10%	10%	10%
Freight	Account for key indicators of freight movement	25%	10%	5%
Economic Competitiveness	Economic benefits the transportation project is expected to provide in economic activity (GDP) and jobs over 10 yrs	10%	N/A	N/A
Accessibility / Connectivity	Improve access to opportunity in rural and less-affluent areas and improve interconnectivity of the transportation network.	N/A	10%	5%

Mobility projects include Highway SITs 1-15 & 18-26; for example:  
 Roadway Widening, Intersection/Interchange Improvements, Access Management



## Bike and Pedestrian Scoring (P6.0)

Criteria	Measure	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
Safety	(Number of crashes x 40%) + (Posted speed limit x 20%) + (Crash severity x 20%) + (Project safety benefit x 20%)	N/A	N/A	15%
Access	(Destination Type x 50%) + (Distance to Prime Destination x 50%)	N/A	N/A	10%
Demand/Density	# of households and employees per square mile near facility	N/A	N/A	10%
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	N/A	N/A	10%
Cost Effectiveness	(Safety + Access + Demand + Connectivity) / Cost to NCDOT	N/A	N/A	5%

# Highway Criteria - Benefit-Cost

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

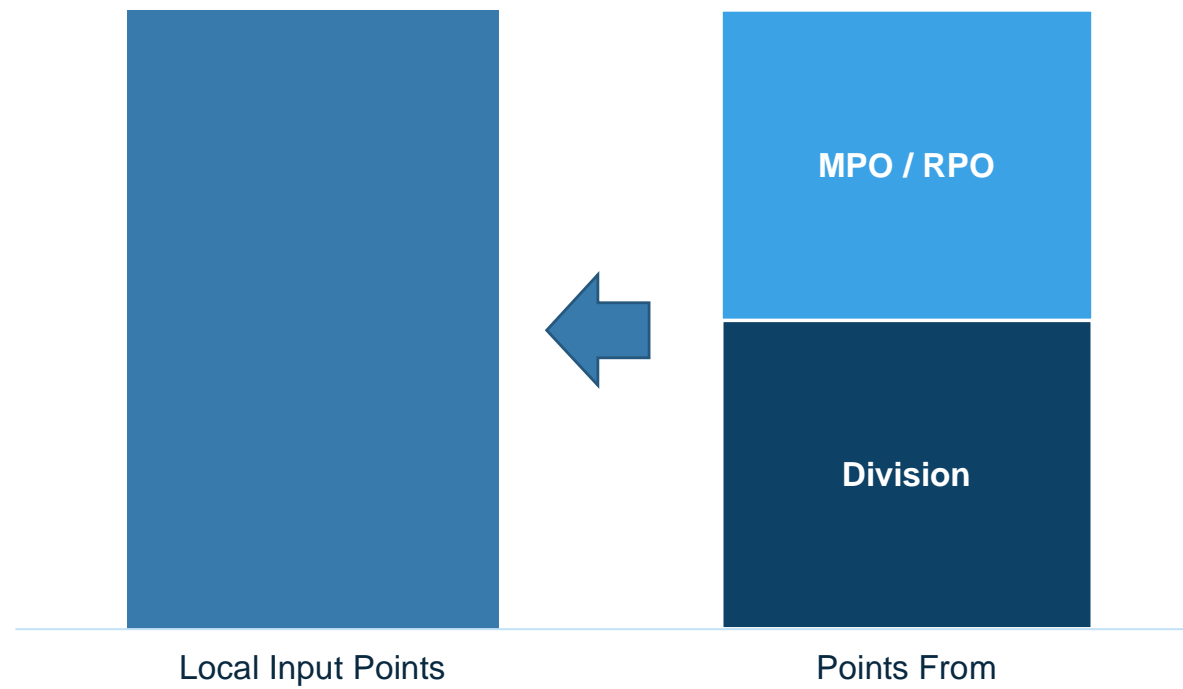
CRITERIA	Highway Improvement Type	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
	Benefit/Cost	Mobility	25%	20%
	Modernization	-	-	-

MEASURES & DATA	Description	Data Source
	[Benefit TTS]	Travel Time Savings Over 10 Years
[Benefit Safety]	Safety Benefits Over 10 Years	Traffic Safety data
[Project Cost]	Estimated Project Cost (UTIL, ROW, CON) at time of submittal	Best available cost: Cost Estimation Tool, Express Designs, Verified Estimate
[Other Funds]	Other funds (non-federal or non-state funds) that are committed to project	Submitting organization

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



# Components of a Score: Local Input Points





## Local Input Points (LIPs) - All Projects & Modes

Criteria	Measure	Statewide Mobility (0%)	Regional Impact (30%)	Division Needs (50%)
Division	Approved local input point methodology	N/A	15%	25%
RPO/MPO	Approved local input point methodology	N/A	15%	25%

Each Division and RPO/MPO receives a pool of LIPs to assign to projects.

Up to 100 LIPs per project at the REG and DIV categories.

$$\text{Regional Impact LIP Score} = [\text{Division LIP}] * 15\% + [\text{RPO/MPO LIP}] * 15\%$$

$$\text{Division Needs LIP Score} = [\text{Division LIP}] * 25\% + [\text{RPO/MPO LIP}] * 25\%$$

# Example Highway Mobility Project Scoring- Project Overview

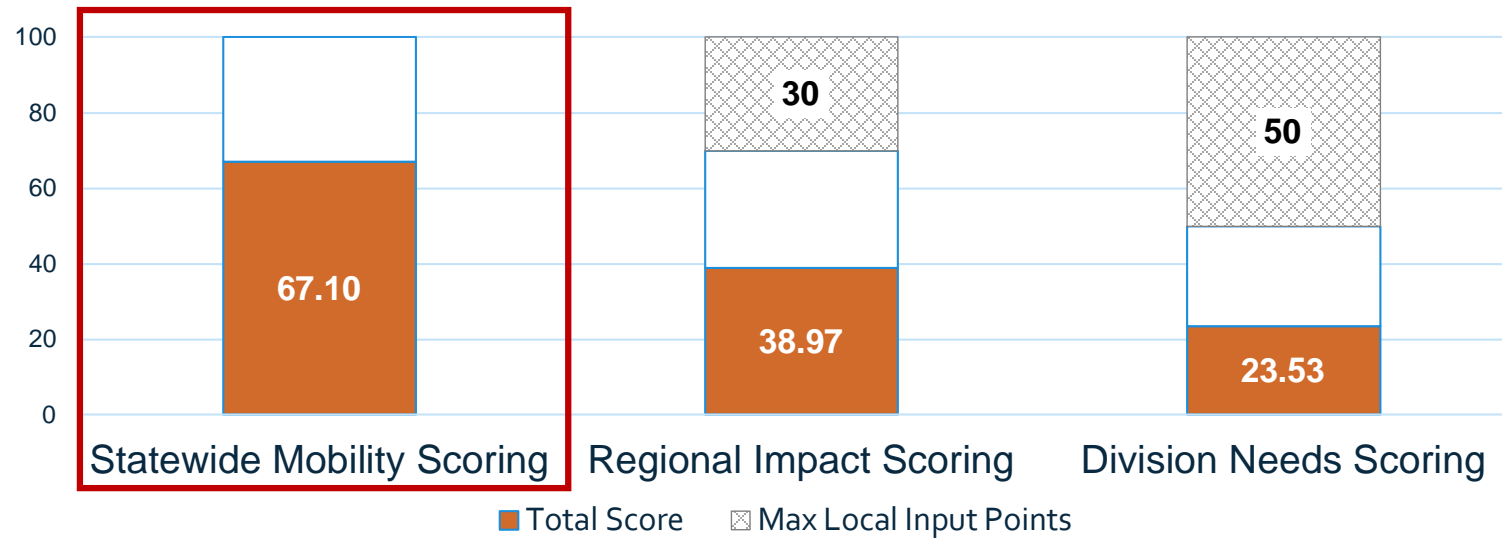
## Project A : Widen Existing Interstate

<b>SIT</b>	1 – Widen Existing Roadway
<b>Eligible Category:</b>	Statewide Mobility
<b>Project Cost:</b>	\$400 M

### Quantitative Score

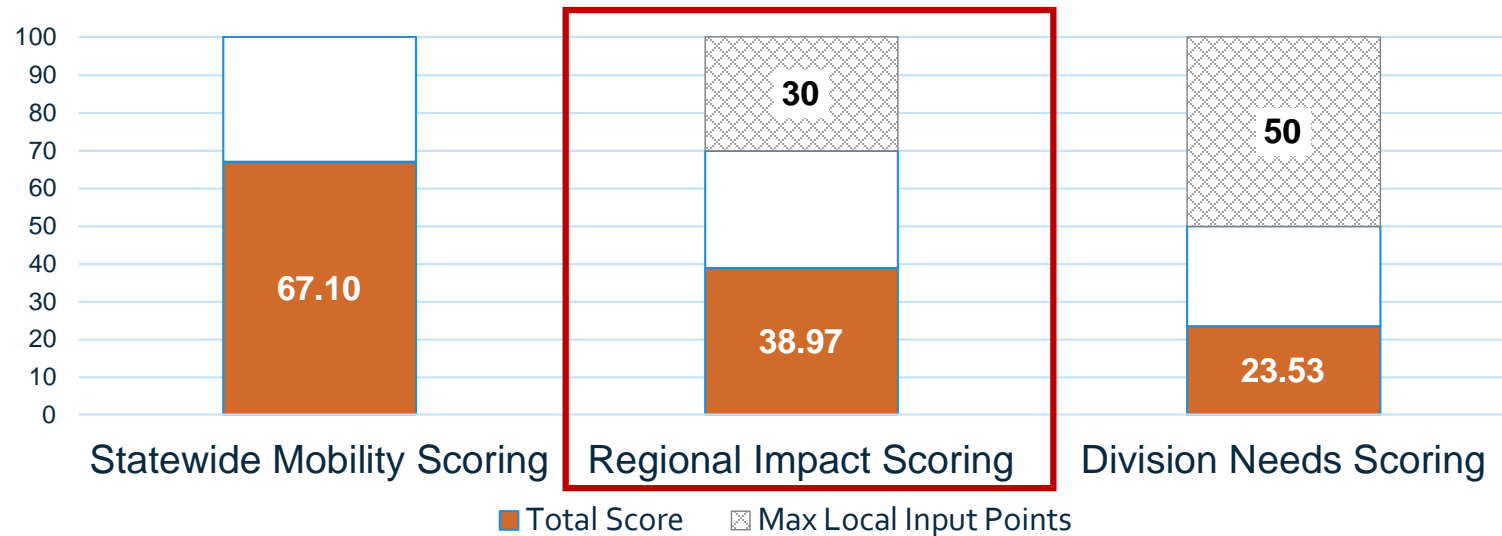
<b>SW</b>	<b>REG</b>	<b>DIV</b>
67.10	38.97	23.53

# Example Highway Mobility Project Scoring – Statewide Mobility



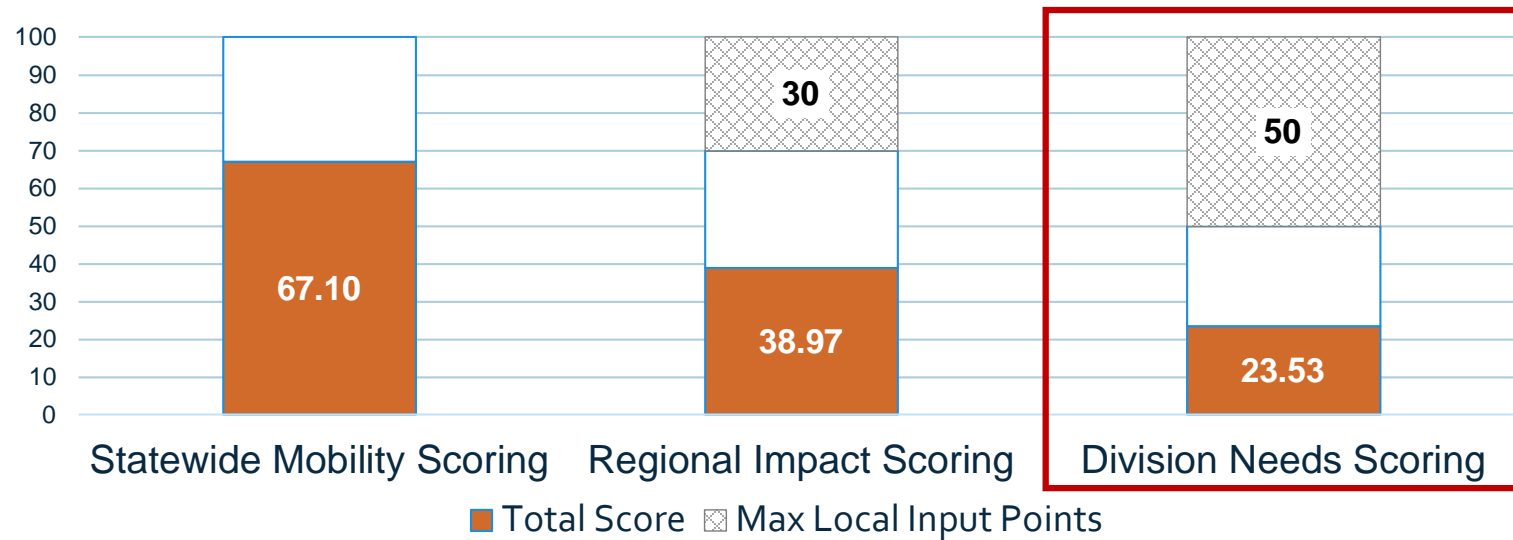
Criteria	Percentage	Scaled Value	Score
Congestion	30%	67.76	20.33
Benefit-Cost	25%	29.85	7.46
Safety	10%	60.84	6.08
Economic Competiveness	10%	85.50	8.55
Freight	25%	98.70	24.68
<b>Statewide Mobility Score TOTAL</b>			<b>67.10</b>

# Example Highway Mobility Project Scoring – Regional Impact



Criteria	Percentage	Scaled Value	Score
Congestion	20%	60.41	12.08
Benefit/Cost	20%	29.85	5.97
Safety	10%	60.84	6.08
Accessibility / Connectivity	10%	49.59	4.96
Freight	10%	98.70	9.87
Local Input Points - Division	15%	Max 100	Max 15
Local Input Points- MPO/RPO	15%	Max 100	Max 15
<b>Regional Impact Score TOTAL</b>			<b>38.97</b>

# Example Highway Mobility Project Scoring – Division Needs



Criteria	Percentage	Scaled Value	Score
Congestion	15%	53.06	7.96
Benefit/Cost	15%	26.45	3.97
Safety	10%	60.84	9.13
Accessibility / Connectivity	15% <sup>1</sup>	49.59	2.48
Freight	0% <sup>1</sup>	98.70	0.00
Local Input Points - Division	25%	Max 100	Max 25
Local Input Points- MPO/RPO	25%	Max 100	Max 25
<b>Division Needs Score TOTAL</b>			<b>23.53</b>

<sup>1</sup> Area Specific Weights

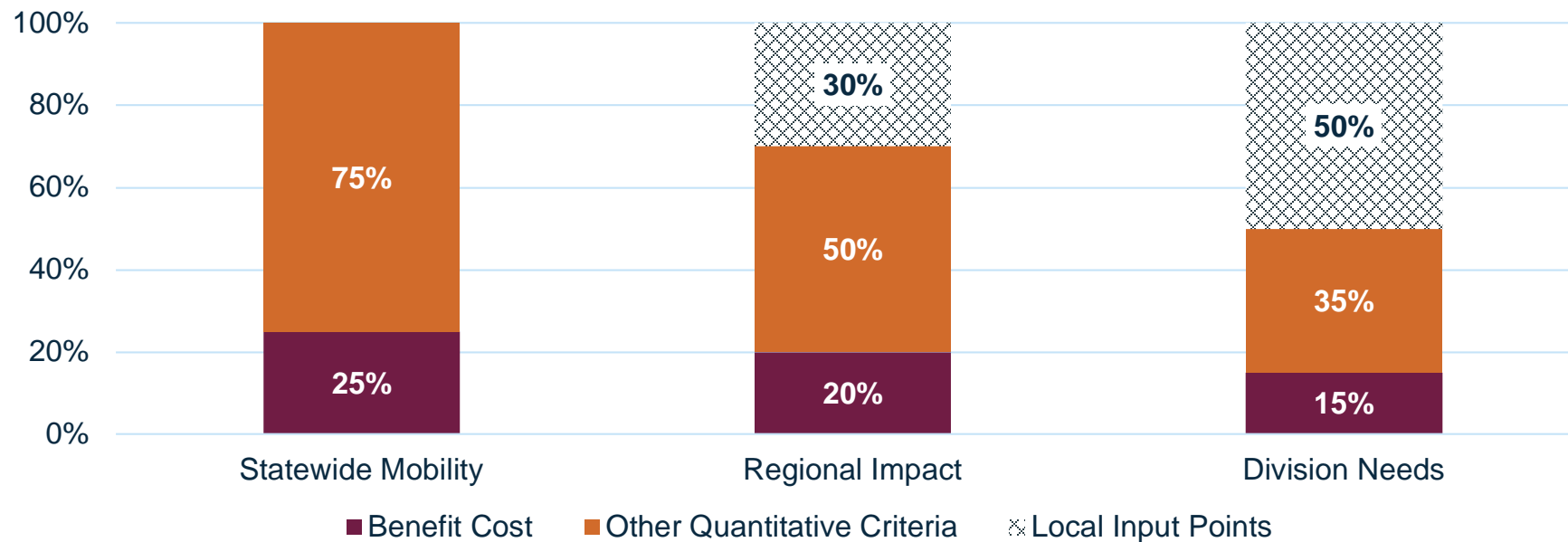
# Cost Impacts in Scoring

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# Estimated Project Cost: Impacts on Scoring

## Highways Mobility Projects: Benefit/Cost Criteria

$$\frac{[Benefit\ TTS] + [Benefit\ Safety]}{[Project\ Cost]} + \frac{[Other\ Funds]}{[Project\ Cost]}$$





# Cost Impact: Project Level Analysis

## Project A : Widen Existing Interstate

SIT : 1 – Widen Existing Roadway

Eligible Category : Statewide Mobility

### Initial Project

<b>Initial Project Cost:</b>	<b>\$400 M</b>
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### Quantitative Score

SW	REG	DIV
67.10	38.97	23.53

### Statewide Mobility

Cong	B/C	Safety	Freight	Econ
67.76	<b>29.85</b>	60.84	98.70	85.50

### Scenario: Project Cost x 2

<b>Scenario Project Cost:</b>	<b>\$800 M</b>
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### Quantitative Score

SW	REG	DIV
63.67	36.22	22.34

### Statewide Mobility

Cong	B/C	Safety	Freight	Econ
67.76	<b>16.14</b>	60.84	98.70	85.50

# Cost Impact: Project Level Analysis

## Project B : Upgrade Corridor

SIT : 2 - Upgrade Arterial to Freeway

Eligible Category : Statewide Mobility

### Initial Project

<b>Initial Project Cost:</b>	<b>\$550 M</b>
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### Quantitative Score

SW	REG	DIV
66.92	45.52	38.20

Statewide Mobility				
Cong	B/C	Safety	Freight	Econ
84.88	<b>60.39</b>	84.11	44.98	67.07

### Scenario: Project Cost x 2

<b>Scenario Project Cost:</b>	<b>\$1.1 B</b>
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### Quantitative Score

SW	REG	DIV
60.86	40.66	35.03

Statewide Mobility				
Cong	B/C	Safety	Freight	Econ
84.88	<b>36.12</b>	84.11	44.98	67.07

# Cost Impact: Project Level Analysis

## Project A: Widen Existing Interstate

	SW	REG	DIV
Initial	67.10	38.97	23.53
Increased Cost Scenario	63.67	36.22	22.34
% Change	<b>(-5.11%)</b>	<b>(-7.05%)</b>	<b>(-5.04%)</b>

Statewide Mobility				
Cong	B/C	Safety	Freight	Econ
67.76	29.85	60.84	98.70	85.50
16.14				

↑ ↑  
Scores very well in Freight & Economic Competitiveness

## Project B : Upgrade Corridor

	SW	REG	DIV
Initial	66.92	45.52	38.20
Increased Cost Scenario	60.86	40.66	35.03
% Change	<b>(-9.1%)</b>	<b>(-10.7%)</b>	<b>(-8.3%)</b>

Statewide Mobility				
Cong	B/C	Safety	Freight	Econ
84.88	60.39	84.11	44.98	67.07
36.12				

# Handouts and Discussion

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# Informational Handouts

## BOT Members will receive:

- Example project scoring utilizing P6.0 methodology
- SPOT Process Overview materials
- P6.0 Scoring Criteria weights (all modes)

## Action Items:

- Solicitation of Topics and Methodology Feedback for Workgroup

# Open Discussion

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**STRATEGIC  
TRANSPORTATION  
INVESTMENTS**

*Smart decisions to keep North Carolina moving.*

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Strategic Prioritization Office of Transportation (SPOT)

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