

Impact Matrix
SEHSR Corridor - Preferred Alternative

Summary of Potential Human and Natural Impacts		Summary of Operational & Physical Characteristics	
Topic	Impacts	Topic	Impacts
Federally Listed T&E Species Impacted	0	Mainline Track Length (miles)	158.38
Number of Impacted Stream Segments	232	Limiting Speed**	varies by section
Impacts to Streams (linear feet)	40,679	Operability/Constructability***	neutral
Impacts to Wetlands (acres)	28.36	Roadwork (miles)	78.46
FEMA Floodplain Crossings (acres shown for preferred)	67.62		
Federal/State Designated Rivers (crossings)	7		
Impacts to Prime and Other Important Farmland (acres)	1,520.1		
Forested uplands (acres)	1,574.6	Rail and Road Construction Cost (millions \$)	\$2,140.30
Hazardous Materials Sites	249	Utility Relocation Cost (millions \$)	\$52.34
Residential Relocations	223	Right-of-Way Cost (millions \$)	\$234.79
Business Relocations	116	TOTAL COSTS (millions \$)	\$2,427.43
Public Schools Impacted	0	<p>* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.</p> <p>** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.</p> <p>*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.</p>	
Noise (Impacted Receptors)	622		
Noise (Severely Impacted Receptors)	65		
Vibration (Impacted Structures)	295		
Section 4(f) Uses- Historic *	44		
Section 4(f) Uses- Parks *	0		
Section 4(f) De Minimis- Historic *	35		
Section 4(f) De Minimis- Parks *	8		
Section 106 Adverse Effects *	46		

Impact Matrix

Section AA- All Alternatives on Common Alignment

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION AA			Topic	SECTION AA		
	VA1	VA2	VA3		VA1	VA2	VA3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	11.31	11.31	11.31
Number of Impacted Stream Segments	20	20	20	Limiting Speed**	N/A	N/A	N/A
Impacts to Streams (linear feet)	3,919	4,518	4,518	Operability/Constructability***	neutral	neutral	neutral
Impacts to Wetlands (acres)	2.32	2.88	2.88	Roadwork (miles)	4.88	4.6	4.6
FEMA Floodplain Crossings (acres shown for preferred)	25.72	18	18				
Federal/State Designated Rivers (crossings)	1	1	1				
Impacts to Prime and Other Important Farmland (acres)	0.00	26.16	26.16				
Forested uplands (acres)	42.57	43.7	43.7	Rail and Road Construction Cost (millions \$)	\$252.70	\$191.60	\$191.60
Hazardous Materials Sites	59	59	59	Utility Relocation Cost (millions \$)	\$20.47	\$20.47	\$20.47
Residential Relocations	40	40	40	Right-of-Way Cost (millions \$)	\$28.11	\$28.11	\$28.11
Business Relocations	7	6	6	TOTAL COSTS (millions \$)	\$301.28	\$240.18	\$240.18
Public Schools Impacted	0	0	0	<p style="margin: 0;">Indicates Recommended Preferred Alternative.</p> <p style="margin: 0;">* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.</p> <p style="margin: 0;">** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.</p> <p style="margin: 0;">*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.</p>			
Noise (Impacted Receptors)	0	0	0				
Noise (Severely Impacted Receptors)	0	0	0				
Vibration (Impacted Structures)	1	1	1				
Section 4(f) Uses- Historic *	4	4	4				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	6	6	6				
Section 4(f) De Minimis- Parks *	2	2	2				
Section 106 Adverse Effects *	4	4	4				

Impact Matrix

Section BB- All Alternatives on Common Alignment

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION BB			Topic	SECTION BB		
	VA1	VA2	VA3		VA1	VA2	VA3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	6.91	6.91	6.91
Number of Impacted Stream Segments	15	17	17	Limiting Speed**	N/A	N/A	N/A
Impacts to Streams (linear feet)	2,078	2,991	2,991	Operability/Constructability***	neutral	neutral	neutral
Impacts to Wetlands (acres)	5.22	4.53	4.53	Roadwork (miles)	3.18	2.2	2.2
FEMA Floodplain Crossings (acres shown for preferred)	11.4	7	7				
Federal/State Designated Rivers (crossings)	0	0	0				
Impacts to Prime and Other Important Farmland (acres)	13.3	12.59	12.59				
Forested uplands (acres)	54.16	57.39	57.39	Rail and Road Construction Cost (millions \$)	\$89.60	\$70.40	\$70.40
Hazardous Materials Sites	10	10	10	Utility Relocation Cost (millions \$)	\$3.87	\$3.87	\$3.87
Residential Relocations	7	6	6	Right-of-Way Cost (millions \$)	\$11.04	\$11.04	\$11.04
Business Relocations	1	1	1	TOTAL COSTS (millions \$)	\$104.51	\$85.31	\$85.31
Public Schools Impacted	0	0	0	█	Indicates Recommended Preferred Alternative.		
Noise (Impacted Receptors)	0	0	0	* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.			
Noise (Severely Impacted Receptors)	0	0	0	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.			
Vibration (Impacted Structures)	2	2	2	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.			
Section 4(f) Uses- Historic *	5	5	5				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	4	4	4				
Section 4(f) De Minimis- Parks *	0	0	0				
Section 106 Adverse Effects *	7	7	7				

Impact Matrix

Section CC- All Alternatives on Common Alignment

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION CC			Topic	SECTION CC		
	VA1	VA2	VA3		VA1	VA2	VA3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	8.91	8.91	8.91
Number of Impacted Stream Segments	19	18	18	Limiting Speed**	80	80	80
Impacts to Streams (linear feet)	2,405	2,047	2,047	Operability/Constructability***	neutral	neutral	neutral
Impacts to Wetlands (acres)	2.52	5.21	5.21	Roadwork (miles)	5.66	3.8	3.8
FEMA Floodplain Crossings (acres shown for preferred)	6.16	7	7				
Federal/State Designated Rivers (crossings)	1	1	1				
Impacts to Prime and Other Important Farmland (acres)	16.4	57.56	57.56				
Forested uplands (acres)	45.05	51.64	51.64	Rail and Road Construction Cost (millions \$)	\$146.60	\$113.20	\$113.20
Hazardous Materials Sites	20	20	20	Utility Relocation Cost (millions \$)	\$4.49	\$4.49	\$4.49
Residential Relocations	48	44	44	Right-of-Way Cost (millions \$)	\$26.14	\$26.14	\$26.14
Business Relocations	1	1	1	TOTAL COSTS (millions \$)	\$177.23	\$143.83	\$143.83
Public Schools Impacted	0	0	0	█	Indicates Recommended Preferred Alternative.		
Noise (Impacted Receptors)	11	11	11	* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.			
Noise (Severely Impacted Receptors)	0	0	0	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.			
Vibration (Impacted Structures)	15	15	15	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.			
Section 4(f) Uses- Historic *	6	6	6				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	6	6	6				
Section 4(f) De Minimis- Parks *	2	2	2				
Section 106 Adverse Effects *	6	6	6				

Impact Matrix

Section DD- Alternatives VA1, VA2, VA3 on Different Alignments

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION DD			Topic	SECTION DD		
	VA1	VA2	VA3		VA1	VA2	VA3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	5.66	5.63	5.66
Number of Impacted Stream Segments	6	6	6	Limiting Speed**	75	70	75
Impacts to Streams (linear feet)	720	739	585	Operability/Constructability***	neutral	negative	positive
Impacts to Wetlands (acres)	2.28	2.19	2.37	Roadwork (miles)	1.5	1.5	1.8
FEMA Floodplain Crossings (acres shown for preferred)	0	0	4.63				
Federal/State Designated Rivers (crossings)	0	0	0				
Impacts to Prime and Other Important Farmland (acres)	23.45	22.82	35.7				
Forested uplands (acres)	53.14	53.46	62.41	Rail and Road Construction Cost (millions \$)	\$77.10	\$76.90	\$74.60
Hazardous Materials Sites	1	1	1	Utility Relocation Cost (millions \$)	\$2.59	\$2.41	\$2.42
Residential Relocations	2	0	2	Right-of-Way Cost (millions \$)	\$2.72	\$2.66	\$2.45
Business Relocations	0	0	0	TOTAL COSTS (millions \$)	\$82.41	\$81.97	\$79.47
Public Schools Impacted	0	0	0	<div style="background-color: #e0e0e0; display: inline-block; width: 15px; height: 15px; vertical-align: middle;"></div> Indicates Recommended Preferred Alternative.			
Noise (Impacted Receptors)	0	0	0	* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.			
Noise (Severely Impacted Receptors)	0	0	0	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.			
Vibration (Impacted Structures)	0	0	0	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.			
Section 4(f) Uses- Historic *	1	1	1				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	6	6	6				
Section 4(f) De Minimis- Parks *	1	1	1				
Section 106 Adverse Effects *	1	1	1				

Impact Matrix

Section A- Alternatives VA1, VA3 on Common Alignment

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION A			Topic	SECTION A		
	VA1	VA2	VA3		VA1	VA2	VA3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	4.93	4.95	4.93
Number of Impacted Stream Segments	12	12	12	Limiting Speed**	80	95	80
Impacts to Streams (linear feet)	2,897	3,094	2,897	Operability/Constructability***	negative	neutral	negative
Impacts to Wetlands (acres)	2.37	2.84	2.37	Roadwork (miles)	2.4	1.97	2.4
FEMA Floodplain Crossings (acres shown for preferred)	1	4.67	1				
Federal/State Designated Rivers (crossings)	0	0	0				
Impacts to Prime and Other Important Farmland (acres)	43.71	51.8	43.71				
Forested uplands (acres)	70.85	64.2	70.85	Rail and Road Construction Cost (millions \$)	\$54.60	\$52.80	\$54.60
Hazardous Materials Sites	1	1	1	Utility Relocation Cost (millions \$)	\$0.42	\$0.42	\$0.42
Residential Relocations	0	0	0	Right-of-Way Cost (millions \$)	\$0.51	\$0.51	\$0.51
Business Relocations	0	0	0	TOTAL COSTS (millions \$)	\$55.53	\$53.73	\$55.53
Public Schools Impacted	0	0	0	█	Indicates Recommended Preferred Alternative.		
Noise (Impacted Receptors)	4	4	4	* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.			
Noise (Severely Impacted Receptors)	1	1	1	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.			
Vibration (Impacted Structures)	0	0	0	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.			
Section 4(f) Uses- Historic *	1	1	1				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	3	3	3				
Section 4(f) De Minimis- Parks *	0	0	0				
Section 106 Adverse Effects *	1	1	1				

Impact Matrix

Section B- Alternatives VA1, VA3 on Common Alignment

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION B			Topic	SECTION B		
	VA1	VA2	VA3		VA1	VA2	VA3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	5.71	5.80	5.71
Number of Impacted Stream Segments	8	9	11	Limiting Speed**	110	90	110
Impacts to Streams (linear feet)	760	496	940	Operability/Constructability***	neutral	negative	neutral
Impacts to Wetlands (acres)	0.64	0.62	0.97	Roadwork (miles)	1.44	1	1.5
FEMA Floodplain Crossings (acres shown for preferred)	0.85	2	2				
Federal/State Designated Rivers (crossings)	0	0	0				
Impacts to Prime and Other Important Farmland (acres)	64.8	40.13	65.40				
Forested uplands (acres)	81.45	77.8	82.38	Rail and Road Construction Cost (millions \$)	\$69.20	\$61.20	\$66.70
Hazardous Materials Sites	3	2	0	Utility Relocation Cost (millions \$)	\$0.26	\$0.30	\$0.26
Residential Relocations	3	2	4	Right-of-Way Cost (millions \$)	\$1.54	\$1.30	\$1.54
Business Relocations	1	1	0	TOTAL COSTS (millions \$)	\$71.00	\$62.80	\$68.50
Public Schools Impacted	0	0	0	<div style="background-color: #e0e0e0; display: inline-block; width: 1em; height: 1em; vertical-align: middle;"></div> Indicates Recommended Preferred Alternative.			
Noise (Impacted Receptors)	13	16	13	* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.			
Noise (Severely Impacted Receptors)	0	0	0	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.			
Vibration (Impacted Structures)	2	5	2	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.			
Section 4(f) Uses- Historic *	1	1	1				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	0	0	0				
Section 4(f) De Minimis- Parks *	0	0	0				
Section 106 Adverse Effects *	1	1	1				

Impact Matrix

Section C- All Alternatives on Common Alignment

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION C			Topic	SECTION C		
	VA1	VA2	VA3		VA1	VA2	VA3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	10.74	10.75	10.75
Number of Impacted Stream Segments	18	21	21	Limiting Speed**	110	110	110
Impacts to Streams (linear feet)	2,803	4,025	4,025	Operability/Constructability***	neutral	neutral	neutral
Impacts to Wetlands (acres)	2.17	1.51	1.51	Roadwork (miles)	3.99	4	4
FEMA Floodplain Crossings (acres shown for preferred)	6.38	1	1				
Federal/State Designated Rivers (crossings)	1	1	1				
Impacts to Prime and Other Important Farmland (acres)	86.3	94.47	94.47				
Forested uplands (acres)	155.05	156.56	156.56	Rail and Road Construction Cost (millions \$)	\$104.60	\$108.40	\$108.40
Hazardous Materials Sites	3	2	2	Utility Relocation Cost (millions \$)	\$1.87	\$1.87	\$1.87
Residential Relocations	4	1	1	Right-of-Way Cost (millions \$)	\$4.34	\$4.34	\$4.34
Business Relocations	8	8	8	TOTAL COSTS (millions \$)	\$110.81	\$114.61	\$114.61
Public Schools Impacted	0	0	0	 Indicates Recommended Preferred Alternative.			
Noise (Impacted Receptors)	9	9	9	* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.			
Noise (Severely Impacted Receptors)	0	0	0	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.			
Vibration (Impacted Structures)	10	11	11	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.			
Section 4(f) Uses- Historic *	1	1	1				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	1	1	1				
Section 4(f) De Minimis- Parks *	0	0	0				
Section 106 Adverse Effects *	1	1	1				

Impact Matrix

Section D- Alternatives VA1, VA3 on Common Alignment, Alternatives VA2 and VA4 on Different Alignments

Summary of Potential Human and Natural Impacts By Section					Summary of Operational & Physical Characteristics By Section				
Topic	SECTION D				Topic	SECTION D			
	VA1	VA2	VA3	VA4		VA1	VA2	VA3	VA4
Federally Listed T&E Species Impacted	1	0	1	0	Mainline Track Length (miles)	6.07	6.41	6.07	6.17
Number of Impacted Stream Segments	14	12	14	9	Limiting Speed**	110	110	110	110
Impacts to Streams (linear feet)	2,050	2,575	2,050	1,998	Operability/Constructability***	neutral	neutral	neutral	neutral
Impacts to Wetlands (acres)	0.99	7.37	0.99	2.03	Roadwork (miles)	1.6	1.5	1.6	1.96
FEMA Floodplain Crossings (acres shown for preferred)	0	4	0	1.31					
Federal/State Designated Rivers (crossings)	0	0	0	0					
Impacts to Prime and Other Important Farmland (acres)	80.45	54.45	80.45	99.9					
Forested uplands (acres)	90.99	92.24	90.99	101.71	Rail and Road Construction Cost (millions \$)	\$67.20	\$53.40	\$67.20	\$63.70
Hazardous Materials Sites	0	1	0	1	Utility Relocation Cost (millions \$)	\$1.28	\$0.66	\$1.28	\$1.28
Residential Relocations	3	2	3	3	Right-of-Way Cost (millions \$)	\$1.82	\$1.00	\$1.82	\$1.85
Business Relocations	2	0	2	2	TOTAL COSTS (millions \$)	\$70.30	\$55.06	\$70.30	\$66.83
Public Schools Impacted	0	0	0	0	<div style="background-color: #f0f0f0; padding: 2px; display: inline-block;"> </div> Indicates Recommended Preferred Alternative.				
Noise (Impacted Receptors)	2	3	2	4	* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.				
Noise (Severely Impacted Receptors)	2	1	2	2	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.				
Vibration (Impacted Structures)	3	1	3	2	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.				
Section 4(f) Uses- Historic *	2	1	2	1					
Section 4(f) Uses- Parks *	0	0	0	0					
Section 4(f) De Minimis- Historic *	0	1	0	1					
Section 4(f) De Minimis- Parks *	0	0	0	0					
Section 106 Adverse Effects *	2	1	2	1					

Impact Matrix
Section E- Alternatives VA1, VA3 on Common Alignment

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION E			Topic	SECTION E		
	VA1	VA2	VA3		VA1	VA2	VA3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	4.21	4.29	4.21
Number of Impacted Stream Segments	5	6	6	Limiting Speed**	110	110	110
Impacts to Streams (linear feet)	860	1,294	1,025	Operability/Constructability***	positive	neutral	positive
Impacts to Wetlands (acres)	1.21	2.41	0.28	Roadwork (miles)	1.66	1.8	1.8
FEMA Floodplain Crossings (acres shown for preferred)	0.85	2	1				
Federal/State Designated Rivers (crossings)	0	0	0				
Impacts to Prime and Other Important Farmland (acres)	59.8	60.71	58.90				
Forested uplands (acres)	52.01	57.07	52.02	Rail and Road Construction Cost (millions \$)	\$59.60	\$59.50	\$60.30
Hazardous Materials Sites	0	0	0	Utility Relocation Cost (millions \$)	\$0.77	\$0.77	\$0.77
Residential Relocations	2	9	2	Right-of-Way Cost (millions \$)	\$1.53	\$1.39	\$1.53
Business Relocations	7	0	7	TOTAL COSTS (millions \$)	\$61.90	\$61.66	\$62.60
Public Schools Impacted	0	0	0	Indicates Recommended Preferred Alternative.			
Noise (Impacted Receptors)	23	22	23	* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.			
Noise (Severely Impacted Receptors)	6	6	6	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.			
Vibration (Impacted Structures)	9	11	9	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.			
Section 4(f) Uses- Historic *	1	1	1				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	0	0	0				
Section 4(f) De Minimis- Parks *	1	1	1				
Section 106 Adverse Effects *	1	1	1				

Impact Matrix

Section F- All Alternatives on Common Alignment

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION F			Topic	SECTION F		
	VA1	VA2	VA3		VA1	VA2	VA3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	4.28	4.28	4.28
Number of Impacted Stream Segments	6	6	6	Limiting Speed**	110	110	110
Impacts to Streams (linear feet)	1,004	1,185	1,185	Operability/Constructability***	neutral	neutral	neutral
Impacts to Wetlands (acres)	0.62	0.60	0.60	Roadwork (miles)	1.55	1.6	1.6
FEMA Floodplain Crossings (acres shown for preferred)	3.20	2	2				
Federal/State Designated Rivers (crossings)	0	0	0				
Impacts to Prime and Other Important Farmland (acres)	25.0	21.65	21.65				
Forested uplands (acres)	67.02	67.01	67.01	Rail and Road Construction Cost (millions \$)	\$45.50	\$47.10	\$47.10
Hazardous Materials Sites	0	0	0	Utility Relocation Cost (millions \$)	\$0.41	\$0.41	\$0.41
Residential Relocations	0	0	0	Right-of-Way Cost (millions \$)	\$0.27	\$0.27	\$0.27
Business Relocations	0	0	0	TOTAL COSTS (millions \$)	\$46.18	\$47.78	\$47.78
Public Schools Impacted	0	0	0	<div style="background-color: #f0f0f0; display: inline-block; width: 1em; height: 1em; vertical-align: middle;"></div> Indicates Recommended Preferred Alternative.			
Noise (Impacted Receptors)	6	6	6	* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.			
Noise (Severely Impacted Receptors)	0	0	0	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.			
Vibration (Impacted Structures)	0	0	0	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.			
Section 4(f) Uses- Historic *	1	1	1				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	0	0	0				
Section 4(f) De Minimis- Parks *	0	0	0				
Section 106 Adverse Effects *	1	1	1				

Impact Matrix
Section G- Alternatives VA1, VA2, VA3, VA4 on Different Alignments

Summary of Potential Human and Natural Impacts By Section					Summary of Operational & Physical Characteristics By Section				
Topic	SECTION G				Topic	SECTION G			
	VA1	VA2	VA3	VA4		VA1	VA2	VA3	VA4
Federally Listed T&E Species Impacted	0	0	0	0	Mainline Track Length (miles)	3.61	3.66	3.55	3.62
Number of Impacted Stream Segments	7	7	4	9	Limiting Speed**	110	90	110	110
Impacts to Streams (linear feet)	654	914	510	1,095	Operability/Constructability***	neutral	negative	positive	positive
Impacts to Wetlands (acres)	0.21	0.49	0.26	0.21	Roadwork (miles)	0.7	0.3	0.58	0.91
FEMA Floodplain Crossings (acres shown for preferred)	1	1	0.32	1					
Federal/State Designated Rivers (crossings)	1	1	1	1					
Impacts to Prime and Other Important Farmland (acres)	25.02	24.96	33.1	49.43					
Forested uplands (acres)	45.54	44.59	43.56	47.55	Rail and Road Construction Cost (millions \$)	\$35.90	\$29.00	\$35.50	\$40.00
Hazardous Materials Sites	0	0	0	0	Utility Relocation Cost (millions \$)	\$0.19	\$0.16	\$0.19	\$0.19
Residential Relocations	0	0	2	1	Right-of-Way Cost (millions \$)	\$0.37	\$0.31	\$0.53	\$0.54
Business Relocations	0	0	0	0	TOTAL COSTS (millions \$)	\$36.46	\$29.47	\$36.22	\$40.73
Public Schools Impacted	0	0	0	0	<div style="background-color: #f0f0f0; display: inline-block; width: 15px; height: 15px; vertical-align: middle;"></div> Indicates Recommended Preferred Alternative.				
Noise (Impacted Receptors)	0	1	2	2	span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.				
Noise (Severely Impacted Receptors)	0	0	0	0	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.				
Vibration (Impacted Structures)	1	0	0	0	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.				
Section 4(f) Uses- Historic *	2	2	2	2					
Section 4(f) Uses- Parks *	0	0	0	0					
Section 4(f) De Minimis- Historic *	0	0	0	0					
Section 4(f) De Minimis- Parks *	0	0	0	0					
Section 106 Adverse Effects *	2	2	2	2					

Impact Matrix
Section H- Alternatives VA1, VA3 on Common Alignment

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION H			Topic	SECTION H		
	VA1	VA2	VA3		VA1	VA2	VA3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	5.53	5.58	5.53
Number of Impacted Stream Segments	10	7	6	Limiting Speed**	110	110	110
Impacts to Streams (linear feet)	2,808	2,023	2,005	Operability/Constructability***	positive	neutral	positive
Impacts to Wetlands (acres)	0.35	0.25	0.25	Roadwork (miles)	4.6	4.1	4.7
FEMA Floodplain Crossings (acres shown for preferred)0.	0.06	0	0				
Federal/State Designated Rivers (crossings)	0	0	0				
Impacts to Prime and Other Important Farmland (acres)	82.0	80.20	79.87				
Forested uplands (acres)	110.64	101.45	110.67	Rail and Road Construction Cost (millions \$)	\$74.90	\$74.50	\$78.80
Hazardous Materials Sites	0	0	0	Utility Relocation Cost (millions \$)	\$0.73	\$0.71	\$0.73
Residential Relocations	1	1	1	Right-of-Way Cost (millions \$)	\$1.14	\$1.11	\$1.14
Business Relocations	0	0	0	TOTAL COSTS (millions \$)	\$76.77	\$76.32	\$80.67
Public Schools Impacted	0	0	0	<div style="background-color: #e0e0e0; display: inline-block; width: 100px; height: 1em; vertical-align: middle;"></div> Indicates Recommended Preferred Alternative.			
Noise (Impacted Receptors)	18	24	18	* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.			
Noise (Severely Impacted Receptors)	2	2	2	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.			
Vibration (Impacted Structures)	5	7	5	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.			
Section 4(f) Uses- Historic *	1	1	1				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	0	0	0				
Section 4(f) De Minimis- Parks *	0	0	0				
Section 106 Adverse Effects *	1	1	1				

Impact Matrix
Section I- Alternatives VA1, VA3 on Common Alignment

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION I			Topic	SECTION I		
	VA1	VA2	VA3		VA1	VA2	VA3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	3.78	3.77	3.77
Number of Impacted Stream Segments	1	0	0	Limiting Speed**	110	110	110
Impacts to Streams (linear feet)	22	6	6	Operability/Constructability***	neutral	neutral	neutral
Impacts to Wetlands (acres)	0.001	0.00	0.00	Roadwork (miles)	3.77	3.8	2.6
FEMA Floodplain Crossings (acres shown for preferred)	0.00	0	0				
Federal/State Designated Rivers (crossings)	0	0	0				
Impacts to Prime and Other Important Farmland (acres)	57.6	65.95	57.54				
Forested uplands (acres)	35.53	40.08	35.51	Rail and Road Construction Cost (millions \$)	\$38.10	\$46.60	\$36.40
Hazardous Materials Sites	2	2	2	Utility Relocation Cost (millions \$)	\$0.99	\$0.92	\$0.99
Residential Relocations	14	8	14	Right-of-Way Cost (millions \$)	\$1.93	\$2.25	\$1.93
Business Relocations	0	0	0	TOTAL COSTS (millions \$)	\$41.02	\$49.77	\$39.32
Public Schools Impacted	0	0	0	 Indicates Recommended Preferred Alternative.			
Noise (Impacted Receptors)	50	50	50	* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.			
Noise (Severely Impacted Receptors)	5	5	5	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.			
Vibration (Impacted Structures)	24	21	24	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.			
Section 4(f) Uses- Historic *	2	2	2				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	0	0	0				
Section 4(f) De Minimis- Parks *	2	2	2				
Section 106 Adverse Effects *	2	2	2				

Impact Matrix
Section J- Alternatives VA1, VA3 on Common Alignment

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION J			Topic	SECTION J		
	VA1	VA2	VA3		VA1	VA2	VA3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	3.99	4.10	3.99
Number of Impacted Stream Segments	5	2	5	Limiting Speed**	110	110	110
Impacts to Streams (linear feet)	2,061	420	2,061	Operability/Constructability***	positive	neutral	positive
Impacts to Wetlands (acres)	0.00	0.22	0.00	Roadwork (miles)	2.5	2.67	2.5
FEMA Floodplain Crossings (acres shown for preferred)	0	0.00	0				
Federal/State Designated Rivers (crossings)	0	0	0				
Impacts to Prime and Other Important Farmland (acres)	80.43	72.1	80.43				
Forested uplands (acres)	64.27	63.06	64.27	Rail and Road Construction Cost (millions \$)	\$42.10	\$37.00	\$42.10
Hazardous Materials Sites	1	1	1	Utility Relocation Cost (millions \$)	\$0.41	\$1.00	\$0.41
Residential Relocations	6	5	6	Right-of-Way Cost (millions \$)	\$1.16	\$1.42	\$1.16
Business Relocations	0	0	0	TOTAL COSTS (millions \$)	\$43.67	\$39.42	\$43.67
Public Schools Impacted	0	0	0	Indicates Recommended Preferred Alternative.			
Noise (Impacted Receptors)	11	21	11	* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.			
Noise (Severely Impacted Receptors)	1	1	1	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.			
Vibration (Impacted Structures)	5	5	5	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.			
Section 4(f) Uses- Historic *	2	1	2				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	0	0	0				
Section 4(f) De Minimis- Parks *	0	0	0				
Section 106 Adverse Effects *	2	1	2				

Impact Matrix
Section K- Alternatives VA1, VA3 on Common Alignment

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION K			Topic	SECTION K		
	VA1	VA2	VA3		VA1	VA2	VA3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	4.96	4.94	4.96
Number of Impacted Stream Segments	11	10	10	Limiting Speed**	110	100	110
Impacts to Streams (linear feet)	1,419	2,447	1,927	Operability/Constructability***	neutral	negative	neutral
Impacts to Wetlands (acres)	0.91	0.47	0.46	Roadwork (miles)	0.13	0	0.2
FEMA Floodplain Crossings (acres shown for preferred)	0.19	0	0				
Federal/State Designated Rivers (crossings)	1	1	1				
Impacts to Prime and Other Important Farmland (acres)	37.6	41.40	36.55				
Forested uplands (acres)	79.21	79.94	79.22	Rail and Road Construction Cost (millions \$)	\$81.80	\$77.00	\$82.80
Hazardous Materials Sites	0	0	0	Utility Relocation Cost (millions \$)	\$0.40	\$0.40	\$0.40
Residential Relocations	0	1	0	Right-of-Way Cost (millions \$)	\$1.57	\$0.90	\$1.57
Business Relocations	5	2	5	TOTAL COSTS (millions \$)	\$83.77	\$78.30	\$84.77
Public Schools Impacted	0	0	0	Indicates Recommended Preferred Alternative.			
Noise (Impacted Receptors)	9	8	9	* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.			
Noise (Severely Impacted Receptors)	0	0	0	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.			
Vibration (Impacted Structures)	1	2	1	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.			
Section 4(f) Uses- Historic *	1	3	1				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	0	1	0				
Section 4(f) De Minimis- Parks *	0	0	0				
Section 106 Adverse Effects *	1	3	1				

Impact Matrix
Section L- Includes Areas in Virginia and North Carolina
Alternatives VA1/NC1 and VA3/NC3 on Common Alignment

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION L			Topic	SECTION L		
	VA1/NC1	VA2/NC2	VA3/NC3		VA1/NC1	VA2/NC2	VA3/NC3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	5.69	5.96	5.75
Number of Impacted Stream Segments	10	9	14	Limiting Speed**	110	100	110
Impacts to Streams (linear feet)	2,502	1,422	2,809	Operability/Constructability***	neutral	negative	neutral
Impacts to Wetlands (acres)	0.72	0.01	0.57	Roadwork (miles)	4.84	8.1	6.5
FEMA Floodplain Crossings (acres shown for preferred)	0.04	0	0				
Federal/State Designated Rivers (crossings)	0	0	0				
Impacts to Prime and Other Important Farmland (acres)	128.5	125.95	122.74				
Forested uplands (acres)	88.46	73.19	91.32	Rail and Road Construction Cost (millions \$)	\$54.50	\$71.30	\$63.00
Hazardous Materials Sites	1	1	1	Utility Relocation Cost (millions \$)	\$1.00	\$1.34	\$1.00
Residential Relocations	8	17	12	Right-of-Way Cost (millions \$)	\$5.42	\$5.36	\$5.42
Business Relocations	1	1	1	TOTAL COSTS (millions \$)	\$60.92	\$78.00	\$69.42
Public Schools Impacted	0	0	0	<div style="background-color: #f0f0f0; padding: 2px; display: inline-block; width: 15px; height: 15px; vertical-align: middle;"></div> Indicates Recommended Preferred Alternative. * Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5. ** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater. *** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.			
Noise (Impacted Receptors)	20	32	20				
Noise (Severely Impacted Receptors)	1	3	1				
Vibration (Impacted Structures)	7	13	7				
Section 4(f) Uses- Historic *	1	2	1				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	0	0	0				
Section 4(f) De Minimis- Parks *	0	0	0				
Section 106 Adverse Effects *	1	2	1				

Impact Matrix
Section M- Alternatives NC1, NC3 on Common Alignment

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION M			Topic	SECTION M		
	NC1	NC2	NC3		NC1	NC2	NC3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	6.14	5.97	6.14
Number of Impacted Stream Segments	2	4	2	Limiting Speed**	110	80	110
Impacts to Streams (linear feet)	442	511	442	Operability/Constructability***	neutral	negative	neutral
Impacts to Wetlands (acres)	0.49	0.00	0.00	Roadwork (miles)	5.37	7	7.5
FEMA Floodplain Crossings (acres shown for preferred)	0.00	0	0				
Federal/State Designated Rivers (crossings)	0	0	0				
Impacts to Prime and Other Important Farmland (acres)	113.5	85.00	90.80				
Forested uplands (acres)	40.5	52.7	48.12	Rail and Road Construction Cost (millions \$)	\$70.70	\$74.30	\$76.10
Hazardous Materials Sites	0	0	0	Utility Relocation Cost (millions \$)	\$1.34	\$1.34	\$1.34
Residential Relocations	18	20	21	Right-of-Way Cost (millions \$)	\$5.77	\$5.10	\$5.77
Business Relocations	4	4	4	TOTAL COSTS (millions \$)	\$77.81	\$80.74	\$83.21
Public Schools Impacted	0	0	0	 Indicates Recommended Preferred Alternative.			
Noise (Impacted Receptors)	41	48	41	* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.			
Noise (Severely Impacted Receptors)	6	1	6	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.			
Vibration (Impacted Structures)	30	28	30	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.			
Section 4(f) Uses- Historic *	1	1	1				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	1	1	1				
Section 4(f) De Minimis- Parks *	0	0	0				
Section 106 Adverse Effects *	1	1	1				

Impact Matrix
Section N- Alternatives NC1, NC3 on Common Alignment

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION N			Topic	SECTION N		
	NC1	NC2	NC3		NC1	NC2	NC3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	3.71	3.77	3.71
Number of Impacted Stream Segments	3	4	3	Limiting Speed**	110	110	110
Impacts to Streams (linear feet)	386	715	385	Operability/Constructability***	positive	neutral	positive
Impacts to Wetlands (acres)	1.25	0.18	1.25	Roadwork (miles)	2.61	2.8	2.5
FEMA Floodplain Crossings (acres shown for preferred)	0.00	0	0				
Federal/State Designated Rivers (crossings)	0	0	0				
Impacts to Prime and Other Important Farmland (acres)	76.1	74.38	65.39				
Forested uplands (acres)	43.43	44.32	42.61	Rail and Road Construction Cost (millions \$)	\$39.80	\$42.60	\$40.70
Hazardous Materials Sites	1	1	1	Utility Relocation Cost (millions \$)	\$0.51	\$0.46	\$0.51
Residential Relocations	2	7	2	Right-of-Way Cost (millions \$)	\$2.08	\$2.57	\$2.08
Business Relocations	0	0	0	TOTAL COSTS (millions \$)	\$42.39	\$45.63	\$43.29
Public Schools Impacted	0	0	0	Indicates Recommended Preferred Alternative.			
Noise (Impacted Receptors)	4	6	4	* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.			
Noise (Severely Impacted Receptors)	0	1	0	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.			
Vibration (Impacted Structures)	6	2	2	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.			
Section 4(f) Uses- Historic *	1	1	1				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	1	1	1				
Section 4(f) De Minimis- Parks *	0	0	0				
Section 106 Adverse Effects *	1	1	1				

Impact Matrix
Section O- Alternatives NC1, NC2, NC3 on Different Alignments

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION O			Topic	SECTION O		
	NC1	NC2	NC3		NC1	NC2	NC3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	5.09	5.16	4.70
Number of Impacted Stream Segments	5	6	9	Limiting Speed**	90	80	110
Impacts to Streams (linear feet)	693	915	3,102	Operability/Constructability***	negative	negative	neutral
Impacts to Wetlands (acres)	0.40	1.63	0.30	Roadwork (miles)	5	5.9	3.94
FEMA Floodplain Crossings (acres shown for preferred)	0	0	0.00				
Federal/State Designated Rivers (crossings)	0	0	0				
Impacts to Prime and Other Important Farmland (acres)	106.22	108.13	124.4				
Forested uplands (acres)	25.26	20.91	46.22	Rail and Road Construction Cost (millions \$)	\$69.60	\$65.50	\$63.30
Hazardous Materials Sites	2	2	1	Utility Relocation Cost (millions \$)	\$0.20	\$0.20	\$0.19
Residential Relocations	9	9	3	Right-of-Way Cost (millions \$)	\$3.56	\$4.19	\$3.84
Business Relocations	0	0	0	TOTAL COSTS (millions \$)	\$73.36	\$69.89	\$67.33
Public Schools Impacted	0	0	0	Indicates Recommended Preferred Alternative.			
Noise (Impacted Receptors)	26	26	10	* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.			
Noise (Severely Impacted Receptors)	6	6	5	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.			
Vibration (Impacted Structures)	14	11	3	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.			
Section 4(f) Uses- Historic *	2	2	1				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	1	1	1				
Section 4(f) De Minimis- Parks *	0	0	0				
Section 106 Adverse Effects *	2	2	1				

Impact Matrix

Section P- All Alternatives on Common Alignment

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION P			Topic	SECTION P		
	NC1	NC2	NC3		NC1	NC2	NC3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	7.99	7.99	7.99
Number of Impacted Stream Segments	10	7	7	Limiting Speed**	80	80	80
Impacts to Streams (linear feet)	1,532	1,520	1,520	Operability/Constructability***	neutral	neutral	neutral
Impacts to Wetlands (acres)	0.91	0.91	0.91	Roadwork (miles)	8.5	10	10
FEMA Floodplain Crossings (acres shown for preferred)	0.00	0	0				
Federal/State Designated Rivers (crossings)	0	0	0				
Impacts to Prime and Other Important Farmland (acres)	87.0	87.83	87.73				
Forested uplands (acres)	12.86	16.07	16.07	Rail and Road Construction Cost (millions \$)	\$108.00	\$105.30	\$105.30
Hazardous Materials Sites	31	22	22	Utility Relocation Cost (millions \$)	\$2.68	\$2.68	\$2.68
Residential Relocations	33	18	18	Right-of-Way Cost (millions \$)	\$6.97	\$6.97	\$6.97
Business Relocations	8	6	6	TOTAL COSTS (millions \$)	\$117.65	\$114.95	\$114.95
Public Schools Impacted	0	0	0	<div style="background-color: #f0f0f0; display: inline-block; width: 1em; height: 1em; vertical-align: middle;"></div> Indicates Recommended Preferred Alternative.			
Noise (Impacted Receptors)	78	78	78	* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.			
Noise (Severely Impacted Receptors)	11	11	11	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.			
Vibration (Impacted Structures)	74	74	74	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.			
Section 4(f) Uses- Historic *	3	3	3				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	2	2	2				
Section 4(f) De Minimis- Parks *	0	0	0				
Section 106 Adverse Effects *	3	3	3				

Impact Matrix
Section Q- Alternatives NC1, NC3 on Common Alignment

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION Q			Topic	SECTION Q		
	NC1	NC2	NC3		NC1	NC2	NC3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	7.70	7.73	7.70
Number of Impacted Stream Segments	10	9	9	Limiting Speed**	110	90	110
Impacts to Streams (linear feet)	1,127	1,009	1,009	Operability/Constructability***	neutral	negative	neutral
Impacts to Wetlands (acres)	0.03	0.03	0.03	Roadwork (miles)	3.32	4.2	4.4
FEMA Floodplain Crossings (acres shown for preferred)	0.00	0	0				
Federal/State Designated Rivers (crossings)	1	1	1				
Impacts to Prime and Other Important Farmland (acres)	96.7	84.30	94.78				
Forested uplands (acres)	49.22	43.41	48.89	Rail and Road Construction Cost (millions \$)	\$81.30	\$78.30	\$77.40
Hazardous Materials Sites	4	4	4	Utility Relocation Cost (millions \$)	\$0.68	\$0.68	\$0.68
Residential Relocations	10	14	17	Right-of-Way Cost (millions \$)	\$7.94	\$6.74	\$7.94
Business Relocations	0	0	0	TOTAL COSTS (millions \$)	\$89.92	\$85.72	\$86.02
Public Schools Impacted	0	0	0	Indicates Recommended Preferred Alternative.			
Noise (Impacted Receptors)	13	13	13	* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.			
Noise (Severely Impacted Receptors)	5	5	5	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.			
Vibration (Impacted Structures)	20	20	20	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.			
Section 4(f) Uses- Historic *	1	1	1				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	0	0	0				
Section 4(f) De Minimis- Parks *	0	0	0				
Section 106 Adverse Effects *	1	1	1				

Impact Matrix
Section R- Alternatives NC1, NC3 on Common Alignment

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION R			Topic	SECTION R		
	NC1	NC2	NC3		NC1	NC2	NC3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	3.21	3.23	3.21
Number of Impacted Stream Segments	2	2	2	Limiting Speed**	110	110	110
Impacts to Streams (linear feet)	438	1,018	475	Operability/Constructability***	positive	neutral	positive
Impacts to Wetlands (acres)	0	0.00	0.00	Roadwork (miles)	0.23	0.3	0.3
FEMA Floodplain Crossings (acres shown for preferred)	0.04	0	0				
Federal/State Designated Rivers (crossings)	0	0	0				
Impacts to Prime and Other Important Farmland (acres)	25.1	12.72	25.83				
Forested uplands (acres)	29.45	21.95	33.78	Rail and Road Construction Cost (millions \$)	\$19.60	\$21.30	\$22.80
Hazardous Materials Sites	0	0	0	Utility Relocation Cost (millions \$)	\$0.02	\$0.02	\$0.02
Residential Relocations	1	1	0	Right-of-Way Cost (millions \$)	\$3.18	\$0.71	\$3.18
Business Relocations	0	0	0	TOTAL COSTS (millions \$)	\$22.80	\$22.03	\$26.00
Public Schools Impacted	0	0	0	<div style="background-color: #f0f0f0; padding: 2px; display: inline-block;"> </div> Indicates Recommended Preferred Alternative.			
Noise (Impacted Receptors)	1	1	1	* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.			
Noise (Severely Impacted Receptors)	0	0	0	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.			
Vibration (Impacted Structures)	3	2	3	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.			
Section 4(f) Uses- Historic *	1	1	1				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	0	0	0				
Section 4(f) De Minimis- Parks *	0	0	0				
Section 106 Adverse Effects *	1	1	1				

Impact Matrix
Section S- Alternatives NC1, NC3 on Common Alignment

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION S			Topic	SECTION S		
	NC1	NC2	NC3		NC1	NC2	NC3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	6.88	6.71	6.88
Number of Impacted Stream Segments	10	11	11	Limiting Speed**	95	95	95
Impacts to Streams (linear feet)	1,620	2,720	2,120	Operability/Constructability***	neutral	neutral	neutral
Impacts to Wetlands (acres)	0.48	0.07	0.55	Roadwork (miles)	2.8	4.1	4.2
FEMA Floodplain Crossings (acres shown for preferred)	0.42	1	1				
Federal/State Designated Rivers (crossings)	0	0	0				
Impacts to Prime and Other Important Farmland (acres)	91.7	105.65	94.88				
Forested uplands (acres)	92.19	101.43	94.61	Rail and Road Construction Cost (millions \$)	\$90.00	\$85.20	\$87.00
Hazardous Materials Sites	7	5	6	Utility Relocation Cost (millions \$)	\$1.05	\$1.01	\$1.05
Residential Relocations	4	8	6	Right-of-Way Cost (millions \$)	\$6.80	\$8.35	\$6.80
Business Relocations	0	0	0	TOTAL COSTS (millions \$)	\$97.85	\$94.56	\$94.85
Public Schools Impacted	0	0	0	Indicates Recommended Preferred Alternative.			
Noise (Impacted Receptors)	22	23	22	* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.			
Noise (Severely Impacted Receptors)	1	1	1	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.			
Vibration (Impacted Structures)	22	22	22	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.			
Section 4(f) Uses- Historic *	2	2	2				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	1	1	1				
Section 4(f) De Minimis- Parks *	0	0	0				
Section 106 Adverse Effects *	2	2	2				

Impact Matrix
Section T- Alternatives NC1, NC3 on Common Alignment

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION T			Topic	SECTION T		
	NC1	NC2	NC3		NC1	NC2	NC3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	2.83	2.96	2.83
Number of Impacted Stream Segments	3	3	3	Limiting Speed**	110	95	110
Impacts to Streams (linear feet)	415	94	415	Operability/Constructability***	neutral	negative	neutral
Impacts to Wetlands (acres)	0.07	0.00	0.07	Roadwork (miles)	0.55	1.1	0.2
FEMA Floodplain Crossings (acres shown for preferred)	0.00	0	0				
Federal/State Designated Rivers (crossings)	0	0	0				
Impacts to Prime and Other Important Farmland (acres)	41.7	38.45	41.90				
Forested uplands (acres)	25.65	20.16	21.61	Rail and Road Construction Cost (millions \$)	\$53.00	\$53.60	\$50.00
Hazardous Materials Sites	4	2	1	Utility Relocation Cost (millions \$)	\$0.91	\$0.34	\$0.90
Residential Relocations	5	2	3	Right-of-Way Cost (millions \$)	\$2.96	\$2.52	\$2.96
Business Relocations	0	0	0	TOTAL COSTS (millions \$)	\$56.87	\$56.46	\$53.86
Public Schools Impacted	0	0	0				
Noise (Impacted Receptors)	25	25	25				
Noise (Severely Impacted Receptors)	0	0	0				
Vibration (Impacted Structures)	5	10	5				
Section 4(f) Uses- Historic *	1	1	1				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	0	0	0				
Section 4(f) De Minimis- Parks *	0	0	0				
Section 106 Adverse Effects *	1	1	1				

Indicates Recommended Preferred Alternative.

* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.

** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.

*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.

Impact Matrix
Section U- Alternatives NC1, NC2, NC3 on Different Alignments

Summary of Potential Human and Natural Impacts By Section				Summary of Operational & Physical Characteristics By Section			
Topic	SECTION U			Topic	SECTION U		
	NC1	NC2	NC3		NC1	NC2	NC3
Federally Listed T&E Species Impacted	0	0	0	Mainline Track Length (miles)	8.88	8.89	8.88
Number of Impacted Stream Segments	19	19	16	Limiting Speed**	85	80	85
Impacts to Streams (linear feet)	3,718	3,010	3,394	Operability/Constructability***	neutral	negative	neutral
Impacts to Wetlands (acres)	0.25	0.21	0.38	Roadwork (miles)	4	4	3.67
FEMA Floodplain Crossings (acres shown for preferred)	1	1	0.00				
Federal/State Designated Rivers (crossings)	1	1	1				
Impacts to Prime and Other Important Farmland (acres)	0.00	0.00	0.0				
Forested uplands (acres)	70.87	70.07	71.94	Rail and Road Construction Cost (millions \$)	\$88.70	\$84.40	\$103.30
Hazardous Materials Sites	10	10	20	Utility Relocation Cost (millions \$)	\$2.11	\$2.11	\$2.11
Residential Relocations	10	8	8	Right-of-Way Cost (millions \$)	\$26.25	\$24.61	\$26.25
Business Relocations	17	17	12	TOTAL COSTS (millions \$)	\$117.06	\$111.12	\$131.66
Public Schools Impacted	0	0	0	Indicates Recommended Preferred Alternative.			
Noise (Impacted Receptors)	159	161	159	* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.			
Noise (Severely Impacted Receptors)	17	17	17	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.			
Vibration (Impacted Structures)	45	45	45	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.			
Section 4(f) Uses- Historic *	1	1	1				
Section 4(f) Uses- Parks *	0	0	0				
Section 4(f) De Minimis- Historic *	1	1	1				
Section 4(f) De Minimis- Parks *	0	0	0				
Section 106 Adverse Effects *	1	1	1				

Impact Matrix

Section V in Downtown Raleigh- Whittaker Mill Road to Boylan Wye Alternatives NC1, NC2, NC3, NC5 on Different Alignments

Summary of Potential Human and Natural Impacts					Summary of Operational & Physical Characteristics				
Topic	Downtown Raleigh				Topic	Downtown Raleigh			
	NC1	NC2	NC3	NC5		NC1	NC2	NC3	NC5
Federally Listed T&E Species Impacted	0	0	0	0	Mainline Track Length (miles)	9.89	9.91	9.97	9.88
Number of Impacted Stream Segments	16	16	15	11	Limiting Speed**	45	45	45	45
Impacts to Streams (linear feet)	1,105	1,107	1,182	1,036	Operability/Constructability***	negative	negative	positive	positive
Impacts to Wetlands (acres)	0.06	0.06	0.05	0.05	Roadwork (miles)	3	3.1	2.7	2.79
FEMA Floodplain Crossings (acres shown for preferred)	4	4	3	1.38					
Federal/State Designated Rivers (crossings)	0	0	0	0					
Impacts to Prime and Other Important Farmland (acres)	0.00	0.00	0.00	0.0					
Forested uplands (acres)	16.92	16.92	17.04	17.05	Rail and Road Construction Cost (millions \$)	\$148.20	\$149.40	\$157.50	\$230.60
Hazardous Materials Sites	76	58	58	79	Utility Relocation Cost (millions \$)	\$2.64	\$2.64	\$2.45	\$2.28
Residential Relocations	0	1	0	0	Right-of-Way Cost (millions \$)	\$53.34	\$56.47	\$90.24	\$79.21
Business Relocations	23	20	54	59	TOTAL COSTS (millions \$)	\$204.18	\$208.51	\$250.19	\$312.09
Public Schools Impacted	0	0	0	0	<div style="background-color: #f0f0f0; padding: 2px; display: inline-block;"> </div> Indicates Recommended Preferred Alternative.				
Total Noise Impacted Receptors	92	92	92	79	* Note that several resources protected under Section 106 and/or Section 4(f) span one or more project sections; impacts are reported for each project section. Therefore, the total number of impacts reported across all sections exceeds the total number of protected resources described in Chapter 3 and Chapter 5.				
Severe Impacts (subset of total)	0	0	0	2	** Limiting Speed is the maximum train speed through the most restrictive curve within the section based on current design assumptions; average running speed through the section could be greater.				
Vibration (Impacted Structures)	48	48	48	4	*** Positive-negative-neutral denotes significant differences in operability or constructability between the alternatives.				
Section 4(f) Uses- Historic *	4	4	1	2					
Section 4(f) Uses- Parks	0	0	0	0					
Section 4(f) De Minimis- Historic	2	2	3	1					
Section 4(f) De Minimis- Parks	1	1	1	1					
Section 106 Adverse Effects *	4	4	3	2					