



**NORTH CAROLINA**  
Department of Transportation

# P8 Highway Modernization Subcommittee Meeting #5

NCDOT SPOT Office

February 13, 2025

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

## Agenda

- Workgroup Feedback
  - On Subcommittee's current direction
- Additional Analysis
  - P7 Score Analysis based on potential changes/improvements
- Discussion Follow-Up
  - Potential changes/improvements for Modernization and Road Diet projects
- Next Steps
- Adjourn

## Housekeeping

- Virtual etiquette:
  - When you are not speaking, please mute yourself. This limits disruption from background noise.
  - Feel free to use the “Raise Hand” feature if you have a question. You can also type “Q” in the chat.

## Workgroup Feedback

- Potential recommendations:
  - Removal of the Pavement Condition criterion from the Modernization criteria
  - Incorporate Congestion at the Division Needs category for Modernization projects
  - Combine Lane Width and Shoulder Width to measure total deficiency
- Feedback
  - Clarifying questions/comments on Lane/Shoulder Width combination and Congestion inclusion
  - Accessibility/Connectivity criterion not a good option in its current state
  - Generally, no outright objections on the Subcommittee's current direction

# Additional Analysis

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## Reference Slide: Scenario Descriptions

- Scenario A
  - Distribute Pavement Condition weight (10%) to Lane and Shoulder Widths
- Scenario B
  - Add Pavement Condition weight (10%) to Safety
- Scenario C
  - Distribute Pavement Condition weight (10%) to Safety and Freight
- Scenario C+
  - Scenario C plus add 5% from Paved Shoulder Width to Freight at Division Category and distribute (10%) from Paved Shoulder Width to Safety and Freight at Statewide Category

## Reference Slide: Scenario Descriptions (Continued)

- Scenario D
  - Distribute Pavement Condition weight (10%) to Safety and Freight and add 5% from Paved Width to Congestion @ DN Category
- Scenario E
  - Combine Shoulder and Lane Widths into one criterion
- Scenario F
  - Distribute Pavement Condition weight (10%) to Safety and Freight. Combine Shoulder and Lane Widths and distribute weights: 25% SM, 10% RI, and 5% DN

## P7 Score Analysis without Pavement Condition Criterion

- **Scenario D:** Distribute Pavement Condition weight (10%) to Safety and Freight and add 5% from Paved Width to Congestion @ DN Category

Criteria	<u>Existing Weights</u>			Criteria	<u>Scenario D Weights</u>		
	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)		Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
Congestion	10%	5%	-	Congestion	10%	5%	5%
Safety	25%	25%	20%	Safety	30%	30%	25%
Freight	25%	10%	5%	Freight	30%	15%	10%
Lane Width	10%	10%	5%	Lane Width	10%	10%	5%
[Paved] Shoulder Width	20%	10%	10%	[Paved] Shoulder Width	20%	10%	5%
Pavement Condition	10%	10%	10%				

## P7 High Scoring Modernization Projects – Scenario D

SPOT ID	Statewide Mobility Quantitative Score (Out of 100)
H141265	80.71
H191794	71.82
H170851	69.63
H172311-B	68.98
H141905	66.74
H184836	66.09
H191792	65.75
H090013-B	62.12
H149001-E	57.98
H230876	57.52
H231780	56.31

SPOT ID	Regional Impact Quantitative Score (Out of 70)
H090514-B	45.44
H230818	42.24
H230331	39.62
H090147-A	39.09
H171105	39.06
H170622	38.08
H090514-A	36.88
H171192	35.87
H192987	35.79
H090090	34.29
H090846	32.92

SPOT ID	Division Needs Quantitative Score (Out of 50)
H231566	32.68
H231584	30.89
H231599	30.60
H191110	26.41
H230527	26.28
H231515	25.36
H111308	25.21
H191119	24.13
H190034	24.12
H090782	24.00
H231404	23.85

## P7 High Scoring Modernization Projects – Scenario D

### Existing Results

	<b>Statewide Mobility</b>	<b>Regional Impact</b>	<b>Division Needs</b>
Average Score	53.89	25.52	15.82
Median Score	52.28	26.03	14.18
Top Quartile	61.65	29.77	20.37
Bottom Quartile	50.25	21.46	11.28

VS

### Scenario D Results

	<b>Statewide Mobility</b>	<b>Regional Impact</b>	<b>Division Needs</b>
Average Score	55.74	25.53	15.90
Median Score	55.04	26.21	16.28
Top Quartile	65.92	29.96	20.86
Bottom Quartile	50.09	21.85	10.26

## P7 Score Analysis without Pavement Condition Criterion

- **Scenario E:** Combine Shoulder and Lane Widths into one criterion

<u>Existing Weights</u>				<u>Scenario E Weights</u>			
Criteria	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)	Criteria	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
Congestion	10%	5%	-	Congestion	10%	5%	-
Safety	25%	25%	20%	Safety	25%	25%	20%
Freight	25%	10%	5%	Freight	25%	10%	5%
Lane Width	10%	10%	5%	Lane Width/[Paved] Shoulder Width	30%	20%	15%
[Paved] Shoulder Width	20%	10%	10%	Pavement Condition	10%	10%	10%
Pavement Condition	10%	10%	10%				

## P7 High Scoring Modernization Projects – Scenario E

SPOT ID	Statewide Mobility Quantitative Score (Out of 100)
H191792	79.08
H170851	77.46
H191794	75.47
H141905	73.22
H141265	72.94
H172311-B	69.74
H184836	66.73
H149001-E	65.41
H090013-B	65.29
H230876	63.95
H090002-AB	62.05

SPOT ID	Regional Impact Quantitative Score (Out of 70)
H090514-B	50.39
H171105	45.85
H090514-A	43.27
H090147-A	39.47
H172202	38.49
H230331	37.83
H230818	36.89
H231718	36.74
H090251-AC	35.11
H191341	34.37
H172338	34.31

SPOT ID	Division Needs Quantitative Score (Out of 50)
H231566	36.60
H231599	34.98
H231584	34.84
H230527	27.88
H231515	27.31
H190034	26.53
H231404	25.80
H193215	25.75
H090782	23.82
H191110	23.50
H184878	23.35

## P7 High Scoring Modernization Projects – Scenario E

### Existing Results

	<b>Statewide Mobility</b>	<b>Regional Impact</b>	<b>Division Needs</b>
Average Score	53.89	25.52	15.82
Median Score	52.28	26.03	14.18
Top Quartile	61.65	29.77	20.37
Bottom Quartile	50.25	21.46	11.28

VS

### Scenario E Results

	<b>Statewide Mobility</b>	<b>Regional Impact</b>	<b>Division Needs</b>
Average Score	59.48	25.63	16.56
Median Score	60.75	25.91	15.85
Top Quartile	68.23	29.47	20.62
Bottom Quartile	53.91	21.22	12.23

## P7 Score Analysis without Pavement Condition Criterion

- **Scenario F:** Distribute Pavement Condition weight (10%) to Safety and Freight. Combine Shoulder and Lane Widths and distribute weights: 25% SM, 10% RI, and 5% DN. Increase Congestion weight to 10 at RI and DN

Existing Weights

Scenario F Weights

Criteria	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)	Criteria	Statewide Mobility (100%)	Regional Impact (70%)	Division Needs (50%)
Congestion	10%	5%	-	Congestion	10%	10%	10%
Safety	25%	25%	20%	Safety	35%	30%	25%
Freight	25%	10%	5%	Freight	30%	20%	10%
Lane Width	10%	10%	5%	Lane Width & [Paved] Shoulder	25%	10%	5%
[Paved] Shoulder Width	20%	10%	10%				
Pavement Condition	10%	10%	10%				

## P7 High Scoring Modernization Projects – Scenario F

SPOT ID	Statewide Mobility Quantitative Score (Out of 100)
H141265	79.51
H191794	78.18
H191792	76.86
H172311-B	75.95
H170851	75.58
H141905	72.84
H184836	71.40
H090013-B	66.98
H230876	64.75
H149001-E	64.57
H231780	64.32

SPOT ID	Regional Impact Quantitative Score (Out of 70)
H090514-B	51.36
H230331	46.63
H171105	44.70
H090514-A	42.09
H090147-A	41.05
H090090	39.49
H230818	38.96
H090805	37.88
H191677	37.19
H170622	37.00
H090846	36.61

SPOT ID	Division Needs Quantitative Score (Out of 50)
H231566	35.35
H231584	34.57
H231599	33.28
H231515	28.01
H111308	27.69
H191110	27.63
H191955	26.46
H192727	26.39
H191119	25.09
H171778	24.91
H230553	24.84

## P7 High Scoring Modernization Projects – Scenario F

### Existing Results

	<b>Statewide Mobility</b>	<b>Regional Impact</b>	<b>Division Needs</b>
Average Score	53.89	25.52	15.82
Median Score	52.28	26.03	14.18
Top Quartile	61.65	29.77	20.37
Bottom Quartile	50.25	21.46	11.28

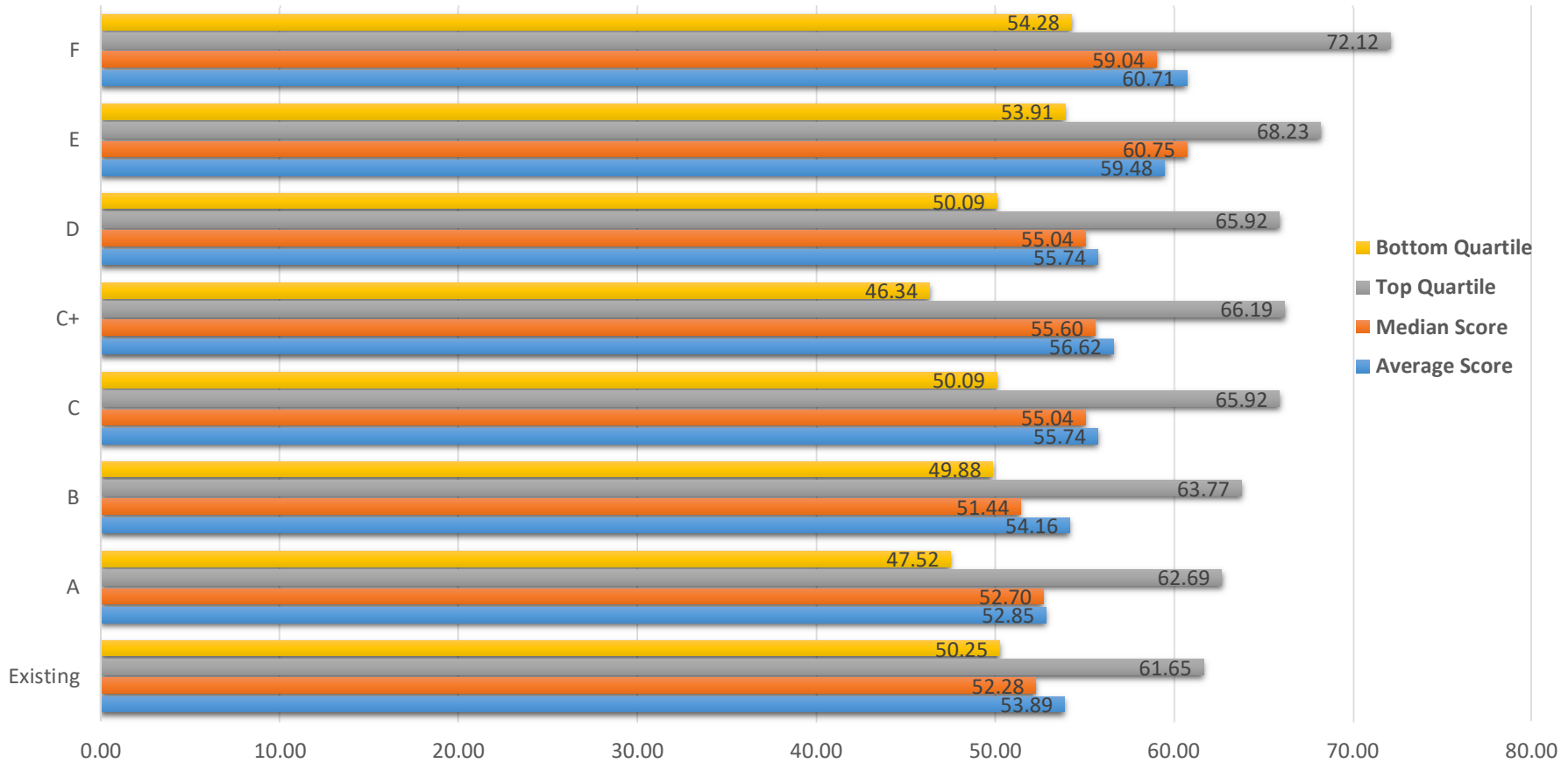
**VS**

### Scenario F Results

	<b>Statewide Mobility</b>	<b>Regional Impact</b>	<b>Division Needs</b>
Average Score	60.71	27.60	16.81
Median Score	59.04	27.85	17.01
Top Quartile	72.12	33.16	21.58
Bottom Quartile	54.28	22.75	11.40

# All Scenarios Statistical Comparison

Statewide Mobility



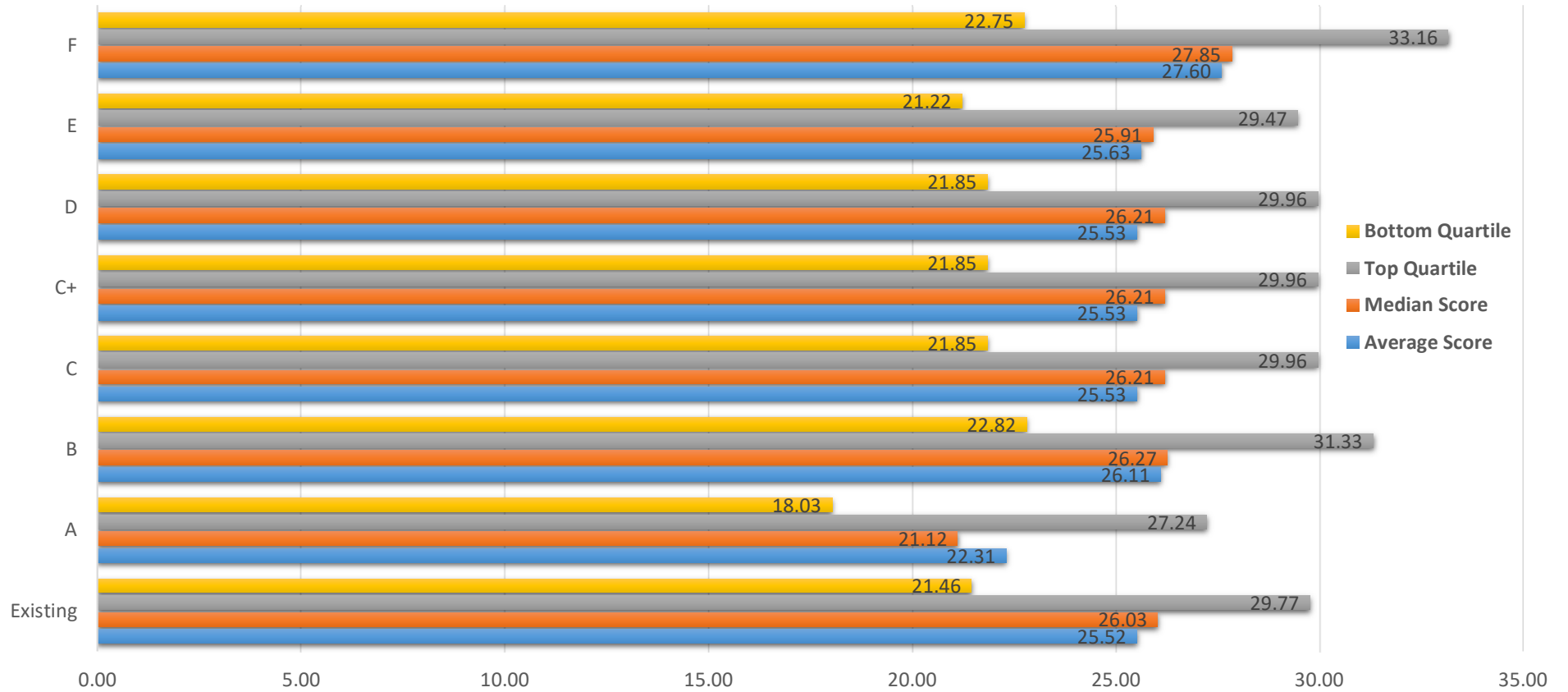
# All Scenarios Score Comparison – Statewide Mobility

SPOT ID	Existing	Scenario A	Score Diff A	Scenario B	Score Diff B	Scenario C	Score Diff C	Scenario C+	Score Diff C+	Scenario D	Score Diff D	Scenario E	Score Diff E	Scenario F	Score Diff F
H141265	73.38	81.14	7.76	79.16	5.77	80.71	7.33	81.26	7.88	80.71	7.33	72.94	-0.44	79.51	6.13
H170851	70.88	65.48	-5.41	67.73	-3.16	69.63	-1.26	69.83	-1.05	69.63	-1.26	77.46	6.58	75.58	4.69
H191794	68.90	67.25	-1.65	70.33	1.43	71.82	2.92	72.44	3.54	71.82	2.92	75.47	6.58	78.18	9.28
H191792	67.03	63.23	-3.81	63.98	-3.05	65.75	-1.28	72.43	5.40	65.75	-1.28	79.08	12.05	76.86	9.83
H141905	66.64	62.80	-3.84	65.36	-1.28	66.74	0.09	66.72	0.08	66.74	0.09	73.22	6.58	72.84	6.19
H172311-B	63.16	64.85	1.69	69.15	5.99	68.98	5.82	69.16	6.00	68.98	5.82	69.74	6.58	75.95	12.79
H184836	60.15	62.57	2.42	63.55	3.40	66.09	5.94	65.66	5.51	66.09	5.94	66.73	6.58	71.40	11.25
H149001-E	58.83	56.36	-2.47	59.89	1.06	57.98	-0.86	55.64	-3.19	57.98	-0.86	65.41	6.58	64.57	5.73
H090013-B	58.71	59.06	0.35	59.13	0.42	62.12	3.41	61.24	2.53	62.12	3.41	65.29	6.58	66.98	8.27
H230876	54.96	55.41	0.46	56.23	1.27	57.52	2.56	55.57	0.61	57.52	2.56	63.95	9.00	64.75	9.79
H193290	54.17	51.36	-2.81	49.97	-4.19	53.07	-1.10	50.84	-3.33	53.07	-1.10	60.75	6.58	57.20	3.04
H090002-AB	52.28	52.42	0.14	50.63	-1.66	51.79	-0.49	46.17	-6.12	51.79	-0.49	62.05	9.76	58.20	5.92
H141863	52.11	47.77	-4.34	45.38	-6.73	49.12	-3.00	46.51	-5.60	49.12	-3.00	60.52	8.41	54.27	2.16
H231780	51.13	48.82	-2.31	54.43	3.30	56.31	5.18	63.17	12.04	56.31	5.18	57.50	6.37	64.32	13.19
H230635	51.01	52.70	1.69	51.18	0.18	54.46	3.46	52.27	1.27	54.46	3.46	57.58	6.58	58.52	7.52
H231170	50.83	43.30	-7.52	50.22	-0.61	50.83	0.00	58.36	7.53	50.83	0.00	50.83	0.00	54.29	3.46
H231288	50.42	52.84	2.42	51.19	0.77	55.04	4.62	53.29	2.87	55.04	4.62	57.00	6.58	59.04	8.61
H090002-AC	50.07	51.88	1.81	49.78	-0.29	51.24	1.17	45.59	-4.48	51.24	1.17	59.83	9.76	57.49	7.42
H190898	48.44	47.28	-1.16	51.44	3.00	49.35	0.91	55.60	7.16	49.35	0.91	47.17	-1.26	51.07	2.64
H192969	40.47	35.50	-4.97	38.16	-2.31	40.94	0.47	45.75	5.28	40.94	0.47	45.04	4.57	45.97	5.50
H090001-A	34.62	35.20	0.58	36.68	2.07	35.31	0.70	39.60	4.99	35.31	0.70	33.35	-1.26	35.70	1.08
H191957	33.27	29.67	-3.60	33.59	0.32	34.76	1.49	39.84	6.58	34.76	1.49	33.27	0.00	36.72	3.45
H141880	27.98	28.75	0.77	28.54	0.56	32.40	4.42	35.27	7.29	32.40	4.42	33.78	5.80	37.00	9.02

<b>Min</b>	-7.52	-6.73	-3.00	-6.12	-3.00	-1.26	1.08
<b>Median</b>	-1.16	0.42	1.17	3.54	1.17	6.58	6.19
<b>Max</b>	7.76	5.99	7.33	12.04	7.33	12.05	13.19
<b>Top Quart</b>	1.23	1.75	3.94	6.29	3.94	6.58	9.15

# All Scenarios Statistical Comparison (Continued)

Regional Impact

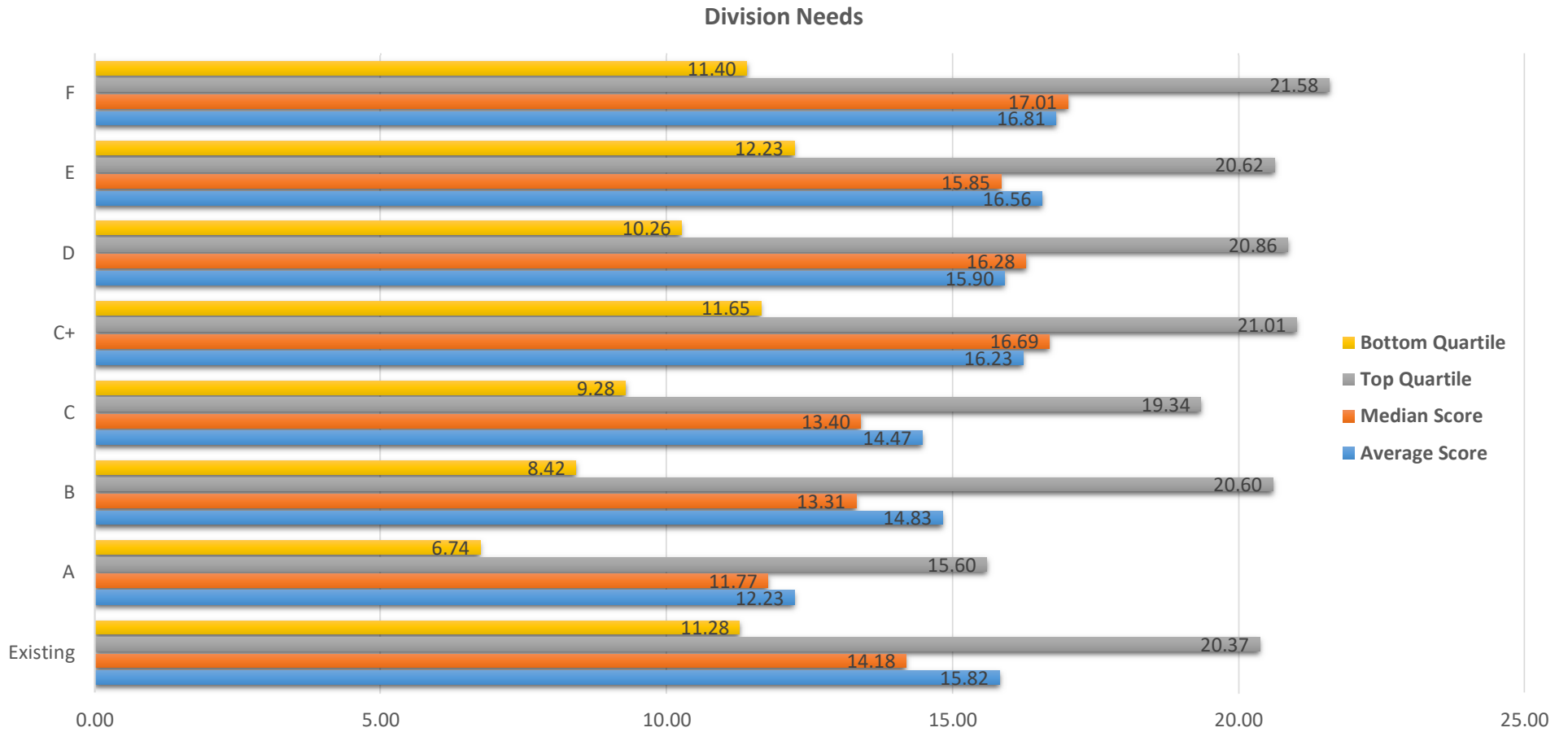


## All Scenarios Score Comparison – Regional Impact

SPOT ID	Existing	Scenario A	Score Diff A	Scenario B	Score Diff B	Scenario C	Score Diff C	Scenario C+	Score Diff C+	Scenario D	Score Diff D	Scenario E	Score Diff E	Scenario F	Score Diff F
H090514-B	43.37	41.48	-1.89	45.23	1.86	45.44	2.06	45.44	2.06	45.44	2.06	50.39	7.02	51.36	7.98
H230818	40.20	40.60	0.39	44.71	4.51	42.24	2.04	42.24	2.04	42.24	2.04	36.89	-3.32	38.96	-1.25
H171105	38.83	36.67	-2.17	38.93	0.09	39.06	0.22	39.06	0.22	39.06	0.22	45.85	7.02	44.70	5.86
H192987	37.88	34.98	-2.90	37.43	-0.45	35.79	-2.08	35.79	-2.08	35.79	-2.08	34.25	-3.63	34.01	-3.87
H230331	37.83	31.72	-6.11	40.12	2.29	39.62	1.79	39.62	1.79	39.62	1.79	37.83	0.00	46.63	8.80
H170622	36.44	35.75	-0.68	37.48	1.04	38.08	1.64	38.08	1.64	38.08	1.64	32.81	-3.63	37.00	0.56
H090514-A	36.25	34.36	-1.89	35.61	-0.64	36.88	0.63	36.88	0.63	36.88	0.63	43.27	7.02	42.09	5.84
H090147-A	34.43	37.83	3.41	39.13	4.70	39.09	4.67	39.09	4.67	39.09	4.67	39.47	5.04	41.05	6.63
H230766	34.39	32.15	-2.24	34.75	0.36	32.01	-2.38	32.01	-2.38	32.01	-2.38	30.77	-3.63	28.06	-6.34
H090805	34.15	25.40	-8.75	31.86	-2.29	31.80	-2.35	31.80	-2.35	31.80	-2.35	34.15	0.00	37.88	3.73
H191677	33.84	25.10	-8.75	31.60	-2.25	32.27	-1.57	32.27	-1.57	32.27	-1.57	33.84	0.00	37.19	3.34
H140865-A	32.64	28.79	-3.85	29.89	-2.75	27.28	-5.37	27.28	-5.37	27.28	-5.37	29.33	-3.32	21.38	-11.26
H111090-A	32.50	28.51	-3.99	28.60	-3.90	28.64	-3.86	28.64	-3.86	28.64	-3.86	28.87	-3.63	25.77	-6.73
H172202	31.47	29.58	-1.89	30.54	-0.94	29.88	-1.59	29.88	-1.59	29.88	-1.59	38.49	7.02	33.14	1.67
H231448	30.86	29.08	-1.78	33.13	2.28	30.58	-0.27	30.58	-0.27	30.58	-0.27	27.56	-3.30	28.94	-1.92
H230577	30.74	24.63	-6.11	31.46	0.72	30.24	-0.50	30.24	-0.50	30.24	-0.50	30.74	0.00	35.59	4.85
H150297	30.18	31.42	1.24	32.18	2.00	32.54	2.36	32.54	2.36	32.54	2.36	26.55	-3.63	30.26	0.08
H090251-AC	30.07	31.40	1.34	31.32	1.26	30.84	0.78	30.84	0.78	30.84	0.78	35.11	5.04	30.95	0.88
H140357	30.04	21.15	-8.89	27.03	-3.02	26.54	-3.51	26.54	-3.51	26.54	-3.51	30.04	0.00	30.55	0.50
H171192	29.92	34.10	4.18	35.91	5.99	35.87	5.95	35.87	5.95	35.87	5.95	26.30	-3.63	33.53	3.61
H230551	29.89	21.99	-7.91	27.90	-1.99	27.36	-2.54	27.36	-2.54	27.36	-2.54	29.89	0.00	32.15	2.26
H231692	29.88	23.24	-6.64	29.69	-0.20	29.40	-0.49	29.40	-0.49	29.40	-0.49	29.88	0.00	33.60	3.72

<b>Min</b>	-9.91			-6.14		-6.19		-6.19		-6.19		-3.63		-11.26
<b>Median</b>	-3.42			0.72		0.21		0.21		0.21		0.00		2.94
<b>Max</b>	4.93			7.73		6.82		6.82		6.82		7.02		12.01
<b>Top Quart</b>	-1.70			2.70		2.08		2.08		2.08		0.00		5.38

# All Scenarios Statistical Comparison (Continued)





# Discussion

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## Potential Recommendations Discussion

- Need to decide weight distribution and document justifications
  - Remove Pavement Condition criterion from Modernization criteria
    - Do we need additional analysis? If so, what?
  - Combine Lane Width and Shoulder Width to measure total deficiency
    - Do we need additional analysis? If so, what?
  - Incorporate Congestion at the Division Needs category for Modernization projects
    - Do we need additional analysis? If so, what?

## Discussion (Continued)

- Potential Subcommittee Recommendation
  - Revise Modernization SIT-16 definition to expand options beyond bringing shoulder width and lane width to design standards
    - Finalize revised definition and document justifications
- Modernization SIT-16 Definition Revision:
  - **Existing:** Modernize Roadway (segment): - Improving a roadway to current design standards primarily by increasing the lane and/or shoulder width. Could also include improving the horizontal or vertical geometry. Could also include adding turn lanes at intersections to help improve mobility on the through route
  - **Proposed:** Modernize Roadway (segment): - Improve roadway safety and traffic operations primarily by increasing the lane and/or shoulder width to current design standards. Could include ancillary improvements such as horizontal or vertical geometry improvements and minor capacity improvements such as adding turn lanes at intersections to help improve mobility

## Mural Discussion Notes

Scenarios Notes

### Scenarios - Notes

Scenario E - Is it a percent deficient for both? Are we trying to get at the total width of deficiency of a lane and shoulder side by side?

It is a cumulative deficiency. There is not a lot (if any) that had lane width deficiency **and** shoulder width deficiency. It was usually one or the other

Are you adding up the deficiency and comparing it to the standard?

It is a total difference standard, but percent difference is an interesting concept. SPOT will look into this

This calculation seems to be going in the right direction

## Mural Discussion Notes

Scenarios Notes

### Scenarios - Notes

With percent difference, it will be interesting to see what this analysis looks like visually on a map (Scenario E)

Scenario F was the largest jump in terms of central tendency measures (average and median score)

Data suggests that a quarter of modernization projects would be at or near the cutoff line - perhaps we have overshot the mark?

SPOT would want to investigate this scenario further

Conceptually, Scenario F seems like an improvement and feels right from a theoretical perspective in terms of what to measure

## Mural Discussion Notes

Scenarios Notes

### Scenarios - Notes

SPOT will look into Scenario F more

E and F are large jump in median score

Top quartile in Scenario F stood out

We did not dig into zero scores, but to some extent E and F did get rid of those zero scores

Scenarios E and F stand out as potential viable options

Combination of two factors is improvement and inclusion of congestion is also an improvement

## Mural Discussion Notes

Additional Analysis

### Notes / Additional Analysis

For congestion, are we creating a problem for project delivery where a project is scored outside of its intended lane?

Congestion helps define the usage-based problem that exists that needs to be factored in (x2)

The Prioritization score is not supposed to be used to develop purpose and need for the project

Having something to show how many people will benefit - congestion is the best tool we have right now for that

## Mural Discussion Notes

Definition Notes

### SIT-16 Definition Revision

Perhaps say minor intersection improvements? Would adding a roundabout be too much? Are we narrowing the SIT description too much?

Do not know that we would want to put an arbitrary limit on what the intersection improvement would include. Could say that through lane capacity is excluded, although that may be more like a widening

There is a category for improving multiple intersections along a corridor. But if you want to improve the road between the intersections, what do you do?

Would not want to handicap designers on what they feel would be the safest solution. particularly at intersections, which is where most crashes occur

## Mural Discussion Notes

Road Diets

### SIT-24 Road Diets Notes

Folding road diet scoring into modernization does not make sense

Road diet is more of a "cousin" than a sibling (safety is biggest connection)

Make sure we are not giving priority to road diet projects that have the most congestion

Can we dig into crash data and focus on crash types where a road diet would be an appropriate treatment?

## Next Steps & Adjourn

- Next Steps
  - Follow-Up analysis
  - Follow-Up Discussions on potential changes/improvements for Modernization and Road Diet projects
- Adjourn
  - Next Meeting: **February 25<sup>th</sup>, 2025 @ 2:30 PM to 4:00 PM**

## Discussion Summary Notes

- The subcommittee is ***leaning towards*** reducing the pavement condition criterion weight to zero for Modernization criteria, combining lane and shoulder widths, and adding a weight for congestion criterion at Division Needs level
  - The pavement condition is not a very meaningful way to score these projects as the condition of all roads is addressed during the resurfacing cycles
  - The combination of lane width and shoulder width is an improvement that provides a measure for total deficiency
  - The inclusion of congestion at the Division Needs level is an improvement that helps define the usage level of roads
- The subcommittee will continue to look at viable options for criteria weights distribution to implement the proposed changes and other potential improvements

## Discussion Summary Notes - Continued

- The subcommittee will continue to discuss other ***potential changes/improvements*** identified in previous meeting
  - Revise the Modernization SIT-16 definition to expand the options beyond widening the Lane and Shoulder widths
  - Revise Road Diet SIT-24 definition to clarify that lanes are not always reduced for these projects
  - Include cross-sections in SPOT Online for Modernization projects to help with generating better cost estimates

**Thank you!**

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## Meeting Attendance – Virtual

Name	Organization
Andy Bailey *	NCDOT
Benard Chola *	NCDOT
Tyler Meyer *	Greensboro MPO
David Graham *	High County RPO
Drew Finley	Fountainworks
Fredrick D. Haith	NCDOT
Janet Robertson *	Lumber River RPO
Jason Myers *	NCDOT
Rose Bauguess	Southwestern RPO
Saman Jeffers *	NCDOT
Sarah Lee *	NCDOT
Brian Wert *	NCDOT
Scott Miller	NCDOT
Stephen Sparks	NCDOT
Tristan Winkler *	French Broad River MPO

\*Workgroup Participant, Alternate, or Advisory