

December 17, 2021

Tony Scheivert, Township Manager  
Upper Uwchlan Township Administrative Offices  
140 Pottstown Pike  
Chester Springs, PA 19425

**Re: Greenridge Road: 64-Lot Residential Community  
Conditional Use Plans (Third Submission)  
Upper Uwchlan Township, Chester County, PA  
UPI Nos. 32-2-17.1 and 32-1-11**

Dear Mr. Scheivert:

On behalf of the applicant, Toll Mid-Atlantic LP Company, Inc., please accept for review our responses to the review letter prepared by Gilmore & Associates, Inc., dated November 4, 2021. The Greenridge Road: Conditional Use Subdivision Plans, dated August 10, 2021, last revised December 15, 2021, and the Fiscal & Recreation Impact Analysis revised December 17, 2021, have been updated in response to the review. Further, a supplement to the Transportation Impact Study (TIS), dated December 10, 2021, has been prepared to address the orientation of traffic counts.

The review letter prepared by Gilmore & Associates, Inc., dated November 4, 2021 has been addressed as follows:

## **II. ZONING ORDINANCE REVIEW**

1. Section 200-54.A(2)[3] – The site contains a Zone A (General) Floodplain. No development is proposed within the Floodplain, and a 150-foot DEP Buffer is shown.

***Response:*** *No response required.*

2. Section 200-69.C(5) – For any proposed activity requiring the submission of a wetland delineation report, stream or wetland encroachment permit, or mitigation plan to the Pennsylvania Department of Environmental Protection (DEP) and/or U.S. Army Corps of Engineers or successor agencies, a copy of all such documentation shall be submitted to the Township. Note #5 on Sheet 2 indicates that a Wetlands Jurisdictional Determination from US Army Corps of Engineers is pending. A copy shall be provided to the Township upon receipt.

***Response:*** *No response required.*

3. Section 200-69.D(4) – The proposed tot lot seems to be rather smaller relative to the size of the development. It also is rather isolated. We defer to the Township Planning Commission on this matter.

The Applicant has relocated the tot lot to a more centralized location on the site. In addition, the size of the lot has been increased to approximately 5,300 SF. For reference,

this would be more than twice the size of the tot lot located at the Reserve at Chester Springs.

**Response:** *The area for the tot lot has been relabeled on the plans as a pocket park and further expanded (+15,000 SF) to allow for play structures in addition to open areas for free play. The space for the pocket park has been moved closer to the intersection of Roads B and C for better visibility/security.*

4. Sections 200-72.C(2)(a)[1] and (b)[1] – Where permitted by the Board of Supervisors as a conditional use, an applicant may utilize the flexible\open space development option for development of any of the uses permitted within the R-2 zoning district. Single-family detached dwellings are proposed and are permitted in the R-2 and F-1 Districts.

**Response:** *No response required.*

5. Section 200-72.C(2)(a)[3] and (b)[3] – Open space uses as set forth in § 200-69 of this chapter is permitted within the F-1 District. The plan proposes 29.19 AC. Of Restricted Open Space; 26.38 AC. is required.

**Response:** *The plans have been revised to now show 29.13 AC of Restricted Open Space.*

6. Section 200-72.D(2)(a)[3][b] – Any area comprising wetlands under the jurisdiction of the U.S. Army Corps of Engineers and/or the Pennsylvania Department of Environmental Protection shall be excluded. The plans indicate that a USACE JD is pending for the site; therefore, the acreage listed on the plans may change slightly.

**Response:** *No response required.*

7. (V) Section 200-107.D(2) – Prohibitive Steep Slopes will be disturbed to construct at least Road A. A variance would be required for this disturbance and the applicant indicates one will be sought.

**Response:** *No response required.*

8. Section 200-107.D(3)(b)[2] - Although this section does permit disturbance of “Precautionary” Steep Slopes for the construction of a primary access as part of a conditional use process, the applicant has not requested this relief in their conditional use application. If it is being sought, the application should be updated accordingly.

Relief is now being requested from this section. Disturbance is permitted “when no practical alternative exists in an area of lesser slope.” While a connection to Lauren Lane would most likely not require disturbance of steep slopes, disturbance cannot be avoided with any connection to Greenridge Road.

**Response:** *No response required.*

9. Section 200-107.D(3)(b)[4] – Although this section does permit disturbance of “Precautionary” Steep Slopes for the construction of a sanitary and stormwater

conveyance systems as part of a conditional use process, the applicant has not requested this relief in their conditional use application. If it is being sought, the application should be updated accordingly.

Relief is now being requested from this section. As it is not possible to avoid these slopes to construct the required storm and sanitary sewer systems, for the development, we have no objection to the granting of this relief.

**Response:** *No response required.*

10. Section 200-117.E – The applicant shall provide verification adequate screening is provided between the site and the surrounding properties to screen the facility from view, preclude any glare from lighting or excessive noise from being ascertainable beyond the boundaries of the property. We defer to the Township Planning Commission and Brandywine Conservancy as to whether or not this requirement has been met.

**Response:** *The applicant will address the screening requirement during the Conditional Use hearing.*

11. Section 200-117.I – The applicant is requesting relief from the requirement to submit an historic impact statement that documents conformance to all requirements of Section 162.9.H of Chapter 162. We defer to the Township Planning Commission and Historic Commission on this matter.

The Township Historic Commission reviewed the application at their October 25, 2021 meeting and offered the following comments:

- Waive historic resource impact statement since only historic resource near proposed development is historic resource #16 and it is over 250 feet away
- Condition conditional use application approval on preservation of sight lines related to historic resource #16
- Condition conditional use application approval on further investigation by the Township of stone structure and any other identified possible historic structure, ruin or landscape feature
- If stone structure and any other structure, ruin or landscape feature determined to be historic resource:
  - o Condition conditional use application approval on preservation of historic stone structure and any other identified historic structure, ruin or landscape feature and sight lines thereto through incorporation into development plans and design

**Response:** *No response required.*

### **III. SUBDIVISION & LAND DEVELOPMENT ORDINANCE REVIEW**

1. **(W)** Section 162-30.A – Maximum grade for a local access road is 10%. The applicant is requesting a waiver to permit a maximum grade of 12%. If this waiver is to be considered as part of the conditional use process, a plan and profile of the roadway should be provided so an evaluation can be made. Otherwise, we would recommend this waiver request be defer until the land development submission.

As requested, the Applicant has provided a plan and profile indicating the proposed vertical alignment for the roadway. Based on our review of the submitted profile, it appears there may be an opportunity to reduce the slope of the section currently proposed to be constructed at 11% to 10% and increase the section of road currently proposed to be 6.08% to approximately 7% which would eliminate the need for this waiver. While we have no objection to the granting of this waiver to allow the roadway to be constructed as currently designed, we believe our above suggested configuration should be considered first.

**Response:** *As suggested, the road grades could be switched to 10% and 7%, which would lower the PVI at station 16+25 almost 8 feet. Based on our preliminary earthwork analysis, the site will have a net export of material using the 11% and 6% combination. Switching to the 10% / 7% combination will only exacerbate the material export situation. Additionally, it is preferred to hold a maximum 6% grade along the fronts of the homes. This provides for better grading for the lots and between the lots. Lastly, the 11% grade is along the unloaded portion of Road 'A', so there will be no lot grading or driveway slope issues.*

2. **(W)** Section 162-33.D – Single access streets, permanently designed as such, shall be not more than 500 feet in length for lots containing less than one acre. Proposed Road "A" exceeds this length. This section is included in Requested Variances/Waivers on Sheet 4. We defer to The Township Traffic Engineer as well as the Township Fire Marshall as to the acceptability of this waiver.

**Response:** *The Township Fire Chief has reviewed the community layout and has indicated the road network and widths are satisfactory for emergency service vehicles.*

3. **(W)** Section 162-39.E – All curbs shall conform to specification for Class A concrete. This section is included in Requested Variances/Waivers on Sheet 4, to permit Belgian block curbing. We have no objection to this waiver as Belgian Block is a suitable material substitute and has been successfully installed in several other developments in the Township.

**Response:** *No response required.*

4. **(W)** Section 162-41.A – Sidewalks may be required on both sides of new streets in residential subdivisions or land developments. The plans propose sidewalk on only one side of Road A and Road B. This section is included in Requested Variances/Waivers on Sheet 4. We defer to the Township Planning Commission on this matter.

**Response:** *Sidewalk is proposed on one side of Road A where there are no lots proposed. A trail is proposed on the southern side of Road A to connect between the sidewalk termination at Lot 64 and Greenridge Road. Sidewalk is not proposed on certain portions of Roads A, B and C. Where sidewalk is proposed, it is 5 feet in width.*

5. **(W)** Section 162-46.B(1) – All lots shall have direct access to a public street. This section is included in Requested Variances/Waivers on Sheet 4, to permit Lot 65 (The sanitary sewer disposal Lot) to exist as an interior lot accessed only via an easement. We

defer to the Township Planning Commission and Township Sewer Consultant on this matter.

**Response:** *No response required.*

## V. FINANCIAL AND RECREATIONAL ANALYSIS REVIEWS

### Recreation Impact Analysis

**(W) Section 162-54.D(3).** - This section provides recommended guidelines for the provision of playground or neighborhood park acreage in residential land developments. With 64 proposed dwelling units, a total of 3 acres of active recreation area is recommended. The Recreation Impact Analysis states that 3.29 acres of active recreation land, which includes a tot lot and walking trails are proposed. The applicant is requesting a waiver to permit active recreation land to be comprised of greater than 25% environmentally sensitive areas. The plans (sheet 4 of 13) show private nature trail included in the active recreation land. However, the definition of Active Recreation in the Zoning Ordinance includes playground, ball courts, and swimming pools while passive recreation is defined as “recreational pursuits which can be carried out with little alteration or disruption to the area in which they are performed.” Such uses include, but are not limited to, hiking, biking and picnicking. As such, not all of the active recreation lands required are to be used for active recreation. We defer comment on the suitability of the amount and type of recreation area proposed to the Planning Commission. However, we would recommend computations be provided which indicate how much in excess of the 25% threshold the proposed open space will be for the Township’s use in considering the waiver.

**Response:** *Section 162-54.D(3) is a Subdivision and Land Development Ordinance (“SALDO”), which requires a minimum amount of suitable areas for recreation. The plans have been updated to provide for 3.02 Acres of Required Playground & Neighborhood Park acreage, meeting the minimum required acreage per Section 162-54.C of the SALDO. This acreage is made up of a pocket park, located between Lots 18 & 19, trails located within 20’ wide public trail easements, both paved and unpaved, and the future Greenridge Road trail. “Active recreation” is not a defined term in the SALDO and the criteria for open space and recreation criteria contemplate trail and pathway uses with said areas.*

*Regarding calculations for the requested waiver, we offer the following for review:*

<b>§162-54.D(3) WAIVER CHART</b>	
PLAYGROUND & NEIGHBORHOOD PARK AREA	ENVIRONMENTALLY SENSITIVE AREA (AC.)
POCKET PARK	.01 AC. or 0%
PAVED TRAIL	.18 AC. or 6%
NATURE TRAIL	1.03 AC. or 34%
GREENRIDGE ROAD TRAIL	.49 ACRES or 16%
TOTAL AREA = 1.71 ACRES or 56%	

*It should be noted that, of the 1.71 Acres, the majority of land within environmentally sensitive areas is made up of what will be low-impact nature trails. The trails have been proposed on the property to mostly run with existing grade and will require minimum clearing to facilitate their use.*

### **Fiscal Impact Analysis**

Section 162-9.H(4)(a)-(c) - This section requires analyses of potential impacts to Public Works, the Township administration, fire and emergency services, and police services. These sections require detailed analyses of the proposed development's impact on the Township's ability to provide these services, projected cost increases, and increases in staff and infrastructure demands, among other requirements. The submitted Fiscal Impact Analysis does not specifically address these considerations. The October 4, 2021 response letter from ESE Consultants requests that the Board of Supervisors authorize the use of the per capita multiplier method (as currently used in the submitted Fiscal Impact Analysis) as opposed to the methodology provided in the Fiscal Impact Handbook to address these concerns. Per the response letter, the per capita multiplier method "includes an analysis of annual operating expenditures for future residents based on the Township's four operating funds, which include nearly all of the Township's expenditures, including those listed above." While the Fiscal Impact Analysis submitted provides detailed information regarding impact to the four operating funds, and therefore to the services mentioned above, we recommend that at a minimum, a brief statement on the anticipated impact to each of these services should be provided.

***Response:*** *The updated Fiscal Impact Analysis enclosed with this submission includes additional analysis and a statement regarding the anticipated impact to each of the referenced services.*

### **VI. TOWNSHIP TRAFFIC CONSULTANT COMMENTS** **McMAHON ASSOCIATES, INC.**

1. SALDO Section 162-9.H(2) – The traffic study has been revised to provide updated existing traffic counts conducted in October 2021, as well as revised trip generation to match the proposed number of residential units. Since traffic volumes have largely stabilized now that COVID-19 related shutdowns have been lifted for a significant time period, and since PennDOT is no longer requiring adjustments to existing traffic volumes, we support the use of the October 2021 traffic counts as a basis for the analysis.

***Response:*** *No response required.*

2. SALDO Section 162-9.H(2) – Based on the results of the traffic study, all of the study intersections will operate at overall LOS A, and all movements will operate at acceptable LOS C or better during the study peak hours in the future with the traffic generated by the proposed homes. In addition, no auxiliary turn lanes are warranted at the site access intersection.

***Response:*** *No response required.*

3. SALDO Section 162-9.H(2) – Please verify the orientation of the traffic counts used in the traffic study at the intersection of Font Road and Greenridge Road/St. Andrews Lane. If revisions are needed, we do not believe this will impact the traffic study results appreciably.

**Response:** *A Supplement to the TIS prepared by the Applicant's traffic engineer addressing the orientation of the traffic counts has been included with this submission.*

4. SALDO Section 162-28.A – Greenridge Road currently provides an approximate 20 to 21-foot cartway width along the site frontage, which does not meet the Township's requirements for a local road of 32 feet. As such, with Greenridge Road classified as a Distributor Road, the southbound Greenridge Road travel lane should be widened along the site frontage to provide a 16-foot half width cartway. The submission includes a Greenridge Road Widening Exhibit, which shows the widening along the site frontage. This plan is conceptual in nature, and more detailed review comments and revisions will be determined during land development. Further, the need to widen the road should be reviewed in light of the existing topography along Greenridge Road and the overall character of the road.

**Response:** *The plans have been updated to request relief from widening Greenridge Road along the property frontage due to the existing topography.*

5. SALDO Section 162-28.A – Roads A and B each provide a 32-foot wide cartway, which meets the Township's cartway width requirements for a local road. However, as with other recent residential developments in the Township, we could support a 28-foot wide cartway for Roads A and B, provided parking is only allowed on one side of the street. A 28-foot wide cartway would require a waiver. Furthermore, there is a long section of Road A with no homes, and with an excessively wide road, there is a greater chance for increased speeding.

**Response:** *The applicant has elected to maintain a 32-foot wide cartway through the site, consistent with its discussion with the Planning Commission.*

6. SALDO Sections 162-30.A – The applicant is requesting a waiver to allow an 11 percent grade along a section of Road A between Lots 4 and 64, which exceeds the required maximum grade along local streets of 10 percent. Based on our review of the detailed vertical design information provided on sheet 9, please note the following:

a. The K-value for the sag vertical curve provided at approximately STA 8+50 should be revised to be 37 in order to provide 200 feet of stopping sight distance.

**Response:** *The 'K' value has been updated.*

b. Based on the vertical profiles provided, it appears possible to revise the design to provide a maximum 10 percent grade (between STA 8+87.5 and STA 15+25) by increasing the 6.08% grade (between STA 17+50 and STA 24+65) to seven percent, which would no longer require the requested waiver.

As such, at this time, we do not support the waiver to allow the 11 percent grade until this is examined further, and unless additional information is provided to justify the waiver.

**Response:** As suggested, the road grades could be switched to 10% and 7%, which would lower the PVI at station 16+25 almost 8 feet. Based on our preliminary earthwork analysis, the site will have a net export of material using the 11% and 6% combination. Switching to the 10% and 7% combination will only exacerbate the material export situation. Additionally, it is preferred to hold a maximum 6% grade along the fronts of the homes. This provides for better grading for the lots and between the lots. Lastly, the 11% grade is along the unloaded portion of Road 'A', so there will be no lot grading or driveway slope issues.

7. SALDO Sections 162-32.F – During land development, please label all curb radii, which should be a minimum of 35 feet.

**Response:** The plans have been updated to show the curb radii measuring 35 feet.

8. SALDO Section 162-33.A – A single access shall not be approved wherever a through street is practical, except where the single access is clearly the basic principle for design of the subdivision. In this case, it appears a roadway connection to Lauren Lane is feasible, and if so, we recommend providing the road connection. Historically, the Township has endorsed connecting adjacent developments when feasible for creation of better access options, emergency access and community planning purposes. The applicant's proposed plan shows this connection as an emergency access only, which would be a reasonable solution only if the full connection is not feasible or approved for some other reason.

**Response:** The applicant is proposing an emergency access via a grass-pave connection to Lauren Lane with an offer of right-of-way dedication to the Township for an extension of Lauren Lane should the Township desire a full vehicular connection between the Property and the Stonehedge residential development. Residents of Stonehedge, through their attorney, and other residents of the Stonehedge development have requested that this connection be emergency access only.

9. SALDO Section 162-33.D – The applicant is requesting a waiver to allow a single access street that exceeds 500 feet. In order justify the waiver request, the applicant proposes the emergency grass paver connection to Lauren Lane, as well as offer a 50-foot wide right-of-way for an extension of Lauren Lane in the future, which would intersect Road A opposite the southern Road A/Road B intersection. Our office supports the full road connection to Lauren Lane. Also, the Township's emergency service personnel should review the proposed community layout and emergency access.

**Response:** The Township Fire Chief has reviewed the community layout and has indicated the road network and widths are satisfactory for emergency service vehicles.

10. SALDO Section 162-33.J – No driveway locations are shown on the plan. However, it is noted that no more than four lots are permitted to access the cul-de-sac turnaround.

**Response:** Driveways will be shown on the land development plans.

11. SALDO Section 162-41 – The applicant is requesting a waiver to allow sidewalk along only one side of Roads A and B in areas that provide homes on both sides of the road. We will defer to the Township on this; however, it has been our experience that sidewalk

on both sides of the road is generally welcomed by the residents, especially in those areas where homes are located.

**Response:** See response to Comment III.4 above.

12. The existing on-site trail requires two midblock pedestrian crossings, as currently proposed. We recommend relocating the trail in the vicinity of the Road A/Greenridge Road intersection so that the pedestrian crossing occurs at the intersection. In addition, during land development, the plans should be revised to provide a crosswalk and appropriate advance warning signing at the remaining midblock trail crossing.

**Response:** *The plans have been revised to extend sidewalk along Lots 58-64 to connect to the proposed nature trail to the South of Road A. The nature trail has also been extended down to the intersection of Road A and Greenridge Road. These revisions have allowed for pedestrian crossings to now occur at the intersection of Road A and Road B as well as Road A and Greenridge Road.*

13. ZO Section 200-75.H(3) –The following comments are based on the sight distance profile information provided on sheet 13:

a. The sight distance line for left-turn vehicles looking ahead (i.e., to the north) should be placed in the center of the northbound Greenridge Road travel lane, 35 feet south of the proposed Road A centerline.

**Response:** *The sight distance line has been revised.*

b. The sight distance line for left-turn vehicles looking behind (i.e., to the south) should be placed in the center of the northbound Greenridge Road travel lane, 45 feet south of the proposed Road A centerline.

**Response:** *The sight distance line has been revised.*

14. Chapter 79-8.C – The proposed redevelopment is located in the Township's Act 209 Transportation Service Area, and as such, this development is subject to the Townships Transportation Impact Fee of \$2,334 per weekday afternoon peak hour trip. Based on the Institute of Transportation Engineers publication Trip Generation 10th Edition, the proposed 64-unit single family home community will generate 66 new trips during the weekday afternoon peak hour. As such, the number of new weekday afternoon peak hour trips subject to the Township's Transportation Impact Fee is 66, and the resultant Transportation Impact Fee is \$154,044.

**Response:** *No response required.*

15. Upon resubmission, the applicant's engineer should compose a response letter that describes how each comment has been addressed and where any plan and/or report revisions are located.

**Response:** *No response required.*

16. Additional comments regarding the traffic improvements and/or land development plans may follow upon receipt of future submissions.

**Response:** *No response required.*

## **VII. TOWNSHIP PLANNING CONSULTANT COMMENTS BRANDYWINE CONSERVANCY**

### Steep Slope Conservation District

1. Zoning Ordinance § 200-107.E(2) states that in making its determination for Conditional Use approval, the Board shall give consideration to the requirements in § 200-107.E(1). We recommend that the Conditional Use Plan be updated to include the elements listed under § 200-107.E(1), including proposed grading and limit of disturbance.

**Response:** *A narrative addressing the requirements of §200-107.E(2) has been included as part of this submission. Engineered design of the proposed grading will occur during land development.*

2. We strongly discourage the proposed 6' wide private nature trail behind the back yards of proposed lots 26-29 and along the northern tract property line. The trail is proposed in the Steep Slope Conservation District with shallow soils and, if cleared, would be subject to severe erosion.

**Response:** *The nature trail behind Lots 26-29 has been removed.*

### Natural and Historic Features Conservation

3. The SALDO provides for a maximum disturbance of existing woodlands up to 25% per the Natural and Historic Features Conservation ordinance §162-55.B(3)(c). Disturbance in excess of 25% of any existing area of woodland requires woodland replacement in accordance with Subsections B(6) through B(9). The Applicant shall provide calculations for woodland disturbance and woodland replacement plantings at the time of subdivision and land development application.

**Response:** *No response required.*

### Open Space

4. Zoning Ordinance § 200-69.E includes standards for ownership of common and/or restricted open space. The Board of Supervisors should consider setting conditions of Conditional Use approval that specify ownership, including a continuing offer of dedication of any restricted open space to the Township.

**Response:** *No response required.*

5. Open Space Management Plan is provided on Sheet 5. Zoning Ordinance § 200-69.F(2) requires that the Applicant provide a more detailed open space management plan for Township review and approval with the preliminary subdivision and land development plan. The Conservancy would be glad to provide a model open space management plan for the Applicant's reference, if requested.

**Response:** *No response required.*

### Recreation

6. Several variances and waivers are requested as shown on Sheet 4, including SALDO § 162.54.D(3) waiver to permit active recreation land to be comprised of greater than 25% environmentally sensitive areas. We are in support of this waiver request provided that the proposed 6' wide private nature trail behind proposed lots 26-29 and along the northern tract property line is not to be included.

**Response:** *As noted above, the 6' wide private nature trail has been removed from the plan.*

7. The location of the tot lot behind proposed lots 19 and 25 is not a suitable location for the following reasons:

- a. The facility would be isolated, located a distance away from Road B and Road C where community surveillance will be difficult;
- b. It is not ideal to place a tot lot at the rear of residential lots.

We suggest that the tot lot be relocated as close as feasible to the sidewalk at the intersection of Road B and Road C where it will be more easily monitored from Roads B and C and the paved community trail. A slight modification in the configuration of lot 19 (and/or lot 20) could provide a suitable area for a tot lot with a slightly smaller footprint. Alternatively, the tot lot could be located adjacent to the community trail north of lot 18. The bump-out (at Roads B/C) could be eliminated to reduce impervious surface and to create more space for a tot lot. The tot lot could be reduced to 0.5 acres (for example) in order to avoid impact to prohibitive slopes. The Fiscal & Recreation impact analysis states that there will be a total of 21.0 acres of usable open space which is in excess of the 9.89 acres of required usable open space. The total active recreation land is proposed to be 3.29 acres which includes the variable width paved trail (0.74 acres), future Greenridge Road trail (0.58 acres), 8 foot wide cleared nature trail (0.91 acres), and tot lot and upland area (1.06 acres). If the 8 foot wide nature trail is not provided, the total active recreation land proposed would be 2.38 acres. In addition, if it is feasible to relocate and reduce the tot lot to 0.5 acres (for example), the total active recreation land proposed would be 1.82 acres. The Township should decide whether a tot lot with a reduced size and total active recreation land proposed would satisfy the standards for recreational open space.

**Response:** *The area for the tot lot has been relabeled on the plan as a pocket park and further expanded (+15,000 SF) to allow for play structures in addition to open areas for free play. The space*

*for the pocket park has been moved closer to the intersection of Roads B and C for better visibility/security.*

*The plans have been further updated to reflect revised area totals for the land making up the required playground and neighborhood park acreage.*

### Trails

8. We strongly discourage the proposed 6' wide private nature trail behind the back yards of proposed lots 26-29 and along the northern tract property line for reasons (in addition to the impact on steep slopes described above).

- a. the trail could potentially infringe on the rear yard privacy of neighboring residences that have relatively short rear yards; and
- b. the trail has no clear destination or purpose and is redundant with the existing driveway to be used as a public trail.

**Response:** *The nature trail behind Lots 26-29 has been removed.*

The Fiscal & Recreation impact analysis states that there will be a total of 21.0 acres of usable open space which is in excess of the 9.89 acres of required usable open space. The total active recreation land is proposed to be 3.29 acres which includes the variable width paved trail (0.74 acres), future Greenridge Road trail (0.58 acres), 8 foot wide cleared nature trail (0.91 acres), and tot lot and upland area (1.06 acres). If the 8 foot wide nature trail is not provided, the total active recreation land proposed would be 2.38 acres. The Township should decide whether the proposed recreational open space and trails, not including the nature trail, would satisfy the standards for recreational open space.

**Response:** *No response required.*

9. The proposed trail connection/emergency access along Lauren Lane promotes pedestrian and bicycle access between neighborhoods and facilitates access to the proposed tot lot. We support the Lauren Lane trail connection as a recreational asset for residents on Stonehedge Drive and Greenridge Road residents.

**Response:** *No response required.*

10. We strongly discourage the proposed paved public trail between lot 2 and lot 3. The trail would infringe on the rear yard privacy of the neighboring residences and introduce additional impervious surfaces in a sensitive area of steep slopes. Since the existing driveway surface is not ADA accessible due to steep grades, we suggest providing wooden steps west of lot 4 (roughly in the location of the existing driveway) that would provide access from the proposed 5' wide sidewalk along Road A to the existing driveway/public trail. A proposed grading plan would help the Township determine

whether this is a viable alternative for the paved public trail that is not intended to be ADA compliant.

**Response:** *The applicant has elected to maintain the proposed trail alignment between Lots 2 and 3. The proposed switchback that ties the trail into Road A allows for easier access and is less of a liability and maintenance issue in comparison to steps. Further, it will be the burden of the applicant to make future buyers aware of the proposed trail. The applicant intends to address screening concerns for this area during land development.*

11. The Applicant has added a 20' wide trail easement to be granted to Upper Uwchlan Township for the future Greenridge Road Trail. We recommend that the Township include a condition of Conditional Use approval that requires the Applicant to design, engineer, and construct a 6' wide paved trail along Greenridge Road as recommended in the Community Trails Master Plan and require a continuing offer of dedication to the Township.

**Response:** *No response required.*

## **VIII. TOWNSHIP SEWER CONSULTANT COMMENTS** **ARRO CONSULTING, INC.**

1. The Developer is proposing 64 Single family detached lots. Utilizing 225 Gallons Per Day/Equivalent Dwelling Unit (GPD/EDU) the sanitary sewer capacity required is 14,400 GPD. The capacity is shown on Sheet 4 of the plan set.

**Response:** *No response required.*

2. Note 15 indicates “*The proposed subdivision will be serviced by the Route 100 Sewage Treatment Plant. Disposal of Effluent will occur on-site through drip irrigation, or, as otherwise directed by the Municipal Authority. The proposed drip irrigation fields will be offered for dedication to Upper Uwchlan Township.*”

- **Treatment Component** - The required treatment capacity, from the Phase 3 Expansion, will need to be purchased. Reservation of sanitary sewer capacity is not guaranteed until purchased.
- **Disposal Component** - The Conceptual Plans indicate proposed disposal areas on-site. The ultimate disposal capacity will be subject to the required evaluation design and permitting as required by the Pennsylvania Department of Environmental Protection (PaDEP).
- **Storage Component** – There appears to be no storage capacity proposed on this Plan. The adequacy of capacity for the project, within the Authority's existing storage capacity will be reviewed pursuant to PaDEP requirements.

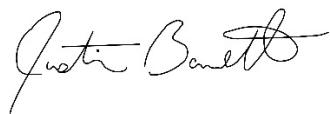
- **Collection and Conveyance System Component** - Review of the capacity within the downstream collection and conveyance system is necessary in order to determine the extent of improvements necessary to accept the proposed flow of 14,400 GPD.

**Response:** *No response required.*

3. Ultimately, the above item numbers 1 and 2 will need to be formalized into a Developer's Agreement with the Township. The necessary financial security shall be posted with the Township, which shall be in a form and amount acceptable to the Township. The design, sewage planning, permitting and construction shall be to the satisfaction of the Authority, Township and PaDEP.

**Response:** *No response required.*

If you have any questions or require additional information, please do not hesitate to contact me.  
Sincerely,

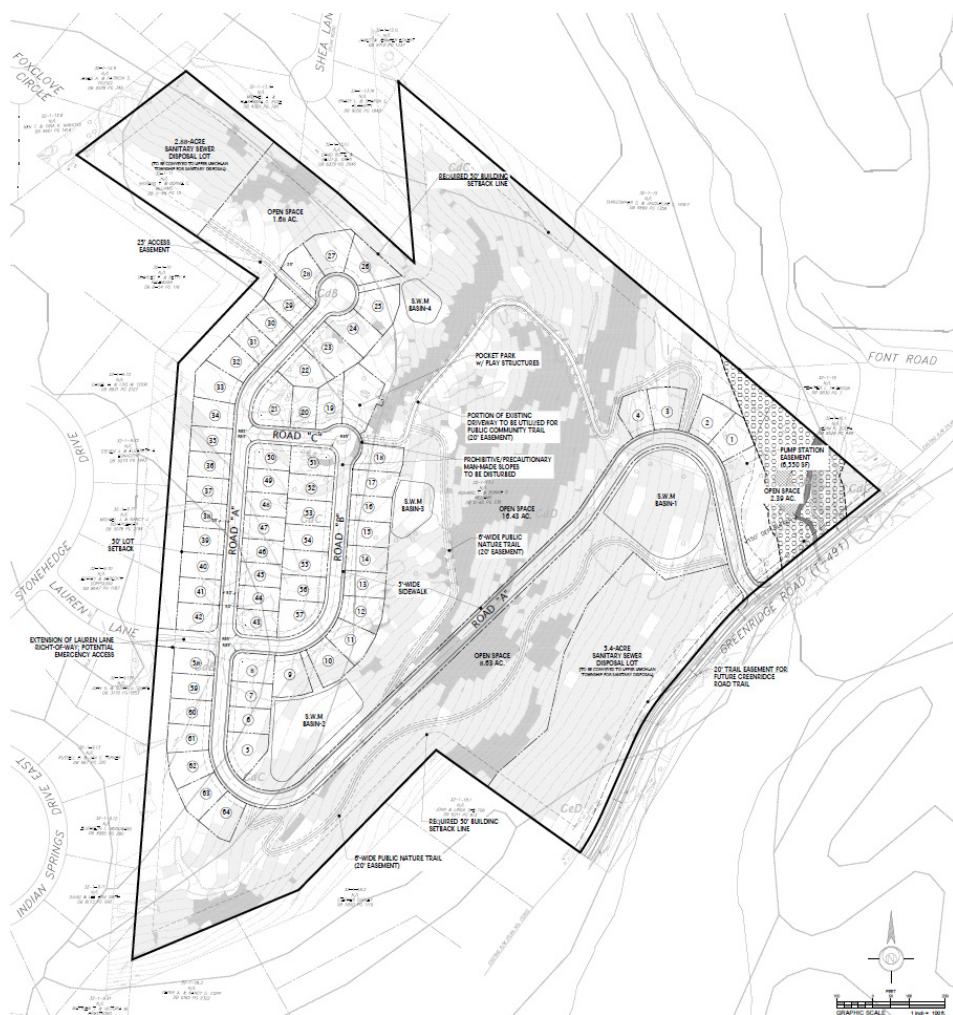


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# STEEP SLOPE CONSERVATION DISTRICT NARRATIVE

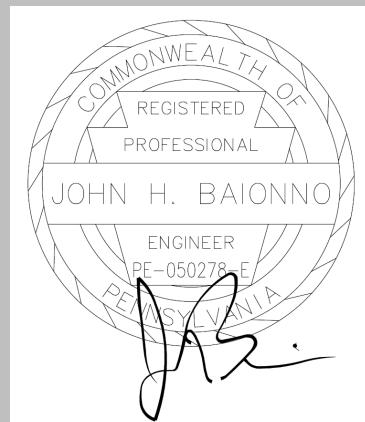
## FOR

# GREENRIDGE ROAD CONDITIONAL USE



**LOCATED IN:**

# UPPER UWCHLAN TOWNSHIP, CHESTER COUNTY, PENNSYLVANIA



**John H. Baionno**  
Professional Engineer  
PA License No. PE 050278-E

December 15, 2021

## Steep Slope Narrative per Zoning Section 200-107.E

### Project Location

This 66-acre project site is known as Tax Parcel Numbers 32-001-0017.1 and 32-001-0011, and is located within Upper Uwchlan Township, Chester County, Pennsylvania. The site is situated on the northwesterly side of Greenridge Road, 0.2 miles southwest of the intersection with Font Road.

The site generally consists of a sloping, wooded hillside, which falls eastward down to Greenridge Road and to an existing stream. A single house and associated facilities are in the northwestern portion of the property, with a driveway that meanders down the slope to Greenridge Road. Offsite to the northeast, a tributary to Black Horse Creek flows southerly, ultimately crossing through the front easterly corner of the site and into a culvert under Greenridge Road, where it merges with Black Horse Creek. Single family residential parcels of varying sizes surround the site and consist of wooded and maintained lawns.

### Project Description

The applicant proposes to construct sixty-four (64) single family detached homes. The development will include the construction of homes, support roads, sidewalks, utilities, stormwater management facilities, and other improvements typical of residential construction. Access to the site will be via Greenridge Road, with an emergency access proposed to connect to Lauren Lane to the west (Stonehedge development).

### Existing Steep Slopes

The site has an elevation change of over 240 feet, from the area around the existing home down to the tributary crossing under Greenridge Road. The existing site generally slopes eastwardly down to Greenridge Road and the adjacent tributary. These existing slopes consist of three categories:

- General Slopes < 15% (32.57 acres)
- Precautionary Steep Slopes between 15% and 25% (26.08 acres)
- Prohibitive Steep Slopes >25% (7.30 acres)

### Steep Slope Disturbance

Proposed disturbances to both the Precautionary and the Prohibitive Steep Slopes are the direct result of providing necessary access to the upper portion of the site where the residential lots are located. The following table summarizes the estimated Steep Slope disturbance:

	Residential Lots	SWM Facilities	Road Right-of-Way	Trails / Pocket Park	Man-Made Slopes
Precautionary	1.25 ac.	2.73 ac.	1.85 ac.	0.66 ac.	0.14 ac.
Prohibitive	0.03 ac.	0.0 ac.	0.47 ac.	0.02 ac.	0.04 ac.
Total	1.28 ac.	2.73 ac.	2.32 ac.	0.68 ac.	0.18 ac.
Estimated Site Total				7.19 ac.	

### Site Soils

The site soils shown on the plans have been generated from the USDA-NRCS Web Soil Survey website. This is based on the Chester County, Pennsylvania Soil Survey, Version 14, dated August 31, 2021. Most of the site consists of Gladstone Gravelly Loam soils, with a small portion of Cokbury Silt Loam (hydric soils) adjacent to the tributary of Black Horse Creek. The Gladstone soils are generally considered well-drained (Hydrologic Soil Group A/B), with depth to water table typically over 80 below the surface.

Preliminary soil test borings and infiltration testing was performed by Geo-Technology Associates on June 8, 2021. The results of this testing indicated that the existing soils will have some capacity to infiltrate stormwater runoff.

### Stormwater Management

Stormwater Management for the site shall be designed in accordance to the following publications:

- Upper Uwchlan Township Stormwater Management Ordinance, Chapter 152.
- Upper Uwchlan Subdivision and Land Development Ordinance, Chapter 162.
- "Pennsylvania Stormwater Best Management Practices Manual", dated December 2006.
- "Urban Hydrology for Small Watersheds" (Technical Release No. 55), published by the United States Department of Agriculture, Soil Conservation Service, dated June 1986.

The proposed Stormwater Management Plan shall be designed to meet the following requirements:

- Per the Township SWM ordinance, the peak rate of stormwater runoff must be attenuated as follows:

Peak Rate Requirements	
Proposed Condition Design Storm	Existing Condition Design Storm
2-year	1-year
5-year	2-year
10-year	2-year
25-year	25-year
50-year	50-year
100-year	100-year

- The drainage patterns and watershed boundaries of the existing site shall be analyzed. The post-developed design will adhere to the above peak rate requirements for each watershed.
- Provide runoff volume control such that the 2-year total post-development runoff volume is equal to or less than the 2-year total pre-development runoff volume. To the greatest extent feasible, retained stormwater volume shall be infiltrated into the groundwater system.
- All existing, on-site, non-forested pervious areas shall be considered meadow.

### *Erosion and Sedimentation Control*

A Soil Erosion and Sedimentation Control Plan shall be prepared for the site, in accordance with the “Erosion and Sediment Control Pollution Control Program Manual: Technical Guidance Number 363-2134-008”, dated March 2012.

The E&S Plan shall follow the general E&S planning and design requirements as follows:

- It shall minimize the extent and duration of earth disturbance to greatest degree feasible while constructing the proposed development. Disturbed areas will be stabilized in accordance with the construction sequence and the requirements of the Chester County Conservation District.
- The plan shall maximize protection of existing drainage features and vegetation through the establishment of conservation areas that protect existing trees and wetland areas.
- The plan shall minimize soil compaction by providing a limit of disturbance boundary and a construction sequence.
- The plan shall incorporate various BMP measures to prevent or minimize the impacts to stormwater runoff.
- A series of swales and storm sewer will divert sediment laden runoff to the sediment basins.
- Filter fabric fence, tree protection, channel lining, and other control measure shall be incorporated into the design to preserve the quality of downstream waters during the construction process.
- Outlet protection shall be proposed at all pipe endwalls to control scour.
- All runoff water from disturbed areas shall be treated by a BMP measure before exiting the site.

### *Construction in Steep Slopes*

For the most part, construction within the Steep Slope areas will be limited to the installation of roads and utilities. The proposed road grade within the Steep Slope area will be limited to a maximum of 11%. While this grade is not typical, it is not out of the ordinary and no extra-ordinary construction measures will be required, for either the roadway or the associated utilities. The road slope adjacent to any of the homes will be limited to a maximum of 8%, which will not require any extra-ordinary construction methods for the homes. Any required retaining walls will be designed by a licensed structural engineer.

Standards and Criteria for review of Conditional Use Applications

Per Zoning Section 200-107.E.2:

- (a)[1] Proposed Road ‘A’ is located such that it will affect the least amount of Prohibitive Steep slopes.
- (a)[2] Proposed Road ‘A’ traverses through Gladstone Gravelly Loam soils, which have a relatively deep depth to water table (typically over 80 below the surface).
- (a)[3] Most of the site consists of Gladstone Gravelly Loam soils, which are considered well-drained (Hydrologic Soil Group A/B). Even though the Steep Slope disturbance is within these Gladstone soils, the stormwater management facilities are also within the Gladstone soils, which will allow stored stormwater volume to infiltrate.
- (b) For the most part, Steep Slope disturbance is limited to what is required to construct the road up the hill to access the main portion of the site.
- (c) The design of the site infrastructure and stormwater management facilities will follow all Township, County, and State requirements to ensure there will be no excess runoff related issues.
- (d) Although the Steep Slope disturbance does require the removal of trees/woods, there is no other way to access the upper portion of the site. Retaining walls will be included in the design in an effort to minimize excessive disturbance to trees/vegetation.
- (e) The existing woods on the site currently provide a natural screen of the existing home and associated facilities located up the hill. The alignment of the proposed road through the Steep Slopes is such that there will not be a direct line of site from Greenridge Road up to the proposed homes at the top of the hill. Therefore, the wooded viewshed when looking up the hill from Greenridge Road will remain.
- (f) The proposed road through the Steep Slope follows the existing contours as much as possible while traversing up the hill.
- (g) The applicant will review various construction methods and practices as part of the design of the site and will incorporate those that are suited to the sloping nature of the site.
- (h) The intent of this application is to provide a means of access through the Steep Slopes up to the upper portion of the site, while (1) maintaining the wooded viewshed, and (2) providing for a stormwater management system that controls the increased runoff and provides groundwater recharge through infiltration.

**FISCAL & RECREATION IMPACT ANALYSIS**  
**Greenridge Development**  
**Upper Uwchlan Township, Chester County**

*Revised*  
*December 16, 2021*

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# Fiscal Impact Analysis

Proposed Greenridge Development  
Upper Uwchlan Township, Chester County  
December 16, 2021

This report examines the annual fiscal impact to Upper Uwchlan Township and the Downingtown Area School District (DASD) of the Greenridge development proposed by Toll Mid-Atlantic L.P., Inc. The report examines the fiscal impact to the Township and School District during any given year after the completion of the proposed project and full occupancy, based on 2021 levels of revenue, expenditures, and taxation. It is an updated version of reports submitted August 9, 2021 and October 3, 2021.

The Greenridge development proposal consists of 64 single family detached dwellings, with four bedrooms each, to be sold for an average price of \$871,495. At buildout, the proposed development will generate \$55,775,680 of market value and \$25,099,056 of assessed value, which is 2.4 percent of the total assessed value of all properties in the Township. At full occupancy, the proposed development will house 224 persons, including 65 school age children (ages 5-17), of whom 60 will attend public (DASD) schools.

The table below shows the annual net fiscal impact (revenue minus expenditures) to the Township and School District of the proposed development. Below the table are sections on assessments, demographics, Township expenditures and revenue, and School District expenditures and revenue. At the end of this report are the spreadsheets for the Township and School District impact, which show the major expenditure and revenue categories for each entity. All cell addresses in the text refer to these spreadsheets.

Proposed Dwelling Type	Number of Units	Annual Net Township Impact	Annual Net School District Impact	Annual Net Combined Impact	Annual Net Combined Impact per Unit
4 BR SFD	64	\$57,837	\$-47,309	<b>\$10,529</b>	\$165

The annual net fiscal impact of the proposed development is projected to be moderately favorable for the Township and moderately unfavorable for the School District, creating an overall annual net surplus. **The annual net combined fiscal impact for the proposed Greenridge development is projected to total positive (or surplus) \$10,529, or positive \$165 per unit.** The annual combined revenue is projected to exceed the annual combined expenditures by 0.9 percent.

In addition to the annual net impact figures shown in the table above, the proposed development will also generate one-time real estate transfer tax revenue from the initial sales of the units over the buildout period, projected to total \$278,878 to each of the Township and School District. Further, the proposed development will generate \$147,444 in traffic impact fees to the Township over the buildout period.

The most important reason for the annual net surplus to the Township is the relatively high value of the proposed homes. The median housing value in Upper Uwchlan Township in the 2019 American Community Survey (a function of the U.S. Census Bureau) was \$442,300. In comparison, the market value of the proposed homes is projected to be \$871,495, nearly twice as high. The higher housing value translates to higher revenue in the real estate tax, earned income tax, and real estate transfer tax categories, for both the Township and School District. For the School District, the higher revenue from the proposed homes does not offset the higher expenditures generated by the greater number of students, resulting in a small annual deficit to the District.

It is projected that the proposed development will not overburden Township facilities or services. The Township will likely not need to expand its facilities or hire additional staff to provide adequate services to the proposed development, since it is only 64 units. The proposed development at buildout and full occupancy is projected to represent only 1.8 percent of the Township population, 1.6 of the Township housing units, and 2.4 percent of the Township assessed value.

### Assessments

The average market value of the proposed units is projected to be \$871,495 (cell C6). The total market value is determined by multiplying the number of units (64, cell B6) by the market value per unit (\$871,495, cell C6). The market value at buildout is projected to total \$55,775,680 (cell D6).

The assessed value is determined by multiplying the market value (totaling \$55,775,680, cell D6) by the 2021 Chester County common level ratio of 45.0 percent, from the Pennsylvania State Tax Equalization Board (cell D18). The assessed value at buildout is projected to total \$25,099,056 (cell E6). This \$25,099,056 in projected assessed value represents 2.4 percent of the entire assessed value of all properties in Upper Uwchlan Township (\$1,058,654,325, from the Chester County Board of Assessment computer data base as of July 29, 2021), and 0.4 percent of the entire assessed value of all properties in the Downingtown Area School District (\$5,697,963,007, according to the DASD 2021-2022 budget). Please note that the Chester County Board of Assessment will determine the actual assessments only when the proposed development is constructed and inspected.

### Demographics

The number of persons per unit is projected to be 3.50 for the proposed four bedroom single family detached dwellings (cell F6). This demographic multiplier is from *Residential Demographic Multipliers – Estimates of the Occupants of New Housing*, by Robert W. Burchell, David Listokin, and William Dolphin of the Rutgers University Center for Urban Policy Research (CUPR), published in June, 2006. This multiplier is based on the U.S. Bureau of the Census 2000 Public Use Microdata Sample, and is specific to four bedroom SFD dwellings with higher values, built between 1990 and 2000, and specifically in Pennsylvania. The number of persons is determined by multiplying the number of units (64, cell B6) by the number of persons per unit (3.50, cell F6). The number of persons projected to reside in the proposed development at buildout and full occupancy totals 224 (cell G6).

The number of school age children per unit is projected to be 1.02 (cell F32 of the School District spreadsheet), from the same CUPR document on Pennsylvania residential demographic multipliers. The number of public school students is determined by multiplying the number of units (64, cell B32) by the number of school age children per unit (1.02, cell F32), and by 92.4 percent (cell D45), to account for those children who will attend private schools or be schooled at home. The figure of 92.4 percent is from the 2019 American Community Survey (the most recent available), a function of the U.S. Census, specifically for Upper Uwchlan Township, which reported 2,697 public school students out of 2,920 school age children. The number of DASD students projected to reside in the proposed development at buildout and full occupancy totals 60 (cell G32).

### Annual Upper Uwchlan Township Expenditures

The 2021 Upper Uwchlan Township budget includes the following seven funds totaling \$10,873,439 in expenditures, shown in the table below with their respective expenditure totals:

Fund	Budgeted Amount
General Fund	\$6,500,327
Capital Reserve Fund	\$2,357,462
Solid Waste Fund	\$1,045,522
Water Resource Protection Fund	\$243,400
Liquid Fuels Fund	\$397,800
Act 209 Traffic Impact Fee Fund	\$0
Sewer Fund	\$328,928
<b>TOTAL</b>	<b>\$10,873,439</b>

In order to find a more accurate measure of the average annual expenditures for the proposed development, this analysis focuses on the regular, annual ongoing operating expenditures of the Township. Such operations are quantified in the following four funds, shown in the table below with their respective sums in the 2021 budget.

Fund	Budgeted Amount
General Fund	\$6,500,327
Solid Waste Fund	\$1,045,522
Water Resource Protection Fund	\$243,400
Liquid Fuels Fund	\$397,800
<b>TOTAL</b>	<b>\$8,187,049</b>

The four operating funds total \$8,187,049 in expenditures for 2021 (cell D19). These four funds cover nearly all Township expenditures, including general government, executive, audit, tax collection, legal, computer, engineering, Township properties, police, fire, ambulance, codes administration, planning and zoning, emergency operations, signs, signals, public works, park and recreation, historical commissions, solid waste collection and disposal, road maintenance, and water resource protection.

The Sewer Fund is excluded because it is a proprietary fund, where revenue from sewer fees and tapping fees is spent on the sewage collection and treatment system. The Capital Reserve Fund is excluded because it is a capital and not operating fund, where revenue from transfers from the General Fund and Sewer Fund, plus some grant revenue and fund balances from previous years, is spent on capital purchases such as the Township Building expansion, Park Road reconstruction, Upland Farms parkland development, Hickory Park lighting, and work at Fellowship Fields. Please note that though the capital expenditures from the Capital Reserve Fund are excluded from this analysis, the annual debt service of \$243,656 is considered an operating expenditure, and is therefore included in the 2021 Township expenditures. The Act 209 Traffic Impact Fee Fund has no budgeted expenditures for 2021.

In order to find a more accurate measure of the average annual operating expenditures for future residents of the proposed development, three categories of funds are subtracted from the total 2021 operating expenditures of \$8,187,049 (cell D19):

1. Pass-Through Funds. Pass-through funds are excluded because the proposed development will have no net impact on these funds, since revenue always equals expenditures. Pass-through funds that are excluded are shown in the table below with their respective sums in the Township's 2021 budget.

Source	Fund	Budgeted Amount
State Utility Tax (PURTA)	General	\$5,000
State Aid Police Pension	General	\$122,000
State Aid Non-Uniform Pension	General	\$80,000
Foreign Fire Insurance	General	\$95,000
Reimbursed Police Wages	General	\$3,000
Rental Property Income	General	\$24,000
Alcoholic Beverages Tax	General	\$600
Engineering Fees	General	\$50,000
Administrative Fees from Engineering	General	\$4,000
Administrative Fees from Legal	General	\$1,000
Legal Services Fees	General	\$6,000
Fees from Engineering CU	General	\$20,000
Fees from Advertising Reimbursements	General	\$500
Pavilion Rental	General	\$500
Field Program Revenue	General	\$30,000
Turf Field Fees	General	\$45,000
Community Events Donations	General	\$10,000
Municipal Authority Reimbursement	General	\$264,736
Hazardous Waste Event	Solid Waste	\$2,000
Leaf Bags Sold	Solid Waste	\$500
Scrap Metal Sold	Solid Waste	\$500
Solid Waste Performance Grant	Solid Waste	\$25,000
Snow Agreement	Liquid Fuels	\$600
Turnback Maintenance	Liquid Fuels	\$14,520
Motor Fuel Vehicle Taxes	Liquid Fuels	\$362,257
<b>TOTAL</b>		<b>\$1,166,713</b>

The 2021 pass-through funds total \$1,166,713.

2. Development Related Funds. The other pass-through category is charges related to the processing and administration of proposed subdivisions and land developments in the Township, shown in the table below with their respective sums in the 2021 budget (all are in the General Fund). Development related funds are excluded because they are in essence a one-time pass-through fund for specific functions normally associated with new development. The funds will be expended on inspections, the administration of permits, etc. while a development is under construction, not on other municipal functions associated with the time after a development is completed. Once a development is completed, the revenue and expenditures for such permits and application fees decrease significantly, but not completely.

Source	Budgeted Amount
Zoning/Subdivision/Land Development	\$6,000
Building Permits	\$425,000
<b>TOTAL</b>	<b>\$431,000</b>
<b>90 Percent Subtracted</b>	<b>\$387,900</b>
<b>10 Percent as Miscellaneous Revenue</b>	<b>\$43,100</b>

Ninety percent of the 2021 development related pass-through funds of \$431,000 (or \$387,900) is excluded from the total expenditures. Only 90 percent of the development related funds is excluded from the expenditure analysis, in acknowledgment that there will still be some expenditures on subdivisions and land developments once they are complete, for things like building renovations and inspections for violations. Please note that in the revenue analysis, below, only 10 percent of the revenue from development related funds (or \$43,100) is included in the category of miscellaneous revenue.

3. Interfund Transfers. Certain interfund transfers are excluded, for two reasons. Since the General Fund and Water Resources Protection Fund are both operating funds, the transfer of \$245,000 is excluded in order to avoid double counting the same expenditures in two included funds. The transfers from the General Fund and Solid Waste Fund to the Capital Fund are excluded in order to focus on operating – and not capital – expenditures. As noted above, the annual debt service of \$243,656 is considered an operating expenditure, and is therefore included in the 2021 Township expenditures.

Source	Budgeted Amount
General Fund to Capital Fund (minus debt service)	\$656,344
General Fund to Water Resources Protection Fund	\$245,000
Solid Waste Fund to Capital Fund	\$100,000
<b>TOTAL</b>	<b>\$1,001,344</b>

The 2021 excluded pass-through funds, development related funds and interfund transfers total \$2,555,957 (cell D20). The 2021 net Township operating expenditures (minus the excluded pass-through funds, development related funds and interfund transfers) are \$5,631,092 (cell D21). Please note that just as the expenditures for the above funds are not included in the expenditure calculations of this section, the revenue from these sources is also not included in the revenue analysis, below.

Then, the Township expenditures associated with existing nonresidential development are subtracted from the net expenditures using the “proportional valuation method” of *The New Practitioner’s Guide to Fiscal Impact Analysis*, by Robert W. Burchell, David Listokin, and William R. Dolphin, Rutgers Center for Urban Policy Research, 1985. First, a portion of the total Township expenditures is assigned to existing nonresidential development, based on the average value of property. According to the Chester County Board of Assessment Land Use Classification Report as of July 29, 2021, the total assessed value of the 4,474 properties in Upper Uwchlan Township was \$1,058,654,325, yielding an average assessed value of \$236,624. Of those properties, 275 were nonresidential (commercial, industrial, institutional, utility, etc., whether taxable or exempt), with a total assessed value of \$164,027,790 (representing 15.5 percent of the Township total), and an average assessed value of \$596,465.

The proportion of average nonresidential assessed value to average Township assessed value (residential

and nonresidential combined) is 2.52, which is then used to determine the refinement coefficient of 1.56 from a graph in *The New Practitioner's Guide*. The refinement coefficient is based on empirical research by the Rutgers University CUPR, and is necessary to adjust the costs of existing nonresidential development in communities without extensive nonresidential development of very high average assessed value, such as Upper Uwchlan Township. By comparison, in communities where the ratio between the average nonresidential assessment and the average overall assessment is above 6, an economy of scale reduces the nonresidential expenditures on a per square foot basis, and the refinement coefficient is below 1.00.

The proportion of Township assessed value in nonresidential uses (15.5 percent) is then multiplied by the refinement coefficient of 1.56, and by the 2021 net Township operating expenditures of \$5,631,092 (cell D21). The result of this calculation is that \$1,359,982 of the net Township operating expenditures (representing 24.2 percent) is attributable to existing nonresidential development (cell D22). This sum is subtracted from the 2021 net Township operating expenditures (\$5,631,092, cell D21), and the remainder (\$4,270,022 in expenditures attributable to existing residential development) is divided by the estimated number of Township residents in 2021, which is 12,275 (cell J18, from the recently released 2020 U.S. Census).

The per capita Township operating expenditures attributable to existing residential development are \$347.86 (cell D23), which are then applied to the number of persons projected to reside in the proposed development at buildout and full occupancy (totaling 224, cell G6) to find the total annual Township expenditures for the proposed development of \$77,921 (cell H6), or \$1,218 per unit (cell I6).

The projected annual Township expenditures of \$77,921 (cell H6) can be differentiated by broad municipal functions, as determined on page 13 of the 2021 Township Budget and shown in the table below. The areas of greatest annual Township expenditure are projected to be public safety (police, fire, etc.) and public works - streets and highways.

Township Expenditure	% of Total	Projected Expenditure
General Government	17.2%	\$13,395
Public Safety	38.6%	\$30,065
Health and Welfare	0.7%	\$542
Public Works - Streets and Highways	25.1%	\$19,539
Public Works - Sanitation	12.8%	\$9,951
Culture and Recreation	5.6%	\$4,381
Other	0.1%	\$48
<b>TOTAL</b>	<b>100.0%</b>	<b>\$77,921</b>

#### Annual Upper Uwchlan Township Revenue

The annual Township revenue is determined by adding the following sources:

- Real estate tax revenue, based on the 2021 Township General Fund tax rate of 1.034 mills (cell J19), applied to the projected assessed value of the proposed development (\$25,099,056, cell E6). Please note that the General Fund tax millage includes the 0.25 mills for ambulance, rescue and emergency services. The annual real estate tax revenue is projected to total \$25,952 (cell B11).

- Earned income tax revenue, based on the tax rate of 0.5 percent (for the General Fund) applied to the household income of residents, which is calculated by determining the monthly housing costs, including a combination of real estate taxes, insurance, homeowners association fees and mortgage costs, as shown in the table below.

Proposed Dwelling Type	Monthly RE Taxes	Monthly Insurance	Monthly HOA Fee	Monthly Mortgage	Minimum Annual Income
4BR SFD	\$1,089	\$90	\$127	\$3,309	\$197,768

The monthly real estate taxes are based on a combined Township plus School District plus County tax rate of 33.311 mills. Insurance costs are projected to be \$90 per month. HOA fees are projected to be \$127 per month. The mortgage costs are based on the conforming rate of 2.88 percent, according to the September 23, 2021 Primary Mortgage Market Survey by Freddie Mac (available on [www.freddiemac.com](http://www.freddiemac.com)). The mortgage costs also assume a 10 percent down payment, which is higher (and therefore more conservative) than the 6.1 percent down payment which is the national median in the first quarter of 2021 for home purchases (as opposed to refinances) according to ATTOM Data Solutions (see <https://www.attomdata.com/news/market-trends/mortgage-origination/attom-data-solutions-q1-2021-u-s-residential-property-mortgage-origination-report/>). The minimum annual household income is determined by adding all the monthly housing costs, multiplying times twelve months, and dividing by 28 percent, according to Fannie Mae criteria that no more than 28 percent of annual household income be used for housing costs. The minimum annual household income necessary to afford the proposed homes and their associated housing costs is projected to be \$197,768 which is then multiplied by the number of units (64, cell B6) and by the Township General Fund tax rate of 0.5 percent. The annual earned income tax revenue is projected to total \$63,286 (cell C11). Please note that this revenue assumes the lowest level of household income needed to afford the mortgage, taxes, insurance and HOA fees. Most households will have significantly higher levels of income, which will result in additional annual revenue to the Township.

- Real estate transfer tax revenue, based on the market value of the units (\$871,495, cell C6) multiplied by the number of units (64, cell B6), multiplied by the projected annual housing turnover rate of 5.0 percent for single family detached dwellings (cell J20), and multiplied by the Township's tax rate of 0.5 percent of market value. The annual real estate transfer tax revenue is projected to total \$13,944 (cell D11). Please note that this annual revenue figure does not include the one-time real estate transfer tax revenue from the initial sales of the units over the buildout period, projected to total \$278,878 (cell A24).
- Trash and recycling fee revenue, based on the Township's annual trash and recycling fee of \$315 (cell J21) applied to the number of units in the proposed development (64, cell B6). The annual trash and recycling fee revenue is projected to total \$20,160 (cell E11).
- Franchise fee and miscellaneous revenue, based on the Township's budgeted revenue from these sources (totaling \$263,100 comprised of \$220,000 in franchise fee revenue and \$43,100 in development related revenue, representing 10 percent of the total revenue in this category associated with existing and not new development, which is \$431,000; see the expenditure analysis, above) divided by the 2021 estimated number of units in the Township (3,980, cell J22, also from the 2020 U.S. Census), and that per unit revenue of \$66.11 (cell J23) is applied to the number of units in the proposed development (64, cell B6). The annual franchise fee and miscellaneous revenue is projected to total \$4,231 (cell F11).
- Liquid Fuels revenue, based on PennDOT's 2021 per person revenue of \$17.8193 (cell J24) applied to the number of persons projected to reside in the proposed development at buildout and full occupancy (totaling 224, cell G6), plus the per mile revenue of \$3,096.7932 applied to the 0.93 linear miles of

roadway to be offered for dedication to the Township. The per person revenue and per mile revenue are found in the current Department of Transportation Bureau of Municipal Services *Municipal Liquid Fuels Allocations Report* (dated February 5, 2021). The annual Liquid Fuels revenue is projected to be \$3,991.52 for the residential element and \$2,891.51 for the roadway element, for a total of \$6,883 (cell G11).

- Interest earnings, based on the projected assessed value of the proposed development (\$25,099,056, cell E6) divided by the Township's total taxable assessed value (\$1,012,628,285, according to the Chester County Board of Assessment computer data base), and multiplying by the Township's projected revenue from interest earnings in the 2021 budget, which totals \$52,600 and is shown in the table below.

Fund	Interest Earnings
General Fund	\$35,000
Solid Waste Fund	\$10,000
Water Resource Protection Fund	\$600
Liquid Fuels Fund	\$7,000
<b>TOTAL</b>	<b>\$52,600</b>

The annual interest earnings are projected to total \$1,304 (cell H11).

The annual Township revenue from all sources is projected to total \$135,760 (cell I11), or \$2,121 per unit (cell J11). The annual net Township impact (revenue minus expenditures) is projected to total positive \$57,838 (cell B15), or positive \$904 per unit (cell C15). Annual revenue is projected to exceed annual expenditures by 74.2 percent (cell D15). Once again, please note that this annual net Township revenue figure does not include the real estate transfer tax revenue of \$278,878 from the initial sales of the units or the \$147,444 in traffic impact fees.

#### Annual Downingtown Area School District Expenditures

The number of units (64, cell B32 of the School District spreadsheet), average market value per unit (\$871,495, cell C32), total market value (\$55,775,680, cell D32), and total assessed value (\$25,099,056, cell E32) are the same as for the Township impact, above. As noted above, the proposed development is projected to generate 1.02 school age child per unit (cell F32) and 60 public school (DASD) students overall (cell G32).

The Downingtown Area School District General Fund budgeted expenditures total \$244,086,119 for the 2021-2022 year (cell D46). The following pass-through funds are subtracted from this total:

Pass-Through Fund	Budgeted Amount
Public Utility Realty Tax	\$161,900
Revenue from LEA Activities	\$1,640,000
Revenue from Intermediary Sources	\$2,284,636
Rentals	\$450,000
Tuition from Patrons	\$190,000
<b>TOTAL</b>	<b>\$4,726,536</b>

The excluded pass-through funds total \$4,726,536. In addition, the budgetary reserve of \$3,645,000 is excluded, representing funds not projected to be expended during the school year. The pass-through funds and budgetary reserve total \$8,371,536 (cell D47), with the remaining School District net expenditures totaling \$235,714,583 (cell D48). This figure is then divided by the 2021-2022 District-wide projected enrollment of 13,351 students (cell D49, from the District's enrollment projections in the 2020-2021 budget book) to find the 2021-2022 DASD net expenditure of \$17,655 per student (cell I44). This per student expenditure is applied to the number of students projected to attend public schools from the proposed development at buildout and full occupancy (totaling 60, cell G32) to find the annual School District expenditures of \$1,064,513 (cell H32), or \$16,633 per unit (cell I32).

#### Annual Downingtown Area School District Revenue

The annual School District revenue is determined by adding the following sources:

- Real estate tax revenue, based on the School District's 2021-2022 tax rate of 27.7260 mills (cell I45) applied to the projected assessed value of the proposed development (totaling \$25,099,056, cell E32). Subtracted from this total is the proposed homestead exclusion at \$7,710 of assessed value per unit applied to the number of units (64, cell B32). The proposed homestead exclusion is projected to subtract \$214 per unit (cell I46) or \$13,681 from the total School District real estate tax revenue for the entire proposed development. The annual real estate tax revenue is projected to total \$682,215 (cell B37).
- Earned income tax revenue, determined using the same method as was used for the Township impact, above. The annual earned income tax revenue is projected to total \$63,286 (cell C37).
- Real estate transfer tax revenue, determined using the same method as was used for the Township impact, above. The annual real estate transfer tax revenue is projected to total \$13,944 (cell D37). As noted above, this annual revenue figure does not include the one-time real estate transfer tax revenue to the School District from the initial sales of the units over the buildout period, projected to total \$278,878 (cell A50).
- State and Federal revenue, based on the projected 2021-2022 DASD budgeted revenue from those sources totaling \$56,587,660 divided by the projected 2021-2022 DASD enrollment of 13,351 (cell D49), or \$4,238 per public school student (cell I48), applied to the projected number of students from the proposed development (totaling 60, cell G32). The annual state and federal revenue is projected to total \$255,556 (cell E37).
- Earnings on investments, based on the projected assessed value of the proposed development (totaling \$25,099,056, cell E32) divided by the School District's total taxable assessed value (\$5,697,963,007, according to the 2021-2022 DASD budget), and multiplying by the School District's 2021-2022 revenue from earnings on investments in the budget (\$500,000, cell I49). The annual earnings on investments are projected to total \$2,202 (cell F37).

The annual School District revenue from all sources is projected to total \$1,017,204 (cell G37), or \$15,894 per unit (cell H37). The annual net School District impact (revenue minus expenditures) is projected to total negative (or deficit) \$47,309 (cell B41), or negative \$739 per unit (cell C41). Annual expenditures are projected to exceed annual revenue by 4.4 percent (cell D41). The projected annual deficit is minimal, representing the DASD expenditures to educate only 2.68 students. Once again, please note that this annual net School District impact does not include the real estate transfer tax revenue of \$278,878 from the initial sales of the units.





**Recreation Impact Analysis**  
**Proposed Greenridge Development**  
**Upper Uwchlan Township, Chester County**  
December 16, 2021

This report examines the recreation impact to Upper Uwchlan Township of the proposed development on the 65.95 acre gross site on the northwest side of Greenridge Road. The proposed development consists of 64 new single family detached dwellings, with four bedrooms each, along with substantial open space. The recreation impact analysis follows the format of Section 162-9.H(3) of the Upper Uwchlan Township Subdivision and Land Development Ordinance.

**A. Projected Age Breakdown of the Residents of the Proposed Development**

As noted in the fiscal impact analysis, above, the number of persons per unit and school age children per unit are derived from the Rutgers University Center for Urban Policy Research data published in June, 2006 and based on the U.S. Bureau of the Census 2000 Public Use Microdata Sample. The Rutgers CUPR examined housing built between 1990 and 2000 specifically in Pennsylvania, and determined the demographic multipliers for a variety of dwelling types (detached, attached, multifamily, etc.), size (in number of bedrooms), and value. The demographic multiplier of 3.50 used in this analysis is for four bedroom single family detached dwellings with very high values. The number of persons is projected to total 224. The age breakdown of the residents of the proposed development is shown below:

Age	Per Unit	Total 64 Units
Total Persons	3.50	224
0-4	0.35	22
5-13	0.79	51
14-17	0.23	15
18-24	0.12	8
25-44	1.20	77
45-64	0.74	47
65-74	0.05	3
75 and over	0.02	1

The demographic multiplier for number of school age children (ages 5-18) per unit is also from the Rutgers CUPR, and is 1.02 per unit. The breakdown of school age children by grade is shown below:

Grade	Per Unit	Total 64 Units
Total School Age Children	1.02	65
K-2	0.31	20

Grade	Per Unit	Total 64 Units
3-6	0.34	22
7-9	0.21	13
10-12	0.16	10

Of the total 65 school age children, only 92.4 percent are projected to attend public schools (see the fiscal impact analysis, above, for the source of this figure). Therefore, only 60 DASD students are projected from the proposed development.

### **B. Description of Proposed Recreational Facilities**

The proposed development site is 65.95 acres gross. Land within permanent rights-of-way, the Flood Hazard District, wetlands, and prohibitive slopes greater than 25 percent totals 6.87 acres, leaving the net tract area as 59.08 acres. The restricted open space on the site totals 29.13 acres (or approximately 44.2 percent of the gross tract area) and includes all areas not part of individual lots, streets, and lots proposed to be conveyed to the Municipal Authority for sanitary disposal. Of the 29.13 acres of open space, 20.98 acres are proposed usable open space, well in excess of the required 9.89 acres of usable open space. The active recreation (park) land is proposed to be 3.02 acres. This area includes the variable width paved trail (0.74 acres), future Greenridge Road trail (0.58 acres), 6 foot wide nature trail (1.34 acres), and pocket park (0.36 acres).

The combination of the sidewalks along Roads A, B and C and the proposed trails will create several pedestrian loops through the entire site. A pocket park is proposed adjacent to Lot 19, in a central location in the proposed development. The pocket park is accessible from the intersection of Road B and Road C. The pocket park will include play equipment for the neighborhood children, along with benches for seating.

### **C. Ownership and Maintenance of Recreational Facilities**

The proposed open space and trails will be owned and maintained privately, by the homeowners association of the proposed development. There will be no burden of maintenance or expense borne by Upper Uwchlan Township.

### **D. Description of Existing Municipal Recreational Facilities, and Impact of Proposed Development**

According to the *Open Space, Recreation and Environmental Resources Plan for Upper Uwchlan Township*, adopted October 19, 2009, as well as the Upper Uwchlan Township Comprehensive Plan, adopted April 21, 2014, the Township's primary active recreation facility is Hickory Park, located on Park Road just south of the Turnpike. The park is described variously as 42.3 acres in size on Page 50 of the *Open Space, Recreation and Environmental Resources Plan*, and as 27 acres on Pages 8 and 20 of the *Plan*. It includes playing fields, tennis courts, basketball courts, play apparatus, paved and unpaved trails, covered picnic tables, bandstand, trash receptacles, restroom building, and parking area. The park is heavily used by organized sports and casual users throughout most of the year.

Uplands Farms is located on the west side of Pottstown Pike at Darrell Drive, north of the Village of Eagle. The park is 56 acres in size, and is a passive recreation facility with trails and a parking lot. This property also includes an historic farm house and barn, as well as lands for wastewater disposal. Larkins Field is located at Graphite Mine Road and Byers Road. This park is 7.2 acres in size, and contains playing fields and paved trails. Fellowship Fields is located on Fellowship Road east of Pottstown Pike.

This park is 17.8 acres in size, and includes playing fields, paved trails, and a picnic pavilion.

Though not a Township facility, Marsh Creek State Park is also located predominantly within the borders of Upper Uwchlan Township. It is 1,705 acres in size, of which 1,372 acres are in the Township. The park includes a 535 acre lake with boating and fishing, as well as a large swimming pool, picnic areas, and hiking and equestrian trails. While much of the park is for passive recreation and natural feature preservation, the swimming and boating satisfy active recreation needs. The State Park is in the southern part of the Township, along Park Road.

Section 162-54 of the Township Subdivision and Land Development Ordinance recommends a minimum of 2.0 acres of playground and neighborhood park acreage for the first 25-50 families in a subdivision, plus 1.0 acre for each additional 50 families or fraction thereof. Therefore, this provision recommends 3.0 acres of playground and neighborhood park acreage for the proposed Greenridge Road development. This area should be suitable for active recreation uses, have only limited environmental constraints, be interconnected with adjacent open space and recreation areas, and be permanently preserved for open space and recreation.

As noted above, the proposed development has 29.13 acres of total restricted open space, 20.98 acres of usable open space, and 3.02 acres of active recreation land, with internal trails along with internal sidewalks connecting to Greenridge Road. These open space areas constitute the neighborhood park for the proposed development, and should accommodate some of the active and passive recreation needs of the prospective residents. But because the on-site facilities do not include all recreation options (i.e., all court and field sports, etc.), the proposed development will likely result in a nominal increase in the use of the existing Township and State recreation facilities, particularly Hickory Park, Marsh Creek State Park, Larkins Field, Upland Farm and Fellowship Field.

The Upper Uwchlan Township *Open Space, Recreation and Environmental Resources Plan* on page 61 includes the Chester County Park and Recreation Guidelines, which call for 0.25 acres of mini-park land per 1,000 population, 2.5 to 3.5 acres of neighborhood park land per 1,000 population, and 3.0 to 6.0 acres of community park land per 1,000 population. With the 224 persons projected to reside in the proposed development, that translates to 0.056 acres of mini-park land, 0.56 to 0.784 acres of neighborhood park land, and 0.672 to 1.344 acres of community park land. As noted above, the proposed development includes 3.02 acres of active recreation land, which includes a pocket park and trails, and 20.98 acres of usable passive recreation open space. These acreage figures appear to meet the Chester County Park and Recreation Guidelines for various types of park land.

The *Open Space, Recreation and Environmental Resources Plan* on page 62 also includes the suggested outdoor activity/facility needs (e.g., basketball courts, tennis courts, baseball fields, etc.), from Chester County *Linking Landscapes*. As noted above, the proposed development will include a pocket park and walking trails, but none of the other recreation facilities that appear on the table in the *Plan*. The prospective residents of the proposed development will use the existing Township and State recreation facilities, including Hickory Park, Marsh Creek State Park, Larkins Field, Upland Farm and Fellowship Field.

#### **E. Proposed Recreation Facilities to Compensate for any Anticipated Deficiencies in Township's Recreation Facilities**

As noted above, proposed open space areas, pocket park and recreation facilities should accommodate some of the recreation needs of the prospective residents. The remaining recreation needs of the prospective residents will be met by the existing Township and State facilities, particularly Hickory Park, Larkins Field, Fellowship Field, Upland Farm and Marsh Creek State Park. The residents of the proposed

development will provide funding to operate and maintain the Township recreation facilities (and all other municipal functions) through the projected annual \$135,760 revenue from the real estate tax, earned income tax, real estate transfer tax, trash and recycling fee, cable TV and miscellaneous revenue, liquid fuels revenue, and interest income (see the fiscal impact analysis, above).

#### **F. Accessibility of Proposed Facilities to General Township Residents**

The proposed pocket park will be privately owned and maintained, and will be available for the use of the residents and guests of the development. The variable width paved trail, future Greenridge Road trail, and 6 foot wide nature trail are to be open to the public and general Township residents.

#### **G. Contributions from Developer to Compensate for Expected Impacts**

Again, given the likelihood that the proposed open space and recreation facilities will accommodate some of the recreation needs of the prospective residents, the nominal increase in the use of existing Township and State facilities, and the significant annual revenue from the proposed development to cover recreation expenditures, no further contributions from the developer are proposed at this time.



TRAFFIC PLANNING AND DESIGN, INC.

WWW.TRAFFICPD.COM

**December 10, 2021**

Mr. Michael Downs, P.E.  
Toll Brothers  
1140 Virginia Drive  
Fort Washington, PA 19034

**RE: Greenridge Road Development – TIS Supplement**

*Upper Uwchlan Township, Chester County, PA*

TPD No. TOLB.00045

Dear Mike:

Traffic Planning and Design, Inc. (TPD) has completed a Transportation Impact Study (TIS) supplement for the proposed Greenridge Road residential development in Upper Uwchlan Township, Chester County, PA. This TIS Supplement has been prepared to address the following McMahon Associates, Inc. comment VI.3 in the November 4, 2021 Conditional Use Plan review letter issued by Gilmore & Associates, Inc.:

*SALDO Section 162-9.H(2) – Please verify the orientation of the traffic counts used in the traffic study at the intersection of Font Road and Greenridge Road/St. Andrews Lane. If revisions are needed, we do not believe this will impact the traffic study results appreciably.*

Per the above comment, TPD reoriented the traffic count at the Font Road intersection with Greenridge Road/St. Andrews Lane, developed the future conditions traffic volumes, and conducted capacity analysis as the intersection. All methodologies utilized were consistent with the previously submitted 10/21/21 TIS for the site. **Tables 1 and 2** below summarize the levels of service and queues during the weekday A.M. and P.M. peak hours at the intersection under existing, base (no-build) and projected (build) conditions.

TABLE 1  
LEVEL OF SERVICE DELAY (SECONDS) SUMMARY

Intersection	Movement	Weekday A.M. Peak Hour			Weekday P.M. Peak Hour		
		Existing Condition	2026 Future Conditions Base	Projected	Existing Condition	2026 Future Conditions Base	Projected
Font Road & Greenridge Road/St. Andrews Lane	EB LTR	A	A	A	B	B	B
	WB LTR	B	B	B	C	C	C
	NB L	A	A	A	A	A	A
	SB L	A	A	A	A	A	A
	<b>ILOS</b>	<b>A (5.2)</b>	<b>A (4.9)</b>	<b>A (5.3)</b>	<b>A (5.6)</b>	<b>A (5.5)</b>	<b>A (5.9)</b>

*E/W = Greenridge Road/St. Andrews Lane; N/S = Font Road*

TABLE 2  
95TH PERCENTILE QUEUE ANALYSIS (IN FEET)

Intersection	Movement	Available Storage (feet)	2026 Future Conditions			
			Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
			Base	Projected	Base	Projected
Font Road & Greenridge Road/St. Andrews Lane	EB LTR	75+	10	13	13	18
	WB LTR	75+	3	3	5	8
	NB L	75+	3	3	13	15
	SB L	75+	0	0	0	0

E/W = Greenridge Road/St. Andrews Lane; N/S = Font Road

As shown in **Tables 1 and 2**, the intersection operations will comply with the requirements outlined in PennDOT's TIS Guidelines. This overall result/conclusion is consistent with the 10/21/21 TIS. The intersection traffic count, volume development worksheet and capacity analyses are **attached**.

If there are questions or additional information is required, please call anytime.

Sincerely,

TRAFFIC PLANNING AND DESIGN, INC.



Guido W. DiMartino, P.E.

Regional Leader – Transportation Planning

GDiMartino@TrafficPD.com

Attachments: Traffic Count – Font Road/Greenridge Road Intersection  
Traffic Volume Development Worksheet  
Capacity Analysis Worksheets

# Manual Traffic Count Printouts



Counter:: Mio  
Counted By:: Mio  
Weather:: Clear

Traffic Planning and Design, Inc  
2500 East High Street  
Suite 650  
Pottstown, Pennsylvania, United States 19464  
610.326.3100 mbressler@trafficpd.com

Count Name: Greenridge Road and  
Font Road  
Site Code:  
Start Date: 10/05/2021  
Page No: 1

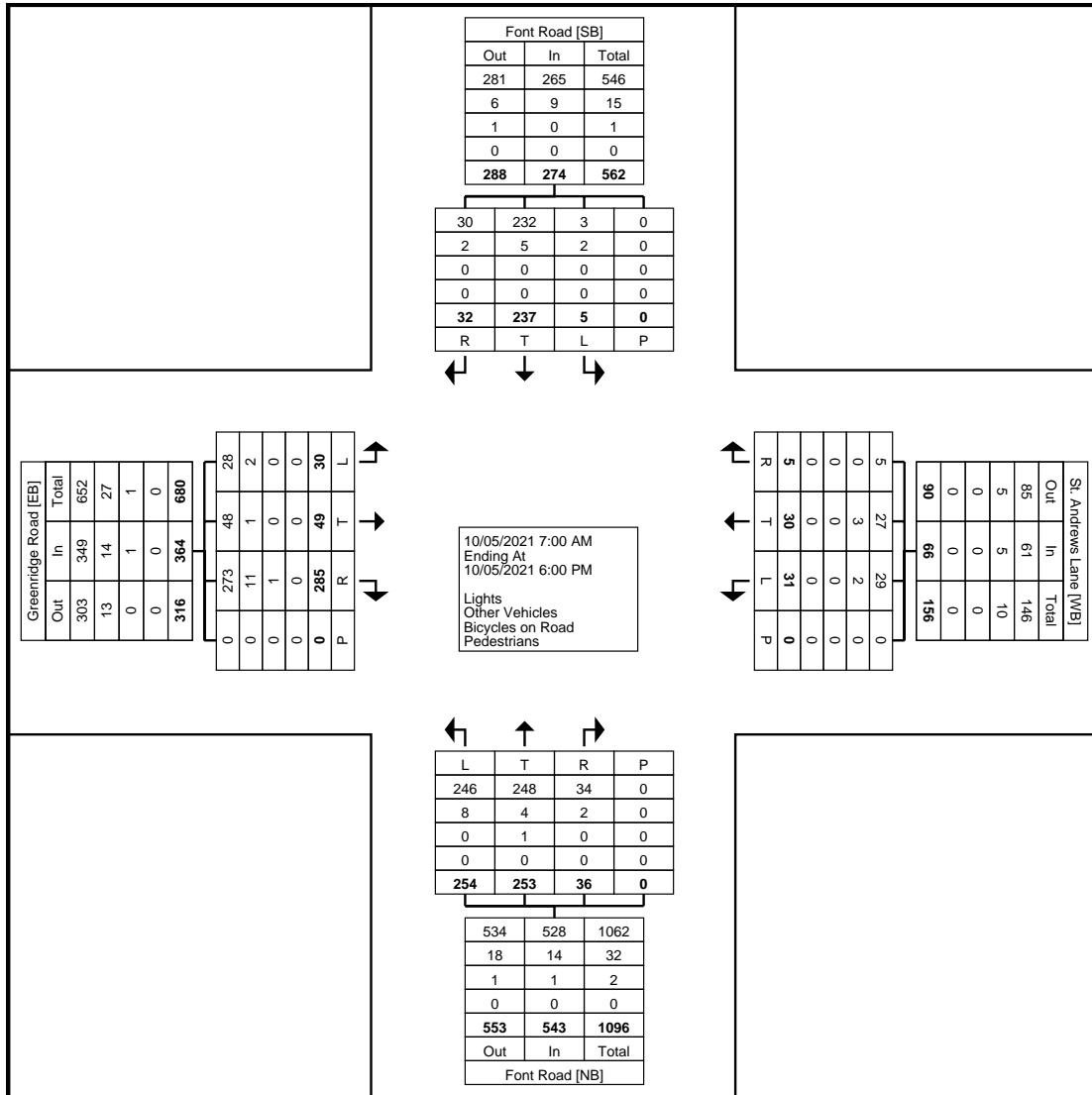
## Turning Movement Data



Counter:: Mio  
Counted By:: Mio  
Weather:: Clear

Traffic Planning and Design, Inc  
2500 East High Street  
Suite 650  
Pottstown, Pennsylvania, United States 19464  
610.326.3100 mbressler@trafficpd.com

Count Name: Greenridge Road and  
Font Road  
Site Code:  
Start Date: 10/05/2021  
Page No: 2



Turning Movement Data Plot



Counter:: Mio  
Counted By:: Mio  
Weather:: Clear

Traffic Planning and Design, Inc  
2500 East High Street  
Suite 650  
Pottstown, Pennsylvania, United States 19464  
610.326.3100 mbressler@trafficpd.com

Count Name: Greenridge Road and  
Font Road  
Site Code:  
Start Date: 10/05/2021  
Page No: 3

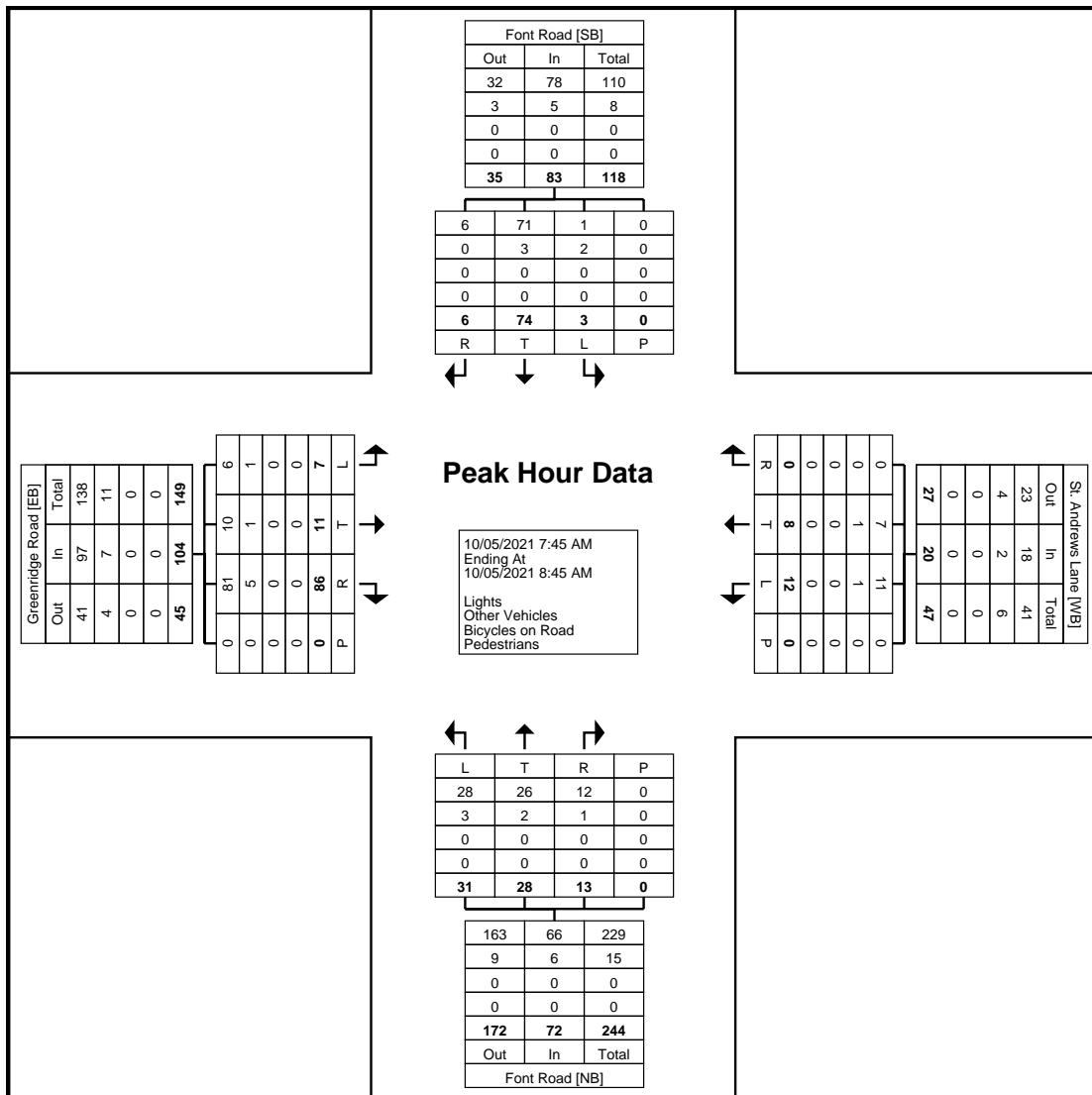
## Turning Movement Peak Hour Data (7:45 AM)



Counter:: Mio  
Counted By:: Mio  
Weather:: Clear

Traffic Planning and Design, Inc  
2500 East High Street  
Suite 650  
Pottstown, Pennsylvania, United States 19464  
610.326.3100 mbressler@trafficpd.com

Count Name: Greenridge Road and  
Font Road  
Site Code:  
Start Date: 10/05/2021  
Page No: 4



Turning Movement Peak Hour Data Plot (7:45 AM)



Counter:: Mio  
Counted By:: Mio  
Weather:: Clear

Traffic Planning and Design, Inc  
2500 East High Street  
Suite 650  
Pottstown, Pennsylvania, United States 19464  
610.326.3100 mbressler@trafficpd.com

Count Name: Greenridge Road and  
Font Road  
Site Code:  
Start Date: 10/05/2021  
Page No: 5

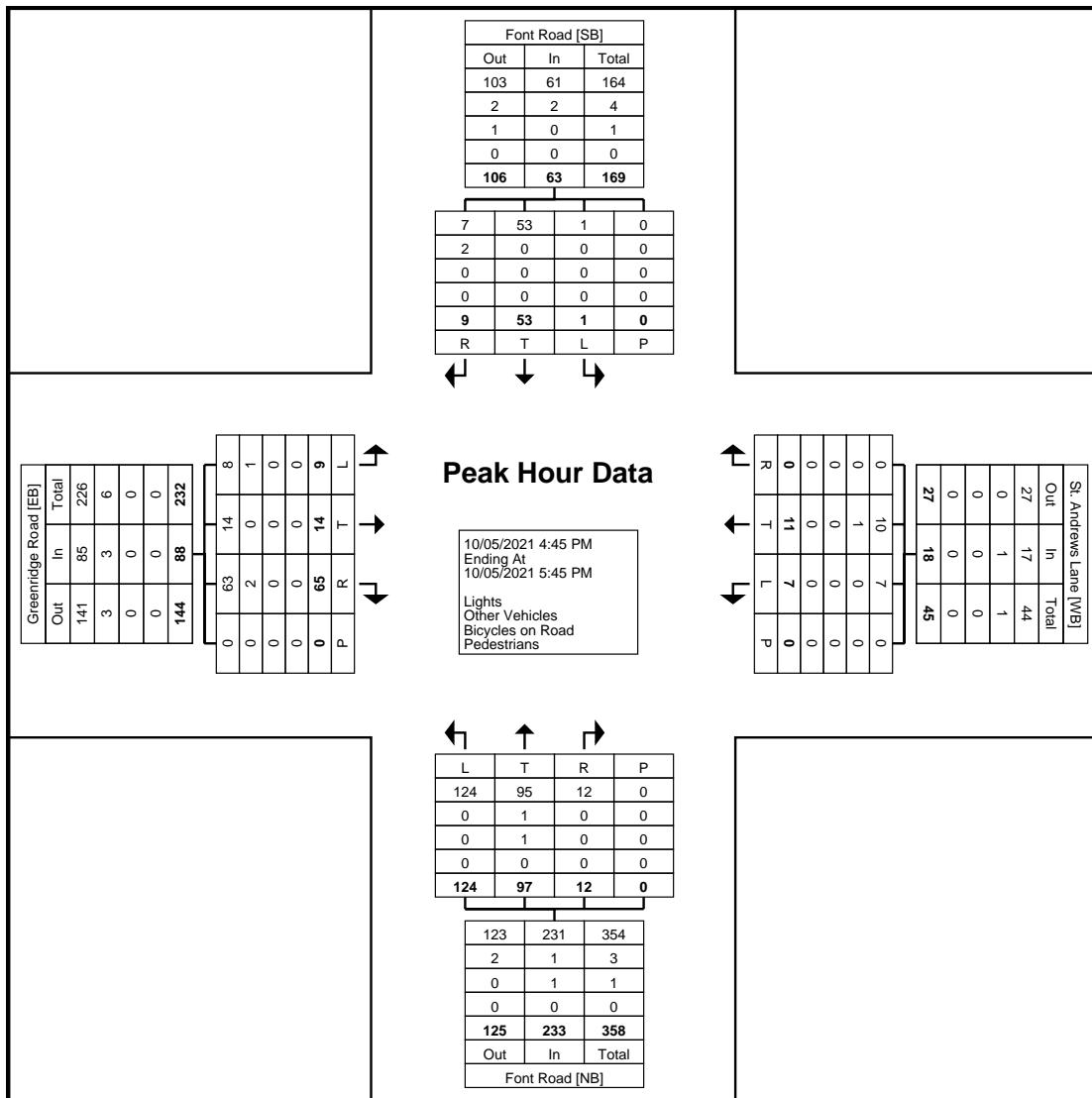
## Turning Movement Peak Hour Data (4:45 PM)



Counter:: Mio  
Counted By:: Mio  
Weather:: Clear

Traffic Planning and Design, Inc  
2500 East High Street  
Suite 650  
Pottstown, Pennsylvania, United States 19464  
610.326.3100 mbressler@trafficpd.com

Count Name: Greenridge Road and  
Font Road  
Site Code:  
Start Date: 10/05/2021  
Page No: 6



## Turning Movement Peak Hour Data Plot (4:45 PM)

# Volume Development Worksheet

TPD# TOLB.00045

12/9/2021

**Traffic Volumes Worksheet**

Intersection:

Synchro Node:

Font Road & Greenridge Road/St. Andrews Lane											
4 Adjacent intersections:			West			East			North		

Time Period: Weekday A.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	
2021 Counts	7	11	86	12	8	0	31	28	13	3	74	6	279
Adjustment													0
Existing Volumes (Adjusted)	7	11	86	12	8	0	31	28	13	3	74	6	279
Base growth (0.61% compounded for 5 yrs)	0	0	3	0	0	0	1	1	0	0	2	0	7
Byers Station 5C	0												0
Byers Station - 40 Town Homes	0												0
Byers Station - Ewing Tract	0												0
Byers Station - Parcel 6C	0												0
Gunner Property	0												1
McKee Fetters Tract	0												0
Nearby Total	0	0	0	0	0	0	0	15	0	0	6	1	
2026 Base Volumes	7	11	89	12	8	0	32	44	13	3	82	7	308
New Trips	6	2	16		1		5						2
Pass By Trips													
													0
Total Trip Distribution	6	2	16	0	1	0	5	0	0	0	0	2	32
2026 Projected Volumes	13	13	105	12	9	0	37	44	13	3	82	9	340

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	
2021 Counts	9	14	65	7	11	0	124	97	12	1	53	9	402
Adjustment													0
Existing Volumes (Adjusted)	9	14	65	7	11	0	124	97	12	1	53	9	402
Base growth (0.61% compounded for 5 yrs)	0	0	2	0	0	0	4	3	0	0	2	0	11
Byers Station 5C	0												0
Byers Station - 40 Town Homes	0												0
Byers Station - Ewing Tract	0												0
Byers Station - Parcel 6C	0												0
Gunner Property	1												0
McKee Fetters Tract	0												0
Nearby Total	1	0	0	0	0	0	0	0	10	0	0	15	0
2026 Base Volumes	10	14	67	7	11	0	128	110	12	1	70	9	439
New Trips	4	1	11		2		18						7
Pass By Trips													
	0												0
Total Trip Distribution	4	1	11	0	2	0	18	0	0	0	0	7	43
2026 Projected Volumes	14	15	78	7	13	0	146	110	12	1	70	16	482

# Capacity Analyses

# Existing Conditions

## 4: Font Road &amp; Greenridge Road/St. Andrews Lane

Existing Conditions

Timing Plan: AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	11	86	12	8	0	31	28	13	3	74	6
Future Volume (vph)	7	11	86	12	8	0	31	28	13	3	74	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	11	11	11
Grade (%)	-2%				1%			-5%			1%	
Link Speed (mph)	35				35			30			30	
Link Distance (ft)	1076				903			900			964	
Travel Time (s)	21.0				17.6			20.5			21.9	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	14%	9%	6%	8%	13%	0%	10%	7%	8%	67%	4%	0%
Shared Lane Traffic (%)												
Sign Control	Stop				Stop			Free			Free	

## Intersection Summary

Area Type: Other

Control Type: Unsignalized

## 4: Font Road &amp; Greenridge Road/St. Andrews Lane

Existing Conditions

Timing Plan: AM Peak Hour

## Intersection

Int Delay, s/veh 5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	11	86	12	8	0	31	28	13	3	74	6
Future Vol, veh/h	7	11	86	12	8	0	31	28	13	3	74	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-2	-	-	1	-	-	-5	-	-	1	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	14	9	6	8	13	0	10	7	8	67	4	0
Mvmt Flow	8	12	92	13	9	0	33	30	14	3	80	6

Major/Minor	Minor2	Minor1			Major1			Major2				
Conflicting Flow All	197	199	83	244	195	37	86	0	0	44	0	0
Stage 1	89	89	-	103	103	-	-	-	-	-	-	-
Stage 2	108	110	-	141	92	-	-	-	-	-	-	-
Critical Hdwy	6.84	6.19	6.06	7.38	6.8	6.3	4.4	-	-	4.3	-	-
Critical Hdwy Stg 1	5.84	5.19	-	6.38	5.83	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	5.19	-	6.38	5.83	-	-	-	-	-	-	-
Follow-up Hdwy	3	4.081	3.1	3	4.117	3.1	3	-	-	3	-	-
Pot Cap-1 Maneuver	895	700	1046	804	675	1106	1119	-	-	1160	-	-
Stage 1	1078	816	-	1043	785	-	-	-	-	-	-	-
Stage 2	1053	801	-	991	794	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	864	677	1046	705	653	1106	1119	-	-	1160	-	-
Mov Cap-2 Maneuver	864	677	-	705	653	-	-	-	-	-	-	-
Stage 1	1046	814	-	1012	761	-	-	-	-	-	-	-
Stage 2	1010	777	-	888	792	-	-	-	-	-	-	-

Approach	EB	WB			NB			SB			
HCM Control Delay, s	9.2	10.4			3.6			0.3			
HCM LOS	A	B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR			
Capacity (veh/h)	1119	-	-	976	683	1160	-	-			
HCM Lane V/C Ratio	0.03	-	-	0.115	0.031	0.003	-	-			
HCM Control Delay (s)	8.3	0	-	9.2	10.4	8.1	0	-			
HCM Lane LOS	A	A	-	A	B	A	A	-			
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.1	0	-	-			

## 4: Font Road &amp; Greenridge Road/St. Andrews Lane

Existing Conditions

Timing Plan: PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	14	65	7	11	0	124	97	12	1	53	9
Future Volume (vph)	9	14	65	7	11	0	124	97	12	1	53	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	11	11	11
Grade (%)	-2%				1%			-5%			1%	
Link Speed (mph)	35				35			30			30	
Link Distance (ft)	1076				903			900			964	
Travel Time (s)	21.0				17.6			20.5			21.9	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	11%	0%	3%	0%	9%	0%	0%	1%	0%	0%	0%	22%
Shared Lane Traffic (%)												
Sign Control	Stop				Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											

#### 4: Font Road & Greenridge Road/St. Andrews Lane

Existing Conditions

Timing Plan: PM Peak Hour

##### Intersection

Int Delay, s/veh 5.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	14	65	7	11	0	124	97	12	1	53	9
Future Vol, veh/h	9	14	65	7	11	0	124	97	12	1	53	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-2	-	-	1	-	-	-5	-	-	1	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	11	0	3	0	9	0	0	1	0	0	0	22
Mvmt Flow	11	17	80	9	14	0	153	120	15	1	65	11

Major/Minor	Minor2	Minor1			Major1			Major2				
Conflicting Flow All	514	514	71	555	512	128	76	0	0	135	0	0
Stage 1	73	73	-	434	434	-	-	-	-	-	-	-
Stage 2	441	441	-	121	78	-	-	-	-	-	-	-
Critical Hdwy	6.81	6.1	6.03	7.3	6.8	6.3	4.3	-	-	4.3	-	-
Critical Hdwy Stg 1	5.81	5.1	-	6.3	5.79	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.81	5.1	-	6.3	5.79	-	-	-	-	-	-	-
Follow-up Hdwy	3	4	3.1	3	4.081	3.1	3	-	-	3	-	-
Pot Cap-1 Maneuver	558	494	1063	486	442	980	1131	-	-	1080	-	-
Stage 1	1099	845	-	669	556	-	-	-	-	-	-	-
Stage 2	704	610	-	1021	813	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	482	421	1063	386	377	980	1131	-	-	1080	-	-
Mov Cap-2 Maneuver	482	421	-	386	377	-	-	-	-	-	-	-
Stage 1	939	844	-	571	475	-	-	-	-	-	-	-
Stage 2	584	521	-	924	812	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.4	15.1	4.6	0.1
HCM LOS	B	C		
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1
Capacity (veh/h)	1131	-	-	778 380 1080
HCM Lane V/C Ratio	0.135	-	-	0.14 0.058 0.001
HCM Control Delay (s)	8.7	0	-	10.4 15.1 8.3
HCM Lane LOS	A	A	-	B C A A
HCM 95th %tile Q(veh)	0.5	-	-	0.5 0.2 0

# Base Conditions

#### 4: Font Road & Greenridge Road/St. Andrews Lane

Base Conditions

Timing Plan: AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	11	89	12	8	0	32	44	13	3	82	7
Future Volume (vph)	7	11	89	12	8	0	32	44	13	3	82	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	11	11	11
Grade (%)	-2%				1%			-5%			1%	
Link Speed (mph)	35				35			30			30	
Link Distance (ft)	1076				903			900			964	
Travel Time (s)	21.0				17.6			20.5			21.9	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	14%	9%	6%	8%	13%	0%	10%	7%	8%	67%	4%	0%
Shared Lane Traffic (%)												
Sign Control	Stop				Stop			Free			Free	

#### Intersection Summary

Area Type: Other

Control Type: Unsignalized

#### 4: Font Road & Greenridge Road/St. Andrews Lane

Base Conditions

Timing Plan: AM Peak Hour

##### Intersection

Int Delay, s/veh 4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	11	89	12	8	0	32	44	13	3	82	7
Future Vol, veh/h	7	11	89	12	8	0	32	44	13	3	82	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-2	-	-	1	-	-	-5	-	-	1	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	14	9	6	8	13	0	10	7	8	67	4	0
Mvmt Flow	8	12	96	13	9	0	34	47	14	3	88	8

Major/Minor	Minor2	Minor1			Major1			Major2				
Conflicting Flow All	225	227	92	274	224	54	96	0	0	61	0	0
Stage 1	98	98	-	122	122	-	-	-	-	-	-	-
Stage 2	127	129	-	152	102	-	-	-	-	-	-	-
Critical Hdwy	6.84	6.19	6.06	7.38	6.8	6.3	4.4	-	-	4.3	-	-
Critical Hdwy Stg 1	5.84	5.19	-	6.38	5.83	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	5.19	-	6.38	5.83	-	-	-	-	-	-	-
Follow-up Hdwy	3	4.081	3.1	3	4.117	3.1	3	-	-	3	-	-
Pot Cap-1 Maneuver	858	677	1035	765	649	1081	1110	-	-	1144	-	-
Stage 1	1066	809	-	1017	769	-	-	-	-	-	-	-
Stage 2	1029	787	-	976	785	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	826	653	1035	666	626	1081	1110	-	-	1144	-	-
Mov Cap-2 Maneuver	826	653	-	666	626	-	-	-	-	-	-	-
Stage 1	1032	807	-	984	744	-	-	-	-	-	-	-
Stage 2	985	762	-	870	783	-	-	-	-	-	-	-

Approach	EB	WB			NB			SB		
HCM Control Delay, s	9.3	10.7			3			0.3		
HCM LOS	A	B								
<hr/>										
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR		
Capacity (veh/h)	1110	-	-	961	649	1144	-	-		
HCM Lane V/C Ratio	0.031	-	-	0.12	0.033	0.003	-	-		
HCM Control Delay (s)	8.3	0	-	9.3	10.7	8.2	0	-		
HCM Lane LOS	A	A	-	A	B	A	A	-		
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.1	0	-	-		

#### 4: Font Road & Greenridge Road/St. Andrews Lane

Base Conditions

Timing Plan: PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	14	67	7	11	0	128	110	12	1	70	9
Future Volume (vph)	10	14	67	7	11	0	128	110	12	1	70	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	11	11	11
Grade (%)	-2%				1%			-5%			1%	
Link Speed (mph)	35				35			30			30	
Link Distance (ft)	1076				903			900			964	
Travel Time (s)	21.0				17.6			20.5			21.9	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	11%	0%	3%	0%	9%	0%	0%	1%	0%	0%	0%	22%
Shared Lane Traffic (%)												
Sign Control	Stop				Stop			Free			Free	

#### Intersection Summary

Area Type: Other

Control Type: Unsignalized

#### 4: Font Road & Greenridge Road/St. Andrews Lane

Base Conditions

Timing Plan: PM Peak Hour

##### Intersection

Int Delay, s/veh 5.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	14	67	7	11	0	128	110	12	1	70	9
Future Vol, veh/h	10	14	67	7	11	0	128	110	12	1	70	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-2	-	-	1	-	-	-5	-	-	1	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	11	0	3	0	9	0	0	1	0	0	0	22
Mvmt Flow	12	17	83	9	14	0	158	136	15	1	86	11

Major/Minor	Minor2	Minor1			Major1			Major2				
Conflicting Flow All	561	561	92	604	559	144	97	0	0	151	0	0
Stage 1	94	94	-	460	460	-	-	-	-	-	-	-
Stage 2	467	467	-	144	99	-	-	-	-	-	-	-
Critical Hdwy	6.81	6.1	6.03	7.3	6.8	6.3	4.3	-	-	4.3	-	-
Critical Hdwy Stg 1	5.81	5.1	-	6.3	5.79	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.81	5.1	-	6.3	5.79	-	-	-	-	-	-	-
Follow-up Hdwy	3	4	3.1	3	4.081	3.1	3	-	-	3	-	-
Pot Cap-1 Maneuver	520	467	1035	449	414	960	1112	-	-	1066	-	-
Stage 1	1072	830	-	646	540	-	-	-	-	-	-	-
Stage 2	682	595	-	990	795	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	445	394	1035	352	349	960	1112	-	-	1066	-	-
Mov Cap-2 Maneuver	445	394	-	352	349	-	-	-	-	-	-	-
Stage 1	906	829	-	546	456	-	-	-	-	-	-	-
Stage 2	559	503	-	891	794	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.7	16	4.5	0.1
HCM LOS	B	C		
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1
Capacity (veh/h)	1112	-	-	741 350
HCM Lane V/C Ratio	0.142	-	-	0.152 0.063
HCM Control Delay (s)	8.8	0	-	10.7 16
HCM Lane LOS	A	A	-	B C
HCM 95th %tile Q(veh)	0.5	-	-	0.5 0.2

# Projected Conditions

## 4: Font Road &amp; Greenridge Road/St. Andrews Lane

Projected Conditions

Timing Plan: AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	13	105	12	9	0	37	44	13	3	82	9
Future Volume (vph)	13	13	105	12	9	0	37	44	13	3	82	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	11	11	11
Grade (%)	-2%				1%			-5%			1%	
Link Speed (mph)	35				35			30			30	
Link Distance (ft)	1076				903			900			964	
Travel Time (s)	21.0				17.6			20.5			21.9	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	14%	9%	6%	8%	13%	0%	10%	7%	8%	67%	4%	0%
Shared Lane Traffic (%)												
Sign Control	Stop				Stop			Free			Free	

## Intersection Summary

Area Type: Other

Control Type: Unsignalized

## 4: Font Road &amp; Greenridge Road/St. Andrews Lane

Projected Conditions

Timing Plan: AM Peak Hour

## Intersection

Int Delay, s/veh 5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	13	105	12	9	0	37	44	13	3	82	9
Future Vol, veh/h	13	13	105	12	9	0	37	44	13	3	82	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-2	-	-	1	-	-	-5	-	-	1	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	14	9	6	8	13	0	10	7	8	67	4	0
Mvmt Flow	14	14	113	13	10	0	40	47	14	3	88	10

Major/Minor	Minor2	Minor1			Major1			Major2				
Conflicting Flow All	238	240	93	297	238	54	98	0	0	61	0	0
Stage 1	99	99	-	134	134	-	-	-	-	-	-	-
Stage 2	139	141	-	163	104	-	-	-	-	-	-	-
Critical Hdwy	6.84	6.19	6.06	7.38	6.8	6.3	4.4	-	-	4.3	-	-
Critical Hdwy Stg 1	5.84	5.19	-	6.38	5.83	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	5.19	-	6.38	5.83	-	-	-	-	-	-	-
Follow-up Hdwy	3	4.081	3.1	3	4.117	3.1	3	-	-	3	-	-
Pot Cap-1 Maneuver	842	667	1033	737	637	1081	1109	-	-	1144	-	-
Stage 1	1065	809	-	1000	759	-	-	-	-	-	-	-
Stage 2	1014	779	-	961	784	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	807	640	1033	626	612	1081	1109	-	-	1144	-	-
Mov Cap-2 Maneuver	807	640	-	626	612	-	-	-	-	-	-	-
Stage 1	1026	807	-	963	731	-	-	-	-	-	-	-
Stage 2	964	750	-	839	782	-	-	-	-	-	-	-

Approach	EB	WB			NB			SB			
HCM Control Delay, s	9.5	11			3.3			0.3			
HCM LOS	A	B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR			
Capacity (veh/h)	1109	-	-	949	620	1144	-	-			
HCM Lane V/C Ratio	0.036	-	-	0.148	0.036	0.003	-	-			
HCM Control Delay (s)	8.4	0	-	9.5	11	8.2	0	-			
HCM Lane LOS	A	A	-	A	B	A	A	-			
HCM 95th %tile Q(veh)	0.1	-	-	0.5	0.1	0	-	-			

## 4: Font Road &amp; Greenridge Road/St. Andrews Lane

Projected Conditions

Timing Plan: PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	15	78	7	13	0	146	110	12	1	70	16
Future Volume (vph)	14	15	78	7	13	0	146	110	12	1	70	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	11	11	11
Grade (%)	-2%				1%			-5%			1%	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1076			903			900			964	
Travel Time (s)		21.0			17.6			20.5			21.9	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	11%	0%	3%	0%	9%	0%	0%	1%	0%	0%	0%	22%
Shared Lane Traffic (%)												
Sign Control	Stop			Stop			Free			Free		

## Intersection Summary

Area Type: Other

Control Type: Unsignalized

## 4: Font Road &amp; Greenridge Road/St. Andrews Lane

Projected Conditions

Timing Plan: PM Peak Hour

## Intersection

Int Delay, s/veh 5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	14	15	78	7	13	0	146	110	12	1	70	16
Future Vol, veh/h	14	15	78	7	13	0	146	110	12	1	70	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-2	-	-	1	-	-	-5	-	-	1	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	11	0	3	0	9	0	0	1	0	0	0	22
Mvmt Flow	17	19	96	9	16	0	180	136	15	1	86	20

Major/Minor	Minor2	Minor1			Major1			Major2				
Conflicting Flow All	610	609	96	660	612	144	106	0	0	151	0	0
Stage 1	98	98	-	504	504	-	-	-	-	-	-	-
Stage 2	512	511	-	156	108	-	-	-	-	-	-	-
Critical Hdwy	6.81	6.1	6.03	7.3	6.8	6.3	4.3	-	-	4.3	-	-
Critical Hdwy Stg 1	5.81	5.1	-	6.3	5.79	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.81	5.1	-	6.3	5.79	-	-	-	-	-	-	-
Follow-up Hdwy	3	4	3.1	3	4.081	3.1	3	-	-	3	-	-
Pot Cap-1 Maneuver	483	441	1030	409	385	960	1105	-	-	1066	-	-
Stage 1	1067	827	-	608	515	-	-	-	-	-	-	-
Stage 2	645	572	-	974	788	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	401	362	1030	308	316	960	1105	-	-	1066	-	-
Mov Cap-2 Maneuver	401	362	-	308	316	-	-	-	-	-	-	-
Stage 1	877	826	-	500	423	-	-	-	-	-	-	-
Stage 2	510	470	-	862	787	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.3	17.5	4.8	0.1
HCM LOS	B	C		
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1
Capacity (veh/h)	1105	-	-	704 313 1066
HCM Lane V/C Ratio	0.163	-	-	0.188 0.079 0.001
HCM Control Delay (s)	8.9	0	-	11.3 17.5 8.4
HCM Lane LOS	A	A	-	B C A A
HCM 95th %tile Q(veh)	0.6	-	-	0.7 0.3 0