

# Appendix

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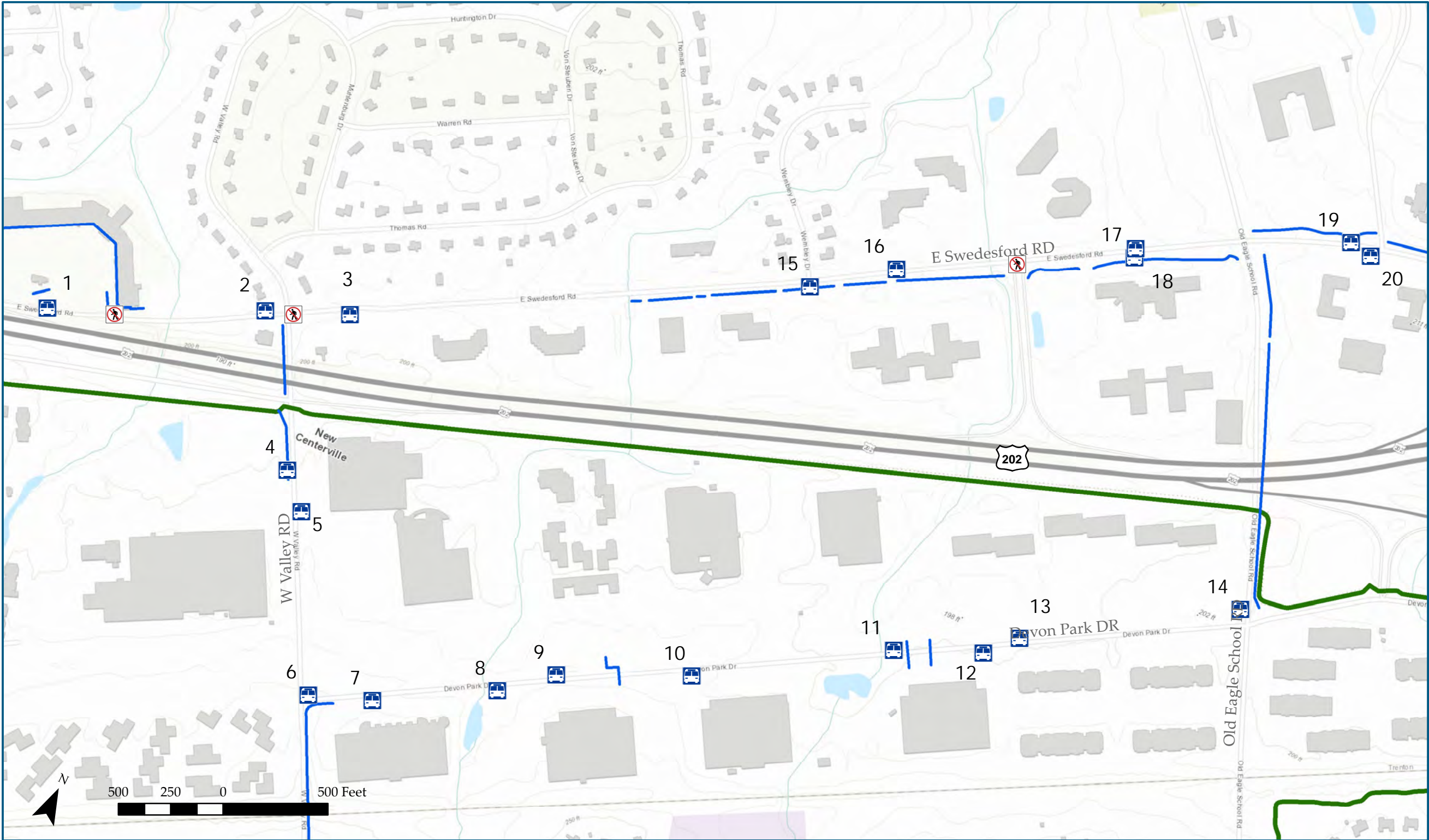


Location #	Bus Shelter	Sidewalk	Property Access	Crosswalk
1	No	No	No	N/A
2	No	No	No	Limited
3	No	No	No	Limited
4	No	Yes	Yes	Limited
5	No	No	No	No
6	No	No	No	No
7	No	No	No	No
8	No	No	No	No
9	No	No	No	No
10	No	No	No	No
11	No	No	Limited	Limited
12	No	No	Limited	Limited
13	No	No	No	No
14	No	No	No	Yes
15	Yes	Yes	Yes	No
16	No	No	No	No
17	No	No	No	Limited
18	Yes	Yes	Yes	Yes
19	No	Yes	Yes	Yes
20	No	Yes	Yes	Yes



# GATEWAY MULTIMODAL TRANSPORTATION STUDY

## BUS STOP INVENTORY



### Legend

- Sidewalks
- Trails
- SEPTA Bus Stops
- Crossing Restriction

Sources:  
Trails, Sidewalks - Chester County GIS





# B | Engineers Opinion of Probable Cost

McMahon Associates, Inc.  
Engineer's Conceptual Opinion of Cost

11/15/2017  
Prepared By: JWW  
Checked By: JJK

**Municipality:** Tredyffrin Township, Chester County, PA  
**Project Name:** Gateway Multimodal Transportation Study - Tredyffrin Township  
**Project Number:** 816452.11

**Roadway(s):** Valley Forge Road (S.R. 0252) and Swedesford Road  
**Project Description:** Evaluate multi-modal transportation connections within the northeastern section of Tredyffrin Township to provide access to all users and provide links between key transportation assets and major destinations within the community.

**Unit Costs Last Revised:** 11/15/2018  
**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.

See the attached intersection specific notes for additional items which should be considered when estimating the cost of design and construction of the proposed improvements.

**Project Area 1: Valley Forge Road (S.R. 0252) - Walker Road to Anthony Wayne Drive**

Item No.	Description	Cost
1	Total Roadway Construction Cost	\$469,410.00
2	Construction Inspection	\$56,330.00
3	Total Roadway Construction + Inspection	\$525,740.00
4	Surveying, Engineering & Permitting	\$187,764.00
5	Utility Relocations	\$60,000.00
6	Right-of-Way Acquisition	\$50,000.00
7	Total Cost (2018 Dollars)	\$823,504.00

**Project Area 2: Gateway Shopping Center Property**

Item No.	Description	Cost
1	Total Roadway Construction Cost	\$231,855.00
2	Construction Inspection	\$27,823.00
3	Total Roadway Construction + Inspection	\$259,678.00
4	Surveying, Engineering & Permitting	\$92,742.00
5	Utility Relocations	\$0.00
6	Right-of-Way Acquisition	\$0.00
7	Total Cost (2018 Dollars)	\$352,420.00

**Project Area 3: Swedesford Road - Gateway Shopping Center to Valley Road (S.R. 1010)**

Item No.	Description	Cost
1	Total Roadway Construction Cost	\$370,581.00
2	Construction Inspection	\$44,470.00
3	Total Roadway Construction + Inspection	\$415,051.00
4	Surveying, Engineering & Permitting	\$148,233.00
5	Utility Relocations	\$60,000.00
6	Right-of-Way Acquisition	\$40,000.00
7	Total Cost (2018 Dollars)	\$663,284.00

**Total Project Cost (2018 Dollars) \$1,839,208.00**

**General Notes:**

- The following costs are rough estimates for budgeting purposes only: Right-of-Way, Construction Inspection, Engineering and Permitting and Utility Relocation. The costs associated with these items will need to be determined through the development of the project. Contingency, Construction Inspection and Inflation are based on PennDOT Publication 352.
- Refer to the intersection spreadsheet details relating to cost calculations and individual intersection assumptions.
- The Engineer's Conceptual Opinion of Cost does not include relocating or resetting existing aboveground/ underground utilities within the limits of the project. Impacts to existing 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, it is recommended (and likely required by law) that utility test pits be performed during the preliminary engineering of the project.**
- The right-of-way and easement acquisition cost is an assumed value based on limited field reconnaissance. The quantity and cost of the required temporary and permanent easement and right-of-way will be determined during the preliminary engineering of the project. The right-of-way fees should be evaluated by a property acquisition firm.
- The size, type and location of all required SWM facilities will need to be determined during the preliminary engineering of the project.



# B | Engineers Opinion of Probable Cost

McMahon Associates, Inc.  
Engineer's Conceptual Opinion of Cost

11/15/2017  
Prepared By: JWJ  
Checked By: JJK

**Engineer's Conceptual Opinion of Cost for  
Valley Forge Road (S.R. 0252) - Walker Road to Anthony Wayne Drive  
Tredyffrin Township, Chester County, PA**

11/15/2018

Item No.	Description	Comment	Unit	Quantity	Unit Cost	Cost
<b>Standard Items</b>						
1	Clearing and Grubbing		LS	1	\$20,000.00	\$20,000.00
2	Class 1 Excavation	For Pavement and Infiltration Trench	CY	570	\$55.00	\$31,350.00
3	Foreign Borrow		CY	150	\$60.00	\$9,000.00
4	Grading (includes topsoil and seeding)	For Roadside Restoration	SY	1,100	\$12.00	\$13,200.00
5	Full Depth Bituminous Pavement Including Wearing Course (8" Bituminous Base Course & No. 2A Sub-base, 8" Depth)		SY	80	\$115.00	\$9,200.00
6	Driveway Adjustments	Reinforced Concrete Pavement	SY	50	\$125.00	\$6,250.00
7	Plain Cement Concrete Curb		LF	355	\$40.00	\$14,200.00
8	Drainage	Yard Drains, Pipe, etc.	LS	1	\$10,000.00	\$10,000.00
9	Cement Concrete Sidewalk		SY	525	\$75.00	\$39,375.00
10	24" White Pavement Markings, Hot Thermoplastic Paint		LF	975	\$8.00	\$7,800.00
11	Marking Legend, Hot Thermoplastic Paint		EA	2	\$250.00	\$500.00
12	Post Mounted Signs		EA	5	\$150.00	\$750.00
<b>Special Items</b>						
13	ADA Curb Ramps		EA	15	\$6,500.00	\$97,500.00
14	Fence	Relocate/Reset	LF	360	\$35.00	\$12,600.00
15	Landscaping		LS	1	\$15,000.00	\$15,000.00
16	Stormwater BMPs	Stone Infiltration Trench	LS	1	\$30,000.00	\$30,000.00
17	Traffic Signal Equipment	Equipment for ADA Crossing	LS	1	\$50,000.00	\$50,000.00
18	<b>Subtotal Roadway Construction Cost</b>	<b>Items 1 - 17</b>				<b>\$366,725.00</b>
19	Maintenance and Protection of Traffic	10% of Item 18				\$36,673.00
20	Erosion and Sediment Control	3% of Item 18				\$11,002.00
21	Mobilization	5% of Item 18				\$18,337.00
22	Contingency	10% of Item 18				\$36,673.00
23	<b>Total Roadway Construction Cost</b>	<b>Items 18 - 22</b>				<b>\$469,410.00</b>
24	Construction Inspection	12% of Item 23				\$56,330.00
25	<b>Total Roadway Construction + Inspection</b>	<b>Items 23 - 24</b>				<b>\$525,740.00</b>
26	Surveying, Engineering and Permitting	40% of Item 23				\$187,764.00
27	Utility Relocations (Poles)		LS	1	\$60,000.00	\$60,000.00
28	Right-of-Way Acquisitions		LS	1	\$50,000.00	\$50,000.00
29	<b>Total Project Cost (2018)</b>	<b>Items 25 - 28</b>				<b>\$823,504.00</b>

**Assumptions:**

-The Engineer's Conceptual Opinion of Cost includes a lump-sum estimate for roadway drainage and Stormwater BMPs. The type, location and size of these facilities must be determined during preliminary engineering of the project, based on existing topography and existing stormwater management facilities (if any).





# B | Engineers Opinion of Probable Cost

McMahon Associates, Inc.  
Engineer's Conceptual Opinion of Cost

11/15/2017  
Prepared By: JJJ  
Checked By: JJK

**Engineer's Conceptual Opinion of Cost for  
Gateway Shopping Center Property  
Tredyffrin Township, Chester County, PA**

11/15/2018

Item No.	Description	Comment	Unit	Quantity	Unit Cost	Cost
<b>Standard Items</b>						
1	Clearing and Grubbing		LS	1	\$14,000.00	\$14,000.00
2	Class 1 Excavation	For Pavement and Infiltration Trench	CY	325	\$55.00	\$17,875.00
3	Foreign Borrow		CY	120	\$60.00	\$7,200.00
4	Grading (includes topsoil and seeding)	For Roadside Restoration	SY	745	\$12.00	\$8,940.00
5	Full Depth Bituminous Pavement Including Wearing Course (8" Bituminous Base Course & No. 2A Sub-base, 8" Depth)		SY	30	\$115.00	\$3,450.00
6	Plain Cement Concrete Curb		LF	105	\$40.00	\$4,200.00
7	Cement Concrete Sidewalk		SY	347	\$75.00	\$26,025.00
8	Type 31 Guide Rail w/ Wood Shield for Pedestrians		LF	103	\$35.00	\$3,605.00
9	Drainage	Yard Drains, Pipe, etc.	LS	1	\$15,000.00	\$15,000.00
10	6" White Pavement Markings, Hot Thermoplastic Paint		LF	120	\$1.50	\$180.00
11	24" White Pavement Markings, Hot Thermoplastic Paint		LF	120	\$8.00	\$960.00
12	Post Mounted Signs		EA	5	\$150.00	\$750.00
<b>Special Items</b>						
13	ADA Curb Ramps		EA	6	\$6,500.00	\$39,000.00
14	Grade Separator	Corner of UPI No. 43-5M-42	LS	1	\$3,000.00	\$3,000.00
15	Pedestrian Railing		LF	45	\$210.00	\$9,450.00
16	Landscaping		LS	1	\$7,500.00	\$7,500.00
17	Stormwater BMPs	Stone Infiltration Trench/Rain Garden	LS	1	\$20,000.00	\$20,000.00
18	<b>Subtotal Roadway Construction Cost</b>	<b>Items 1 - 17</b>				<b>\$181,135.00</b>
19	Maintenance and Protection of Traffic	10% of Item 18				\$18,114.00
20	Erosion and Sediment Control	3% of Item 18				\$5,435.00
21	Mobilization	5% of Item 18				\$9,057.00
22	Contingency	10% of Item 18				\$18,114.00
23	<b>Total Roadway Construction Cost</b>	<b>Items 18 - 22</b>				<b>\$231,855.00</b>
24	Construction Inspection	12% of Item 23				\$27,823.00
25	<b>Total Roadway Construction + Inspection</b>	<b>Items 23 - 24</b>				<b>\$259,678.00</b>
26	Surveying, Engineering and Permitting	40% of Item 23				\$92,742.00
27	Utility Relocations (Poles)		LS	1	\$0.00	\$0.00
28	Right-of-Way Acquisitions		LS	1	\$0.00	\$0.00
29	<b>Total Project Cost (2018)</b>	<b>Items 25 - 28</b>				<b>\$352,420.00</b>

**Assumptions:**

-The Engineer's Conceptual Opinion of Cost includes a lump-sum estimate for roadway drainage and Stormwater BMPs. The type, location and size of these facilities must be determined during preliminary engineering of the project, based on existing topography and existing stormwater management facilities (if any).



# B | Engineers Opinion of Probable Cost

McMahon Associates, Inc.  
Engineer's Conceptual Opinion of Cost

11/15/2017  
Prepared By: JJJ  
Checked By: JJK

**Engineer's Conceptual Opinion of Cost for  
Swedesford Road - Gateway Shopping Center to Valley Road (S.R. 1010)  
Tredyffrin Township, Chester County, PA**

11/15/2018

Item No.	Description	Comment	Unit	Quantity	Unit Cost	Cost
<b>Standard Items</b>						
1	Clearing and Grubbing		LS	1	\$20,000.00	\$20,000.00
2	Class 1 Excavation	For Pavement and Infiltration Trench	CY	150	\$55.00	\$8,250.00
3	Foreign Borrow		CY	500	\$60.00	\$30,000.00
4	Grading (includes topsoil and seeding)	For Roadside Restoration	SY	1,400	\$12.00	\$16,800.00
5	Full Depth Bituminous Pavement Including Wearing Course (8" Bituminous Base Course & No. 2A Sub-base, 8" Depth)		SY	15	\$115.00	\$1,725.00
6	Driveway Adjustment		SY	90	\$80.00	\$7,200.00
7	Plain Cement Concrete Curb		LF	115	\$40.00	\$4,600.00
8	Cement Concrete Sidewalk		SY	420	\$75.00	\$31,500.00
9	Plain Cement Concrete Pavement, 4" Thickness		SY	10	\$120.00	\$1,200.00
10	Type 31 Guide Rail w/ Wood Shield for Pedestrians		LF	450	\$35.00	\$15,750.00
11	Impact Attenuator		EA	1	\$3,500.00	\$3,500.00
12	Drainage	Yard Drains, Pipe, etc.	LS	1	\$15,000.00	\$15,000.00
13	6" White Pavement Markings, Hot Thermoplastic Paint		LF	300	\$1.50	\$450.00
14	24" White Pavement Markings, Hot Thermoplastic Paint		LF	130	\$8.00	\$1,040.00
15	Post Mounted Signs		EA	10	\$150.00	\$1,500.00
<b>Special Items</b>						
16	ADA Curb Ramps		EA	7	\$6,500.00	\$45,500.00
17	Pedestrian Railing		LF	50	\$210.00	\$10,500.00
18	Landscaping		LS	1	\$10,000.00	\$10,000.00
19	Culvert Modifications	Wingwall Extension	LS	1	\$25,000.00	\$25,000.00
20	Stormwater BMPs	Infiltration Berm	LS	1	\$20,000.00	\$20,000.00
21	Traffic Signal Equipment		LS	1	\$20,000.00	\$20,000.00
22	<b>Subtotal Roadway Construction Cost</b>	<b>Items 1 - 21</b>				<b>\$289,515.00</b>
23	Maintenance and Protection of Traffic	10% of Item 22				\$28,952.00
24	Erosion and Sediment Control	3% of Item 22				\$8,686.00
25	Mobilization	5% of Item 22				\$14,476.00
26	Contingency	10% of Item 22				\$28,952.00
27	<b>Total Roadway Construction Cost</b>	<b>Items 22 - 26</b>				<b>\$370,581.00</b>
28	Construction Inspection	12% of Item 27				\$44,470.00
29	<b>Total Roadway Construction + Inspection</b>	<b>Items 27 - 28</b>				<b>\$415,051.00</b>
30	Surveying, Engineering and Permitting	40% of Item 27				\$148,233.00
31	Utility Relocations (Poles)		LS	1	\$60,000.00	\$60,000.00
32	Right-of-Way Acquisitions		LS	1	\$40,000.00	\$40,000.00
33	<b>Total Project Cost (2018)</b>	<b>Items 29 - 32</b>				<b>\$663,284.00</b>

**Assumptions:**

-The Engineer's Conceptual Opinion of Cost includes a lump-sum estimate for roadway drainage and Stormwater BMPs. The type, location and size of these facilities must be determined during preliminary engineering of the project, based on existing topography and existing stormwater management facilities (if any).





Standard	181: SLDO	208: Zoning	177: Streets and Sidewalks
<b>Pedestrian Facilities</b>			
<b>Definitions</b>	Sidewalk: An improved all-weather paved area parallel to and separate from the street which is used as a pedestrian walking area.	Sidewalk: An improved all-weather paved area parallel to and separate from the street which is used as a pedestrian walking area.	not covered
<b>When Required?</b>	Article IX-46M: 1) required for properties fronting Green Routes Pedestrian Network, otherwise may be required if meets goal in comp plan	not covered	not covered
<b>Where Required?</b>	Article IX-46M: 3) both sides of street, unless land development is only on one side	Article XVIII-72A: Sidewalks shall be provided between a building and the street. For Town Center District lots located more than 1.0 mile from a train station measured in a radius from the center of the train station, the Planning Commission shall have the discretion to approve a modified pedestrian circulation design in conjunction with a proposed site design.; Article XX-83.1B: Sidewalks shall be provided on all streets and as needed on internal roadways so as to create direct pedestrian linkages throughout the district and the Paoli area, in particular, to the multi-modal transportation center.	not covered
<b>Design Standards</b>	Article IX-46M: General- 6' sidewalk with 6' buffer in commercial area, 4' sidewalk with 5' buffer in residential area; different standards for Lancaster Ave	Streetscape design regulations in 181-46M	not covered
<b>Owner/maintenance?</b>	not covered	not covered	177-12A: Not later than 30 hours after snow or sleet has ceased to fall, it shall be the duty of all tenants or occupants of occupied properties and the owners or agents in charge of unoccupied properties abutting on public streets in Tredyffrin Township to clear or cause to be cleared a pathway in the sidewalk in front of their respective properties in the event of snow, or to cover the sidewalk with salt, cinders, sawdust or similar ice-control materials in the event of ice or sleet.
<b>ADA Standards Referenced?</b>	Article IX-46M: 7) Sidewalks shall be designed and constructed to meet all design criteria required by the Americans with Disabilities Act.	not covered	not covered
<b>Bus Stop Amenities?</b>	Article IX-46M: 4) The area between the buildings and parallel to the sidewalk shall contain a combination of shade trees, ground cover, planting beds and grass and pedestrian amenities such as bus shelters.	Allowed in all zoning districts except the Flood Hazard District (208-122)	not covered
<b>Crosswalks Covered?</b>	Article IX-45B: Pedestrian crosswalks shall be provided within blocks of over 1,000 feet in length.; Article IX-46M: 9) Crosswalks not less than 10 feet wide and with paving not less than four feet wide shall be required where necessary to provide access to schools, churches, parks and commercial areas. Crosswalks shall be maintained by the abutting property owners or homeowners' association in the same manner as sidewalks on public or private streets.	208-102A(5): Pedestrian walkways and crosswalks must be provided within any parking area containing more than 60 cars, or where any parking space is located more than 100 feet from the entrance to any building served by the parking facility. Pedestrian walkways and crosswalks must be a minimum of four feet wide, and adequately marked and lighted.	not covered



Standard	181: SLDO	208: Zoning	177: Streets and Sidewalks
<b>Trail Facilities</b>			
<b>Definitions</b>	not covered	not covered	N/A
<b>When Required?</b>	Article IX-46M: 1) required for properties fronting Green Routes Pedestrian Network, otherwise may be required if meets goal in comp plan	not covered	N/A
<b>Where Required?</b>	Article IX-46M: 10) a system of bicycle, equestrian and/or pedestrian paths for public use generally unrelated to and separate from streets may be required and secured by dedication or easement. Such paths shall be consistent with any existing plans specified by the Township so as to encourage the formation of an interconnecting trail network both within and beyond the Township. (...) shall be located adjacent to existing or proposed lot lines or in such manner as to minimize any obstruction to the development. Existing paths may be relocated if a connection with a path on the property or on an adjoining property is established.	not covered	N/A
<b>Design Standards</b>	Article IX-46M: 10) Such paths normally shall not exceed 10 feet in width	not covered	N/A
<b>Owner/maintenance?</b>	not covered	not covered	N/A
<b>Surface Treatment</b>	Article IX-46M: 2) The approving Township authority for a subdivision or land development application shall determine whether a sidewalk or path or a combination of both is constructed with concrete, asphalt or another suitable material based on existing features of the land, potential usage of the sidewalk or path, and the general character of the area.	not covered	N/A
<b>Bicycle Facilities</b>			
<b>Definitions</b>	not covered	not covered	N/A
<b>When required?</b>	not covered	not covered	N/A
<b>Where required?</b>	not covered	not covered	N/A
<b>Design Standards</b>	not covered	not covered	N/A
<b>Owner/Maintenance?</b>	not covered	not covered	N/A
<b>Bicycle parking required?</b>	not covered	not covered	N/A



Standard	181: SLDO	208: Zoning	177: Streets and Sidewalks	195: Vehicles and Traffic
<b>Roadways</b>				
<b>Definitions</b>	Street: A public or privately owned right-of-way, serving as means of vehicular and pedestrian travel.; also defined - Cartway, Cul-de-sac, Right-of-way, Etc.	Street: A public or privately owned right-of-way, serving as means of vehicular and pedestrian travel.; also defined - Arterial Highway, Collector Road, Cul-de-sac, Road, Etc.	Street: An open way, generally paved and usually publicly owned, serving as a means of vehicular and/or pedestrian passage and furnishing access to abutting properties.; also defined- Right-of-way, Road	195-1A: the word "street" may be used interchangeably with the word "highway" and shall have the same meaning as the word "highway" as defined in the Vehicle Code.
<b>Various Provisions</b>	contains very detailed design standards- "thoughtful and imaginative design"; "curvilinear design"	mostly refers to building setbacks	regulates street excavation	195-50: Speed Limits; 195-51: Signals; 195-57: Through Streets; 195-58: Stop Intersections; 195-50: Truck Traffic; 195-66: Parking Permit Zones; various other traffic and parking ordinances

