

Appendix D – Engineer’s Conceptual Opinion of Cost for Capital Projects with Conceptual Plans

Municipality: East Brandywine Township, West Brandywine Township, Uwchlan Township, Chester County, PA
Project Name: East-West Bicycle and Pedestrian Facilities Plan
Project Number: 815490.11

Plan Title: East-West Trail Concepts
Roadway(s): Dowling Forge Road, Creek Road, Cedar Knoll Road, Hopewell Road, Echo Dell Road, Batten Drive, Buck Road, Rock Raymond Road, Hibernia Road
Project Description: Refer to East-West Bicycle and Pedestrian Facilities Plan Report

Unit Costs Last Revised: 8/3/2017
Source: ECMS Bid Price History and Similar Project Experience

Disclaimer: McMahon Associates, Inc. has provided this opinion of cost as requested by the client. Please note that opinions of cost are subject to change based on plan/design revisions, fluctuations in unit costs, field conditions, and differences in locale. Opinions of cost are provided for use in budgeting, but in no way intended to be construed as a final cost for the project. Final costs are contingent only on actual bids from contractors. McMahon Associates, Inc. will not be held responsible for differences between this opinion of cost and contractor bid costs.

Estimate No.	Description	Notes	Cost
E-SC-2	East - Struble Connector - 2		\$836,000.00
E-SC-1	East - Struble Connector - 1		\$1,565,000.00
E-SC-1 (P)	East - Struble Connector - 1 - Parking Lot for Trailhead		\$419,000.00
E-SC-4	East - Struble Connector - 4		\$927,000.00
E-CP-1	East - Community Park - 1		\$846,000.00
W-HC-2	West - Hibernia Connector - 2		\$497,000.00
W-HC-3	West - Hibernia Connector - 3		\$597,000.00
W-HC-4	West - Hibernia Connector - 4		\$1,024,000.00
	Total Cost		\$6,711,000.00

General Notes:

1. Refer to the intersection spreadsheet details relating to cost calculations and individual intersection assumptions.
2. The contingency and inspection percentages are based on PennDOT Publication 352. Inflation is not included and costs provided are in 2017 dollars.
3. The Engineer's Conceptual Opinion of Cost does not include relocating or resetting existing underground utilities within the limits of the project or the provision of any future utilities. Impacts to existing underground utilities will need to be determined during the preliminary engineering of the project through subsurface utility engineering. Due to visible evidence of subsurface utilities within the project area (underground electric, water, sewer, gas and telecommunication) it is recommended (and likely required by law) that utility test pits be
5. The Utility Relocations cost is a rough estimate based on relocating existing surface utilities (poles, hydrants, etc.) identified through aerial imagery and limited field views. Underground utility relocations are not included in this estimate. These costs are subject to change through the development of the project and based on the Utility owner's rights.
6. Legal right-of-way lines and property lines are estimated based on GIS data and plans provided by East Brandywine Township. Legal right-of-way lines or property lines have not been independently verified through field survey or title/deed research. Existing legal rights-of-way and existing property lines, as well as the size and location of any required rights-of-way (temporary or permanent), will need to be determined during the preliminary engineering of the project.
7. The following costs are rough estimates for budgeting purposes only: Engineering and Permitting, Utility Relocations, and Right of Way. The costs associated with these items will need to be determined through the development of the project.

Item No.	Description	Comment	Unit	Quantity	Unit Cost	Cost
Standard Items						
1	Clearing and Grubbing		LS	1	\$45,000.00	\$45,000.00
2	Class 1 Excavation		CY	500	\$65.00	\$32,500.00
3	Foreign Borrow		CY	250	\$75.00	\$18,750.00
4	Grading (includes topsoil and seeding)		SY	1,500	\$15.00	\$22,500.00
5	Full Depth Bituminous Pavement + Wearing Course (8" Bituminous Base Course & 8" Subbase)		SY	10	\$200.00	\$2,000.00
6	Driveway Adjustments		SY	30	\$150.00	\$4,500.00
7	Milling and Bituminous Overlay (including Tack Coat)		SY	0	\$25.00	\$0.00
8	Plain Cement Concrete Curb		LF	0	\$45.00	\$0.00
9	Drainage Upgrades	Type DW and ES Walls	LS	1	\$30,000.00	\$30,000.00
10	Gabion Wall		SY	80	\$450.00	\$36,000.00
11	6" Base Drain		LF	0	\$13.00	\$0.00
12	Guide Rail		LF	200	\$55.00	\$11,000.00
13	Construction Surveying, Schedule, Equipment Package		LS	1	\$10,000.00	\$10,000.00
14	4" Yellow Pavement Markings, Hot Thermoplastic Paint		LF	0	\$1.50	\$0.00
15	4" White Pavement Markings, Hot Thermoplastic Paint		LF	0	\$1.50	\$0.00
16	6" White Pavement Markings, Hot Thermoplastic Paint		LF	0	\$2.00	\$0.00
17	24" White Pavement Markings, Hot Thermoplastic Paint		LF	100	\$8.00	\$800.00
18	24" Yellow Pavement Markings, Hot Thermoplastic Paint		LF	0	\$8.00	\$0.00
19	Marking Legend, "PED", Hot Thermoplastic Paint		EA	2	\$300.00	\$600.00
20	Marking Legend, "XING", Hot Thermoplastic Paint		EA	2	\$300.00	\$600.00
21	Marking Legend, "Shared Lane"		EA	0	\$450.00	\$0.00
22	Marking Legend, "Handicap Parking"		EA	0	\$450.00	\$0.00
23	Signage		EA	6	\$150.00	\$900.00
24	Pervious Pavement Path		SY	1,280	\$90.00	\$115,200.00
25	Cement Concrete Sidewalk		SY	0	\$100.00	\$0.00
26	ADA Accessible Curb Ramp		EA	3	\$6,500.00	\$19,500.00
27	Traffic Signal Upgrades		LS	0	\$0.00	\$0.00
28	Rapid Rectangular Flashing Beacon		LS	1	\$30,000.00	\$30,000.00
29	Surface-Mounted Delineators SM-2		EA	0	\$40.00	\$0.00
Special Items						
30	Post Construction Stormwater Management	Approx. 5% of Item 37	LS	1	\$20,000.00	\$20,000.00
31	Split Rail Fence		LF	230	\$22.00	\$5,060.00
32	Sidewalk Protective Fence, Vinyl-Coated Steel		LF	0	\$184.00	\$0.00
33	Landscape Restoration		SF	0	\$35.00	\$0.00
34	Miscellaneous Relocations		LS	0	\$0.00	\$0.00
35	Parking Stop		EA	0	\$0.00	\$0.00
36	Grade Separating Wall		SF	0	\$60.00	\$0.00
37	Subtotal Trail Construction Cost	Items 1 - 36				\$405,000.00
38	Maintenance and Protection of Traffic	Approx. 8% of Item 37				\$33,000.00
39	Erosion and Sediment Control	Approx. 2.5% of Item 37				\$11,000.00
40	Mobilization	Approx. 5% of Item 37				\$21,000.00
41	Contingency	Approx. 15% of Items 37 - 40				\$71,000.00
42	Total Trail Construction Cost	Items 37 - 41				\$541,000.00
43	Construction Inspection	15% of Item 42				\$82,000.00
44	Total Trail Construction + Inspection	Items 42 - 43				\$623,000.00
45	Survey, Engineering and Permitting	Approx. 30% of Item 42				\$163,000.00
46	Utilities		LS	1	\$40,000.00	\$40,000.00
47	Right-of-Way	Rough Estimate	LS	1	\$10,000.00	\$10,000.00
48	Total Project Cost (2017 Dollars)	Items 44 - 47				\$836,000.00

Assumptions & Notes:

- Necessary drainage and PCSWM upgrades subject to stormwater analysis during preliminary engineering

Item No.	Description	Comment	Unit	Quantity	Unit Cost	Cost
Standard Items						
1	Clearing and Grubbing		LS	1	\$20,000.00	\$20,000.00
2	Class 1 Excavation		CY	430	\$65.00	\$27,950.00
3	Foreign Borrow		CY	350	\$75.00	\$26,250.00
4	Grading (includes topsoil and seeding)		SY	780	\$15.00	\$11,700.00
5	Full Depth Bituminous Pavement + Wearing Course (8" Bituminous Base Course & 8" Subbase)		SY	680	\$200.00	\$136,000.00
6	Driveway Adjustments		SY	0	\$60.00	\$0.00
7	Milling and Bituminous Overlay (including Tack Coat)		SY	0	\$25.00	\$0.00
8	Plain Cement Concrete Curb		LF	0	\$45.00	\$0.00
9	Drainage Upgrades		LS	1	\$15,000.00	\$15,000.00
10	Gabion Wall		SY	0	\$450.00	\$0.00
11	6" Base Drain		LF	0	\$13.00	\$0.00
12	Guide Rail		LF	0	\$55.00	\$0.00
13	Construction Surveying, Schedule, Equipment Package		LS	1	\$10,000.00	\$10,000.00
14	4" Yellow Pavement Markings, Hot Thermoplastic Paint		LF	0	\$1.50	\$0.00
15	4" White Pavement Markings, Hot Thermoplastic Paint		LF	200	\$1.50	\$300.00
16	6" White Pavement Markings, Hot Thermoplastic Paint		LF	225	\$2.00	\$450.00
17	24" White Pavement Markings, Hot Thermoplastic Paint		LF	225	\$8.00	\$1,800.00
18	24" Yellow Pavement Markings, Hot Thermoplastic Paint		LF	0	\$8.00	\$0.00
19	Marking Legend, "PED", Hot Thermoplastic Paint		EA	2	\$300.00	\$600.00
20	Marking Legend, "XING", Hot Thermoplastic Paint		EA	2	\$300.00	\$600.00
21	Marking Legend, "Shared Lane"		EA	0	\$450.00	\$0.00
22	Marking Legend, "Handicap Parking"		EA	0	\$450.00	\$0.00
23	Signage		EA	10	\$150.00	\$1,500.00
24	Pervious Pavement Path		SY	700	\$90.00	\$63,000.00
25	Cement Concrete Sidewalk		SY	0	\$100.00	\$0.00
26	ADA Accessible Curb Ramp		EA	4	\$6,500.00	\$26,000.00
27	Traffic Signal Upgrades		LS	0	\$0.00	\$0.00
28	Rapid Rectangular Flashing Beacon		LS	1	\$60,000.00	\$60,000.00
29	Surface-Mounted Delineators SM-2		EA	0	\$40.00	\$0.00
Special Items						
30	Post Construction Stormwater Management	Approx. 5% of Item 37 (Excluding Bridge)	LS	1	\$25,000.00	\$25,000.00
31	Split Rail Fence		LF	600	\$22.00	\$13,200.00
32	Sidewalk Protective Fence, Vinyl-Coated Steel		LF	0	\$184.00	\$0.00
33	Landscape Restoration	25 @ \$600 per Tree	SF	430	\$35.00	\$15,050.00
34	Miscellaneous Relocations	Existing Stone Abutment	LS	1	\$70,000.00	\$70,000.00
35	Temporary Construction Access		LS	1	\$20,000.00	\$20,000.00
36	Pedestrian Bridge	See Note 3	LS	1	\$315,000.00	\$315,000.00
37	Subtotal Trail Construction Cost	Items 1 - 36				\$859,000.00
38	Maintenance and Protection of Traffic	Approx. 8% of Item 1 -35				\$44,000.00
39	Erosion and Sediment Control	Approx. 2.5% of Item 37				\$22,000.00
40	Mobilization	Approx. 5% of Item 37				\$43,000.00
41	Contingency	Approx. 15% of Items 37 - 40				\$97,000.00
42	Total Trail Construction Cost	Items 37 - 41				\$1,065,000.00
43	Construction Inspection	15% of Item 42				\$160,000.00
44	Total Trail Construction + Inspection	Items 42 - 43				\$1,225,000.00
45	Survey, Engineering and Permitting	Approx. 30% of Item 42				\$320,000.00
46	Utilities		LS	1	\$10,000.00	\$10,000.00
47	Right-of-Way	Rough Estimate	LS	1	\$10,000.00	\$10,000.00
48	Total Project Cost (2017 Dollars)	Items 44 - 47				\$1,565,000.00

Assumptions & Notes:

- Necessary drainage and PCSWM upgrades subject to stormwater analysis during preliminary engineering
- Estimate Does not include parking lot and associated items South of Dowlin Forge Road
- Includes bridge, protective fencing, deck, abutments, and rock erosion protection

Item No.	Description	Comment	Unit	Quantity	Unit Cost	Cost
Standard Items						
1	Clearing and Grubbing		LS	1	\$10,000.00	\$10,000.00
2	Class 1 Excavation		CY	600	\$65.00	\$39,000.00
3	Foreign Borrow		CY	0	\$75.00	\$0.00
4	Grading (includes topsoil and seeding)		SY	2,210	\$15.00	\$33,150.00
5	Full Depth Bituminous Pavement + Wearing Course (8" Bituminous Base Course & 8" Subbase)		SY	0	\$125.00	\$0.00
6	Driveway Adjustments	Parking Lot Driveway	SY	220	\$60.00	\$13,200.00
7	Milling and Bituminous Overlay (including Tack Coat)		SY	0	\$25.00	\$0.00
8	Plain Cement Concrete Curb		LF	0	\$45.00	\$0.00
9	Drainage Upgrades		LS	1	\$17,000.00	\$17,000.00
10	Gabion Wall		SY	0	\$450.00	\$0.00
11	6" Base Drain		LF	0	\$13.00	\$0.00
12	Guide Rail		LF	0	\$55.00	\$0.00
13	Construction Surveying, Schedule, Equipment Package		LS	1	\$5,000.00	\$5,000.00
14	4" Yellow Pavement Markings, Hot Thermoplastic Paint		LF	0	\$1.50	\$0.00
15	4" White Pavement Markings, Hot Thermoplastic Paint		LF	0	\$1.50	\$0.00
16	6" White Pavement Markings, Hot Thermoplastic Paint		LF	0	\$2.00	\$0.00
17	24" White Pavement Markings, Hot Thermoplastic Paint		LF	0	\$8.00	\$0.00
18	24" Yellow Pavement Markings, Hot Thermoplastic Paint		LF	0	\$8.00	\$0.00
19	Marking Legend, "PED", Hot Thermoplastic Paint		EA	0	\$300.00	\$0.00
20	Marking Legend, "XING", Hot Thermoplastic Paint		EA	0	\$300.00	\$0.00
21	Marking Legend, "Shared Lane"		EA	0	\$450.00	\$0.00
22	Marking Legend, "Handicap Parking"		EA	1	\$450.00	\$450.00
23	Signage		EA	5	\$150.00	\$750.00
24	Pervious Pavement Path	6' Path	SY	40	\$90.00	\$3,600.00
25	Cement Concrete Sidewalk		SY	0	\$100.00	\$0.00
26	ADA Accessible Curb Ramp		EA	1	\$6,500.00	\$6,500.00
27	Traffic Signal Upgrades		LS	0	\$0.00	\$0.00
28	Rapid Rectangular Flashing Beacon		LS	0	\$0.00	\$0.00
29	Surface-Mounted Delineators SM-2		EA	0	\$40.00	\$0.00
Special Items						
30	Post Construction Stormwater Management	Approx. 5% of Item 37	LS	1	\$15,000.00	\$15,000.00
31	Split Rail Fence		LF	120	\$22.00	\$2,640.00
32	Sidewalk Protective Fence, Vinyl-Coated Steel		LF	0	\$184.00	\$0.00
33	Landscape Restoration	Screening	SF	1,100	\$35.00	\$38,500.00
34	Miscellaneous Relocations		LS	0	\$0.00	\$0.00
35	Parking Stop		EA	15	\$200.00	\$3,000.00
36	Parking Area (Gravel)		SY	805	\$50.00	\$40,250.00
37	Subtotal Trail Construction Cost	Items 1 - 36				\$228,000.00
38	Maintenance and Protection of Traffic	Approx. 6% of Item 37				\$14,000.00
39	Erosion and Sediment Control	Approx. 2.5% of Item 37				\$6,000.00
40	Mobilization	Approx. 5% of Item 37				\$12,000.00
41	Contingency	Approx. 15% of Items 37 - 40				\$39,000.00
42	Total Trail Construction Cost	Items 37 - 41				\$299,000.00
43	Construction Inspection	15% of Item 42				\$45,000.00
44	Total Trail Construction + Inspection	Items 42 - 43				\$344,000.00
45	Engineering and Permitting	Approx. 25% of Item 42				\$75,000.00
46	Utilities		LS	1	\$0.00	\$0.00
47	Right-of-Way	Rough Estimate	LS	1	\$0.00	\$0.00
48	Total Project Cost (2017 Dollars)	Items 44 - 47				\$419,000.00

Assumptions & Notes:

1. Necessary drainage and PCSWM upgrades subject to stormwater analysis during preliminary engineering
2. Estimate includes 15 space parking lot, driveway and connecting path.
3. No traffic operational improvements (shoulder upgrades, deceleration lanes, etc.) are included in this estimate.

Item No.	Description	Comment	Unit	Quantity	Unit Cost	Cost
Standard Items						
1	Clearing and Grubbing		LS	1	\$75,000.00	\$75,000.00
2	Class 1 Excavation		CY	830	\$65.00	\$53,950.00
3	Foreign Borrow		CY	125	\$75.00	\$9,337.50
4	Grading (includes topsoil and seeding)		SY	2,500	\$15.00	\$37,500.00
5	Full Depth Bituminous Pavement + Wearing Course (8" Bituminous Base Course & 8" Subbase)		SY	3	\$125.00	\$375.00
6	Driveway Adjustments		SY	29	\$60.00	\$1,740.00
7	Milling and Bituminous Overlay (including Tack Coat)		SY	0	\$25.00	\$0.00
8	Plain Cement Concrete Curb		LF	0	\$45.00	\$0.00
9	Drainage Upgrades		LS	1	\$15,000.00	\$15,000.00
10	Gabion Wall		SY	0	\$450.00	\$0.00
11	6" Base Drain		LF	0	\$13.00	\$0.00
12	Guide Rail		LF	420	\$55.00	\$23,100.00
13	Construction Surveying, Schedule, Equipment Package		LS	1	\$15,000.00	\$15,000.00
14	4" Yellow Pavement Markings, Hot Thermoplastic Paint		LF	0	\$1.50	\$0.00
15	4" White Pavement Markings, Hot Thermoplastic Paint		LF	0	\$1.50	\$0.00
16	6" White Pavement Markings, Hot Thermoplastic Paint		LF	0	\$2.00	\$0.00
17	24" White Pavement Markings, Hot Thermoplastic Paint		LF	100	\$8.00	\$800.00
18	24" Yellow Pavement Markings, Hot Thermoplastic Paint		LF	0	\$8.00	\$0.00
19	Marking Legend, "PED", Hot Thermoplastic Paint		EA	2	\$300.00	\$600.00
20	Marking Legend, "XING", Hot Thermoplastic Paint		EA	2	\$300.00	\$600.00
21	Marking Legend, "Shared Lane"		EA	0	\$450.00	\$0.00
22	Marking Legend, "Handicap Parking"		EA	0	\$450.00	\$0.00
23	Signage		EA	10	\$150.00	\$1,500.00
24	Pervious Pavement Path		SY	1,500	\$90.00	\$135,000.00
25	Cement Concrete Sidewalk		SY	0	\$100.00	\$0.00
26	ADA Accessible Curb Ramp		EA	2	\$6,500.00	\$13,000.00
27	Traffic Signal Upgrades		LS	0	\$0.00	\$0.00
28	Rapid Rectangular Flashing Beacon		LS	1	\$30,000.00	\$30,000.00
29	Surface-Mounted Delineators SM-2		EA	0	\$40.00	\$0.00
Special Items						
30	Post Construction Stormwater Management	Approx. 5% of Item 37	LS	1	\$23,000.00	\$23,000.00
31	Split Rail Fence		LF	500	\$22.00	\$11,000.00
32	Sidewalk Protective Fence, Vinyl-Coated Steel		LF	0	\$184.00	\$0.00
33	Landscape Restoration		SF	0	\$35.00	\$0.00
34	Miscellaneous Relocations		LS	0	\$0.00	\$0.00
35	Parking Stop		EA	0	\$0.00	\$0.00
36	Grade Separating Wall		SF	0	\$60.00	\$0.00
37	Subtotal Trail Construction Cost	Items 1 - 36				\$447,000.00
38	Maintenance and Protection of Traffic	Approx. 10% of Item 37				\$45,000.00
39	Erosion and Sediment Control	Approx. 2.5% of Item 37				\$12,000.00
40	Mobilization	Approx. 5% of Item 37				\$23,000.00
41	Contingency	Approx. 15% of Items 37 - 40				\$80,000.00
42	Total Trail Construction Cost	Items 37 - 41				\$607,000.00
43	Construction Inspection	15% of Item 42				\$92,000.00
44	Total Trail Construction + Inspection	Items 42 - 43				\$699,000.00
45	Engineering and Permitting	Approx. 30% of Item 42				\$183,000.00
46	Utilities		LS	1	\$25,000.00	\$25,000.00
47	Right-of-Way	Rough Estimate	LS	1	\$20,000.00	\$20,000.00
48	Total Project Cost (2017 Dollars)	Items 44 - 47				\$927,000.00

Assumptions & Notes:

- Necessary drainage and PCSWM upgrades subject to stormwater analysis during preliminary engineering

Item No.	Description	Comment	Unit	Quantity	Unit Cost	Cost
Standard Items						
1	Clearing and Grubbing		LS	1	\$15,000.00	\$15,000.00
2	Class 1 Excavation		CY	1,500	\$65.00	\$97,500.00
3	Foreign Borrow		CY	50	\$75.00	\$3,750.00
4	Grading (includes topsoil and seeding)		SY	1,650	\$15.00	\$24,750.00
5	Full Depth Bituminous Pavement + Wearing Course (8" Bituminous Base Course & 8" Subbase)		SY	20	\$200.00	\$4,000.00
6	Driveway Adjustments		SY	215	\$60.00	\$12,900.00
7	Milling and Bituminous Overlay (including Tack Coat)		SY	0	\$25.00	\$0.00
8	Plain Cement Concrete Curb		LF	0	\$45.00	\$0.00
9	Drainage Upgrades		LS	1	\$15,000.00	\$15,000.00
10	Gabion Wall		SY	0	\$450.00	\$0.00
11	6" Base Drain		LF	0	\$13.00	\$0.00
12	Guide Rail		LF	0	\$55.00	\$0.00
13	Construction Surveying, Schedule, Equipment Package		LS	1	\$10,000.00	\$10,000.00
14	4" Yellow Pavement Markings, Hot Thermoplastic Paint		LF	0	\$1.50	\$0.00
15	4" White Pavement Markings, Hot Thermoplastic Paint		LF	0	\$1.50	\$0.00
16	6" White Pavement Markings, Hot Thermoplastic Paint		LF	0	\$2.00	\$0.00
17	24" White Pavement Markings, Hot Thermoplastic Paint		LF	275	\$8.00	\$2,200.00
18	24" Yellow Pavement Markings, Hot Thermoplastic Paint		LF	0	\$8.00	\$0.00
19	Marking Legend, "PED", Hot Thermoplastic Paint		EA	2	\$300.00	\$600.00
20	Marking Legend, "XING", Hot Thermoplastic Paint		EA	2	\$300.00	\$600.00
21	Marking Legend, "Shared Lane"		EA	0	\$450.00	\$0.00
22	Marking Legend, "Handicap Parking"		EA	0	\$450.00	\$0.00
23	Signage		EA	8	\$150.00	\$1,200.00
24	Pervious Pavement Path		SY	830	\$90.00	\$74,700.00
25	Cement Concrete Sidewalk		SY	0	\$100.00	\$0.00
26	ADA Accessible Curb Ramp		EA	6	\$6,500.00	\$39,000.00
27	Traffic Signal Upgrades		LS	0	\$0.00	\$0.00
28	Rapid Rectangular Flashing Beacon		LS	1	\$30,000.00	\$30,000.00
29	Surface-Mounted Delineators SM-2		EA	0	\$40.00	\$0.00
Special Items						
30	Post Construction Stormwater Management	Approx. 5% of Item 37	LS	1	\$15,000.00	\$15,000.00
31	Split Rail Fence		LF	200	\$22.00	\$4,400.00
32	Sidewalk Protective Fence, Vinyl-Coated Steel		LF	0	\$184.00	\$0.00
33	Landscape Restoration		SF	3,000	\$4.00	\$12,000.00
34	Miscellaneous Relocations		LS	1	\$5,000.00	\$5,000.00
35	Parking Stop		EA	0	\$0.00	\$0.00
36	Grade Separating Wall	Single Faced Barrier Wall (Arch. Finish)	LF	120	\$275.00	\$33,000.00
37	Subtotal Trail Construction Cost	Items 1 - 36				\$401,000.00
38	Maintenance and Protection of Traffic	Approx. 8% of Item 37				\$33,000.00
39	Erosion and Sediment Control	Approx. 2.5% of Item 37				\$11,000.00
40	Mobilization	Approx. 5% of Item 37				\$21,000.00
41	Contingency	Approx. 15% of Items 37 - 40				\$70,000.00
42	Total Trail Construction Cost	Items 37 - 41				\$536,000.00
43	Construction Inspection	15% of Item 42				\$81,000.00
44	Total Trail Construction + Inspection	Items 42 - 43				\$617,000.00
45	Engineering and Permitting	Approx. 30% of Item 42				\$161,000.00
46	Utilities	Rough Estimate	LS	1	\$10,000.00	\$10,000.00
47	Right-of-Way	Rough Estimate	LS	1	\$58,000.00	\$58,000.00
48	Total Project Cost (2017 Dollars)	Items 44 - 47				\$846,000.00

Assumptions & Notes:

1. Necessary drainage and PCSWM upgrades subject to stormwater analysis during preliminary engineering

Item No.	Description	Comment	Unit	Quantity	Unit Cost	Cost
Standard Items						
1	Clearing and Grubbing		LS	1	\$20,000.00	\$20,000.00
2	Class 1 Excavation		CY	290	\$65.00	\$18,850.00
3	Foreign Borrow		CY	50	\$75.00	\$3,750.00
4	Grading (includes topsoil and seeding)		SY	716	\$15.00	\$10,740.00
5	Full Depth Bituminous Pavement + Wearing Course (8" Bituminous Base Course & 8" Subbase)		SY	100	\$200.00	\$20,000.00
6	Driveway Adjustments		SY	100	\$60.00	\$6,000.00
7	Milling and Bituminous Overlay (including Tack Coat)		SY	0	\$25.00	\$0.00
8	Plain Cement Concrete Curb		LF	370	\$45.00	\$16,650.00
9	Drainage Upgrades	No Outlet Location	LS	1	\$5,000.00	\$5,000.00
10	Gabion Wall		SY	0	\$450.00	\$0.00
11	6" Base Drain		LF	370	\$13.00	\$4,810.00
12	Guide Rail		LF	0	\$55.00	\$0.00
13	Construction Surveying, Schedule, Equipment Package		LS	1	\$7,500.00	\$7,500.00
14	4" Yellow Pavement Markings, Hot Thermoplastic Paint		LF	0	\$1.50	\$0.00
15	4" White Pavement Markings, Hot Thermoplastic Paint		LF	0	\$1.50	\$0.00
16	6" White Pavement Markings, Hot Thermoplastic Paint		LF	0	\$2.00	\$0.00
17	24" White Pavement Markings, Hot Thermoplastic Paint		LF	100	\$8.00	\$800.00
18	24" Yellow Pavement Markings, Hot Thermoplastic Paint		LF	0	\$8.00	\$0.00
19	Marking Legend, "PED", Hot Thermoplastic Paint		EA	2	\$300.00	\$600.00
20	Marking Legend, "XING", Hot Thermoplastic Paint		EA	2	\$300.00	\$600.00
21	Marking Legend, "Shared Lane"		EA	0	\$450.00	\$0.00
22	Marking Legend, "Handicap Parking"		EA	0	\$450.00	\$0.00
23	Signage		EA	12	\$150.00	\$1,800.00
24	Pervious Pavement Path		SY	320	\$90.00	\$28,800.00
25	Cement Concrete Sidewalk		SY	205	\$110.00	\$22,550.00
26	ADA Accessible Curb Ramp		EA	3	\$6,500.00	\$19,500.00
27	Traffic Signal Upgrades		LS	0	\$0.00	\$0.00
28	Rapid Rectangular Flashing Beacon		LS	1	\$30,000.00	\$30,000.00
29	Surface-Mounted Delineators SM-2		EA	0	\$40.00	\$0.00
Special Items						
30	Post Construction Stormwater Management	Approx. 5% of Item 37	LS	1	\$12,000.00	\$12,000.00
31	Split Rail Fence		LF	0	\$22.00	\$0.00
32	Sidewalk Protective Fence, Vinyl-Coated Steel		LF	0	\$184.00	\$0.00
33	Landscape Restoration		SF	30	\$35.00	\$1,050.00
34	Miscellaneous Relocations	Step Adjustment	LS	1	\$3,000.00	\$3,000.00
35	Parking Stop		EA	0	\$0.00	\$0.00
36	Grade Separating Wall		SF	60	\$100.00	\$6,000.00
37	Subtotal Trail Construction Cost	Items 1 - 36				\$240,000.00
38	Maintenance and Protection of Traffic	Approx. 10% of Item 37				\$24,000.00
39	Erosion and Sediment Control	Approx. 2.5% of Item 37				\$6,000.00
40	Mobilization	Approx. 5% of Item 37				\$12,000.00
41	Contingency	Approx. 15% of Items 37 - 40				\$43,000.00
42	Total Trail Construction Cost	Items 37 - 41				\$325,000.00
43	Construction Inspection	15% of Item 42				\$49,000.00
44	Total Trail Construction + Inspection	Items 42 - 43				\$374,000.00
45	Engineering and Permitting	Approx. 30% of Item 42				\$98,000.00
46	Utilities	Rough Estimate	LS	0	\$0.00	\$0.00
47	Right-of-Way	Rough Estimate	LS	1	\$25,000.00	\$25,000.00
48	Total Project Cost (2017 Dollars)	Items 44 - 47				\$497,000.00

Assumptions & Notes:

1. Necessary drainage and PCSWM upgrades subject to stormwater analysis during preliminary engineering
2. Estimate includes, items East of Hibernia Road.

Item No.	Description	Comment	Unit	Quantity	Unit Cost	Cost
Standard Items						
1	Clearing and Grubbing		LS	1	\$50,000.00	\$50,000.00
2	Class 1 Excavation		CY	490	\$65.00	\$31,850.00
3	Foreign Borrow		CY	100	\$75.00	\$7,500.00
4	Grading (includes topsoil and seeding)		SY	1,260	\$15.00	\$18,900.00
5	Full Depth Bituminous Pavement + Wearing Course (8" Bituminous Base Course & 8" Subbase)		SY	76	\$125.00	\$9,500.00
6	Driveway Adjustments		SY	325	\$60.00	\$19,500.00
7	Milling and Bituminous Overlay (including Tack Coat)		SY	0	\$25.00	\$0.00
8	Plain Cement Concrete Curb		LF	300	\$45.00	\$13,500.00
9	Drainage Upgrades		LS	1	\$5,000.00	\$5,000.00
10	Gabion Wall		SY	0	\$450.00	\$0.00
11	6" Base Drain		LF	300	\$13.00	\$3,900.00
12	Guide Rail		LF	0	\$55.00	\$0.00
13	Construction Surveying, Schedule, Equipment Package		LS	1	\$10,000.00	\$10,000.00
14	4" Yellow Pavement Markings, Hot Thermoplastic Paint		LF	0	\$1.50	\$0.00
15	4" White Pavement Markings, Hot Thermoplastic Paint		LF	0	\$1.50	\$0.00
16	6" White Pavement Markings, Hot Thermoplastic Paint		LF	0	\$2.00	\$0.00
17	24" White Pavement Markings, Hot Thermoplastic Paint		LF	100	\$8.00	\$800.00
18	24" Yellow Pavement Markings, Hot Thermoplastic Paint		LF	0	\$8.00	\$0.00
19	Marking Legend, "PED", Hot Thermoplastic Paint		EA	0	\$300.00	\$0.00
20	Marking Legend, "XING", Hot Thermoplastic Paint		EA	0	\$300.00	\$0.00
21	Marking Legend, "Shared Lane"		EA	0	\$450.00	\$0.00
22	Marking Legend, "Handicap Parking"		EA	0	\$450.00	\$0.00
23	Signage		EA	6	\$150.00	\$900.00
24	Pervious Pavement Path		SY	720	\$90.00	\$64,800.00
25	Cement Concrete Sidewalk		SY	161	\$100.00	\$16,100.00
26	ADA Accessible Curb Ramp		EA	1	\$6,500.00	\$6,500.00
27	Traffic Signal Upgrades		LS	0	\$0.00	\$0.00
28	Rapid Rectangular Flashing Beacon		LS	0	\$0.00	\$0.00
29	Surface-Mounted Delineators SM-2		EA	0	\$40.00	\$0.00
Special Items						
30	Post Construction Stormwater Management	Approx. 5% of Item 37	LS	1	\$14,000.00	\$14,000.00
31	Split Rail Fence		LF	0	\$22.00	\$0.00
32	Sidewalk Protective Fence, Vinyl-Coated Steel		LF	0	\$184.00	\$0.00
33	Landscape Restoration		SF	150	\$35.00	\$5,250.00
34	Miscellaneous Relocations		LS	0	\$0.00	\$0.00
35	Parking Stop		EA	0	\$0.00	\$0.00
36	Grade Separating Wall		SF	0	\$60.00	\$0.00
37	Subtotal Trail Construction Cost	Items 1 - 36				\$278,000.00
38	Maintenance and Protection of Traffic	Approx. 10% of Item 37				\$23,000.00
39	Erosion and Sediment Control	Approx. 2.5% of Item 37				\$7,000.00
40	Mobilization	Approx. 5% of Item 37				\$14,000.00
41	Contingency	Approx. 15% of Items 37 - 40				\$49,000.00
42	Total Trail Construction Cost	Items 37 - 41				\$371,000.00
43	Construction Inspection	15% of Item 42				\$56,000.00
44	Total Trail Construction + Inspection	Items 42 - 43				\$427,000.00
45	Engineering and Permitting	Approx. 30% of Item 42				\$112,000.00
46	Utilities		LS	0	\$0.00	\$0.00
47	Right-of-Way	Rough Estimate	LS	1	\$58,000.00	\$58,000.00
48	Total Project Cost (2017 Dollars)	Items 44 - 47				\$597,000.00

Assumptions & Notes:

- Necessary drainage and PCSWM upgrades subject to stormwater analysis during preliminary engineering
- Estimate includes all Items West of Hibernia Road to Hibernia Park

Item No.	Description	Comment	Unit	Quantity	Unit Cost	Cost
	Standard Items					
1	Clearing and Grubbing		LS	1	\$40,000.00	\$40,000.00
2	Class 1 Excavation		CY	500	\$65.00	\$32,500.00
3	Foreign Borrow		CY	41	\$75.00	\$3,075.00
4	Grading (includes topsoil and seeding)		SY	680	\$15.00	\$10,200.00
5	Full Depth Bituminous Pavement + Wearing Course (8" Bituminous Base Course & 8" Subbase)		SY	375	\$200.00	\$75,000.00
6	Driveway Adjustments		SY	0	\$60.00	\$0.00
7	Milling and Bituminous Overlay (including Tack Coat)		SY	2,400	\$25.00	\$60,000.00
8	Plain Cement Concrete Curb		LF	0	\$45.00	\$0.00
9	Drainage Upgrades	Add'l Pipe + Inlets	LS	1	\$30,000.00	\$30,000.00
10	Gabion Wall		SY	0	\$450.00	\$0.00
11	6" Base Drain		LF	0	\$13.00	\$0.00
12	Guide Rail		LF	270	\$55.00	\$14,850.00
13	Construction Surveying, Schedule, Equipment Package		LS	1	\$7,500.00	\$7,500.00
14	4" Yellow Pavement Markings, Hot Thermoplastic Paint		LF	1,250	\$1.50	\$1,875.00
15	4" White Pavement Markings, Hot Thermoplastic Paint		LF	1,800	\$1.50	\$2,700.00
16	6" White Pavement Markings, Hot Thermoplastic Paint		LF	0	\$2.00	\$0.00
17	24" White Pavement Markings, Hot Thermoplastic Paint		LF	0	\$8.00	\$0.00
18	24" Yellow Pavement Markings, Hot Thermoplastic Paint		LF	0	\$8.00	\$0.00
19	Marking Legend, "PED", Hot Thermoplastic Paint		EA	0	\$300.00	\$0.00
20	Marking Legend, "XING", Hot Thermoplastic Paint		EA	0	\$300.00	\$0.00
21	Marking Legend, "Shared Lane"		EA	0	\$450.00	\$0.00
22	Marking Legend, "Handicap Parking"		EA	0	\$450.00	\$0.00
23	Signage		EA	10	\$150.00	\$1,500.00
24	Pervious Pavement Path		SY	400	\$90.00	\$36,000.00
25	Cement Concrete Sidewalk		SY	0	\$100.00	\$0.00
26	ADA Accessible Curb Ramp		EA	2	\$6,500.00	\$13,000.00
27	Traffic Signal Upgrades		LS	0	\$0.00	\$0.00
28	Rapid Rectangular Flashing Beacon		LS	0	\$0.00	\$0.00
29	Surface-Mounted Delineators		EA	0	\$75.00	\$0.00
	Special Items					
30	Post Construction Stormwater Management	Approx. 5% of Item 37	LS	1	\$15,000.00	\$15,000.00
31	Split Rail Fence		LF	400	\$22.00	\$8,800.00
32	Sidewalk Protective Fence, Vinyl-Coated Steel		LF	125	\$184.00	\$23,000.00
33	Landscape Restoration		SF	0	\$35.00	\$0.00
34	Miscellaneous Relocations		LS	0	\$0.00	\$0.00
35	Parking Stop		EA	0	\$0.00	\$0.00
36	Barrier Wall (Arch. Finish)	Cost includes 2 impact attenuators	LF	600	\$275.00	\$165,000.00
37	Subtotal Trail Construction Cost	Items 1 - 36				\$540,000.00
38	Maintenance and Protection of Traffic	Approx. 10% of Item 37				\$54,000.00
39	Erosion and Sediment Control	Approx. 2.5% of Item 37				\$14,000.00
40	Mobilization	Approx. 5% of Item 37				\$27,000.00
41	Contingency	Approx. 15% of Items 37 - 40				\$96,000.00
42	Total Trail Construction Cost	Items 37 - 41				\$731,000.00
43	Construction Inspection	15% of Item 42				\$110,000.00
44	Total Trail Construction + Inspection	Items 42 - 43				\$841,000.00
45	Engineering and Permitting	Approx. 25% of Item 42				\$183,000.00
46	Utilities		LS	0	\$0.00	\$0.00
47	Right-of-Way	Rough Estimate	LS	0	\$0.00	\$0.00
48	Total Project Cost (2017 Dollars)	Items 44 - 47				\$1,024,000.00

Assumptions & Notes:

- Necessary drainage and PCSWM upgrades subject to stormwater analysis during preliminary engineering
- Estimate includes all roadway items, and trail west of Brandywine Creek Bridge
- Estimate includes a single face concrete barrier with architectural finish to match the existing Cedar Knoll Road bridge. If this type of barrier is not required or used, the cost could be reduced by up to \$400,000.