

Potential Programmatic Enhancements

- Bus Schedule/Ride Time Evaluation
- Student Dismissal - Buses vs. Other Vehicles
- Additional Staff in the drop-off/pick-up areas
- Student Dismissal Times (e.g. Conestoga High School and T/E Middle School).
- Additional Crossing Guards
- Municipal Enforcement of Existing Parking Restrictions
- Potential Grant Funding Opportunities

➤ Conestoga High and T/E Middle Schools

- Bus Turnaround Area for sports team buses
- Additional Bus/Vehicle Queue Lane on Old State Road
- Vehicle Queue Area on Conestoga Road
- EB Conestoga Road Left Turn Lane at Cassatt Road
- Review/Modify Traffic Signal Operations
- T/E Middle School Additional Parking Lot and Queue Lane

➤ **Valley Forge Middle School**

- Secondary Driveway to Chesterbrook Boulevard
- EB Walker Road Right Turn Lane
- SB Valley Forge Road Right Turn Lane

➤ **Valley Forge Elementary School**

- Secondary Driveway
- WB Walker Road Right Turn Lane
- EB Walker Road Left Turn Lane
- Widen Existing Driveway

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TRAFFIC/CIRCULATION IMPROVEMENTS STUDY

*Tredyffrin / Easttown School District
Valley Forge Elementary School
Valley Forge Middle School
Tredyffrin Easttown Middle School
Conestoga High School*

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Figures

FIGURE 1 – Tredyffrin Township Zoning Ordinance – Chapter 208: Attachment 3

FIGURE 2 – Tredyffrin Township Stormwater Applicability Requirements – Chapter 174: Table 7.1

FIGURE 3 – Valley Forge Elementary School Zoning Summary

FIGURE 4 – Valley Forge Middle School Zoning Summary

FIGURE 5 – Tredyffrin Easttown Middle School Zoning Summary

FIGURE 6 – Conestoga High School Zoning Summary

FIGURE 6A – Irish Road Parking Lot Zoning Summary

1. EXECUTIVE SUMMARY

The Tredyffrin/Easttown School District is evaluating potential designs to improve vehicular access and circulation in and around the Valley Forge Elementary School, Valley Forge Middle School, Tredyffrin Easttown Middle School, and Conestoga High School. Heckendorn Shiles Architects has coordinated with the School District and prepared potential options to improve the existing conditions. Pennoni was retained to review the selected improvements and evaluate each for preliminary permitting and construction costs. These improvements were evaluated using available aerial images, GIS data, existing records, and sketches provided by Heckendorn Shiles Architects. The development of base plans with greater detail and a revised Township ordinance review is recommended if the School District decides to construct one of the proposed improvements.

2. VALLEY FORGE ELEMENTARY SCHOOL

2.1. OVERALL ORDINANCE REVIEW

Valley Forge Elementary School is in Tredyffrin Township within the R1-Residential zoning district. The parcel has frontage along Walker Road, a local road. Uses owned and operated by a public agency, public school district, are permitted by right within the zoning district. The parcel of land is subject to the bulk area requirements as defined in §208-23 and Attachment 3 of the zoning ordinance for nondwelling use. Attachment 3 has been included as Figure 1. The zoning summary for the parcel, Figure 3, has been prepared for the existing conditions of the site and the proposed improvements.

The existing conditions were found to have, but not limited to, two zoning nonconformities. The maximum building coverage exceeds the permitted coverage by approximately 0.1% and existing sidewalks are located within the required buffer to the adjacent residential properties.

2.2. SECOND DRIVEWAY OFF OF WALKER ROAD

2.2.1. ORDINANCE REVIEW

The proposed improvement includes the construction of a two-lane driveway and access drive between the existing driveway and Anthony Walker Drive.

Impervious coverage on the parcel is permitted up to 25%. A second driveway off Walker Road will result in the need for a variance from §208-23(C) of the zoning ordinance for the maximum permitted impervious cover. The additional impervious surface from the proposed driveway will result in coverage of 26.80%, approximately 18,325 SF of additional on-site impervious surface. A second accessway is required to be constructed at least 300 FT from the existing accessway per §208-102(C)(1).

The parcel abuts residential districts on all sides and a buffer area of 25 FT is required per §208-23(H) when a nondwelling use abuts a residential district. The proposed driveway will be the second within the buffer area and a second driveway within a buffer area is permitted only by special exception from the zoning hearing board.

The "2017 Parking Study Update" prepared by Daley and Jalboot Architects identified that 76 parking spaces were required by code and there were 100 existing parking spaces. The proposed design will increase the total onsite parking to 117 spaces.

The construction of the driveway will create land disturbance and will be subject to requirements of the Township's Subdivision and Land Development Ordinance and Planning Commission's approval. Land development projects proposing more than 500 SF of impervious surface are subject to the requirements of the Township's Stormwater Management Ordinance. Figure 2 summarizes the stormwater management

requirements per the total proposed impervious surface. Storm sewer infrastructure and an infiltrating stormwater management facility of approximately 3,665 SF in area, sized per the 5:1 impervious coverage loading ratio, will be necessary to manage the stormwater runoff from the proposed driveway. The stormwater management facility will be designed to meet the requirements specified in the Township's ordinance.

2.2.2. ESTIMATED CONSTRUCTION BUDGET AND SCHEDULE

ITEM	EST. COST
VALLEY FORGE ELEMETARY SCHOOL	
SECONDARY DRIVEWAY OFF OF WALKER ROAD	
REMOVE - TREES	\$ 8,000
REMOVE - CONCRETE CURB	\$ 3,000
REMOVE - CONCRETE SIDEWALK	\$ 500
REMOVE - ASPHALT PAVING	\$ 1,500
REMOVE AND RELOCATION - SITE UTILITES	\$ 35,000
EARTHWORK/GRADING/FINE GRADING	\$ 75,000
STORMWATER MANAGEMENT	\$ 80,000
NEW ASPHALT - FULL DEPTH	\$ 107,000
ASPHALT PAVING - MILL and OVERLAY	\$ 31,000
NEW CONCRETE CURB	\$ 66,000
PAVEMENT STRIPING	\$ 10,000
NEW LIGHTING	\$ 75,000
EROSION & SEDIMENTATION CONTROLS	\$ 25,000
GENERAL CONDITIONS (15%)	\$ 77,550
CONTINGENCY (20%)	\$ 103,400
Subtotal	\$ 697,950

* Cost estimate does not include property/Right-of-Way acquisition

Preparation of construction documentation will take approximately 3-4 months. The permitting process will take approximately 4-6 months to receive Township and conservation district approvals. Construction of the proposed improvements will take approximately 3-4 months. A revised budget and schedule is recommended to be prepared as additional details of the improvement are developed.

2.3. WIDENED DRIVEWAY, EASTBOUND/WESTBOUND WALKER ROAD LEFT/RIGHT TURN LANE

2.3.1. ORDINANCE REVIEW

The proposed improvement includes the construction of a left turn lane and right turn lane in Walker Road at the existing driveway. The existing driveway is also proposed to be widened to add additional lanes for traffic.

A widened driveway off Walker Road will result in the need for a variance from §208-102(C)(1) of the zoning ordinance for the maximum permitted width of an accessway. The existing accessway is approximately 24 FT wide and an additional lane will increase the total width of the accessway. Impervious coverage on the parcel is permitted up to 25%. The additional impervious surface from the proposed driveway will result in coverage of 24.58%, approximately 2,100 SF of additional on-site impervious surface. The additional impervious surface from the turning lanes is approximately 3,450 SF in area.

The parcel abuts residential districts on all sides and a buffer area of 25 FT is required per §208-23(H) when a nondwelling use abuts a residential district. The proposed right and left turn lanes will require the adjacent sidewalk along Walker Road to be reconstructed within the buffer. Sidewalk is not permitted in the buffer and a variance from §208-102(B)(2) of the zoning ordinance will be required and additional Right-of-Way may be required and is not part of the cost estimate.

The construction of the widened driveway and turning lanes are public improvements that will be dedicated to the Township, create land disturbance and will be subject to requirements of the Township's Subdivision and Land Development Ordinance and Planning Commission's approval. Land development projects proposing more than 500 SF of impervious surface are subject to the requirements of the Township's Stormwater Management Ordinance. Figure 2 summarizes the stormwater management requirements per the total proposed impervious surface. Storm sewer infrastructure and an infiltrating stormwater management facility of approximately 690 SF in area, sized per the 5:1 impervious coverage loading ratio, will be necessary to manage the stormwater runoff from the proposed impervious surfaces. The stormwater management facility will be designed to meet the requirements specified in the Township's ordinance.

2.3.2. ESTIMATED CONSTRUCTION BUDGET AND SCHEDULE

ITEM	EST. COST
VALLEY FORGE ELEMETARY SCHOOL	
WB RIGHT TURN LANE, EB LEFT TURN LANE, & WIDEN DRIVEWAY	
REMOVE - CONCRETE CURB	\$ 3,000
REMOVE - CONCRETE SIDEWALK	\$ 3,600
REMOVE AND RELOCATION - SITE UTILITES	\$ 15,000
EARTHWORK/GRADING/FINE GRADING	\$ 25,000
STORMWATER MANAGEMENT	\$ 60,000
NEW ASPHALT - FULL DEPTH	\$ 20,500
ASPHALT PAVING - MILL and OVERLAY	\$ 20,000
CONCRETE SIDEWALK PAVING	\$ 90,000
NEW CONCRETE CURB	\$ 30,000
PAVEMENT STRIPING	\$ 5,000
EROSION & SEDIMENTATION CONTROLS	\$ 10,000
GENERAL CONDITIONS (15%)	\$ 42,315
CONTINGENCY (20%)	\$ 56,420
Subtotal	\$ 380,835

* Cost estimate does not include property/Right-of-Way acquisition

Preparation of construction documentation will take approximately 3-4 months. The permitting process will take approximately 4-6 months to receive Township and conservation district approvals. Construction of the proposed improvements will take approximately 2-3 months. A revised budget and schedule is recommended to be prepared as additional details of the improvement are developed.

2.4. COVERED DROP-OFF AREAS

2.4.1. ORDINANCE REVIEW

The proposed improvement includes the construction of a canopy along the existing drive aisle in the area of the front door. Existing sidewalk and curb is also proposed to be replaced.

Covered drop-off areas will require a determination from the Township as to whether they will be considered an increase in building coverage. Building coverage on the parcel is permitted up to 10%. The proposed covered drop-offs are approximately 12,367 SF in area and will increase the overall site building coverage to 11.76%. A variance from §208-23(B) of the zoning ordinance will be required for the increased coverage. An

impervious surface increase of approximately 850 SF will result from the proposed covered drop-offs.

The construction of the covered drop-off areas will result in land disturbance and will be subject to requirements of the Township's Subdivision and Land Development Ordinance and Planning Commission's approval. Land development projects proposing more than 500 SF of impervious surface are subject to the requirements of the Township's Stormwater Management Ordinance. Figure 2 summarizes the stormwater management requirements per the total proposed impervious surface. Storm sewer infrastructure and an infiltrating stormwater management facility of approximately 170 SF in area, sized per the 5:1 impervious coverage loading ratio, will be necessary to manage the stormwater runoff from the proposed impervious surfaces. The stormwater management facility will be designed to meet the requirements specified in the Township's ordinance.

2.4.2. ESTIMATED CONSTRUCTION BUDGET AND SCHEDULE

ITEM	EST. COST
VALLEY FORGE ELEMETARY SCHOOL	
COVERED DROP-OFF AREA	
REMOVE - CONCRETE CURB	\$ 2,500
REMOVE - CONCRETE SIDEWALK	\$ 5,000
STORMWATER MANAGEMENT	\$ 50,000
CONCRETE SIDEWALK PAVING	\$ 10,000
NEW CONCRETE CURB	\$ 10,500
EROSION & SEDIMENTATION CONTROLS	\$ 5,000
GENERAL CONDITIONS (15%)	\$ 12,450
CONTINGENCY (20%)	\$ 16,600
Subtotal	\$ 112,050

* Cost estimate does not include property/Right-of-Way acquisition

Preparation of construction documentation will take approximately 2-3 months. The permitting process will take approximately 4-6 months to receive Township and conservation district approvals. The fabrication schedule and cost of the structure should be reviewed with the contractor and fabricator. A revised schedule is recommended to be prepared as additional details of the improvement are developed.

3. VALLEY FORGE MIDDLE SCHOOL

3.1. OVERALL ORDINANCE REVIEW

Valley Forge Middle School is in Tredyffrin Township within the R1/2-Residential zoning district. The school district property to the north of the middle school property contains athletic fields and was not reviewed as part of this feasibility study. The parcel has frontage along Walker Road and Chesterbrook Boulevard, local roads, and Valley Forge Road, state route 252. Uses owned and operated by a public agency, public school district, are not permitted by right within the zoning district. The parcel of land is subject to the bulk area requirements as defined in §208-19 and Attachment 3 of the zoning ordinance for nondwelling use. Attachment 3 has been included as Figure 1. The zoning summary for the parcel, Figure 4, has been prepared for the existing conditions of the site and the proposed improvements.

The existing conditions were found to have, but not limited to, eight zoning nonconformities. The current use is not permitted by right, maximum building coverage exceeds the permitted coverage by approximately 2.8%, the maximum impervious coverage exceeds the permitted coverage by approximately 5.86%, a building is located in the rear yard, a buffer is not provided along the Walker Road, sidewalk exists within the Walker Road buffer area, Walker Road contains too many access points, and the accessways are not separated by 300 FT.

3.2. EASTBOUND WEST WALKER ROAD RIGHT TURN LANE

3.2.1. ORDINANCE REVIEW

The proposed improvement includes the construction of a right turn lane in West Walker Road for vehicle movements onto southbound Valley Forge Road.

The proposed turning lane improvements may affect the southern property owner. The improvements will impact the property line, the width of the lane, and associated grading. For the purposes of this study, improvements are assumed to be within the public right-of-way. The additional impervious surface from the turning lane is approximately 2,150 SF in area. Further coordination with the traffic engineer is recommended to review the possibility of adding a lane on the northern side of Walker Road to be aligned with Walker Road on the east side of Valley Forge Road.

The construction of the turning lane is a public improvement that will be dedicated to the Township, create land disturbance, and will be subject to requirements of the Township's Subdivision and Land Development Ordinance and Planning Commission's approval. Land development projects proposing more than 500 SF of impervious surface are subject to the requirements of the Township's Stormwater Management Ordinance. Figure 2 summarizes the stormwater management requirements per the total proposed impervious surface. Storm sewer infrastructure and an infiltrating stormwater management facility of approximately 430 SF in area, sized per the 5:1 impervious

coverage loading ratio, will be necessary to manage the stormwater runoff from the proposed impervious surface. The stormwater management facility will be designed to meet the requirements specified in the Township's ordinance.

3.2.2. ESTIMATED CONSTRUCTION BUDGET AND SCHEDULE

ITEM	EST. COST
VALLEY FORGE MIDDLE SCHOOL	
EASTBOUND WEST WALKER ROAD RIGHT TURN LANE	
REMOVE - CONCRETE CURB	\$ 1,000
REMOVE AND RELOCATION - SITE UTILITIES	\$ 50,000
EARTHWORK/GRADING/FINE GRADING	\$ 25,000
STORMWATER MANAGEMENT	\$ 100,000
NEW ASPHALT - FULL DEPTH	\$ 7,500
NEW CONCRETE CURB	\$ 10,000
PAVEMENT STRIPING	\$ 5,000
EROSION & SEDIMENTATION CONTROLS	\$ 20,000
GENERAL CONDITIONS (15%)	\$ 32,775
CONTINGENCY (20%)	\$ 43,700
Subtotal	\$ 294,975

* Cost estimate does not include property/Right-of-Way acquisition

Preparation of construction documentation will take approximately 3-4 months. The permitting process will take approximately 4-6 months to receive Township and conservation district approvals. Additional permitting time may be needed depending on the PennDOT Highway Occupancy Permit requirements for the improvements affecting Valley Forge Road. Construction of the proposed improvements will take approximately 2-3 months. A revised budget and schedule is recommended to be prepared as additional details of the improvement are developed.

3.3. SOUTHBOUND VALLEY FORGE ROAD RIGHT TURN LANE

3.3.1. ORDINANCE REVIEW

The proposed improvement includes the construction of a right turn lane on Valley Forge Road for vehicle movements onto westbound West Walker Road.

The majority of the construction of the turning lane will occur within the public right-of-way of Valley Forge Road. Valley Forge Road is a State road and will require a PennDOT Highway Occupancy Permit. Additional Right-of-Way may be required and is not part of the cost estimate. A wall may need to be constructed for the steeper grades on the

School District property adjacent to Valley Forge Road. The construction and schedule will be subject to the requirements of PennDOT and further coordination with Tredyffrin Township.

3.3.2. ESTIMATED CONSTRUCTION BUDGET AND SCHEDULE

ITEM	EST. COST
VALLEY FORGE MIDDLE SCHOOL	
SOUTHBOUND VALLEY FORGE ROAD RIGHT TURN LANE	
REMOVE - CONCRETE CURB	\$ 1,250
EARTHWORK/GRADING/FINE GRADING	\$ 40,000
STORMWATER MANAGEMENT	\$ 60,000
REMOVE AND RELOCATION – SITE/TRAFFIC UTILITIES	\$ 130,000
NEW ASPHALT - FULL DEPTH	\$ 15,250
NEW CONCRETE CURB	\$ 12,500
PAVEMENT STRIPING	\$ 5,000
EROSION AND SEDIMENTATION CONTROLS	\$ 20,000
GENERAL CONDITIONS (15%)	\$ 42,600
CONTINGENCY (20%)	\$ 56,800
Subtotal	\$ 383,400

* Cost estimate does not include property/Right-of-Way acquisition

Preparation of construction documentation will take approximately 3-4 months. The permitting process will take approximately 4-6 months to receive PennDOT, Township, and conservation district approvals. Additional permitting time may be needed depending on the PennDOT Highway Occupancy Permit requirements. Construction of the proposed improvements will take approximately 2-3 months. A revised budget and schedule is recommended to be prepared as additional details of the improvement are developed.

3.4. SECONDARY DRIVEWAY AT CHESTERBROOK BOULEVARD

3.4.1. ORDINANCE REVIEW

The proposed improvement includes the construction of a two-lane driveway and access drive to connect West Walker Road to Chesterbrook Boulevard.

The proposed driveway improvements may affect the southern property owner due to the property line location, the size of the required curb radius, establishment of a clear sight triangle, and associated grading and tree removal. The improvements are assumed to be within the public right-of-way for this study. Additional Right-of-Way and/or

easements may be required and is not part of the cost estimate. The additional impervious surfaces from the turning lane is approximately 3,634 SF in area.

The construction of the driveway is a public improvement that will be dedicated to the Township, create land disturbance and will be subject to requirements of the Township's Subdivision and Land Development Ordinance and Planning Commission's approval. Tree removal necessary for the improvements must be reviewed and approved by the Planning Commission. Land development projects proposing more than 500 SF of impervious surface are subject to the requirements of the Township's Stormwater Management Ordinance. Figure 2 summarizes the stormwater management requirements per the total proposed impervious surface. Storm sewer infrastructure and an infiltrating stormwater management facility of approximately 727 SF in area, sized per the 5:1 impervious coverage loading ratio, will be necessary to manage the stormwater runoff from the proposed impervious surface. The stormwater management facility will be designed to meet the requirements specified in the Township's ordinance.

3.4.2. ESTIMATED CONSTRUCTION BUDGET AND SCHEDULE

ITEM	EST. COST
VALLEY FORGE MIDDLE SCHOOL	
SECONDARY DRIVEWAY AT CHESTERBROOK BOULEVARD	
REMOVE - TREES	\$ 8,000
REMOVE - CONCRETE CURB	\$ 2,800
REMOVE AND RELOCATION - SITE UTILITES	\$ 15,000
EARTHWORK/GRADING/FINE GRADING	\$ 60,000
STORMWATER MANAGEMENT	\$ 150,000
NEW ASPHALT - FULL DEPTH	\$ 44,000
ASPHALT PAVING - MILL and OVERLAY	\$ 27,000
NEW CONCRETE CURB	\$ 12,500
PAVEMENT STRIPING	\$ 2,500
EROSION & SEDIMENTATION CONTROLS	\$ 20,000
GENERAL CONDITIONS (15%)	\$ 51,270
CONTINGENCY (20%)	\$ 68,360
Subtotal	\$ 461,430

* Cost estimate does not include property/Right-of-Way acquisition

Preparation of construction documentation will take approximately 3-4 months. The permitting process will take approximately 4-6 months to receive Township and conservation district approvals. Additional time may be needed for the development of easements and acquisition of Right-of-Way. Construction of the proposed improvements will take approximately 3-4 months.

A revised budget and schedule is recommended to be prepared as additional details of the improvement are developed.

3.5. NORTHBOUND VALLEY FORGE ROAD LEFT TURN ADVANCE

3.5.1. ORDINANCE REVIEW

The proposed improvement includes the construction of a left turn signal at the intersection of Valley Forge Road and West Walker Road for vehicles traveling northbound on Valley Forge Road. A left turn lane for vehicles currently exists.

The construction of the left turn signal will occur within the public right-of-way of Valley Forge Road. Valley Forge Road is a state road and will require a PennDOT Highway Occupancy Permit. The construction will be subject to the requirements of PennDOT.

3.5.2. ESTIMATED CONSTRUCTION BUDGET AND SCHEDULE

Adjusting the signal timing of the existing equipment for additional left turns and installing a new signal is estimated to take 4-6 months for design, permitting, and construction and cost approximately \$50,000. A revised budget and schedule is recommended to be prepared as additional details of the improvement are developed.

3.6. COVERED DROP-OFF AREAS

3.6.1. ORDINANCE REVIEW

The proposed improvement includes the construction of canopies along the existing drive aisle in the area of the front door. Existing sidewalk and curb is also proposed to be replaced.

Covered drop-off areas will require a determination from the Township as to whether they will be considered an increase in building coverage. Building coverage on the parcel is permitted up to 10%. The proposed covered drop-offs are approximately 6,508 SF in area and will increase the overall site building coverage to 13.38%. A variance from §208-19(B) of the zoning ordinance will be required for the increased coverage. An impervious surface increase of approximately 3,278 SF will result from the proposed covered drop-offs. Impervious coverage on the parcel is permitted up to 25% and the proposed coverage is 31.16%. A variance from §208-19(C) of the zoning ordinance will be required for the maximum permitted impervious cover.

The construction of the covered drop-off areas will create land disturbance and will be subject to requirements of the Township's Subdivision and Land Development Ordinance and Planning Commission's approval. Land development projects proposing

more than 500 SF of impervious surface are subject to the requirements of the Township's Stormwater Management Ordinance. Figure 2 summarizes the stormwater management requirements per the total proposed impervious surface. Storm sewer infrastructure and an infiltrating stormwater management facility of approximately 656 SF in area, sized per the 5:1 impervious coverage loading ratio, will be necessary to manage the stormwater runoff from the proposed impervious surfaces. The stormwater management facility will be designed to meet the requirements specified in the Township's ordinance.

3.6.2. ESTIMATED CONSTRUCTION BUDGET AND SCHEDULE

ITEM	EST. COST
VALLEY FORGE MIDDLE SCHOOL	
COVERED DROP-OFF AREAS	
REMOVE - CONCRETE CURB	\$ 1,500
REMOVE - CONCRETE SIDEWALK	\$ 15,000
STORMWATER MANAGEMENT	\$ 50,000
CONCRETE SIDEWALK PAVING	\$ 43,125
NEW CONCRETE CURB	\$ 12,250
EROSION & SEDIMENTATION CONTROLS	\$ 5,000
GENERAL CONDITIONS (15%)	\$ 19,031
CONTINGENCY (20%)	\$ 25,375
Subtotal	\$ 171,281

* Cost estimate does not include property/Right-of-Way acquisition

Preparation of construction documentation will take approximately 2-3 months. The permitting process will take approximately 4-6 months to receive Township and conservation district approvals. The fabrication schedule and cost of the structure should be reviewed with the contractor and fabricator. A revised schedule is recommended to be prepared as additional details of the improvement are developed.