



**NORTH CAROLINA**  
Department of Transportation

# Introduction

STI Training

NCDOT SPOT Office

May 31 – June 1, 2023

Connecting people, products and places safely and efficiently with customer focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina

## SPOT Office Staff

**Brian Wert, P.E.**  
SPOT Manager  
Prioritization Office (SPOT)  
(919) 707-4657  
[bmwert@ncdot.gov](mailto:bmwert@ncdot.gov)

**Sarah E. Lee**  
Non-Highway Modes  
Prioritization Office (SPOT)  
(919) 707-4742  
[selee@ncdot.gov](mailto:selee@ncdot.gov)

**Steven Bolyard, P.E.**  
Highway Mode  
Prioritization Office (SPOT)  
(919) 707-4640  
[sjbolyard@ncdot.gov](mailto:sjbolyard@ncdot.gov)

**Saman Jeffers, E.I.T.**  
Highway Mode  
Prioritization Office (SPOT)  
(919) 707-4613  
[stjeffers@ncdot.gov](mailto:stjeffers@ncdot.gov)

**Austin Chamberlain**  
GIS Support  
Prioritization Office (SPOT)  
(919) 707-4650  
[sachamberlain@ncdot.gov](mailto:sachamberlain@ncdot.gov)



SPOT@NCDOT.GOV

## Training Goals

1. Gain an understanding of the Prioritization, scoring, and programming process
2. Leave with a practicable and applicable understanding of how the process works and your role in the process
3. Understand what additional training and resources are ahead

➤ Note: these slides contain references to P5 and P6 where applicable as informational or reference material

# Agenda

Day 1	Day 2
<b>Begin 10:00am</b>	<b>Begin 8:30am</b>
Introduction	Day 1 Recap
Session 1 – STI Legislation	Session 6 – Scoring Process
<b>Lunch</b>	<b>Lunch</b>
Session 2 – Prioritization and Programming Basics	Session 7 – Scoring Tools and Resources
Session 3 – Prioritization and Programming Process	Session 8 – Submitting Good Candidate Highway Projects
Session 4 – Non-Highway Scoring Details	Session 9 – Select Advanced Scoring Details
Session 5 – Highway Scoring Details	Session 10 – Resources, Upcoming Items, and Takeaways
<b>End by 4:30pm</b>	<b>End by 3:30pm (or earlier)</b>



## Housekeeping

- Restrooms & exits
- Refreshments
- Lunches
- Parking Lot
- Wifi & laptops

## Introductions & Ice Breaker

- Pick 1 Starburst and tell the group:
  - Your name
  - Who you represent
- **Red** - If you could only eat one food for the rest of your life what would it be? What is your favorite food?
- **Orange** - what is your favorite place you've traveled to? if you could visit any place in the world, where would you choose and why?
- **Yellow** - What was your first job? What was your favorite job?
- **Pink** - if you didn't have to work for a living, what would you do? What is the best or worst career advice you've ever received?



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# Session 1: STI Legislation

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# Background



## Project Life Cycle



## Terminology

- Prioritization = assigning data and scores to projects
- STIP = State Transportation Improvement Program  
= 10-year document of project funding and schedules
- Programming = process of assigning funding and schedule to projects

# Prioritization and Programming

*Article 14B.  
Strategic Prioritization Funding  
Plan for Transportation  
Investments.*

**§ 136-189.10. Definitions.**  
*The following definitions apply  
in this Article...*



# Prioritization and Programming



STATE TRANSPORTATION  
IMPROVEMENT PROGRAM (STIP)



2020-2029

# 2019

June 2019



# Project Selection Reform

Previous perception:

I'll agree to your project if you agree to mine...



Public wanted politics removed from decision-making

NCDOT needed transparency in project selection

This led to Transportation Reform...



2011 - 2012

**Prioritization Process is now in Law**

*“The Department shall develop and utilize a **process for selection of transportation projects** that is based on professional standards in order to most efficiently use limited resources to benefit all citizens of the State.*

*The strategic prioritization process should be a **systematic, data-driven process** that includes a **combination of quantitative data, qualitative input, and multimodal characteristics, and should include local input.***

*The Department shall develop a process for standardizing or approving local methodology used in Metropolitan Planning Organization and Rural Transportation Planning Organization prioritization.” - S.L. 2012-84*



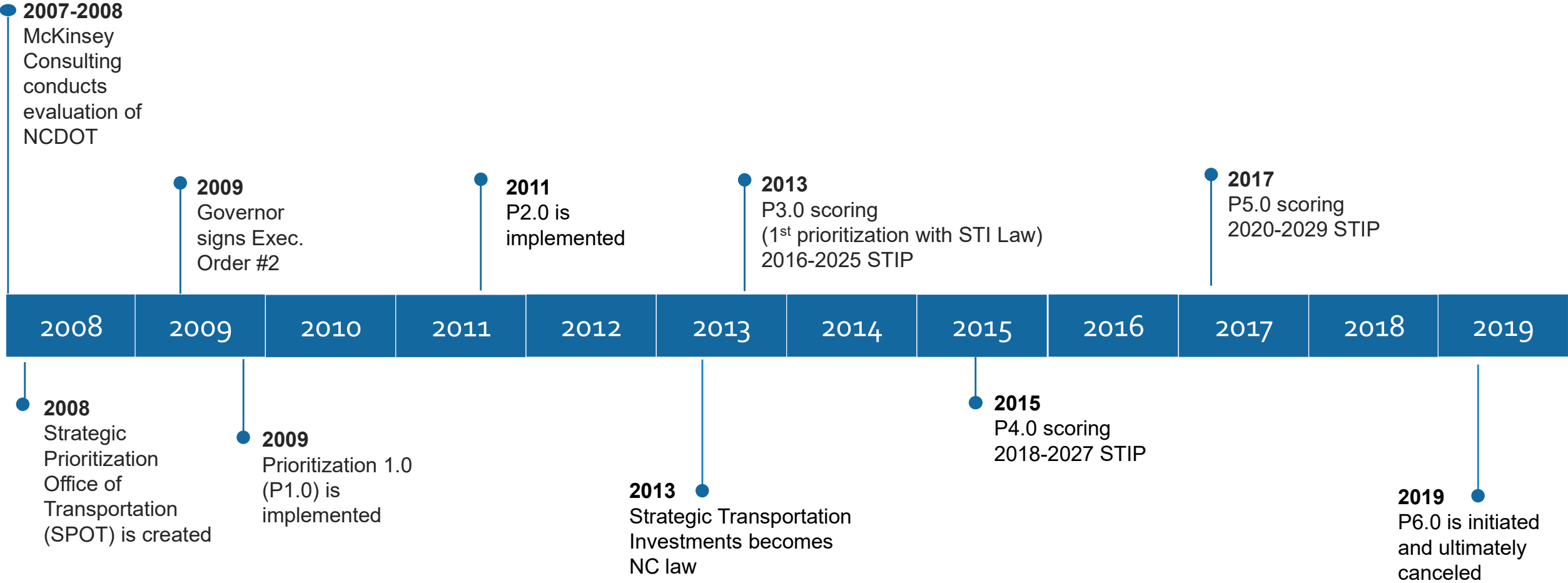
**STRATEGIC  
TRANSPORTATION  
INVESTMENTS**  
*Smart decisions to keep North Carolina moving.*

# STI Education

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# History of Prioritization

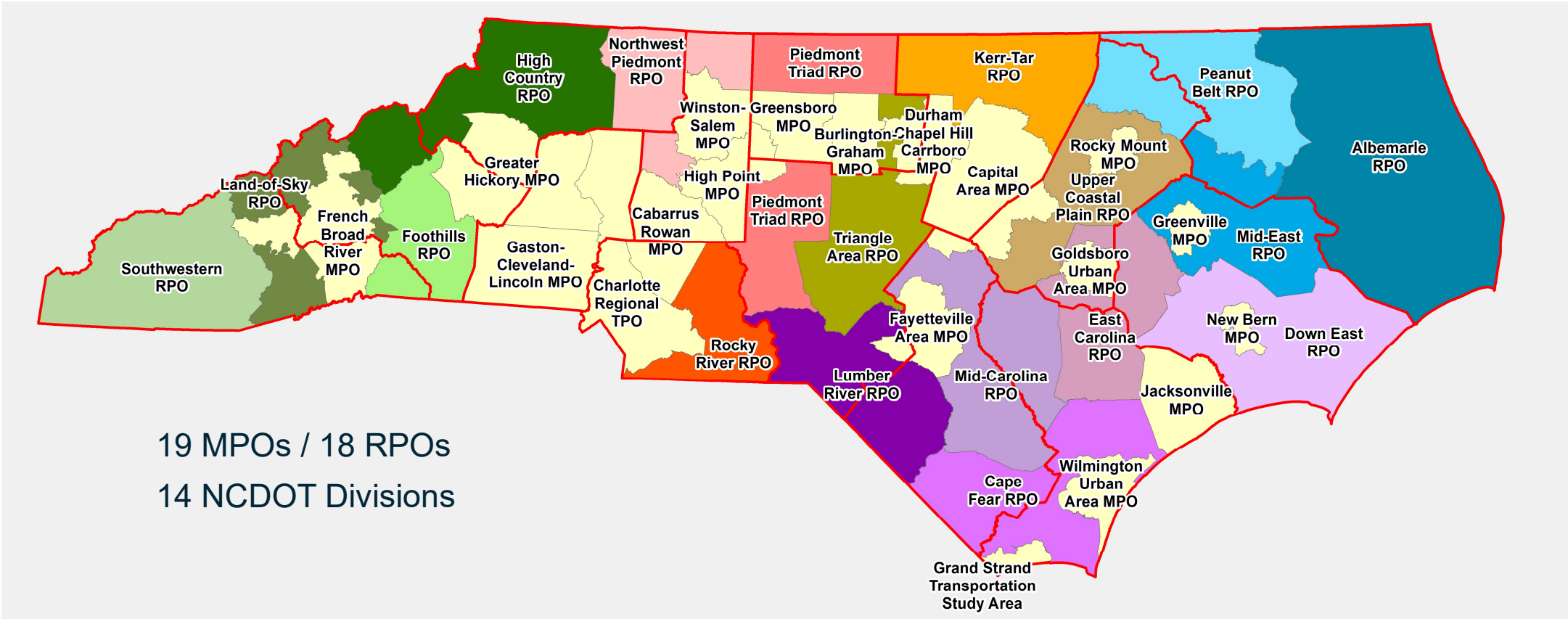


# STI Background

- NCDOT funds six modes of transportation
  - Highway, Aviation, Bicycle/Pedestrian, Ferry, Public Transportation, Rail

- Annual Budget of approx. \$4.8B (\$2.8B for STI)

- Key Partners:



## Strategic Transportation Investments (STI) Law

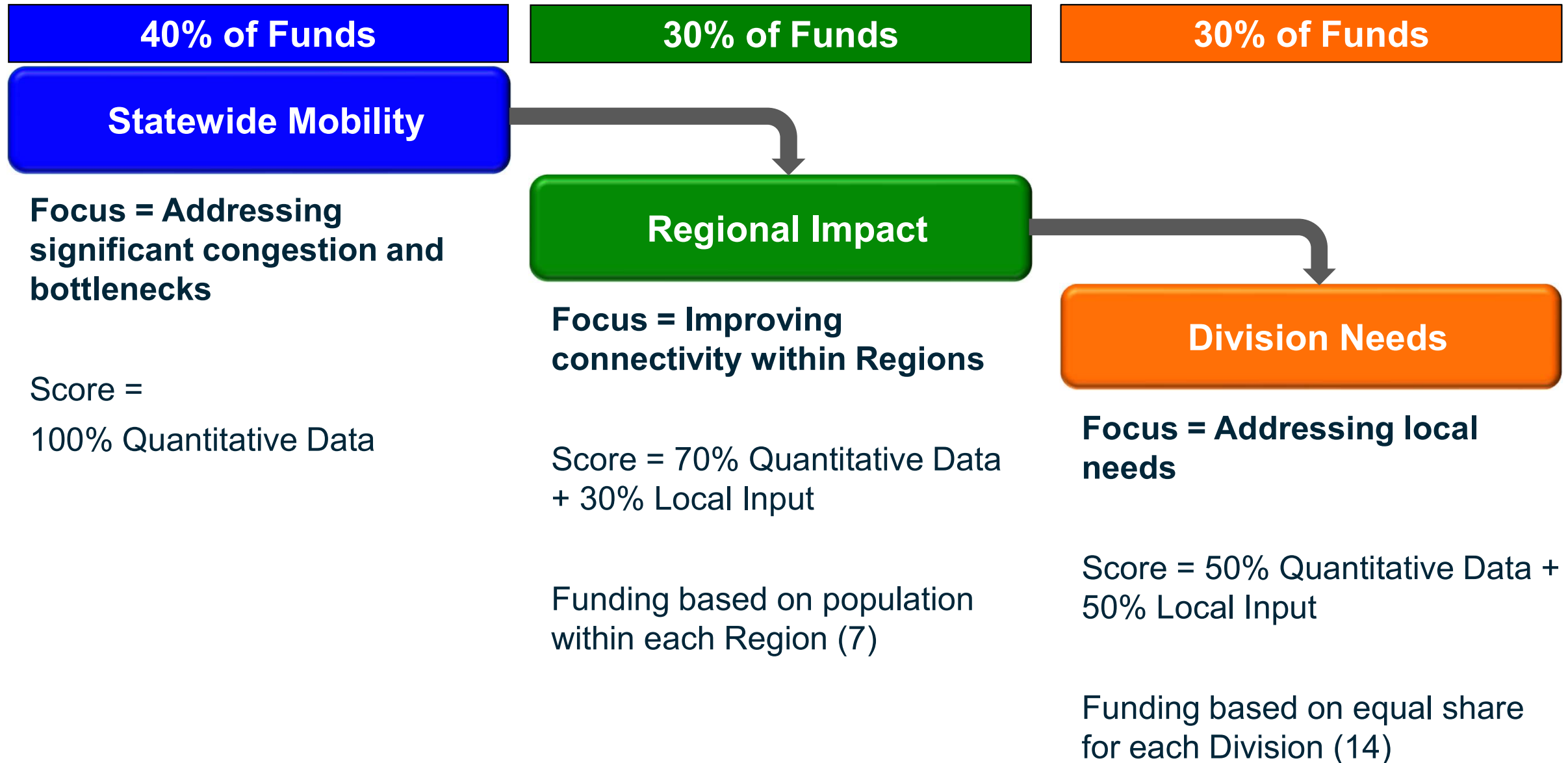
- Prioritizes capital expenditures across all modes (Mobility/Expansion + Modernization)
- Needs-based, data-driven
- Directly ties funding to Prioritization results
- Funding comes from Highway Trust Fund and Federal Aid Program
- Workgroup used every cycle for improvement

## STI Law Definitions

- STI Law defines:
  - Funding Categories and Percentages
  - Project Eligibility
  - Highway Scoring Criteria Names
  - Funding Constraints
- Workgroup recommends and BOT approves:
  - Scoring Process (timeframe, submittals, carryovers, etc.)
  - Highway Measures and Weights
  - Non-Highway Criteria, Measures, and Weights
  - Modal Allocation (funding allocation between modes)
  - Local Input Points

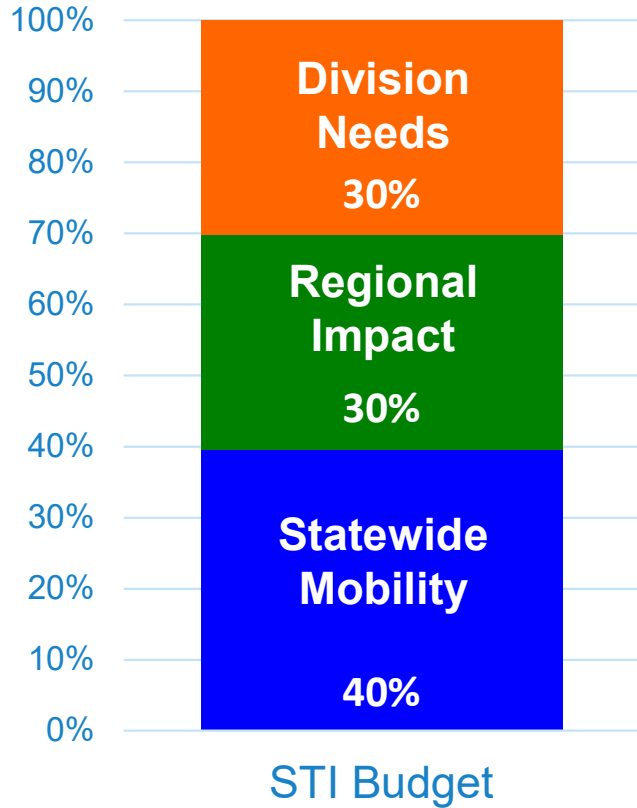


# How STI Works





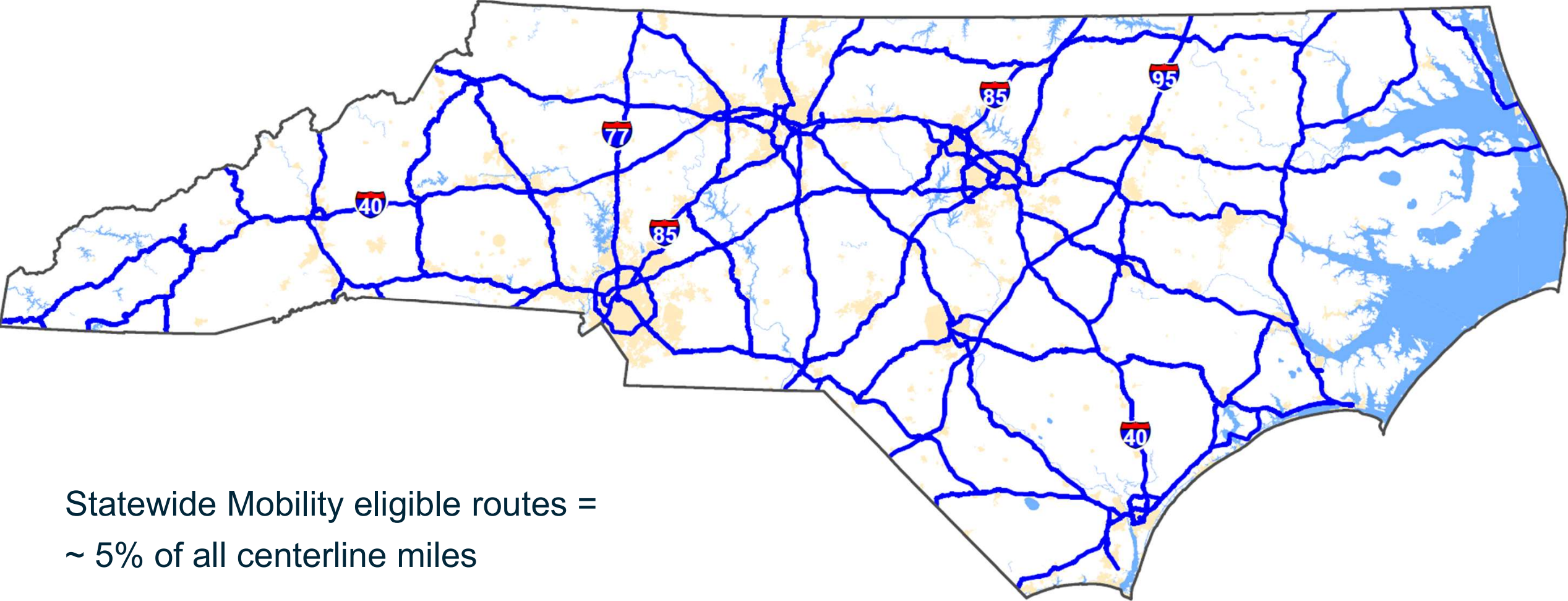
# STI Categories



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	Other Commercial Service Airports not in Statewide	All Airports without Commercial Service (General Aviation)
Bicycle-Pedestrian	N/A	N/A	All projects (\$0 state highway trust funds)
Public Transportation	N/A	Service spanning two or more counties	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)

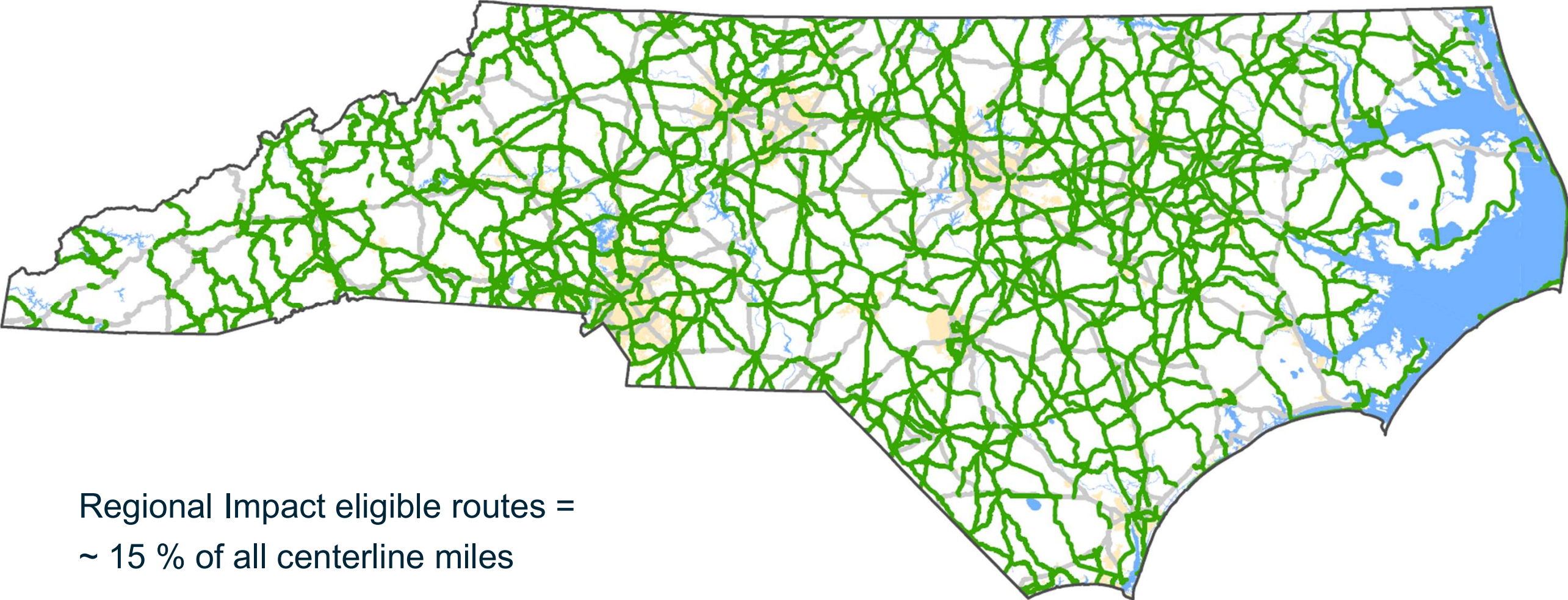
<sup>1</sup> STRAHNET – Strategic Highway Network, system of roads deemed necessary for emergency mobilization and peacetime movement of personnel and equipment to support U.S. military operations

# Project Eligibility: Highway – Statewide Mobility



Statewide Mobility eligible routes =  
~ 5% of all centerline miles

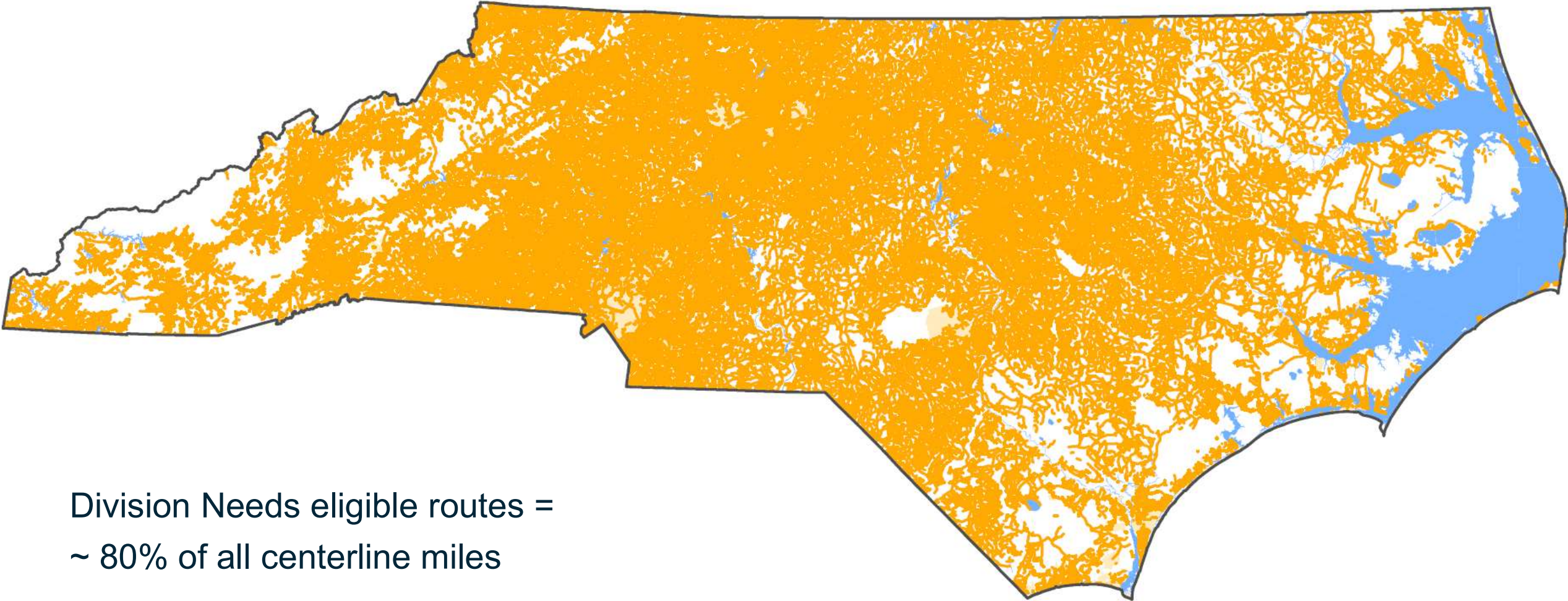
# Project Eligibility: Highway – Regional Impact



Regional Impact eligible routes =  
~ 15 % of all centerline miles

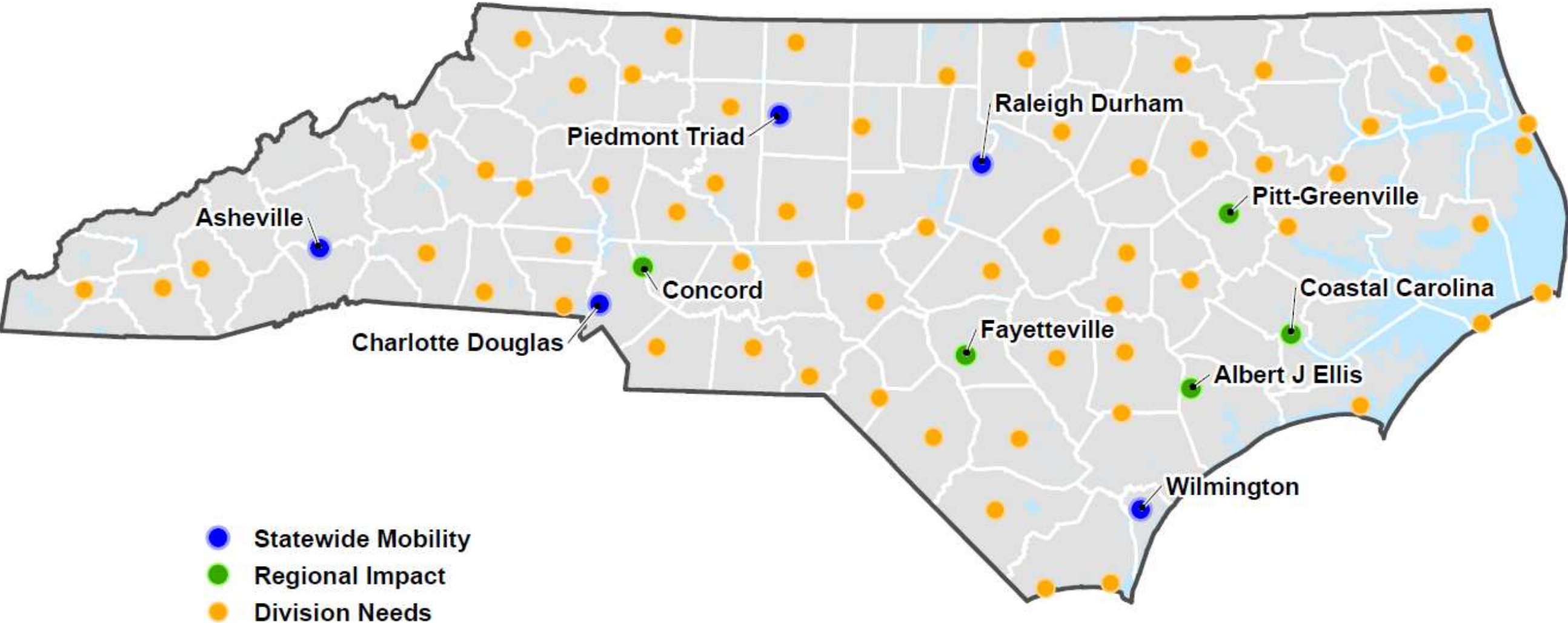


# Project Eligibility: Highway – Division Needs



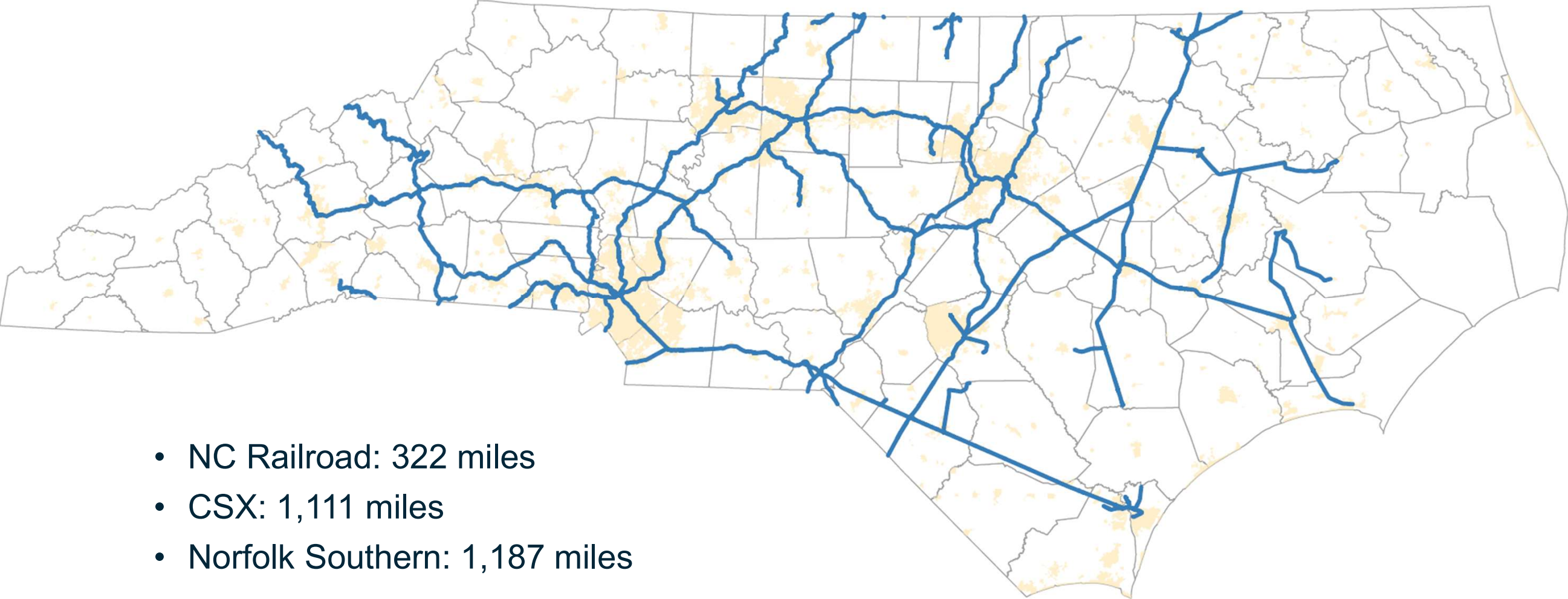
Division Needs eligible routes =  
~ 80% of all centerline miles

# Project Eligibility: Aviation – All Categories



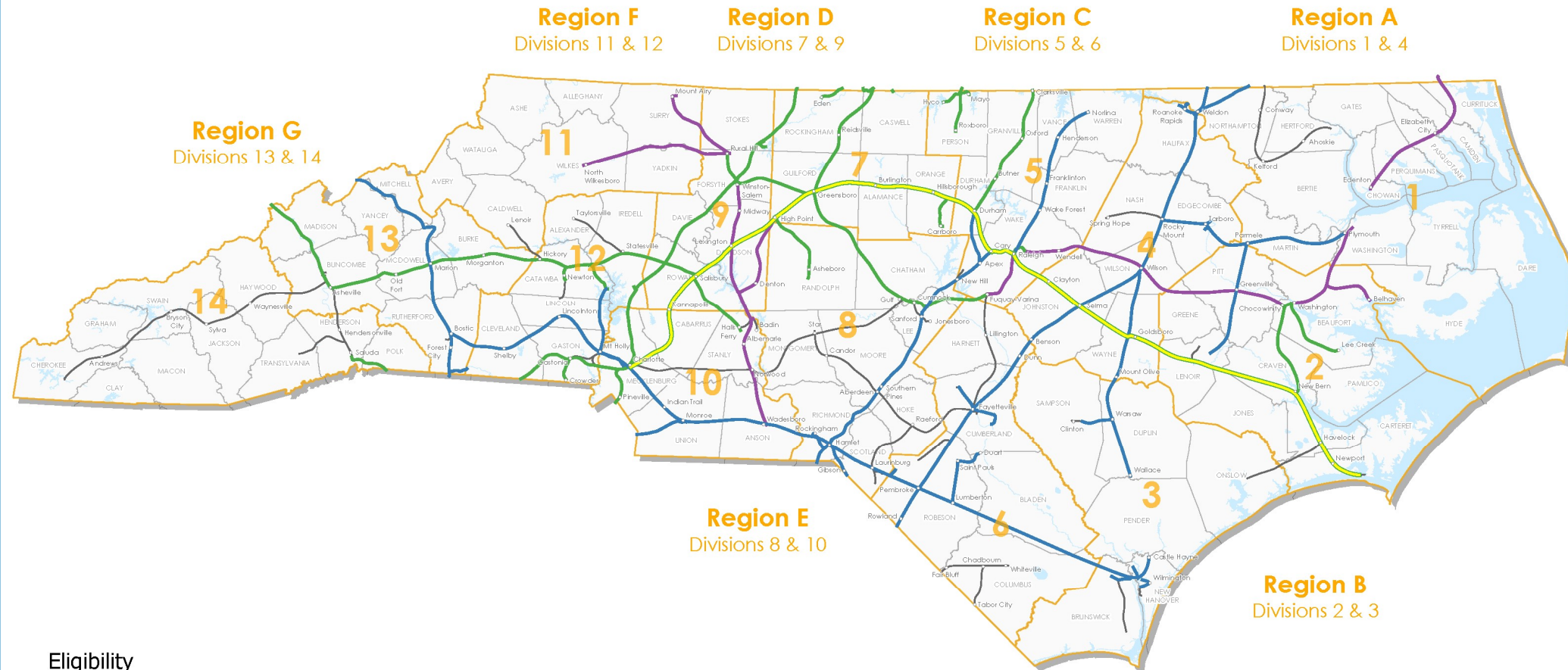


# Project Eligibility: Rail – Statewide Mobility



- NC Railroad: 322 miles
- CSX: 1,111 miles
- Norfolk Southern: 1,187 miles

### Rail Corridors Eligible for Funding Under the Strategic Transportation Investment Law in North Carolina



- Eligibility**
- CSX Owned and Operated - Eligible
  - NS Owned and Operated - Eligible
  - NCRRC Owned, Class I Operated - Eligible
  - Class I Owned, Short Line Operated - Eligible
  - State Owned, or Short Line Owned and Operated - Not Eligible



# STI Law Scoring

- Criteria:
  - Quantitative criteria (data-driven) – all categories
  - Qualitative criteria (Local Input Points) – Regional Impact and Division Needs categories
- 0 to 100 scale
- Selection of projects in ranked order
- Legislation provides the names of Highway quantitative criteria:

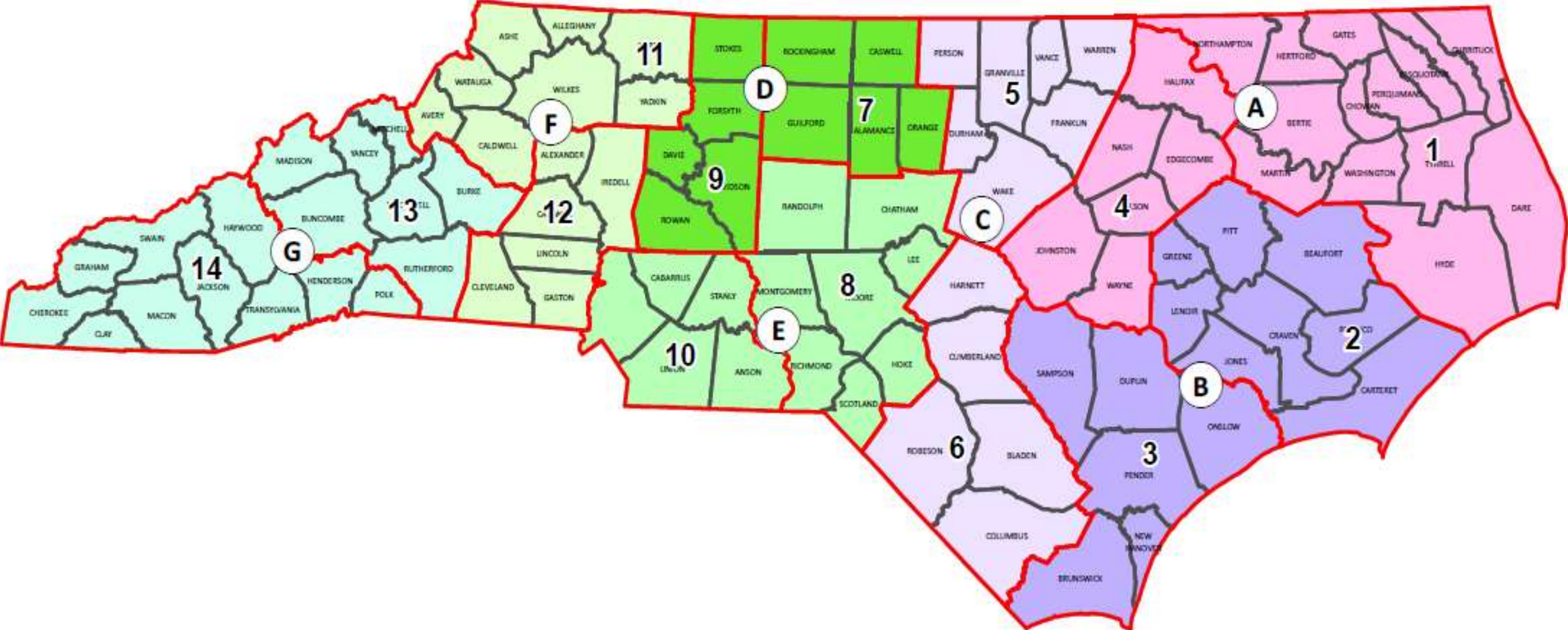
Congestion	Benefit/Cost	Safety	Freight	Economic Competitiveness <sup>1</sup>
Accessibility/ Connectivity <sup>2</sup>	Multimodal	Lane Width	Shoulder Width	Pavement Score

<sup>1</sup> Statewide Mobility only; <sup>2</sup> Regional Impact & Division Needs only

- Workgroup flexibility in determining the methodology used to calculate criteria
- Non-Highway Modes must have a minimum of 4 quantitative criteria



# STI Regions and Divisions



# STI Funding Caps and Restrictions Impacting Programming



Corridor Cap:  
Statewide Mobility



Funding limits:  
Light rail and commuter  
rail projects



Funding limits:  
Regional Impact  
Transit projects



Funding limits:  
Airport projects in all  
categories



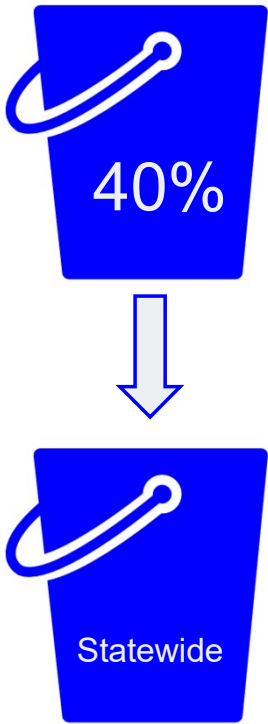
Prohibition:  
Using state funds to match federal-aid for  
independent bicycle and pedestrian projects

## State Transportation Improvement Program (STIP)

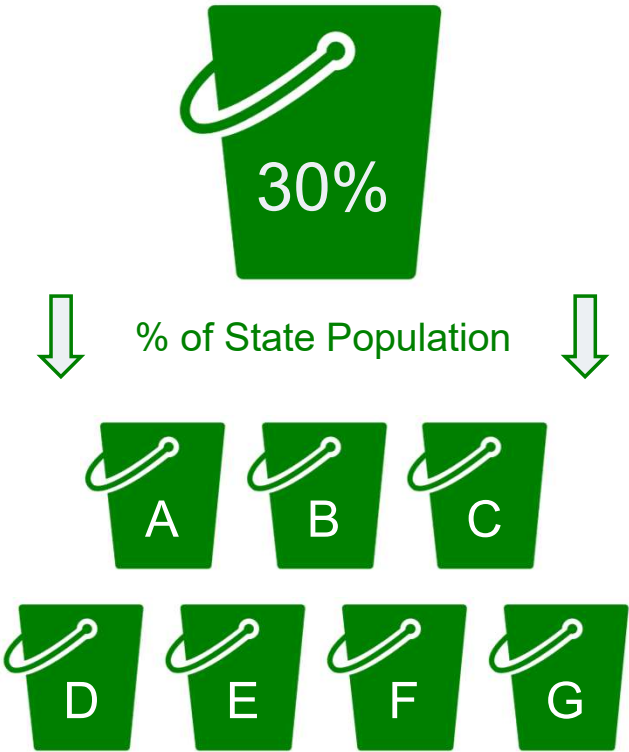
- STIP identifies funding and scheduling of projects in NCDOT's capital program (~55% of DOT Budget)
- 10 Year Program (currently 2020-2029)
  - First half is "Delivery STIP" – committed projects
  - Second half is "Developmental STIP" – projects in early scoping and environmental development stage
- Updated approximately every 2 years
- STIP contains different project types:
  - Highway & non-highway (Prioritization)
  - Bridges, safety, Interstate Maintenance, CMAQ

# STIP Funding Distribution

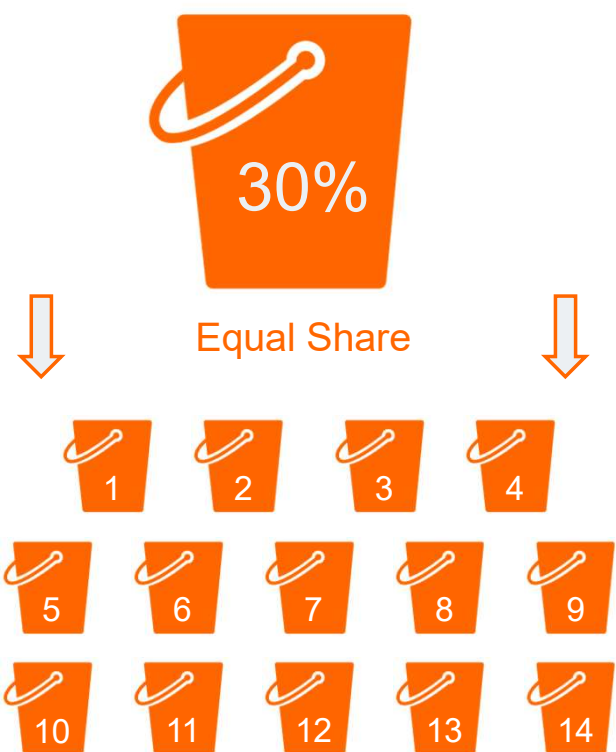
## Statewide Mobility



## Regional Impact



## Division Needs





# Scoring Process

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



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

**Statewide Mobility**  
40% of Funds

1. Projects programmed
2. 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

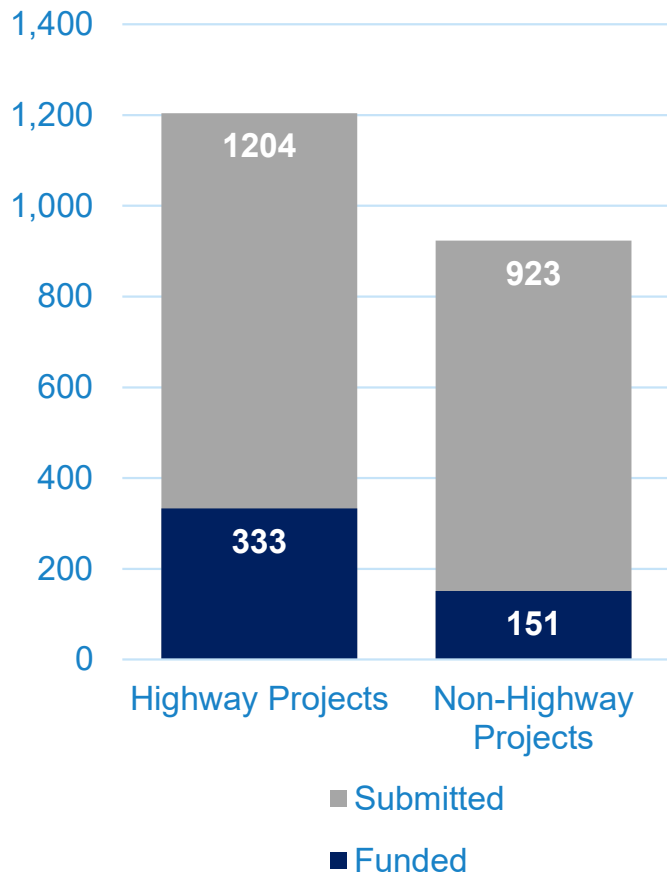
**Regional Impact Score =**  
70% Quantitative +  
30% Local Input

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

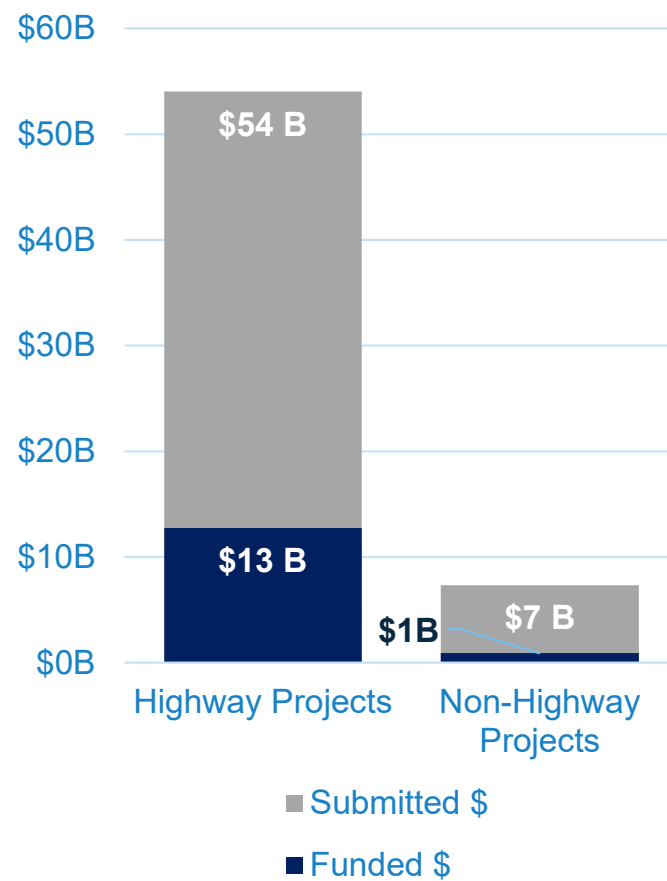
# Prioritization 5.0

# 2020-2029 STIP

### Project Count



### Evaluated Project Costs



## Workgroup Process

### § 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 Process

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



## Workgroup Default Decision Points

- P7 Schedule
- Workgroup Meeting Schedule
- Carryover Project Definition
- Number of Submittals
- Number of Local Input Points
- Criteria Names (Non-Highway)
- Measures and Weights (all modes)
- Modal allocation (funding split between modes)

# End of Session 1

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Department of Transportation

# Session 2: Prioritization and Programming Basics

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# Project Database

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# Projects Scheduled for Delivery

Definition: Projects NOT subject to re-evaluation in next round of Prioritization

Applies to 2024-2033 STIP (scheduled for adoption)

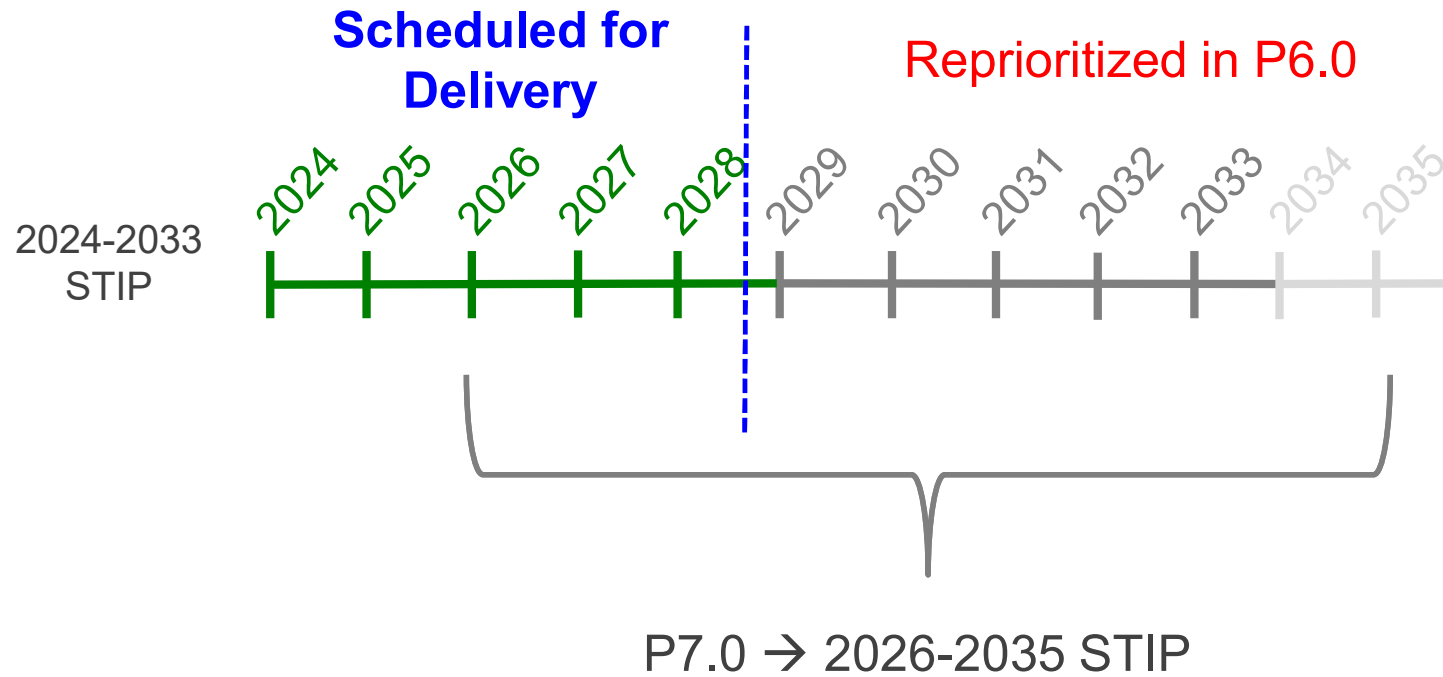
- Applies to all modes
- Applies to first year of programming (ROW or CON)
- Future dollars tied up

➤ Programmed for ROW or CON between 2024 and 2028

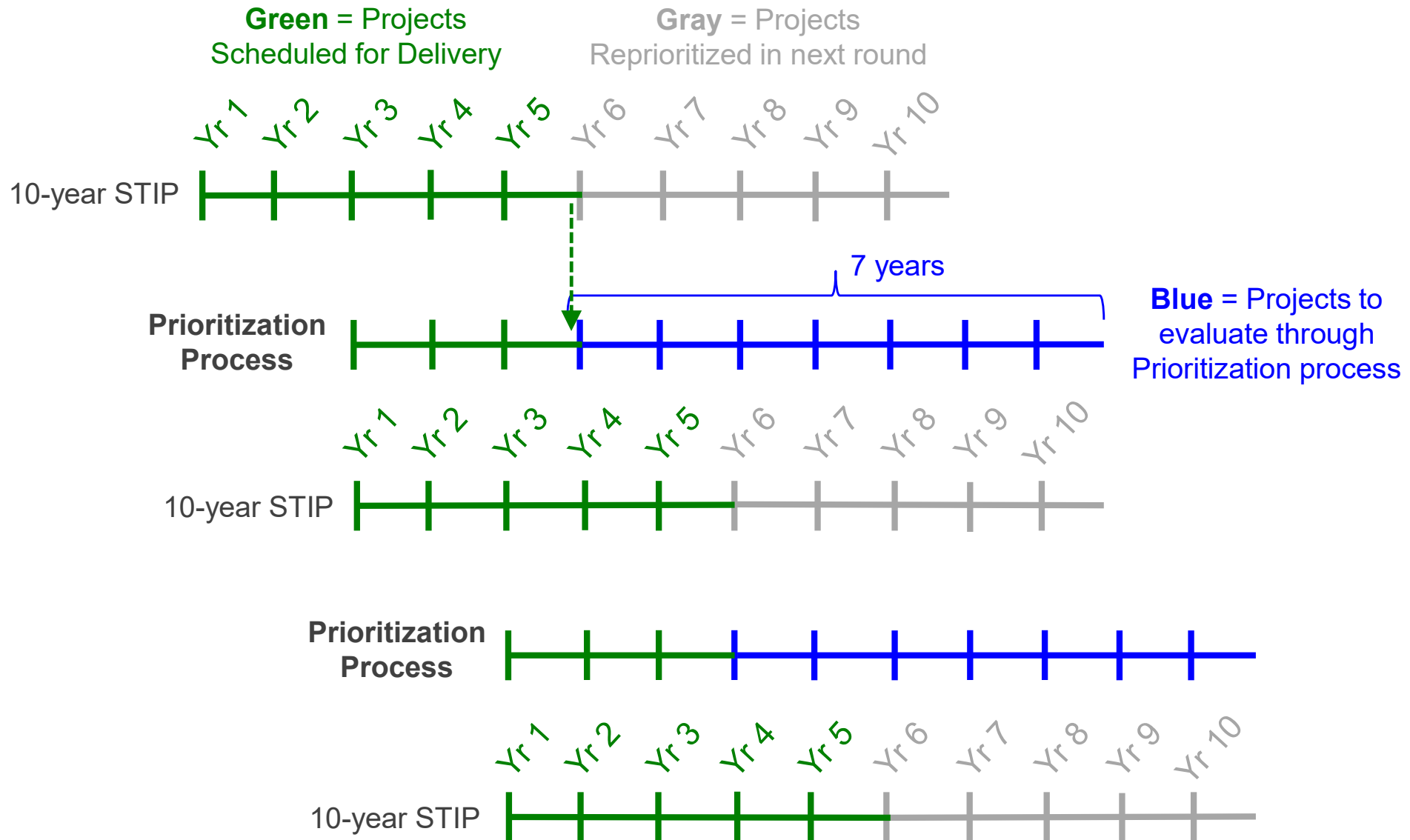
Previously known as “Committed” projects



# 5-Year Window of Projects Scheduled for Delivery



# Projects Scheduled for Delivery / Years Subject to Reprioritization



## Carryover Projects

- Carryover projects are automatically evaluated in the next round of Prioritization
- P7 Workgroup recommended Carryover projects to be defined as:
  - In the adopted 2024-2033 STIP and not scheduled for delivery
  - Have completed environmental documents
  - Sibling of programmed projects
  - Two P6.0 new submittals (per partner discretion)
- Modifications:
  - Segmenting counts as additional submittal slot
  - Scope changes do not count as additional submittal slot
  - 1 out / 1 in allowed with partner agreement
- All other projects “removed” and available for resubmittal [Holding Tank]

## Project Submittals

- P7 Workgroup recommended the number of project submittals to be calculated using the same formula as in P6:

### MPOs and RPOs

- Base of 12 submittals, plus:
  - + 1 submittal for every 50,000 in population
  - + 1 submittal for every 500 centerline miles(No maximum number of submittals)

### Divisions

- 14 submittals
- Formula applies to each mode
- 1 out / 1 in (with Carryover projects) allowed with partner agreement

## Recommended P7 Number of Submittals

MPO/RPO Name	2020 Census Population	Population rounded to nearest 50,000	P7 Add'l Projects Based on Population	2023 Centerline Miles	Centerline Miles rounded to nearest 500	P7 Add'l Projects based on Centerline Miles	P7 Maximum Submittals for Each Mode
Albemarle RPO	174,219	150,000	3	2,937	3,000	6	<b>21</b>
Burlington-Graham MPO	176,195	200,000	4	1,036	1,000	2	<b>18</b>
Cabarrus-Rowan MPO	352,583	350,000	7	1,996	2,000	4	<b>23</b>
Cape Fear RPO	140,902	150,000	3	2,238	2,000	4	<b>19</b>
Capital Area MPO	1,304,889	1,300,000	26	4,158	4,000	8	<b>46</b>
Charlotte Regional Transportation PO	1,494,627	1,500,000	30	3,677	3,500	7	<b>49</b>
Down East RPO	139,417	150,000	3	1,905	2,000	4	<b>19</b>
Durham-Chapel Hill-Carrboro MPO	462,954	450,000	9	1,337	1,500	3	<b>24</b>
Eastern Carolina RPO	169,863	150,000	3	2,960	3,000	6	<b>21</b>
Fayetteville Area MPO	404,905	400,000	8	1,358	1,500	3	<b>23</b>
Foothills RPO	132,825	150,000	3	2,077	2,000	4	<b>19</b>
French Broad River MPO	426,274	450,000	9	2,561	2,500	5	<b>26</b>
Gaston-Cleveland-Lincoln MPO	404,464	400,000	8	2,998	3,000	6	<b>26</b>
Goldsboro Urban Area MPO	90,276	100,000	2	597	500	1	<b>15</b>
Grand Strand Area Transportation Study	47,909	50,000	1	271	500	1	<b>14</b>
Greater Hickory MPO	367,982	350,000	7	3,168	3,000	6	<b>25</b>
Greensboro Urban Area MPO	406,916	400,000	8	1,589	1,500	3	<b>23</b>
Greenville Urban Area MPO	140,982	150,000	3	465	500	1	<b>16</b>
High Country RPO	212,443	200,000	4	4,158	4,000	8	<b>24</b>

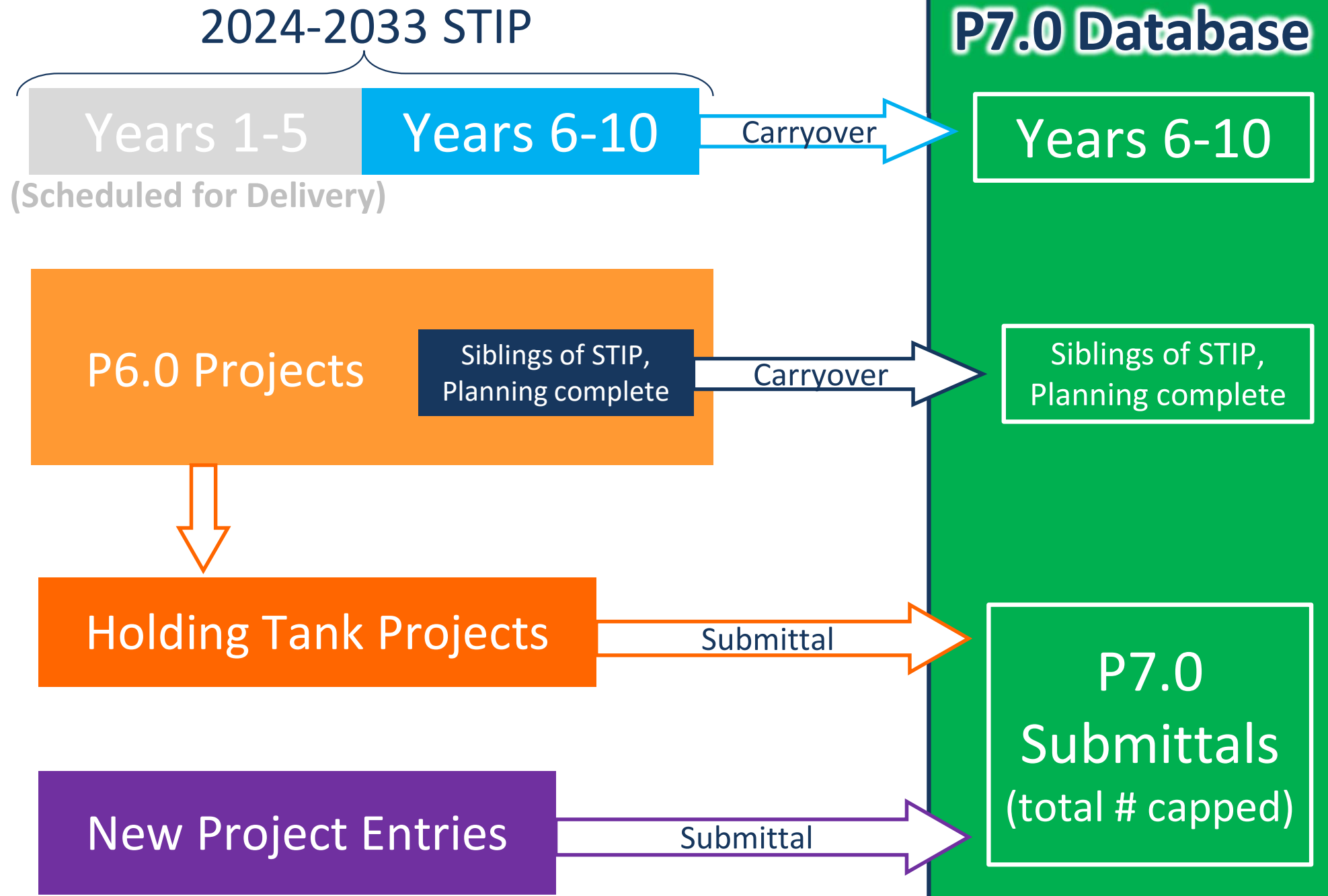


## Recommended P7 Number of Submittals

MPO/RPO Name	2020 Census Population	Population rounded to nearest 50,000	P7 Add'l Projects Based on Population	2023 Centerline Miles	Centerline Miles rounded to nearest 500	P7 Add'l Projects based on Centerline Miles	P7 Maximum Submittals for Each Mode
High Point Urban Area MPO	291,390	300,000	6	1,837	2,000	4	<b>22</b>
Jacksonville Urban Area MPO	198,407	200,000	4	569	500	1	<b>17</b>
Kerr-Tar RPO	165,829	150,000	3	2,837	3,000	6	<b>21</b>
Land-of-Sky RPO	68,364	50,000	1	1,196	1,000	2	<b>15</b>
Lumber River RPO	222,064	200,000	4	3,363	3,500	7	<b>23</b>
Mid-Carolina RPO	182,912	200,000	4	3,479	3,500	7	<b>23</b>
Mid-East RPO	110,738	100,000	2	2,143	2,000	4	<b>18</b>
New Bern Area MPO	54,294	50,000	1	254	500	1	<b>14</b>
Northwest Piedmont RPO	166,565	150,000	3	2,989	3,000	6	<b>21</b>
Peanut Belt RPO	113,183	100,000	2	2,628	2,500	5	<b>19</b>
Piedmont Triad RPO	260,674	250,000	5	3,970	4,000	8	<b>25</b>
Rocky Mount Urban Area MPO	77,662	100,000	2	487	500	1	<b>15</b>
Rocky River RPO	103,648	100,000	2	2,109	2,000	4	<b>18</b>
Southwestern RPO	143,270	150,000	3	2,618	2,500	5	<b>20</b>
Triangle Area RPO	230,432	250,000	5	2,931	3,000	6	<b>23</b>
Upper Coastal Plain RPO	232,705	250,000	5	3,089	3,000	6	<b>23</b>
Wilmington Urban Area MPO	296,302	300,000	6	827	1,000	2	<b>20</b>
Winston-Salem Urban Area MPO	449,926	450,000	9	1,479	1,500	3	<b>24</b>

## Recommended P7 Number of Submittals

<b>Division</b>	<b>P7 Maximum Submittals for Each Mode</b>
01	14
02	14
03	14
04	14
05	14
06	14
07	14
08	14
09	14
10	14
11	14
12	14
13	14
14	14

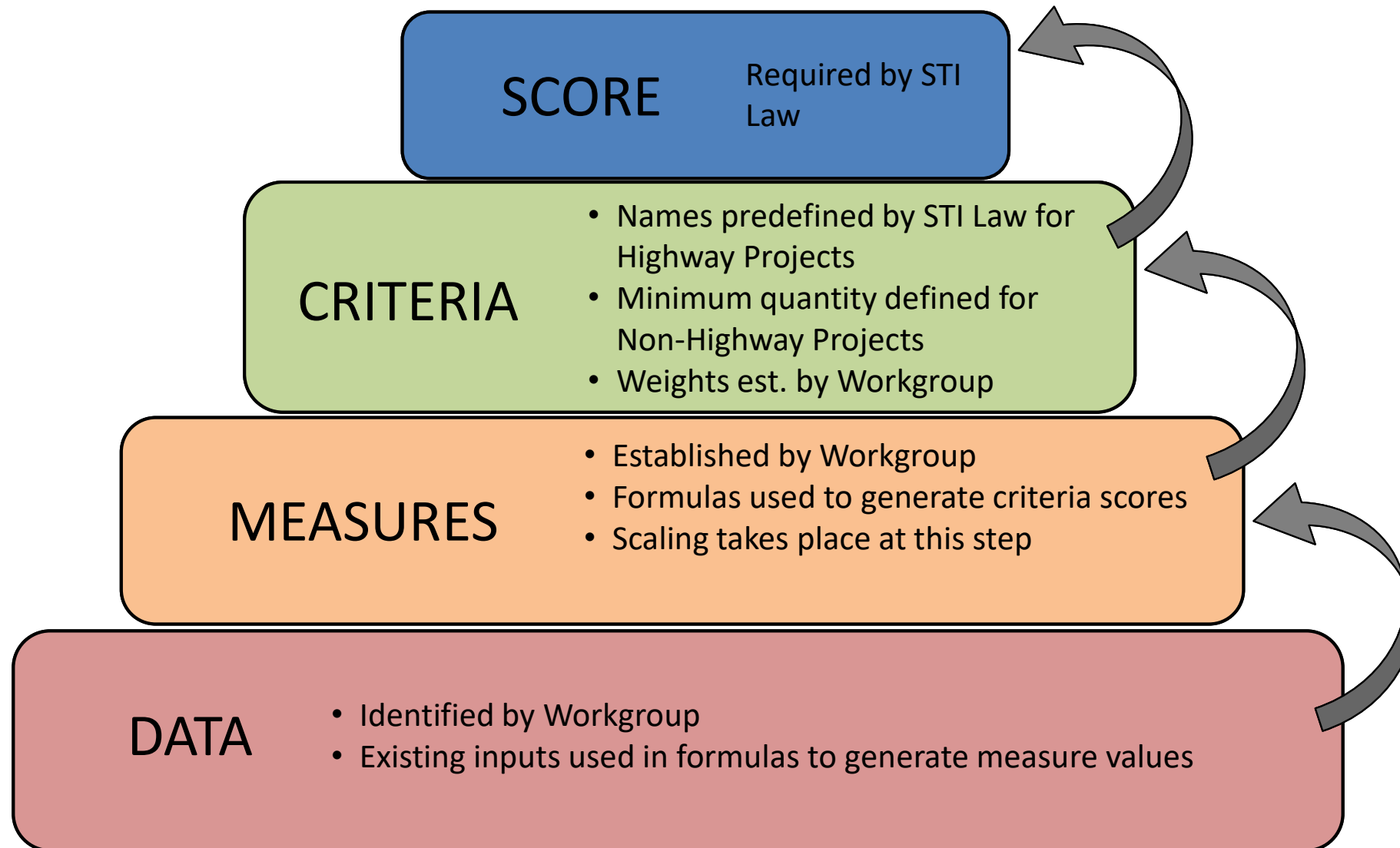


# Building a Score

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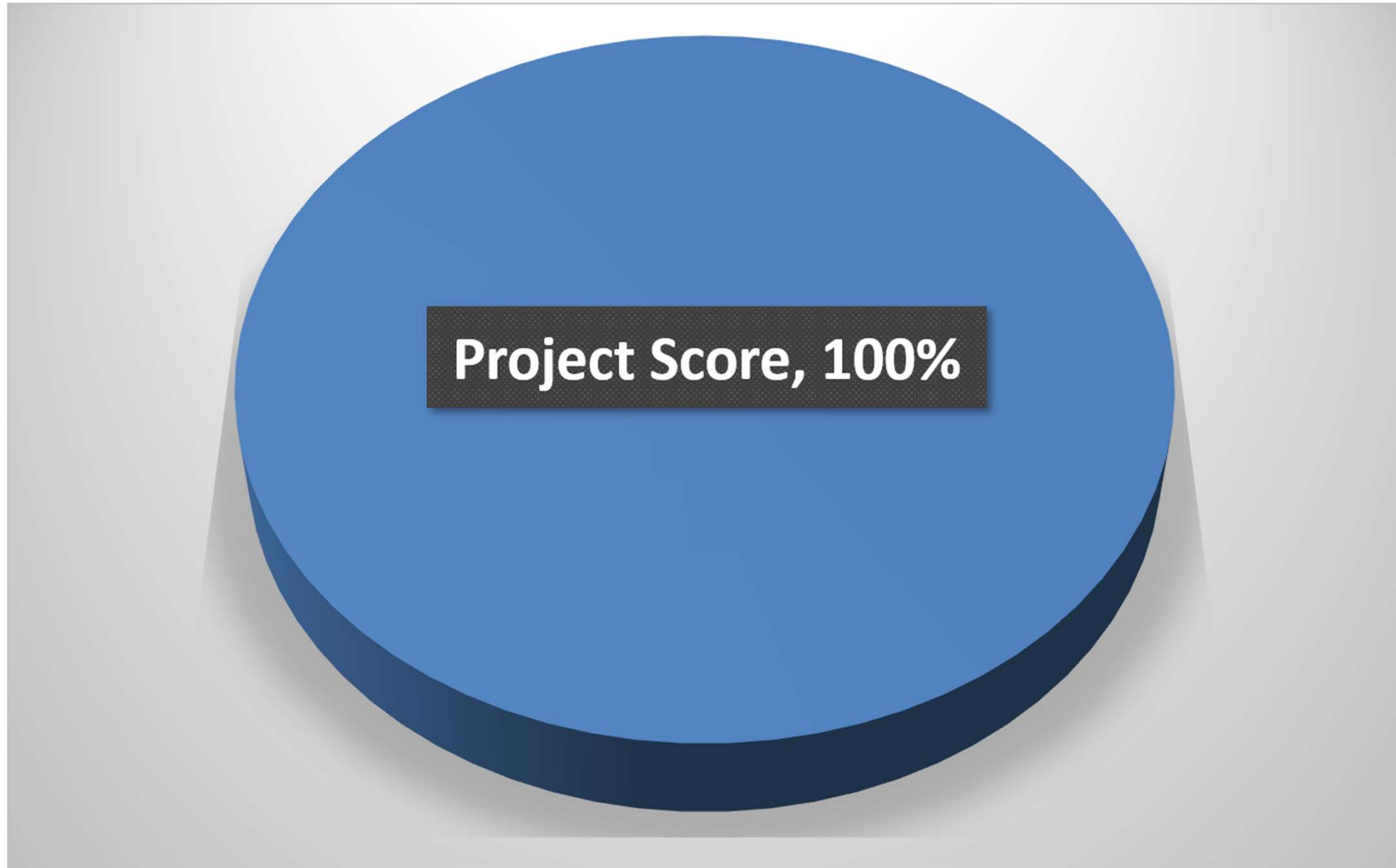


# Quantitative Score Building Blocks



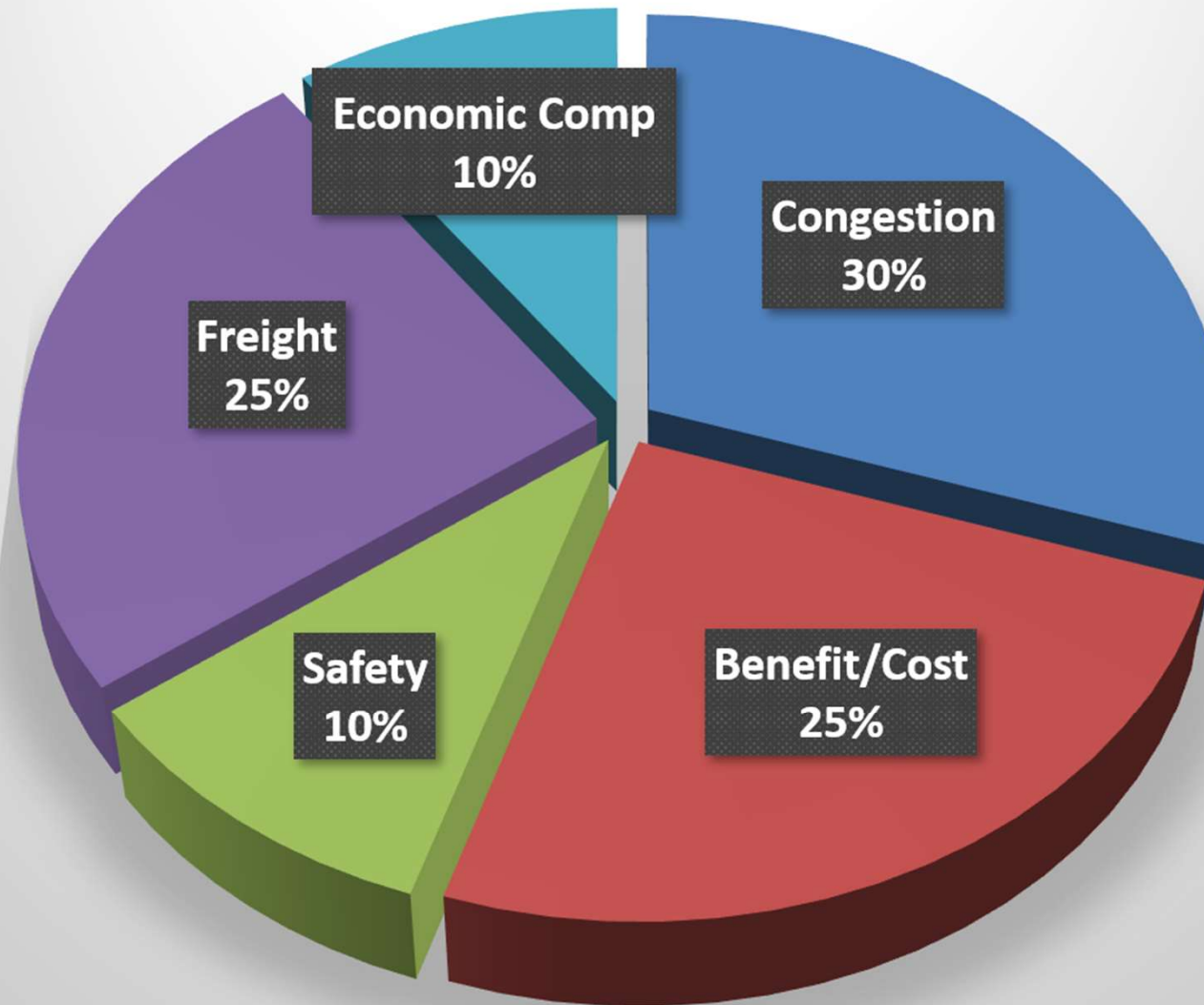


## Building Block Level: Quantitative Score



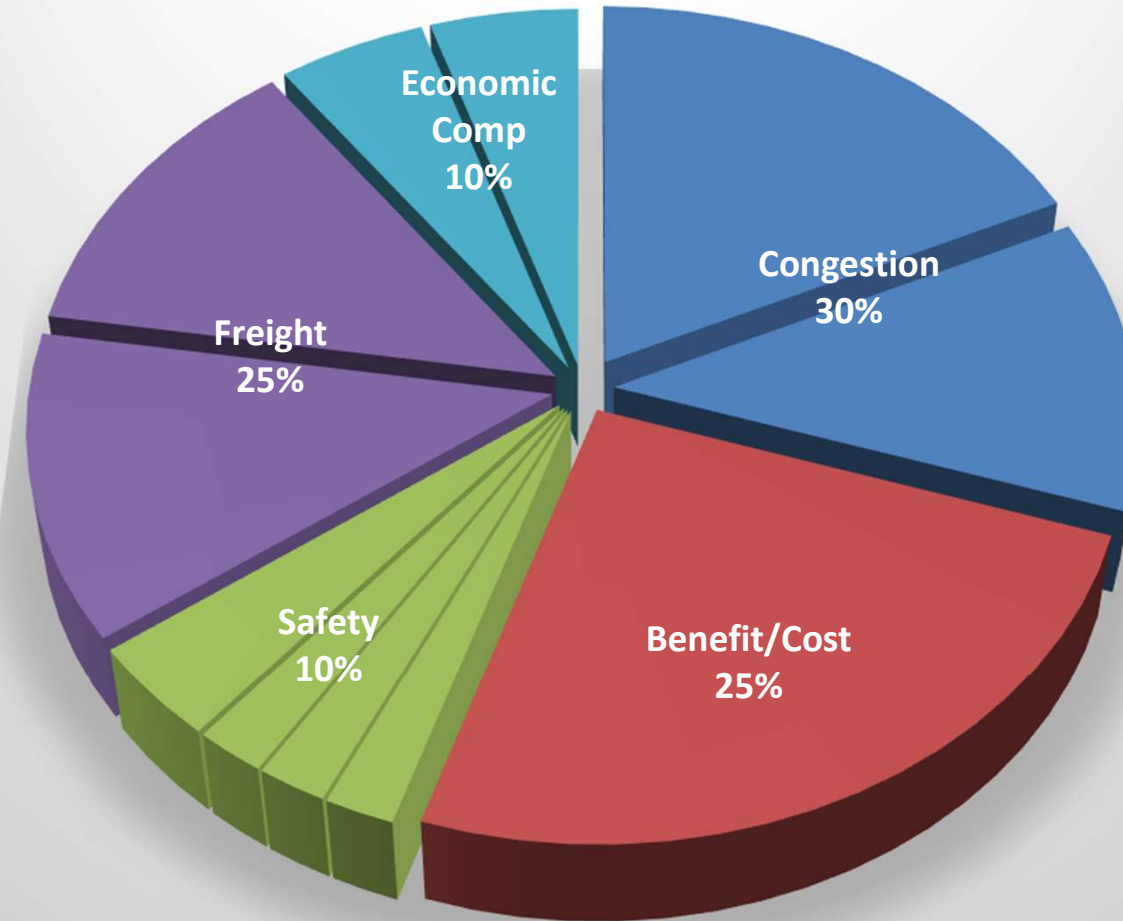
# Building Block Level: Criteria

(Statewide Highway Mobility Segment Example)



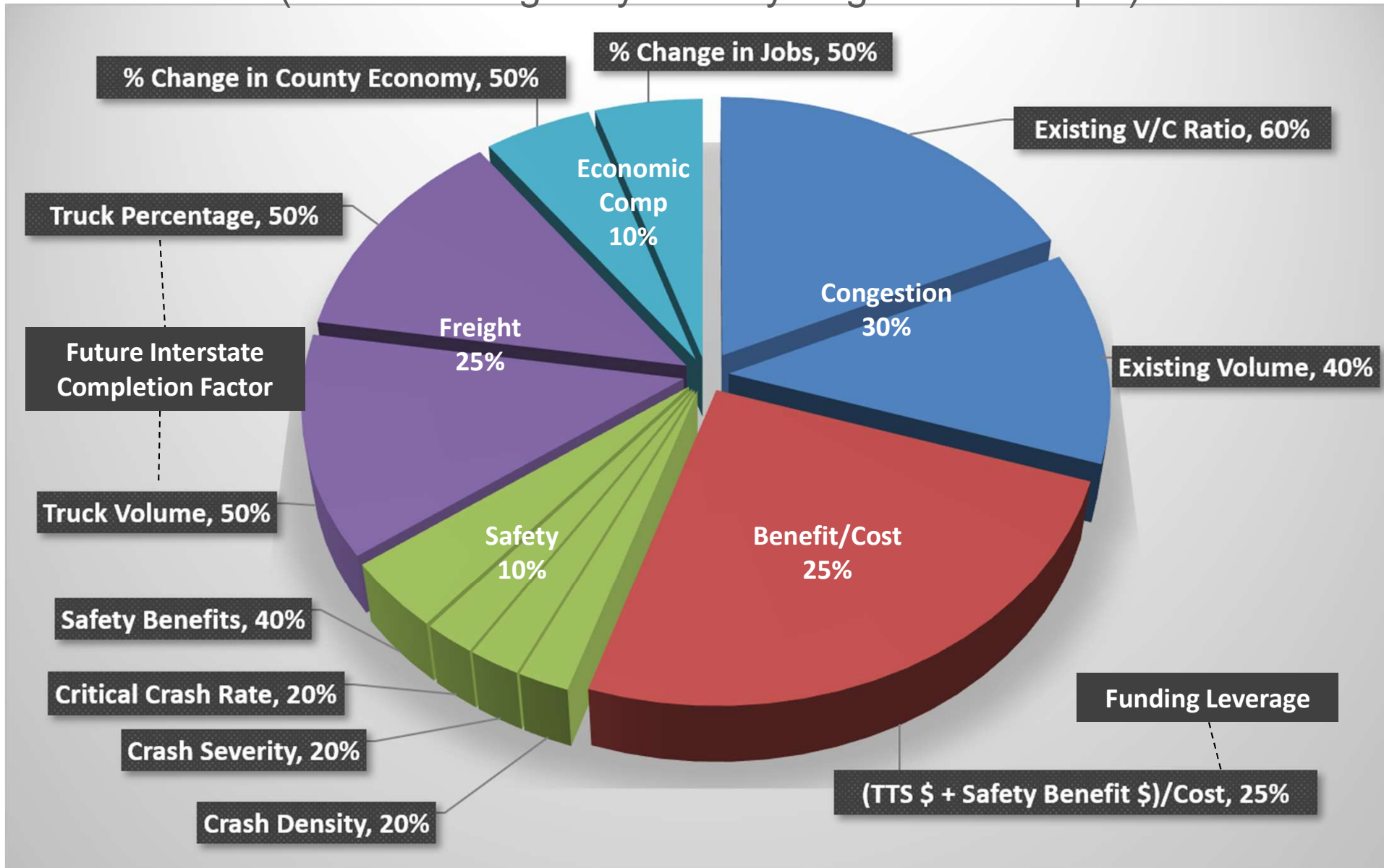
# Building Block Level: Measure

(Statewide Highway Mobility Segment Example)

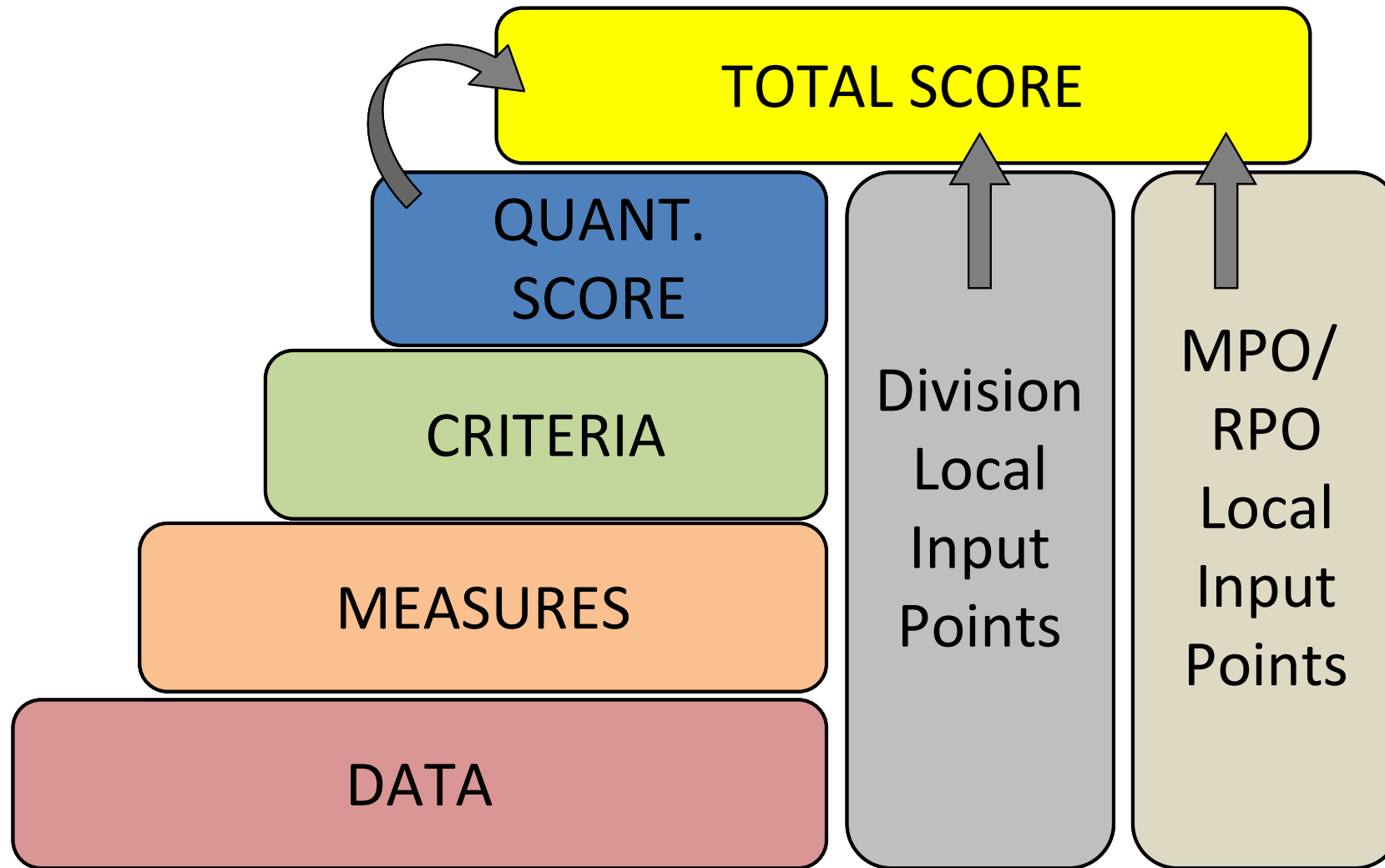


# Building Block Level: Measure

(Statewide Highway Mobility Segment Example)



# Total Score Building Blocks





# Quantitative Score vs. Local Input

Funding Category	<u>QUANTITATIVE</u>		<u>LOCAL INPUT</u>	
	Data		Division	MPO/RPO
<b>Statewide Mobility</b>	Criteria 1 = 30% Criteria 2 = 25% Criteria 3 = 15% Criteria 4 = 10% Criteria 5 = 15% Criteria 6 = 5%	100%	--	--
<b>Regional Impact</b>	Criteria 1 = 20% Criteria 2 = 20% Criteria 3 = 10% Criteria 4 = 10% Criteria 5 = 10%	70%	15%	15%
<b>Division Needs</b>	Criteria 1 = 15% Criteria 2 = 15% Criteria 3 = 10% Criteria 4 = 5% Criteria 5 = 5%	50%	25%	25%



# Local Input Points

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## P6 Methodology for Local Input Points

- P7 Workgroup recommended the number of local input points to be calculated using the same formula as in P6:

### Number of Points per Area

- Base of 1,000 points
  - + 100 additional points for every 50,000 (rounding up to next) in population
- Max 2,500 points per area
- Same allocation for Regional Impact and Division Needs
- 100 point max per project per category

## Recommended P7 Number of Local Input Points

MPO/RPO Name	2020 Census Population	Population rounded to next 50,000	P7 Local Input Points
Albemarle RPO	174,219	200,000	<b>1,400</b>
Burlington-Graham MPO	176,195	200,000	<b>1,400</b>
Cabarrus-Rowan MPO	352,583	400,000	<b>1,800</b>
Cape Fear RPO	140,902	150,000	<b>1,300</b>
Capital Area MPO	1,304,889	1,350,000	<b>2,500</b>
Charlotte Regional Transportation PO	1,494,627	1,500,000	<b>2,500</b>
Down East RPO	139,417	150,000	<b>1,300</b>
Durham-Chapel Hill-Carrboro MPO	462,954	500,000	<b>2,000</b>
Eastern Carolina RPO	169,863	200,000	<b>1,400</b>
Fayetteville Area MPO	404,905	450,000	<b>1,900</b>
Foothills RPO	132,825	150,000	<b>1,300</b>
French Broad River MPO	426,274	450,000	<b>1,900</b>
Gaston-Cleveland-Lincoln MPO	404,464	450,000	<b>1,900</b>
Goldsboro Urban Area MPO	90,276	100,000	<b>1,200</b>
Grand Strand Area Transportation Study	47,909	50,000	<b>1,100</b>
Greater Hickory MPO	367,982	400,000	<b>1,800</b>
Greensboro Urban Area MPO	406,916	450,000	<b>1,900</b>
Greenville Urban Area MPO	140,982	150,000	<b>1,300</b>
High Country RPO	212,443	250,000	<b>1,500</b>

## Recommended P7 Number of Local Input Points

<b>MPO/RPO Name</b>	<b>2020 Census Population</b>	<b>Population rounded to next 50,000</b>	<b>P7 Local Input Points</b>
High Point Urban Area MPO	291,390	300,000	<b>1,600</b>
Jacksonville Urban Area MPO	198,407	200,000	<b>1,400</b>
Kerr-Tar RPO	165,829	200,000	<b>1,400</b>
Land-of-Sky RPO	68,364	100,000	<b>1,200</b>
Lumber River RPO	222,064	250,000	<b>1,500</b>
Mid-Carolina RPO	182,912	200,000	<b>1,400</b>
Mid-East RPO	110,738	150,000	<b>1,300</b>
New Bern Area MPO	54,294	100,000	<b>1,200</b>
Northwest Piedmont RPO	166,565	200,000	<b>1,400</b>
Peanut Belt RPO	113,183	150,000	<b>1,300</b>
Piedmont Triad RPO	260,674	300,000	<b>1,600</b>
Rocky Mount Urban Area MPO	77,662	100,000	<b>1,200</b>
Rocky River RPO	103,648	150,000	<b>1,300</b>
Southwestern RPO	143,270	150,000	<b>1,300</b>
Triangle Area RPO	230,432	250,000	<b>1,500</b>
Upper Coastal Plain RPO	232,705	250,000	<b>1,500</b>
Wilmington Urban Area MPO	296,302	300,000	<b>1,600</b>
Winston-Salem Urban Area MPO	449,926	450,000	<b>1,900</b>

## Recommended P7 Number of Local Input Points

Division	2020 Census Population	Population rounded to next 50,000	P7 Local Input Points
01	259,368	300,000	<b>1,600</b>
02	498,175	500,000	<b>2,000</b>
03	751,268	800,000	<b>2,500</b>
04	605,706	650,000	<b>2,300</b>
05	1,642,369	1,650,000	<b>2,500</b>
06	689,414	700,000	<b>2,400</b>
07	959,124	1,000,000	<b>2,500</b>
08	538,152	550,000	<b>2,100</b>
09	774,545	800,000	<b>2,500</b>
10	1,629,022	1,650,000	<b>2,500</b>
11	371,163	400,000	<b>1,800</b>
12	779,095	800,000	<b>2,500</b>
13	516,304	550,000	<b>2,100</b>
14	373,793	400,000	<b>1,800</b>

# Scoring Overview

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# P6 Aviation Scoring

Criteria	Measure Description	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
NCDOA Project Rating	NCDOA Project Rating	40%	30%	25%
FAA ACIP Rating	FAA Airport Capital Improvement Plan (ACIP) rating	30%	15%	10%
Constructability Index	Sum of metrics rating project constructability	10%	10%	5%
Benefit/Cost	(Total Economic Contribution / Cost to NCDOT) + Funding Leverage	20%	15%	10%



## P6 Bicycle and Pedestrian Scoring

Criteria	Measure Description	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
Safety	(Number of crashes x 40%) + (Crash severity x 20%) + (Safety risk x 20%) + (Project safety benefit x 20%)	N/A	N/A	20%
Accessibility/ Connectivity	Points of Interest pts + Connections pts + Route pts	N/A	N/A	15%
Demand/Density	# of households and employees per square mile near facility	N/A	N/A	10%
Cost Effectiveness	(Safety + Accessibility/Connectivity + Demand/Density) / Cost to NCDOT	N/A	N/A	5%



# P6 Ferry Scoring

Criteria	Measure Description	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
Asset Condition	100 - Asset Condition Rating	N/A	15%	15%
Benefits	Number of hours (in \$) saved compared to driving	N/A	10%	10%
Accessibility/ Connectivity	# of nearby Points of Interest	N/A	10%	10%
Asset Efficiency	3-year maintenance cost / 3-year replacement cost	N/A	15%	15%
Capacity/ Congestion	% of vehicles left behind at each departure compared to total carried by the route	N/A	20%	-



## P6 Public Transportation Scoring – Mobility

Criteria	Measure Description	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
Impact	Number of trips generated by project	N/A	15%	10%
Demand/ Density	Total Trips / Service population	N/A	20%	10%
Efficiency	Total trips / Total revenue seat hours	N/A	10%	10%
Cost Effectiveness	Additional trips / (Cost to NCDOT / Lifespan of project)	N/A	25%	20%

Project Types:

- Route-specific vehicles (new or expansion only)
  - Fixed guideway vehicles, fixed route vehicles, deviated fixed route vehicles
- Corridors
  - Fixed guideway (commuter rail, intercity rail, light rail)
  - Bundle of vehicle + other (ex. stops / shelters, park and rides, bus pullouts)
  - Bus Rapid Transit (BRT)
  - Bus on Shoulder System (BOSS) / Busway



## P6 Public Transportation Scoring – Demand Response

Criteria	Measure Description	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
Impact	Number of trips affected by project	N/A	10%	10%
Demand/ Density	Total hours with the project in place / Service population	N/A	20%	15%
Efficiency	Vehicle Utilization Ratio	N/A	15%	10%
Cost Effectiveness	Additional trips / (Cost to NCDOT / Lifespan of project)	N/A	25%	15%

Project Types:

- Demand Response vehicles (expansion only)
  - No facilities – either submit Demand Response facilities under Facility category or under Mobility category if bundled with a vehicle
  - Clarified for P7 – Demand Response includes MicroTransit service purchases (vehicles and software)



## P6 Public Transportation Scoring – Facility

Criteria	Measure Description	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
Impact	Number of trips affected by project	N/A	N/A	15%
Demand/ Density	Ridership Growth Trend for the Previous 5 Years	N/A	N/A	10%
Efficiency	Efficiency Score	N/A	N/A	10%
Cost Effectiveness	Additional trips / (Cost to NCDOT / Lifespan of project)	N/A	N/A	15%

Project Types:

- Passenger stations
  - Clarified for P7 – includes Mobility Hubs with Transit service
- Individual or bundled stops/shelters
- Individual or bundled park and ride lots
- Administration/Maintenance buildings





## P6 Rail Scoring

Criteria	Measure Description	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
Benefit-Cost	Benefit-Cost score	35%	25%	10%
System Opportunities	(Accessibility/Connectivity score x 50%) + (Multimodal score x 50%)	15%	10%	15%
Safety	Safety score	30%	15%	10%
Capacity and Diversion	(Volume/Capacity score x 75%) + (Highway Diversion score x 25%)	10%	10%	10%
Economic Competitiveness	Economic Competitiveness score	10%	10%	5%

- Only Class I Freight projects eligible in Statewide Mobility
- Passenger Rail only eligible for Regional Impact and Division Needs

 **P6 Highway - Mobility**

Criteria	Measure Description	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
Congestion	[Volume] and [Volume/Capacity]	30%	20%	15%
Benefit/Cost	[10-year Travel Time Savings benefit] + [10-year Safety Benefit] / [Cost to NCDOT]	25%	20%	15%
Safety	SEG: Crash Density, Crash Severity, Crash Rate, Safety Benefits INT: Crash Frequency, Crash Severity, Safety Benefits	10%	10%	10%
Freight	[Truck Volumes] and [Truck Percentage]	25%	10%	5%
Economic Competitiveness	TREDIS Model Output: [% Change in Long-Term Jobs] and [% Change in County Economy over 10 years]	10%	-	-
Accessibility / Connectivity	[Measurement of county economic distress indicators] and [degree the project upgrades mobility of the roadway]	-	10%	5%

*Project Types: Widening, Intersection/Interchange Improvements, Access Management, and other capacity additions*

 **P6 Highway - Modernization**

Criteria	Measure Description	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
Congestion	[Volume] and [Volume/Capacity]	10%	5%	-
Safety	SEG: Crash Density, Crash Severity, Crash Rate, Safety Benefits INT: Crash Frequency, Crash Severity, Safety Benefits	25%	25%	20%
Freight	[Truck Volumes] and [Truck Percentage]	25%	10%	5%
Lane Width	Existing lane width vs. DOT design standard	10%	10%	5%
[Paved] Shoulder Width	Existing paved shoulder width vs. DOT design standard	20%	10%	10%
Pavement Condition	Existing Pavement Condition Rating (PCR) along the project	10%	10%	10%

*Project Types: Modernize Roadway and Upgrade Freeway to Interstate Standards*

# End of Session 2

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**NORTH CAROLINA**  
Department of Transportation

# Session 3: Prioritization and Programming Process

STI Training

NCDOT SPOT Office

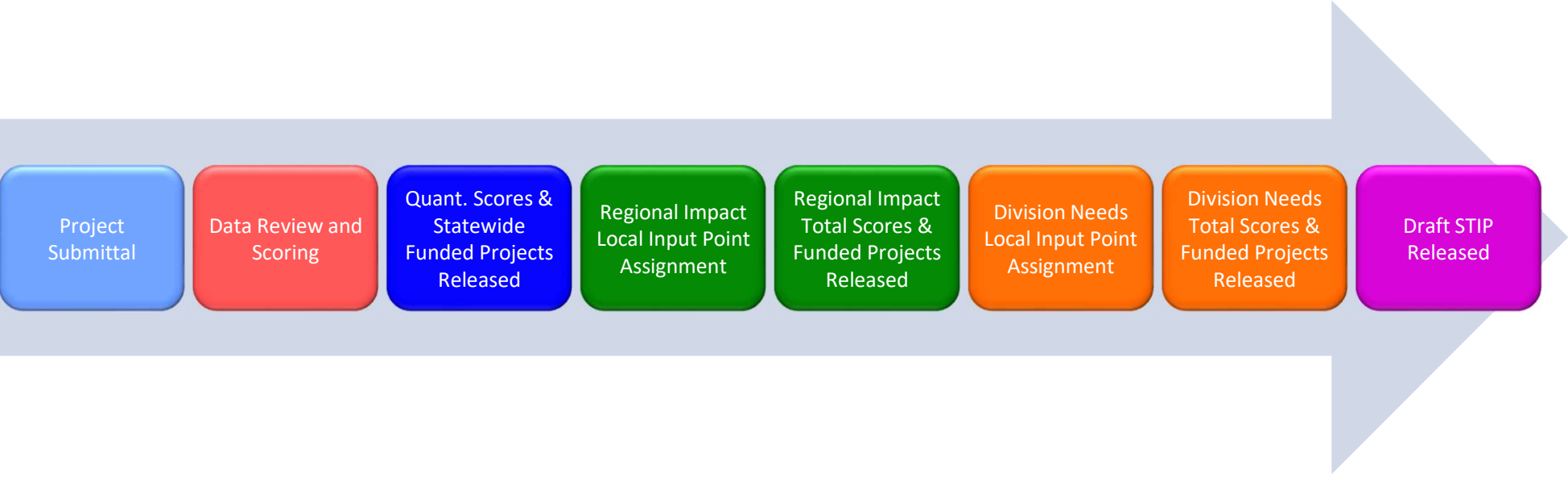
May 31 – June 1, 2023

Connecting people, products and places safely and efficiently with customer focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina





# Scoring Process

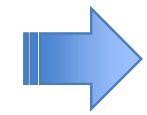


*“Article 14B.  
Strategic Prioritization Funding Plan for Transportation Investments.  
§ 136-189.10. Definitions.  
The following definitions apply in this Article:*



Priorities

- ①
- ②
- ③





# STATE TRANSPORTATION IMPROVEMENT PROGRAM (STIP)



2020-2029

# 2019

July 2019

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

# Prioritization Process

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# Prioritization feeds the STIP

**Prioritization 1.0 and 2.0 prior to STI Law passing**

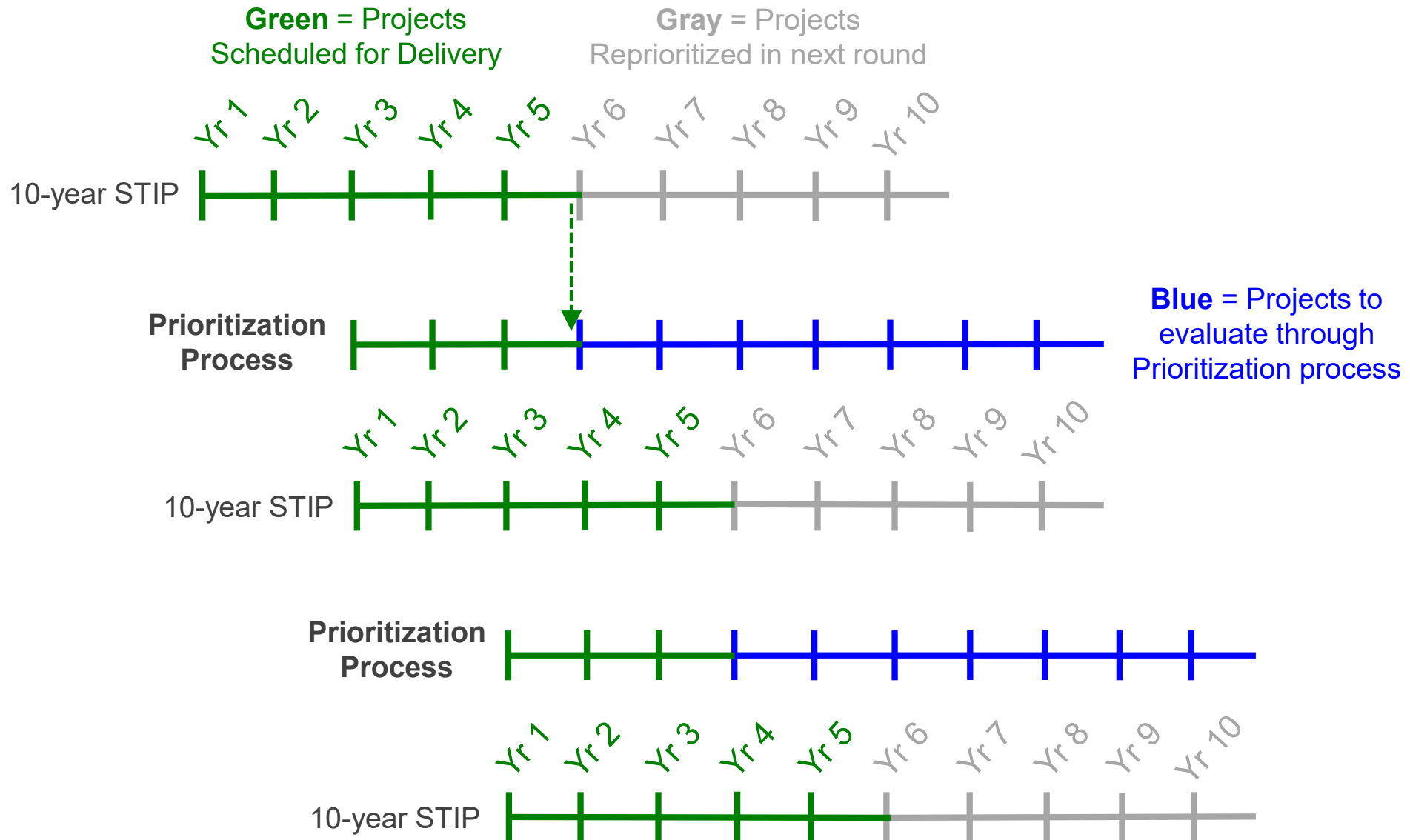
**Prioritization 3.0 (P3.0) → 2016-2025 STIP**

**P4.0 → 2018-2027 STIP (Current Adopted STIP)**

**P5.0 → 2020-2029 STIP**

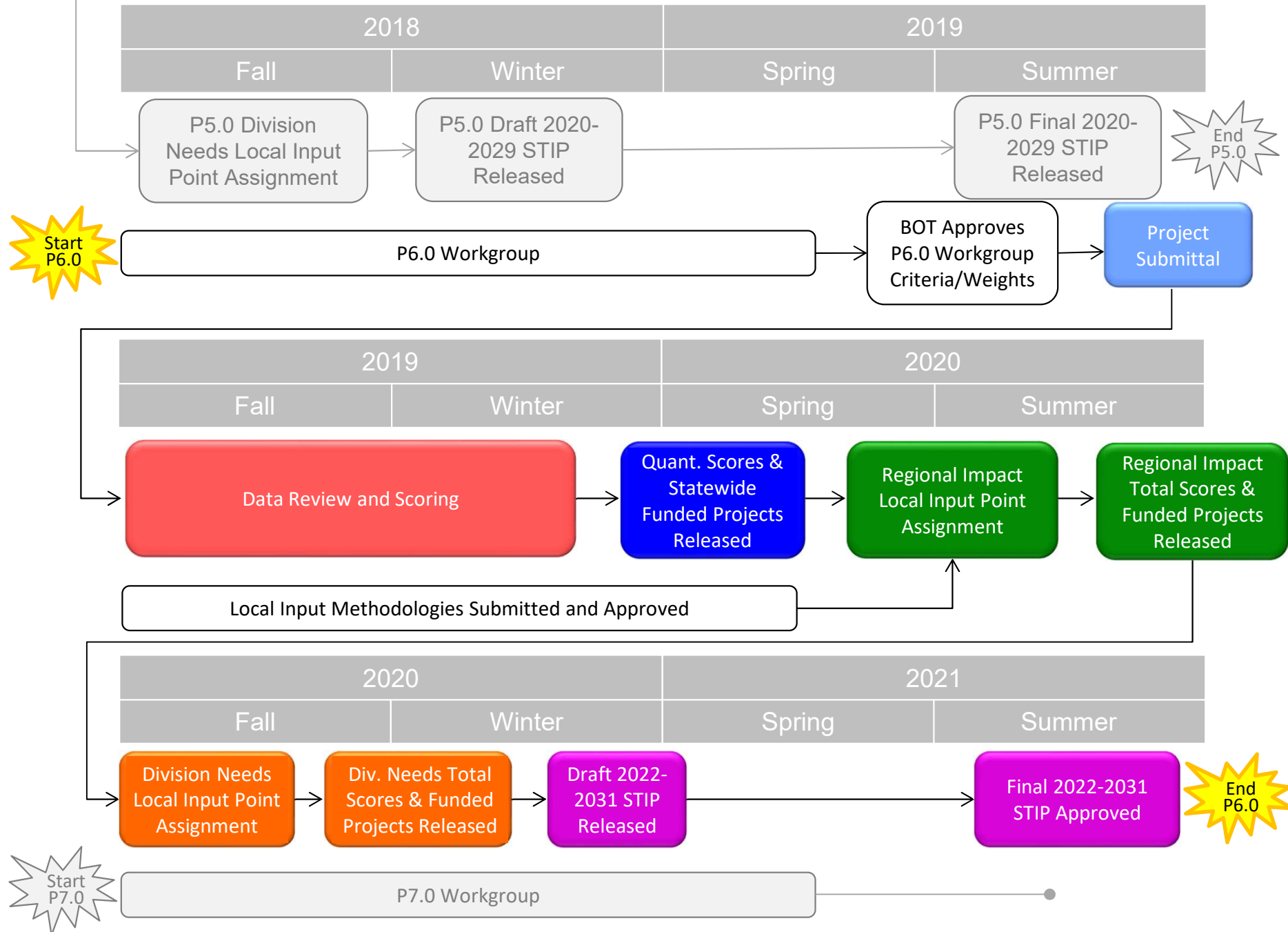


# Projects Scheduled for Delivery / Years Subject to Reprioritization





# 3-Year Prioritization & 2-Year STIP Cycle

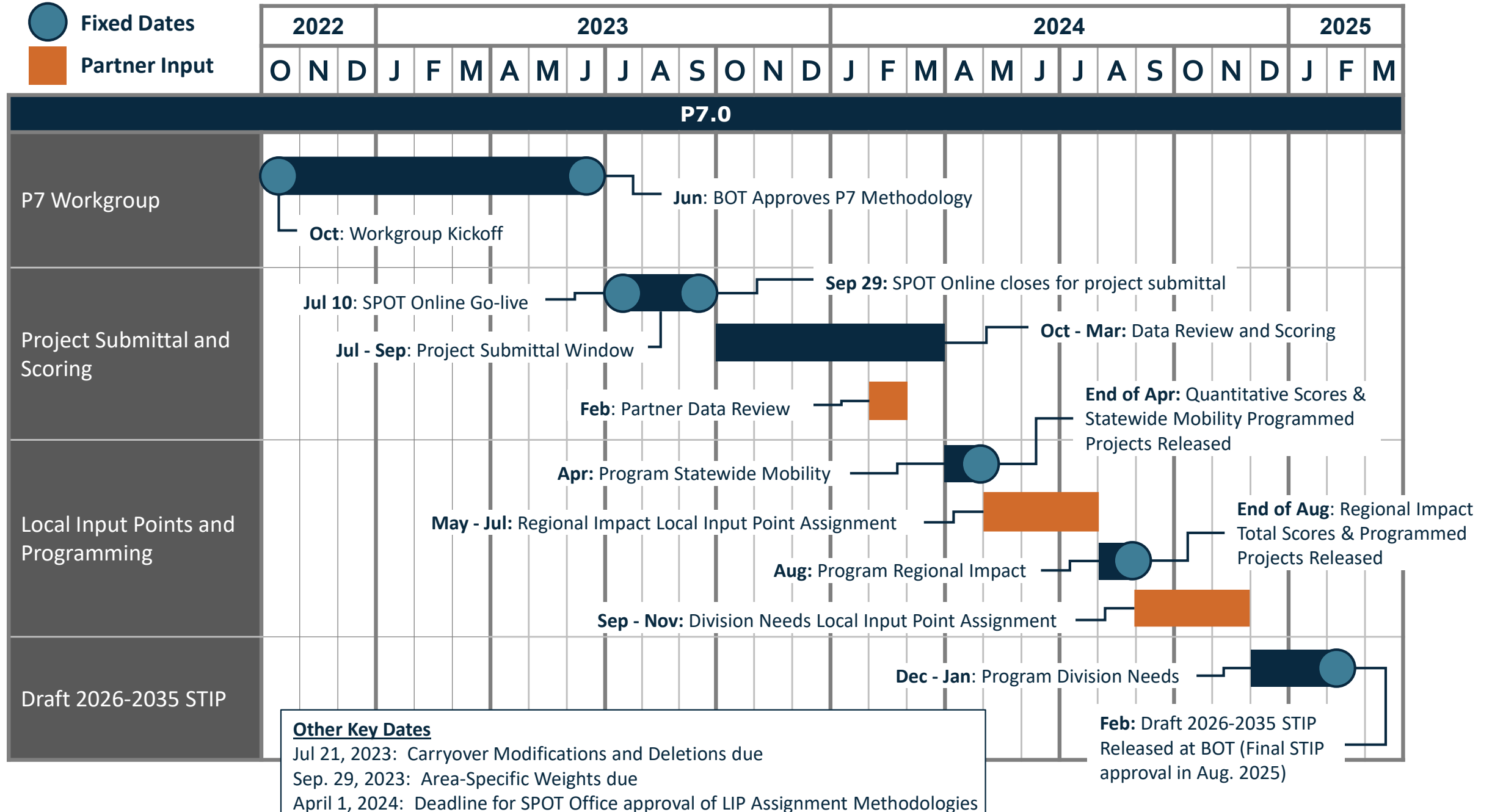


# P7 Schedule

Updated April 24, 2023

Dates set per P7 Workgroup in October 2022

- Fixed Dates
- Partner Input

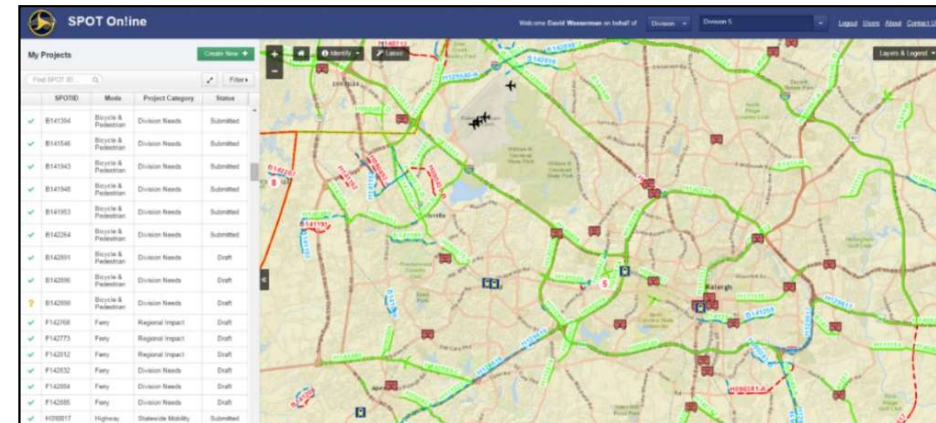




## Project Submittal

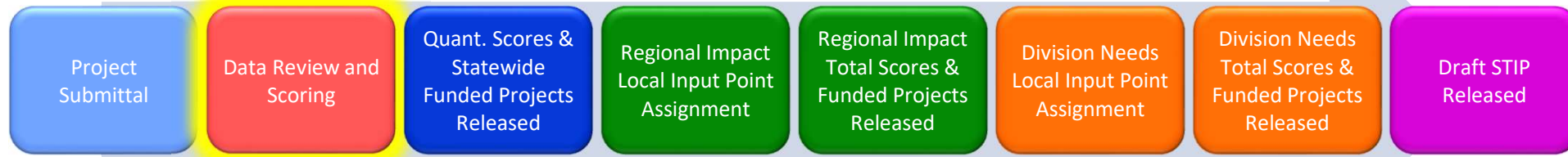
Preparing for submittals:

- Pre-submittal process
- Modifications and deletions
- Public input on draft project lists
- Testing projects in SPOT On!ine and spreadsheets
- **Coordination vital** between MPOs, RPOs, and Divisions



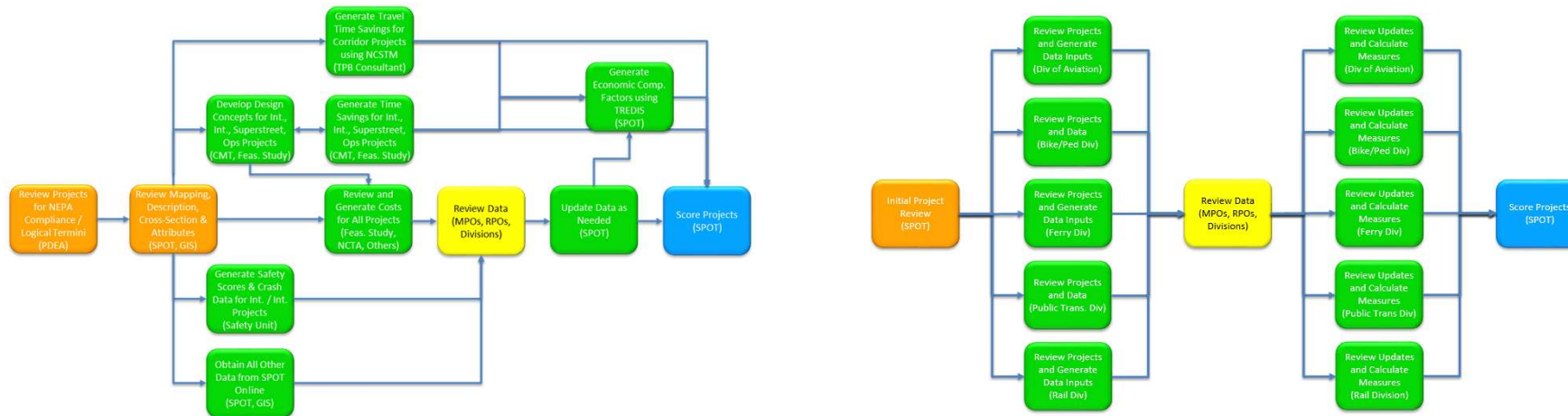
MPOs, RPOs, and Divisions enter and submit New and/or Holding Tank projects in SPOT On!ine

SPOT processes Carryover projects in SPOT On!ine



## Data Review and Scoring

Complex scoring process – SPOT works with many units



All data and measures distributed to submitters – opportunity to review and correct

(More details in Highway and Non-Highway scoring sessions)



## Quant. Scores & SW Funded Projects

SPOT calculates quantitative scores for all projects (SW, REG, and DIV)

SW project total scores = 100% data-driven (quantitative score)

STIP unit programs projects based on total score

- Schedule based on expected delivery
- Corridor and Aviation caps





## Regional Impact LIPs, Total Scores, & Funded Projects

MPOs, RPOs, and Divisions assign LIPs to all modes

- Use an Approved Methodology
- Preliminary assignment receives public input
- Final points entered in SPOT On!ine

SPOT totals project scores

STIP unit programs projects based on total score

- Schedule based on expected delivery
- Modal Allocation (Normalization)
- Aviation and transit caps





## Division Needs LIPs, Total Scores, & Funded Projects

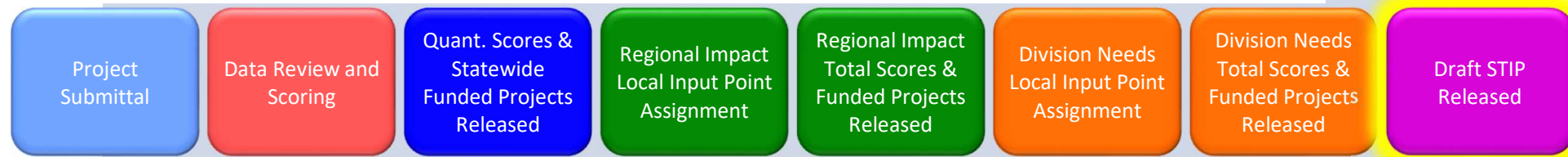
MPOs, RPOs, and Divisions assign LIPs to all modes

- Use an Approved Methodology
- Preliminary assignment receives public input
- Final points entered in SPOT On!ine

SPOT totals project scores

STIP unit programs projects based on total score

- Schedule based on expected delivery
- Modal allocation (Normalization)
- Aviation caps; Bike/Ped fund restrictions



## Draft STIP Released

10 year document that programs projects (assigns funding and schedules)

- \$28B+ of projects (>55% of DOT Budget)

Draft STIP released for public comment

Final STIP approved by BOT approximately 6 months later  
– incorporates changes

Projects in STIP:

- Funded Statewide, Regional, and Division projects (includes Committed)
- Alternate Criteria projects
- Exempt and Transition projects

# Exercise Set Up

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# Funding and Programming

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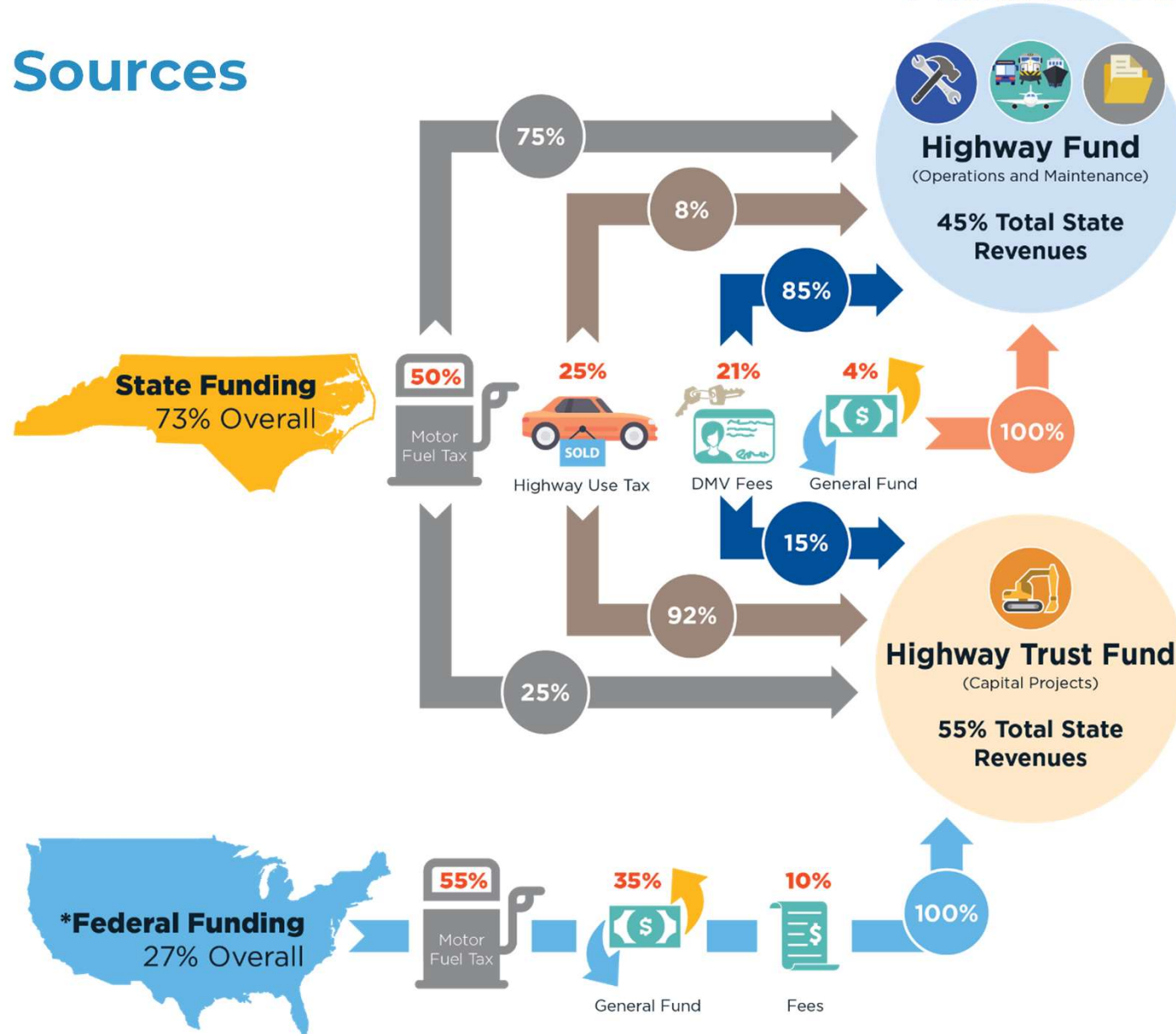


## Iterative Programming Process

**Projects Submitted**

- SPOT Online
- Data reviewed
- Quantitative scores calculated

# DOT Funding Sources



\* IJJA's USDOT FHWA and FTA FFY 2022-23 Allocations

Breakdown between the Highway funds and Highway Trust funds will change in State Fiscal Year 2024 and again in 2029<sup>6</sup>



# STIP Revenues

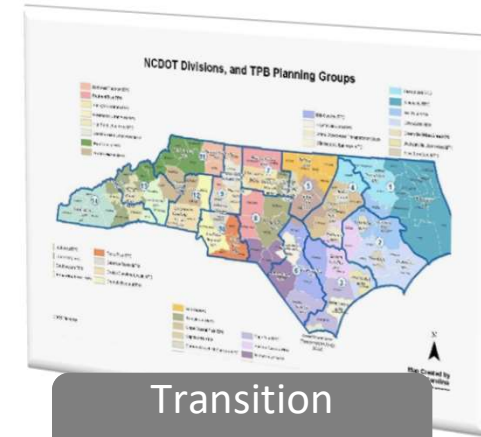


# STIP Expenditures



Items funded prior to allocation to buckets (exempt from STI formula)

- NCTA Gap Funding
- Transfers
- Program Admin.
- NC Ports
- Prelim. Eng.



Bonus Allocation

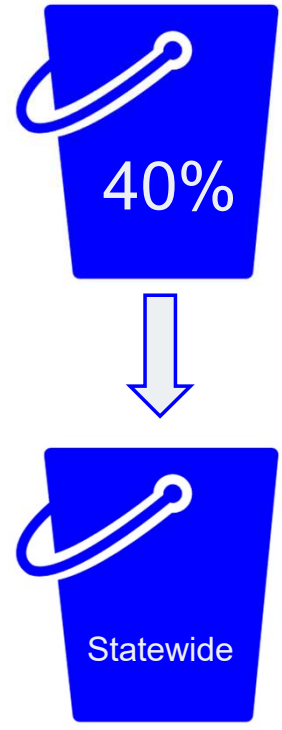
Cost Increases

Transition Projects



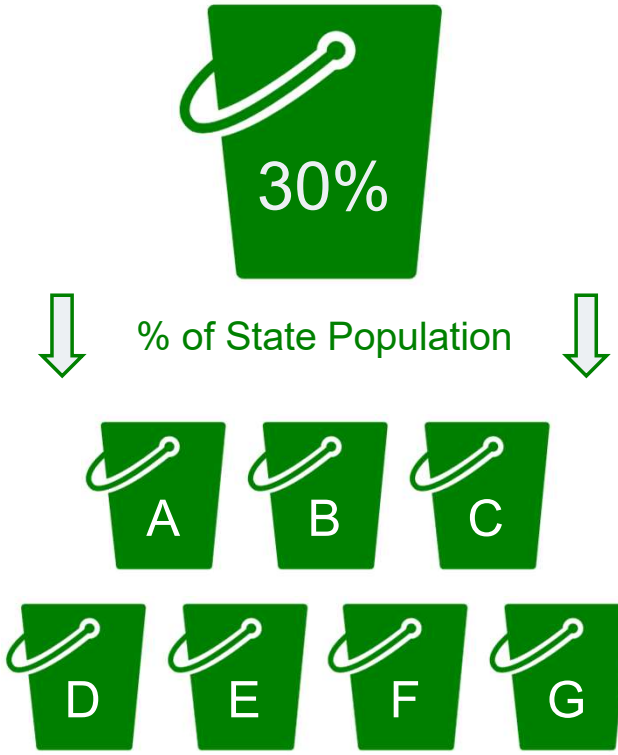
# STIP Funding Distribution

## Statewide Mobility



- Programmed First  
 Interstate Maintenance  
 Bridge Replacement  
 Bridge Rehabilitation  
 Highway Safety  
 Committed Projects

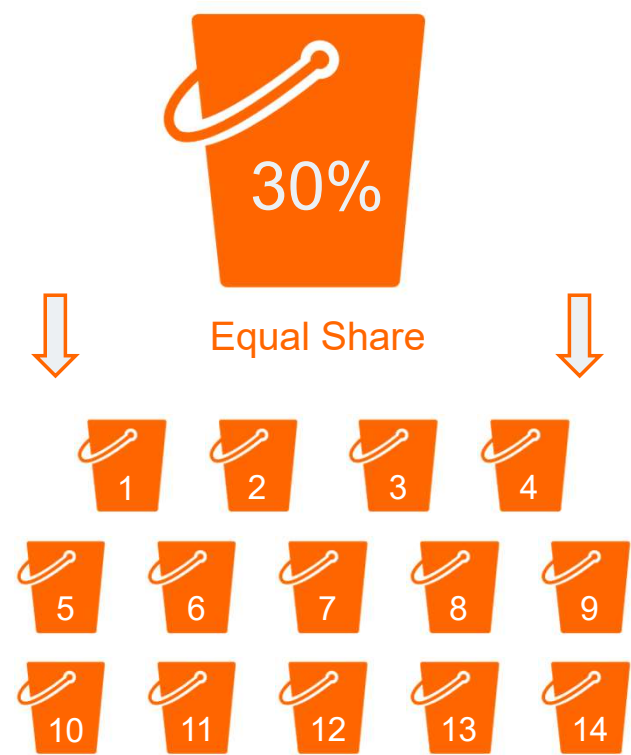
## Regional Impact



- Programmed First (per bucket)  
 Bridge Replacement  
 Bridge Rehabilitation  
 Highway Safety  
 Committed Projects

# Prioritization and Programming Process

## Division Needs



- Programmed First (per bucket)  
 Bridge Replacement  
 Bridge Rehabilitation  
 Highway Safety  
 MPO Direct Attributable  
 Transportation Alternatives  
 Highway-Rail Crossing  
 Economic Development  
 Committed Projects

# Draft 2024-2033 STIP Budget

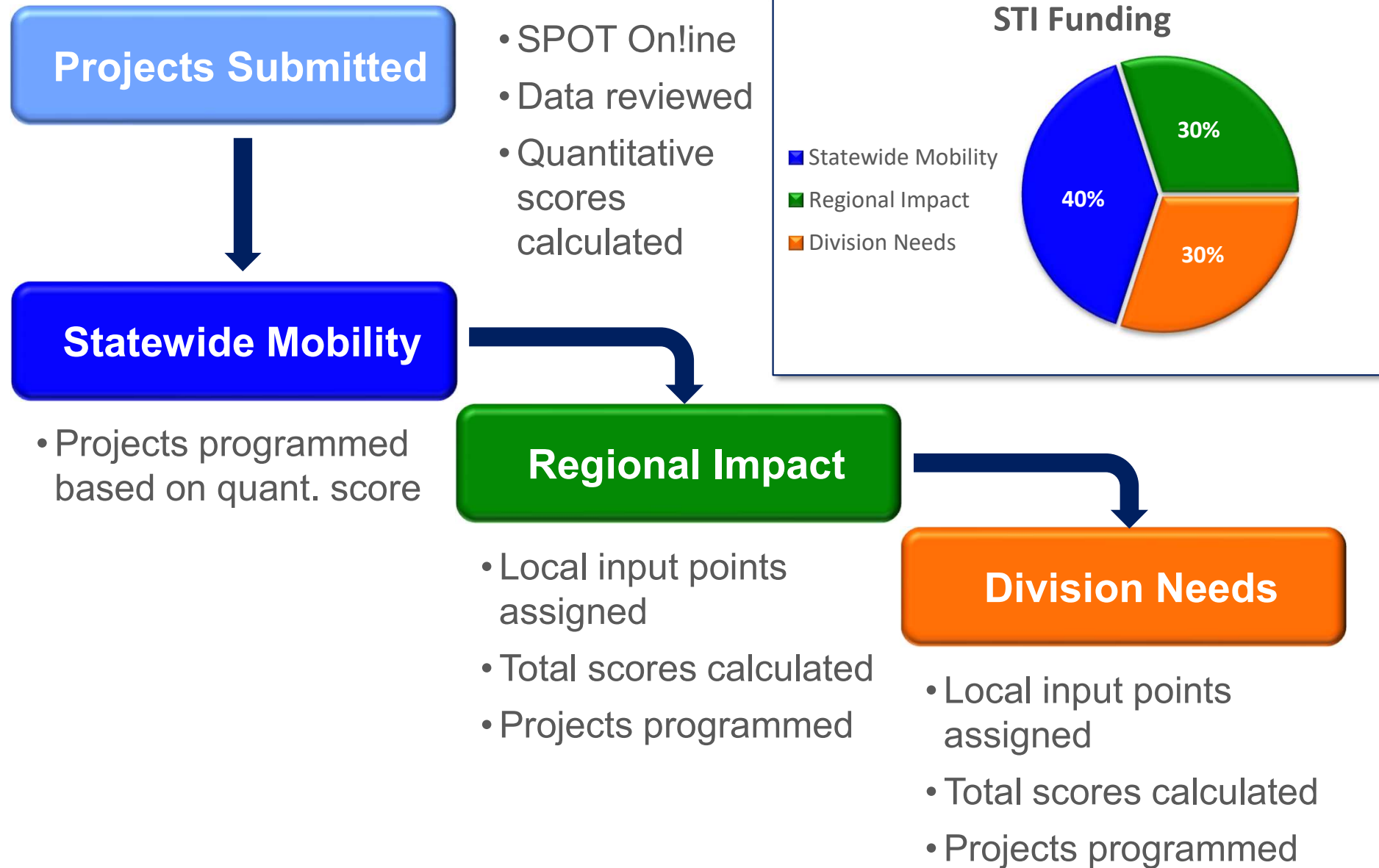
CATEGORY	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
<b>Total State Highway Trust Fund Revenues</b>	<b>\$ 2,164.00</b>	<b>\$ 2,378.00</b>	<b>\$ 2,470.00</b>	<b>\$ 2,544.30</b>	<b>\$ 2,612.00</b>	<b>\$ 2,699.80</b>	<b>\$ 2,792.50</b>	<b>\$ 2,884.00</b>	<b>\$ 2,978.30</b>	<b>\$ 3,074.50</b>
Less Transfers for NCTA GAP Funding	(49.00)	(49.00)	(49.00)	(49.00)	(49.00)	(49.00)	(49.00)	(49.00)	(49.00)	(49.00)
Less Transfer to Highway Fund	(0.40)	(0.40)	(0.40)	(0.40)	(0.40)	(0.40)	(0.40)	(0.40)	(0.40)	(0.40)
Less Program Administration	(50.25)	(55.22)	(57.35)	(59.08)	(60.65)	(62.69)	(64.84)	(66.97)	(69.16)	(71.39)
Less Transfer to State Ports	(45.00)	(45.00)	(45.00)	(45.00)	(45.00)	(45.00)	(45.00)	(45.00)	(45.00)	(45.00)
Less PE	(250.00)	(250.00)	(250.00)	(250.00)	(250.00)	(250.00)	(250.00)	(250.00)	(250.00)	(250.00)
Less State Match for SPR Funds	(9.17)	(9.35)	(9.53)	(9.53)	(9.53)	(9.53)	(9.53)	(9.53)	(9.53)	(9.53)
Net State Trust Fund Revenues	1,760.18	1,969.03	2,058.71	2,131.29	2,197.42	2,283.18	2,373.73	2,463.10	2,555.21	2,649.18
Less Bonus Alloc. for Tolling & Local Participation	\$ (47.91)	\$ (65.12)	\$ (22.77)	\$ (41.06)	\$ (42.12)	\$ (43.84)	\$ (20.20)	\$ (20.20)	\$ (0.20)	\$ -
Subtotal	1,712.28	1,903.92	2,035.94	2,090.22	2,155.30	2,239.34	2,353.53	2,442.90	2,555.01	2,649.18
Less Inflation	(25.68)	(86.53)	(156.39)	(228.08)	(306.90)	(318.86)	(335.12)	(347.85)	(363.81)	(377.22)
<b>Total Available State Trust Funds for Programming</b>	<b>1,686.59</b>	<b>1,817.38</b>	<b>1,879.56</b>	<b>1,862.14</b>	<b>1,848.40</b>	<b>1,920.48</b>	<b>2,018.40</b>	<b>2,095.05</b>	<b>2,191.20</b>	<b>2,271.96</b>
<b>Federal Aid</b>	<b>1,530.50</b>	<b>1,557.00</b>	<b>1,586.00</b>	<b>1,586.00</b>	<b>1,586.00</b>	<b>1,586.00</b>	<b>1,586.00</b>	<b>1,586.00</b>	<b>1,586.00</b>	<b>1,586.00</b>
Less SPR Funds	(36.68)	(37.41)	(38.13)	(38.13)	(38.13)	(38.13)	(38.13)	(38.13)	(38.13)	(38.13)
Less CMAQ	(30.00)	(30.00)	(30.00)	(30.00)	(30.00)	(30.00)	(30.00)	(30.00)	(30.00)	(30.00)
Less ADHS	(16.10)	(16.10)	(16.10)	(16.10)	(16.10)	(16.10)	(16.10)	(16.10)	(16.10)	(16.10)
Less CARBON Reduction	(20.00)	(20.00)	(20.00)	(20.00)	(20.00)	(20.00)	(20.00)	(20.00)	(20.00)	(20.00)
Net Federal Aid Revenues	1,427.72	1,453.49	1,481.77	1,481.77	1,481.77	1,481.77	1,481.77	1,481.77	1,481.77	1,481.77
Less Inflation	(21.42)	(66.06)	(113.82)	(161.69)	(210.99)	(210.99)	(210.99)	(210.99)	(210.99)	(210.99)
<b>Total Available Federal-Aid for Programming</b>	<b>1,406.30</b>	<b>1,387.43</b>	<b>1,367.95</b>	<b>1,320.08</b>	<b>1,270.78</b>	<b>1,270.78</b>	<b>1,270.78</b>	<b>1,270.78</b>	<b>1,270.78</b>	<b>1,270.78</b>
<b>Total Available for Programming (State + Federal)</b>	<b>3,092.90</b>	<b>3,204.81</b>	<b>3,247.51</b>	<b>3,182.23</b>	<b>3,119.18</b>	<b>3,191.25</b>	<b>3,289.18</b>	<b>3,365.83</b>	<b>3,461.98</b>	<b>3,542.74</b>
Less Transition Funding	(45.63)	(16.74)	(9.85)	-	-	-	-	-	-	-
Funds Available to Allocate to Categories	\$ 3,047.26	\$ 3,188.07	\$ 3,237.65	\$ 3,182.23	\$ 3,119.18	\$ 3,191.25	\$ 3,289.18	\$ 3,365.83	\$ 3,461.98	\$ 3,542.74
STATEWIDE	1,218.90	1,275.23	1,295.06	1,272.89	1,247.67	1,276.50	1,315.67	1,346.33	1,384.79	1,417.09
REGIONAL	914.18	956.42	971.30	954.67	935.75	957.38	986.75	1,009.75	1,038.59	1,062.82
LESS STBGDA ON REGIONAL AND STATEWIDE ROUTES	(9.33)	(8.29)	(9.28)	(5.08)	(1.38)	0.00	0.00	0.00	0.00	0.00
REGIONAL TOTAL REVISED	904.85	948.13	962.02	949.59	934.37	957.38	986.75	1,009.75	1,038.59	1,062.82
DIVISION	914.18	956.42	971.30	954.67	935.75	957.38	986.75	1,009.75	1,038.59	1,062.82

(Dollars in Millions)

Note that values only represent a snapshot in time.



# Iterative Programming Process



## Factors in STIP Development

- Prioritization scores
- Modal allocation (Highway vs. Non-Highway) (p.k.a. Normalization)
- Funding category allocations (40% vs. 30% vs. 30%)
  - \$ already reserved for Committed projects
- Project development schedules
- STI funding caps and restrictions



# STI Legislation Funding Caps and Restrictions Impacting Programming



Statewide Mobility corridor cap



Funding limit on light rail and commuter rail projects



Funding limits on Regional Impact transit projects

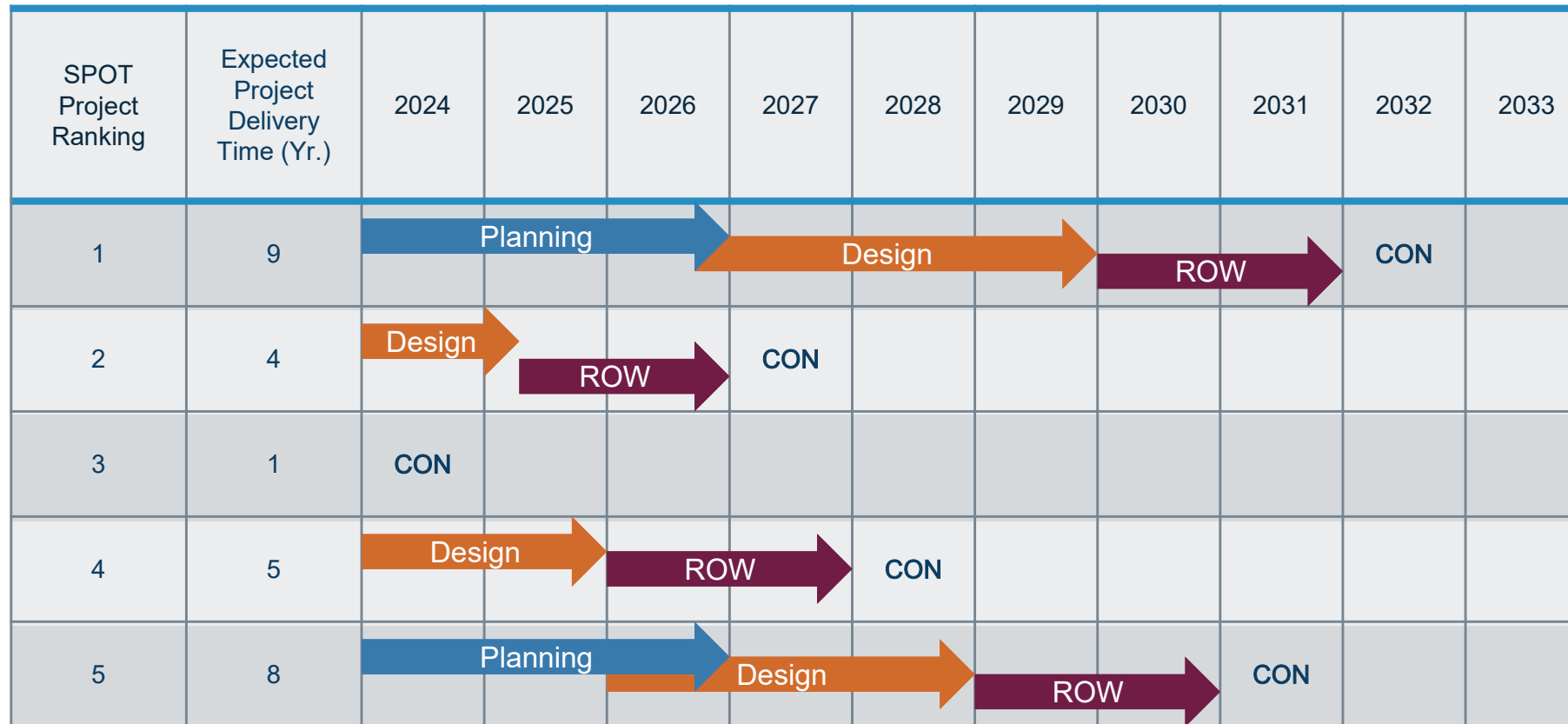


Funding limits on airport projects in all categories






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




## Scheduling Impacts to Programming



- Regardless of priority, projects cannot be programmed for Right of Way (ROW) or Construction prior to completion of planning/environmental (NEPA) and design work
- A lower scoring project that can be delivered soon may get scheduled prior to a higher ranking project that still needs extensive work

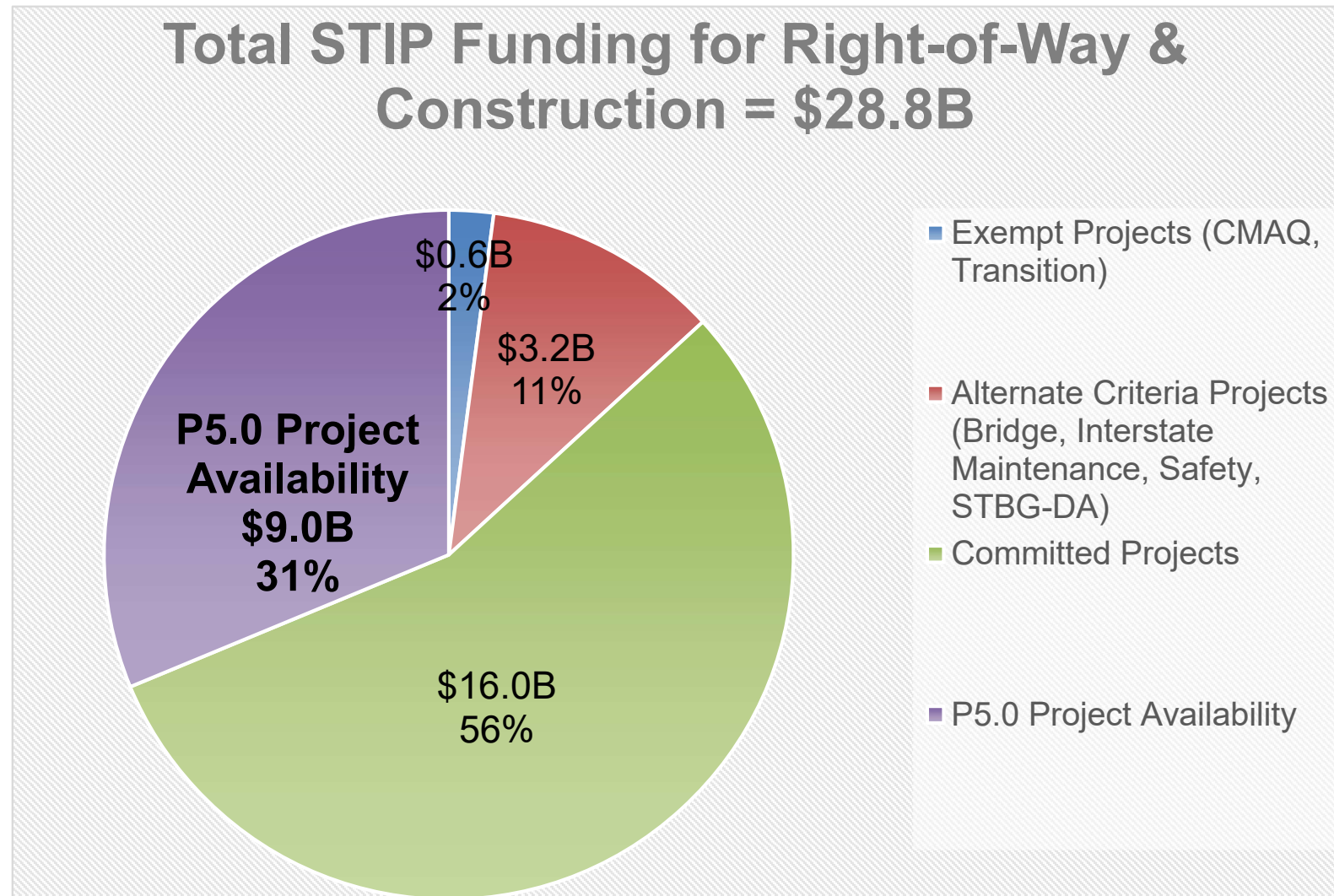
## Annual Funding Balance

Category	2024	2025	2026	2027	2028	Total
Statewide						Budget Target
Regional						Budget Target
Division						Budget Target
	Annual Budget	Annual Budget	Annual Budget	Annual Budget	Annual Budget	

Test	Key	Level	Testing	Threshold
Annual Budget Test		Federal	Annual amount programmed vs annual budget	Per FHWA guidance
Limitation on Variance – 5 year		State	5-year programmed amounts vs budget targets set by law Per statewide, regional and division categories	+/- 15 %
Limitation on Variance – 10 year		State	10-year programmed amounts vs budget targets set by law Per statewide, regional and division categories	+/- 10 %

# 2020-2029 STIP Funding (P4 leading into P5)

[Magnitude comparisons of funding]



# Modal Allocation

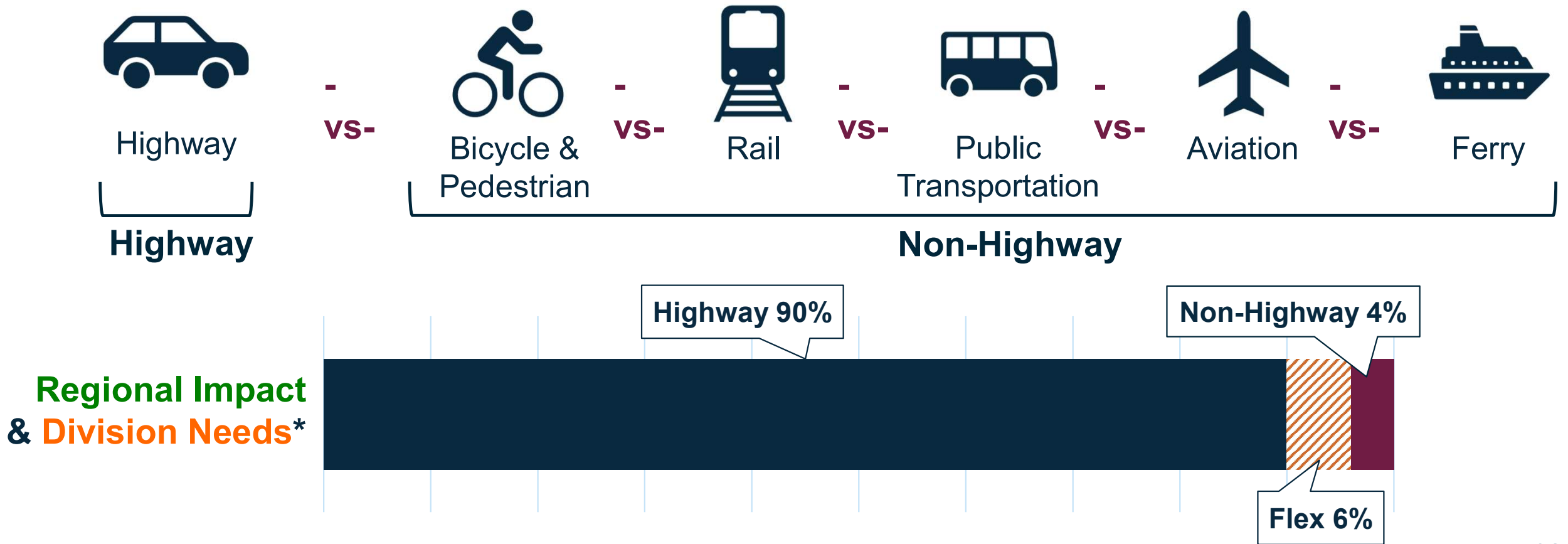
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## P6 Modal Allocation (p.k.a. Normalization)

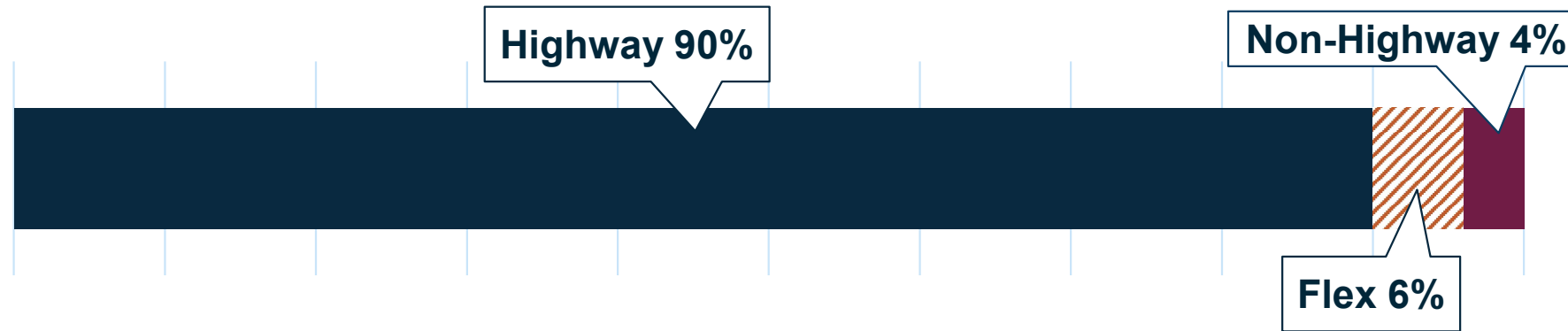
- Challenge: Intent of STI legislation is to fund best transportation projects, regardless of mode; but different criteria and weights are used in each mode
- **Modal Allocation** = Allocation of funds between Highway & Non-Highway Projects



\***Statewide Mobility** – No modal allocation, competition based only on quantitative scores



## P6 Modal Allocation



	Regional Impact	Division Needs
<b>Highway</b>	90% (Region competition)	90% (Division competition)
<b>Non-Highway</b>	4% (Statewide competition)	4% (Division competition)
<b>Flex</b>	6% (Region competition)	6% (Division competition)

## Applying Normalization – Statewide Mobility

### 1. Statewide Competition

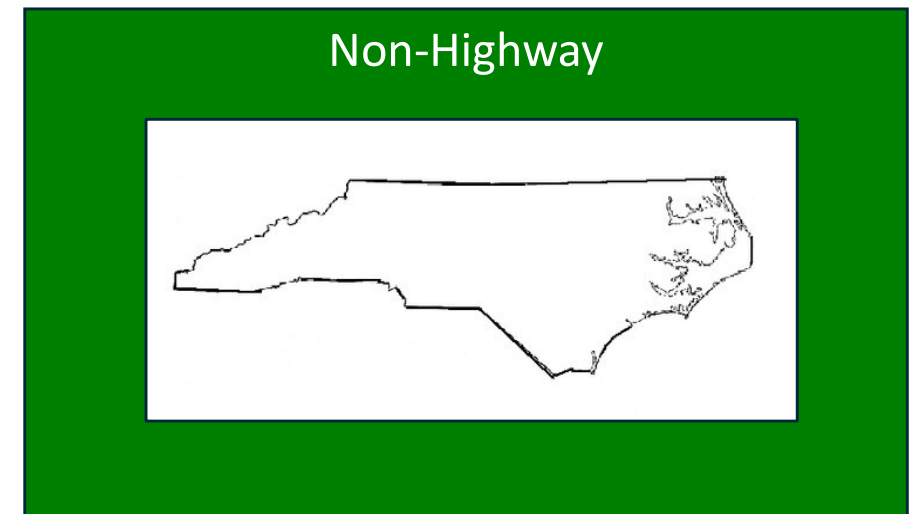
- Determine how much is already spoken for; amount remaining is available for projects in Prioritization
- Sort eligible Highway, Rail, and Aviation projects by score in descending order
- Select projects until available funding is allocated



## Applying Normalization – Regional Impact

### 1. Non-Highway Only (Statewide Competition)

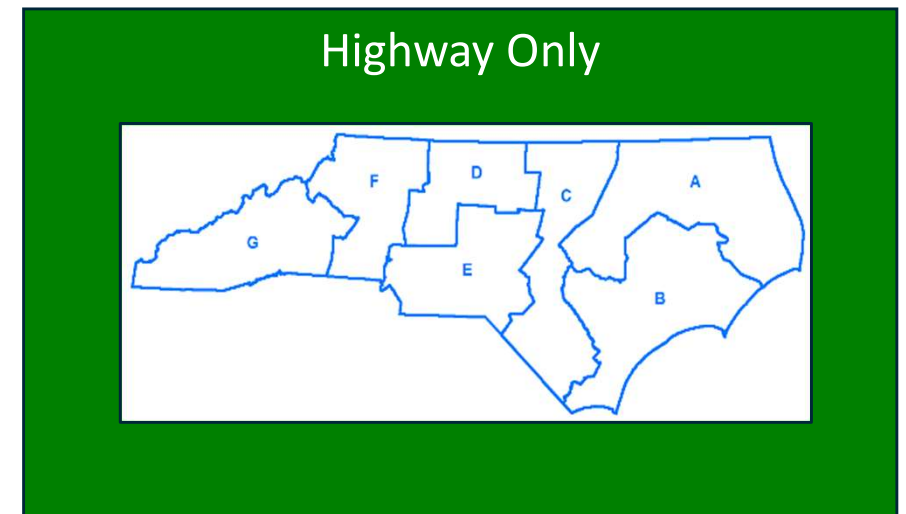
- Determine 4% of total Revised Regional Impact Budget (10-year, adjusted budget based on lookback law)
  - REG budget revised after subtracting DA funds used on SW and REG eligible projects
- Determine how much in 4% Non-Highway is already spoken for (includes committed projects); amount remaining is available for projects in Prioritization
  - Projects funded with STBG-DA and exempt funds (e.g. CMAQ, CRP) are NOT included in the 4% non-highway calculation.
- Sort eligible Non-Highway projects by prioritization cycle and score in descending order
- Select projects until available funding is allocated



## Applying Normalization – Regional Impact

### 2. Highway Only (Regional Competition)

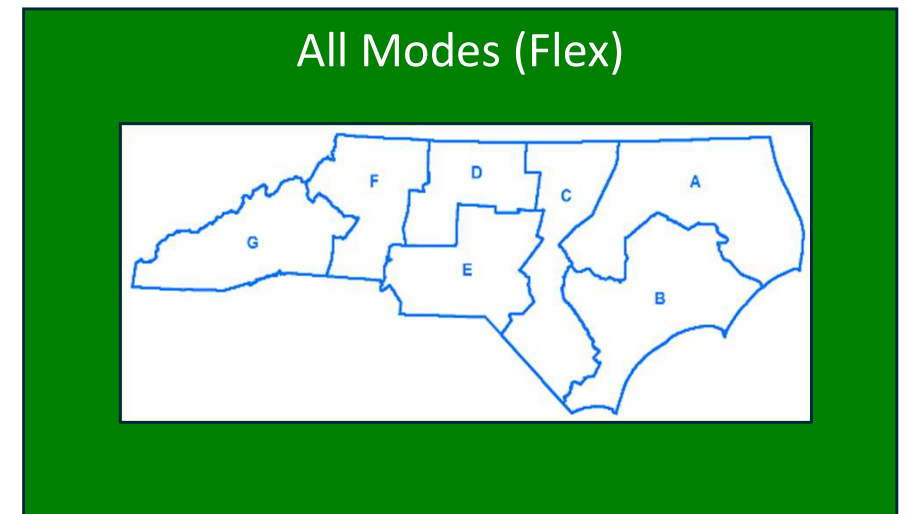
- Set aside 6% of each Region's allocation (10-year, adjusted budget based on lookback law)
- Within each region, subtract amount of Non-Highway programmed (over 10 years)
- Determine how much of remaining is already spoken for (includes committed projects); amount remaining is available for projects in Prioritization
  - Includes Bridge and Safety projects
- Within each Region, sort eligible Highway projects by prioritization cycle and score in descending order
- Select projects until available funding is allocated



## Applying Normalization – Regional Impact

### 3. All-Modes Flex (Regional Competition)

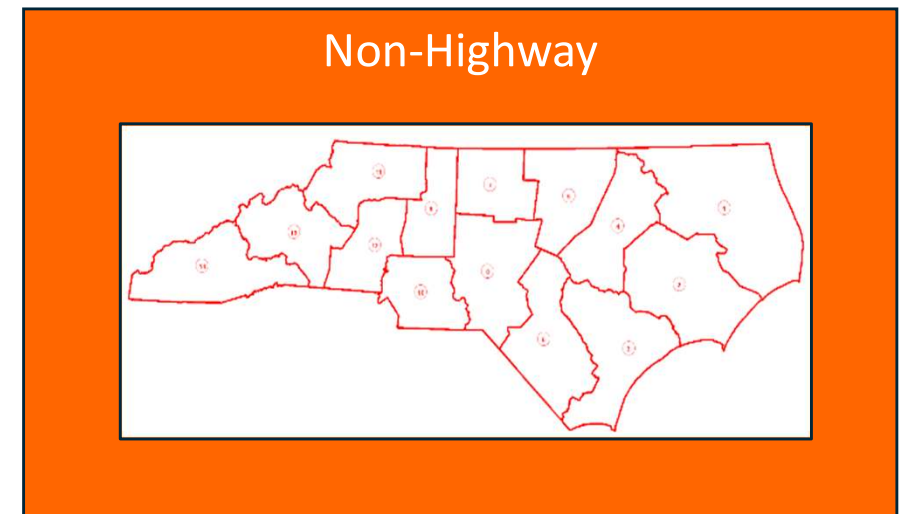
- Determine 6% set aside (10-year, adjusted from step 2)
- Within each Region, sort eligible Highway and Non-Highway projects by prioritization cycle and score in descending order
- Select projects until available funding is allocated



## Applying Normalization – Division Needs

### 1. Non-Highway Only (Division Competition)

- Determine 4% of individual Division Needs Budgets (10-year, adjusted based on lookback law)
- Determine how much is already spoken for (includes committed projects); amount remaining is available for projects in Prioritization
  - STBG-DA and TAP-DA funds are NOT included in the calculation of committed Non-Hwy projects
- Within each Division, sort Non-Highway projects by prioritization cycle and score in descending order
- Select projects until available funding is allocated

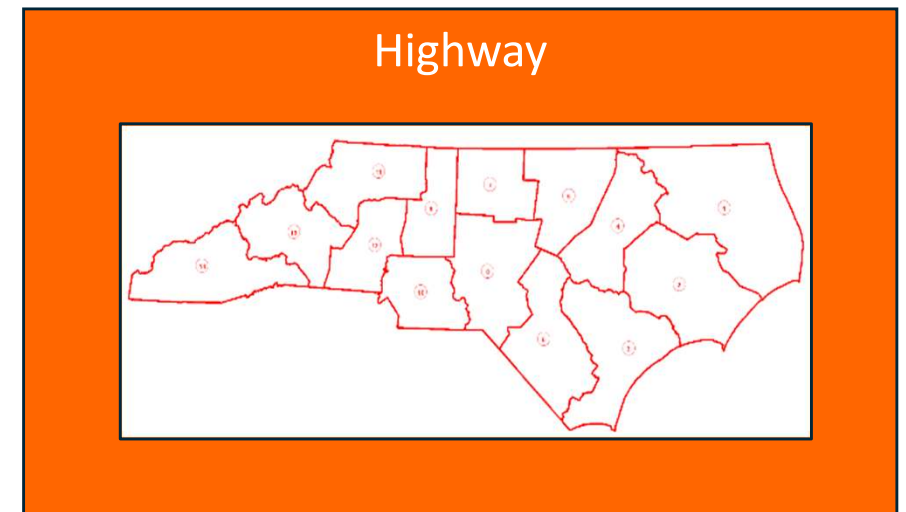




## Applying Normalization – Division Needs

### 2. Highway Only (Division Competition)

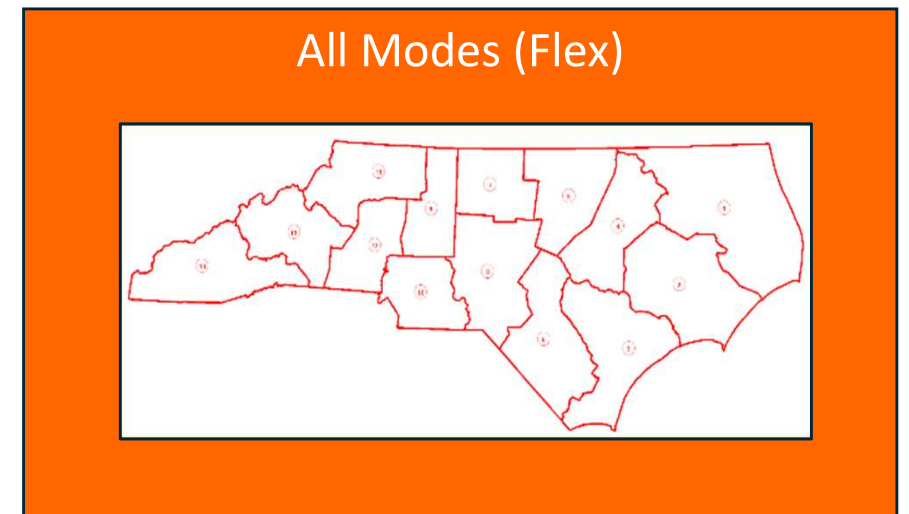
- Set aside 6% of each Division's allocation (10-year, adjusted based on lookback law)
- Within each Division, subtract amount of 4% programmed (over 10 years)
- Determine how much of remaining is already spoken for
  - Includes committed projects, bridge, safety, & economic development
  - Does not include STBG-DA projects
  - Amount remaining is available for projects for Prioritization
- Within each Division, sort Highway projects by prioritization cycle and score in descending order
- Select projects until available funding is allocated



## Applying Normalization – Division Needs

### 3. All-Modes Flex (Division Competition)

- Determine 6% set aside (10-year, adjusted from step 3)
- Within each Division, sort Highway and Non-Highway projects by prioritization cycle and score in descending order
- Select projects until available funding is allocated



# End of Session 3

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**NORTH CAROLINA**  
Department of Transportation

# Session 4: Non-Highway Scoring Details

STI Training

NCDOT SPOT Office

May 31 – June 1, 2023

Connecting people, products and places safely and efficiently with customer focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina

# Contact Information

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# Reminders

MPOs, RPOs, and Divisions are the only project submitters

Communicate, communicate, communicate!

Mode:	Coordinate on project needs with:
Aviation	Airport sponsor NCDOT Division of Aviation
Bicycle/Pedestrian	Local governments
Ferry	NCDOT Ferry Division
Public Transportation	ITRE Transit systems
Rail	NCDOT Rail Division



# NCDOT Modal Contacts

Sarah Lee, SPOT Office

[selee@ncdot.gov](mailto:selee@ncdot.gov)

(919) 707-4742

## Aviation

- Wasan Alkaissi, NCDOT Division of Aviation

[walkaissi@ncdot.gov](mailto:walkaissi@ncdot.gov)

- Airport Project Managers (Regional), NCDOT Division of Aviation

<https://www.ncdot.gov/divisions/aviation/Pages/contact.aspx> (map)

# NCDOT Modal Contacts

## Bicycle/Pedestrian

- Ryan Brumfield, NCDOT Integrated Mobility Division (IMD)  
[rbrumfield@ncdot.gov](mailto:rbrumfield@ncdot.gov)
- Other IMD staff (TBD)

## Ferry

- Cat Peele, NCDOT Ferry Division  
[cdpee@ncdot.gov](mailto:cdpee@ncdot.gov)

# NCDOT Modal Contacts

## Public Transportation

- Ryan Brumfield, NCDOT Integrated Mobility Division (IMD)  
[rmbrumfield@ncdot.gov](mailto:rmbrumfield@ncdot.gov)
- Kai Monast, NCSU ITRE  
[kcmonast@ncsu.edu](mailto:kcmonast@ncsu.edu)

## Rail

- Neil Perry, NCDOT Rail Division  
[nlperry@ncdot.gov](mailto:nlperry@ncdot.gov)
- Alix Demers, NCDOT Rail Division  
[ademers1@ncdot.gov](mailto:ademers1@ncdot.gov)

# Aviation

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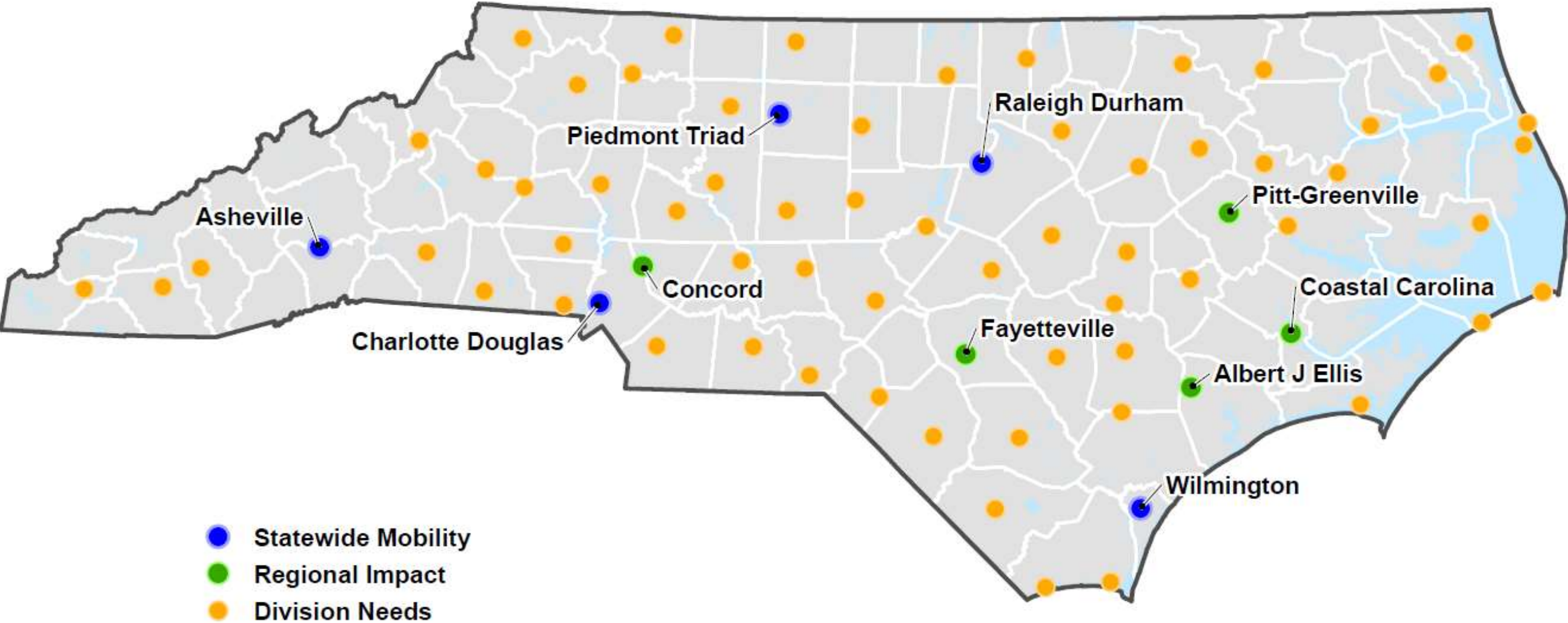


# Project Eligibility

Statewide	Regional	Division
<ul style="list-style-type: none"> <li>• Large Commercial Service airports (375,000 or more enplanements annually)</li> <li>• Funding cap: \$500k / project / year                             <ul style="list-style-type: none"> <li>• Up to 3 years per NCDOT policy</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Commercial Service airports not included in Statewide</li> <li>• Funding cap: \$300k / project / year                             <ul style="list-style-type: none"> <li>• Up to 3 years per NCDOT policy</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• General Aviation airports</li> <li>• Funding cap: \$18.5M annually over entire category</li> </ul>



# Project Eligibility





## Proposed P7 Specific Improvement Types

- 100 - Runway Approach
- 200 - Runway Safety Area
- 300 - Runway Protection Zones
- 500 - Runway Length & WIDTH
- 600 - Pavement Strength
- 800 - Runway Edge Lighting
- 1100 - Taxiway Requirements
- 1200 - Aircraft Apron / Helipad Requirements
- 1300 - General Aviation Terminal Building
- 1400 - Taxiway and Apron Edge Lighting
- 1500 - Airfield Signage
- 1700 - Approach Lighting
- 1900 - Hangars
- 2100 - Perimeter Fencing
- 2200 - Fuel Facilities
- 3000 - Other



# P6 Aviation Scoring

Criteria	Measure Description	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
NCDOA Project Rating	NCDOA Project Rating	40%	30%	25%
FAA ACIP Rating	FAA Airport Capital Improvement Plan (ACIP) rating	30%	15%	10%
Constructability Index	Sum of metrics rating project constructability	10%	10%	5%
Benefit/Cost	(Total Economic Contribution / Cost to NCDOT) + Funding Leverage	20%	15%	10%

# Criteria: NCDOA Project Rating

Funding Category	Criteria Weight
Statewide Mobility	40%
Regional Impact	30%
Division Needs	25%

- **Purpose:** Assigns point values based on priority and need of the project. Utilizes the North Carolina Division of Aviation (DOA) Master Project Categories from the Statewide Airports System Plan.
- **Measure:** NCDOA Project Rating

# Criteria: FAA ACIP Rating

Funding Category	Criteria Weight
Statewide Mobility	30%
Regional Impact	25%
Division Needs	10%

- **Purpose:** The Airport Capital Improvement Plan (ACIP) rating serves as the primary planning tool for the FAA for systematically identifying, prioritizing and assigning funds to critical airport development and associated capital needs for the National Airspace System (NAS)
- **Measure:** Federal Aviation Administration (FAA) Airport Capital Improvement Plan (ACIP) rating

# Criteria: Constructability Index

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

- **Purpose:** Measures project’s readiness for construction
- **Measure:** Sum of 7 metrics rating project constructability
  - Project has 90% design complete at project submission
  - Project has final environmental document complete at project submission
  - Land acquisition requirement
  - Project meets system plan goals
  - Airport DoA Financial Risk Factor Rating
  - Airport has clear approach for each end of primary runway
  - Airport has a legally enforceable protection zone

# Criteria: Constructability Index – Details

Metric	Score		% of Total Criteria Score <i>(Informational)</i>
	Subtotal	Max # of Points	
<b>Project design complete</b> (90% complete at submission of project)		100	30%
<b>Project final environmental document complete</b> at submission of project		80	24%
<b>Land acquisition</b>		60	18%
Construction project and requires land acquisition	0		
Construction project and does not requires land acquisition	60		
Land acquisition only project	60		
<b>Project meets system plan goals</b>		40	12%
No	0		
Only exceeds	20		
Meets or meets and exceeds	40		
<b>Airport DoA Financial Risk Factor Rating</b> (25 points - the rating score)		25	7%
<b>Airport has clear approach for <u>each</u> end of primary runway</b>		20	6%
Has “close in” obstructions	0		
No “close in” obstructions	3		
No obstructions within RSA, including FAA compliant measures	7		
No obstructions within threshold siting surface	9		
No obstructions within Federal Aviation Regulation (FAR) Part 77	10		
<b>Airport has a legally enforceable protection zone</b>		10	3%
Does not have a legally enforceable protection zone	0		
Has a legally enforceable protection zone but does not meet Part 77	5		
Legally enforceable protection zone meets Part 77	10		

**Total** 335 100%



# Criteria: Benefit/Cost

Funding Category	Criteria Weight
Statewide Mobility	20%
Regional Impact	15%
Division Needs	10%

- Purpose:** Measures total economic contribution as a ratio of benefit verses cost

- Measure:** 
$$\left( \frac{\left( \frac{\$ \text{ Econ. Contribution of Airport}}{\text{Total \# of IFR Ops of Airport}} \right) * \text{NCDOA Capital Project Rating}}{\text{Cost to NCDOT}} + \left( \frac{\text{Other Funds}}{\text{Total Project Cost}} \right) \times 100 \right)$$

# Bicycle & Pedestrian

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# Project Eligibility and Requirements

- Minimum total project cost = \$100,000
- Eligible costs include preliminary engineering, right-of-way, utilities, and construction
- 20% of total project cost is currently required as non-federal match by local governments
  
- Project must be included in an adopted plan
  - Includes adopted bicycle plans, greenway plans, pedestrian plans, Safe Routes to School action plans, comprehensive transportation plans (CTPs), and long-range transportation plans

## P6 Specific Improvement Types

- 1 - Grade-Separated Bicycle Facility (Bicycle)
- 2 - Off-Road/Separated Linear Bicycle Facility (Bicycle)
- 3 - On-Road; Designated Bicycle Facility (Bicycle)
- 4 - On-Road Bicycle Facility (Bicycle)
- 5 - Multi-Site Bicycle Facility (Bicycle)
- 6 - Grade-Separated Pedestrian Facility (Pedestrian)
- 7 - Protected Linear Pedestrian Facility (Pedestrian)
- 8 - Multi-Site Pedestrian Facility (Pedestrian)
- 9 - Improved Pedestrian Facility (Pedestrian)



## P6 Bicycle and Pedestrian Scoring

Criteria	Measure Description	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
Safety	(Number of crashes x 40%) + (Crash severity x 20%) + (Safety risk x 20%) + (Project safety benefit x 20%)	N/A	N/A	20%
Accessibility/ Connectivity	Points of Interest pts + Connections pts + Route pts	N/A	N/A	15%
Demand/Density	# of households and employees per square mile near facility	N/A	N/A	10%
Cost Effectiveness	(Safety + Accessibility/Connectivity + Demand/Density) / Cost to NCDOT	N/A	N/A	5%

# Criteria: Safety

Funding Category	Criteria Weight
Statewide Mobility	N/A
Regional Impact	N/A
Division Needs	20%

- **Purpose:** Identify projects that provide improved or alternative traveling options that reduce the risk of vehicle and bicycle/pedestrian crashes and create a safer transportation environment for users
  
- **Measure:** Number of crashes \* 40% +  
Crash severity \* 20% +  
Safety risk \* 20% +  
Safety benefit \* 20%



# Safety Measures

- **Number of Crashes: 40% weight:**
  - Bicycle and pedestrian crashes within last 5 years along the corridor
  
- **Crash Severity: 20% weight**
  - Average of severity rating among number of crashes
  
- **Safety Risk: 20% weight**
  - Utilizes ATLAS data to calculate safety risk score for each roadway segment based on various factors and crash history (see following score table)
  
- **Safety Benefit: 20% weight**
  - Score for each project type (see following lookup table)

# Safety Measures: Safety Risk

- Analysis based on all bicycle and pedestrian crashes to identify scores per risk factor, weighted to calculate total score per roadway segment
- Geoprocessed in SPOT On!ine
- Higher exposure = higher risk = higher score

Risk Factor	Background	Notes	Weight
Location within an incorporated area (incl. ETJ)	Overall descriptor for crash locations	Preferred over urbanized/non-urbanized; similar to land use results	10
Surrounding land uses	More refined context descriptor for crash locations, indicates travel	Residential/Commercial rank highest; Agri/Vacant, Institutional, Other lower categories	20
Roadway configuration	Median without positive control OR one-way may indicate longer crossing distances	Heavy emphasis on two-way, undivided roadways (over one-way or divided roadways)	20
Posted speed limit	Indicator for risk for severe or fatal crashes	25, 35 mph rank highest; 45, 55 mph mid-tier; 60+ mph lowest scores	20
Annual average daily traffic	Indicates increase risk for crash (exposure)	Highest scores to 15,000-40,000; Mid-tier scores for (2,000-6,000), (6,000-9,000), (9,000-15,000); Lowest scores for roads <2,000 or >40,000	30

# Safety Measures: Safety Benefit

Bicycle	SIT	Pedestrian	SIT	Score
New Bicycle/Pedestrian Bridge, New Bicycle/Pedestrian Tunnel, Rail-Trail, Shared-Use Path / Multi-Use Path	1, 2	New Pedestrian Bridge, New Pedestrian Tunnel, Rail-Trail, Shared-Use Path / Multi-Use Path	6, 7	7
Buffered Bicycle Lane, Contra-Flow Bicycle Lanes, Separated Bike Lane, Sidepath	2	Sidepath, Sidewalk	7	6
Bicycle Lane	3	Sidewalk Widening, Trail Improvement	9	5
Paved Shoulder	4	Crossing Island, Curb Extensions, Streetscape / Corridor Improvements	8,9	4
Bicycle Detection / Actuation, Bicycle Signal, Curb Raddi Revisions, Hybrid Beacon, Intersection Markings / Signage, Lighting, Mid-Block Crossing	5	Accessible Pedestrian Signals, Curb Ramp, Lighting, Marked Crosswalk, Mid-Block Crossing, Pedestrian Hybrid Beacon, Pedestrian Signal, Rectangular Rapid Flashing Beacon	8	3
Shared Lane Marking ("Sharrows"), Signage	4			2
Bicycle Corral, Bicycle Parking, Bicycle Share / Micro-Mobility Share, Bicycle Wheel Channel, Wayfinding	5	Wayfinding	8	1

# Criteria: Accessibility/Connectivity

Funding Category	Criteria Weight
Statewide Mobility	N/A
Regional Impact	N/A
Division Needs	15%

- **Purpose:** Identify projects that:
  - Provide access to nearby points of interest
  - Improve connectivity between destinations
  - Improve connectivity of bicycle/pedestrian network
  - Improve access and continuity of designated bicycle routes

• **Measure:**  $\left( \begin{array}{l} \text{POI \# total} \\ \text{(no cap)} \end{array} + \begin{array}{l} \text{Connection \# total} \\ \text{(no cap/average)} \end{array} + \begin{array}{l} \text{Route \# total} \end{array} \right)$

## Accessibility/Connectivity Measures: Points of Interest (POI)

- **Utilizes ATLAS data and other data layers to measure number of points of interest within project buffer**
  - Buffer = 1.5 miles for bicycle (SITs 1-5), 0.5 miles for pedestrian (SITs 6-9)
- **POI categories automatically measured within SPOT On!ine:**
  - Government buildings
  - Fire/EMS
  - Transit routes
  - Schools (K-12, public/private), universities, colleges
  - Parks (national, state, local)
  - Tourist destinations (historic districts, major sports)
  - Medical (hospitals and public/private clinics)
  - Places of worship
  - Adult education centers
  - **Grocery stores, convenience stores, and pharmacies (P7)**
- **POI categories manually added by project submitters:**
  - Employment centers
  - Tourist destinations (museums, theaters, auditoriums, historic landmarks)
  - Shelters

## Accessibility/Connectivity Measures: Connectivity

- **Points totaled for connections made by project to various degrees of bicycle/pedestrian infrastructure/projects**
  - Connections allowed at either end of project or anywhere along project
    - Not required to have connection at endpoints
  - 1 point per each connection to Existing bike/ped infrastructure or Committed bike/ped projects
    - Committed = in STIP or with local funds
  - 1 point (max) for any connections to bike/ped projects in a plan
- **Connections to be entered manually by project submitters**
- **ATLAS PBIN (Pedestrian Bicycle Infrastructure Network)** to be utilized as reference layer
  - Displays existing and planned infrastructure



## Accessibility/Connectivity Measures: Designated Routes

- **Points assigned if project is improving National/State/Regional bike route or designated state/federal trails**
  - 2 points if project is on/improves a designated route
  - 1 point if project connects to a designated route

# Criteria: Demand / Density

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

- **Purpose:** Identify projects in areas where the presence of higher concentrations of residents and employees can potentially benefit a higher number of users
- **Measure:** Population per square mile \* 50% +  
Employees per square mile \* 50%
- **Notes:**
  - Population and employees measured within 1.5 mi for bicycle projects
  - Population and employees measured within 0.5 mi for pedestrian projects
  - Population includes factor for unoccupied housing units (second homes) + group housing, excluding prisons

# Criteria: Cost Effectiveness

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

- Purpose:** Measures other criteria scores combined to generate a user benefit compared to the cost to NCDOT

- Measure:** 
$$\left( \frac{\text{(Safety + Accessibility/Connectivity + Demand/Density)}}{\text{Cost to NCDOT}} \right)$$

# Ferry

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# Project Eligibility

Statewide	Regional	Division
Not Eligible	<ul style="list-style-type: none"><li>• New Installation of Ramp &amp; Gantry (Capacity Expansion)</li><li>• Bulkhead Expansion (associated with Capacity Expansion)</li><li>• Additional Mooring Slips (to accommodate Capacity Expansion)</li><li>• New (Capacity Expansion) Ferry (River or Sound Class)</li></ul>	<ul style="list-style-type: none"><li>• Replacement of Ferry (River, Hatteras, or Sound Class)</li><li>• Replacement of Support Vessels (Barges, Tugs, etc.)</li></ul>



# P7 Updates to Specific Improvements

Purpose: Current list of Ferry SITs is not complete for all potential needs of the Ferry system

<u>P6</u>	<u>P7 updates (new/edits in green)</u>
1 - Replacement Vessel (Support Fleet) - Tug	1 - Replacement Vessel (Support Fleet) - Tug
2 - Replacement Vessel (Support Fleet) - Barge	2 - Replacement Vessel (Support Fleet) - Barge
3 - Replacement Vessel - River Class Ferry	# - Replacement Vessel – Dredge
4 - Replacement Vessel - Sound Class Vessel	3 - Replacement Vessel - River Class Ferry (like for like)
5 - Replacement Vessel - Passenger	4 - Replacement Vessel - Sound Class Vessel (like for like)
6 - New River Class Vessel (to increase capacity)	5 - Replacement Vessel - Passenger (like for like)
7 - New Sound Class Vessel (to increase capacity)	# - Replacement Vessel – Hatteras Class (to increase capacity)
8 - New Passenger Vessel (to increase capacity)	6 - New River Class Vessel (to increase capacity)
9 - New Ramp & Gantry (to increase capacity)	7 - New Sound Class Vessel (to increase capacity)
10 - Port Expansion (to increase capacity)	8 - New Passenger Vessel (to increase capacity)
11 - Other shipyard infrastructure	9 - New Ramp & Gantry (to increase capacity)
	10 - Port Expansion (to increase capacity)
	11 - Other Terminal or Shipyard Infrastructure
	## - Terminal Replacement
	## - New Terminal & Vessel
	## - New Terminal



# P7 Updates to Routes

Purpose: Current list of Ferry routes is not complete for all potential needs of the Ferry system

<u>P6</u>	<u>P7 updates (new/edits in green)</u>
Southport - Ft Fisher	Southport - Ft Fisher
Cherry Branch - Minnesott	Cherry Branch - Minnesott
Aurora - Bayview	Aurora - Bayview
Currituck - Knotts Island	Currituck - Knotts Island
Hatteras - Ocracoke (South Dock) - vehicle	Hatteras - Ocracoke (South Dock) - vehicle
Cedar Island – Ocracoke (Silver Lake)	Cedar Island – Ocracoke (Silver Lake)
Swan Quarter – Ocracoke (Silver Lake)	Swan Quarter – Ocracoke (Silver Lake)
Statewide: Support Vessel	Statewide: Support Vessel
Hatteras – Ocracoke (Silver Lake) – passenger	Hatteras – Ocracoke (Silver Lake) – passenger
New route	<i>New route</i>
	<i>Consideration of including Terminals, including New</i>
	<i>Consideration of Stumpy Point – Rodanthe (emergency)</i>



## P6 Ferry Scoring

Criteria	Measure Description	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
Asset Condition	100 - Asset Condition Rating	N/A	15%	15%
Benefits	Number of hours (in \$) saved compared to driving	N/A	10%	10%
Accessibility/ Connectivity	# of nearby Points of Interest	N/A	10%	10%
Asset Efficiency	3-year maintenance cost / 3-year replacement cost	N/A	15%	15%
Capacity/ Congestion	% of vehicles left behind at each departure compared to total carried by the route	N/A	20%	-

# Criteria: Asset Condition

Funding Category	Criteria Weight
Statewide Mobility	N/A
Regional Impact	15%
Division Needs	15%

- **Purpose:** Integrity of asset condition
- **Measure:** 100 - Asset Condition Rating
- **Source:** Ferry Division (Vessel Health Ratings)
- **Note:** Vessels reviewed annually, full inspections completed every three years

# Criteria: Benefits

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

- **Purpose:** Project benefits based on monetized travel time savings due to VMT reduction
- **Measure:** Monetized value of number of hours saved
- **Source:** Ferry Division via National Mapping Software

# Criteria: Accessibility/Connectivity

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

- **Purpose:** Determine the level of connectivity and accessibility per route, in regards to connecting people to their intended destinations (jobs, services, and other points of interest)
- **Measure:** The number of POI (points of interest) within 3 concentric rings of the route (10, 20, & 30 miles) is determined, scaled by a multiplying factor (75% for Ring 1, 50% for Ring 2, 25% for Ring 3), and totaled
- **Source:** Points of Interest as counted from maps of the important destination within the pre-determined circles of influence. These maps are generated in collaboration between NCDOT and NC Department of Commerce GIS personnel.

# Criteria: Asset Efficiency

Funding Category	Criteria Weight
Statewide Mobility	N/A
Regional Impact	15%
Division Needs	15%

- **Purpose:** Cost effectiveness of maintenance for the asset vs. replacement of the asset. Maintenance costs at 60% of replacement cost is critical.
- **Measure:** 3-year maintenance cost / pro-rated 3-year replacement cost
- **Source:** SAP/BSIP and like purchase histories



# Criteria: Capacity/Congestion

Funding Category	Criteria Weight
Statewide Mobility	N/A
Regional Impact	20%
Division Needs	0%

- **Purpose:** Evaluation of traffic left and number of trips. Indicates need to enhance capacity and reduce congestion.
- **Measure:** Percentage of the number of vehicles left behind at each departure compared to the total number of vehicles loaded and carried by the route (in a year time frame)
- **Source:** Based on monthly traffic report
- **Note:** The Ferry Division acknowledges that this is not the preferred methodology for collecting this data, but until such time that an investment into hardware and software to calculate this data in a more accurate manner is addressed, this is the best methodology available.

# Public Transportation

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# Project Eligibility and Requirements

- Project eligibility based on STI law

	Statewide	Regional	Division
<b>Public Transportation</b>	N/A	“Service spanning two or more counties and serving more than one municipality” (based on route and not provider)	“Service not included in Regional”; “Multimodal terminals and stations serving passenger transit systems” (includes <u>all facilities</u> )

- Minimum total project cost = \$40,000
- Replacement vehicles funded through other methods
- Allowed to request between 10% and 90% of total project cost (up to legislative cap)

# Project Categories

- Projects are scored in 3 separate categories:
  1. Mobility (Route-Specific)
  2. Demand-Response
  3. Facility
  
- Project measures will be scaled within each criteria, separately within each project category

	<u>Mobility</u>	<u>Demand Response</u>	<u>Facility</u>
<b>Impact</b>	Scale	Scale	Scale
<b>Demand / Density</b>	Scale	Scale	Scale
<b>Efficiency</b>	Scale	Scale	Scale
<b>Cost Effectiveness</b>	Scale	Scale	Scale

# Specific Improvement Types

- 1 - Mobility (route-specific) - New Service
- 2 - Mobility (route-specific) - Headway Reduction
- 3 - Mobility (route-specific) - Extension
- 4 - Demand Response
- 5 - Facility - Passenger Station
- 6 - Facility - Stop/Shelter
- 7 - Facility - Park and Ride
- 8 - Facility - Administrative
- 9 - Facility - Maintenance



# P6 Public Transportation Scoring – Mobility

Criteria	Measure Description	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
Impact	Number of trips generated by project	N/A	15%	10%
Demand/ Density	Total Trips / Service population	N/A	20%	10%
Efficiency	Total trips / Total revenue seat hours	N/A	10%	10%
Cost Effectiveness	Additional trips / (Cost to NCDOT / Lifespan of project)	N/A	25%	20%

Project Types:

- Route-specific vehicles (new or expansion only)
  - Fixed guideway vehicles, fixed route vehicles, deviated fixed route vehicles
- Corridors
  - Fixed guideway (commuter rail, intercity rail, light rail)
  - Bundle of vehicle + other (ex. stops / shelters, park and rides, bus pullouts)
  - Bus Rapid Transit (BRT)
  - Bus on Shoulder System (BOSS) / Busway



# Criteria: Impact

Funding Category	Criteria Weight
Statewide Mobility	N/A
Regional Impact	15%
Division Needs	10%

**Purpose:** Measure the number of trips generated by the project

**Measure:** New routes:  $\left( \begin{array}{c} \text{Additional annual trips} \\ \text{[project]} \end{array} \right)$

Headway Reduction:  $\left( \begin{array}{c} \text{Additional annual trips} + \text{Relieved existing annual trips} \\ \text{[project]} \qquad \qquad \qquad \text{[route]} \end{array} \right)$

**Notes:** Additional Trips = 10 years in the future with new/expanded service (2029)

# Criteria: Demand / Density

Funding Category	Criteria Weight
Statewide Mobility	N/A
Regional Impact	20%
Division Needs	10%

**Purpose:** Measure the total trips on the route compared to the population serviced by the route

**Measure:**

$$\left( \frac{\text{Existing annual trips [route]} + \text{Additional annual trips [project]}}{\text{Service population [route]}} \right)$$

**Notes:** Additional Trips = 10 years in the future with new/expanded service (2029)

# Criteria: Efficiency

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

**Purpose:** Measure the total trips on the route with the project in place compared to the total revenue-seat-hours on the route with the project in place

**Measure:**

$$\left( \frac{\text{Existing annual trips [route]} + \text{Additional annual trips [project]}}{\left( \text{Existing annual revenue hours [route]} + \text{Additional annual revenue hours [project]} \right) \times \left( \text{Existing seats [route SUM]} + \text{Additional seats [project SUM]} \right)} \right)$$

**Notes:** Additional Trips = 10 years in the future with new/expanded service (2029)

# Criteria: Cost Effectiveness

Funding Category	Criteria Weight
Statewide Mobility	N/A
Regional Impact	25%
Division Needs	20%

**Purpose:** Measure the additional trips generated by the project compared to the annualized cost to NCDOT

**Measure:** 
$$\left( \frac{\text{Additional annual trips [project]}}{\text{Cost to NCDOT / Lifespan of project}} \right)$$

**Notes:** Additional Trips = 10 years in the future with new/expanded service (2029)



# P6 Public Transportation Scoring – Demand Response

Criteria	Measure Description	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
Impact	Number of trips affected by project	N/A	10%	10%
Demand/ Density	Total hours with the project in place / Service population	N/A	20%	15%
Efficiency	Vehicle Utilization Ratio	N/A	15%	10%
Cost Effectiveness	Additional trips / (Cost to NCDOT / Lifespan of project)	N/A	25%	15%

Project Types:

- Demand Response vehicles (expansion only)
  - No facilities – either submit Demand Response facilities under Facility category or under Mobility category if bundled with a vehicle
  - Clarified for P7 – Demand Response includes MicroTransit service purchases (vehicles and software)

# Criteria: Impact

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

**Purpose:** Measure the number of trips generated by the project

**Measure:**  $\left( \begin{array}{c} \text{Additional annual trips} \\ \text{[project]} \end{array} \right)$

**Notes:** Additional Trips = 10 years in the future with new/expanded service (2029)

# Criteria: Demand / Density

Funding Category	Criteria Weight
Statewide Mobility	N/A
Regional Impact	20%
Division Needs	15%

**Purpose:** Measure the total hours of the system compared to the population serviced by the system

**Measure:**

$$\left( \frac{\text{Existing annual hours [system]} + \text{Additional annual hours [project]}}{\text{Service population [system]}} \right)$$

**Notes:** Additional Trips = 10 years in the future with new/expanded service (2029)

Service Population = county areas not served by fixed routes (3/4 mile within fixed route)



# Criteria: Efficiency

Funding Category	Criteria Weight
Statewide Mobility	N/A
Regional Impact	15%
Division Needs	10%

**Purpose:** Measure the utilization ratio of the system

**Measure:** 
$$\left( \frac{\text{Number of vehicles in maximum service}}{\text{Number of vehicles in total fleet}} \right)$$

# Criteria: Cost Effectiveness

Funding Category	Criteria Weight
Statewide Mobility	N/A
Regional Impact	25%
Division Needs	15%

**Purpose:** Measure the additional trips generated by the project compared to the annualized cost to NCDOT

**Measure:** 
$$\left( \frac{\text{Additional annual trips [project]}}{\text{Cost to NCDOT / Lifespan of project}} \right)$$

**Notes:** Additional Trips = 10 years in the future with new/expanded service (2029)



## P6 Public Transportation Scoring – Facility

Criteria	Measure Description	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
Impact	Number of trips affected by project	N/A	N/A	15%
Demand/ Density	Ridership Growth Trend for the Previous 5 Years	N/A	N/A	10%
Efficiency	Efficiency Score	N/A	N/A	10%
Cost Effectiveness	Additional trips / (Cost to NCDOT / Lifespan of project)	N/A	N/A	15%

Project Types:

- Passenger stations
  - Clarified for P7 – includes Mobility Hubs with Transit service
- Individual or bundled stops/shelters
- Individual or bundled park and ride lots
- Administration/Maintenance buildings

# Criteria: Impact

Funding Category	Criteria Weight
Statewide Mobility	N/A
Regional Impact	20%
Division Needs	15%

**Purpose:** Measure the number of trips generated by the project

**Measure:**  $\left( \begin{array}{c} \text{Additional annual trips} \\ \text{[project]} \end{array} \right)$

**Notes:** Additional Trips = 10 years in the future with new/expanded service (2029)  
Administrative / Maintenance Facilities: facility data is converted into trips

# Criteria: Demand / Density

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

**Purpose:** Measure the growth in ridership for the system over the previous 5 years

**Measure:**  $\left( \begin{array}{c} \text{Ridership Growth Trend for} \\ \text{the Previous 5 Years} \\ \text{[system]} \end{array} \right)$

# Criteria: Efficiency

Funding Category	Criteria Weight
Statewide Mobility	N/A
Regional Impact	15%
Division Needs	10%

**Purpose:** Measure the efficiency of the result of the project

**Measure:** Utilizes lookup table

Passenger stations, stops/shelters, park and rides: Total annual trips at the facility with the project in place

$$\left( \begin{array}{l} \text{Existing annual trips} + \text{Additional annual trips} \\ \text{[facility]} \qquad \qquad \qquad \text{[project]} \end{array} \right)$$

Administrative facilities: Square footage per total FTE (includes operators)

Maintenance facilities: Number of vehicles per bay at planned fleet size

**Notes:** Additional Trips = 10 years in the future with new/expanded service (2029)

# Efficiency Score (Passenger Facilities)

<u>Stops/Shelters</u>	<u>NEW Station or Park and Ride</u>	<u>EXPANSION Station or Park and Ride</u>	<u>Points</u>
Total Annual Trips with project (per shelter) [facility(ies)]	Total Annual Trips with project [facility]	Total Annual Trips with project [facility]	
>20,000	>50,000	>100,000	6
15,001 - 20,000	37,501 - 50,000	75,001 - 100,000	5
10,001 - 15,000	25,001 - 37,500	50,001 - 75,000	4
5,001 - 10,000	12,501 - 25,000	25,001 - 50,000	3
1 - 5000	1 - 12,500	1 - 25,000	2
0	0	0	1

- Higher trips = higher points
- Values based on future conditions with project in place



# Efficiency Score (Administrative or Maintenance Facilities)

<u>Administrative Facility</u>	<u>Maintenance Facility</u>	<u>Points</u>
Sq.Ft. per total FTE (includes operators) [facility]	Vehicles per bay at planned fleet size [facility]	
150 - 350	8 - 10	6
75 - 149 or 351 - 425	6 - 7.9 or 10.1 - 12	4
<75 or >425	<6 or >12	2

- Highest score is based on optimum facility values
- Values based on future conditions with project in place

# Criteria: Cost Effectiveness

Funding Category	Criteria Weight
Statewide Mobility	N/A
Regional Impact	25%
Division Needs	15%

**Purpose:** Measure the additional trips generated by the project compared to the annualized cost to NCDOT

**Measure:** 
$$\left( \frac{\text{Additional annual trips [project]}}{\text{Cost to NCDOT / Lifespan of project}} \right)$$

**Notes:** Additional Trips = 10 years in the future with new/expanded service (2029)

Administrative / Maintenance Facilities: facility data is converted into trips

# Rail

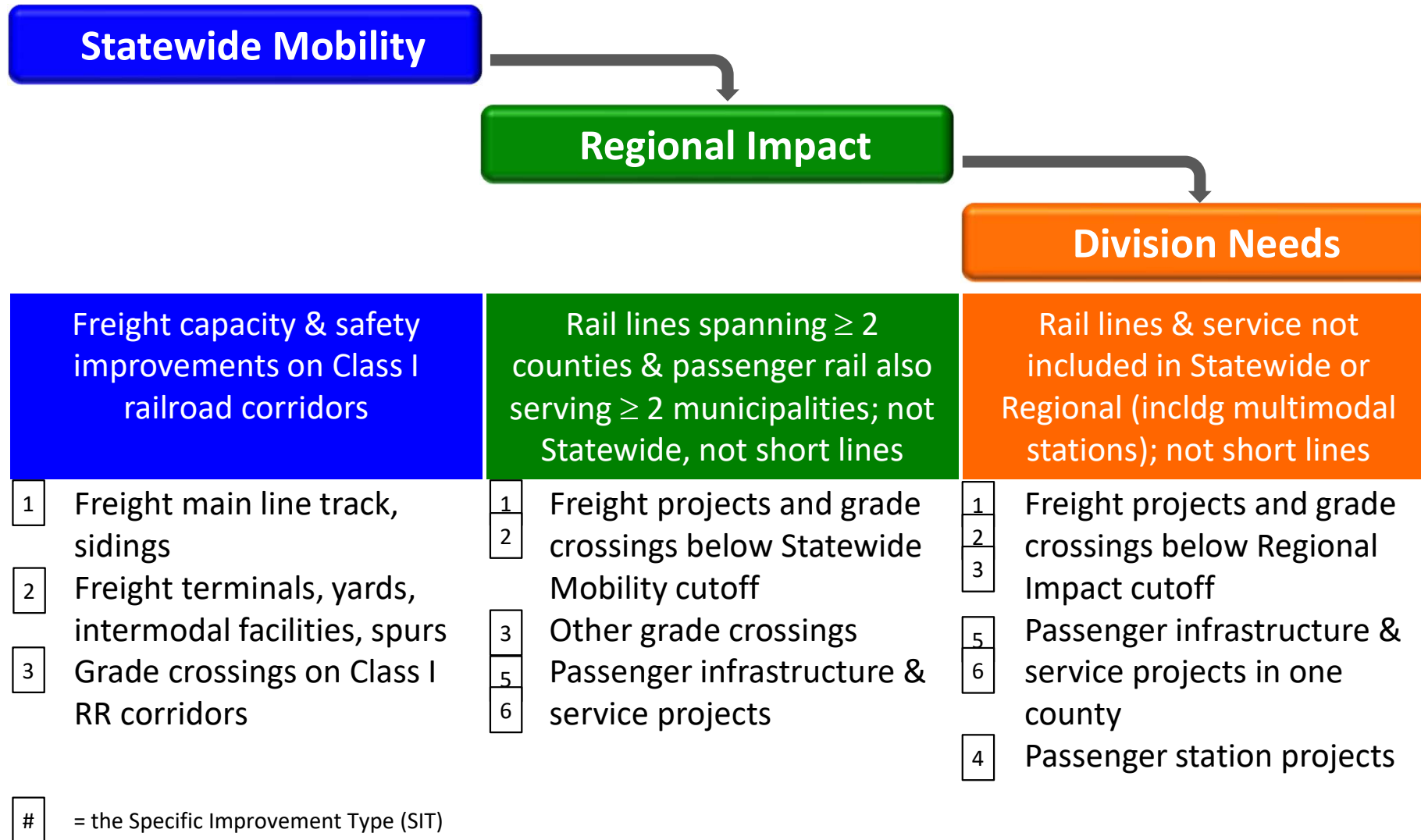
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## Specific Improvement Types

- 1 - Freight rail infrastructure improvement or construction (line)
- 2 - Freight rail infrastructure improvement or construction (point)
- 3 - Highway-rail crossing improvement (point)
- 4 - Passenger rail station improvement or construction (point)
- 5 - Passenger rail service (line)
- 6 - Other passenger rail improvements (point)
  
- **New SIT recommended for P7: “7 – Corridor modernization (line)”**

# STI Law Eligibility – Rail Projects



## Rail Project Eligibility

### Rules of Thumb

- Class I railroad is the owner and/or operator → project is likely **eligible** under the Rail mode

AND

- Project's primary purpose is to improve railroad operations → project **fits** under the Rail mode

## Rail Project Eligibility

Owner of Rail Corridor	Operator on Rail Corridor	Combo Likely?	STI Eligible?
Class I Freight (NS, CSX)	Both Class I Freight & Passenger	common (CSX A Line)	✓
	Class I Freight (NS, CSX)	common	✓
	Class I Passenger (Amtrak)	rare	✓
	Short Line	common (CLNA on NS Line)	✓
	No Operator	rare	✓
Class I Passenger (Amtrak)	Both Class I Freight & Passenger	rare	✓
	Class I Freight (NS, CSX)	rare	✓
	Class I Passenger (Amtrak)	common (NEC)	✓
	Short Line	no	✓
	No Operator	no	✓
NCRR (real estate holding, not a Class I RR) = SHORTLINE	Both Class I Freight & Passenger	common (GRO-CLT)	✓
	Class I Freight (NS, CSX)	common (EC Branch)	✓
	Class I Passenger (Amtrak)	common (RGH-GRO)	✓
	Short Line	rare	✗
	No Operator	rare	✗*

\* Note: project eligibility will depend upon who the operator will be with service in place.

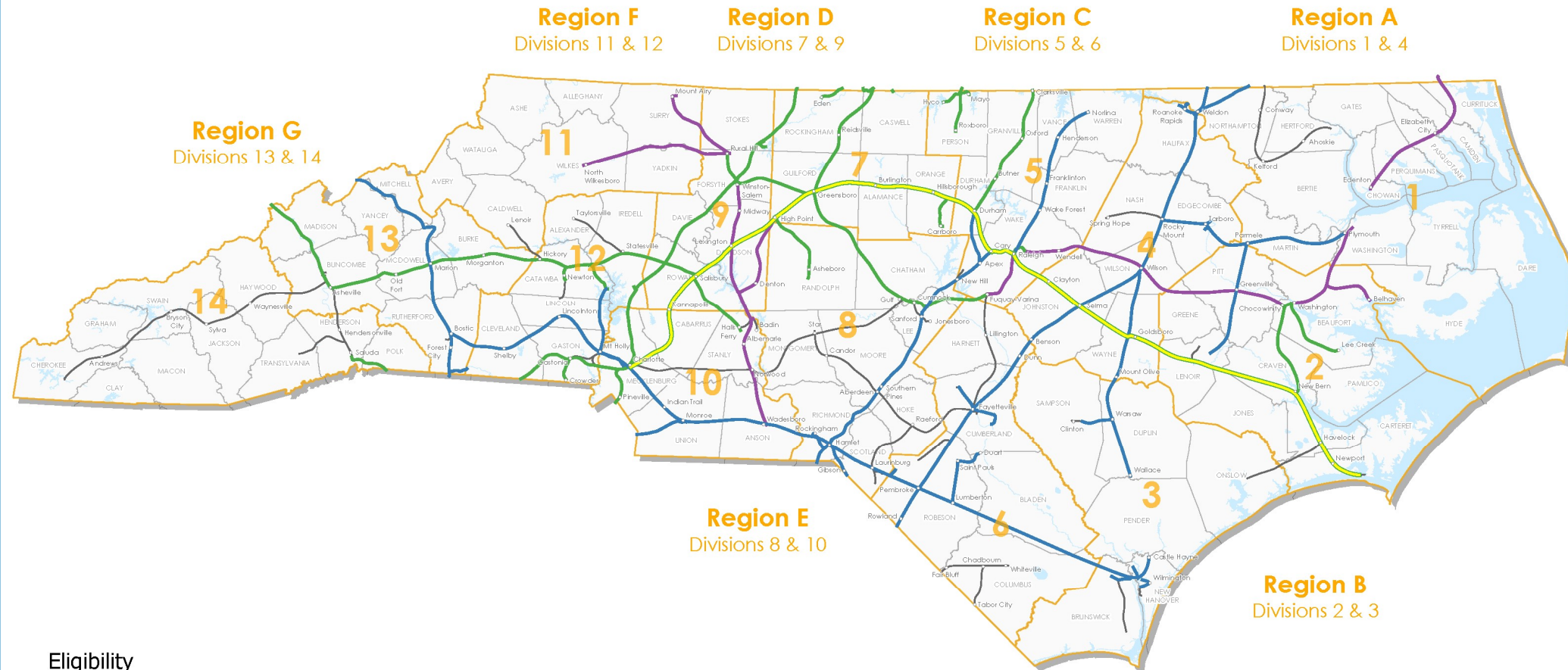


## Rail Project Eligibility

Owner of Rail Corridor	Operator on Rail Corridor	Combo Likely?	STI Eligible?
State-owned non-NCRR (NCDOT, NCSPA)	Both Class I Freight & Passenger	no	✓
	Class I Freight (NS, CSX)	no	✓
	Class I Passenger (Amtrak)	no	✓
	Short Line	common (ABA Line & Ports w CLNA/WTRY)	✗
	No Operator (preserved corridor)	common (Wallace-Castle Hayne, SFF, HG)	✗*
Short Line	Both Class I Freight & Passenger	no	✓
	Class I Freight (NS, CSX)	rare	✓
	Class I Passenger (Amtrak)	no	✓
	Short Line (includes DoD)	common	✗
	No Operator	common (sections out-of-service)	✗

\* Note: project eligibility will depend upon who the operator will be with service in place.

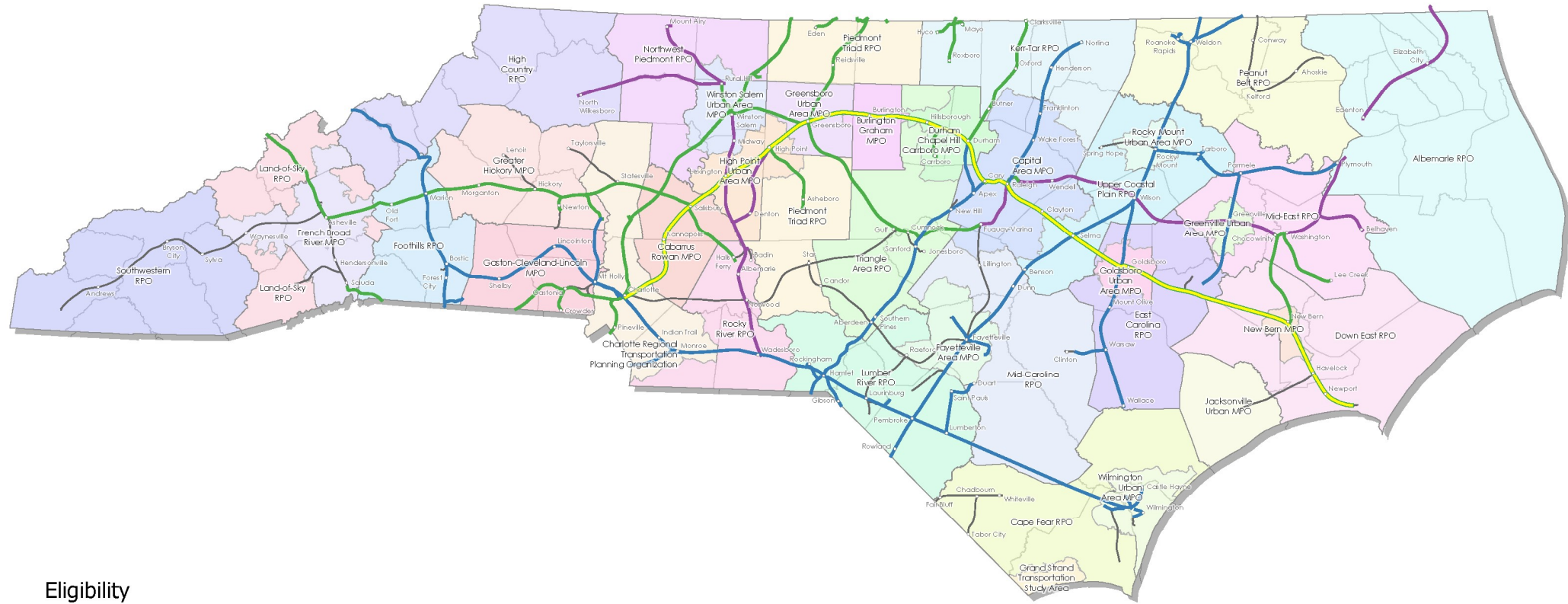
### Rail Corridors Eligible for Funding Under the Strategic Transportation Investment Law in North Carolina



- Eligibility**
- CSX Owned and Operated - Eligible
  - NS Owned and Operated - Eligible
  - NCRRC Owned, Class I Operated - Eligible
  - Class I Owned, Short Line Operated - Eligible
  - State Owned, or Short Line Owned and Operated - Not Eligible



### Rail Corridors Eligible for Funding Under the Strategic Transportation Investment Law in North Carolina MPOs & RPOs Displayed



**Eligibility**

- CSX Owned and Operated - Eligible
- NS Owned and Operated - Eligible
- NCCR Owned, Class I Operated - Eligible
- Class I Owned, Short Line Operated - Eligible
- State Owned, or Short Line Owned and Operated - Not Eligible



# P6.0 Rail Scoring

Criteria	Measure	Statewide Mobility* (100%)	Regional Impact (70%)	Division Needs (50%)
Benefit-Cost	Benefit-Cost score	35%	25%	10%
System Opportunities	(Accessibility/Connectivity score x 50%) + (Multimodal score x 50%)	15%	10%	15%
Safety	Safety score	30%	15%	10%
Capacity & Diversion	(Volume/Capacity score x 75%) + (Highway Diversion score x 25%)	10%	10%	10%
Economic Competitiveness	Economic Competitiveness score	10%	10%	5%

\*Only Class I Freight projects eligible in Statewide Mobility Category  
 Passenger projects only eligible at Regional Impact and Division Needs Categories

# Key Data Inputs by Rail Project Type

## Proposed P7.0 Methodology

Criteria	XING	FGT	PAX SVC	PAX STN	MOD
• Raw Measure					
<b>Benefit-Cost</b>	Crash Data				Travel Times
		Delay		Vehicle Miles Traveled	Energy Used
					Pollutants Emitted
	Project Costs, Vehicle Hours Traveled				
<b>System Opportunities</b>					
• Accessibility/Connectivity	Employee-based	Mile-based	Point-of-Interest-based		N/A in P7.0
• Multimodal	Lookup Table				
<b>Safety</b>	Investigative Index	Investigative Index*			
<b>Capacity &amp; Diversion</b>					
• Volume/Capacity	AADT/Capacity	Trains/Track Capacity	Riders vs. Seats	Riders vs. Sq Ft	Operational Capacity
• Highway Diversion	N/A	Truck Vol Reduction/ Diversion Distance	Passenger-Miles		N/A in P7.0
<b>Economic Competitiveness</b>	Year 20 Full-Time Jobs & Weighted Unemployment				

\* If submitted project has improved crossings, they will be scored.



# Components of Each Criterion by Project Type

- For each criterion, the following information will now be shared:
  - Definition and purpose
  - Highlights (important notes and/or results)
  - Criterion calculation
- Note, the criteria are shown from easiest to most complex to calculate
- Note, the following details are available upon request
  - Calculations and tools to yield the Raw Measure Score
  - Necessary data inputs

CRITERION: SafetyDescription**Definition**

- Measurement of crash potential at highway-rail crossings based on the NCDOT Rail Division's FHWA-approved SARAH Investigative Index.
- All rail projects with crossing improvements receive safety points.

**Highlights**

- Projects with solely highway-rail crossing improvements rise to the top in this criterion.



CRITERION: SafetyCriterion

*Safety = SCALED Measure Safety Score*

CRITERION: SafetyRaw Measure

$$Safety = \sum_{k=1}^K \left[ \left( \begin{array}{c} SARAH \\ Investigative \\ Index \end{array} \right)_k \times \left( \begin{array}{c} Mitigation \\ Factor \end{array} \right)_k \right]$$

*for all highway–rail crossings  $k$  being improved in project*

CRITERION: SafetyInputs**Where:**

- SARAH Investigative Index = an integer ranking of hazard-potential; derived from level of crossing protection, highway traffic volume, train volume & speed, track parameters, crash history, and sight distance
- Mitigation Factor:
  - 1.0 = Grade separation (eliminates risk)
  - 0.5 = At-grade improvements (reduces risk)

CRITERION: System OpportunitiesDescription**Definition**

- Measurement of the project's degree of access to industrial/commercial development or nearby points of interest, and the degree of interaction between Rail and other modes (multimodal benefits).

**Highlights**

- Criterion has been satisfactory/working effectively.

CRITERION: System Opportunities

Criterion

*System Opportunities =*

$$0.50 \left( \frac{\text{Accessibility / Connectivity}}{\text{SCALED Measure Score}} \right) + 0.50 \left( \frac{\text{Multimodal}}{\text{SCALED Measure Score}} \right)$$

CRITERION: System Opportunities

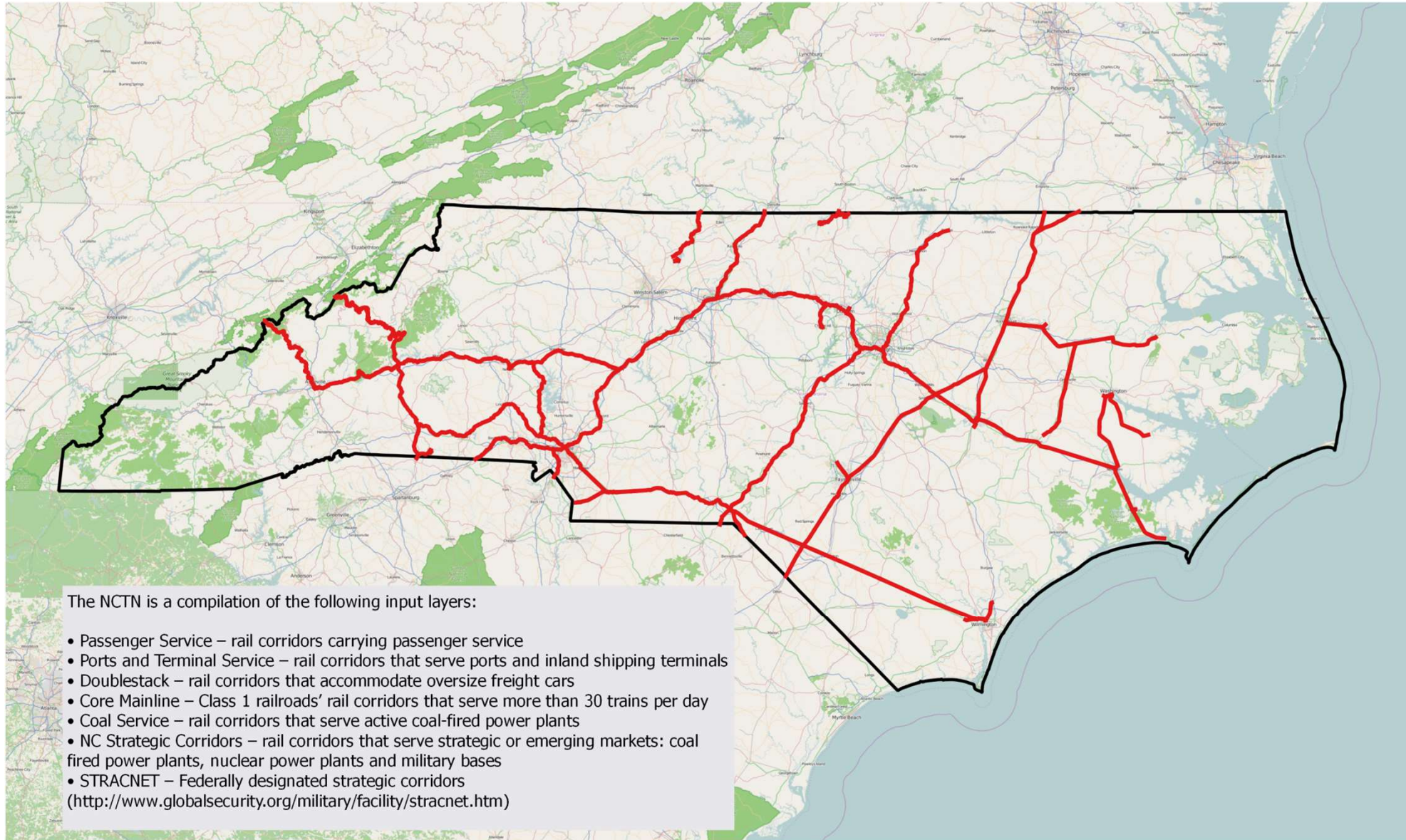
Raw Measure

Accessibility/Connectivity

<b>XING</b>	
<b>FGT</b>	$= \left( \frac{\text{Percentage of project that improves the}}{\text{NC Transportation Network statewide rail system}} \right)$
<b>PAX</b>	$= \left( \frac{\text{POIs within 10 miles of new station}}{\text{Average POIs within 10 miles of existing state – supported stations}} \right)$



## North Carolina Transportation Network (Rail Corridors)



CRITERION: System Opportunities

Raw Measure

Multimodal

Score based on:

- potential for benefit of projects in other modes
- relative degree of interaction between Rail and other modes

<b>XING</b>	<ul style="list-style-type: none"> <li>• Benefits: Highway, Bike/Ped</li> <li>• Projects occur more frequently and have highest exposure to other modes due to use of crossings by all trains</li> </ul>	<b>100</b>
<b>FGT</b>	<ul style="list-style-type: none"> <li>• Benefits: Highway</li> <li>• Projects at next level of frequency; allows for reduced trucks on highway therefore increasing capacity</li> </ul>	<b>66</b>
<b>PAX SVC</b>	<ul style="list-style-type: none"> <li>• Benefits: Public Transportation, Bike/Ped</li> <li>• Exposure to other modes is limited to time of day and ridership</li> </ul>	<b>33</b>
<b>PAX STN</b>	<ul style="list-style-type: none"> <li>• No currently recognized benefit to other modes</li> </ul>	<b>0</b>

CRITERION: System Opportunities

Raw Measure  
Multimodal

- Score based on potential for benefit of projects in other modes
- And on relative degree of interaction between Rail and other modes

<b>XING</b>	<ul style="list-style-type: none"> <li>• Benefits: Highway, Bike/Ped</li> <li>• Projects occur more frequently and have highest exposure to other modes due to use of crossings by all trains</li> </ul>	<b>100</b>
<b>FGT</b>	<ul style="list-style-type: none"> <li>• Benefits: Highway</li> <li>• Projects at next level of frequency; allows for reduced trucks on highway therefore increasing capacity</li> </ul>	<b>66</b>
<b>PAX SVC</b>	<ul style="list-style-type: none"> <li>• Benefits: Public Transportation, Bike/Ped</li> <li>• Exposure to other modes is limited to time of day and ridership</li> </ul>	<b>33</b>
<b>PAX STN</b>	<ul style="list-style-type: none"> <li>• No currently recognized benefit to other modes</li> </ul>	<b>0</b>
<b>MOD</b>	<ul style="list-style-type: none"> <li>• No currently recognized benefits to other modes</li> </ul>	<b>0</b>



CRITERION: Capacity & DiversionDescription**Definition**

- Measurement of train volume compared to track capacity, and the amount of freight and/or passenger volumes diverted off highways by the project.

**Highlights**

- Criterion has been satisfactory/working effectively.
- Freight project types rise to the top.

CRITERION: Capacity & DiversionCriterion

$\left( \begin{array}{c} \textit{Capacity \& Diversion} \\ \textit{Criteria Score} \end{array} \right) =$

$$0.75 \left( \begin{array}{c} \textit{Volume/Capacity} \\ \textit{SCALED Measure Score} \end{array} \right) + 0.25 \left( \begin{array}{c} \textit{Highway Diversion} \\ \textit{SCALED Measure Score} \end{array} \right)$$



CRITERION: Capacity & Diversion

Raw Measure  
Volume/Capacity

<b>XING</b>	<ul style="list-style-type: none"> <li>based on peak average daily traffic (highway), roadway capacity, and the State Authoritative Rail and Highway database</li> </ul> $= \text{MAX} \left( \frac{\text{AADT}_k}{\text{Highway Capacity}_k} \right) \text{ for all improved sites } k \text{ in project}$
<b>FGT</b>	<ul style="list-style-type: none"> <li>based on track charts, reported rail volumes, and capacity modeling</li> </ul> $= \frac{\text{Total Daily Trains}}{\text{Typical Corridor Capacity}}$
<b>PAX SVC</b>	$= \frac{\text{Daily Riders}}{\text{Daily Seats}}$
<b>PAX STN</b>	<ul style="list-style-type: none"> <li>based on Amtrak station design standards, track charts, and equipment specifications</li> <li>Includes seating and standing space and peak hour traffic</li> </ul>

CRITERION: Capacity & Diversion

Raw Measure  
Volume/Capacity

<b>XING</b>	<ul style="list-style-type: none"> <li>based on peak average daily traffic (highway), roadway capacity, and the State Authoritative Rail and Highway database</li> </ul> $= \text{MAX} \left( \frac{\text{AADT}_k}{\text{Highway Capacity}_k} \right) \text{ for all improved sites } k \text{ in project}$
<b>FGT</b>	<ul style="list-style-type: none"> <li>based on track charts, reported rail volumes, and capacity modeling</li> </ul> $= \frac{\text{Total Daily Trains}}{\text{Typical Corridor Capacity}}$
<b>PAX SVC</b>	$= \frac{\text{Daily Riders}}{\text{Daily Seats}}$
<b>PAX STN</b>	<ul style="list-style-type: none"> <li>based on Amtrak station design standards, track charts, and equipment specifications</li> <li>Includes seating and standing space and peak hour traffic</li> </ul>
<b>MOD</b>	<ul style="list-style-type: none"> <li>Based on railroad timetables, reported rail volumes, and rail operations applied</li> </ul> $= \text{Operational Capacity}_{\text{Before}} - \text{Operational Capacity}_{\text{After}}$

CRITERION: Capacity & DiversionRaw Measure  
Highway Diversion

<b>XING</b>	$= 0$
<b>FGT</b>	$= \text{Annual Volume Reduction} \times \text{Diversion Distance}$
<b>PAX</b>	$= \text{CarShare} \times \text{PaxMiles}$

CRITERION: Benefit-CostDescription**Definition**

- Measurement of monetized benefits compared to the cost of the project to NCDOT, and the amount of other/local funds compared to the total project cost.

**Highlights**

- Criterion has been satisfactory/working effectively.
- Inputs strongly vary from project type to project type.
- Highway-railway crossing project types rise to the top.

CRITERION: Benefit-Cost

Criterion

$$\left( \begin{array}{l} \textit{Benefit-Cost} \\ \textit{Criteria Score} \end{array} \right) = \left( \begin{array}{l} \textit{Benefit-Cost} \\ \textit{SCALED Measure Score} \end{array} \right) + \left( \begin{array}{l} \textit{Funding Leverage} \\ \textit{Additional Points} \end{array} \right)$$

**With:**

$$\left( \begin{array}{l} \textit{Funding Leverage} \\ \textit{Additional Points} \end{array} \right) = \left[ 100 \times \frac{\textit{Other Funds}}{\left( \begin{array}{l} \textit{Estimated Total} \\ \textit{Project Cost[CON \& ROW]} \end{array} \right)} \right]$$

CRITERION: Benefit-Cost

Raw Measure

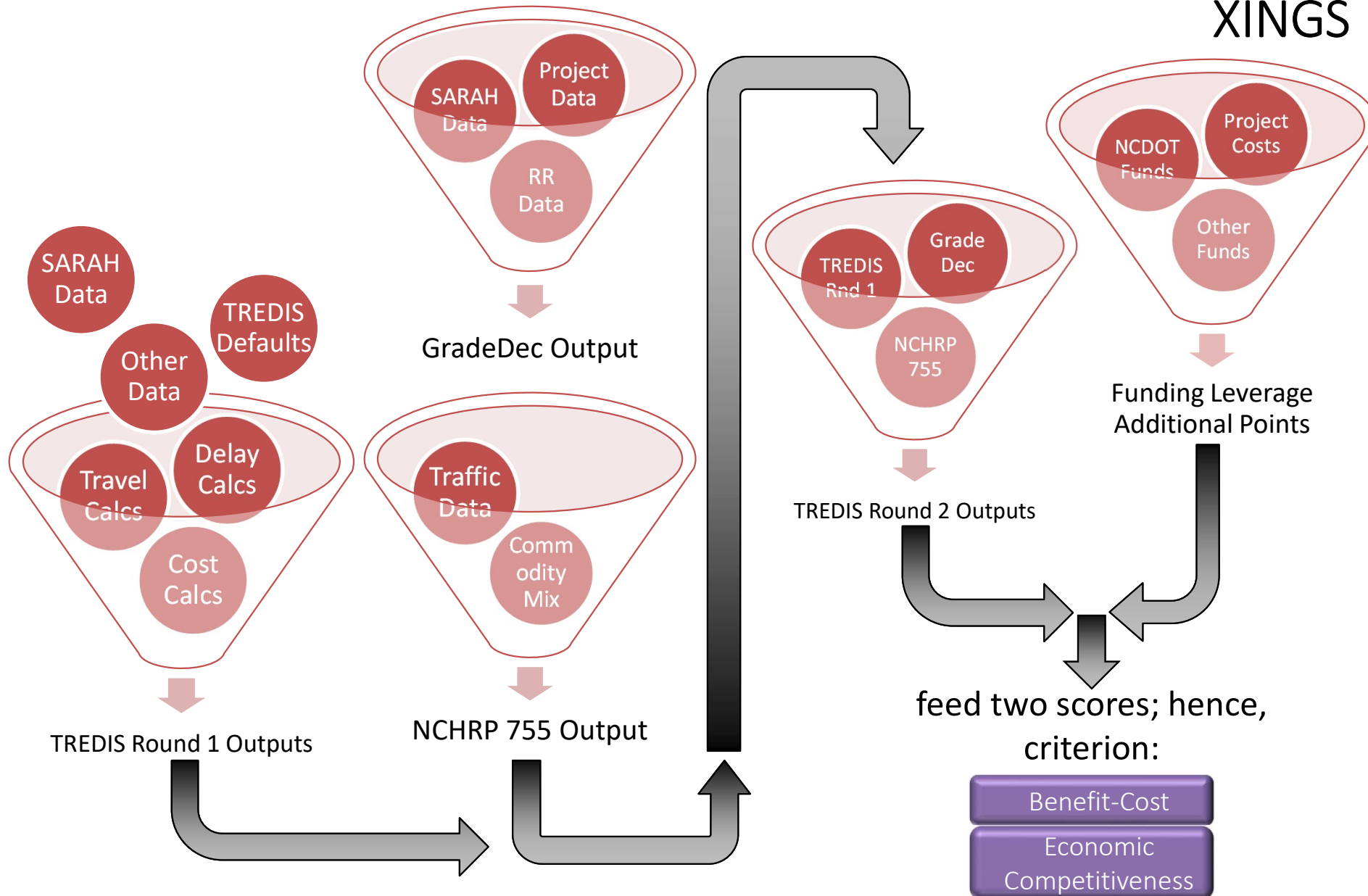
$$\left( \begin{array}{l} \textit{Benefit-Cost} \\ \textit{RAW} \end{array} \right) = \frac{\left( \begin{array}{l} \textit{Rail Monetized} \\ \textit{Benefits[adjusted]} \end{array} \right)}{\left( \begin{array}{l} \textit{Cost to NCDOT} \end{array} \right)}$$

**Where:**

- Rail Monetized Benefits =  $\left( \begin{array}{l} \textit{Benefit Cost Ratio} \\ \textit{Full Societal BCA} \\ \textit{All Benefit Categories} \end{array} \right)$  TREDIS Output

CRITERION: Benefit-Cost

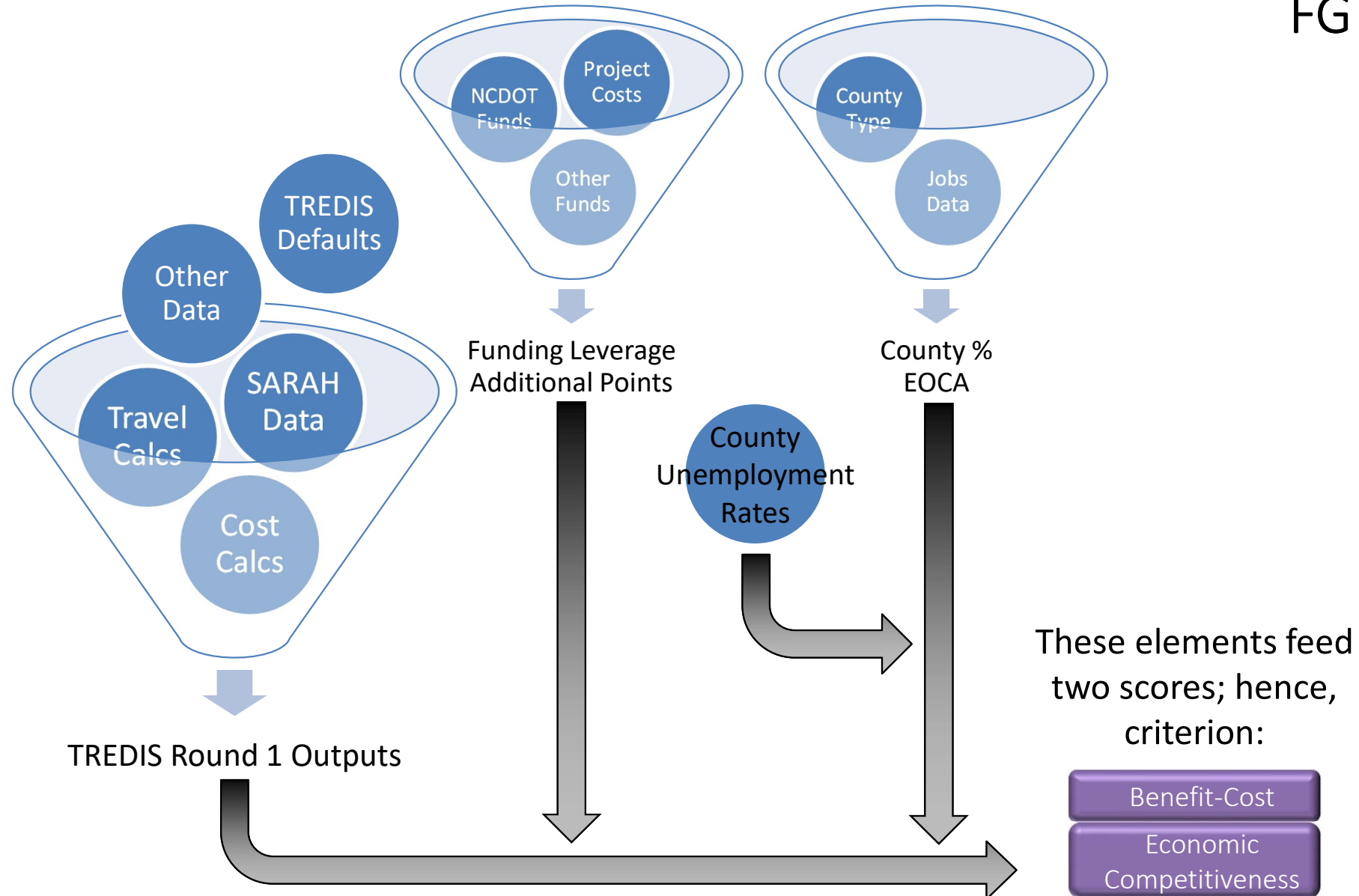
Inputs  
XINGS



CRITERION: Benefit-Cost

Inputs

FGT

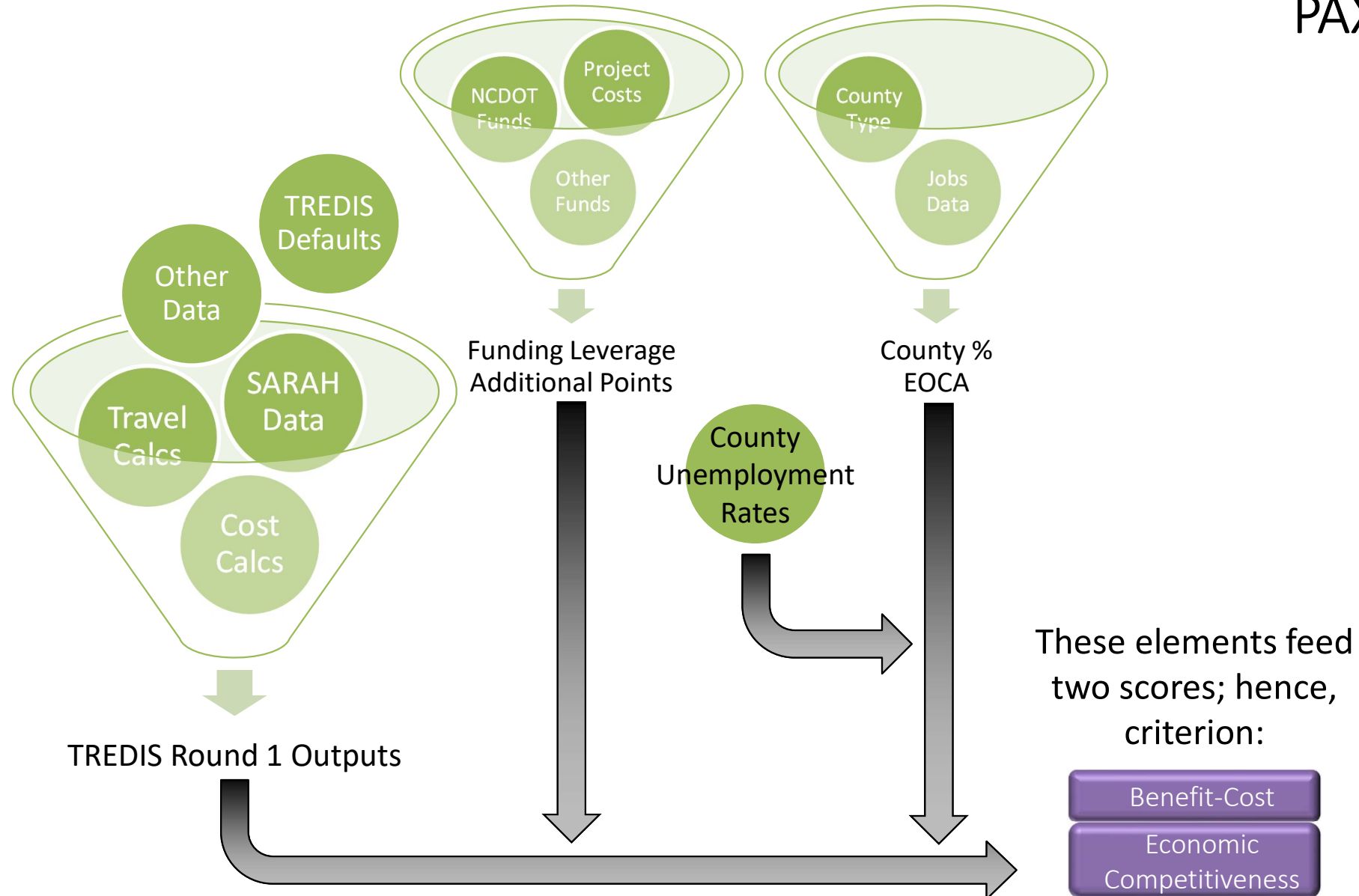




CRITERION: Benefit-Cost

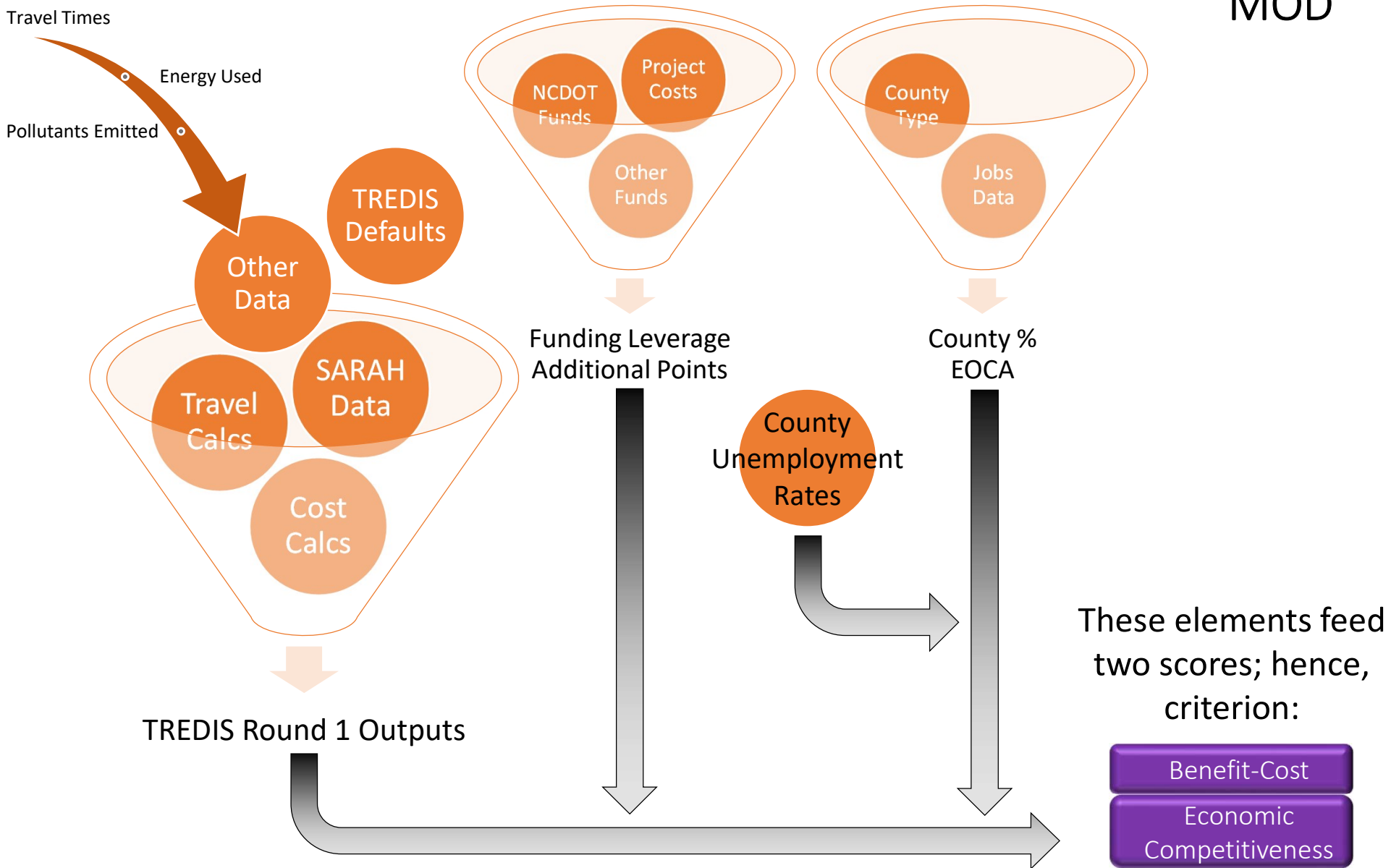
Inputs

PAX



CRITERION: Benefit-Cost

Inputs  
MOD



CRITERION: Economic CompetitivenessDescription**Definition**

- Measurement of the estimated number of full-time jobs created in 20 years.

**Highlights**

- Requires complex set of inputs, intermediate calculations, and software runs.
- Criterion has been satisfactory/working effectively.
- Freight project types rise to the top.

CRITERION: Economic Competitiveness Criterion

$$\left( \begin{array}{c} \textit{Economic Competitiveness} \\ \textit{Criteria Score} \end{array} \right) = \left( \begin{array}{c} \textit{Economic Competitiveness} \\ \textit{SCALED Measure Score} \end{array} \right)$$

CRITERION: Economic Competitiveness Raw Measure

$$\left( \begin{array}{c} \textit{Economic Competitiveness} \\ \textit{RAW} \end{array} \right) = \overbrace{\left( \begin{array}{c} \textit{Year 20} \\ \textit{Full-time Jobs} \end{array} \right)}^{\text{TREDIS Output}} \times \left( \begin{array}{c} \textit{Weighted Unemployment} \\ \textit{Rate Across Counties } j \end{array} \right)$$

CRITERION: Economic Competitiveness Inputs

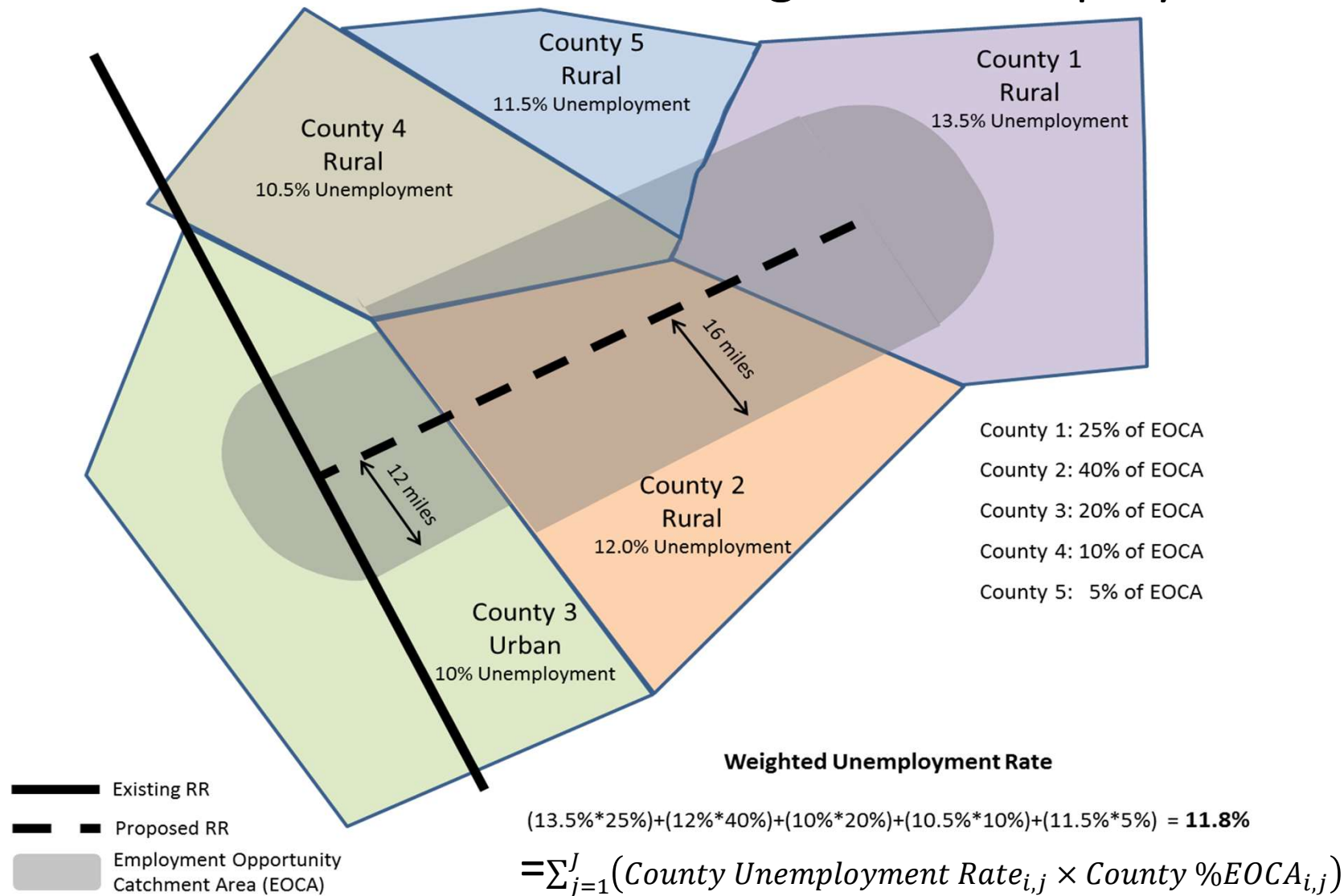
Weighted Unemployment Rate

$$\left( \begin{array}{c} \textit{Weighted Unemployment Rate} \\ \textit{across all touched counties} \end{array} \right)$$

CRITERION: Economic Competitiveness

Inputs

Weighted Unemployment Rate





# End of Session 4

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**NORTH CAROLINA**  
Department of Transportation

# Session 5: Highway Scoring Details

STI Training

NCDOT SPOT Office

May 31 – June 1, 2023

Connecting people, products and places safely and efficiently with customer focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina



# Highway Scoring – Eligible Criteria with P6.0 Measures

<u>Criteria</u>	<u>Measure(s)</u>	<u>Existing Conditions</u>	<u>Project Benefits (Future Conditions)</u>
<b>Congestion</b>	Volume/Capacity + Volume		
<b>Benefit / Cost</b>	(Travel Time Savings + Safety Benefits) / Cost to NCDOT		
<b>Safety Score</b>	Critical Crash Rate, Density, Severity, Safety Benefits		
<b>Economic Competitiveness</b>	% Change in Jobs + % Change in County Economy		
<b>Accessibility / Connectivity</b>	County Economic Indicator, Improve Mobility		
<b>Freight</b>	Truck Volume, Truck %, Future Interstate Completion		
<b>Multimodal</b>	Multimodal Benefits		
<b>Lane Width</b>	Existing Width vs. Standard Width		
<b>Shoulder Width</b>	Existing Width vs. Standard Width		
<b>Pavement Score</b>	Pavement Condition Rating		

# Highway Modernization vs. Mobility

Splitting out Mobility and Modernization Highway specific improvement types (SITs) – as done in P2.0 scoring

## Modernization

- Different set of default criteria and weights
- SIT 16 – Modernize Roadway
- SIT 17 – Upgrade Freeway to Interstate Standards

## Mobility

- Adding capacity to roadway
- All remaining SITs (1-15, 18-26)
- WG recommended same weights as P5.0 scoring

**Anticipated for P7 that Road Diets will be able to score as either Mobility or Modernization**



# P6 Highway - Mobility

Criteria	Measure Description	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
Congestion	[Volume] and [Volume/Capacity]	30%	20%	15%
Benefit/Cost	[10-year Travel Time Savings benefit] + [10-year Safety Benefit] / [Cost to NCDOT]	25%	20%	15%
Safety	SEG: Crash Density, Crash Severity, Crash Rate, Safety Benefits INT: Crash Frequency, Crash Severity, Safety Benefits	10%	10%	10%
Freight	[Truck Volumes] and [Truck Percentage]	25%	10%	5%
Economic Competitiveness	TREDIS Model Output: [% Change in Long-Term Jobs] and [% Change in County Economy over 10 years]	10%	-	-
Accessibility / Connectivity	[Measurement of county economic distress indicators] and [degree the project upgrades mobility of the roadway]	-	10%	5%

*Project Types: Widening, Intersection/Interchange Improvements, Access Management, and other capacity additions*



# P6 Highway - Modernization

Criteria	Measure Description	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
Congestion	[Volume] and [Volume/Capacity]	10%	5%	-
Safety	SEG: Crash Density, Crash Severity, Crash Rate, Safety Benefits INT: Crash Frequency, Crash Severity, Safety Benefits	25%	25%	20%
Freight	[Truck Volumes] and [Truck Percentage]	25%	10%	5%
Lane Width	Existing lane width vs. DOT design standard	10%	10%	5%
[Paved] Shoulder Width	Existing paved shoulder width vs. DOT design standard	20%	10%	10%
Pavement Condition	Existing Pavement Condition Rating (PCR) along the project	10%	10%	10%

*Project Types: Modernize Roadway and Upgrade Freeway to Interstate Standards*

# Highway – Congestion

Funding Category	Mobility Default Weights	Modernization Defaults
Statewide Mobility	30%	10%
Regional Impact	20%	5%
Division Needs	15%	-

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

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

*Peak ADT will be used as the Existing Volume*

# Peak Average Daily Traffic

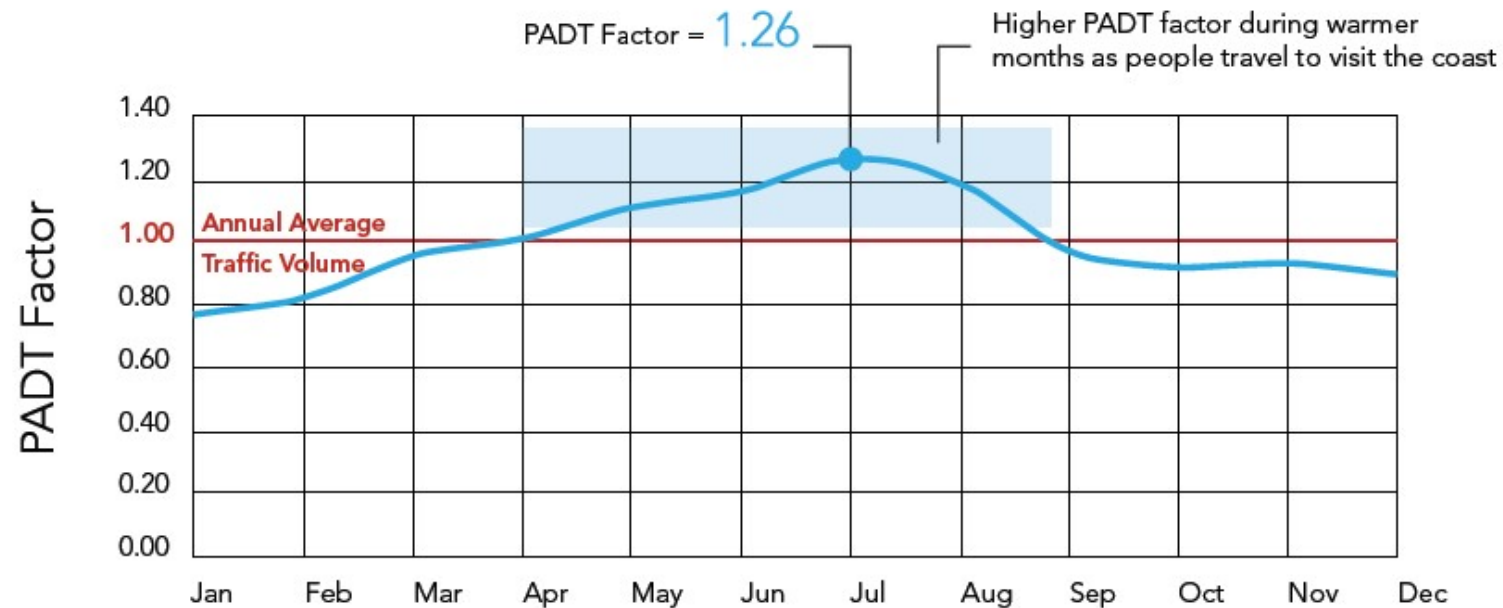
PADT = ADT occurring in peak month (includes weekday & weekend)

Estimated by factoring AADT to the peak month:

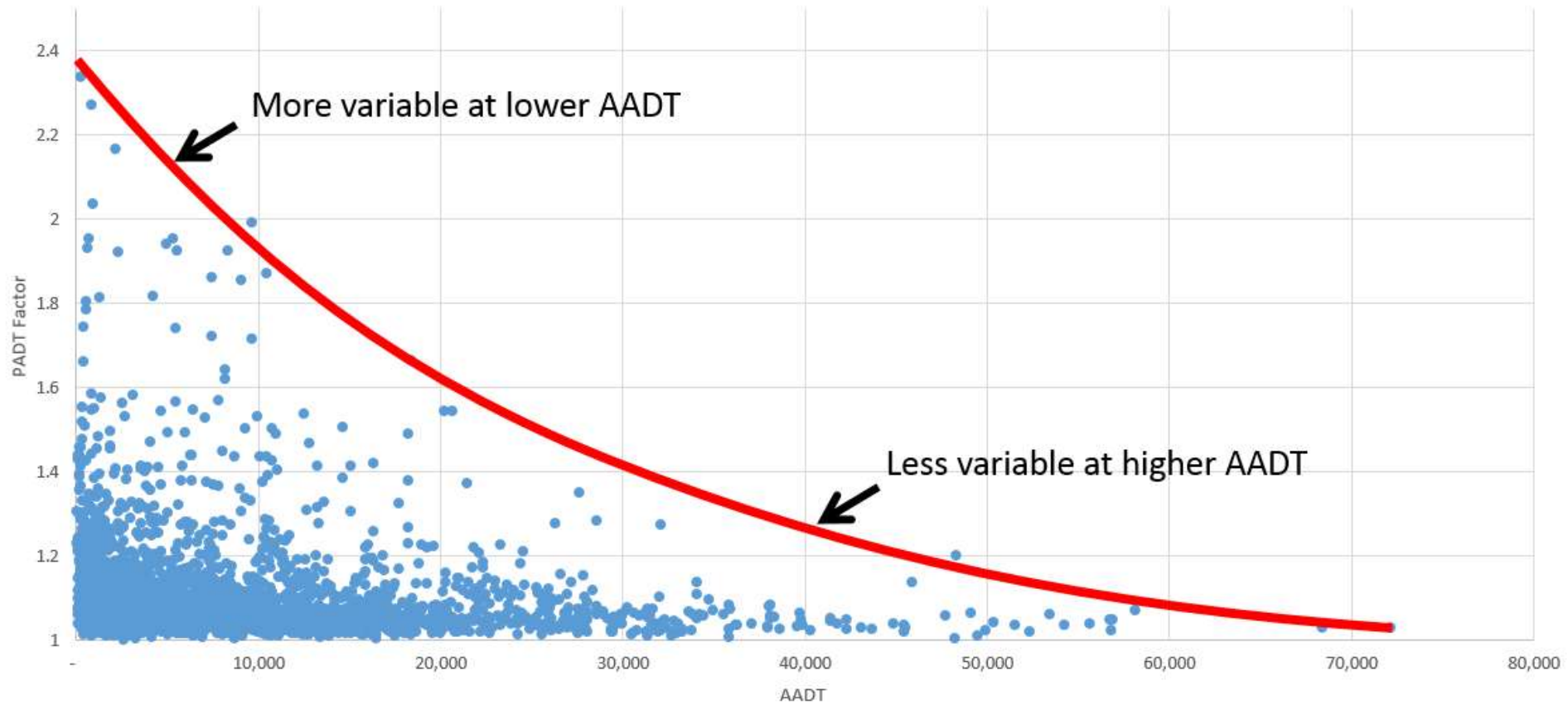
$$\text{PADT} = \text{AADT} \times \text{PADT Factor}$$

Based on seasonal and continuous counts if available

- ◆ An example for I-40 near Wilmington:



# Peak Average Daily Traffic





# Highway – Benefit-Cost

Funding Category	Mobility Default Weights	Modernization Defaults
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**

$$\left[ \frac{(\text{Travel Time Savings over 10 years in \$} + \text{Safety Benefits over 10 years in \$})}{\text{Project Cost to NCDOT at time of submittal}} \right] + \left[ \left[ \frac{\text{Other Funds}}{\text{Total Project Cost}} \right] \times 100 \right]$$

*Cost can be lowered and score increased if other funds (non-federal or non-state funds) are designated towards the projects*

- *Includes Toll Revenue minus financing costs*

# Highway – Benefit-Cost

## Benefits Calculations

### Travel Time Savings

Multiple approaches for calculating:

- NCSTM – SW & REG corridor projects
- CMT – Intersection / Interchange / Superstreet / Operational projects
- CALC – Others
  
- Input to TREDIS

### Safety benefits

Safety benefit factor X existing # of crashes by monetized severity

**Costs** - Construction, Right-of-Way, and Utilities

# Highway – Safety

Funding Category	Mobility Default Weights	Modernization Defaults
Statewide Mobility	10%	25%
Regional Impact	10%	25%
Division Needs	10%	20%

**Purpose – measure existing crashes along/at the project location and calculate future safety benefits**

SEGMENTS	INTERSECTIONS
20% Crash Density	30% Crash Frequency
20% Crash Severity	30% Severity Index
20% Critical Crash Rate	40% Safety Benefits
40% Safety Benefits	

*Based on NCDOT 5-Year mileposted crash data 2014-2018*

# Highway – Freight

Funding Category	Mobility Default Weights	Modernization Defaults
Statewide Mobility	25%	25%
Regional Impact	10%	10%
Division Needs	5%	5%

**Purpose – Account for key indicators of freight movement**

**50% (Truck Volume) + 50% (Truck %) + Future Interstate Completion Factor**

Future Interstate Completion Factor [Modernization Projects] =  $((\text{Project Length} / \text{Miles Needed to Complete Future Interstate Corridor between NHS Routes}) \times 100) / 2$

Future Interstate Completion Factor [All Other Projects] =  $((\text{Project Length} / \text{Miles Needed to Complete Future Interstate Corridor between NHS Routes}) \times 100)$

*Max Future Interstate Completion Factor = 25*

# Highway – Economic Competitiveness

Funding Category	Mobility Default Weights	Modernization Defaults
Statewide Mobility	10%	-
Regional Impact	N/A	N/A
Division Needs	N/A	N/A

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

Score based on Output from **TREDIS<sup>®</sup>** (Economic Impact Model)

50% - % change in County Economy

50% - % change in Long-Term Job Creation

*Does NOT include contingent (prospective) development*

*Criteria is not intended to evaluate projects for recruiting purposes*

# Highway – Accessibility / Connectivity

Funding Category	Mobility Default Weights	Modernization Defaults
Statewide Mobility	N/A	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 Economic Indicator** – Points are based on economic distress indicators:

- property tax base per capita
- population growth
- median household income
- unemployment rate

**50% - Improve Mobility** – If project upgrades mobility of roadway (e.g. eliminating signals), points based on travel time savings per user

Anticipated change to P7 – More projects to be eligible for “Improve Mobility” component

# Highway – Accessibility / Connectivity

## Improve Mobility (Does project upgrade the roadway facility type?)

Focus on improving how the roadway functions, with emphasis on enhancing traffic flow, removing/bypassing traffic signals, and increasing access control

Eligibility based on 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

Anticipated that in P7 roundabout, intersection upgrade to interchange projects, access management, and ITS/Signal System projects will also qualify

New Location (Freeway, Multilane Highway, Superstreet) and

Upgrade Intersection to Signalized Superstreet or Interchange/Grade separation projects also eligible

If project is eligible, travel time savings per user is the measure



# Highway – Multimodal

Funding Category	Mobility Default Weights	Modernization Defaults
Statewide Mobility	-	-
Regional Impact	-	-
Division Needs	-	-

**Purpose – measure degree the highway project benefits other modes**

**Score based on sum of benefits to other modes**

Benefit points awarded based on:

- Proximity to airports, ferry terminals, ports, intermodal terminals, passenger bus or rail stations, park & ride lots, military bases
- If project includes bicycle and/or pedestrian accommodations, transit roadway components (bus-on-shoulder, pullouts, signal prioritization, etc), managed lanes

# Highway – Multimodal Benefits Table

Mode	Benefit
Aviation	Within 1 mile of commercial service airport (passenger & freight access points)
Aviation	Within 1 mile of red & blue general aviation airport
Bike/Ped	Includes sidewalks, pedestrian crossings, striped bicycle lanes, wide outside lanes (greater than or equal to 14 feet), OR 4ft paved shoulder
Ferry	Within 1 mile of ferry terminal access point
Port	Within 1 mile of Port of Morehead City OR Port of Wilmington access points
Rail	Within 1 mile of NHS truck / rail intermodal terminal
Rail	Within 1 mile of Amtrak Station access point
Rail	Includes new highway-rail grade separation (primary purpose of project is highway)
Transit	Includes bus pullouts, transit bypass lanes, OR transit signal prioritization
Transit	Includes bus-on-shoulder-system (BOSS) OR managed lanes
Transit	Within 1 mile of major passenger station access points
Transit	Within 1 mile of standalone park and ride lot (minimum # spaces)
Military	Within 1 mile of access point to major military base on STRAHNET / defense access roads

Each row in above table is worth 1 point. Project score = sum of points

# Highway – Lane Width

Funding Category	Mobility Default Weights	Modernization Defaults
Statewide Mobility	-	10%
Regional Impact	-	10%
Division Needs	-	5%

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

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

- Greater the difference (deficiency), the higher points the project receives
- Does NOT mean that project will be constructed to design standard

# Highway – [Paved] Shoulder Width

Funding Category	Mobility Default Weights	Modernization Defaults
Statewide Mobility	-	20%
Regional Impact	-	10%
Division Needs	-	10%

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

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

- Greater the difference (deficiency), the higher points the project receives
- Does NOT mean that project will be constructed to design standard

# Highway – Pavement Condition

Funding Category	Mobility Default Weights	Modernization Defaults
Statewide Mobility	-	10%
Regional Impact	-	10%
Division Needs	-	10%

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

## 100 – Pavement Condition Rating

- Based on 2018 Pavement Condition Survey
- Higher scores indicate poorer pavement condition

# End of Session 5

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**NORTH CAROLINA**  
Department of Transportation

# Day 1 Recap

STI Training

NCDOT SPOT Office

May 31 – June 1, 2023

Connecting people, products and places safely and efficiently with customer focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina



## Training Goals

1. Gain an understanding of the Prioritization, scoring, and programming process
2. Leave with a practicable and applicable understanding of how the process works and your role in the process
3. Understand what additional training and resources are ahead

### Reminders:

- This is a LOT of information → focus on the foundation, takeaways, and who to ask
- Further training opportunities are coming
- Further documentation and guidance will be available
- It frequently takes a full cycle before a person has a working understanding of the process
- These slides and recordings of the final training session will be available in early June



**NORTH CAROLINA**  
Department of Transportation

# Session 6: Scoring Process

STI Training

NCDOT SPOT Office

May 31 – June 1, 2023

Connecting people, products and places safely and efficiently with customer focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina

# Iterative Scoring & Programming Process

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



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

**Statewide Mobility**  
40% of Funds

1. Projects programmed
2. 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

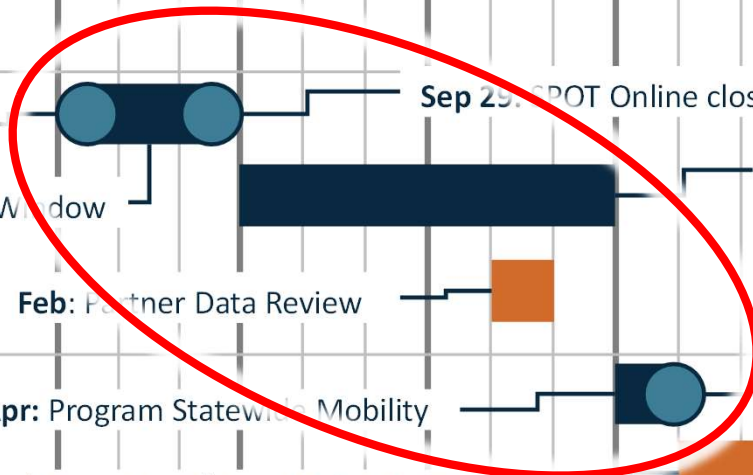
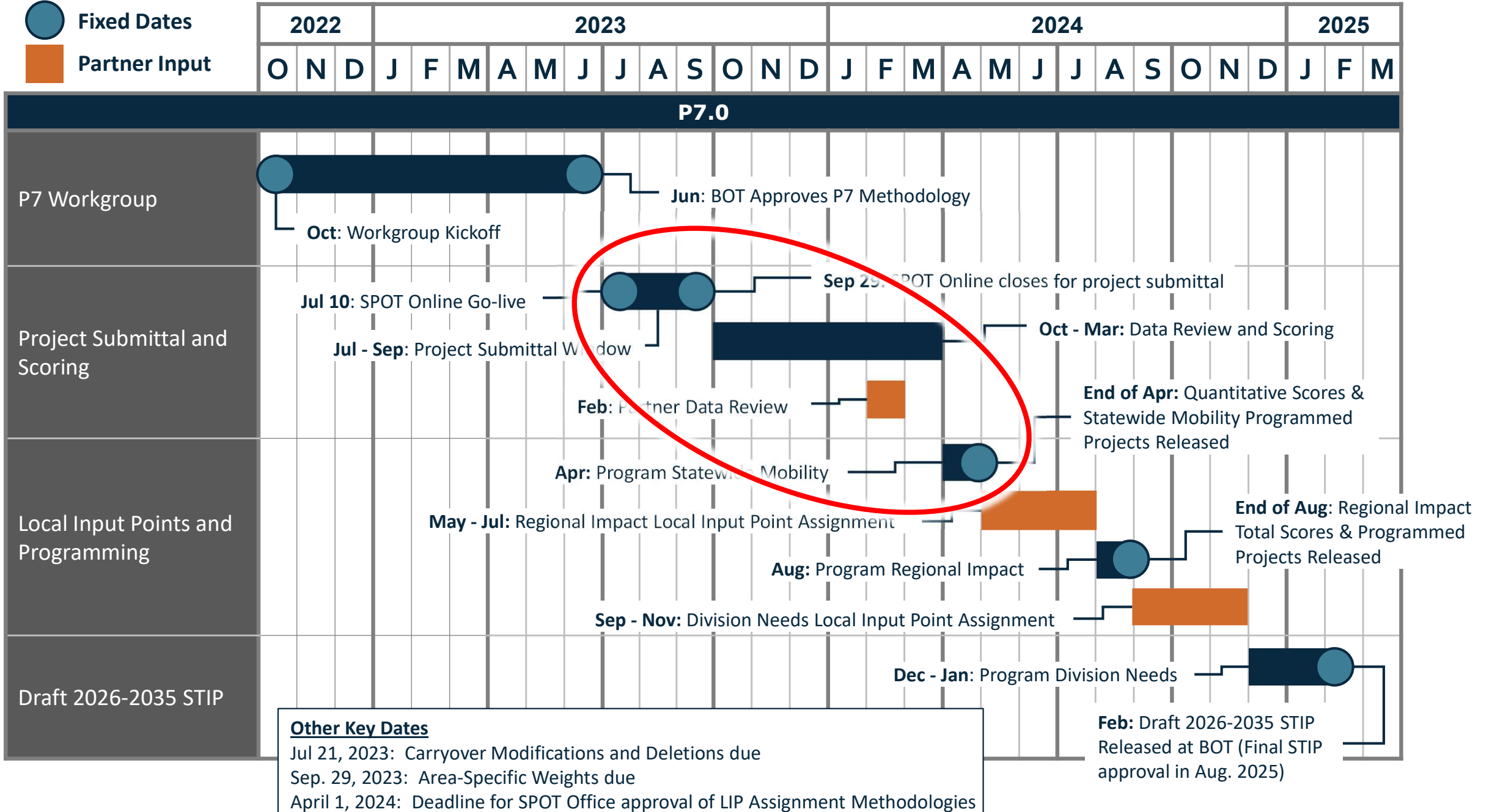
**Division Needs Score =**  
50% Quantitative +  
50% Local Input

# P7 Schedule

Updated April 24, 2023

Dates set per P7 Workgroup in October 2022

- Fixed Dates
- Partner Input



# Prioritization 7.0 (P7) Timeline

- July – September 2023: MPOs, RPOs, and Divisions submit projects
- October 2023 – March 2024: SPOT / Prioritization Team score projects
- April 2024: P7 quantitative scores released



# Project Scoring

Complex process

Many different NCDOT business units and external partners involved

HIGHWAY PROJECTS	MODAL PROJECTS
Congestion Management Unit	Division of Aviation
Technical Services Unit	Integrated Mobility Division / ITRE
Traffic Safety Unit	Ferry Division
North Carolina Turnpike Authority (NCTA)	Rail Division
STIP Unit	SPOT
Feasibility Studies Unit / Central Corridor Engineers	
ITS and Signals Unit	
Transportation Planning Division (TPD)	
GIS Unit	
Consultants	
SPOT	

# Scoring Process

1. SPOT reviews # of submitted projects for all modes

Follow up with each MPO, RPO, and Division if # of submittals was greater or less than the maximum allotment to ensure all approved projects were submitted

2. SPOT reviews eligibility categories of submitted projects

3. Split projects into 6 modal spreadsheets

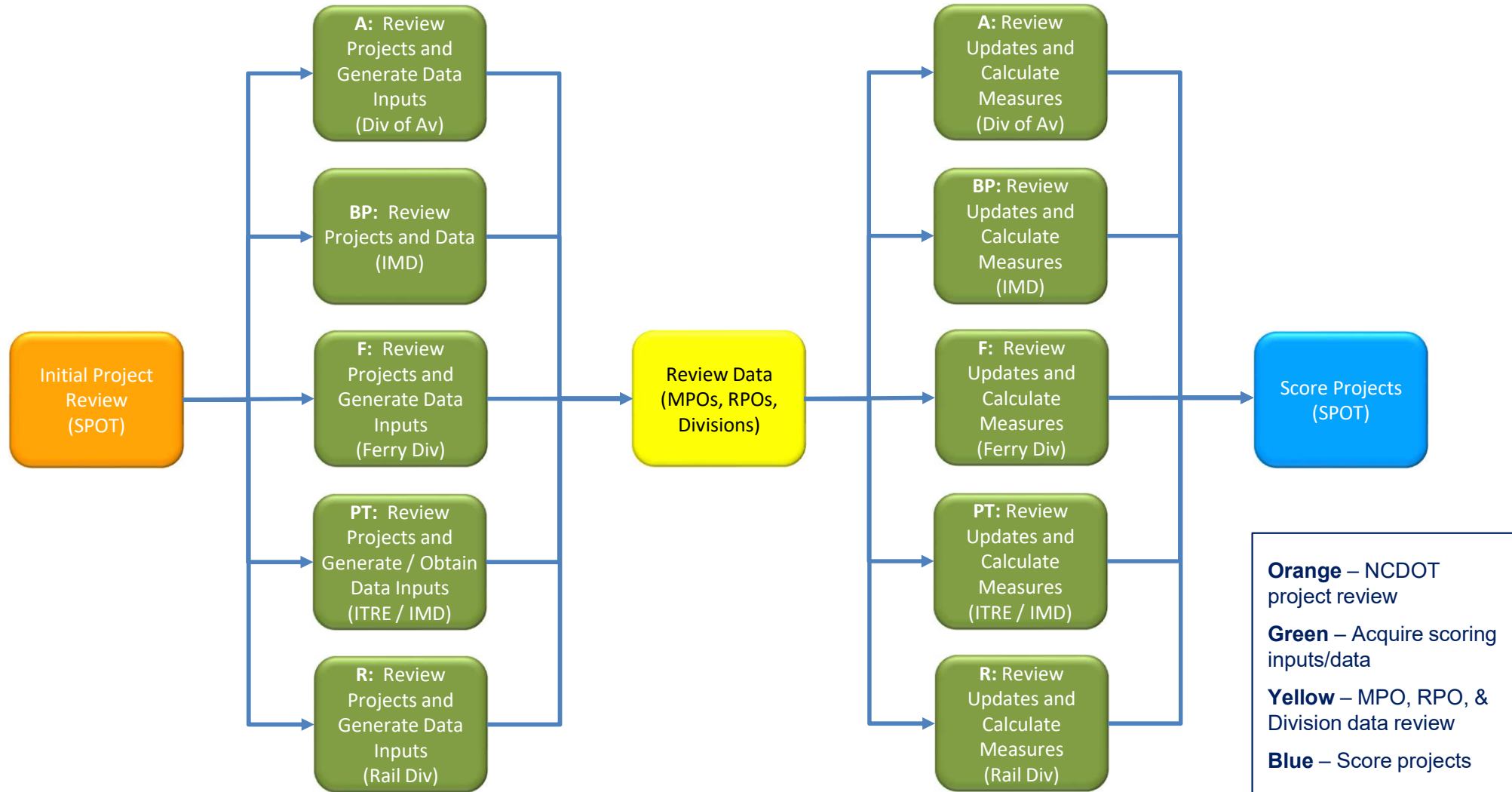


# Non-Highway Process

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# Quantitative Scoring Process

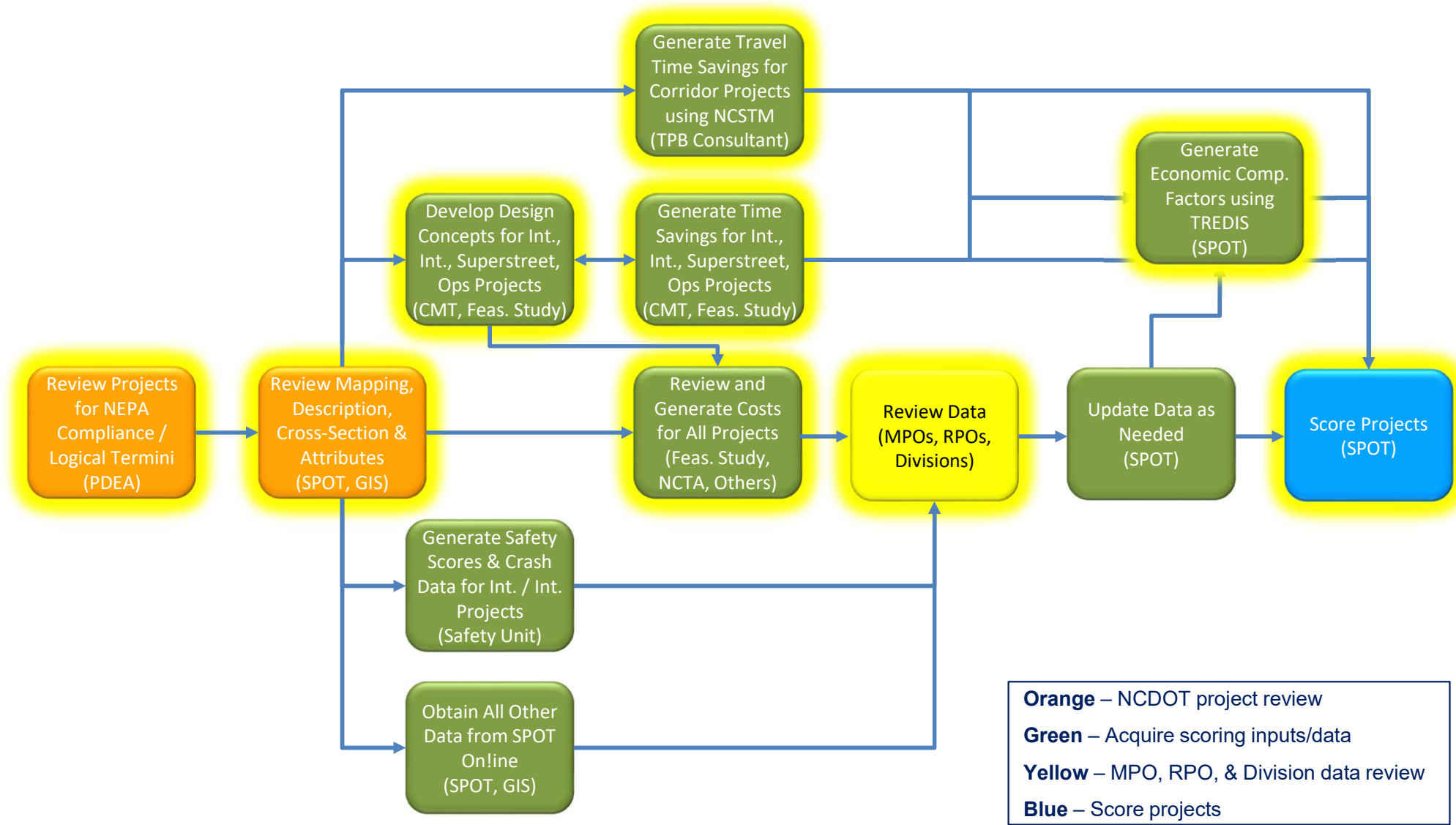


# Highway Process

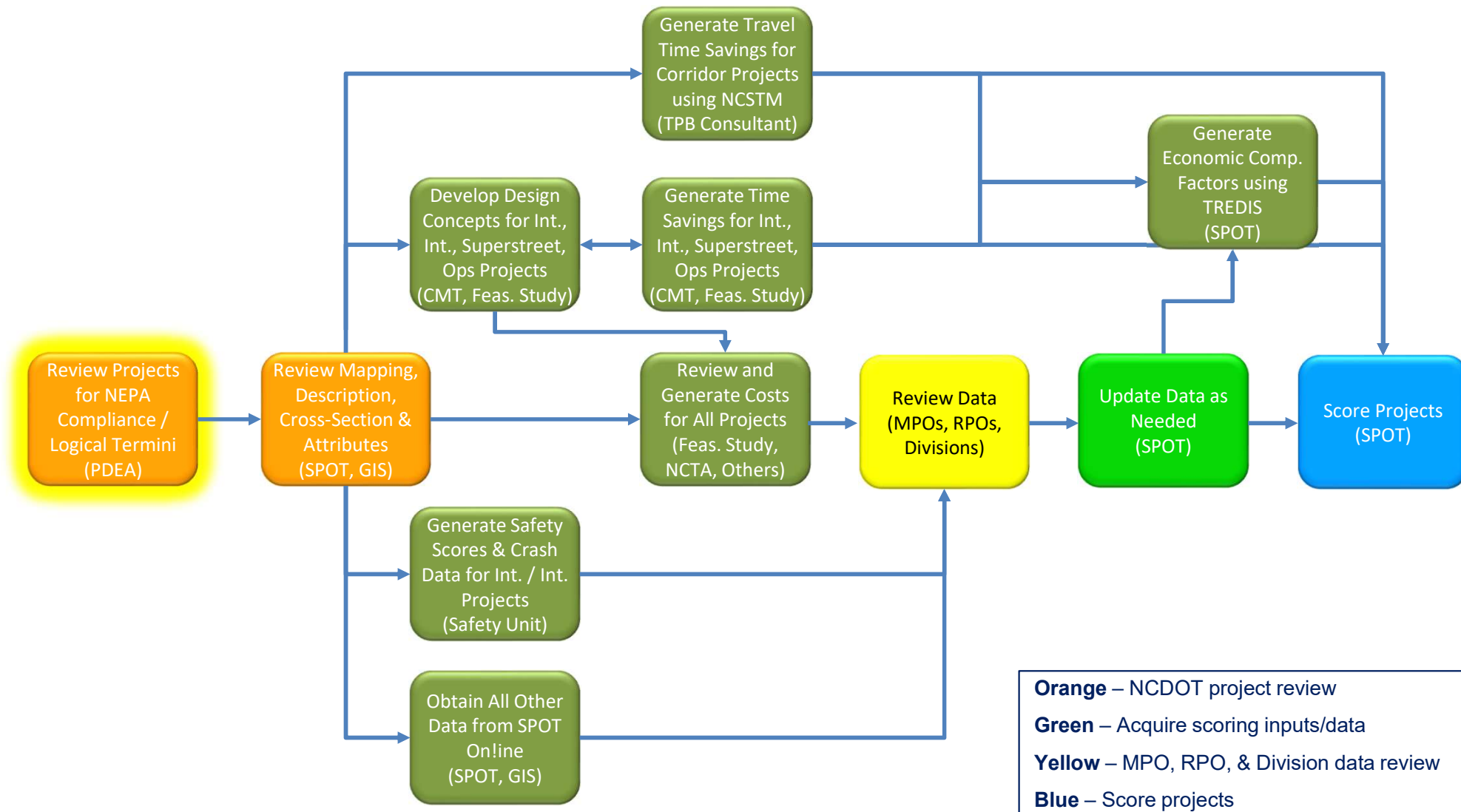
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# Highway Quantitative Scoring Process



# Highway Quantitative Scoring Process





# NEPA / Logical Termini Review

## Why review?

- NEPA [and lawsuits]

## What are typically not logical termini?

- Political/geographic boundaries (unless the road changes here)
- Streams, rivers, etc.

The screenshot shows the Federal Highway Administration's Environmental Review Toolkit. The page is titled "NEPA and Transportation Decisionmaking" and is dated November 5, 1993. It includes an introduction section and a definition of logical termini. The introduction discusses the need for a "whole" or integrated project and the importance of logical termini in project development. The definition of logical termini states that they are defined as (1) rational end points for a transportation improvement, and (2) rational end points for a review of the environmental impacts.

**U.S. Department of Transportation  
Federal Highway Administration**

About Programs Resources Briefing Room Contact Search FHWA

**Environmental Review Toolkit**

Home Planning and Environment NEPA and Project Development Accelerating Project Delivery Historic Preservation Section 4(f) Water, Wetlands, and Wildlife

**NEPA and Project Development**

Program Overview

NEPA Implementation

**NEPA and Transportation Decisionmaking**

- Purpose and Need
- Alternatives
- Impacts
- Mitigation
- Interagency Coordination
- Public Involvement

NEPA Documentation

Environmental Justice

Safety and NEPA

Interim Guidance on the Application of Travel and Land Use Forecasting in NEPA

Bridge Case Study

Active & Inactive Environmental Impact Statements

Submit Feedback

**NEPA and Transportation Decisionmaking**

*The Development of Logical Project Termini*

November 5, 1993

**I. Introduction**

In developing a project concept which can be advanced through the stages of planning, environment, design, and construction, the project sponsor needs to consider a "whole" or integrated project. This project should satisfy an identified need, such as safety, rehabilitation, economic development, or capacity improvements, and should be considered in the context of the local area socioeconomic and topography, the future travel demand, and other infrastructure improvements in the area. Without framing a project in this way, proposed improvements may miss the mark by only peripherally satisfying the need or by causing unexpected side effects which require additional corrective action. A problem of "segmentation" may also occur where a transportation need extends throughout an entire corridor but environmental issues and transportation need are inappropriately discussed for only a segment of the corridor.

The Federal Highway Administration (FHWA) regulations outline three general principles at 23 CFR 771.111(f) that are to be used to frame a highway project.

In order to ensure meaningful evaluation of alternatives and to avoid commitments to transportation improvements before they are fully evaluated, the action evaluated in each environmental impact statement (EIS) or finding of no significant impact (FONSI) shall:

1. Connect logical termini and be of sufficient length to address environmental matters on a broad scope;
2. Have independent utility or independent significance, i.e., be usable and be a reasonable expenditure even if no additional transportation improvements in the area are made; and
3. Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

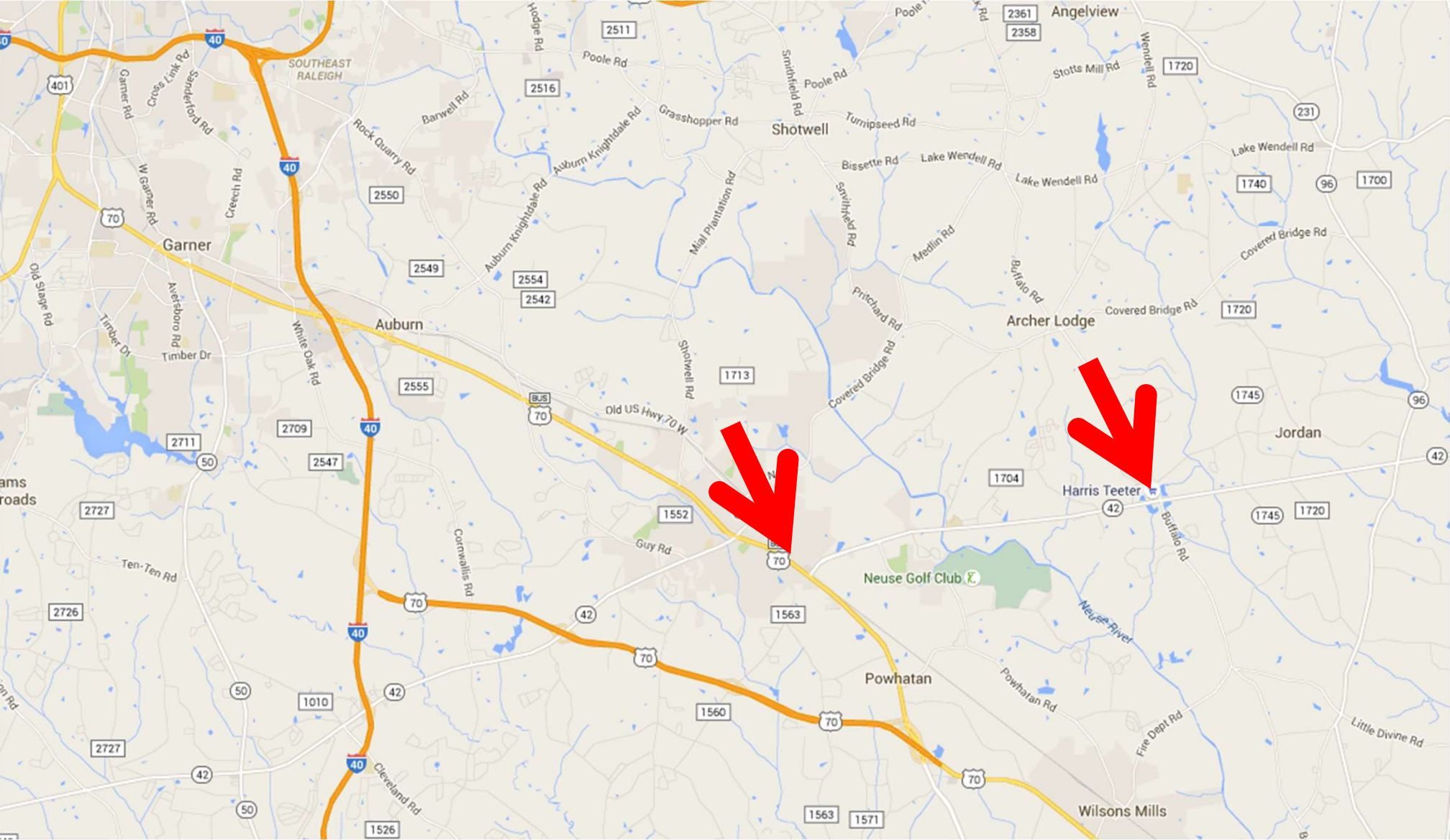
The aim of this paper is to discuss criteria that can be used to select logical termini (project limits) for development of a project. The primary discussion will be on the first of the three factors mentioned above. However, all three are interrelated and necessary to the development of an integrated project.

The remainder of this paper is divided into three sections. Section II will further define logical termini. Section III will discuss several case studies covering factors that can come into play in choosing termini, and Section IV will offer some conclusions.

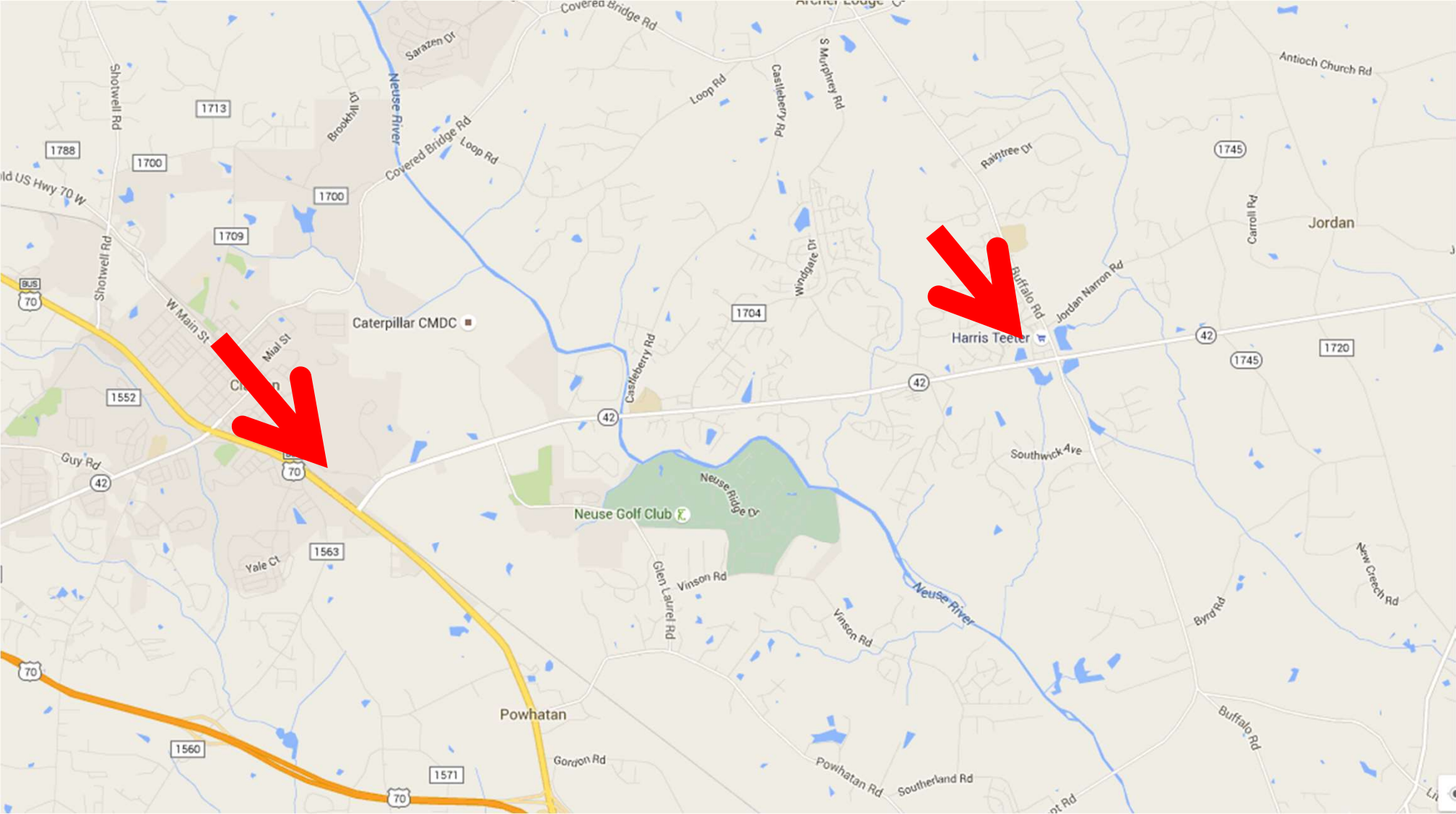
**II. A Definition of Logical Termini**

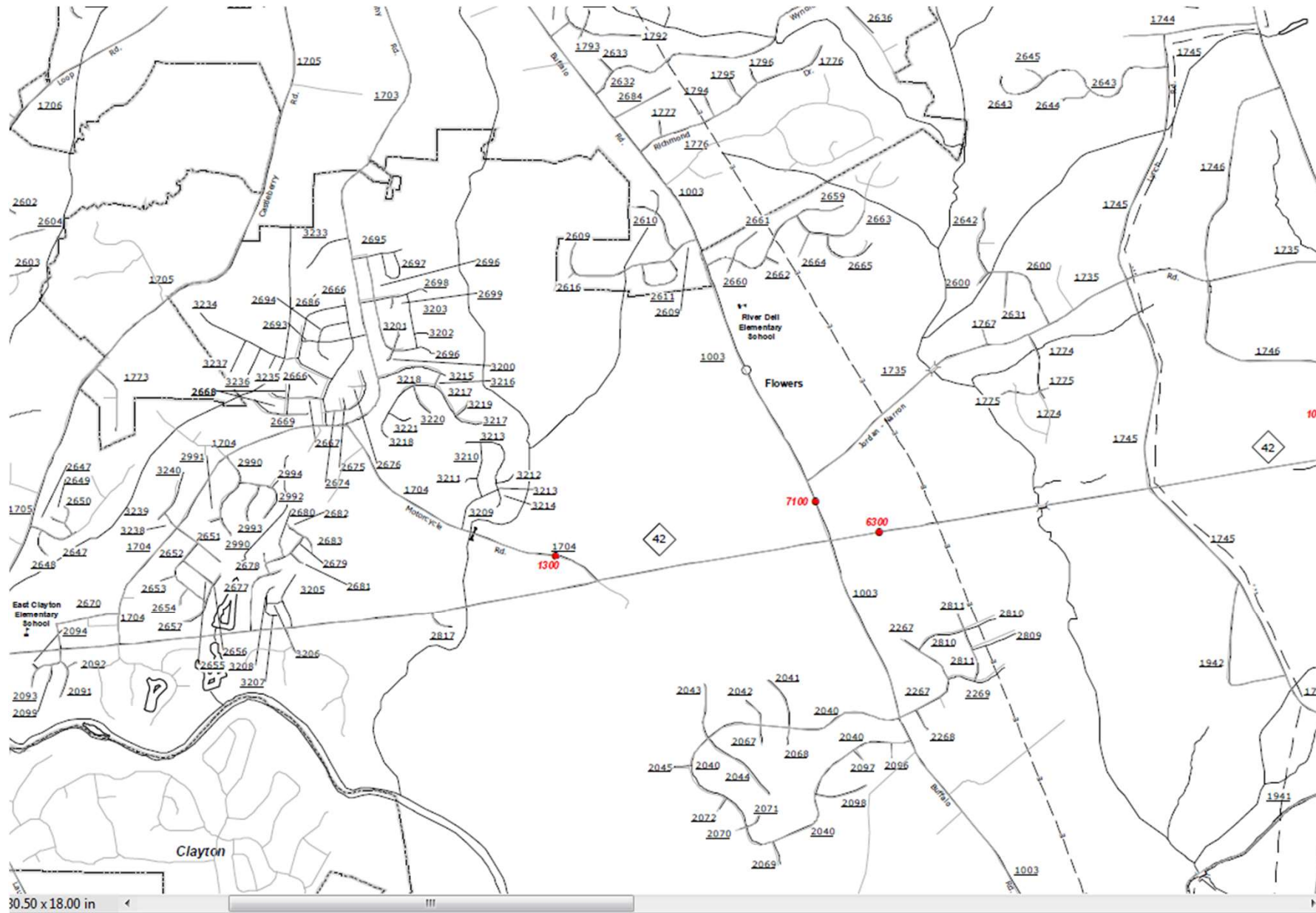
Logical termini for project development are defined as (1) rational end points for a transportation improvement, and (2) rational end points for a review of the environmental impacts. The environmental impact review frequently covers a broader geographic area than the strict limits of the transportation improvements. In the past, the most common termini have been points of major traffic generation, especially intersecting roadways. This is due to the fact that in most cases traffic generators determine the size and type of facility being proposed. However, there are also cases where the project improvement is not primarily related to congestion due to traffic generators, and the choice of termini based on these generators may not be appropriate. The next section will show some examples where this is the case.

<https://www.environment.fhwa.dot.gov/projdev/tdmtermini.asp>

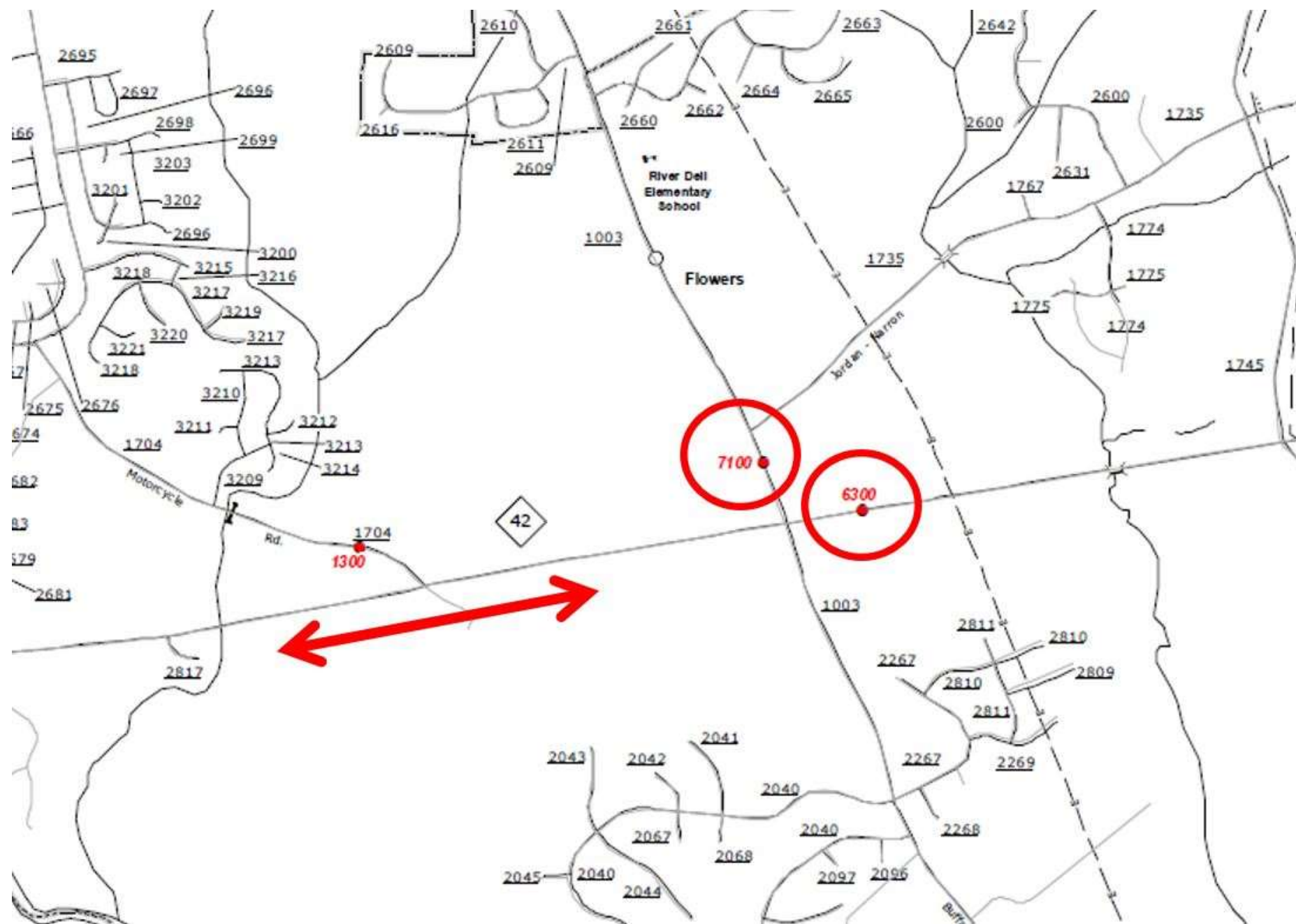


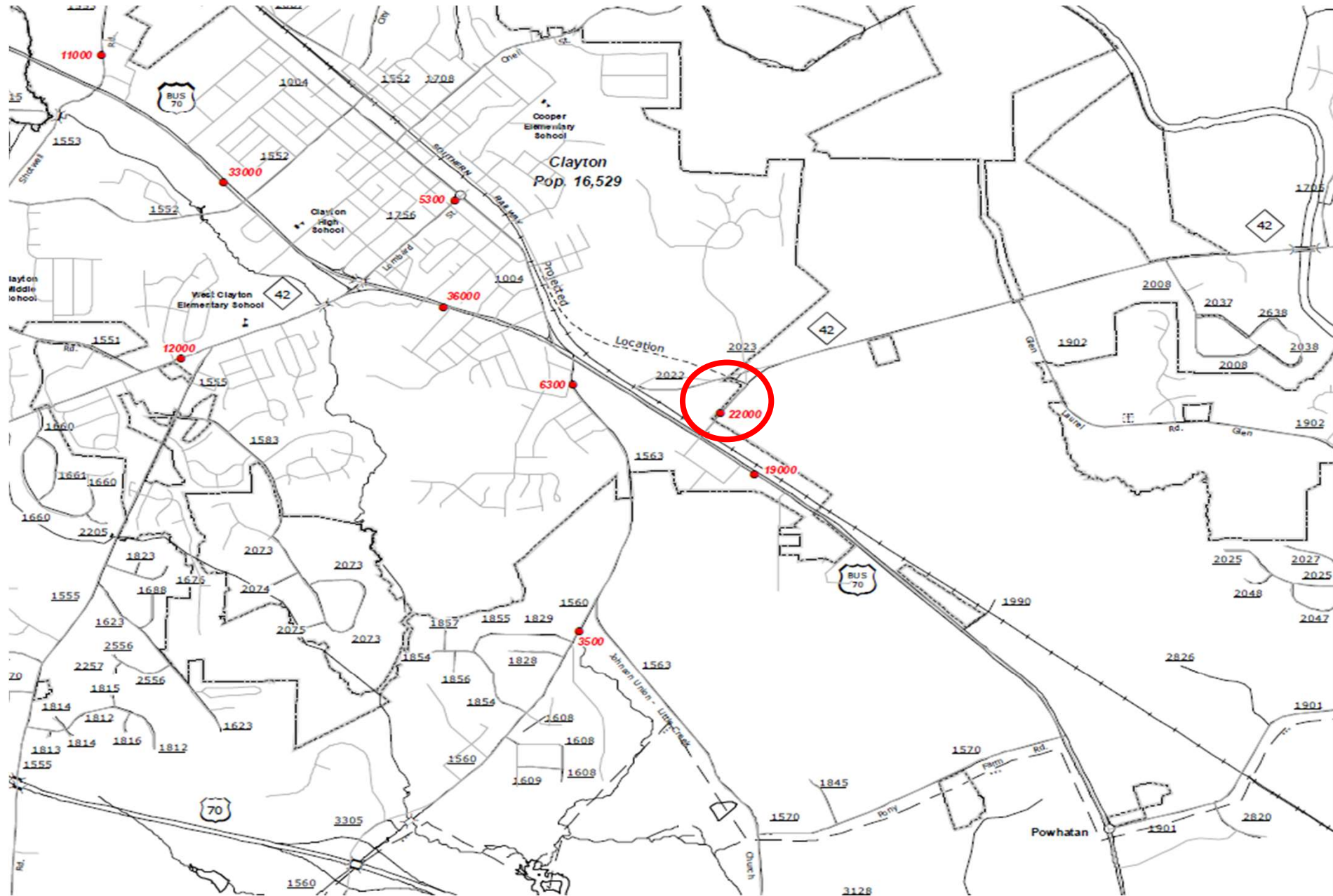




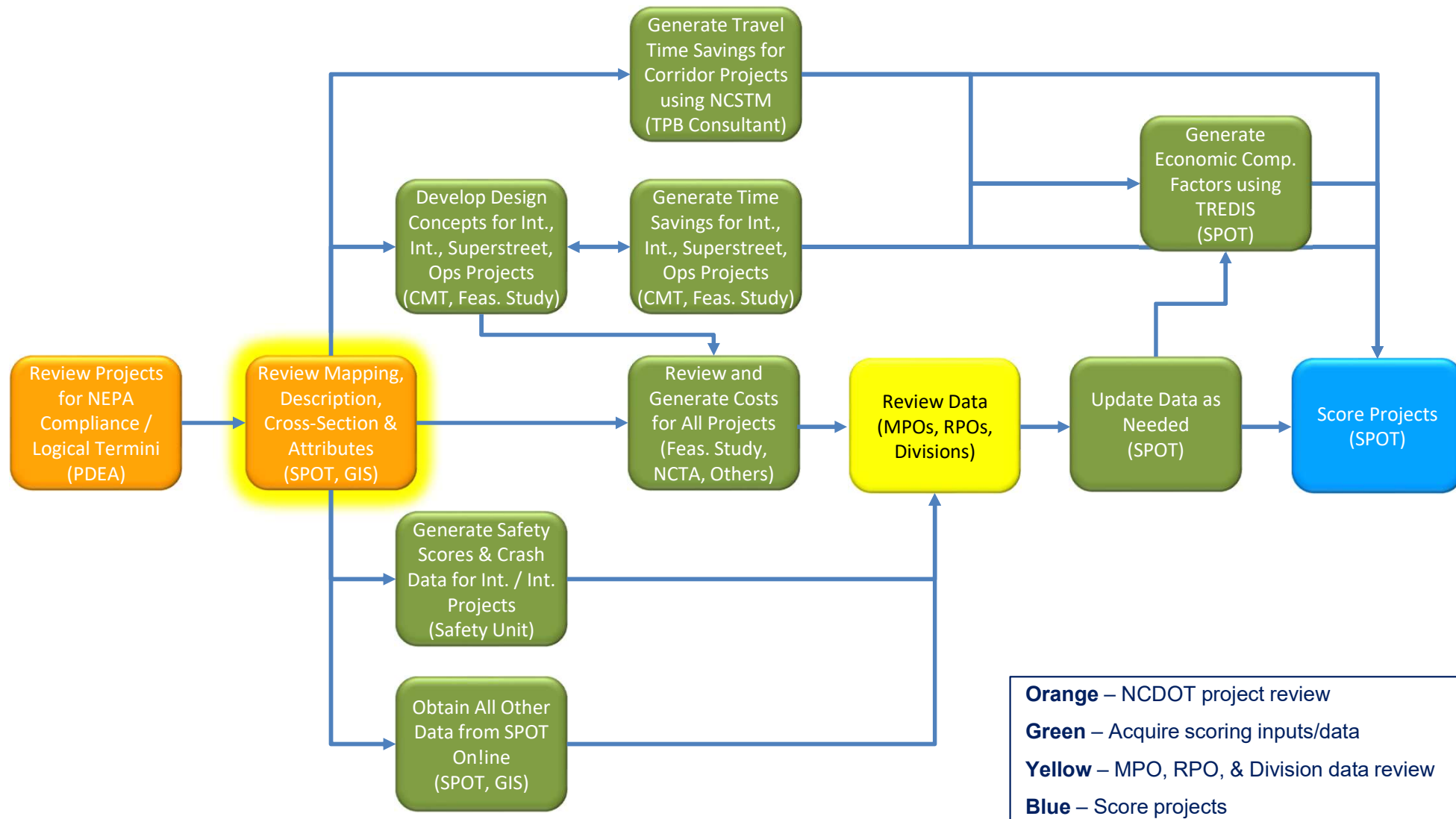








# Highway Quantitative Scoring Process



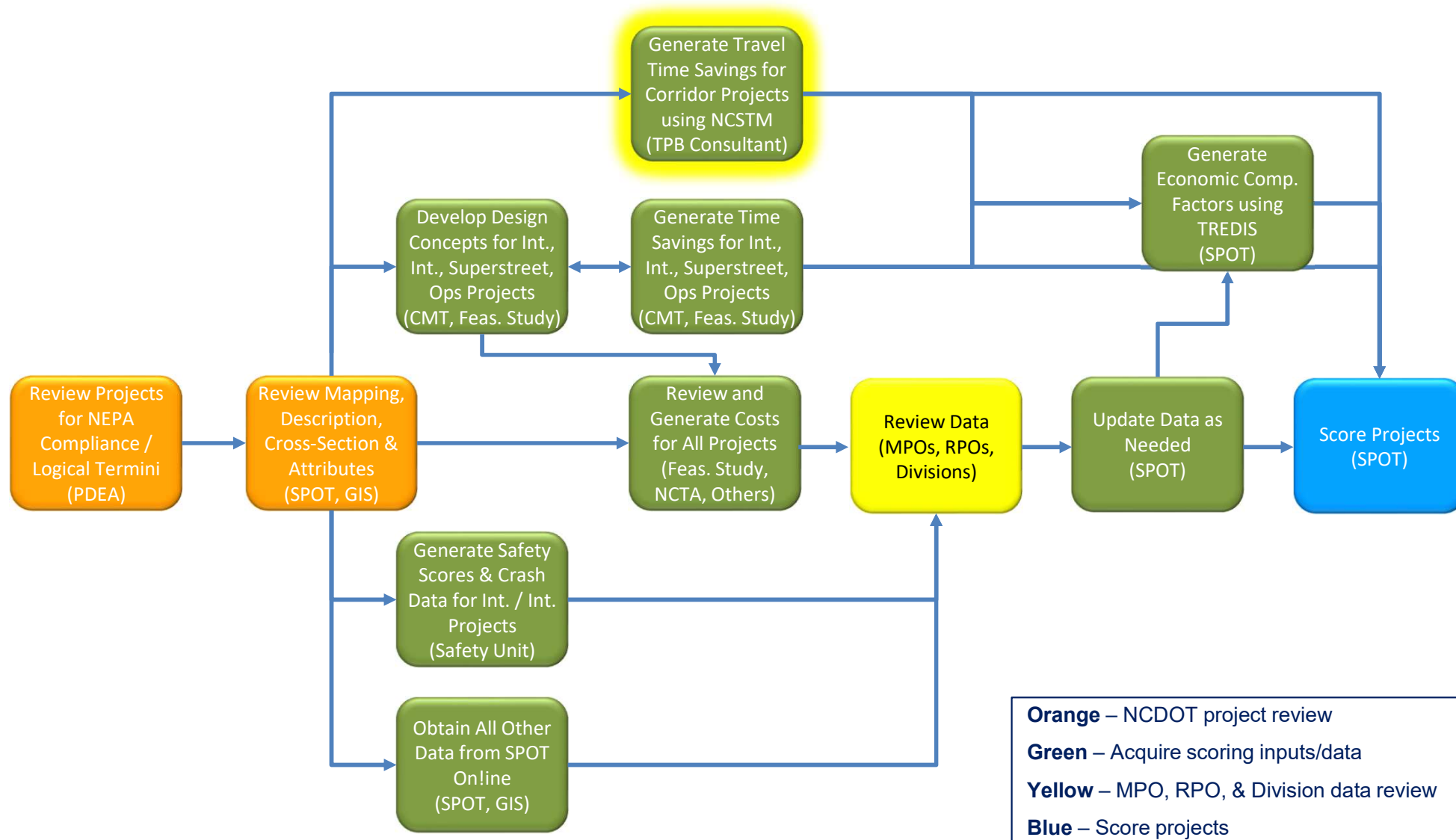
# Review Mapping, Description & Attributes

## SPOT and GIS Unit thoroughly review each project:

- Mapping to ensure it matches project description, including projects on local roadways
- Proposed cross-section to ensure it matches project description
- Overlapping projects
- Parallel routes for all new location projects
- Project attributes to ensure they are correct (such as STI category, facility type, functional classification, etc)



# Highway Quantitative Scoring Process





# Travel Time Savings

## Multiple criteria

- Benefit / Cost
- Economic Competitiveness
- Accessibility / Connectivity

## Multiple ways to calculate

- NCSTM
- CMT
- CALC

All approaches account for growth over 10 year analysis period

# Travel Time Savings - NCSTM

## North Carolina Statewide Travel Demand Model

- Developed over 6 year period in TransCAD
- Includes all Primary Routes
- Embedded national truck model
- 2010 Base Year, 2040 Future Year
- MPOs, RPOs reviewed initial socio-economic data (control totals)

## Use

- Network-wide analysis for each project (independently) in 2015 & 2025
- E+C Network includes committed projects (same for each)
- Tested for P3.0; First used in P4.0 (Statewide Mobility)
- P5.0 → Statewide Mobility and Regional Impact

# Travel Time Savings - NCSTM

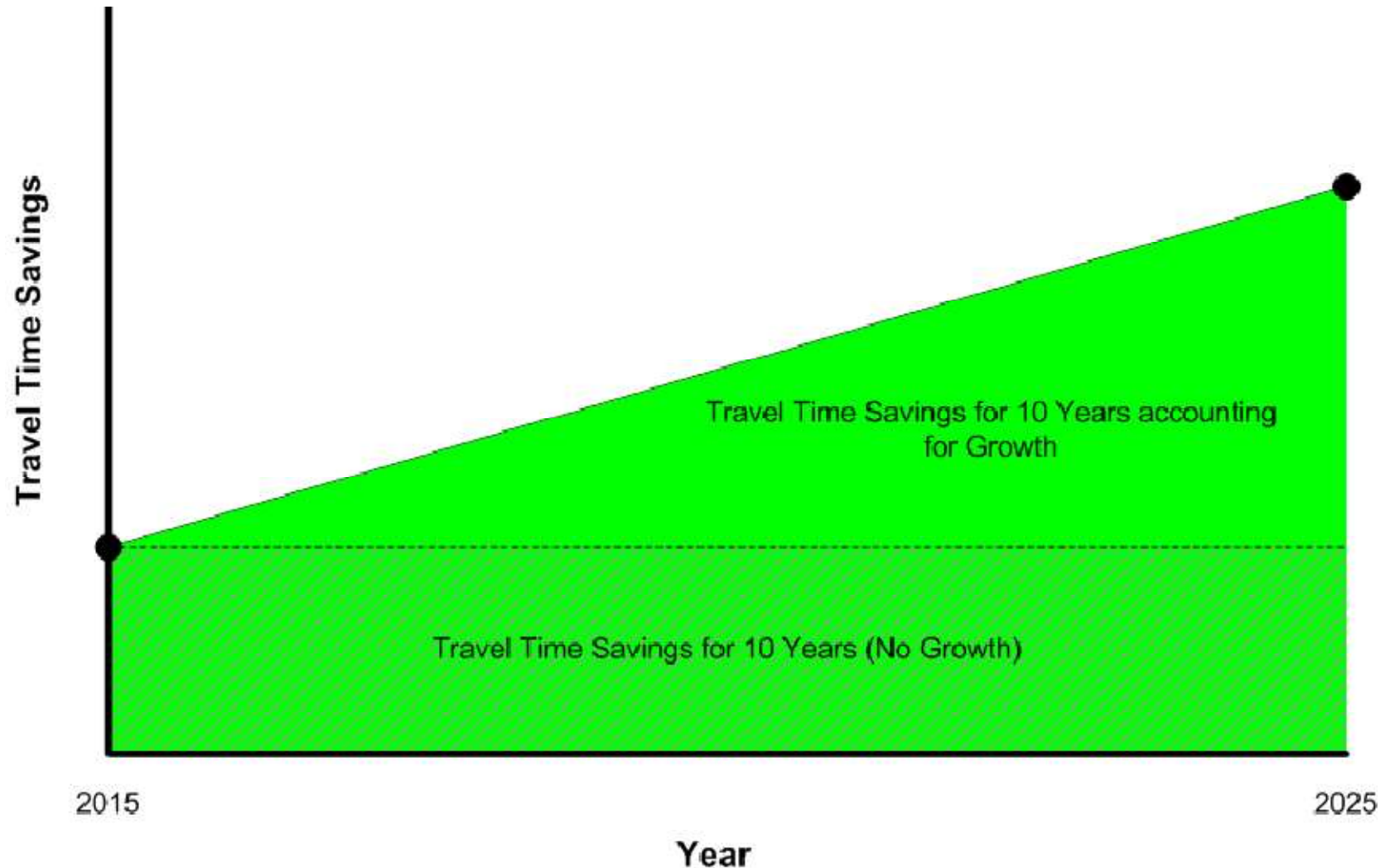
Managed and run by consultant

## Outputs

- Based Year (2015) Travel Time Savings – Autos
- Based Year (2015) Travel Time Savings – Trucks
- Future Year (2025) Travel Time Savings – Autos
- Future Year (2025) Travel Time Savings – Trucks
  
- Inputs to TREDIS

# Travel Time Savings - NCSTM

Calculate the entire area under the line for total TTS (x2)



## Travel Time Savings - NCSTM

Multiply TTS over 10 years – Autos by VOT (\$12.75)

Multiply TTS over 10 years – Trucks by VOT (\$50.00)

Total TTS over 10 years = Sum of above

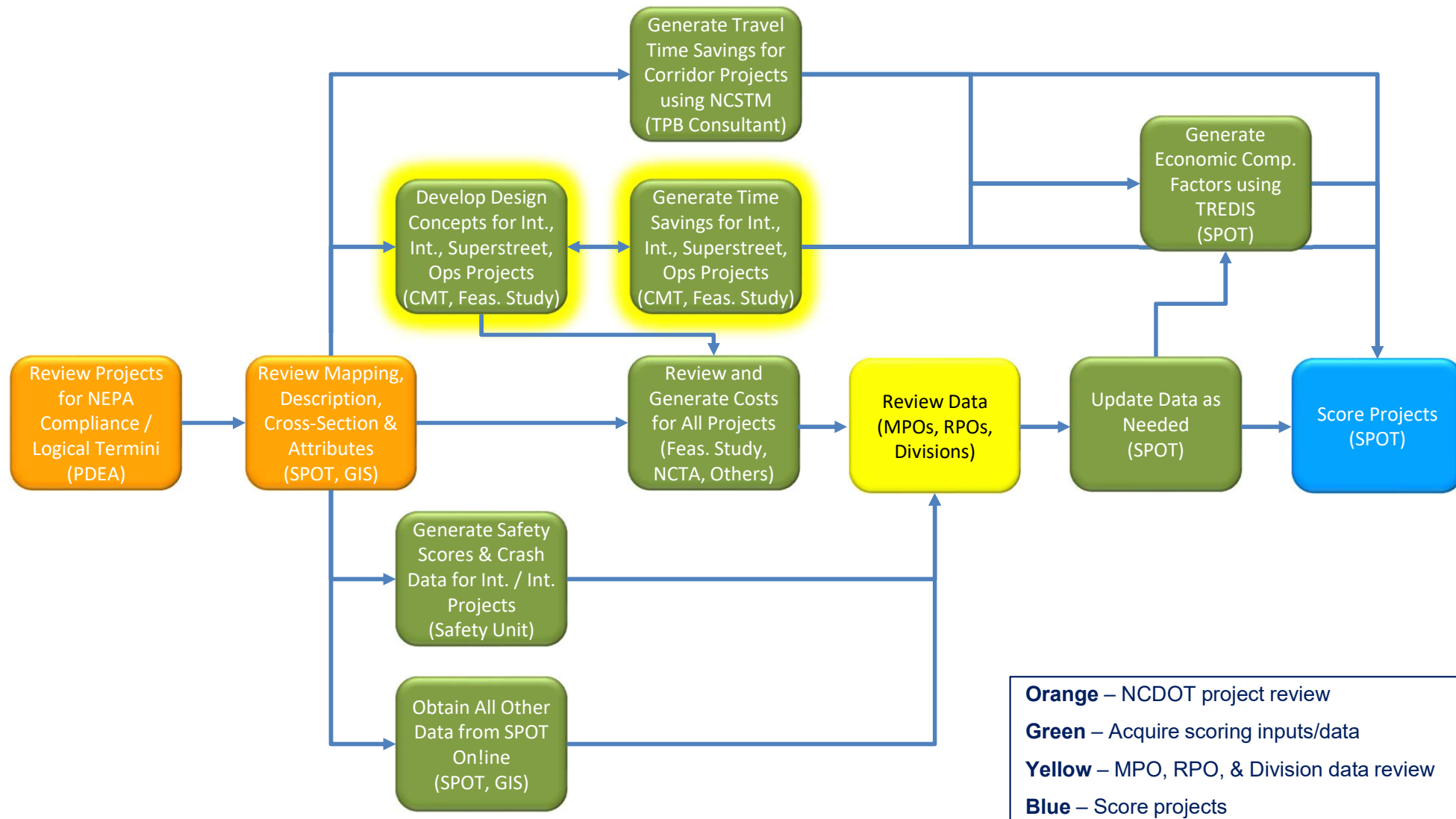
# Travel Time Savings - NCSTM

## North Carolina Statewide Travel Demand Model

- New 2017 Base Year
- 2045 Future Year
- 2020 to 2030 – 10 Year Run



# Highway Quantitative Scoring Process



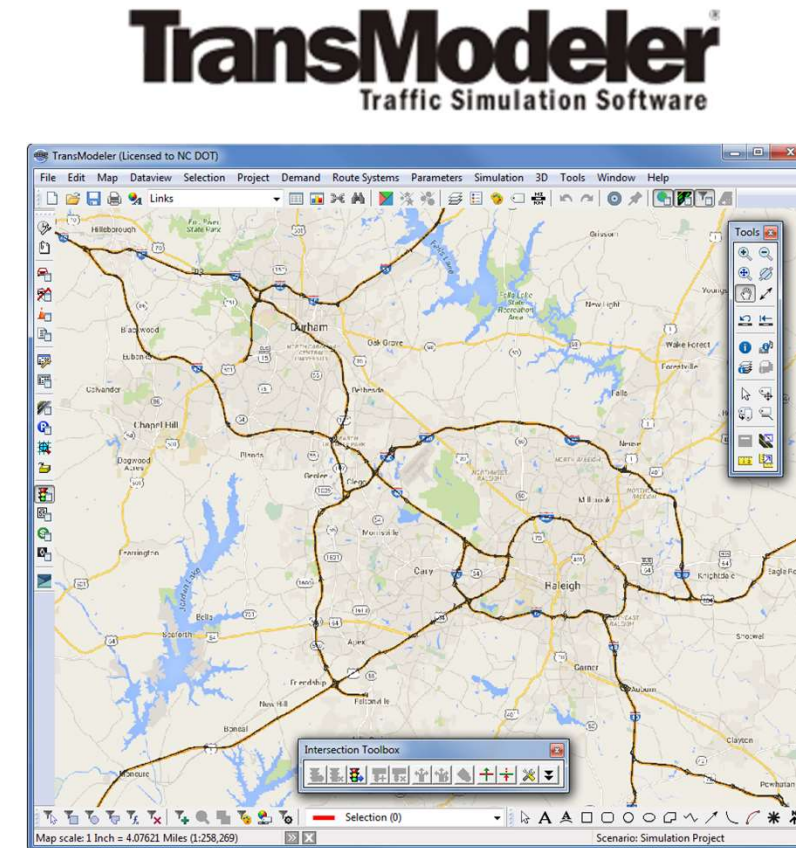
# Travel Time Savings - CMT

## Congestion Management Team

- Microsimulations in TransModeler
  - Intersection
  - Interchange
  - Superstreet
  - Auxiliary Lane
  - Operational Projects
- Incorporates traffic growth

## Use

- Location-specific analysis per project (independently) in 2015 & 2025
- P2.0, P3.0, P4.0, P5.0 → All STI Categories



# Travel Time Savings - CMT

Eight Models - 2015 and 2025, No-Build & Build, AM & PM

## Inputs

- Existing Volumes, Turning Movements, Actual K and D values
- Growth rates derived (NCSTM and other sources)

## Outputs

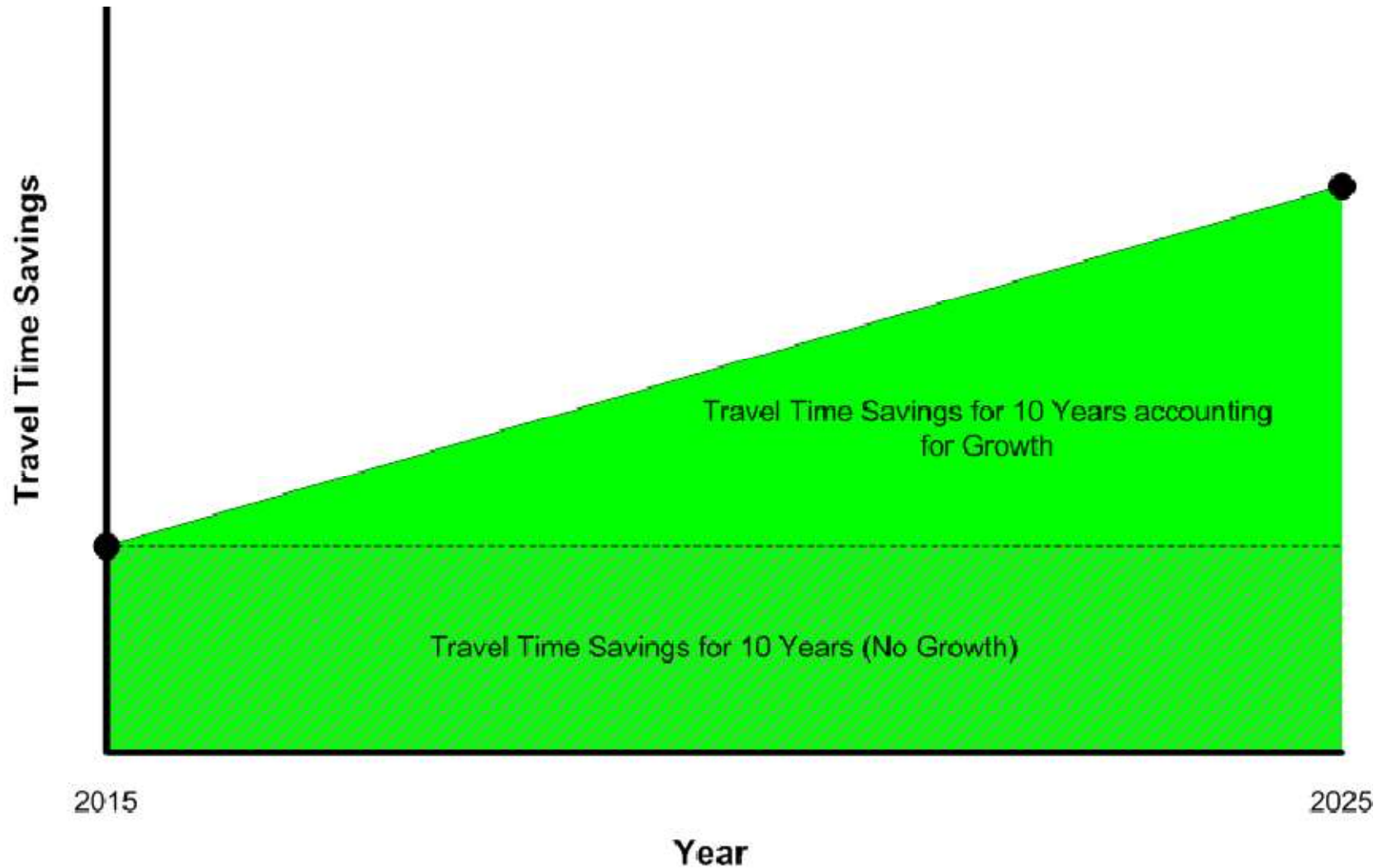
- Base Year (2015) Travel Time Savings
- Future Year (2025) Travel Time Savings

## Formula

1. TTS 10 YR = entire area under the line (similar to NCSTM) → (hrs)

# Travel Time Savings - CMT

Calculate the entire area under the line for total TTS



# Travel Time Savings - CMT

## Formula (cont'd)

2. Separate TTS 10 YR → TTS 10 Years (Auto) & TTS 10 Years (Trucks)
  - Based on existing auto and truck %s
  
3. **TTS 10 Years (\$)** = Multiply TTS 10 Years (Auto) & TTS 10 Years (Trucks) by values of time



# CMT – Alternative Development

Reviews each project individually

- Coordinates with design team (includes Feasibility Studies Unit)

If improvement concept provided, it was analyzed unless problems were identified (operational issues, constructability, etc.)

If no concept submitted, team develops concept using high tech methods...

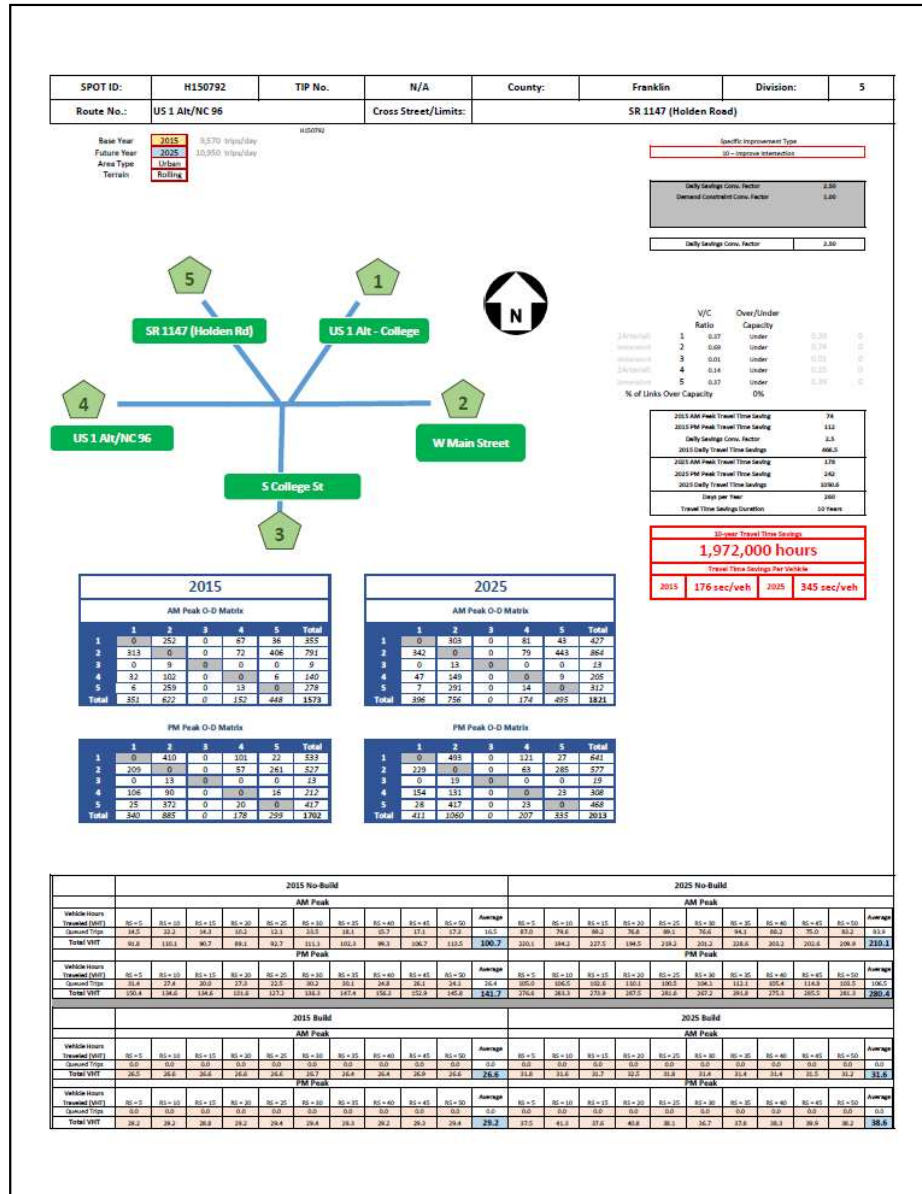


# CMT – Alternative Development





# CMT – Summary Reports



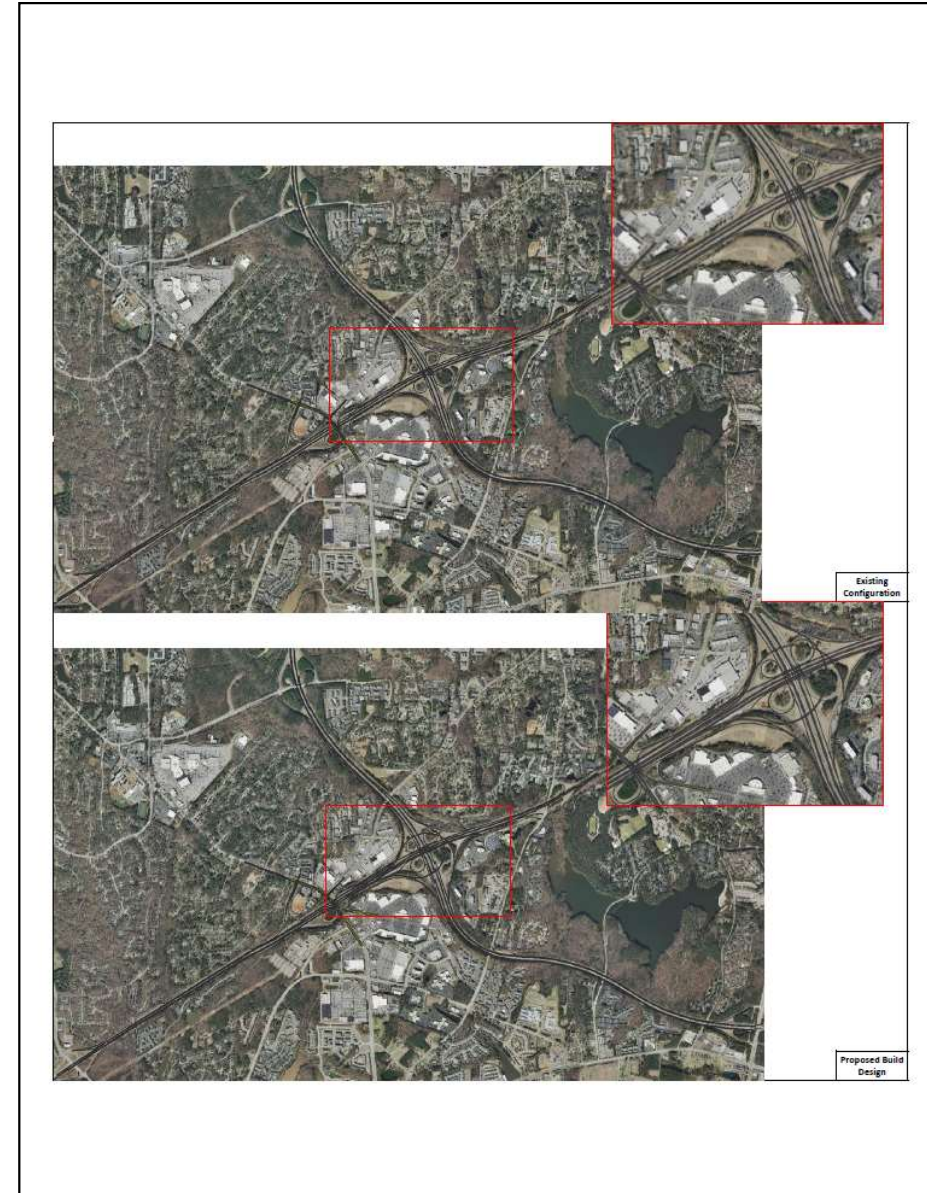
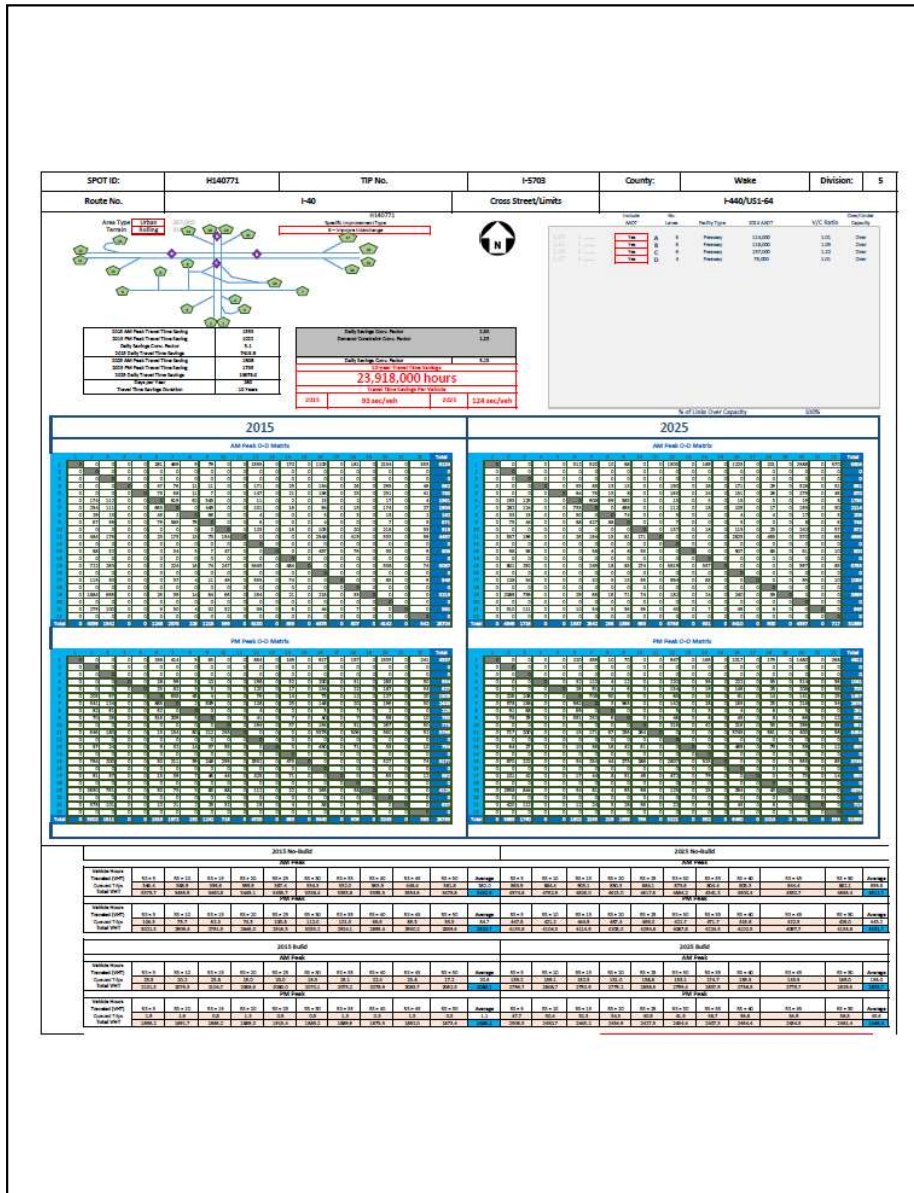
Existing Configuration



Proposed Build Design



# CMT – Summary Reports



# Travel Time Savings - CALC

## Calculation

- Simple before & after analysis for just the segment
- Accounts for existing congestion
- Incorporates traffic growth

## Use

- P2.0, P3.0, P4.0 (Regional Impact, Division Needs)
- P5.0 → Projects not evaluated in NCSTM or CMT; Division Needs
  - Access management, signal systems, other ITS projects

# Travel Time Savings - CALC

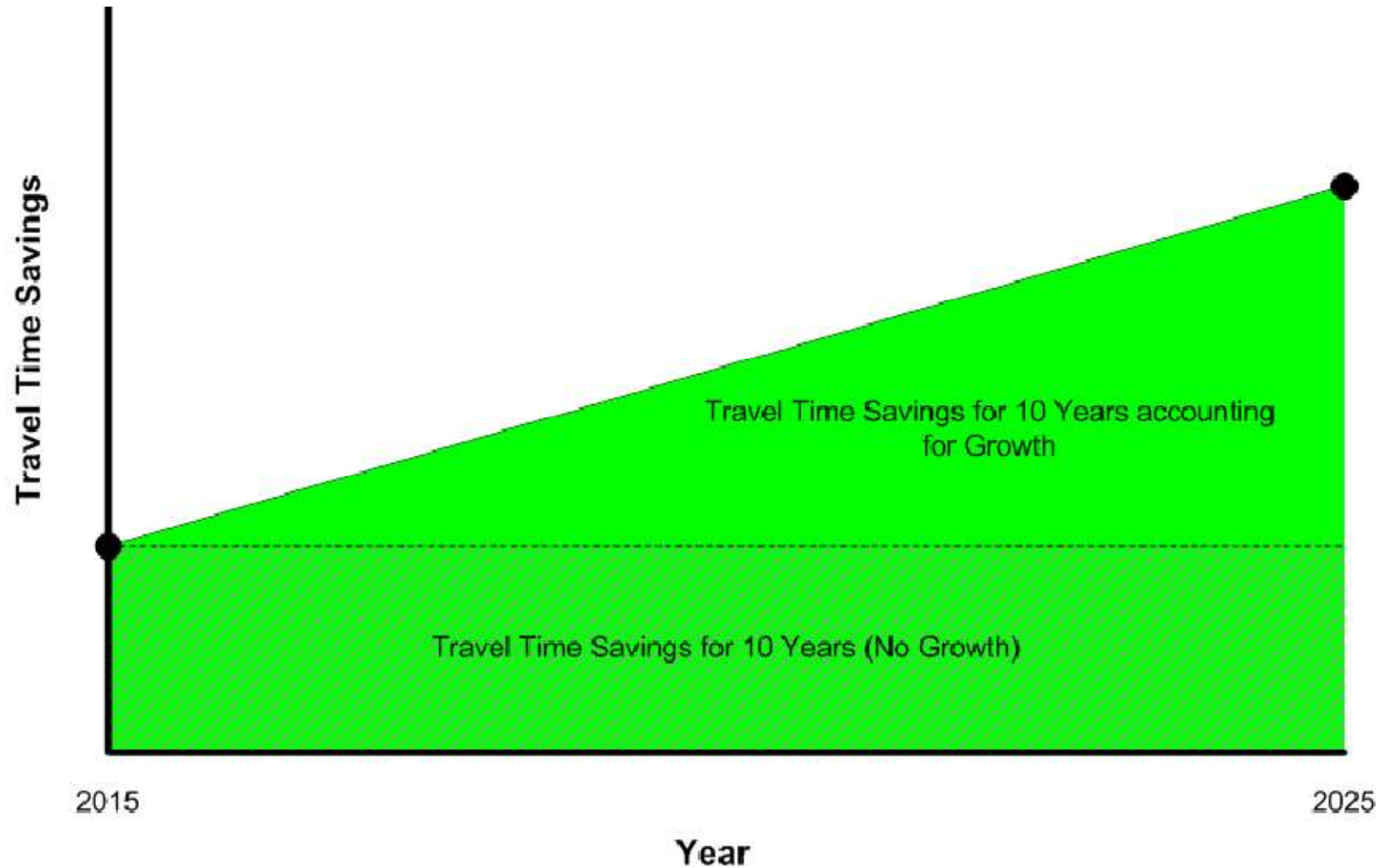
## Formula

1. Calculate TTS in Base Year (2015)
  - A. Calculate TT along existing facility  
$$TT \text{ (Existing)} = (\text{Length/Speed Limit}) \times \text{Congestion Factor}$$
  - B. Calculate TT along existing facility if project was open to traffic today  
$$TT \text{ (Project)} = (\text{Length/Speed Limit}) \times \text{Congestion Factor}$$
  - C. Calculate TTS for Base Year for all users  
$$TTS \text{ BY} = (TT \text{ (Existing)} - TT \text{ (Project)}) \times AADT \times 260 \text{ days/yr} \times \text{Peak-to-Daily}$$
2. Repeat above calculation except grow volume for 10 years → TTS FY
  - Growth rates derived from NCSTM and other sources
3. TTS 10 YR = entire area under the line (similar to NCSTM & CMT)



# Travel Time Savings - CALC

Calculate the entire area under the line for total TTS





# Travel Time Savings - CALC

## Formula (cont'd)

4. Separate TTS 10 YR → TTS 10 Years (Auto) & TTS 10 Years (Trucks)
  - Based on existing auto and truck %s
  
5. **TTS 10 Years (\$)** = Multiply TTS 10 Years (Auto) & TTS 10 Years (Trucks) by VOT

## Notes:

### Congestion Factor

- Accounts for effect of congestion on travel time, using v/c ratio
- Based on volume/delay curves in models
- V/C ratio will likely change between existing and with project in place
- With project, travel time, length, and speed could change
- New location projects → parallel route used for existing TT, new route used for project TT

# Travel Time Savings Methods

Project Eligibility	Type (Based on SIT)	Statewide Mobility Scoring	Regional Impact Scoring	Division Needs Scoring
Statewide Mobility	Segment	NCSTM	NCSTM	CALC
	Int/Int/SS/Ops	CMT	CMT	CMT
	Other	CALC	CALC	CALC
Regional Impact	Segment		NCSTM	CALC
	Int/Int/SS/Ops		CMT	CMT
	Other		CALC	CALC
Division Needs	Segment			CALC
	Int/Int/SS/Ops			CMT
	Other			CALC

Subject matter experts review results to ensure fair comparison

# Travel Time Savings – A/C

## Accessibility/Connectivity

**50% - Improve Mobility** – If project upgrades mobility of roadway (e.g. eliminating signals), points based on travel time savings per user

### TTS Per User

- CMT provides for all Int/Int/SS/Ops projects
- Use CALC for all other projects

# P6.0 Highway SITs

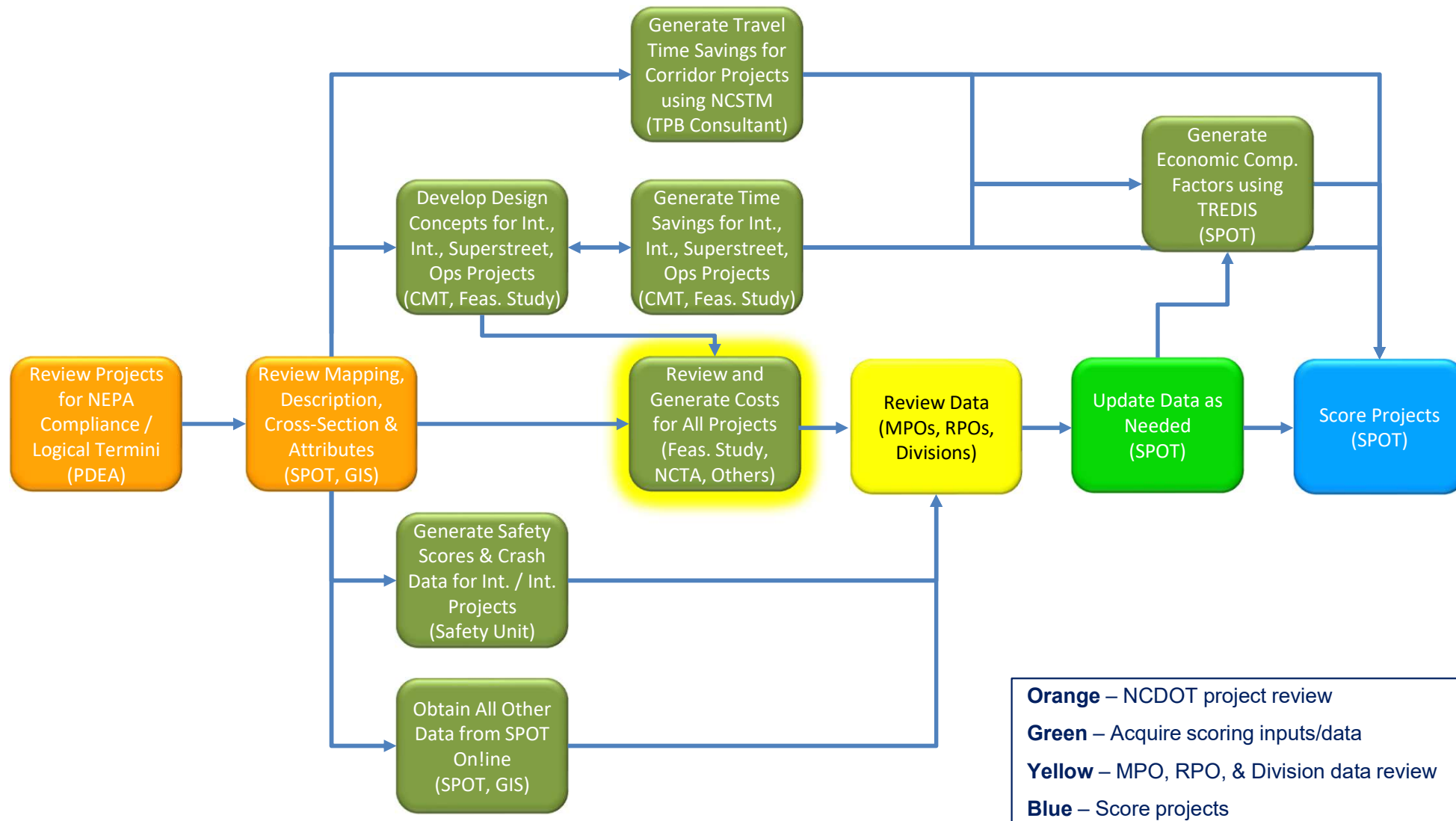
Highway Specific Improvement Types for P5.0	
1 - Widen Existing Roadway	14 - Closed Loop Signal System
2 - Upgrade Arterial to Freeway/Expressway	15 - Install Cameras and DMS
3 - Upgrade Expressway to Freeway	16 - Modernize Roadway
4 - Upgrade Arterial to Superstreet	17 - Upgrade Freeway to Interstate 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

Primary scoring differences in Travel Time Savings & Safety Benefits

# Safety Benefit Factors

1 - Widen Existing Roadway	Varies	Segment
1A - Widen Existing Roadway - Add lane to Freeway	10	Segment
1B - Widen Existing Roadway - Widen 2 lane roadway to 4 lane divided - Rural	55	Segment
1C - Widen Existing Roadway - Install two-way left turn lane on a two lane roadway	20	Segment
1D - Widen Existing Roadway - All other projects	0	Segment
2 - Upgrade Arterial to Freeway/Expressway	40	Segment
3 - Upgrade Expressway to Freeway	25	Segment
4 - Upgrade Arterial to Superstreet	35	Segment
5 - Construct Roadway on New Location	Varies	Segment
5A - Construct Roadway on New Location - Freeway Bypass	10	Segment
5B - Construct Roadway on New Location - Superstreet Bypass	5	Segment
5C - Construct Roadway on New Location - Multi-Lane Highway Bypass	5	Segment
5D - Construct Roadway on New Location - All other projects	0	Segment
6 - Widen Existing Roadway and Construct Part on New Location	Varies	Segment
6A - Construct Roadway on New Location - Freeway Bypass	10	Segment
6B - Construct Roadway on New Location - Superstreet Bypass	5	Segment
6C - Construct Roadway on New Location - Multi-Lane Highway Bypass	5	Segment
6D - Construct Roadway on New Location - All other projects	0	Segment
7 - Upgrade At-grade Intersection to Interchange or Grade Separation	40	Point
8 - Improve Interchange	10	Point
9 - Convert Grade Separation to Interchange	0	Point
10 - Improve Intersection	Varies	Point
10A - Improve Intersection - Roundabout	40	Point
10B - Improve Intersection - All other projects	25	Point
11 - Access Management	25	Segment
12 - Ramp Metering	5	Segment
13 - Citywide Signal System	5	Segments
14 - Closed Loop Signal System	15	Segment
15 - Install Cameras and DMS	0	Segment
16 - Modernize Roadway	20	Segment
17 - Upgrade Freeway to Interstate Standards	10	Segment
18 - Widen Existing or Construct New Local (Non-State) Roadway	0	Segment
19 - Improve Intersection on Local (Non-State) Roadway	25	Point
20 - Convert Grade Separation to Interchange to Relieve Existing Congested Interchange	0	Point
21 - Realign Multiple Intersections	15	Points
22 - Construct Auxiliary Lanes or Other Operational Improvements	10	Segment
23 - Improve Highway / Railroad Crossing	90	Point
24 - Implement Road Diet	25	Segment


# Highway Quantitative Scoring Process





# Highway Costs for Scoring

More Detailed



Source	Notes
Cost Estimation Tool	Built into SPOT Online
Express Design	All projects should have Express Design costs, at a minimum, before being programmed in STIP
Verified Estimate	By Right-of-Way, Utilities, and Construction Units

Other Possible Sources
NC Turnpike Authority
MPO/RPO/Division Guidance & Studies
Mobility & Safety Division ITS Cost Estimates

# Costs

CET automatically generates – Only used if nothing else available

More accurate estimates:

- STIP Unit – Verified costs
- NCTA – Costs and toll revenues for toll and managed lane projects
- Mobility and Safety – costs for signal system, ITS, and OPs projects
- Feasibility Studies Unit – Reviews estimates for other projects

# Costs – Feasibility Studies Unit

Use recent feasibility study / express design if available

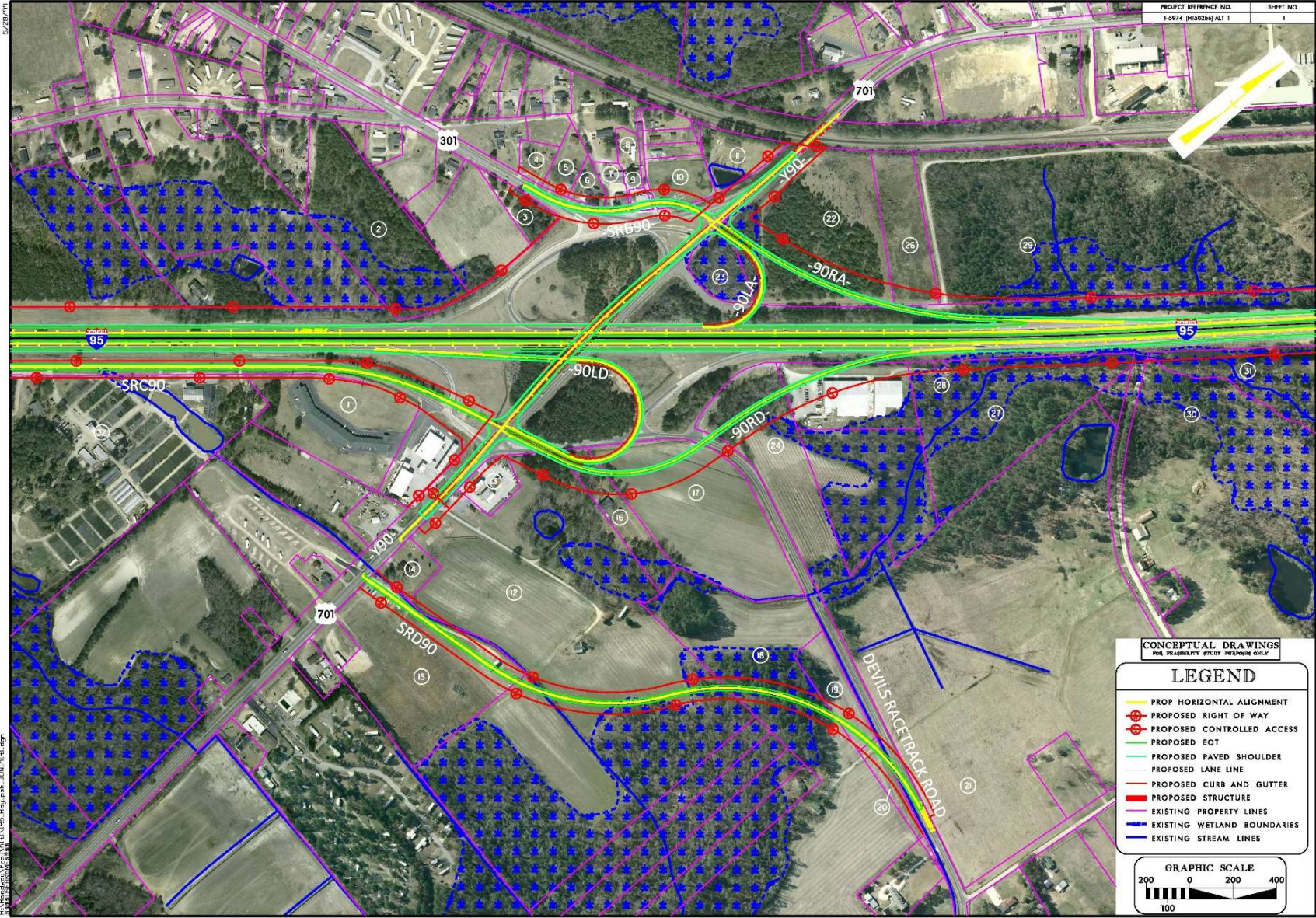
For others focus is on:

- All projects with interchanges
  - Intersection improvements with potential for high R/W cost
  - Modernization projects in mountainous and very wet areas
  - Superstreets
- Conduct Express Design (Cost) – Consultant Teams
- Environ. Screening, Conceptual Design (Quantities and R/W Footprint)

Other estimates from CET are reviewed and updated as appropriate using engineering judgement

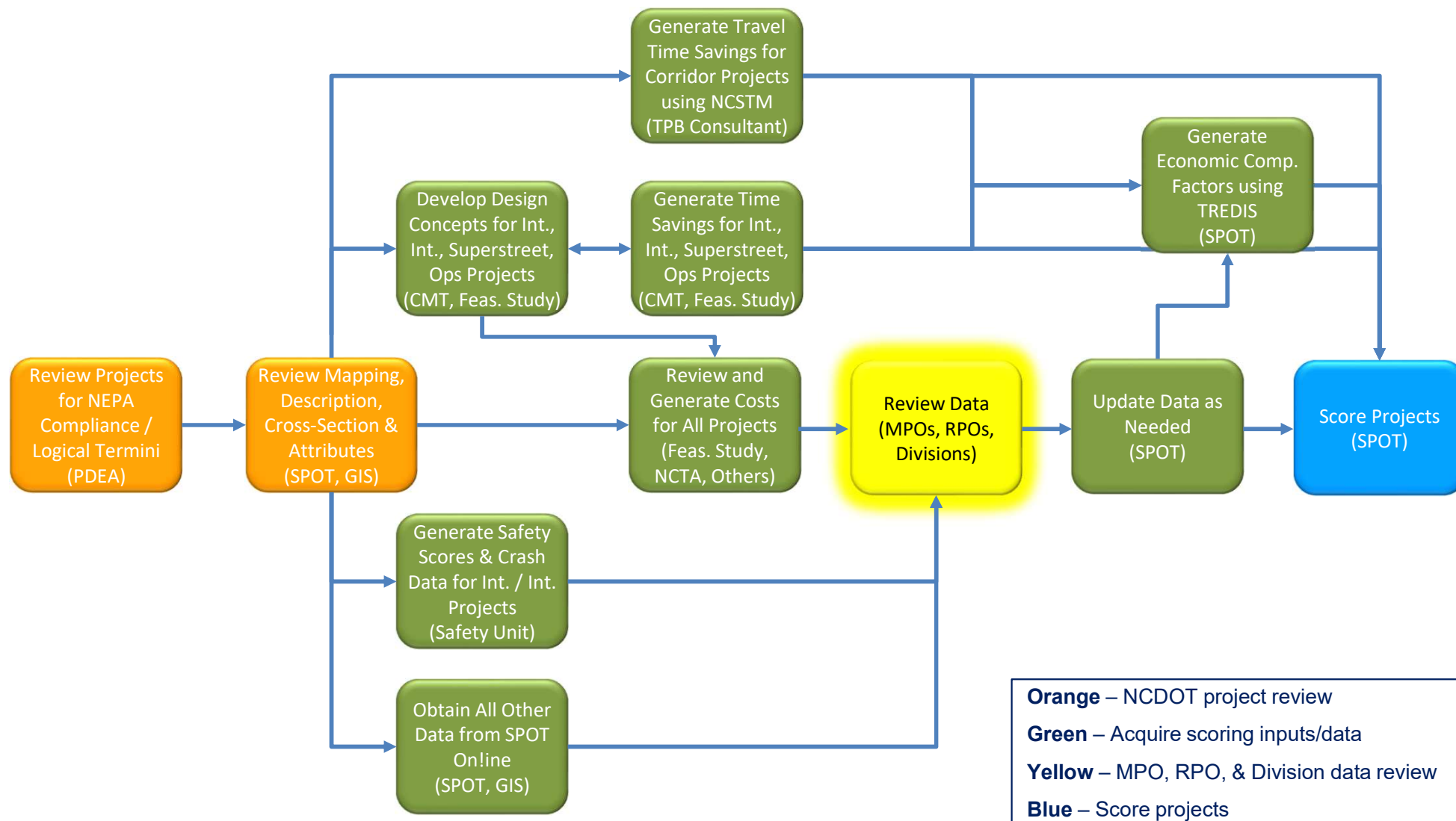


# Costs – Feasibility Studies Unit





# Highway Quantitative Scoring Process



# Data Review

MPOs, RPOs & Divisions (multiple weeks)

## Key Opportunity

- Confirm data is correct and identify possible errors
  - Data spreadsheet, GIS data provided by SPOT, local knowledge
- Prior to scoring

SPOT reviews all possible errors and updates as appropriate



# GIS Data Sources

AADT, PADT, Truck Data – Traffic Survey Unit

- Truck data only available on NHS Routes

Capacities – NCLOS

Pavement Data – PMS (Pavement Mgmt Unit)

Crash Data, Speed Limit – TEAAS (Mobility & Safety)

# Lanes, Median – Road Characteristics

# GIS Data

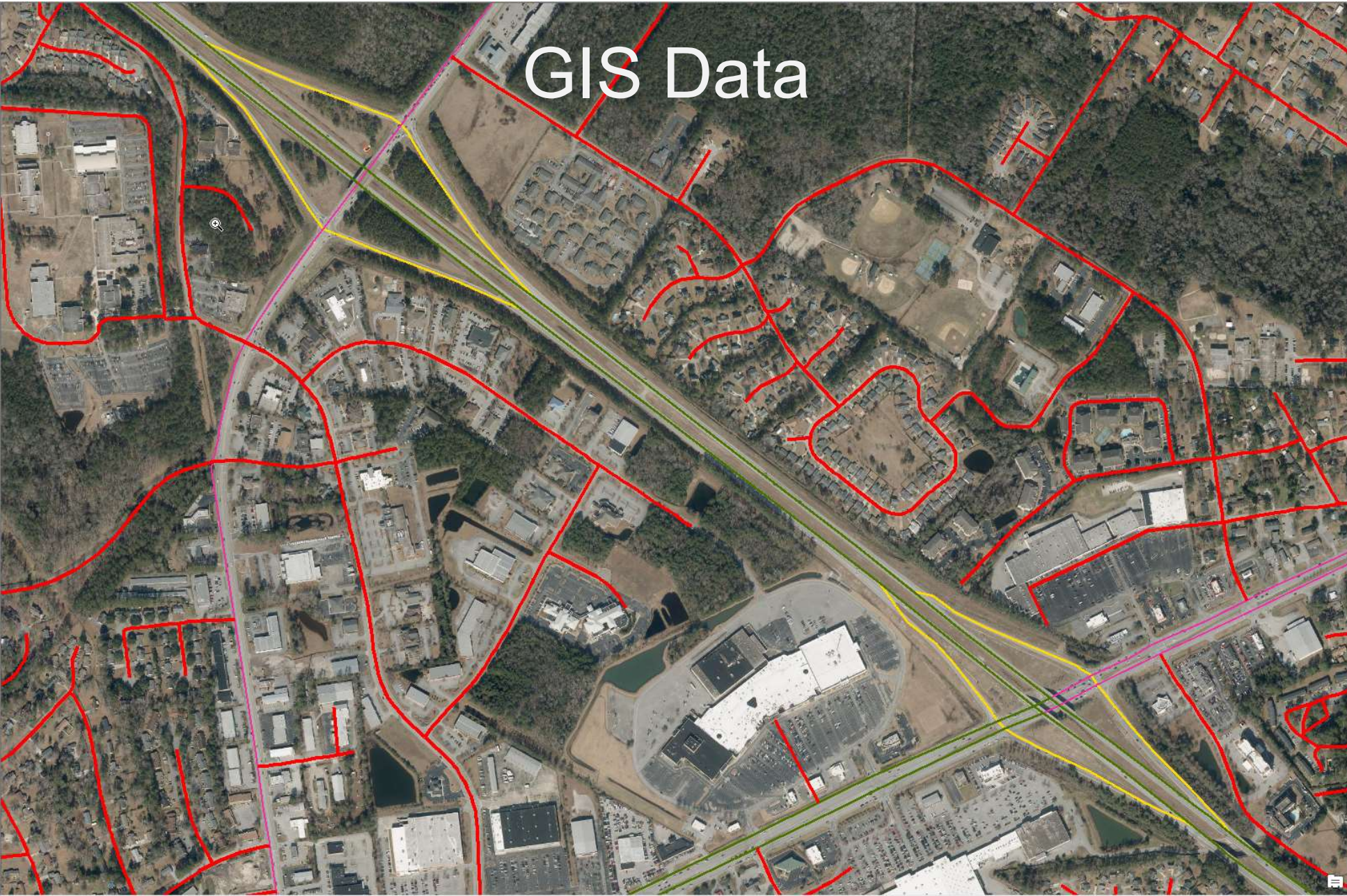






State Maintained Roads





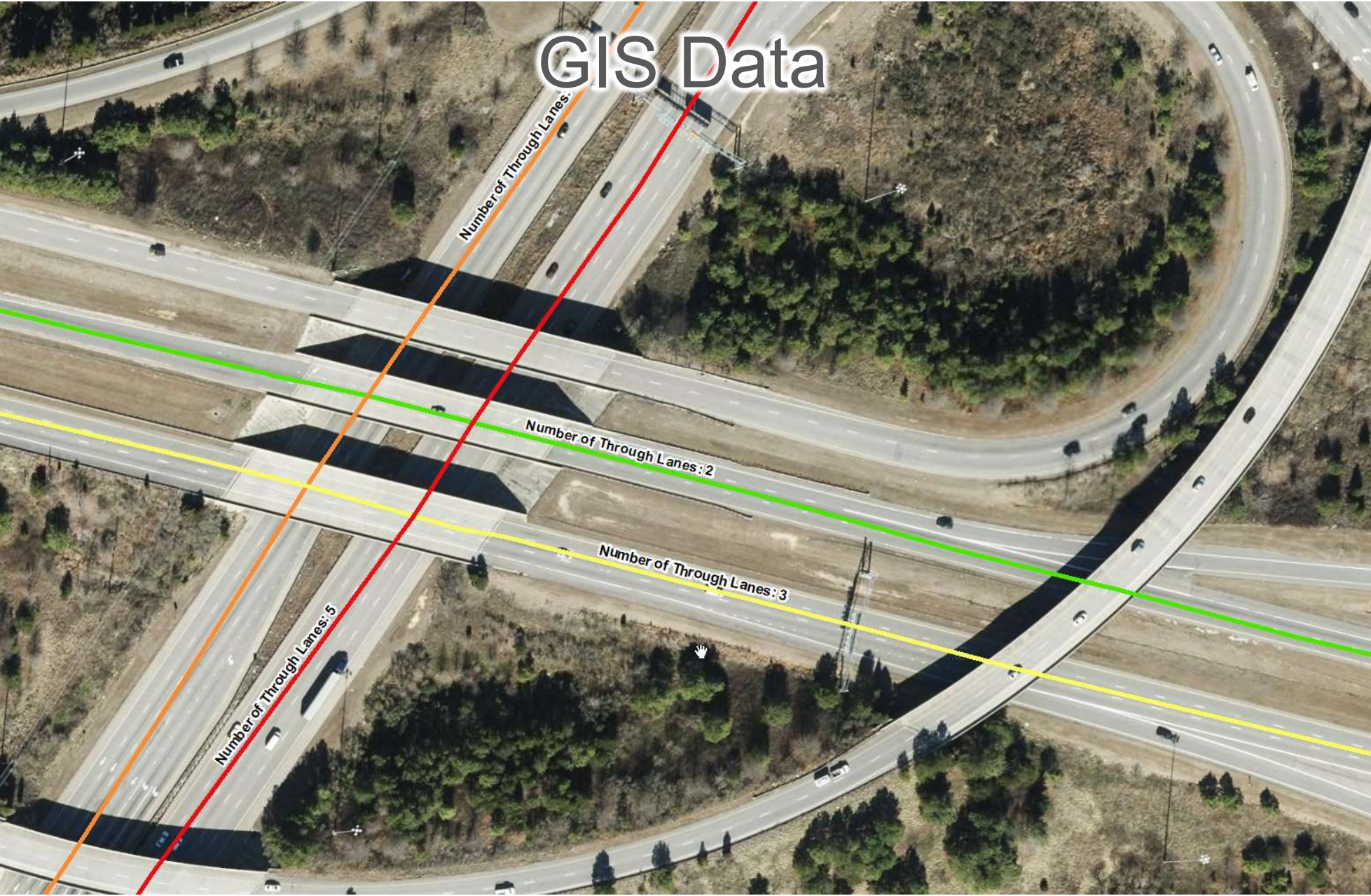
Local Roads



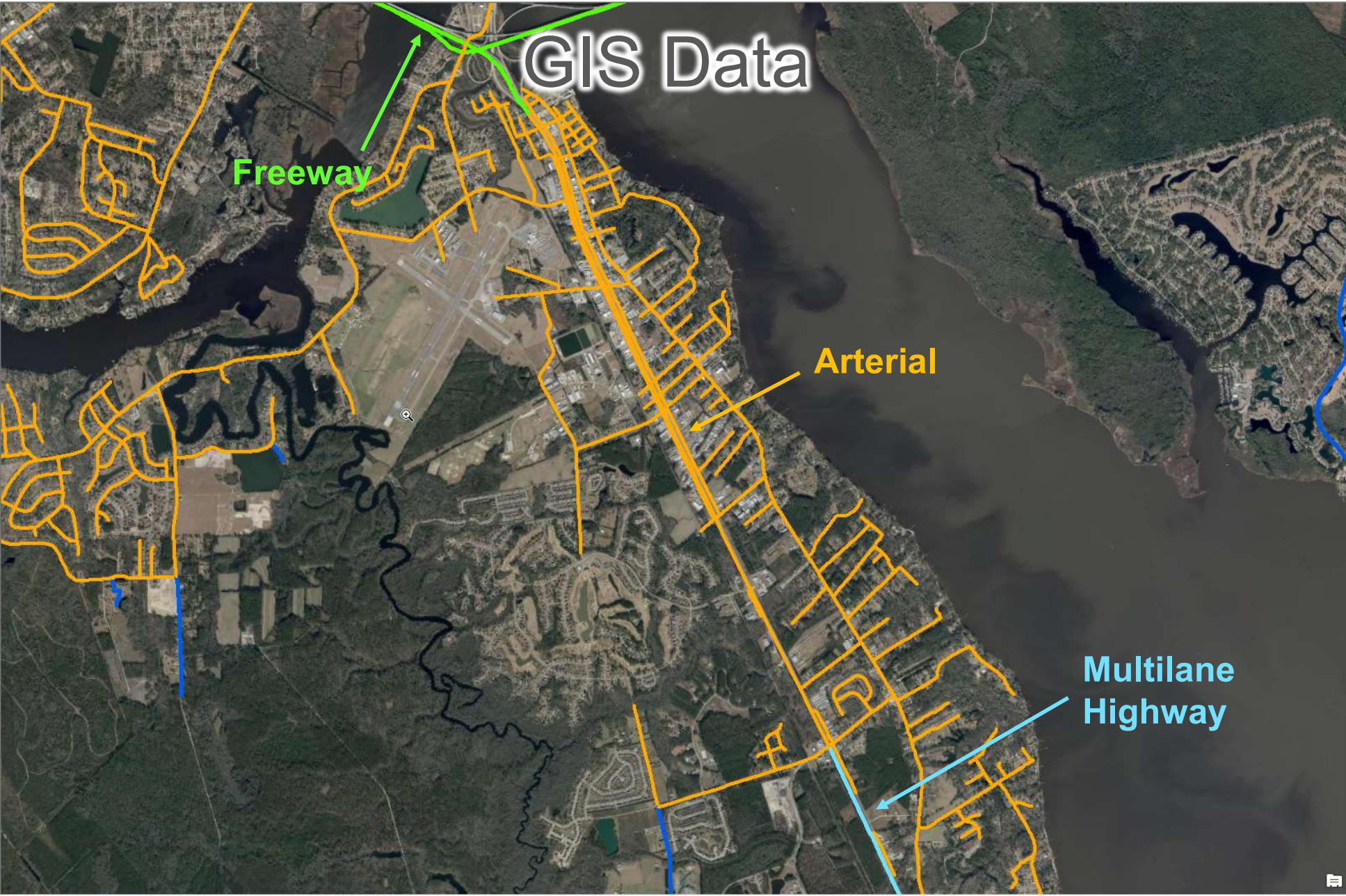


Inventory Side Only









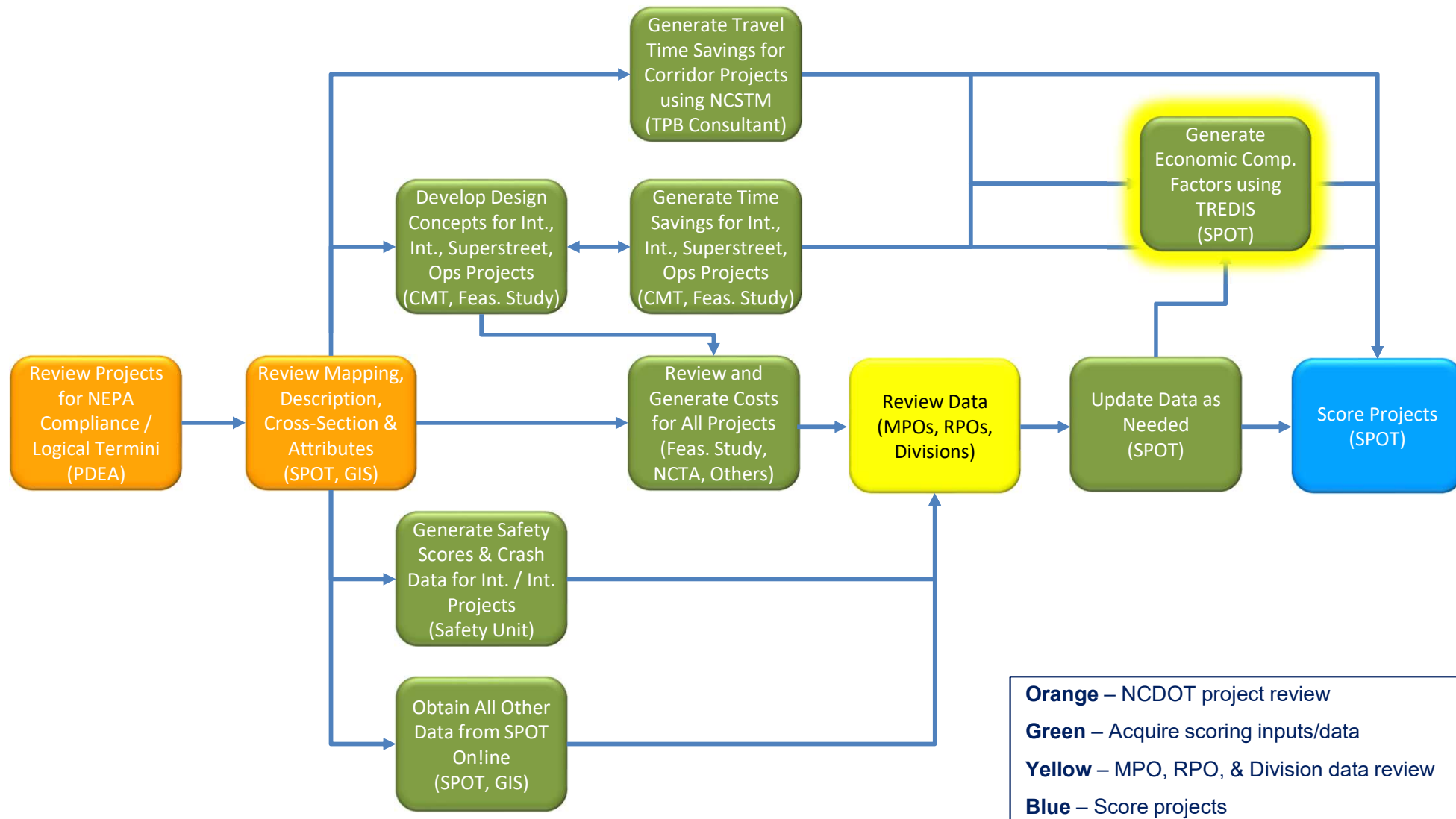








# Highway Quantitative Scoring Process





# What is TREDIS?

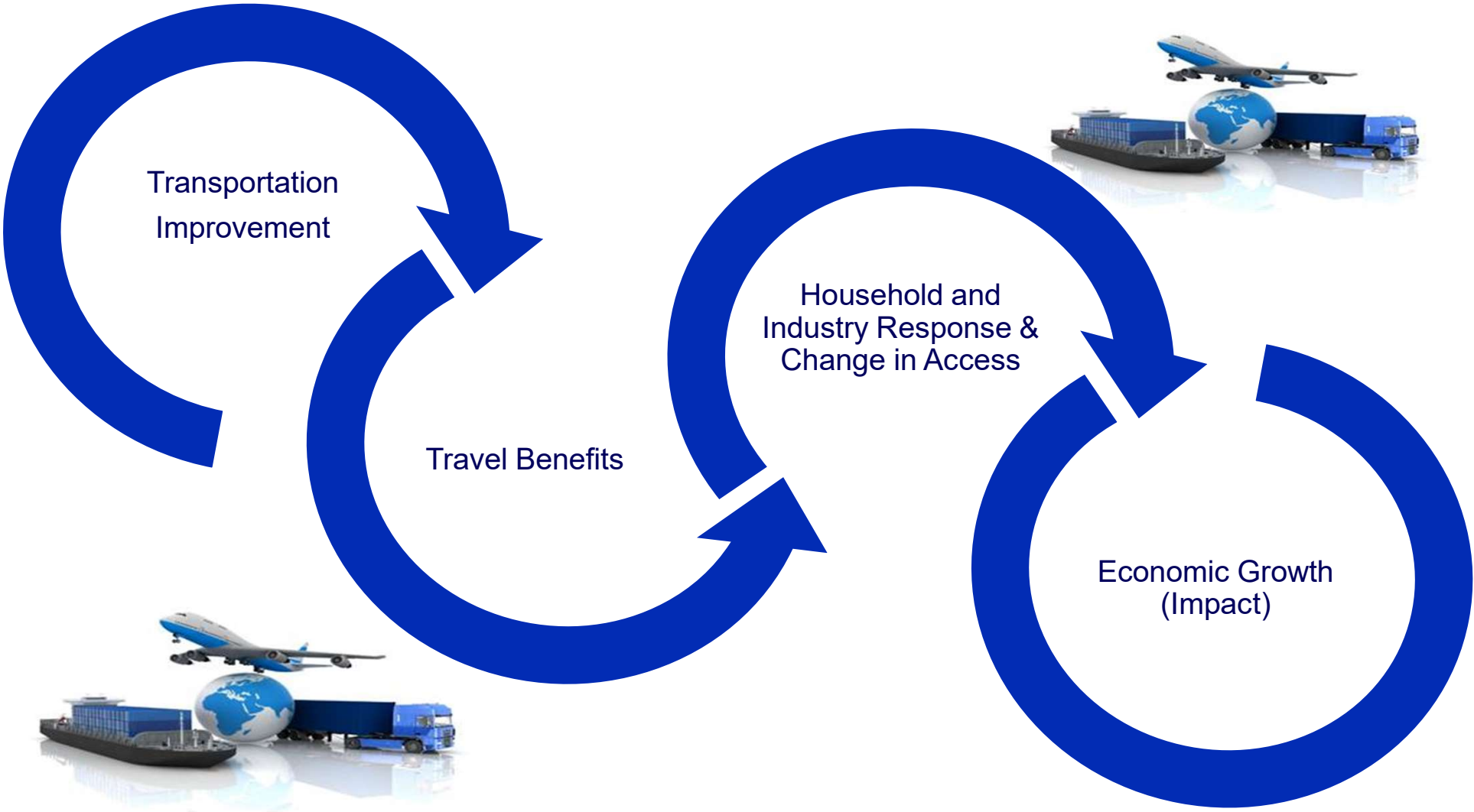
**TREDIS®** is a robust and flexible **decision support system** that connects transportation and economics.



Widely used for economic evaluation of transportation plans, programs and projects across the US, Canada and Australia.

A key component of state level prioritization in Idaho, Kansas, Ohio, Nebraska, Wisconsin, and others.

# How It Works





# TREDIS P6.0

## Inputs

- Annual Trips
- Annual Veh-Miles Traveled
- Annual Veh-Hours Traveled
- For each of:
  - Baseline and Project-Build cases
  - Passenger Vehicles and Trucks

## Outputs

- Future year percentage change in employment
- Future year percentage change in county economy
  - 10-year GDP added by the project, divided by the 10-year level of value in the baseline economy

# TREDIS

must match a Project Name on the "Project" tab		Must be set to "Base" or "Project"	must match a Region Name on the "Regions" tab that also matches "Project"	must match a Region Name on the "Periods" tab that also matches "Project"	Only drop-down options allowed	Annual		
Project Name	Year	Scenario	Region Name	Period	Default ModelPurpose	Period Veh or Pax-Trips	Period VMT or PMT	Period VHT or PHT
H090001-A	2016	Base	Default Region	Annual	All Trucks/Freight	114,886	2,722,796	48,209
H090001-A	2016	Base	Default Region	Annual	Passenger Car/All	1,183,260	28,043,259	496,524
H090001-A	2016	Project	Default Region	Annual	All Trucks/Freight	114,886	2,129,985	45,954
H090001-A	2016	Project	Default Region	Annual	Passenger Car/All	1,183,260	21,937,638	473,304
H090001-A	2025	Base	Default Region	Annual	All Trucks/Freight	126,906	3,007,661	53,253
H090001-A	2025	Base	Default Region	Annual	Passenger Car/All	1,307,055	30,977,205	548,472
H090001-A	2025	Project	Default Region	Annual	All Trucks/Freight	126,906	2,352,828	50,762
H090001-A	2025	Project	Default Region	Annual	Passenger Car/All	1,307,055	24,232,801	522,822
H090001-B	2016	Base	Default Region	Annual	All Trucks/Freight	114,886	2,722,796	48,209
H090001-B	2016	Base	Default Region	Annual	Passenger Car/All	1,183,260	28,043,259	496,524
H090001-B	2016	Project	Default Region	Annual	All Trucks/Freight	114,886	2,129,985	45,954
H090001-B	2016	Project	Default Region	Annual	Passenger Car/All	1,183,260	21,937,638	473,304
H090001-B	2025	Base	Default Region	Annual	All Trucks/Freight	126,906	3,007,661	53,253
H090001-B	2025	Base	Default Region	Annual	Passenger Car/All	1,307,055	30,977,205	548,472
H090001-B	2025	Project	Default Region	Annual	All Trucks/Freight	126,906	2,352,828	50,762
H090001-B	2025	Project	Default Region	Annual	Passenger Car/All	1,307,055	24,232,801	522,822
H090001-C	2016	Base	Default Region	Annual	All Trucks/Freight	114,886	2,722,796	48,209
H090001-C	2016	Base	Default Region	Annual	Passenger Car/All	1,183,260	28,043,259	496,524

			Project Information					Current Economic Patterns				Baseline Economic Patterns Data		
Group Name	Project ID	Project Name	Project Owner	Study Region	Results Year	Discount Rate	Industry	Employment	Output (mil. \$2017)	Value Added (mil. \$2017)	Personal Income (mil. \$2017)	Employment	Output (mil. \$2017)	Value Added (mil. \$2017)
								2017	2017	2017	2017	2025	2025	2025
P4 Projects Batch1	H090001-A	dswasserman	Default Region	2025	3.00%	TOTAL - All Indust	3,520	437	209	120	3,398	496	240	
P4 Projects Batch1	H090001-B	dswasserman	Default Region	2025	3.00%	TOTAL - All Indust	3,520	437	209	120	3,398	496	240	
P4 Projects Batch1	H090001-C	dswasserman	Default Region	2025	3.00%	TOTAL - All Indust	3,520	437	209	120	3,398	496	240	
P4 Projects Batch1	H090002-AB	dswasserman	Default Region	2025	3.00%	TOTAL - All Indust	179,010	23,812	12,175	7,598	193,058	29,871	15,071	
P4 Projects Batch1	H090002-AC	dswasserman	Default Region	2025	3.00%	TOTAL - All Indust	179,010	23,812	12,175	7,598	193,058	29,871	15,071	
P4 Projects Batch1	H090005-D	dswasserman	Default Region	2025	3.00%	TOTAL - All Indust	3,950	401	181	106	3,999	475	211	
P4 Projects Batch1	H090010-AA	dswasserman	Default Region	2025	3.00%	TOTAL - All Indust	87,697	11,811	8,144	5,205	92,336	14,876	10,116	
P4 Projects Batch1	H090010-AB	dswasserman	Default Region	2025	3.00%	TOTAL - All Indust	87,697	11,811	8,144	5,205	92,336	14,876	10,116	
P4 Projects Batch1	H090010-AC	dswasserman	Default Region	2025	3.00%	TOTAL - All Indust	87,697	11,811	8,144	5,205	92,336	14,876	10,116	
P4 Projects Batch1	H090013-A	dswasserman	Default Region	2025	3.00%	TOTAL - All Indust	15,273	2,454	1,041	648	14,063	2,750	1,163	
P4 Projects Batch1	H090013-B	dswasserman	Default Region	2025	3.00%	TOTAL - All Indust	15,273	2,454	1,041	648	14,063	2,750	1,163	
P4 Projects Batch1	H090017	dswasserman	Default Region	2025	3.00%	TOTAL - All Indust	18,586	2,711	1,235	747	17,578	3,056	1,399	
P4 Projects Batch1	H090019-A	dswasserman	Default Region	2025	3.00%	TOTAL - All Indust	51,997	7,376	3,493	2,143	56,011	9,522	4,476	
P4 Projects Batch1	H090019-B	dswasserman	Default Region	2025	3.00%	TOTAL - All Indust	51,997	7,376	3,493	2,143	56,011	9,522	4,476	
P4 Projects Batch1	H090019-BA	dswasserman	Default Region	2025	3.00%	TOTAL - All Indust	51,997	7,376	3,493	2,143	56,011	9,522	4,476	
P4 Projects Batch1	H090022	dswasserman	Default Region	2025	3.00%	TOTAL - All Indust	38,710	5,413	2,507	1,496	36,139	6,162	2,875	
P4 Projects Batch1	H090023-A	dswasserman	Default Region	2025	3.00%	TOTAL - All Indust	12,114	2,229	906	547	11,406	2,630	1,101	



# TREDIS<sup>®</sup>

TRANSPORTATION ECONOMICS

*More effective decisions through evaluation of economic benefits, costs and impacts*

**TREDIS Software News & Updates**

- **TREDIS 5 Now with Implan 2015 data!!**
- **See New Tech Updates in User Resources:**
  - New Modes: Taxis and TNC
  - TREDAIR available for small airport analyses
  - Reliability and Travel Growth Enhancements
  - Project Import Spreadsheet Updated
  - Fuel Type and Cost Enhancements
  - Existing Facility Analysis reintroduced
  - Advisory on Downloading Results to Excel
- **TREDIS Version and Data Retention Policy**

User Name

Password

Access last project?

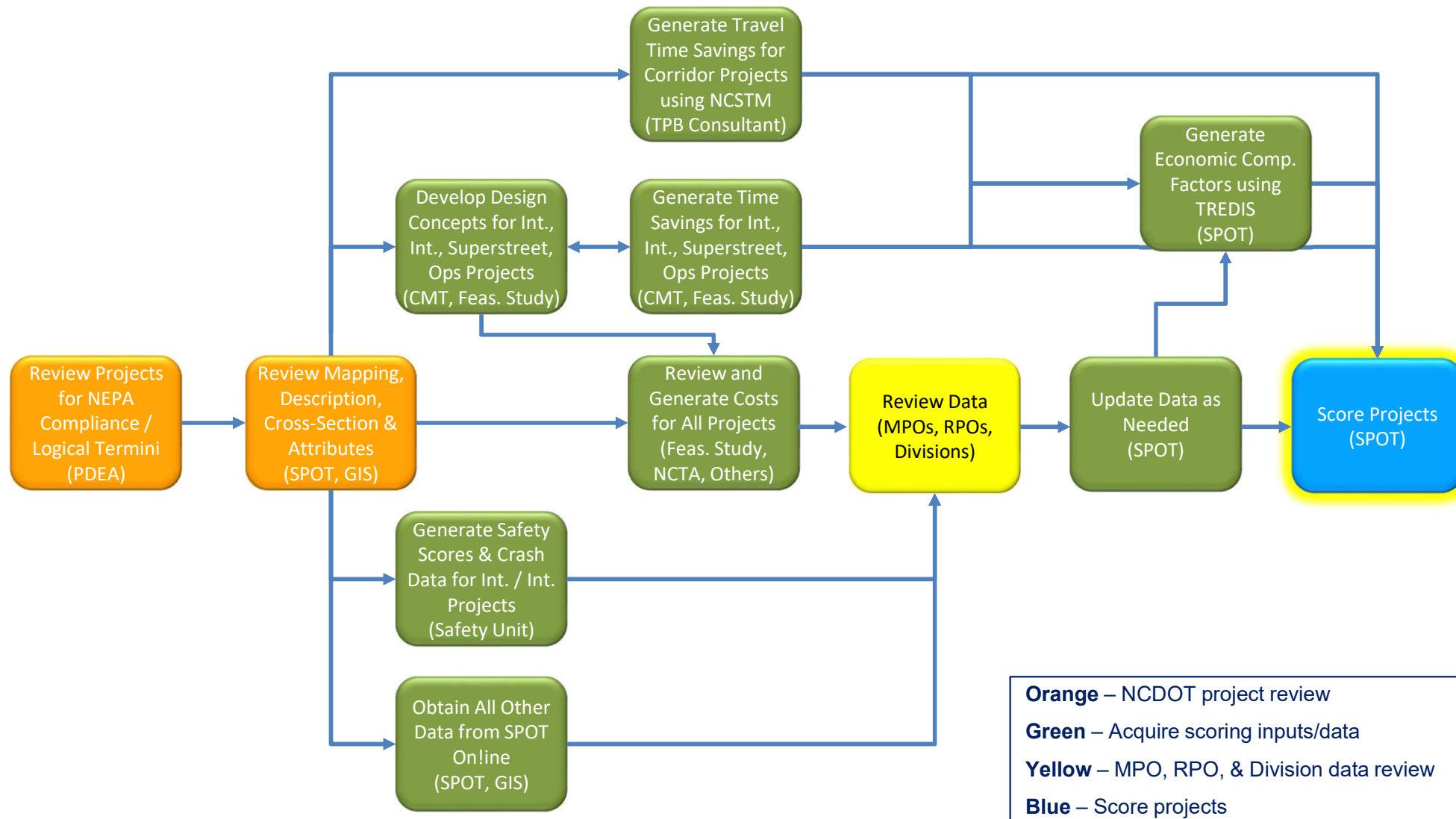
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for more information:  
**tredis.com**

TREDIS Software Group - [Economic Development Research Group, Inc.](#) - 155 Federal Street - Boston, MA 02110 - (617) 303-0424 - [sales@tredis.com](mailto:sales@tredis.com)

# Highway Quantitative Scoring Process





# Scoring Projects

Data = 👍



SPOT ID	TIP	Project Category	Route	From / Cross Street	To	Description	Specific Improvement Type	Cost to NCDOT	Statewide Mobility Quantitative Score (Out of 100)	Regional Impact Quantitative Score (Out of 70)	Division Needs Quantitative Score (Out of 50)
H090001-A	A-0009A	Statewide Mobility	US 74 (New Route Corridor K)	US 19 Business in Andrews	US 129	Construct Multi-Lanes, on New Location.	5 - Construct Roadway on New Location	\$ 381,225,000	37.31	23.86	15.10
H090001-B	A-0009B	Statewide Mobility	US 74 (New Route Corridor K)	US 129	NC 143 North of Cheoah	Construct Multi-Lanes, on New Location.	5 - Construct Roadway on New Location	\$ 95,200,000	37.31	23.86	15.10
H090001-C	A-0009C	Statewide Mobility	US 74 (New Route Corridor K)	NC 143 North of Cheoah	NC 28 at Stecoah	Construct Multi-Lanes, on New Location.	5 - Construct Roadway on New Location	\$ 44,040,000	58.72	40.99	27.95
H090002-AB	A-0010AB	Statewide Mobility	I-26, US 19, US 23	US 25	SR 2207	Upgrade Roadway to interstate Standards and Add Additional Lanes.	1 - Widen Existing Roadway	\$ 73,000,000	46.11	26.92	17.94
H090002-AC	A-0010AC	Statewide Mobility	I-26, US 19, US 23	SR 2207	South of SR 2148	Upgrade Roadway to interstate Standards and Add Additional Lanes.	17 - Upgrade Freeway to Interstate Standards	\$ 27,600,000	46.94	31.08	21.20
H090005-D	A-0011D	Statewide Mobility	US 64	East of the Hiwassee River	East of NC 175	Widen to Multi-Lanes.	1 - Widen Existing Roadway	\$ 31,727,000	28.01	21.66	16.18
H090010-AA	I-3306AA	Statewide Mobility	I-40	I-85	NC 86	Add Additional Lanes.	1 - Widen Existing Roadway	\$ 97,300,000	75.84	44.61	32.07
H090010-AB	I-3306AB	Statewide Mobility	I-40	NC 86	US 19501	Add Additional Lanes.	1 - Widen Existing Roadway	\$ 47,400,000	75.06	47.01	33.79
H090013-A	I-5899A	Statewide Mobility	I-74	US 74 Business east of Hamlet	US 74 Business west of Laurinburg	Upgrade Roadway to Interstate	2 - Upgrade Arterial to Freeway/Expressway	\$ 225,200,000	63.52	37.17	23.25
H090013-B	I-5899B	Statewide Mobility	I-74	US 74 Business west of Laurinburg	US 74 Business east of Maxton	Upgrade Freeway to Interstate Standards	17 - Upgrade Freeway to Interstate Standards	\$ 112,900,000	51.78	30.92	19.28
H090017		Statewide Mobility	I-85	US 1		Provide Additional Traffic Movements	8 - Improve Interchange	\$ 45,100,000	42.31	24.76	13.95
H090019-A	I-4400A	Statewide Mobility	I-26	US 25	US 64	Add Additional Lanes.	1 - Widen Existing Roadway	\$ 80,000,000	75.07	39.68	27.87
H090019-B	I-4400B	Statewide Mobility	I-26	US 64	US 25 Business	Add Additional Lanes.	1 - Widen Existing Roadway	\$ 80,000,000	81.34	38.38	26.59



# End of Session 6

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**NORTH CAROLINA**  
Department of Transportation

# Session 7: Scoring Tools and Resources

STI Training

NCDOT SPOT Office

May 31 – June 1, 2023

Connecting people, products and places safely and efficiently with customer focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina

## Summary of Available Tools

- Scoring Spreadsheets
  - SPOT Online
- Submittal resources
- Testing Spreadsheets
  - Highway
  - BikePed (future)

# Scoring Spreadsheet – Overview

## Basic Information and Scores

SPOT ID	Mode	YIP	Project Category	Route / Facility Name	From / Cross Street	To	Description	Specific Improvement Type	Cost in MCOBT	Statwide Mobility Impact Score (0-10)	Regional Mobility Impact Score (0-10)	Division Score (0-10)	Primary Funding Sr.	Division(s)	MPD(s) / RPD(s)	County(ies)	Primary Purpose
D168883	Bicycle & Pedestrian		Division Needs	SR 1742 Hwy 51	Princeton Loop	Watershill Drive	Concurrent sidewalk, concurrent associated signage and marking work and gutter and other street improvements where needed in order to facilitate sidewalk installation.	2- Protected Linear Pedestrian Facility (Pedestrian)	\$ 33,526	N/A	N/A	28.55	0	82	Greenville Urban Area MPO	PIII	To provide pedestrian facilities in a residential area near a school.
D168882	Bicycle & Pedestrian		Division Needs	S. Tar River Greenway P&D	Green Hill - South Tar Connector Greenway	Near Camptonan HCS (Eastside Park)	Greenway connecting HCS to Tar River in Harder Creek and both north and south family housing units. Multi-family housing units include: The Oasis, East 35, Harder Pointe Apartments, etc.	2- Off-Road/Separated Linear Bicycle Facility (Bicycle)	\$ 5,147,284	N/A	N/A	22.55	0	82	Greenville Urban Area MPO	PIII	To safely increase access to the Tar River in residential areas multiple neighborhoods.
D168787	Bicycle & Pedestrian		Division Needs	Corraline Thread Trail Segment 04	Nelsons Leaf Rd	Parkdale Road	Concurrent greenway parallel to future Southbound segment from Nelsons Leaf Road to new intersection of Parkdale/US257/Small-Hamill Road.	2- Off-Road/Separated Linear Bicycle Facility (Bicycle)	\$ 2,426,488	N/A	N/A	15.55	7	12	Charlottesville Regional Transportation Planning Organization	Local	Provide a sustainable transportation system that improves the quality of life for residents, promotes healthy living and is sensitive to the significant features of the natural and historic environments. Emphasize designing transportation systems and facilities that preserve and complement the area's natural features.

## Criteria Scores

Safety	Accessibility of Crossings	Demand of Demand	Cost Effectiveness
25.14	35.78	48.22	38.14
38.68	57.15	58.55	3.81
22.74	55.15	24.32	16.87

## Measure Values (Raw and Scaled)

Number of Crossings	Average Crank Score	Average Crank Score	Safety Risk Score	Safety Risk Score	Project Safety Score	Project Safety Score	Accessibility of Crossings	Accessibility of Crossings	Personnel Per Square Foot	Personnel Per Square Foot	Employee Per Square Foot	Employee Per Square Foot	Cost Effectiveness	Cost Effectiveness	
1	0.88	1	0.88	0.3354	53.81	5	71.51	23	35.78	1,318.55	54.88	251.23	35.36	0.88121813	38.14
1	0.88	1	0.88	0.4232	33.48	7	188.88	42	57.15	1,755.48	72.74	363.55	44.33	0.88883888	3.81
1	0.88	1	0.88	0.3558	15.71	7	188.88	37	55.15	323.37	24.66	124.42	22.47	0.88884838	16.87

## Cost and Data →



Preliminary Engineering / Dev Cost	ROW Cost	Right-of-Way Cost	Construction Cost	Total Project Cost (Final)	Total Project Cost (Interim)	Source of Cost Estimate	Other Funds - State	Other Funds - Local	Other Funds - Other	Other Funds - Total	Cost to MCOBT	Facility Type	Project Location	Included in Plan	Name of Plan	Within 2mi of Sub	Local Government of MCOBT Area	X ROW Req'd	X Preliminary Engineering / Dev Compl	Environmental Assessment Type	Division Category	Division Code	Average Crank Score	Safety Risk Score	Safety Score	Buffer	Personnel Within Buffer	Personnel Within Buffer	Employee Within Buffer	Employee Within Buffer	Number Buffer	Number Manual	Total Number	County	Cost = 0
\$ 66,621	\$ 5,888	\$ -	\$ 118,813	\$ 127,434	\$ 123,813	Contractor Bid/Pre-Cost Estimate/Text and final estimate	Town of Watershill	\$ 33,487	\$ -	\$ 33,487	\$ 33,526	Sidewalk	0.13	Y	Bicycle & Pedestrian Plan	Y	Watershill	0	0	Categorical Exclusion Type III	0	0	0	0.3354	5	0.37	1,288.88	1,318.55	243.88	251.23	5	13	18	3	Y
\$ 1,354,333	\$ 58,888	\$ 178,888	\$ 1,782,854	\$ 1,872,854	\$ 1,322,854	Combination of Bid/Pre-Cost Estimate/Text and final estimate	City of Greenville	\$ 1,775,274	\$ -	\$ 1,775,274	\$ 5,147,284	Shared-Use Path / Multi-Use Path	1.86	Y	2815-2845 GUMPO Metropolitan Transportation Plan	Y	City of Greenville	0	0	Categorical Exclusion Type III	0	0	0	0.4232	7	18.85	15,832.88	1,755.48	4,814.88	363.55	33	8	33	3	H
\$ 268,888	\$ 1,425,888	\$ -	\$ 1,675,888	\$ 3,168,888	\$ 3,168,888	CRPPO Staff	Town of Travelers	\$ 673,688	\$ -	\$ 673,688	\$ 2,426,488	Shared-Use Path / Multi-Use Path	1.22	Y	Travelers Pedestrian Plan (2018), Corraline Thread Trail Master Plan (2019)	Y	Town of Travelers, Local/County	0	0	Categorical Exclusion Type III	0	0	0	0.3558	7	18.71	3,075.88	323.37	1,314.88	124.42	21	12	33	3	Y

# Highway – Congestion

Funding Category	Mobility Default Weights	Modernization Defaults
Statewide Mobility	30%	10%
Regional Impact	20%	5%
Division Needs	15%	-

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

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

*Peak ADT will be used as the Existing Volume*



# Scoring Spreadsheet – How to View

- Prioritization Resources page:  
<https://connect.ncdot.gov/projects/planning/Pages/PrioritizationResources.aspx>
- Explore the spreadsheet yourself, become familiar with it
- Learn to use tools such as filter, sort, etc. to make the data digestible and easier to analyze/review
- Examples:
  - Filter to your organization as the Submitter
  - Filter to your organization as the MPO/RPO/Division (location section) – USE TEXT FILTERS!
  - Hide columns you’re temporarily not using
  - Sort data columns to find outliers
  - Whatever works for you!

# SPOT Online

4 –  
Create  
New

3b –  
Identify

2 –  
Map

3a –  
Layers &  
Legend

1 –  
Project  
Grid

5 – Grid  
buttons

The screenshot shows the SPOT Online web application interface. At the top left is the SPOT Online logo. The main header area contains a 'My Projects' section with a 'Create New +' button (labeled 4) and a search bar. Below the search bar is a table of project entries (labeled 1). The table has columns for Flag, SPOT ID, Mode, Project Category, and Status. The entry with SPOT ID H190189 is highlighted in blue. To the right of the table is a map of North Carolina (labeled 2) with various counties and cities visible. A large black circle highlights a specific area on the map. At the top right of the map area, there are buttons for 'Identify' (labeled 3b) and 'Lasso'. Below the map, there are 'Submit', 'Export', 'Edit', and 'Delete' buttons (labeled 5). In the top right corner, there is a user greeting 'Welcome Sarah Lee (SPOT Office)', a 'Logout' link, and a 'Layers & Legend' button (labeled 3a). A scale bar and zoom controls are also visible on the map.

Flag	SPOT ID	Mode	Project Category	Status
✓	H190061	Highway	Statewide Mobility	Draft
?	H190063	Highway	Statewide Mobility	Draft
✓	H190064	Highway	Statewide Mobility	Draft
✓	H190069	Highway	Statewide Mobility	Draft
?	H190070	Highway	Statewide Mobility	Draft
✓	H190071	Highway	Statewide Mobility	Draft
✓	H190073	Highway	Statewide Mobility	Draft
?	H190142	Highway	Statewide Mobility	Draft
✓	H190189	Highway	Statewide Mobility	Draft
✓	H190190	Highway	Statewide Mobility	Draft
✓	H190194	Highway	Statewide Mobility	Draft
?	H190237	Highway	Statewide Mobility	Draft
✓	H190246	Highway	Statewide Mobility	Draft
?	H190251	Highway	Statewide Mobility	Draft
?	H190253	Highway	Statewide Mobility	Draft

## Submittal Resources

- Prioritization Data page:  
<https://connect.ncdot.gov/projects/planning/Prioritization%20Data/Forms/AllItems.aspx>  
Folder = P6 / Submittal Guidance
- Submittal guidance documents (to be updated for P7)
- PDFs of cross sections and intersection/interchange designs
- Testing spreadsheet (next slide)

## Testing Spreadsheet(s)

- Prioritization Data page:

<https://connect.ncdot.gov/projects/planning/Prioritization%20Data/Forms/AllItems.aspx>

Folder = P7 / Training Tools

# End of Session 7

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**NORTH CAROLINA**  
Department of Transportation

# Session 8: Submitting Good Candidate Highway Projects

STI Training

NCDOT SPOT Office

May 31 – June 1, 2023

Connecting people, products and places safely and efficiently with customer focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina

# Good Scoring Projects

What makes a good [quantitative] scoring project?

- Depends on criteria
- Volume likely has the biggest influence
  - Embedded in multiple criteria
  - Volume/Capacity is generally more critical than just volume
    - Scaling can minimize the impact of raw volumes
    - In P6, volumes of 30,000 had a scaled score of 80 or greater
- Safety benefits can still carry a project score

# Submitting Competitive Projects

## Segmenting Projects

- Help or hurt?
- Why not try both?

## Project limits

- Make sure they're appropriate for problem you're trying to solve

# Intersection vs Corridor Projects

## Intersection/Interchange Projects

- Typically lower cost
- Volume and capacity data averaged then doubled

## Corridor Projects

- SW and REG evaluated in NCSTM – system-wide benefits
- Longer projects likely yields more benefits, but higher cost
- Test data for segments vs longer project

For corridor project w/ interchange/intersection improvements, submit both (if possible)

- Gives int./int. projects twice the opportunity

# Data is Your Friend

Use data to help determine submittals

- SPOT On!ine
- GIS layers available

Talk to experts

- Corridor Development Engineers
- SPOT
- Mobility & Safety (Congestion Mgmt and Traffic System Operations)
- Division staff



# Red Flags

Low volume, low safety scores, minimal safety benefit

High cost

- Corridor cap

Lack of support

COMMUNICATE, COMMUNICATE, COMMUNICATE

# P6.0 Scoring Spreadsheet

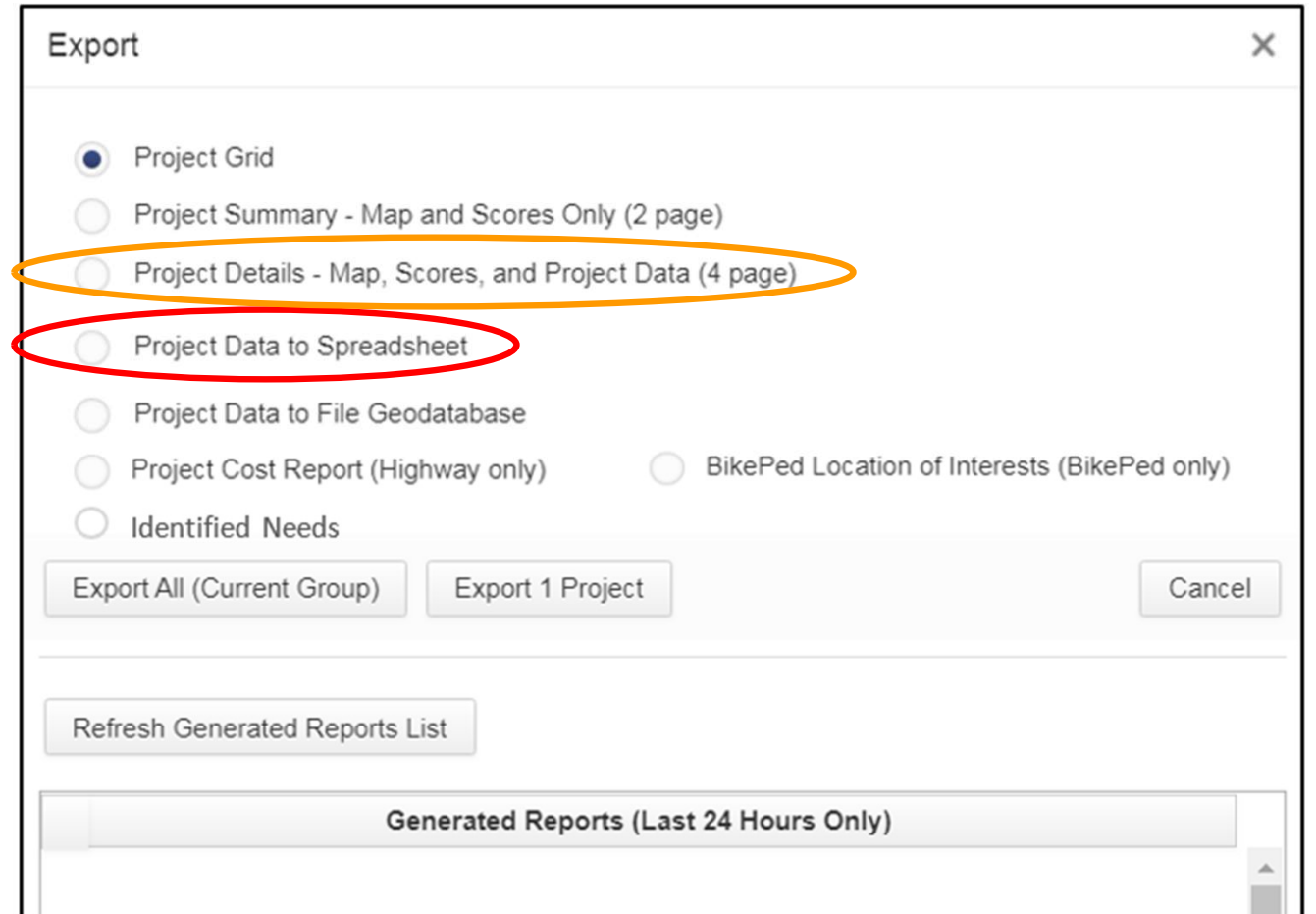
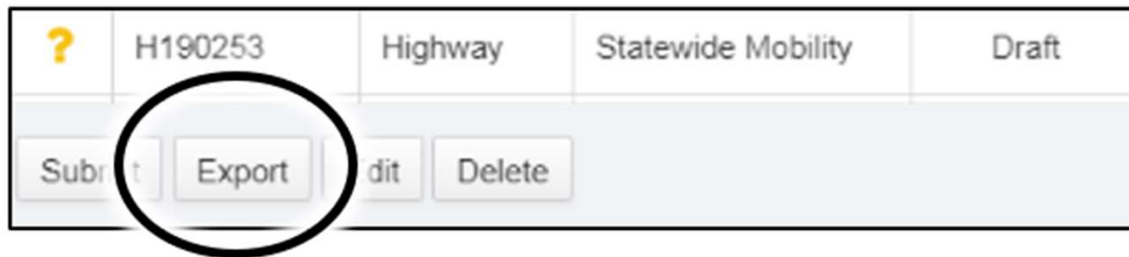
Prioritization Resources website:

<https://connect.ncdot.gov/projects/planning/Pages/PrioritizationResources.aspx>

~ GROUP EXERCISE / PROJECT ANALYSIS ~

## Export and Testing Tutorial

Export function in SPOT Online:



## Export and Testing Tutorial

4-page PDF exports (project detail summaries, great for elected officials):



### NCDOT Prioritization 6.0 Project Summary

**SPOT ID:** B170484      **Mode:** Bicycle & Pedestrian      **Status:** Submitted

#### US 15/501 Business (Durham-Chapel Hill Boulevard)

**From/Cross Street:** Nation Avenue

**Specific Improvement Type:** 7 - Protected Linear Pedestrian Facility (Pedestrian)

**To:** US 15/501 Business (University Drive)

**Project Category:** Division Needs

**Length:** 0.7

**TIP#:**

**Fully Funded in Draft STIP?** No

**Cost to NCDOT:** \$1,841,000

**Description:**

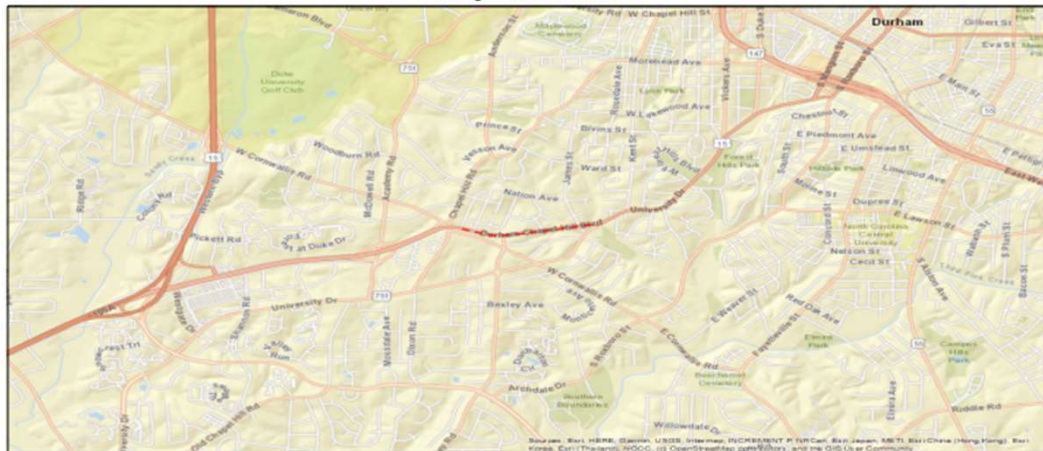
Construct sidewalks improve bicycle lanes and install intersection improvements.

**Division(s):** Division 5

**County(s):** Durham

**MPOS(s)/RPO(s):** Durham-Chapel Hill-Carrboro MPO

**Project Location**



<b>Statewide Mobility Total Score: N/A</b>		
<b>Quantitative Score</b>	<b>Division Engineer Points</b>	<b>MPO/RPO Points</b>
N/A		

<b>Regional Impact Total Score: N/A</b>		
<b>Quantitative Score</b>	<b>Division Engineer Points</b>	<b>MPO/RPO Points</b>
N/A		

<b>Division Needs Total Score: 40.87</b>		
<b>Quantitative Score</b>	<b>Division Engineer Points</b>	<b>MPO/RPO Points</b>
Cost Effectiveness (5%)	56.01	Percent: 25% Points:
Accessibility/Connectivity (15%)	82.74	
Demand/Density (10%)	87.48	
Safety (20%)	84.53	
<b>Totals: Weight: 50% Weighted Score: 40.87</b>		

**Criteria Measures**

Criteria	Measure	Raw Value	Scaled Value
<b>Safety</b>	Number of Crashes (40%)	3	82
	Crash Severity (20%)	31	94.59
	Safety Risk (20%)	0	92.05
	Project Safety Benefit (20%)	6	71.91
<b>Accessibility / Connectivity</b>	Accessibility / Connectivity (100%)	130	82.74
<b>Demand/Density</b>	Persons per Squire Mile (50%)	3,921	95.77
	Employees Per Square Mile (50%)	1,248	79.19
<b>Cost Effectiveness</b>	Cost Effectiveness Value (100%)	0.000138	56.01

**Project Data**

<b>Data:</b>		<b>Project Cost:</b>	
Project Local ID:		Preliminary Engineering / Design Cost:	\$615,000
Included in Plan?	Yes	Right-of-Way Cost:	\$85,000
Name and Year of Plan:	2006 DurhamWalks! Pedestrian Plan 2017 DCHC MPO CTP	Utilities Cost:	\$135,000
Within 2 mi. of K-8 School?	Yes	Construction Cost:	\$2,235,000
Local Government(s) where project is located:	City of Durham	<b>Total Project Cost (including PE/Design) - used for required match:</b>	\$3,070,000
Right-of-Way % Acquired:	25	<b>Total Project Cost (without PE/Design) - used for scoring:</b>	\$2,455,000
PE / Design % Completed:	0	Other Funding:	\$614,000
Facility Type:	Sidewalk	Other Funding Source(s):	
Bicycle and Pedestrian Crashes:	3	<b>Cost to NCDOT:</b>	\$1,841,000
Average Crash Severity:	31	Source of Cost Estimation:	NCDOT Bike-Ped Cost Estimation Tool
Safety Risk Score:	0.42		
Number of Automatic POI:	17		
Number of Manual POI:	109		
Number of Existing or Committed Connections:	2		
Planned Connections?	Yes		
Improves or Connects to Designated Route:	Project connects to a designated route		
Name of Designated Route:	DCHC MPO MTP Regional Route - Connection between Durham and Chapel Hill (University Drive)		
Population Within Buffer Area:	5830		
Employees Within Buffer Area:	1855		
Project Sponsor (Organization):	City of Durham		
Submitted by:	Durham-Chapel Hill-Carrboro MPO		



## Export and Testing Tutorial

Export to spreadsheet provides a .csv file of the selected project(s) (or all your projects)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	
1		Draft or Submitted					From	To			Yes/No		SW Quant	Reg Quant	Reg Total I	Reg Total I	Div Quant	Div Total P	Div Total	Score (Quant+	
2	SpotID	ProjectSta	Mode	ProjectCat	TIP	RouteFacil	FromCross	ToCrossSt	Description	SpecificIm	FundedSta	FundedCat	Statewidel	RegImpact	RegImpact	RegImpact	DivisionNe	DivNeedsL	DivNeedsT	FundingRe	Al
3	B190608	Draft	Bicycle & F	Division Needs		W Lebanon	Church Str	Manning A	5' wide	7 - Protected Linear	Pedestrian F		0	0			0			D	Br
4	B192401	Submitted	Bicycle & F	Division Needs		Midway Pa	NC 24	Piney Gree	Construct	2 - Off-Road/Separated	Linear B		0	0			0			B	Ja
5	B172099	Draft	Bicycle & F	Division Needs		W. Fleming	Burkemon	S. College	Construct	2 - Off-Road/Separated	Linear Bicycle Facility (Bicycle)									G	G
6	B141411	Draft	Bicycle & F	Division Needs		Adams Dri	Spencer Av	SR 2466 (V	Construct	7 - Protected Linear	Pedestrian Facility (Pedestrian)										
7	B192324	Submitted	Bicycle & F	Division Needs		W.T. Harri	W.T. Harri	Campbell C	Construct	7 - Protected Linear	Pedestrian F		0	0			0			E	Cl
8	B141030	Submitted	Bicycle & F	Division Needs	EB-5729	NC 97 (Atk	US 64	E. Raleigh	Convert fo	2 - Off-Road/Separated	Linear B		0	0			0			A	R
9	B192119	Submitted	Bicycle & F	Division Needs		NC 74	Anson HS	NC 74	Improved	8 - Multi-Site	Pedestrian Facility		0	0			0			E	R
10	B190389	Submitted	Bicycle & F	Division Needs		NC 12	Buxton Ba	Frisco Bath	This projec	7 - Protected Linear	Pedestrian F		0	0			0			A	Al
11	B191871	Submitted	Bicycle & F	Division Needs		US 64 (W	I-73/I-74	S Park St/C	Construct	7 - Protected Linear	Pedestrian F		0	0			0			E	Pi
12	B190473	Draft	Bicycle & F	Division Needs		Four Oaks	SR 1178 (B	Four Oaks	Construct	2 - Off-Road/Separated	Linear Bicycle Facility (Bicycle)									A	U

Can save the .csv as Excel file for your own use

Or, simply use the data directly for testing...



# Export and Testing Tutorial

Transfer necessary data from export files to testing spreadsheet

SpotID	TIP	ProjectCategory	ROUTENA	FromCross	ToCrossStr	Description	SpecificIm P
H190014		Division Needs		GLP Onew	Powhatan	New locat	5 - Constru
H190028	R-3430A	Division Needs	SR 1001 (N	US 70	Catawba F	Widen SR	1 - Widen
H190017		Division Needs	SR 1161 (N	NC 150 (C	US 74	Construct	11 - Acces
H190020		Statewide Mobility	SR 55 ALT	Race Track	Road	Intersecti	10 - Impro
H190016		Division Needs	SR 1161 (N	SR 1158 (H	US 74	Widen roa	1 - Widen
H190018		Division Needs	SR 1161 (N	NC 150 (C	US 74	Widen to e	1 - Widen

ExistingLengthMiles	ProjectLengthMiles	ExistingFacilityType	ProjectFac	ExistingLar	ProjectLan	Existir
1.28299382	0.45922536	Arterial	Arterial	1	1	Undiv
3.75831242	3.75831242	Arterial	Arterial	1	1	Undiv
3.17260398	3.17260398	Two Lane Highway	Two Lane	1	1	Undiv
0.5	0.5	Arterial	Arterial	2	2	Undiv
2.46218736	2.46218736	Two Lane Highway	Two Lane	1	1	Undiv
3.17260398	3.17260398	Two Lane Highway	Two Lane	1	1	Undiv

SPOT ID	TIP	Project Category	Route	From / Cross Street	To	Description	Specific Improvement Type
H223808		Division Needs	SR 1686 (Oak Summit Rd)	NC 8 (Germanton Rd)	SR 2207 (Old Rural Hall Rd)	Widen existing 2-lane roadway to a 3-lane (Two way, Center LT Lane) C & G, sidewalk, and bike	1 - Widen Existing Roadway

Existing Length - Existing or Parallel Route (Miles)	Existing Length - Existing or Google Maps (Miles)	Individual Project Length (Miles)	Grouped Project Length (Miles)	Existing Facility Type	Project Facility Type	E
1.62	1.62	1.62	1.62	Arterial	Arterial	
	0.00		0.00			
	0.00		0.00			



# Local Contribution

Leverage new dollars (non-state or non-federal)

Scaling creates unknowns

3 opportunities to submit local contribution

- Project submittal
- Regional Impact local input points
- Division Needs local input points

# Highway – Benefit-Cost

Funding Category	Mobility Default Weights	Modernization Defaults
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**

$$\left[ \frac{(\text{Travel Time Savings over 10 years in \$} + \text{Safety Benefits over 10 years in \$})}{\text{Project Cost to NCDOT at time of submittal}} \right] + \left[ \frac{\text{Other Funds}}{\text{Total Project Cost}} \times 100 \right]$$

- Cost can be lowered and score increased if other funds (non-federal or non-state funds) are committed
- Maximum 100 point score

# Local Contribution – Project Submittal

Required if other funds considered for SW Mobility projects

Also applies for REG and DIV projects

Affects both parts of the B/C formula

- Only B/C component (first part) is scaled

Contribution is locked in

Risk – Impact is not known due to scaling

# Local Contribution – REG or DIV LIP

Affects only one part of the B/C formula

- B/C locked in; Funding leverage updated

Quantitative score updated

Opportunity to see affect of scaling and cascading

- Can add to contribution at time of submittal if desired

Spreadsheet provided to test impact



# Local Contribution

Contributing other funds (non-state or non-federal formula) is a non-binding commitment

- Project score tied to contribution
- If decrease in contribution occurs, project subject to reprioritization (except est. toll revenue)

Requires letter of commitment from donating party when entering local contribution (hwy only)

# Bonus Allocation

## Highway only

- 50% of local commitment of non-State/Federal funds will be returned to local area for other high scoring projects in that area

# End of Session 8

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**NORTH CAROLINA**  
Department of Transportation

# Session 9: Select Advanced Scoring Details

STI Training

NCDOT SPOT Office

May 31 – June 1, 2023

Connecting people, products and places safely and efficiently with customer focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina

# Area-Specific Weights

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## Area-Specific Weights

- Used in P6 and prior
- Available for Regional Impact and Division Needs scoring

### Requirements:

1. Unanimous agreement between all applicable MPOs/RPOs/Division Engineers
  - Action required for **disagreement**
  - Area-Specific Weights do not rollover from previous cycle
  - Within applicable Funding Region(s) or Division(s)
2. Memo to SPOT from each MPO/RPO/Division Engineer, referencing TAC Chair(s) agreement

# P5.0 Area-Specific Criteria Weights

Location	Weight Reductions	Weight Additions
Region A	-5% Congestion	+5% Freight
Division 1	-5% Freight -10% Benefit/Cost -10% Congestion	+10% Safety +15% Access/Conn
Division 5	-5% Freight -5% Access/Conn	+5% Benefit/Cost +5% Safety
Divisions 6, 7, 8, 11	-5% Freight	+5% Safety
Division 13	-5% Access/Conn	+5% Safety
Division 14	-5% Freight -5% Access/Conn	+10% Pavement Cond

# 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

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

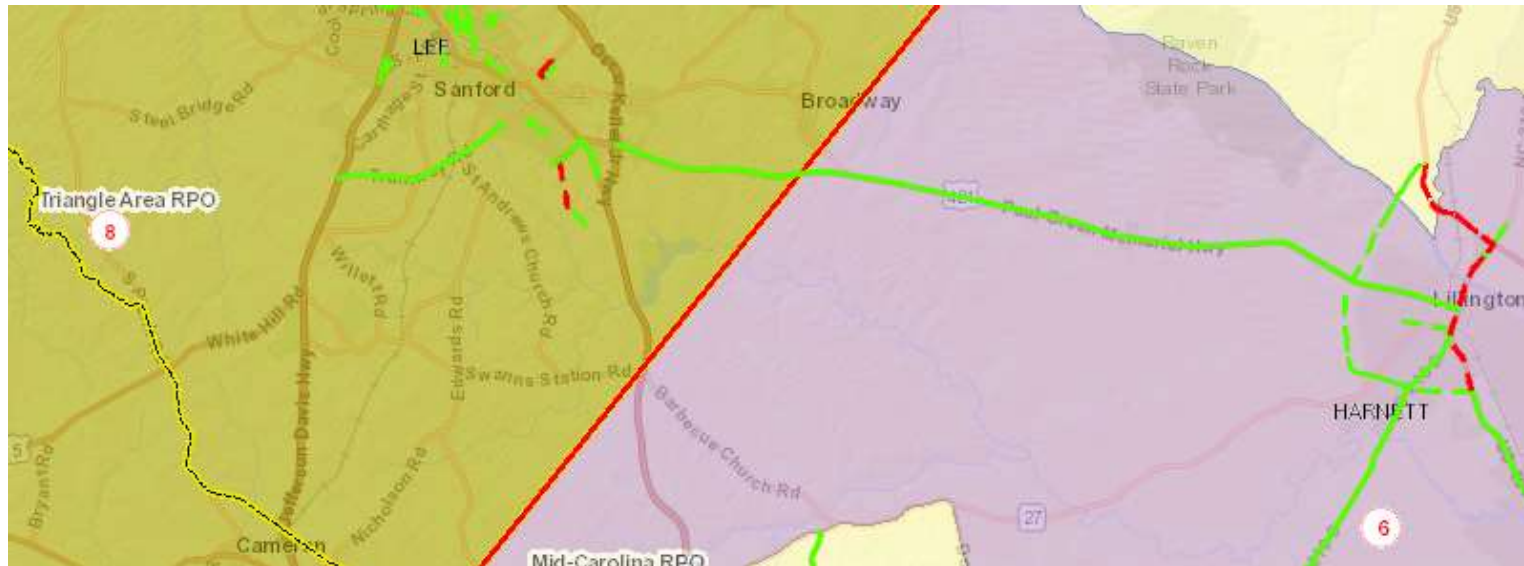


# Donations

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## Local Input Points – Donations



First MPO/RPO	First MPO/RPO %	Second MPO/RPO	Second MPO/RPO %
Mid-Carolina RPO	74	Triangle Area RPO	26

Max LIPs for Mid-Carolina RPO = 74 → *assign 74 & donate 26 to Triangle Area RPO*

Max LIPs for Triangle Area RPO = 26 → *assign 26 & donate 74 to Mid-Carolina RPO*

- Requires coordination and agreement between donating and receiving organizations, as well as documentation to SPOT Office showing agreement, SPOT ID, and number of points donated
- Points may also be donated to projects entirely within another organization

## Project Submittals – Donations

- Submittal slot(s) may be donated from one organization to another
  - Between POs
  - Between Divisions
- Just as with LIP donations, requires coordination and agreement between donating and receiving organizations, as well as documentation to SPOT Office showing agreement and SPOT ID(s) being used for each donated submittal slot

# Scaling

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## Scaling

Ranking of an individual raw measure score in comparison to the total project population of that measure

Incorporated in P4 to address P3 statistical issues

Uses standardized methodology to produces a more uniform distribution of results within each measure

**Highest** raw measure value = 100 scaled value

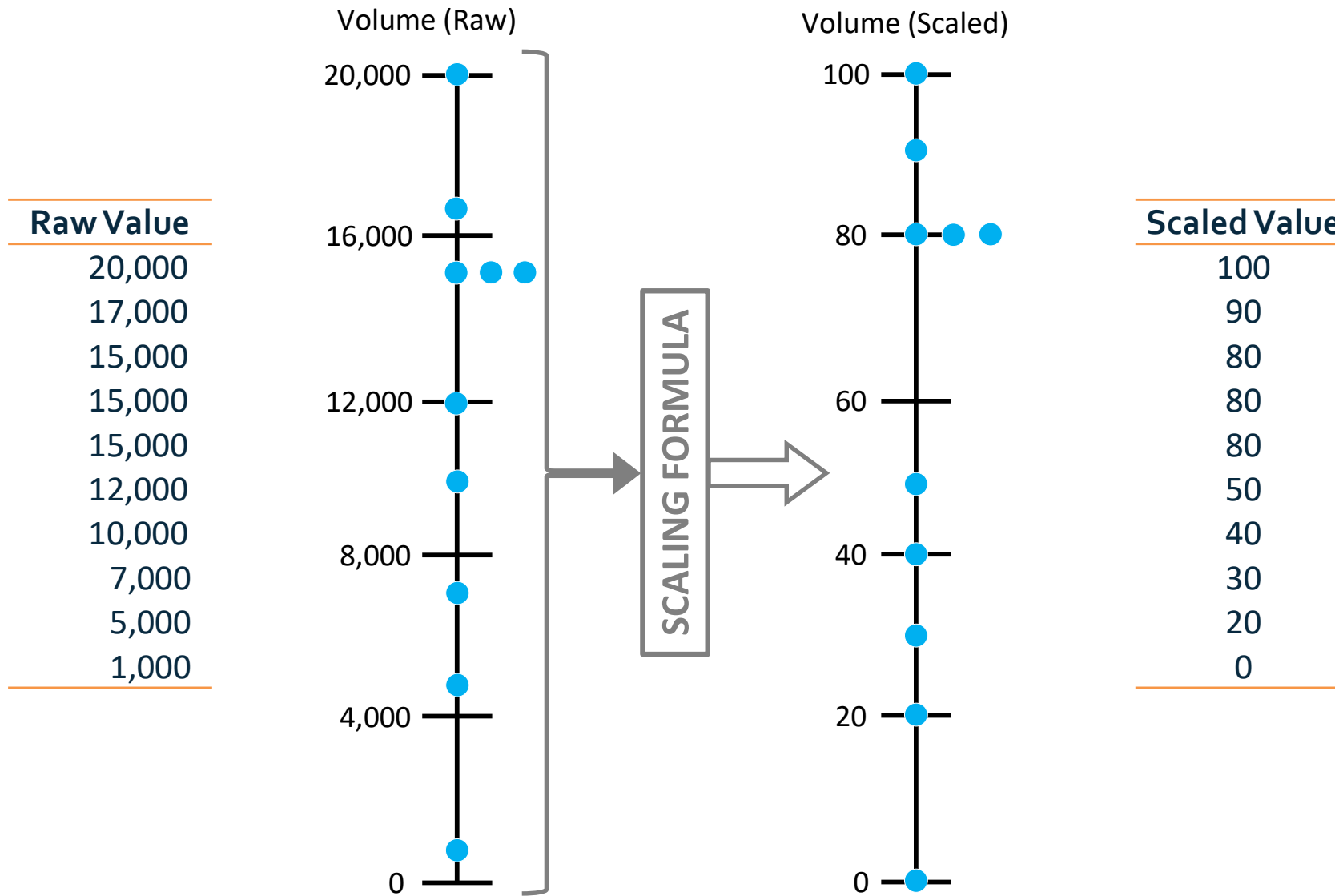
**Lowest** raw measure value = 0 scaled value

**All other values** based on percentage of projects less than or equal to that value

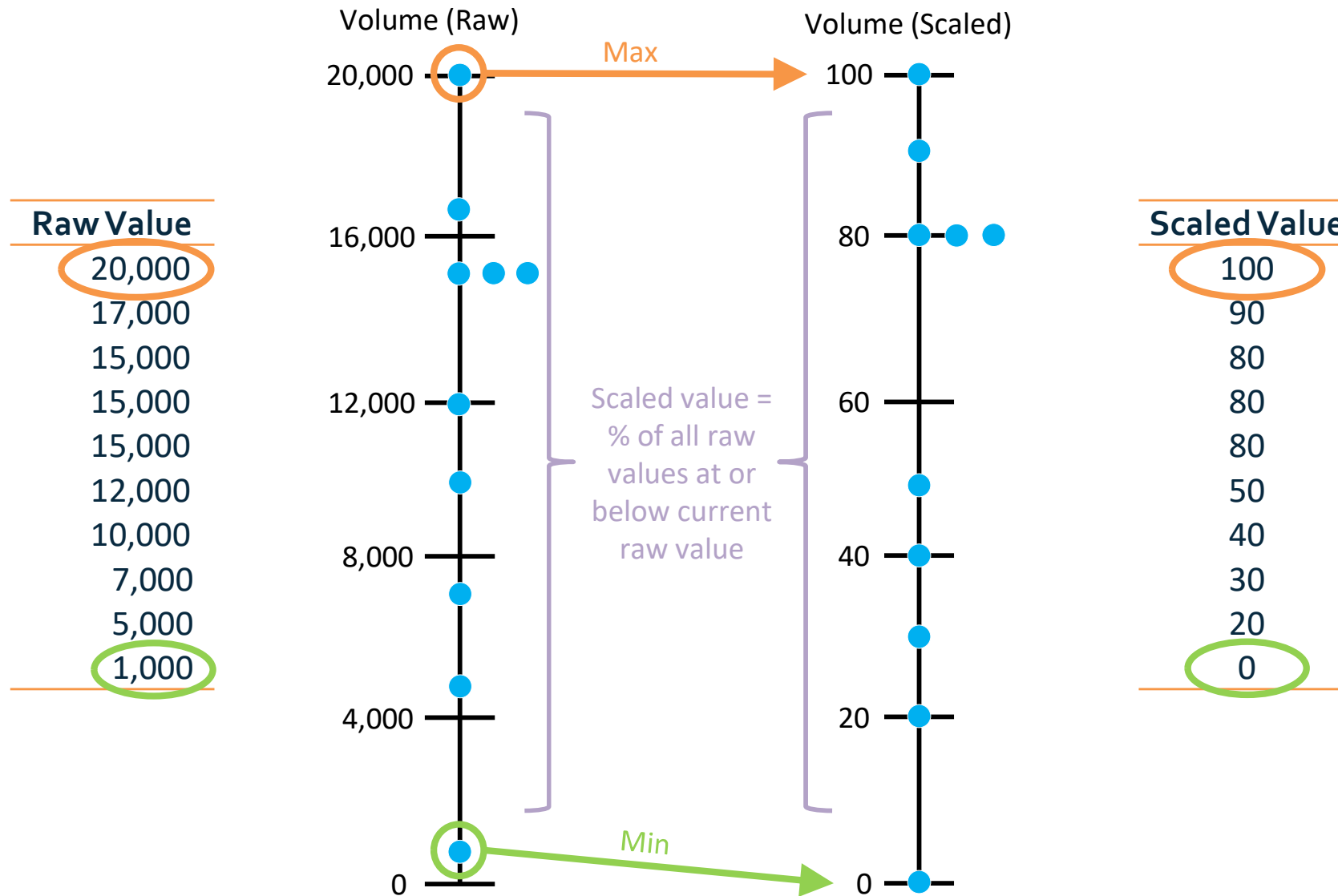


# Scaling – Example

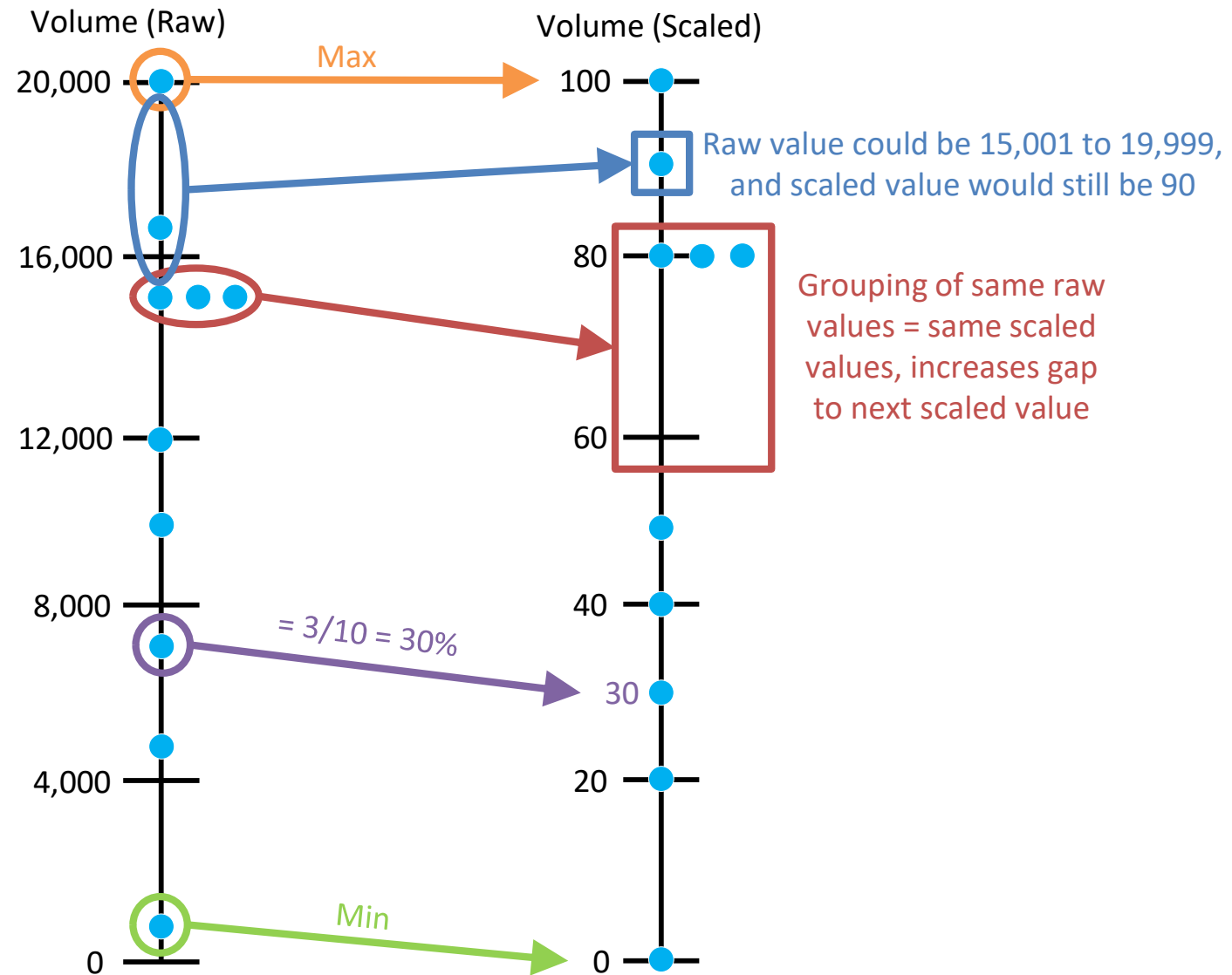
Select Advanced Scoring Details



# Scaling – Example



# Scaling – Example



# Local Input Point Methodologies

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# 2011 – 2012

## **Prioritization Process is now in Law**

*“The Department shall develop and utilize a process for selection of transportation projects that is based on professional standards in order to most efficiently use limited resources to benefit all citizens of the State.*

*The strategic prioritization process should be a systematic, data-driven process that includes a combination of quantitative data, qualitative input, and multimodal characteristics, and should include local input.*

***The Department shall develop a process for standardizing or approving local methodology used in Metropolitan Planning Organization and Rural Transportation Planning Organization prioritization.” - S.L. 2012-84***



# Local Input Point Methodologies

## Transparency

### Minimum requirements

- 2 Criteria – at least one qualitative criteria
- Understandable to public
- Preliminary point assignments guided by methodology
- Public comment opportunity for preliminary point assignment
- Deviations with final point assignment clearly articulated
- **Flexing (P6.0 Change)**
- Methodology, point assignment and deviations (if any) posted on website

# Division Engineer Methodology

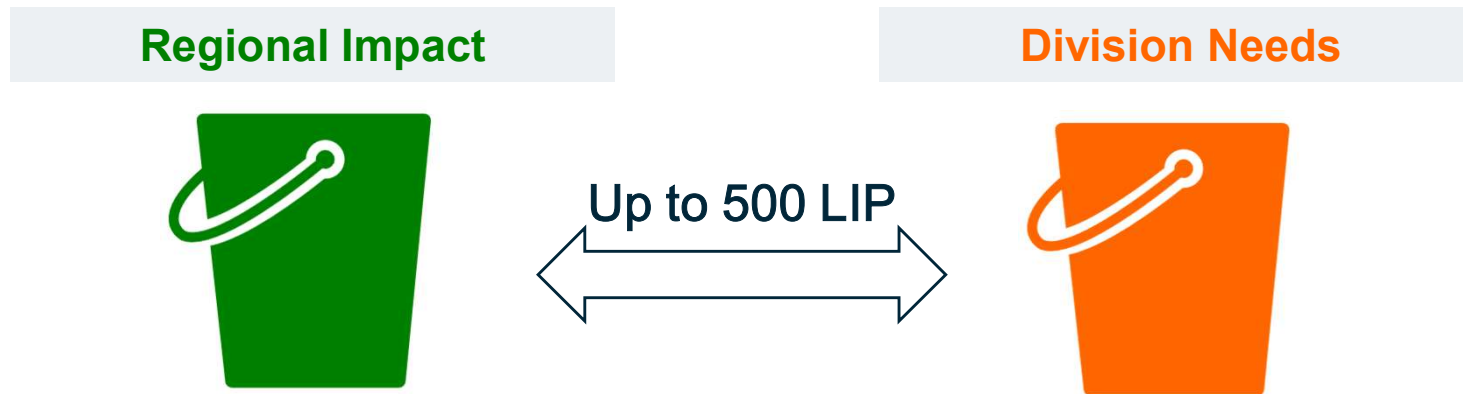
- Menu of standard criteria for Divisions to choose from
- Each Division selects criteria for:
  - Highway Regional & Division
  - Non-Highway Regional & Division

REGIONAL IMPACT	REGIONAL IMPACT	REGIONAL IMPACT	DIVISION NEEDS	DIVISION NEEDS	DIVISION NEEDS	Comments
Division Engineer Methodology Points (Criteria Points)	<b>PRELIMINARY</b> Division Engineer Local Input Points (out of 100 - 15% of total score)	<b>FINAL</b> Division Engineer Local Input Points (out of 100 - 15% of total score)	Division Engineer Methodology Points (Criteria Points)	<b>PRELIMINARY</b> Division Engineer Local Input Points (out of 100 - 25% of total score)	<b>FINAL</b> Division Engineer Local Input Points (out of 100 - 25% of total score)	(Use this section to note reason if local point assignment does not align with project ranking using methodology points.)

- Posted online with other Local Methodologies. One document with all Divisions' chosen criteria:  
<https://connect.ncdot.gov/projects/planning/Pages/PrioritizationResources.aspx>
- Divisions post their methodology points, input points and comments

## Local Input Points – Flex Policy

- Flex Policy = up to 50% of an organization's base local input points (500 LIPs max) can be flexed between Regional Impact and Division Needs within each MPO/RPO or NCDOT Division



- Use of this policy is optional
- Each organization's choice to potentially use flexing would need to be included in the approved LIP methodology (i.e. "flexing clause")
- Allows for more flexibility in addressing various areas' needs in each category and among the different modes/types of projects

# Funding Caps

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# STI Legislation Funding Caps and Restrictions Impacting Programming



Statewide Mobility corridor cap



Funding limit on light rail and commuter rail projects



Funding limits on Regional Impact transit projects



Funding limits on airport projects in all categories



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

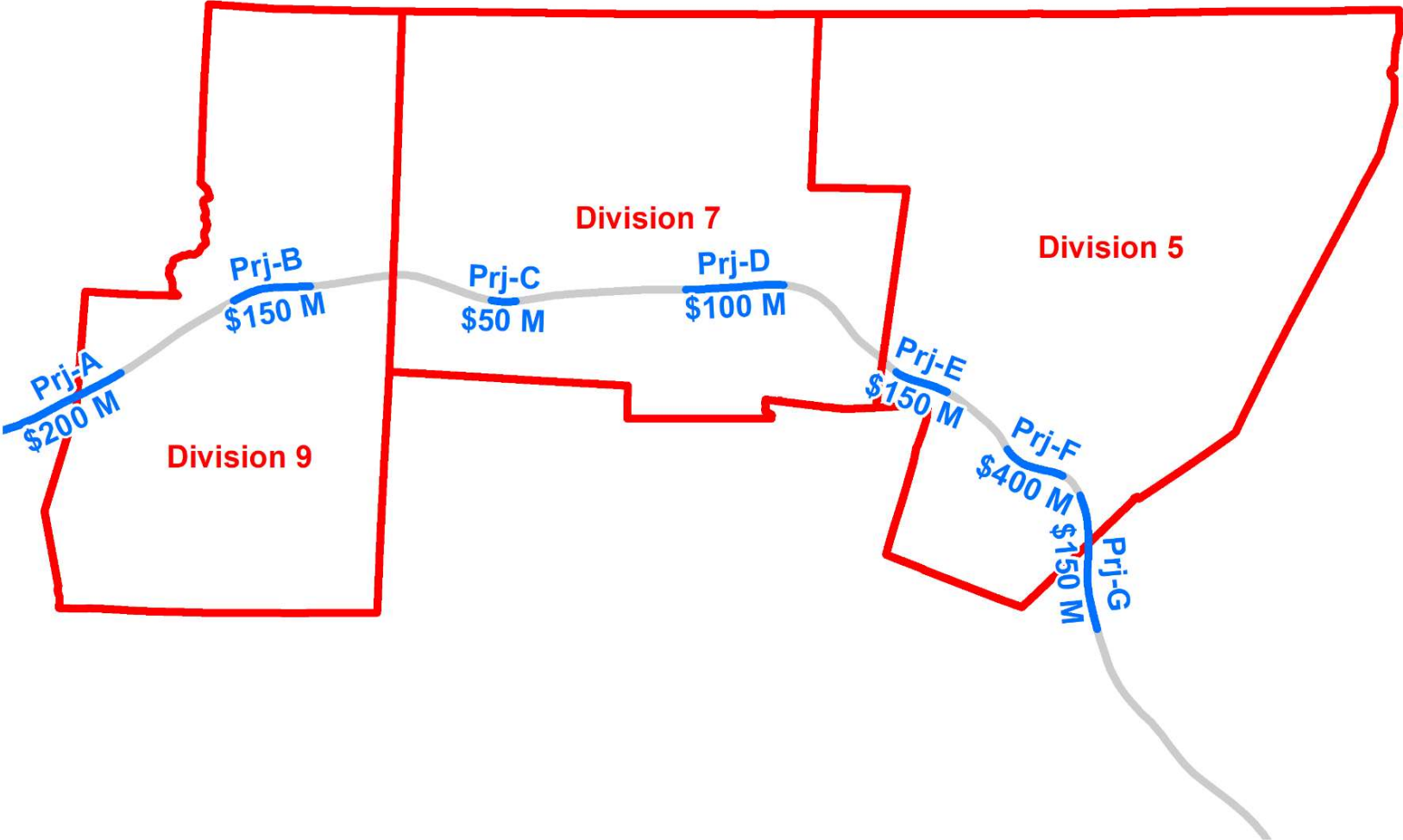


# Corridor Cap

## **136-189.11, (d), (1), b:**

Project cap. – No more than ten percent (10%) of the funds projected to be allocated to the Statewide Strategic Mobility category over any five-year period may be assigned to any project or group of projects in the same corridor within a Highway Division or within adjoining Highway Divisions.

# Corridor Cap



# Corridor Cap

## Divisions 7 & 9

Project	Cost
Prj-A	\$200 M
Prj-B	\$150 M
Prj-C	\$50 M
Prj-D	\$100 M

**Total: 500 Million**

## Divisions 7 & 5

Project	Cost
Prj-C	\$50 M
Prj-D	\$100 M
Prj-E	\$150 M
Prj-F	\$400 M
Prj-G	\$150 M

**Total: 850 Million**

# Corridor Cap

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2020 THRU 2029
<b>HIGHWAY TRUST FUND REVENUES</b>												
25% of Gas Tax Revenues	\$ 593.00	\$ 610.00	\$ 625.00	\$ 641.00	\$ 653.00	\$ 665.00	\$ 675.00	\$ 683.00	\$ 693.00	\$ 704.00	\$ 690.00	\$ 6,639.00
DMV Fees & Investment Income	152.00	153.00	165.00	167.00	171.00	176.00	199.00	204.00	209.00	215.00	241.00	\$ 1,900.00
Use Tax	807.00	814.00	815.00	824.00	845.00	871.00	894.00	917.00	941.00	967.00	1,028.00	\$ 8,916.00
<b>Total State Highway Trust Fund Revenues</b>	<b>\$ 1,552.00</b>	<b>\$ 1,577.00</b>	<b>\$ 1,605.00</b>	<b>\$ 1,632.00</b>	<b>\$ 1,669.00</b>	<b>\$ 1,712.00</b>	<b>\$ 1,768.00</b>	<b>\$ 1,804.00</b>	<b>\$ 1,843.00</b>	<b>\$ 1,886.00</b>	<b>\$ 1,959.00</b>	<b>\$ 17,455.00</b>
Less Transfers for NCTA GAP Funding	(49.00)	(49.00)	(49.00)	(49.00)	(49.00)	(49.00)	(49.00)	(49.00)	(49.00)	(49.00)	(49.00)	\$ (490.00)
Less GO Debt Service	(50.04)	(59.77)	-	-	-	-	-	-	-	-	-	\$ (59.77)
Less Transfer to Highway Fund	(0.40)	(0.40)	(0.40)	(0.40)	(0.40)	(0.40)	(0.40)	(0.40)	(0.40)	(0.40)	(0.40)	\$ (4.00)
Less Program Administration	(36.04)	(36.62)	(37.27)	(37.90)	(38.76)	(39.76)	(41.06)	(41.89)	(42.80)	(43.80)	(45.49)	\$ (405.33)
Less Transfer to State Ports	(45.00)	(45.00)	(45.00)	(45.00)	(45.00)	(45.00)	(45.00)	(45.00)	(45.00)	(45.00)	(45.00)	\$ (450.00)
<b>Net State Trust Fund Revenues</b>	<b>1,371.52</b>	<b>1,386.21</b>	<b>1,473.33</b>	<b>1,499.70</b>	<b>1,535.84</b>	<b>1,577.84</b>	<b>1,632.54</b>	<b>1,667.71</b>	<b>1,705.80</b>	<b>1,747.80</b>	<b>1,819.11</b>	<b>\$ 16,045.89</b>
<b>Federal Aid</b>	<b>1,261.00</b>	<b>1,289.00</b>	<b>1,289.00</b>	<b>1,289.00</b>	<b>1,289.00</b>	<b>1,289.00</b>	<b>1,289.00</b>	<b>1,289.00</b>	<b>1,289.00</b>	<b>1,289.00</b>	<b>1,289.00</b>	<b>12,890.00</b>
Less SPR Funds	(34.14)	(34.90)	(34.90)	(34.90)	(34.90)	(34.90)	(34.90)	(34.90)	(34.90)	(34.90)	(34.90)	(348.98)
Less CMAQ	(30.00)	(30.00)	(30.00)	(30.00)	(30.00)	(30.00)	(30.00)	(30.00)	(30.00)	(30.00)	(30.00)	(300.00)
Less DMS (Formerly EEP)	(20.00)	(20.00)	(20.00)	(20.00)	(20.00)	(20.00)	(20.00)	(20.00)	(20.00)	(20.00)	(20.00)	(200.00)
Less Yadkin River GARVEE debt service	(15.62)	(5.13)	(5.13)	-	-	-	-	-	-	-	-	(10.26)
<b>Net Federal Aid Revenues</b>	<b>1,161.24</b>	<b>1,198.97</b>	<b>1,198.97</b>	<b>1,204.10</b>	<b>1,204.10</b>	<b>1,204.10</b>	<b>1,204.10</b>	<b>1,204.10</b>	<b>1,204.10</b>	<b>1,204.10</b>	<b>1,204.10</b>	<b>12,030.76</b>
<b>Available Subtotal (Trust and Federal-aid)</b>	<b>2,532.76</b>	<b>2,585.18</b>	<b>2,672.30</b>	<b>2,703.80</b>	<b>2,739.95</b>	<b>2,781.95</b>	<b>2,836.65</b>	<b>2,871.81</b>	<b>2,909.90</b>	<b>2,951.91</b>	<b>3,023.21</b>	<b>28,076.65</b>
Less PE	(250.00)	(250.00)	(250.00)	(250.00)	(250.00)	(250.00)	(250.00)	(250.00)	(250.00)	(250.00)	(250.00)	(2,500.00)
<b>Subtotal</b>	<b>2,282.76</b>	<b>2,335.18</b>	<b>2,422.30</b>	<b>2,453.80</b>	<b>2,489.95</b>	<b>2,531.95</b>	<b>2,586.65</b>	<b>2,621.81</b>	<b>2,659.90</b>	<b>2,701.91</b>	<b>2,773.21</b>	<b>25,576.65</b>
Less Construction Cost Overruns	(58.73)	(60.31)	(62.92)	(63.86)	(64.95)	(66.21)	(67.85)	(68.90)	(70.05)	(71.31)	(73.45)	(669.80)
Less Bonus Alloc. for Tolling & Local Participation	(36.70)	(40.20)	(47.40)	(40.20)	(43.82)	(23.67)	(3.32)	(7.09)	(4.59)	(61.95)	(58.63)	(330.86)
<b>Funds Available for Programming Subtotal</b>	<b>2,187.33</b>	<b>2,234.67</b>	<b>2,311.98</b>	<b>2,349.74</b>	<b>2,381.18</b>	<b>2,442.07</b>	<b>2,515.47</b>	<b>2,545.81</b>	<b>2,585.26</b>	<b>2,568.65</b>	<b>2,641.14</b>	<b>24,575.99</b>
Less Inflation	0.00	(11.17)	(34.80)	(59.21)	(84.41)	(111.85)	(115.21)	(116.60)	(118.41)	(117.64)	(120.96)	(890.26)
<b>Funds Available for Programming</b>	<b>\$ 2,187.33</b>	<b>\$ 2,223.50</b>	<b>\$ 2,277.19</b>	<b>\$ 2,290.53</b>	<b>\$ 2,296.76</b>	<b>\$ 2,330.23</b>	<b>\$ 2,400.27</b>	<b>\$ 2,429.21</b>	<b>\$ 2,466.86</b>	<b>\$ 2,451.01</b>	<b>\$ 2,520.18</b>	<b>23,685.72</b>
Less Transition Funding	(170.41)	(88.89)	(69.14)	(40.90)	(37.39)	(36.29)	(14.98)	(9.85)	-	-	-	(297.44)
<b>Funds Available to Allocate to Categories</b>	<b>\$ 2,016.92</b>	<b>\$ 2,134.61</b>	<b>\$ 2,208.05</b>	<b>\$ 2,249.63</b>	<b>\$ 2,259.37</b>	<b>\$ 2,293.94</b>	<b>\$ 2,385.29</b>	<b>\$ 2,419.36</b>	<b>\$ 2,466.86</b>	<b>\$ 2,451.01</b>	<b>\$ 2,520.18</b>	<b>\$ 23,388.28</b>
STATEWIDE	806.77	853.84	883.22	899.85	903.75	917.57	954.11	967.75	986.74	980.40	1,008.07	9,355.31
REGIONAL	605.08	640.38	662.41	674.89	677.81	688.18	715.59	725.81	740.06	735.30	756.05	7,016.48
LESS STPDA ON REGIONAL AND STATEWIDE ROUTES	(8.84)		(2.80)	(5.14)	(3.58)	(3.20)	(3.20)	(3.20)				(21.13)
<b>REGIONAL TOTAL REVISED</b>	<b>596.24</b>	<b>640.38</b>	<b>659.61</b>	<b>669.74</b>	<b>674.23</b>	<b>684.98</b>	<b>712.39</b>	<b>722.61</b>	<b>740.06</b>	<b>735.30</b>	<b>756.05</b>	<b>6,995.36</b>
DIVISION	605.08	640.38	662.41	674.89	677.81	688.18	715.59	725.81	740.06	735.30	756.05	7,016.48

Statewide Mobility Corridor Cap = 10% of sum highlighted \$  
(for each 5 yr period)

(Dollars in Millions)



# Corridor Cap

## Divisions 7 & 9

Project	Cost
Prj-A	\$200 M
Prj-B	\$150 M
Prj-C	\$50 M
Prj-D	\$100 M

**Total: 500 Million**

## Divisions 7 & 5

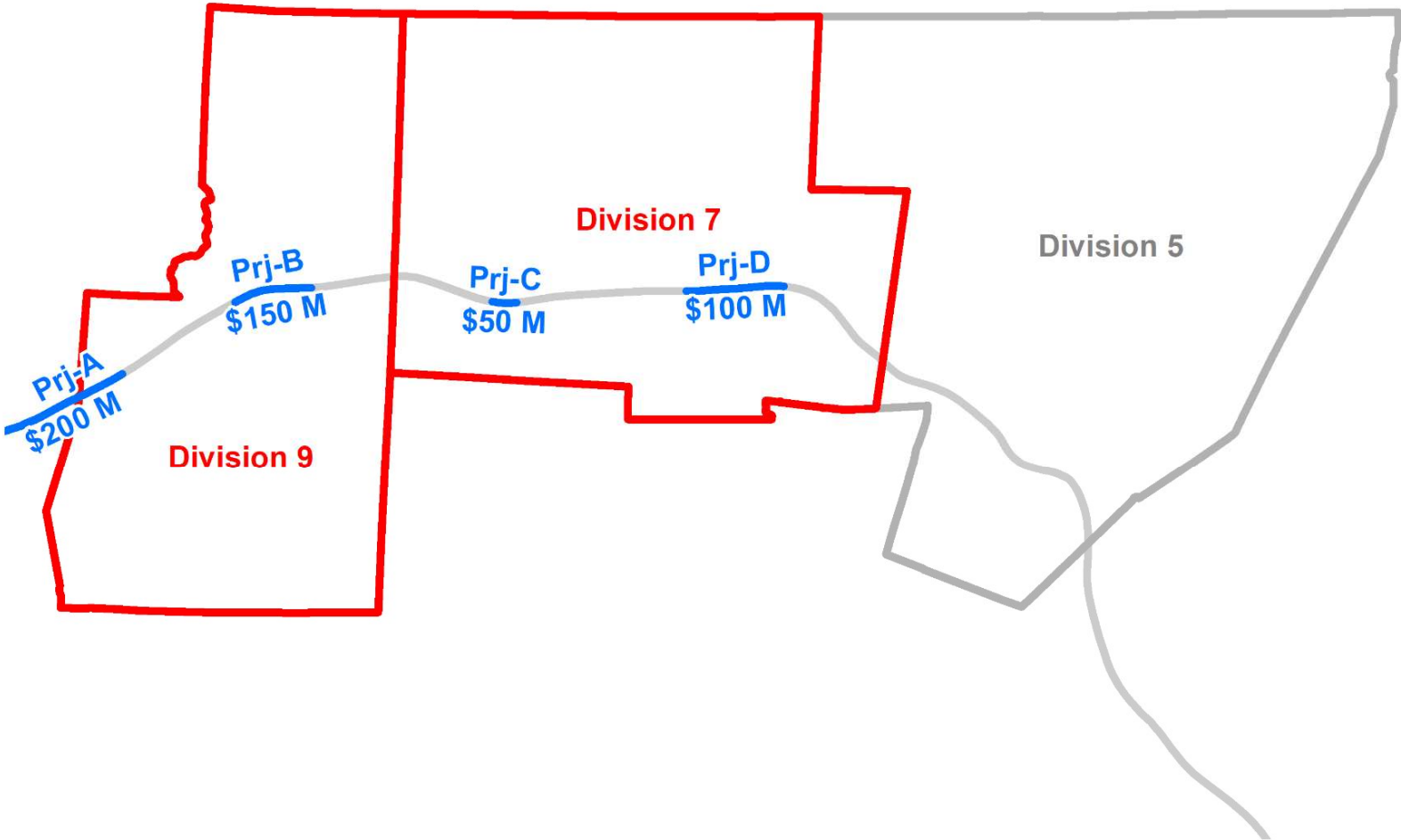
Project	Cost
Prj-C	\$50 M
Prj-D	\$100 M
Prj-E	\$150 M
Prj-F	\$400 M
Prj-G	\$150 M

**Total: 850 Million**

**Cap for 1<sup>st</sup> 5 Years: \$445,823,000**



# Corridor Cap



# Corridor Cap

## Divisions 7 & 9

Project	Cost
Prj-A	\$200 M
Prj-B	\$150 M
Prj-C	\$50 M
Prj-D	\$100 M

**Total: 400 Million**

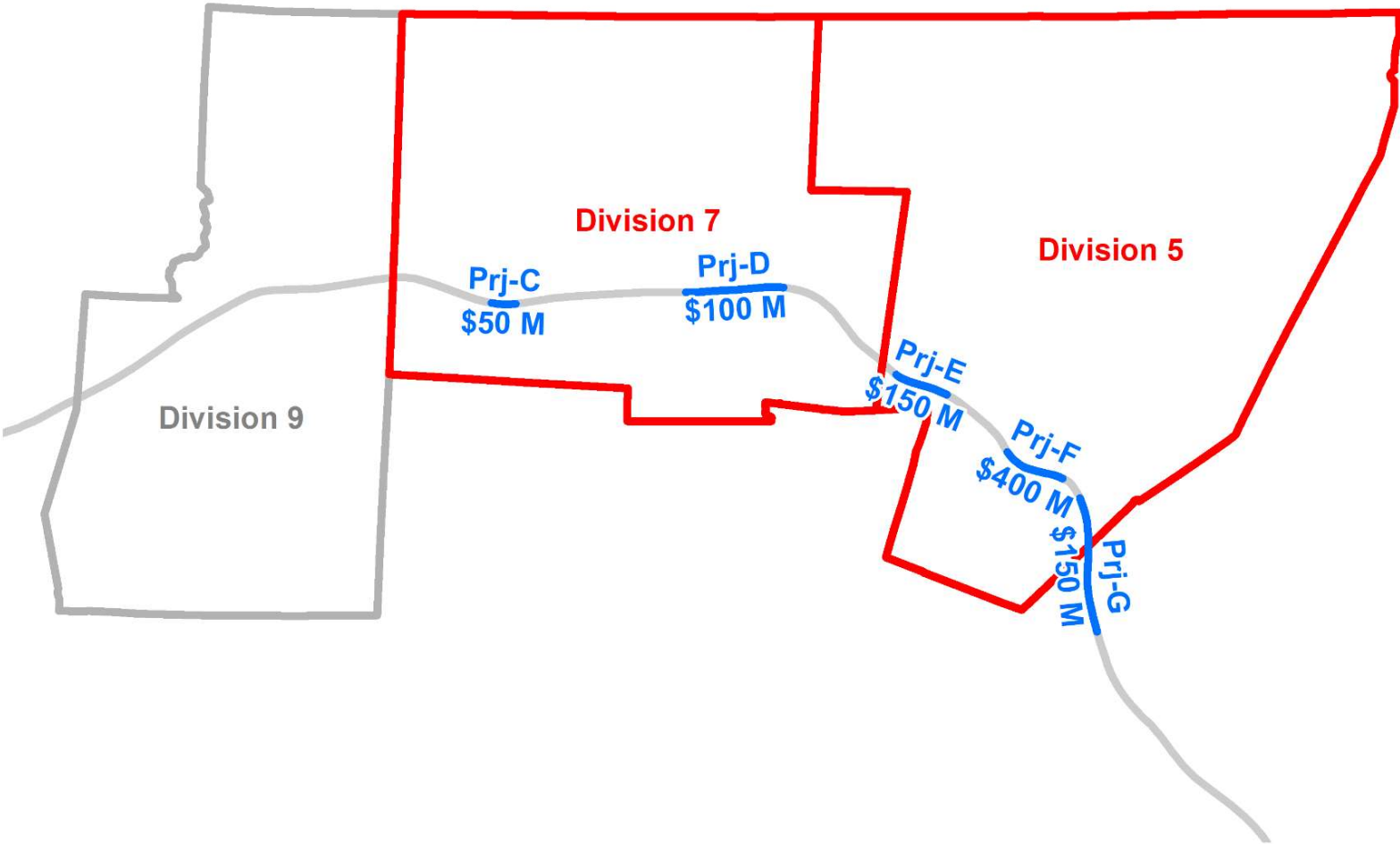
## Divisions 7 & 5

Project	Cost
Prj-C	\$50 M
Prj-D	\$100 M
Prj-E	\$150 M
Prj-F	\$400 M
Prj-G	\$150 M

**Total: 750 Million**

**Cap for 1<sup>st</sup> 5 Years: \$445,823,000**

# Corridor Cap



# Corridor Cap

## Divisions 7 & 9

Project	Cost
Prj-A	\$200 M
Prj-B	\$150 M
Prj-C	\$50 M
Prj-D	\$100 M

**Total: 400 Million**

## Divisions 7 & 5

Project	Cost
Prj-C	\$50 M
Prj-D	\$100 M
Prj-E	\$150 M
Prj-F	\$400 M
Prj-G	\$150 M

**Total: 350 Million**

**Cap for 1<sup>st</sup> 5 Years: \$445,823,000**

# Programming STI Projects

**DRAFT 2020 - 2029 STIP - COMPARISON FOR 10 YEAR PERIOD**

**STATEWIDE CATEGORY**

STATEWIDE REVENUE 10 YEAR PERIOD	STATEWIDE REVENUE ADJUSTMENT	REVISED STATEWIDE REVENUE 10 YEAR PERIOD	STATEWIDE CATEGORY PROGRAMMED	DIFFERENCE	PERCENTAGE DIFFERENCE
\$9,355,310	\$274,522	\$9,629,832	\$10,941,801	(\$1,311,969)	-13.62%

**REGIONAL CATEGORY**

DISTRIBUTION REGIONS	REGION	REGION REVENUE 10 YEAR PERIOD	REGION REVENUE ADJUSTMENT	REVISED REGION REVENUE 10 YEAR	DA FUNDING (HIGHWAY)	DA FUNDING (NON-HIGHWAY)	AMOUNT REMAINING	4% NON-HIGHWAY PROGRAMMED	AMOUNT REMAINING	90% HIGHWAY PROGRAMMED	AMOUNT REMAINING	6% HIGHWAY PROGRAMMED	6% NON-HIGHWAY PROGRAMMED	DIFFERENCE	PERCENT DIFFERENCE	DISTRIBUTION REGIONS
1 & 4	A	\$592,013	(\$17,543)	\$574,470	\$0	\$0	\$574,470	\$429	\$574,041	\$293,733	\$280,308	\$0	\$0	\$280,308	48.79%	1 & 4
2 & 3	B	\$845,591	\$26,753	\$872,344	\$0	\$0	\$872,344	\$1,179	\$871,165	\$595,849	\$275,316	\$19,000	\$0	\$256,316	29.38%	2 & 3
5 & 6	C	\$1,543,626	\$73,236	\$1,616,862	\$0	\$0	\$1,616,862	\$87,837	\$1,529,025	\$1,002,657	\$526,368	\$49,852	\$0	\$476,516	29.47%	5 & 6
7 & 9	D	\$1,171,592	(\$53,431)	\$1,118,161	\$0	\$0	\$1,118,161	\$14,737	\$1,103,423	\$612,905	\$490,518	\$0	\$0	\$490,518	43.87%	7 & 9
8 & 10	E	\$1,445,455	\$167,394	\$1,612,849	\$0	\$0	\$1,612,849	\$5,179	\$1,607,670	\$1,144,814	\$462,856	\$17,500	\$0	\$445,356	27.61%	8 & 10
11 & 12	F	\$784,495	\$40,367	\$824,862	\$0	\$0	\$824,862	\$638	\$824,223	\$525,288	\$298,935	\$0	\$0	\$298,935	36.24%	11 & 12
13 & 14	G	\$612,589	\$65,116	\$677,705	\$0	\$0	\$677,705	\$429	\$677,276	\$415,358	\$261,918	\$17,100	\$0	\$244,818	36.12%	13 & 14
TOTALS		\$6,995,361	\$301,892	\$7,297,253	\$0	\$0	\$7,297,253	\$110,426	\$7,186,823	\$4,590,602	\$2,596,219	\$103,452	\$0	\$2,492,767		TOTALS

Note: Any DA funding applied is a Statewide or Regional Category project will be deducted from Total Regional Budget

Total Percent Difference 34.16%

**DIVISION CATEGORY**

DIVISION	DIVISION REVENUE 10 YEAR PERIOD	DIVISION REVENUE ADJUSTMENT	REVISED DIVISION REVENUE 10 YEAR	DA FUNDING (HIGHWAY)	DA FUNDING (NON-HIGHWAY)	AMOUNT REMAINING	4% NON-HIGHWAY PROGRAMMED	AMOUNT REMAINING	90% HIGHWAY PROGRAMMED	AMOUNT REMAINING	6% HIGHWAY PROGRAMMED	6% NON-HIGHWAY PROGRAMMED	DIFFERENCE	PERCENT DIFFERENCE	DIVISION
1	\$501,177	\$37,810	\$538,987	\$0	\$0	\$538,987	\$6,393	\$532,594	\$296,136	\$236,457	\$34,472	\$0	\$201,985	37.47%	1
2	\$501,177	\$40,763	\$541,940	\$0	\$0	\$541,940	\$9,669	\$532,271	\$336,295	\$195,975	\$51,328	\$0	\$144,647	26.69%	2
3	\$501,177	\$35,013	\$536,190	\$32,590	\$0	\$503,600	\$8,793	\$494,807	\$350,143	\$144,663	\$0	\$0	\$144,663	26.98%	3
4	\$501,177	(\$5,383)	\$495,794	\$10,096	\$2,070	\$483,628	\$11,516	\$472,112	\$140,721	\$331,390	\$0	\$0	\$331,390	66.84%	4
5	\$501,177	\$41,039	\$542,216	\$99,836	\$55,561	\$386,819	\$42,341	\$344,477	\$222,523	\$121,953	\$0	\$0	\$121,953	22.49%	5
6	\$501,177	(\$1,698)	\$499,479	\$4,144	\$460	\$494,875	\$14,381	\$480,493	\$253,955	\$226,537	\$0	\$0	\$226,537	45.35%	6
7	\$501,177	\$43,327	\$544,504	\$19,340	\$39,042	\$486,121	\$29,298	\$456,822	\$319,514	\$137,307	\$0	\$756	\$136,551	25.08%	7
8	\$501,177	\$56,893	\$558,070	\$100	\$1,967	\$556,002	\$36,302	\$519,699	\$269,415	\$250,284	\$0	\$174	\$250,110	44.82%	8
9	\$501,177	\$5,217	\$506,394	\$63,796	\$3,592	\$439,006	\$24,678	\$414,328	\$214,490	\$199,837	\$0	\$0	\$199,837	39.46%	9
10	\$501,177	\$9,415	\$510,592	\$135,064	\$7,155	\$368,372	\$27,229	\$341,143	\$142,095	\$199,047	\$21,100	\$3,023	\$174,924	34.26%	10
11	\$501,177	\$43,181	\$544,358	\$6,601	\$0	\$537,757	\$6,943	\$530,814	\$283,226	\$247,587	\$0	\$2,700	\$244,887	44.99%	11
12	\$501,177	\$32,959	\$534,136	\$69,835	\$1,467	\$462,834	\$13,012	\$449,822	\$306,221	\$143,600	\$900	\$7,767	\$134,933	25.26%	12
13	\$501,177	\$13,078	\$514,255	\$26,275	\$0	\$487,980	\$8,538	\$479,442	\$384,376	\$95,065	\$39,900	\$5,741	\$49,424	9.61%	13
14	\$501,177	\$20,530	\$521,707	\$19,100	\$0	\$502,607	\$7,698	\$494,909	\$307,251	\$187,657	\$29,000	\$6,342	\$152,315	29.20%	14
TOTALS	\$7,016,478	\$372,144	\$7,388,622	\$486,776	\$111,314	\$6,790,528	\$246,791	\$6,543,733	\$3,826,362	\$2,717,359	\$176,700	\$26,503	\$2,514,156		TOTALS

Total Percent Difference 34.03%

(Dollars in Thousands)



# End of Session 9

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**NORTH CAROLINA**  
Department of Transportation

# Session 10: Resources, Upcoming Items, and Takeaways

STI Training

NCDOT SPOT Office

May 31 – June 1, 2023

Connecting people, products and places safely and efficiently with customer focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina

## Takeaways

- Alternative Funding Opportunities
- Websites
- Upcoming training
- Schedule and Final Reminders

# Alternative Funding Opportunities

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## Alternative Funding Opportunities

- Spot Safety Funding
  - Max funding per project = \$400,000
  - Typically can be designed and constructed within 18 months of funding approval
  - Contact Mobility and Safety to learn more
- Spot Mobility Funding
  - Maximum funding per project = \$750,000
  - Preference to projects that will improve access to a school
  - Contact Mobility and Safety to learn more
- Economic Development Funding
  - Time-critical job creation opportunities
  - Max \$10M per project
  - Contact Division office to learn more
- Others...



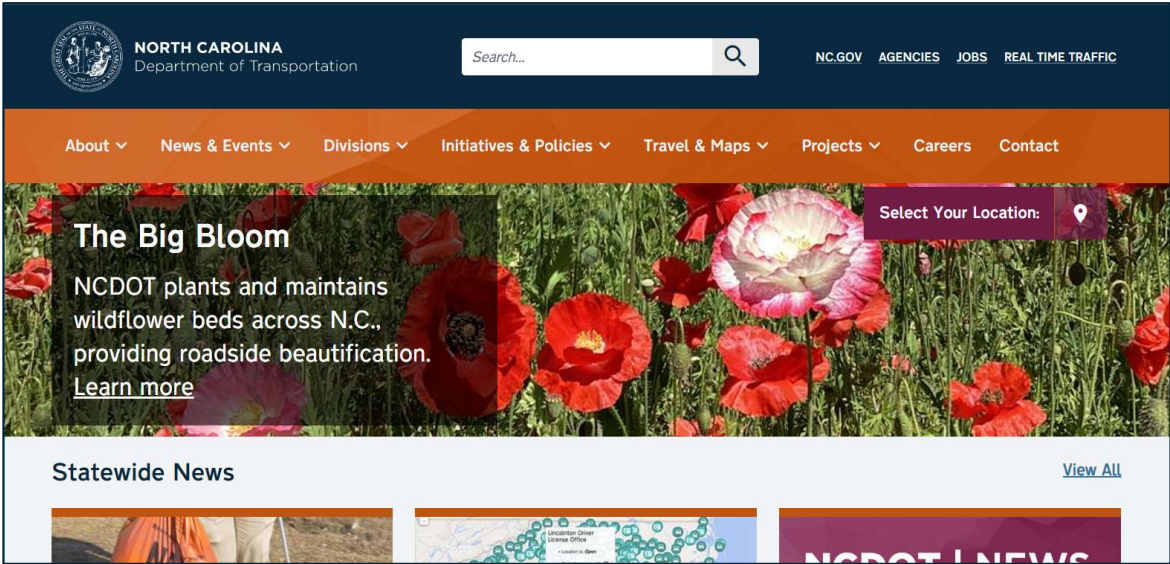
# Websites

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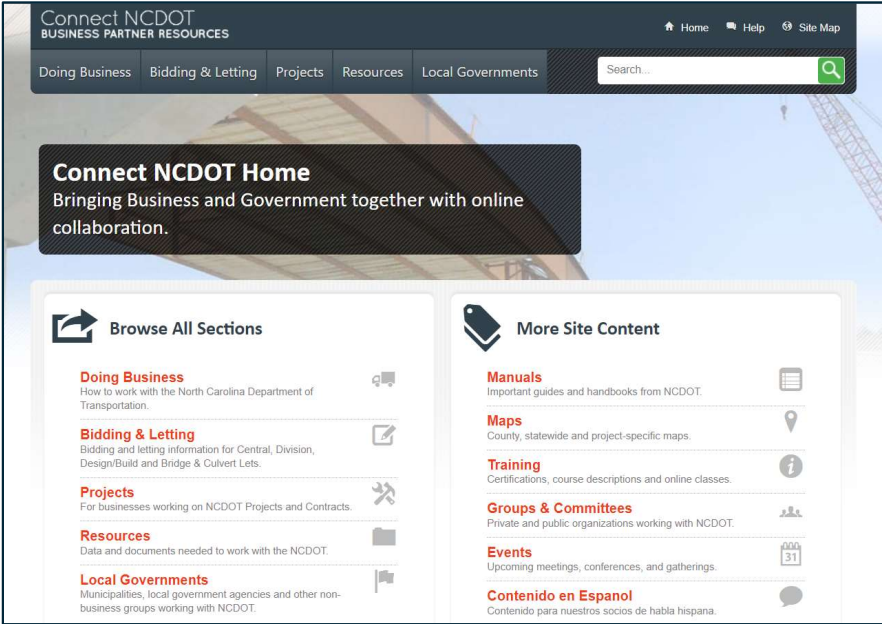


# Where can you find \_\_\_\_\_ ?

- Generally: [www.ncdot.gov](http://www.ncdot.gov)



- Additional business information and data:  
<https://connect.ncdot.gov/Pages/default.aspx>




# Where to find the STIP

The screenshot shows the North Carolina Department of Transportation website. At the top, the logo and name are visible. A search bar is present. The navigation menu includes 'About', 'News & Events', 'Divisions', 'Initiatives & Policies', and 'Travel & Maps'. The 'Initiatives & Policies' menu is circled in red. Below it, the 'Improving Transportation' link is also circled in red. A red arrow points from this link to a grid of program cards. The 'State Transportation Improvement Program' card is circled in red, with another red arrow pointing to it from the 'Improving Transportation' link. Other cards include 'N.C. Bridges', 'NC Moves 2050 Plan', 'Road Cons...', 'Strategic Transportation Corridors', and 'Access for All'.



# Where to find the STIP

## State Transportation Improvement Program



**About the 2020-2029 State Transportation Improvement Program**

The current State Transportation Improvement Program, which identifies transportation projects that will receive funding between 2020 and 2029, is made up of 1,718 projects, including 399 non-highway projects, in every county across the state.

[Learn More →](#)

**2020-2029 Current STIP**

- About the STIP
- STIP Highlights
- STIP Projects Map
- STIP Documents & Resources**
- Frequently Asked Questions

**2024-2033 Draft STIP**

- STIP Development Timeline
- Draft STIP Resources**
- News Releases

**Contact**

Planning & Programming  
[Send Message](#)

1534 Mail Service Center  
Raleigh, NC 27699-1534

NORTH CAROLINA  
Department of Transportation

Search...

NC.GOV AGENCIES JOBS REAL TIME TRAFFIC

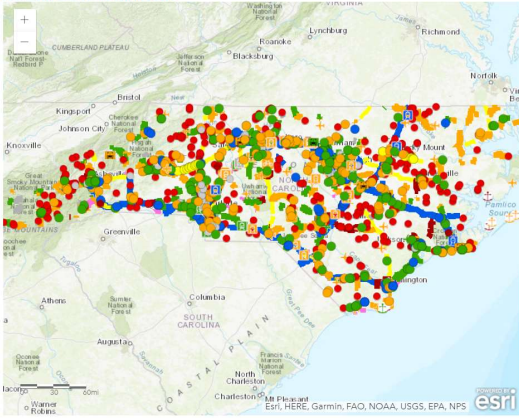
About News & Events Divisions Initiatives & Policies Travel & Maps Projects Careers Contact

Home » Initiatives & Policies » Transportation » State Transportation Improvement Program » 2024-2033 STIP Development » Draft STIP Resources


## Draft STIP Resources

### Draft 2024-2033 STIP Map

[View a more detailed map here.](#)



**Draft STIP Document**

 [2024-2033 Draft STIP \(Revised Aug. 4, 2022\)](#)  
Excel

- Initiatives & Policies
- About the 2020-2029 STIP
- STIP Highlights
- 2020-2029 STIP Projects Map
- 2024-2033 STIP Development
- Draft STIP Resources**
- News Releases
- Developing & Updating the STIP
- Frequently Asked Questions
- Documents & Resources

## Prioritization Websites

- Prioritization Resources page:

<https://connect.ncdot.gov/projects/planning/Pages/PrioritizationResources.aspx>

- Prioritization Data page:

<https://connect.ncdot.gov/projects/planning/Prioritization%20Data/Forms/AllItems.aspx>

- [www.ncdot.gov/sti](http://www.ncdot.gov/sti)



# STIP Staff

## Western

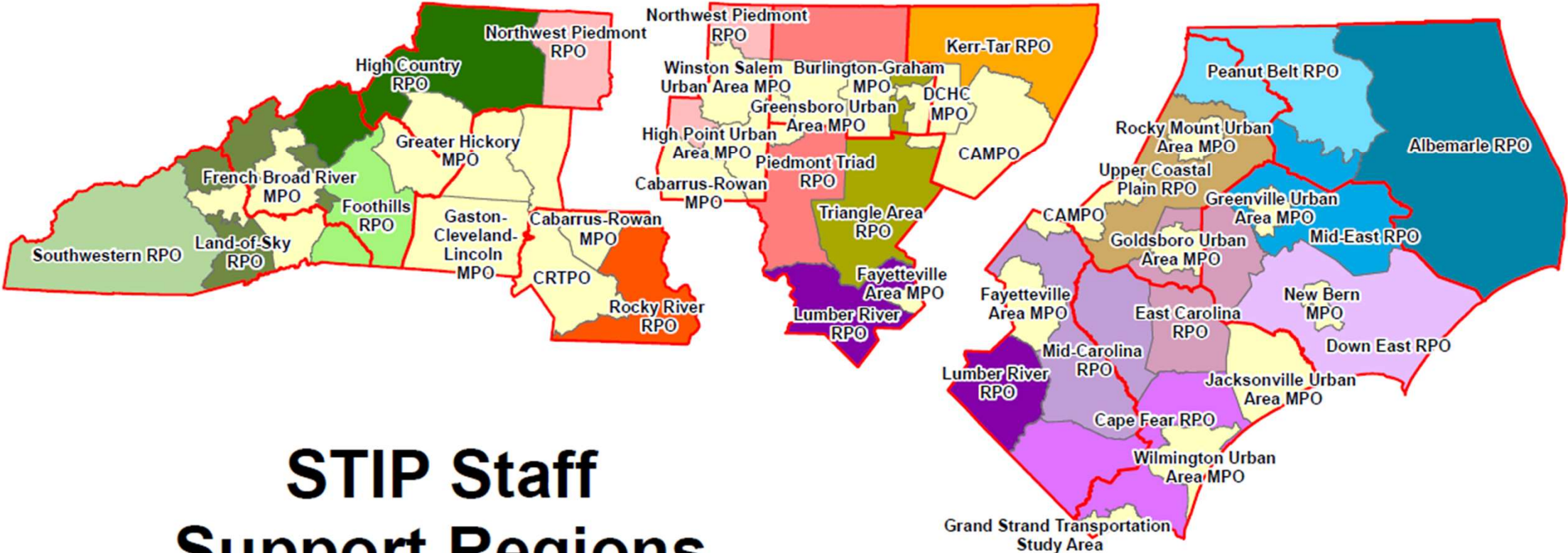
David Wasserman  
Divisions 10, 11, 12, 13 & 14  
919-707-4743  
dswasserman@ncdot.gov

## Central

Jason Schronce  
Divisions 5, 7, 8 & 9  
919 707 4646  
jschronce@ncdot.gov

## Eastern

Ben Johnson  
Divisions 1, 2, 3, 4 & 6  
919-707-4631  
bljohnson2@ncdot.gov



# STIP Staff Support Regions

# SPOT Office Staff

**Brian Wert, P.E.**  
SPOT Manager  
Prioritization Office (SPOT)  
(919) 707-4657  
[bmwert@ncdot.gov](mailto:bmwert@ncdot.gov)

**Sarah E. Lee**  
Non-Highway Modes  
Prioritization Office (SPOT)  
(919) 707-4742  
[selee@ncdot.gov](mailto:selee@ncdot.gov)

**Steven Bolyard, P.E.**  
Highway Mode  
Prioritization Office (SPOT)  
(919) 707-4640  
[sjbolyard@ncdot.gov](mailto:sjbolyard@ncdot.gov)

*(TBD)*  
Highway Mode  
Prioritization Office (SPOT)

**Austin Chamberlain**  
GIS Support  
Prioritization Office (SPOT)  
(919) 707-4650  
[sachamberlain@ncdot.gov](mailto:sachamberlain@ncdot.gov)



SPOT@NCDOT.GOV

# Upcoming Training

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# Additional Upcoming Training

Events / Training	Guidance / Information
<p><b>SPOT Online Introductory Training:</b> SPOT will offer a virtual session for new users to learn the basics of project entry and navigating the system. (Timing under development.)</p>	<p><b>SPOT Online access:</b> SPOT will reach out to sign up new partners and confirm access for existing partners.</p>
<p><b>P7 Scoring Updates:</b> SPOT will hold a virtual session(s) in <b>June</b> to walk through the details of scoring changes for P7.</p>	<p><b>Carryovers:</b> SPOT will provide the draft list of Carryover projects for P7.</p>
<p><b>SPOT Online Updates:</b> SPOT will hold a virtual session(s) in <b>July</b> to walk through the changes and updates to project entry for P7.</p>	<p><b>Testing spreadsheets:</b> SPOT will provide more information on available tools for testing project scores.</p>
<p><b>Project Entry / SPOT Online Workshops:</b> SPOT will hold 1-day regional sessions (West, Central, East) in <b>August / September</b> to assist partners with project entry questions and troubleshooting.</p>	<p><b>Deadlines:</b> SPOT will provide due dates for aspects such as Carryover modifications, Carryover deletions, Area-Specific Weights, and Local Input Point Assignment Methodologies.</p>

- Future training opportunities will cover additional topics
- Trainings will be a combination of in-person and virtual
- Stay tuned for final dates in email updates

# Schedule and Final Reminders

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## Final Reminders

- Submittal window – July 10 to September 29
- Data review – February 2024 (potentially spread out earlier)
- LIP Methodologies – review committee to begin in 2024 (approve all by April 1, 2024)
- Watch emails for training schedules, SPOT Online user account info, and guidance updates
- Use resources and tools!
- Reach out for help...
  - Utilize Division DPEs / CDEs, experienced peers, and...

**SPOT@NCDOT.GOV**

# End of Session 10

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**Thank you!**

