

Appendix E



Contents:

Overall Cost Summary

Cost Summary by Phase

Returning the Corridor to Rail Service

Estimated Costs

Costs estimates for both design and construction of the proposed Ecusta Rail Trail are provided in this section. A total cost summary is presented first, followed by a similar summary for each phase.

Following trail cost estimates, a brief description and analysis of the costs to return the rail corridor to rail service are presented

All cost estimates should be considered with the following notes and limitations in mind:

- This “Opinion of Probable Cost” (OPC) should not be considered a guaranteed maximum cost, but instead is a professional opinion of probable construction costs at the time of this study. Seamon, Whiteside & Associates, Inc. has no control over the cost of labor, equipment, materials, or a contractor’s method of pricing. It should be anticipated that bids and actual costs will vary from this OPC.
- The “Cost Factor”, as utilized, is a percentage of calculated costs, which is added to the subtotal. The Cost Factor helps compensate for unknown elements or conditions, variations in quantities used, and other unforeseen circumstances.

- Seamon, Whiteside & Associates, Inc. urges the Owner to develop a separate “Contingency Fund” above and beyond the total figure in the OPC. This fund will provide for modifications to the design, higher than anticipated costs, and other program alterations after construction initiation.

Proposed Ecusta Rail Trail

Summary of Probable Costs

Cost Estimate Details

CATEGORY	% OF TOTAL	TOTAL
A. Earthwork, Demolition, Clearing + Erosion Control	18%	\$2,407,803.84
B. General Construction	23%	\$3,116,249.86
C. Bridges	16%	\$2,089,800.00
D. Additional Construction	5%	\$635,335.00
E. Trailhead Construction	22%	\$2,950,000.00
COST FACTOR	17%	\$2,239,837.74
GRAND TOTAL ALL AREAS	100%	\$13,439,026.44
Anticipated Design and Engineering Fees		
Preliminary Planning	2%	\$268,780.53
Construction Documents	5%	\$671,951.32
Construction Services and Administration	3%	\$403,170.79
Total Design and Engineering Fees		\$1,343,902.64

NO.	ITEM	QTY.	UNIT	COST	EXTENSION
A. EARTHWORK, DEMOLITION, CLEARING + EROSION CONTROL					
1	Clearing + Grubbing	107,352	LF	\$2.94	\$315,614.88
2	Silt Fence (Each Side)	107,352	LF	\$9.10	\$976,903.20
3	Fine Grading	107,352	LF	\$4.28	\$459,466.56
4	Construction Entrance	54	EA	\$3,000.00	\$162,000.00
5	Railroad Cross-Tie and Rail Removal	107,352	LF	\$4.28	\$459,466.56
6	Hydroseeding	106,546	LF	\$0.32	\$34,094.72
Total Earthwork, Demolition, Clearing + Erosion Control					\$2,407,545.92
B. General Construction					
7	4" Hot Mix Asphalt (Surface Course)	107,352	LF	\$13.59	\$1,458,913.68
8	4" Paint Striping	107,352	LF	\$2.09	\$224,365.68
9	6" Base Course (Where Required)	1,500	LF	\$13.33	\$19,995.00
10	48" Black Vinyl Chain Link Fence	13,310	LF	\$16.05	\$213,625.50
11	Landscape Buffer	23,987	LF	\$50.00	\$1,199,350.00
Total General Construction					\$3,116,249.86
C. Bridges					
12	New Bike and Pedestrian Bridge Structure	0	LF	\$2,500.00	\$0.00
13	Rehabilitation of Existing Bridge Structure	1,548	LF	\$1,350.00	\$2,089,800.00
Total Bridges					\$2,089,800.00
D. Additional Construction					
14	Detectable Warning Mat	138	EA	\$175.00	\$24,150.00
15	Signage (Traffic Control, Educational, Directional)	315	EA	\$321.00	\$101,115.00
16	Retaining Wall	0	LF	\$40.00	\$0.00
17	Intersection Treatment 1 (Unsignalized Crossing)	62	EA	\$5,525.00	\$342,550.00
18	Intersection Treatment 2 (Signalized Crossing - Countdown Signal Only)	1	EA	\$10,020.00	\$10,020.00
19	Refuge Island with Landscape	0	EA	\$42,800.00	\$0.00
20	Intersection Treatment 2 (Signalized Crossing - HAWK)	3	EA	\$52,500.00	\$157,500.00
Total Additional Construction					\$635,335.00
E. Trailhead/Overlook Construction					
Total Trailhead Construction					\$2,950,000.00
SUBTOTAL ALL AREAS					\$11,198,930.78
COST FACTOR					20% Contingency
GRAND TOTAL ALL AREAS					\$13,438,716.94

SUMMARY OF PROBABLE COSTS

CATEGORY	% OF TOTAL	TOTAL
A. Earthwork, Demolition, Clearing + Erosion Control	18%	\$2,407,545.92
B. General Construction	23%	\$3,116,249.86
C. Bridges	16%	\$2,089,800.00
D. Additional Construction	5%	\$635,335.00
E. Trailhead Construction	22%	\$2,950,000.00
COST FACTOR	17%	\$2,239,786.16
GRAND TOTAL ALL AREAS	100%	\$13,438,716.94

Henderson County Phase 1

Cost Estimate Details

NO.	ITEM	QTY.	UNIT	COST	EXTENSION
A. EARTHWORK, DEMOLITION, CLEARING + EROSION CONTROL					
1	Clearing + Grubbing	12,481	LF	\$2.94	\$36,694.14
2	Silt Fence (Each Side)	12,481	LF	\$9.10	\$113,577.10
3	Fine Grading	12,481	LF	\$4.28	\$53,418.68
4	Construction Entrance	6	EA	\$3,000.00	\$18,000.00
5	Railroad Cross-Tie and Rail Removal	12,481	LF	\$4.28	\$53,418.68
6	Hydroseeding	12,481	LF	\$0.32	\$3,993.92
<i>Total Earthwork, Demolition, Clearing + Erosion Control</i>					\$279,102.52
B. General Construction					
7	4" Hot Mix Asphalt (Surface Course)	12,481	LF	\$13.59	\$169,616.79
8	4" Paint Striping	12,481	LF	\$2.09	\$26,085.29
9	6" Base Course (Where Required)	1,500	LF	\$13.33	\$19,995.00
10	48" Black Vinyl Chain Link Fence	1,760	LF	\$16.05	\$28,248.00
11	Landscape Buffer	3,512	LF	\$50.00	\$175,600.00
<i>Total General Construction</i>					\$419,545.08
C. Bridges					
12	New Bike and Pedestrian Bridge Structure	0	LF	\$2,500.00	\$0.00
13	Rehabilitation of Existing Bridge Structure	78	LF	\$1,350.00	\$105,300.00
<i>Total Bridges</i>					\$105,300.00
D. Additional Construction					
14	Detectable Warning Mat	24	EA	\$175.00	\$4,200.00
15	Signage (Traffic Control, Educational, Directional)	55	EA	\$321.00	\$17,655.00
16	Retaining Wall	0	LF	\$40.00	\$0.00
17	Intersection Treatment 1 (Unsignalized Crossing)	10	EA	\$5,525.00	\$55,250.00
18	Intersection Treatment 2 (Signalized Crossing - Countdown Signal Only)	0	EA	\$10,020.00	\$0.00
19	Refuge Island with Landscape	0	EA	\$42,800.00	\$0.00
20	Intersection Treatment 2 (Signalized Crossing - HAWK)	0	EA	\$52,500.00	\$0.00
<i>Total Additional Construction</i>					\$77,105.00
E. Trailhead Construction					
21	Williams Street Trailhead	1	LS	\$800,000.00	\$800,000.00
22	Laurel Park Trailhead	1	LS	\$89,000.00	\$89,000.00
<i>Total Trailhead Construction</i>					\$889,000.00
SUBTOTAL ALL AREAS					\$1,770,052.60
COST FACTOR 20% Contingency					\$354,010.52
GRAND TOTAL ALL AREAS					\$2,124,063.12

SUMMARY OF PROBABLE COSTS

CATEGORY	% OF TOTAL	TOTAL
A. Earthwork, Demolition, Clearing + Erosion Control	13%	\$279,102.52
B. General Construction	20%	\$419,545.08
C. Bridges	5%	\$105,300.00
D. Additional Construction	4%	\$77,105.00
E. Trailhead Construction	42%	\$889,000.00
COST FACTOR	17%	\$354,010.52
GRAND TOTAL ALL AREAS	100%	\$2,124,063.12

Summary of Probable Costs

CATEGORY	% OF TOTAL	TOTAL
A. Earthwork, Demolition, Clearing + Erosion Control	13%	\$279,102.52
B. General Construction	20%	\$419,545.08
C. Bridges	5%	\$105,300.00
D. Additional Construction	4%	\$77,105.00
E. Trailhead Construction	42%	\$889,000.00
COST FACTOR	17%	\$354,010.52
GRAND TOTAL ALL AREAS	100%	\$2,124,063.12
Anticipated Design and Engineering Fees		
Preliminary Planning	2%	\$42,481.26
Construction Documents	5%	\$106,203.16
Construction Services and Administration	3%	\$63,721.89
Total Design and Engineering Fees		\$212,406.31

Henderson County Phase 2

Summary of Probable Costs

Cost Estimate Details

CATEGORY	% OF TOTAL	TOTAL
A. Earthwork, Demolition, Clearing + Erosion Control	6%	\$118,892.76
B. General Construction	16%	\$337,367.04
C. Bridges	0%	\$0.00
D. Additional Construction	3%	\$73,685.00
E. Trailhead Construction	59%	\$1,265,000.00
COST FACTOR	17%	\$358,988.96
GRAND TOTAL ALL AREAS	100%	\$2,153,933.76
Anticipated Design and Engineering Fees		
Preliminary Planning	2%	\$43,078.68
Construction Documents	5%	\$107,696.69
Construction Services and Administration	3%	\$64,618.01
Total Design and Engineering Fees		\$215,393.38

NO.	ITEM	QTY.	UNIT	COST	EXTENSION
A. EARTHWORK, DEMOLITION, CLEARING + EROSION CONTROL					
1	Clearing + Grubbing	5,253	LF	\$2.94	\$15,443.82
2	Silt Fence (Each Side)	5,253	LF	\$9.10	\$47,802.30
3	Fine Grading	5,253	LF	\$4.28	\$22,482.84
4	Construction Entrance	3	EA	\$3,000.00	\$9,000.00
5	Railroad Cross-Tie and Rail Removal	5,253	LF	\$4.28	\$22,482.84
6	Hydroseeding	5,253	LF	\$0.32	\$1,680.96
Total Earthwork, Demolition, Clearing + Erosion Control					\$118,892.76
B. General Construction					
7	4" Hot Mix Asphalt (Surface Course)	5,253	LF	\$13.59	\$71,388.27
8	4" Paint Striping	5,253	LF	\$2.09	\$10,978.77
9	6" Base Course (Where Required)	0	LF	\$13.33	\$0.00
10	48" Black Vinyl Chain Link Fence	0	LF	\$16.05	\$0.00
11	Landscape Buffer	5,100	LF	\$50.00	\$255,000.00
Total General Construction					\$337,367.04
C. Bridges					
12	New Bike and Pedestrian Bridge Structure	0	LF	\$2,500.00	\$0.00
13	Rehabilitation of Existing Bridge Structure	0	LF	\$1,350.00	\$0.00
Total Bridges					\$0.00
D. Additional Construction					
14	Detectable Warning Mat	8	EA	\$175.00	\$1,400.00
15	Signage (Traffic Control, Educational, Directional)	10	EA	\$321.00	\$3,210.00
16	Retaining Wall	0	LF	\$40.00	\$0.00
17	Intersection Treatment 1 (Unsignalized Crossing)	3	EA	\$5,525.00	\$16,575.00
18	Intersection Treatment 2 (Signalized Crossing - Countdown Signal Only)	0	EA	\$10,020.00	\$0.00
19	Refuge Island with Landscape	0	EA	\$42,800.00	\$0.00
20	Intersection Treatment 2 (Signalized Crossing - HAWK)	1	EA	\$52,500.00	\$52,500.00
Total Additional Construction					\$73,685.00
E. Trailhead Construction					
21	Etowah Town Center Trailhead	1	LS	\$210,000.00	\$210,000.00
22	EPONA Trailhead	1	LS	\$1,055,000.00	\$1,055,000.00
Total Trailhead Construction					\$1,265,000.00
SUBTOTAL ALL AREAS					\$1,794,944.80
COST FACTOR					20% Contingency \$358,988.96
GRAND TOTAL ALL AREAS					\$2,153,933.76

SUMMARY OF PROBABLE COSTS

CATEGORY	% OF TOTAL	TOTAL
A. Earthwork, Demolition, Clearing + Erosion Control	6%	\$118,892.76
B. General Construction	16%	\$337,367.04
C. Bridges	0%	\$0.00
D. Additional Construction	3%	\$73,685.00
E. Trailhead Construction	59%	\$1,265,000.00
COST FACTOR	17%	\$358,988.96
GRAND TOTAL ALL AREAS	100%	\$2,153,933.76

Henderson County Phase 3

Cost Estimate Details

NO.	ITEM	QTY.	UNIT	COST	EXTENSION
A. EARTHWORK, DEMOLITION, CLEARING + EROSION CONTROL					
1	Clearing + Grubbing	11,021	LF	\$2.94	\$32,401.74
2	Silt Fence (Each Side)	11,021	LF	\$9.10	\$100,291.10
3	Fine Grading	11,021	LF	\$4.28	\$47,169.88
4	Construction Entrance	8	EA	\$3,000.00	\$24,000.00
5	Railroad Cross-Tie and Rail Removal	11,021	LF	\$4.28	\$47,169.88
6	Hydroseeding	11,020	LF	\$0.32	\$3,526.40
<i>Total Earthwork, Demolition, Clearing + Erosion Control</i>					\$254,559.00
B. General Construction					
7	4" Hot Mix Asphalt (Surface Course)	11,021	LF	\$13.59	\$149,775.39
8	4" Paint Striping	11,021	LF	\$2.09	\$23,033.89
9	6" Base Course (Where Required)	0	LF	\$13.33	\$0.00
10	48" Black Vinyl Chain Link Fence	4,225	LF	\$16.05	\$67,811.25
11	Landscape Buffer	1,950	LF	\$50.00	\$97,500.00
<i>Total General Construction</i>					\$338,120.53
C. Bridges					
12	New Bike and Pedestrian Bridge Structure	0	LF	\$2,500.00	\$0.00
13	Rehabilitation of Existing Bridge Structure	15	LF	\$1,350.00	\$20,250.00
<i>Total Bridges</i>					\$20,250.00
D. Additional Construction					
14	Detectable Warning Mat	16	EA	\$175.00	\$2,800.00
15	Signage (Traffic Control, Educational, Directional)	35	EA	\$321.00	\$11,235.00
16	Retaining Wall	0	LF	\$40.00	\$0.00
17	Intersection Treatment 1 (Unsignalized Crossing)	8	EA	\$5,525.00	\$44,200.00
18	Intersection Treatment 2 (Signalized Crossing - Countdown Signal Only)	0	EA	\$10,020.00	\$0.00
19	Refuge Island with Landscape	0	EA	\$42,800.00	\$0.00
20	Intersection Treatment 2 (Signalized Crossing - HAWK)	0	EA	\$52,500.00	\$0.00
<i>Total Additional Construction</i>					\$58,235.00
E. Trailhead Construction					
21	Dixie Diner Trailhead	1	LS	\$120,000.00	\$120,000.00
<i>Total Trailhead Construction</i>					\$120,000.00
SUBTOTAL ALL AREAS					\$791,164.53
COST FACTOR					20% Contingency
GRAND TOTAL ALL AREAS					\$949,397.44

SUMMARY OF PROBABLE COSTS

CATEGORY	% OF TOTAL	TOTAL
A. Earthwork, Demolition, Clearing + Erosion Control	27%	\$254,559.00
B. General Construction	36%	\$338,120.53
C. Bridges	2%	\$20,250.00
D. Additional Construction	6%	\$58,235.00
E. Trailhead Construction	13%	\$120,000.00
COST FACTOR	17%	\$158,232.91
GRAND TOTAL ALL AREAS	100%	\$949,397.44

Summary of Probable Costs

CATEGORY	% OF TOTAL	TOTAL
A. Earthwork, Demolition, Clearing + Erosion Control	27%	\$254,559.00
B. General Construction	36%	\$338,120.53
C. Bridges	2%	\$20,250.00
D. Additional Construction	6%	\$58,235.00
E. Trailhead Construction	13%	\$120,000.00
COST FACTOR	17%	\$158,232.91
GRAND TOTAL ALL AREAS	100%	\$949,397.44
Anticipated Design and Engineering Fees		
Preliminary Planning	2%	\$18,987.95
Construction Documents	5%	\$47,469.87
Construction Services and Administration	3%	\$28,481.92
Total Design and Engineering Fees		\$94,939.74

Henderson County Phase 4

Summary of Probable Costs

Cost Estimate Details

CATEGORY	% OF TOTAL	TOTAL
A. Earthwork, Demolition, Clearing + Eroision Control	11%	\$262,142.00
B. General Construction	15%	\$344,181.68
C. Bridges	45%	\$1,048,950.00
D. Additional Construction	5%	\$122,265.00
E. Trailhead Construction	8%	\$181,000.00
COST FACTOR	17%	\$391,707.74
GRAND TOTAL ALL AREAS	100%	\$2,350,246.42
Anticipated Design and Engineering Fees		
Preliminary Planning	2%	\$47,004.93
Construction Documents	5%	\$117,512.32
Construction Services and Administration	3%	\$70,507.39
Total Design and Engineering Fees		\$235,024.64

NO.	ITEM	QTY.	UNIT	COST	EXTENSION
A. EARTHWORK, DEMOLITION, CLEARING + EROSION CONTROL					
1	Clearing + Grubbing	11,826	LF	\$2.94	\$34,768.44
2	Silt Fence (Each Side)	11,826	LF	\$9.10	\$107,616.60
3	Fine Grading	11,826	LF	\$4.28	\$50,615.28
4	Construction Entrance	5	EA	\$3,000.00	\$15,000.00
5	Railroad Cross-Tie and Rail Removal	11,826	LF	\$4.28	\$50,615.28
6	Hydroseeding	11,020	LF	\$0.32	\$3,526.40
Total Earthwork, Demolition, Clearing + Erosion Control					\$262,142.00
B. General Construction					
7	4" Hot Mix Asphalt (Surface Course)	11,826	LF	\$13.59	\$160,715.34
8	4" Paint Striping	11,826	LF	\$2.09	\$24,716.34
9	6" Base Course (Where Required)	0	LF	\$13.33	\$0.00
10	48" Black Vinyl Chain Link Fence	0	LF	\$16.05	\$0.00
11	Landscape Buffer	3,175	LF	\$50.00	\$158,750.00
Total General Construction					\$344,181.68
C. Bridges					
12	New Bike and Pedestrian Bridge Structure	0	LF	\$2,500.00	\$0.00
13	Rehabilitation of Existing Bridge Structure	777	LF	\$1,350.00	\$1,048,950.00
Total Bridges					\$1,048,950.00
D. Additional Construction					
14	Detectable Warning Mat	8	EA	\$175.00	\$1,400.00
15	Signage (Traffic Control, Educational, Directional)	15	EA	\$321.00	\$4,815.00
16	Retaining Wall	0	LF	\$40.00	\$0.00
17	Intersection Treatment 1 (Unsignalized Crossing)	2	EA	\$5,525.00	\$11,050.00
18	Intersection Treatment 2 (Signalized Crossing - Countdown Signal Only)	0	EA	\$10,020.00	\$0.00
19	Refuge Island with Landscape	0	EA	\$42,800.00	\$0.00
20	Intersection Treatment 2 (Signalized Crossing - HAWK)	2	EA	\$52,500.00	\$105,000.00
Total Additional Construction					\$122,265.00
E. Trailhead Construction					
21	Grass Roots Cafe Trailhead	1	LS	\$76,000.00	\$76,000.00
22	Banner Farm Road Overlook	1	LS	\$105,000.00	\$105,000.00
Total Trailhead Construction					\$181,000.00
SUBTOTAL ALL AREAS					\$1,958,538.68
COST FACTOR				20% Contingency	\$391,707.74
GRAND TOTAL ALL AREAS					\$2,350,246.42

SUMMARY OF PROBABLE COSTS

CATEGORY	% OF TOTAL	TOTAL
A. Earthwork, Demolition, Clearing + Eroision Control	11%	\$262,142.00
B. General Construction	15%	\$344,181.68
C. Bridges	45%	\$1,048,950.00
D. Additional Construction	5%	\$122,265.00
E. Trailhead Construction	8%	\$181,000.00
COST FACTOR	17%	\$391,707.74
GRAND TOTAL ALL AREAS	100%	\$2,350,246.42

Henderson County Phase 5

Cost Estimate Details

NO.	ITEM	QTY.	UNIT	COST	EXTENSION
A. EARTHWORK, DEMOLITION, CLEARING + EROSION CONTROL					
1	Clearing + Grubbing	12,929	LF	\$2.94	\$38,011.26
2	Silt Fence (Each Side)	12,929	LF	\$9.10	\$117,653.90
3	Fine Grading	12,929	LF	\$4.28	\$55,336.12
4	Construction Entrance	4	EA	\$3,000.00	\$12,000.00
5	Railroad Cross-Tie and Rail Removal	12,929	LF	\$4.28	\$55,336.12
6	Hydroseeding	12,929	LF	\$0.32	\$4,137.28
<i>Total Earthwork, Demolition, Clearing + Erosion Control</i>					\$282,474.68
B. General Construction					
7	4" Hot Mix Asphalt (Surface Course)	12,929	LF	\$13.59	\$175,705.11
8	4" Paint Striping	12,929	LF	\$2.09	\$27,021.61
9	6" Base Course (Where Required)	0	LF	\$13.33	\$0.00
10	48" Black Vinyl Chain Link Fence	600	LF	\$16.05	\$9,630.00
11	Landscape Buffer	1,775	LF	\$50.00	\$88,750.00
<i>Total General Construction</i>					\$301,106.72
C. Bridges					
12	New Bike and Pedestrian Bridge Structure	0	LF	\$2,500.00	\$0.00
13	Rehabilitation of Existing Bridge Structure	71	LF	\$1,350.00	\$95,850.00
<i>Total Bridges</i>					\$95,850.00
D. Additional Construction					
14	Detectable Warning Mat	8	EA	\$175.00	\$1,400.00
15	Signage (Traffic Control, Educational, Directional)	25	EA	\$321.00	\$8,025.00
16	Retaining Wall	0	LF	\$40.00	\$0.00
17	Intersection Treatment 1 (Unsignalized Crossing)	4	EA	\$5,525.00	\$22,100.00
18	Intersection Treatment 2 (Signalized Crossing - Countdown Signal Only)	0	EA	\$10,020.00	\$0.00
19	Refuge Island with Landscape	0	EA	\$42,800.00	\$0.00
20	Intersection Treatment 2 (Signalized Crossing - HAWK)	0	EA	\$52,500.00	\$0.00
<i>Total Additional Construction</i>					\$31,525.00
E. Trailhead Construction					
<i>Total Trailhead Construction</i>					\$0.00
SUBTOTAL ALL AREAS					\$710,956.40
COST FACTOR					\$142,191.28
GRAND TOTAL ALL AREAS					\$853,147.68

SUMMARY OF PROBABLE COSTS

CATEGORY	% OF TOTAL	TOTAL
A. Earthwork, Demolition, Clearing + Erosion Control	33%	\$282,474.68
B. General Construction	35%	\$301,106.72
C. Bridges	11%	\$95,850.00
D. Additional Construction	4%	\$31,525.00
E. Trailhead Construction	0%	\$0.00
COST FACTOR	17%	\$142,191.28
GRAND TOTAL ALL AREAS	100%	\$853,147.68

Summary of Probable Costs

CATEGORY	% OF TOTAL	TOTAL
A. Earthwork, Demolition, Clearing + Erosion Control	33%	\$282,474.68
B. General Construction	35%	\$301,106.72
C. Bridges	11%	\$95,850.00
D. Additional Construction	4%	\$31,525.00
E. Trailhead Construction	0%	\$0.00
COST FACTOR	17%	\$142,191.28
GRAND TOTAL ALL AREAS	100%	\$853,147.68
Anticipated Design and Engineering Fees		
Preliminary Planning	2%	\$17,062.95
Construction Documents	5%	\$42,657.38
Construction Services and Administration	3%	\$25,594.43
Total Design and Engineering Fees		\$85,314.77

Henderson County Phase 6

Summary of Probable Costs

Cost Estimate Details

CATEGORY	% OF TOTAL	TOTAL
A. Earthwork, Demolition, Clearing + Erosion Control	21%	\$220,233.64
B. General Construction	33%	\$342,196.06
C. Bridges	23%	\$232,200.00
D. Additional Construction	6%	\$59,840.00
E. Trailhead Construction	0%	\$0.00
COST FACTOR	17%	\$170,893.94
GRAND TOTAL ALL AREAS	100%	\$1,025,363.64
Anticipated Design and Engineering Fees		
Preliminary Planning	2%	\$20,507.27
Construction Documents	5%	\$51,268.18
Construction Services and Administration	3%	\$30,760.91
Total Design and Engineering Fees		\$102,536.36

NO.	ITEM	QTY.	UNIT	COST	EXTENSION
A. EARTHWORK, DEMOLITION, CLEARING + EROSION CONTROL					
1	Clearing + Grubbing	9,667	LF	\$2.94	\$28,420.98
2	Silt Fence (Each Side)	9,667	LF	\$9.10	\$87,969.70
3	Fine Grading	9,667	LF	\$4.28	\$41,374.76
4	Construction Entrance	6	EA	\$3,000.00	\$18,000.00
5	Railroad Cross-Tie and Rail Removal	9,667	LF	\$4.28	\$41,374.76
6	Hydroseeding	9,667	LF	\$0.32	\$3,093.44
Total Earthwork, Demolition, Clearing + Erosion Control					\$220,233.64
B. General Construction					
7	4" Hot Mix Asphalt (Surface Course)	9,667	LF	\$13.59	\$131,374.53
8	4" Paint Striping	9,667	LF	\$2.09	\$20,204.03
9	6" Base Course (Where Required)	0	LF	\$13.33	\$0.00
10	48" Black Vinyl Chain Link Fence	350	LF	\$16.05	\$5,617.50
11	Landscape Buffer	3,700	LF	\$50.00	\$185,000.00
Total General Construction					\$342,196.06
C. Bridges					
12	New Bike and Pedestrian Bridge Structure	0	LF	\$2,500.00	\$0.00
13	Rehabilitation of Existing Bridge Structure	172	LF	\$1,350.00	\$232,200.00
Total Bridges					\$232,200.00
D. Additional Construction					
14	Detectable Warning Mat	16	EA	\$175.00	\$2,800.00
15	Signage (Traffic Control, Educational, Directional)	40	EA	\$321.00	\$12,840.00
16	Retaining Wall	0	LF	\$40.00	\$0.00
17	Intersection Treatment 1 (Unsignalized Crossing)	8	EA	\$5,525.00	\$44,200.00
18	Intersection Treatment 2 (Signalized Crossing - Countdown Signal Only)	0	EA	\$10,020.00	\$0.00
19	Refuge Island with Landscape	0	EA	\$42,800.00	\$0.00
20	Intersection Treatment 2 (Signalized Crossing - HAWK)	0	EA	\$52,500.00	\$0.00
Total Additional Construction					\$59,840.00
E. Trailhead Construction					
Total Trailhead Construction					\$0.00
SUBTOTAL ALL AREAS					\$854,469.70
COST FACTOR				20% Contingency	\$170,893.94
GRAND TOTAL ALL AREAS					\$1,025,363.64

SUMMARY OF PROBABLE COSTS

CATEGORY	% OF TOTAL	TOTAL
A. Earthwork, Demolition, Clearing + Erosion Control	21%	\$220,233.64
B. General Construction	33%	\$342,196.06
C. Bridges	23%	\$232,200.00
D. Additional Construction	6%	\$59,840.00
E. Trailhead Construction	0%	\$0.00
COST FACTOR	17%	\$170,893.94
GRAND TOTAL ALL AREAS	100%	\$1,025,363.64

Transylvania County Phase 1

Cost Estimate Details

NO.	ITEM	QTY.	UNIT	COST	EXTENSION
A. EARTHWORK, DEMOLITION, CLEARING + EROSION CONTROL					
1	Clearing + Grubbing	12,821	LF	\$2.94	\$37,693.74
2	Silt Fence (Each Side)	12,821	LF	\$9.10	\$116,671.10
3	Fine Grading	12,821	LF	\$4.28	\$54,873.88
4	Construction Entrance	5	EA	\$3,000.00	\$15,000.00
5	Railroad Cross-Tie and Rail Removal	12,821	LF	\$4.28	\$54,873.88
6	Hydroseeding	12,821	LF	\$0.32	\$4,102.72
<i>Total Earthwork, Demolition, Clearing + Erosion Control</i>					\$283,215.32
B. General Construction					
7	4" Hot Mix Asphalt (Surface Course)	12,821	LF	\$13.59	\$174,237.39
8	4" Paint Striping	12,821	LF	\$2.09	\$26,795.89
9	6" Base Course (Where Required)	0	LF	\$13.33	\$0.00
10	48" Black Vinyl Chain Link Fence	2,200	LF	\$16.05	\$35,310.00
11	Landscape Buffer	800	LF	\$50.00	\$40,000.00
<i>Total General Construction</i>					\$276,343.28
C. Bridges					
12	New Bike and Pedestrian Bridge Structure	0	LF	\$2,500.00	\$0.00
13	Rehabilitation of Existing Bridge Structure	205	LF	\$1,350.00	\$276,750.00
<i>Total Bridges</i>					\$276,750.00
D. Additional Construction					
14	Detectable Warning Mat	18	EA	\$175.00	\$3,150.00
15	Signage (Traffic Control, Educational, Directional)	45	EA	\$321.00	\$14,445.00
16	Retaining Wall	0	LF	\$40.00	\$0.00
17	Intersection Treatment 1 (Unsignalized Crossing)	8	EA	\$5,525.00	\$44,200.00
18	Intersection Treatment 2 (Signalized Crossing - Countdown Signal Only)	0	EA	\$10,020.00	\$0.00
19	Refuge Island with Landscape	0	EA	\$42,800.00	\$0.00
20	Intersection Treatment 2 (Signalized Crossing - HAWK)	0	EA	\$52,500.00	\$0.00
<i>Total Additional Construction</i>					\$61,795.00
E. Trailhead Construction					
21	Everett Road and Old Hendersonville Highway Trailhead	1	LS	\$140,000.00	\$140,000.00
<i>Total Trailhead Construction</i>					\$140,000.00
SUBTOTAL ALL AREAS					\$1,038,103.60
COST FACTOR					\$207,620.72
GRAND TOTAL ALL AREAS					\$1,245,724.32

SUMMARY OF PROBABLE COSTS

CATEGORY	% OF TOTAL	TOTAL
A. Earthwork, Demolition, Clearing + Erosion Control	23%	\$283,215.32
B. General Construction	22%	\$276,343.28
C. Bridges	22%	\$276,750.00
D. Additional Construction	5%	\$61,795.00
E. Trailhead Construction	11%	\$140,000.00
COST FACTOR	17%	\$207,620.72
GRAND TOTAL ALL AREAS	100%	\$1,245,724.32

Summary of Probable Costs

CATEGORY	% OF TOTAL	TOTAL
A. Earthwork, Demolition, Clearing + Erosion Control	23%	\$283,215.32
B. General Construction	22%	\$276,343.28
C. Bridges	22%	\$276,750.00
D. Additional Construction	5%	\$61,795.00
E. Trailhead Construction	11%	\$140,000.00
COST FACTOR	17%	\$207,620.72
GRAND TOTAL ALL AREAS	100%	\$1,245,724.32
Anticipated Design and Engineering Fees		
Preliminary Planning	2%	\$24,914.49
Construction Documents	5%	\$62,286.22
Construction Services and Administration	3%	\$37,371.73
Total Design and Engineering Fees		\$124,572.43

Transylvania County Phase 2

Summary of Probable Costs

Cost Estimate Details

CATEGORY	% OF TOTAL	TOTAL
A. Earthwork, Demolition, Clearing + Erosion Control	18%	\$167,904.28
B. General Construction	17%	\$155,532.62
C. Bridges	2%	\$17,550.00
D. Additional Construction	7%	\$62,730.00
E. Trailhead Construction	39%	\$355,000.00
COST FACTOR	17%	\$151,743.38
GRAND TOTAL ALL AREAS	100%	\$910,460.28
Anticipated Design and Engineering Fees		
Preliminary Planning	2%	\$18,209.21
Construction Documents	5%	\$45,523.01
Construction Services and Administration	3%	\$27,313.81
Total Design and Engineering Fees		\$91,046.03

NO.	ITEM	QTY.	UNIT	COST	EXTENSION
A. EARTHWORK, DEMOLITION, CLEARING + EROSION CONTROL					
1	Clearing + Grubbing	7,309	LF	\$2.94	\$21,488.46
2	Silt Fence (Each Side)	7,309	LF	\$9.10	\$66,511.90
3	Fine Grading	7,309	LF	\$4.28	\$31,282.52
4	Construction Entrance	5	EA	\$3,000.00	\$15,000.00
5	Railroad Cross-Tie and Rail Removal	7,309	LF	\$4.28	\$31,282.52
6	Hydroseeding	7,309	LF	\$0.32	\$2,338.88
Total Earthwork, Demolition, Clearing + Erosion Control					\$167,904.28
B. General Construction					
7	4" Hot Mix Asphalt (Surface Course)	7,309	LF	\$13.59	\$99,329.31
8	4" Paint Striping	7,309	LF	\$2.09	\$15,275.81
9	6" Base Course (Where Required)	0	LF	\$13.33	\$0.00
10	48" Black Vinyl Chain Link Fence	2,550	LF	\$16.05	\$40,927.50
11	Landscape Buffer	0	LF	\$50.00	\$0.00
Total General Construction					\$155,532.62
C. Bridges					
12	New Bike and Pedestrian Bridge Structure	0	LF	\$2,500.00	\$0.00
13	Rehabilitation of Existing Bridge Structure	13	LF	\$1,350.00	\$17,550.00
Total Bridges					\$17,550.00
D. Additional Construction					
14	Detectable Warning Mat	16	EA	\$175.00	\$2,800.00
15	Signage (Traffic Control, Educational, Directional)	35	EA	\$321.00	\$11,235.00
16	Retaining Wall	0	LF	\$40.00	\$0.00
17	Intersection Treatment 1 (Unsignalized Crossing)	7	EA	\$5,525.00	\$38,675.00
18	Intersection Treatment 2 (Signalized Crossing - Countdown Signal Only)	1	EA	\$10,020.00	\$10,020.00
19	Refuge Island with Landscape	0	EA	\$42,800.00	\$0.00
20	Intersection Treatment 2 (Signalized Crossing - HAWK)	0	EA	\$52,500.00	\$0.00
Total Additional Construction					\$62,730.00
E. Trailhead Construction					
21	Crab Creek Road Trailhead	1	LS	\$260,000.00	\$260,000.00
22	French Broad River Overlook	1	LS	\$95,000.00	\$95,000.00
Total Trailhead Construction					\$355,000.00
SUBTOTAL ALL AREAS					\$758,716.90
COST FACTOR					20% Contingency \$151,743.38
GRAND TOTAL ALL AREAS					\$910,460.28

SUMMARY OF PROBABLE COSTS

CATEGORY	% OF TOTAL	TOTAL
A. Earthwork, Demolition, Clearing + Erosion Control	18%	\$167,904.28
B. General Construction	17%	\$155,532.62
C. Bridges	2%	\$17,550.00
D. Additional Construction	7%	\$62,730.00
E. Trailhead Construction	39%	\$355,000.00
COST FACTOR	17%	\$151,743.38
GRAND TOTAL ALL AREAS	100%	\$910,460.28

Transylvania County Phase 3

Cost Estimate Details

NO.	ITEM	QTY.	UNIT	COST	EXTENSION
A. EARTHWORK, DEMOLITION, CLEARING + EROSION CONTROL					
1	Clearing + Grubbing	8,830	LF	\$2.94	\$25,960.20
2	Silt Fence (Each Side)	8,830	LF	\$9.10	\$80,353.00
3	Fine Grading	8,830	LF	\$4.28	\$37,792.40
4	Construction Entrance	5	EA	\$3,000.00	\$15,000.00
5	Railroad Cross-Tie and Rail Removal	8,830	LF	\$4.28	\$37,792.40
6	Hydroseeding	8,830	LF	\$0.32	\$2,825.60
<i>Total Earthwork, Demolition, Clearing + Erosion Control</i>					\$199,723.60
B. General Construction					
7	4" Hot Mix Asphalt (Surface Course)	8,830	LF	\$13.59	\$119,999.70
8	4" Paint Striping	8,830	LF	\$2.09	\$18,454.70
9	6" Base Course (Where Required)	0	LF	\$13.33	\$0.00
10	48" Black Vinyl Chain Link Fence	0	LF	\$16.05	\$0.00
11	Landscape Buffer	2,525	LF	\$50.00	\$126,250.00
<i>Total General Construction</i>					\$264,704.40
C. Bridges					
12	New Bike and Pedestrian Bridge Structure	0	LF	\$2,500.00	\$0.00
13	Rehabilitation of Existing Bridge Structure	93	LF	\$1,350.00	\$125,550.00
<i>Total Bridges</i>					\$125,550.00
D. Additional Construction					
14	Detectable Warning Mat	8	EA	\$175.00	\$1,400.00
15	Signage (Traffic Control, Educational, Directional)	20	EA	\$321.00	\$6,420.00
16	Retaining Wall	0	LF	\$40.00	\$0.00
17	Intersection Treatment 1 (Unsignalized Crossing)	4	EA	\$5,525.00	\$22,100.00
18	Intersection Treatment 2 (Signalized Crossing - Countdown Signal Only)	0	EA	\$10,020.00	\$0.00
19	Refuge Island with Landscape	0	EA	\$42,800.00	\$0.00
20	Intersection Treatment 2 (Signalized Crossing - HAWK)	0	EA	\$52,500.00	\$0.00
<i>Total Additional Construction</i>					\$29,920.00
E. Trailhead Construction					
<i>Total Trailhead Construction</i>					\$0.00
SUBTOTAL ALL AREAS					\$619,898.00
COST FACTOR					\$123,979.60
GRAND TOTAL ALL AREAS					\$743,877.60

SUMMARY OF PROBABLE COSTS

CATEGORY	% OF TOTAL	TOTAL
A. Earthwork, Demolition, Clearing + Erosion Control	27%	\$199,723.60
B. General Construction	36%	\$264,704.40
C. Bridges	17%	\$125,550.00
D. Additional Construction	4%	\$29,920.00
E. Trailhead Construction	0%	\$0.00
COST FACTOR	17%	\$123,979.60
GRAND TOTAL ALL AREAS	100%	\$743,877.60

Summary of Probable Costs

CATEGORY	% OF TOTAL	TOTAL
A. Earthwork, Demolition, Clearing + Erosion Control	27%	\$199,723.60
B. General Construction	36%	\$264,704.40
C. Bridges	17%	\$125,550.00
D. Additional Construction	4%	\$29,920.00
E. Trailhead Construction	0%	\$0.00
COST FACTOR	17%	\$123,979.60
GRAND TOTAL ALL AREAS	100%	\$743,877.60
Anticipated Design and Engineering Fees		
Preliminary Planning	2%	\$14,877.55
Construction Documents	5%	\$37,193.88
Construction Services and Administration	3%	\$22,316.33
Total Design and Engineering Fees		\$74,387.76

Transylvania County Phase 4

Cost Estimate Details

Summary of Probable Costs

CATEGORY	% OF TOTAL	TOTAL
A. Earthwork, Demolition, Clearing + Erosion Control	31%	\$339,297.80
B. General Construction	31%	\$337,152.45
C. Bridges	15%	\$167,400.00
D. Additional Construction	5%	\$58,235.00
E. Trailhead Construction	0%	\$0.00
COST FACTOR	17%	\$180,417.05
GRAND TOTAL ALL AREAS	100%	\$1,082,502.30
Anticipated Design and Engineering Fees		
Preliminary Planning	2%	\$21,650.05
Construction Documents	5%	\$54,125.12
Construction Services and Administration	3%	\$32,475.07
Total Design and Engineering Fees		\$108,250.23

NO.	ITEM	QTY.	UNIT	COST	EXTENSION
A. EARTHWORK, DEMOLITION, CLEARING + EROSION CONTROL					
1	Clearing + Grubbing	15,215	LF	\$2.94	\$44,732.10
2	Silt Fence (Each Side)	15,215	LF	\$9.10	\$138,456.50
3	Fine Grading	15,215	LF	\$4.28	\$65,120.20
4	Construction Entrance	7	EA	\$3,000.00	\$21,000.00
5	Railroad Cross-Tie and Rail Removal	15,215	LF	\$4.28	\$65,120.20
6	Hydroseeding	15,215	LF	\$0.32	\$4,868.80
Total Earthwork, Demolition, Clearing + Erosion Control					\$339,297.80
B. General Construction					
7	4" Hot Mix Asphalt (Surface Course)	15,215	LF	\$13.59	\$206,771.85
8	4" Paint Striping	15,215	LF	\$2.09	\$31,799.35
9	6" Base Course (Where Required)	0	LF	\$13.33	\$0.00
10	48" Black Vinyl Chain Link Fence	1,625	LF	\$16.05	\$26,081.25
11	Landscape Buffer	1,450	LF	\$50.00	\$72,500.00
Total General Construction					\$337,152.45
C. Bridges					
12	New Bike and Pedestrian Bridge Structure	0	LF	\$2,500.00	\$0.00
13	Rehabilitation of Existing Bridge Structure	124	LF	\$1,350.00	\$167,400.00
Total Bridges					\$167,400.00
D. Additional Construction					
14	Detectable Warning Mat	16	EA	\$175.00	\$2,800.00
15	Signage (Traffic Control, Educational, Directional)	35	EA	\$321.00	\$11,235.00
16	Retaining Wall	0	LF	\$40.00	\$0.00
17	Intersection Treatment 1 (Unsignalized Crossing)	8	EA	\$5,525.00	\$44,200.00
18	Intersection Treatment 2 (Signalized Crossing - Countdown Signal Only)	0	EA	\$10,020.00	\$0.00
19	Refuge Island with Landscape	0	EA	\$42,800.00	\$0.00
20	Intersection Treatment 2 (Signalized Crossing - HAWK)	0	EA	\$52,500.00	\$0.00
Total Additional Construction					\$58,235.00
E. Trailhead Construction					
Total Trailhead Construction					\$0.00
SUBTOTAL ALL AREAS					\$902,085.25
COST FACTOR					20% Contingency
GRAND TOTAL ALL AREAS					\$1,082,502.30

SUMMARY OF PROBABLE COSTS

CATEGORY	% OF TOTAL	TOTAL
A. Earthwork, Demolition, Clearing + Erosion Control	31%	\$339,297.80
B. General Construction	31%	\$337,152.45
C. Bridges	15%	\$167,400.00
D. Additional Construction	5%	\$58,235.00
E. Trailhead Construction	0%	\$0.00
COST FACTOR	17%	\$180,417.05
GRAND TOTAL ALL AREAS	100%	\$1,082,502.30

Returning the Rail Corridor to Rail Service

The proposed 18.5 mile Ecusta RailTrail conversion is based on a federal system commonly known as railbanking. Under this system, the railway under consideration is allowed to be converted to a public transportation corridor for the use of pedestrians, bicyclists, and the general public, thereby enhancing the public park system and expanding existing greenways. The second part of the railbanking system is the ability to return the converted pathway back to the original use of rail traffic, which may or may not be for public transportation and freight. Based on these guiding principles, initial planning should be incorporated to allow for both directives to be fulfilled without being irreversible.

The original railway was constructed in 1894 and provided service until 2002, when the closing of the Ecusta paper mill ended the need for the freight line. The rail line and associated bridges have remained unused and unmaintained since approximately 2002. The current owner of the railway is Norfolk Southern Corporation. It should be noted that, at the time of this particular railway construction, a system of standards was still in the relatively early stages of formation. There were two principle organizations that noted recommendations and common practices for railway design and construction. They were the Roadmaster's and Maintenance of Way Association and the American Railway Bridge and Building Association. Both of these organizations were active during the time of the original construction. A short time after the construction, a third group was established to provide standards in the engineering of railways and associated railway bridges. This was referred to as the American Railway Engineering

Association, and it was composed of specialty committees that established guidelines and published technical manuals relevant to the design, construction, and maintenance of railways. These collections of technical bulletins were combined into *The Manual of Railway Engineering* in the early 1970's, which is still updated and published today. The former organizations were combined to form the American Railway Engineering and Maintenance-of-Way Association, commonly referred to as AREMA. This is the governing body that establishes the guidelines for current railway development, and it would need to be utilized to provide the criteria for the re-construction of the lines if the railway were returned to rail service.

The loading and structural requirements for railways of current design are far greater than when the original line was completed in the late 1800's. An in depth analysis would be required for each bridge and condition within that bridge structure. Soil studies would be required for timber pile capacity; the geotechnical information would also be required for headwall and retaining wall designs. Water flow and water table issues would also require study in order to design for possible bridge scour. The existing metal properties would need to be field determined to allow for complete structural analysis of existing conditions.

The following table provides a preliminary cost estimate for returning the rail corridor to service. Data for this estimate is from the Rehabilitation Cost Estimate produced by the Missouri Highway and Transportation Department. It is anticipated that construction costs will differ from this estimate, and the Client should factor in a 10%-20% contingency to account for any discrepancies.

Unit Cost for Railroad and Bridge Improvements

BRIDGE ELEMENT	UNIT	PRICE PER UNIT
Rail, #100 Relay	TON	\$275
Joints, S.H.	EA	\$9.50
Tie Plates, S.H., D.H.	EA	\$1.05
Anchors	EA	\$1.05
Bolts (1" x 5 1/2")	KEGS	\$131.00
Washers	EA	\$0.30
Ties	EA	\$26.00
Ballast	TONS	\$10.00
Unloading Rail	MILE	\$2,000.00
Unloading Ties	EA	\$125.00
Rail Clean-Up	MILE	\$2,000.00
Install Crossties	EA	\$11.00
Install Rail	LF	\$7.32
Install Anchors	EA	\$0.35
Surface and Line	LF	\$0.47
Tighten Joints	MILE	\$2,000.00
Turnouts	EA	\$3,600.00
Switch Ties	EA	\$3,200.00
Install Turnouts	EA	\$6,500.00
Install Switch Ties	EA	\$1,580.00
Bridge Ties	EA	\$34.00
Install Bridge Ties	EA	\$28.00
Road Crossing Materials	LF	\$420.00
Working Crossings	LF	\$87.00
Bridge Rehabilitation (Superstructure)	LF	\$2,100.00
Bridge Rehabilitation (Substructure)	LF	\$2,400.00
Other Costs (drainage, signage, etc.)	-	10% of bridge cost
Preliminary Planning	-	1%-2% of bridge cost
Construction Documents	-	5% of bridge cost
Construction Services + Administration	-	3%-5% of bridge cost
Total Per Mile Cost (Not Including Bridges or associated professional services)	MI	\$250,000.00 - \$350,000.00