NORTH CAROLINA
Department of Transportation

P8 Highway Modernization Subcommittee Meeting #4

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.

Additional Analysis

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, 15% RI, and 10% 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

	Existing Weights				Scenario D 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%	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%	Pavement Condition	-	-	-

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

	Statewide Mobility	Regional Impact	Division Needs
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

	Statewide Mobility	Regional Impact	Division Needs
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

	Existing Weights				Scenario E 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%	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

	Statewide Mobility	Regional Impact	Division Needs
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

	Statewide Mobility	Regional Impact	Division Needs
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, 15% RI, and 10% DN

	Existing Weights				Scenario C 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%	[Paved] Shoulder Width	-	-	-
Pavement Condition	10%	10%	10%	Pavement Condition	-	-	-

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

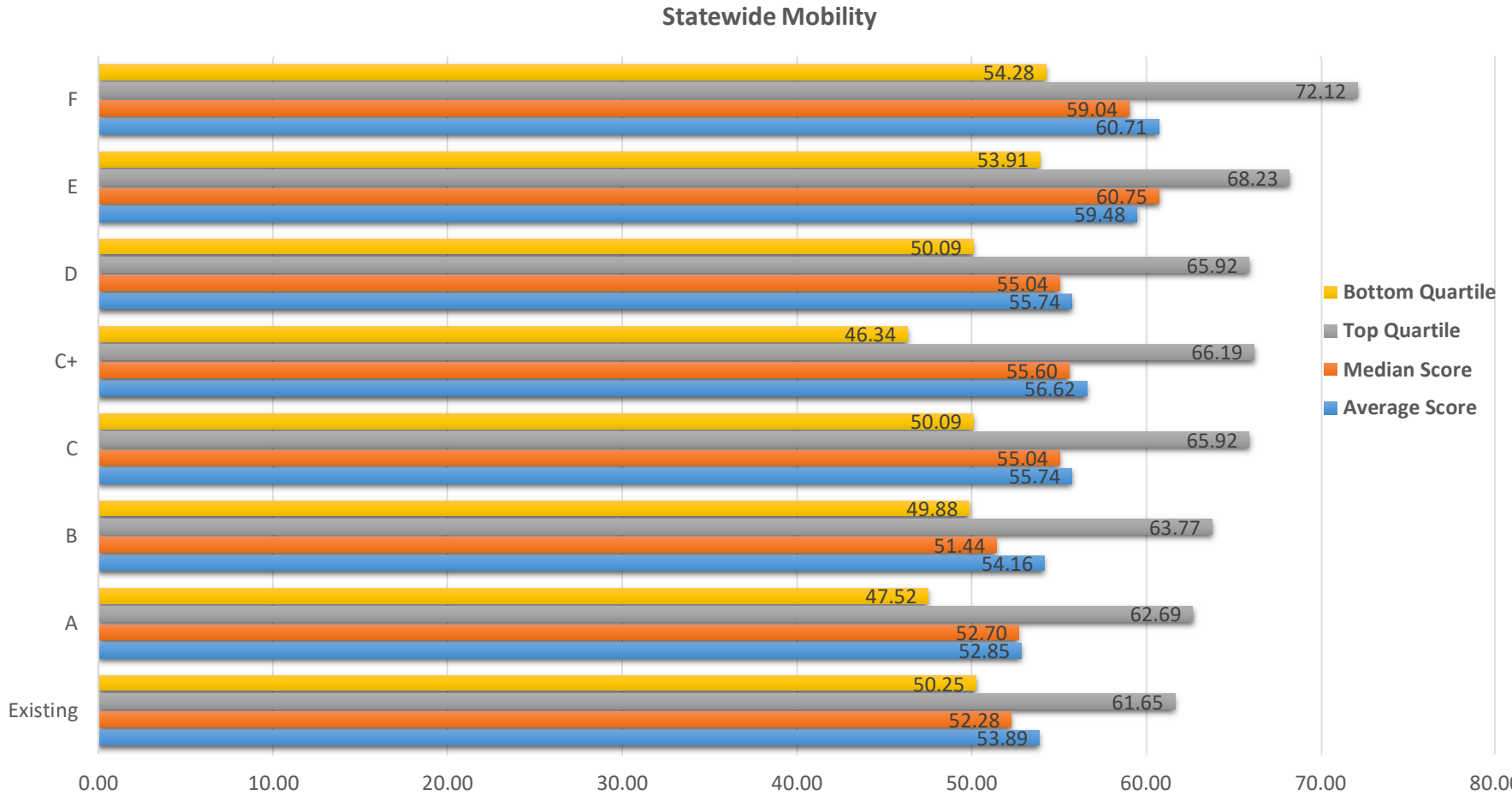
	Statewide Mobility	Regional Impact	Division Needs
Average Score	53.89	25.52	15.82
Median Score	52.28	26.03	14.18
Top Quartile	61.65	29.77	20.37
Bottom Quartile	50.25	21.46	11.28

VS

Scenario F Results

	Statewide Mobility	Regional Impact	Division Needs
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

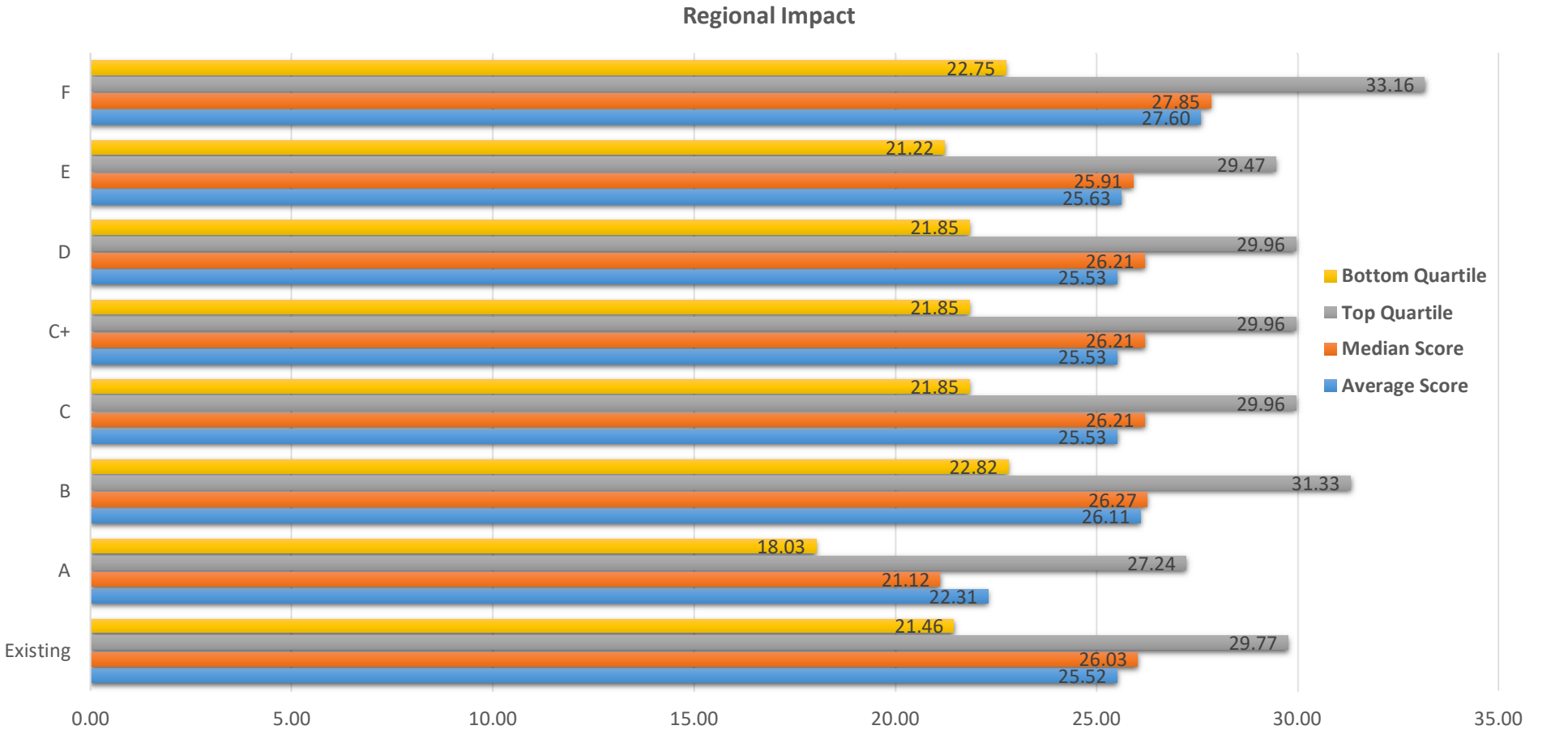
All Scenarios Statistical Comparison



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

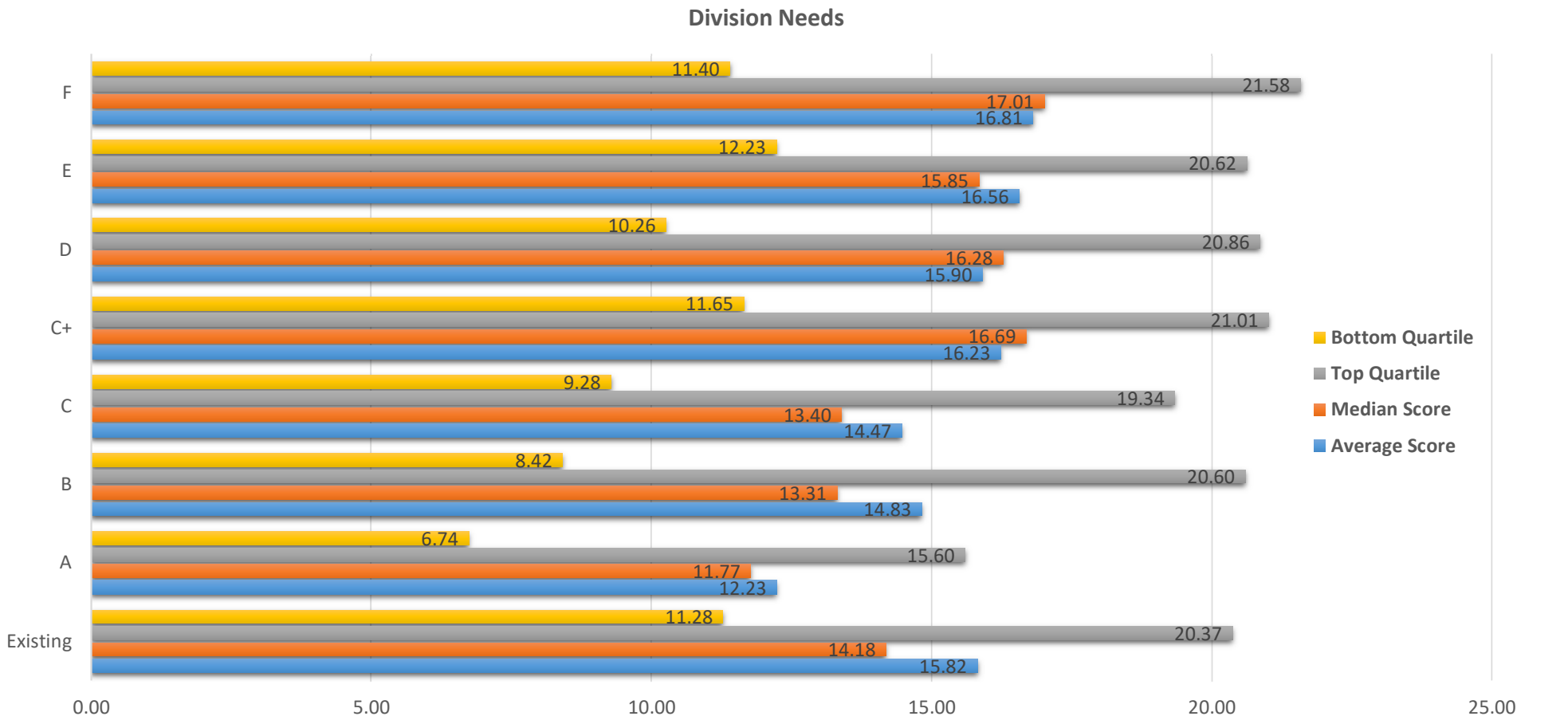
All Scenarios Statistical Comparison (Continued)



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

All Scenarios Statistical Comparison (Continued)



All Scenarios Score Comparison – Division Needs

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
H231566	35.28	33.12	-2.17	37.68	2.40	33.73	-1.55	32.07	-3.22	32.68	-2.61	36.60	1.31	35.35	0.07
H231584	34.09	31.92	-2.17	36.01	1.92	30.93	-3.16	28.46	-5.63	30.89	-3.20	34.84	0.75	34.57	0.48
H231599	33.35	31.19	-2.17	34.98	1.63	31.66	-1.70	29.92	-3.43	30.60	-2.75	34.98	1.63	33.28	-0.08
H231515	30.06	20.15	-9.91	28.21	-1.85	22.72	-7.34	24.01	-6.05	25.36	-4.69	27.31	-2.74	28.01	-2.05
H230527	28.58	28.58	0.00	28.58	0.00	28.58	0.00	28.42	-0.16	26.28	-2.30	27.88	-0.70	23.54	-5.04
H190034	28.04	28.04	0.00	28.04	0.00	28.04	0.00	25.75	-2.29	24.12	-3.92	26.53	-1.51	21.30	-6.74
H231404	26.43	22.47	-3.96	24.16	-2.27	23.60	-2.83	25.98	-0.46	23.85	-2.58	25.80	-0.63	21.11	-5.32
H230638	25.22	25.22	0.00	25.22	0.00	25.22	0.00	21.96	-3.26	20.23	-4.99	19.86	-5.36	17.16	-8.06
H090782	25.20	18.56	-6.64	25.98	0.78	23.22	-1.98	25.55	0.35	24.00	-1.19	23.82	-1.38	24.79	-0.41
H184878	23.98	18.25	-5.73	18.29	-5.69	17.65	-6.33	19.12	-4.86	21.05	-2.93	23.35	-0.63	21.46	-2.53
H230326	23.69	23.69	0.00	23.69	0.00	23.69	0.00	16.95	-6.74	16.65	-7.04	21.60	-2.09	15.66	-8.03
H191110	23.50	18.64	-4.86	26.70	3.20	25.18	1.68	27.69	4.19	26.41	2.91	23.50	0.00	27.63	4.13
H230634	23.31	19.04	-4.27	18.42	-4.89	18.21	-5.11	19.99	-3.32	18.25	-5.06	23.14	-0.18	15.15	-8.16
H191955	23.17	13.82	-9.35	19.92	-3.26	18.49	-4.69	20.11	-3.07	22.47	-0.70	23.17	0.00	26.46	3.28
H185154	23.01	16.59	-6.42	23.23	0.22	20.99	-2.02	23.19	0.18	21.69	-1.31	21.89	-1.12	22.40	-0.61
H191119	22.91	17.08	-5.84	24.40	1.48	23.17	0.26	25.61	2.70	24.13	1.22	22.91	0.00	25.09	2.18
H193215	22.87	20.98	-1.89	20.69	-2.18	19.88	-2.99	17.36	-5.51	17.07	-5.80	25.75	2.89	17.98	-4.89
H231168	22.66	14.52	-8.14	20.63	-2.04	19.88	-2.78	22.19	-0.47	20.59	-2.08	22.66	0.00	21.29	-1.37
H111162	22.54	16.13	-6.42	22.58	0.04	20.51	-2.04	22.69	0.15	21.05	-1.49	21.51	-1.04	21.60	-0.95
H111308	21.63	17.58	-4.06	24.61	2.97	22.72	1.09	25.29	3.66	25.21	3.57	20.69	-0.94	27.69	6.06
H190107	20.94	20.94	0.00	20.94	0.00	20.94	0.00	18.72	-2.21	16.60	-4.33	20.50	-0.44	13.79	-7.14
H190910	20.45	11.44	-9.01	16.02	-4.44	12.79	-7.66	13.47	-6.98	14.51	-5.94	18.84	-1.61	16.23	-4.23
H185158	20.11	14.78	-5.34	20.69	0.57	19.12	-1.00	21.29	1.17	19.75	-0.36	19.33	-0.79	20.38	0.27
		Min	-9.99		-8.21		-7.66		-6.98		-7.04		-5.36		-9.27
		Median	-4.01		0.00		-0.89		0.43		-0.71		0.00		0.48
		Max	3.50		7.50		5.61		7.47		7.75		9.91		11.33
		Top Quart	0.00		0.88		0.00		3.71		3.52		0.05		5.17

Discussion

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

Discussion (Continued)

- Potential Subcommittee Recommendations
  - Revise Road Diet SIT-24 definition to clarify that lanes are not always reduced for these projects
    - Finalize revised definition and document justifications
- Road Diet SIT-24 definition revision:
  - Existing: Implement Road Diet to Improve Safety (segment) – Enhancing the safety of a roadway by reducing the lanes within the cross-section
  - Proposed: Implement Road Diet to Improve Safety (segment) – Enhancing the safety of a roadway by reallocating roadway width within the cross-section

Discussion (Continued)

- Potential Subcommittee Recommendation
  - Include cross-sections in SPOT Online for Modernization projects to help improve estimates
    - Identify cross-sections to include and document justifications

Next Steps & Adjourn

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

Thank you!