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UPPER PERKIOMEN VALLEY REGIONAL TRANSPORTATION STUDY AREA

CAPITAL IMPROVEMENTS PLAN

EAST GREENVILLE BOROUGH, PENNSBURG BOROUGH, RED HILL BOROUGH, GREEN LANE BOROUGH, UPPER HANOVER TOWNSHIP, MARLBOROUGH TOWNSHIP

MONTGOMERY COUNTY, PA

Prepared for:

Upper Perkiomen Valley Regional Planning Commission
Montgomery County Planning Commission

July 2007
MCPC 0601

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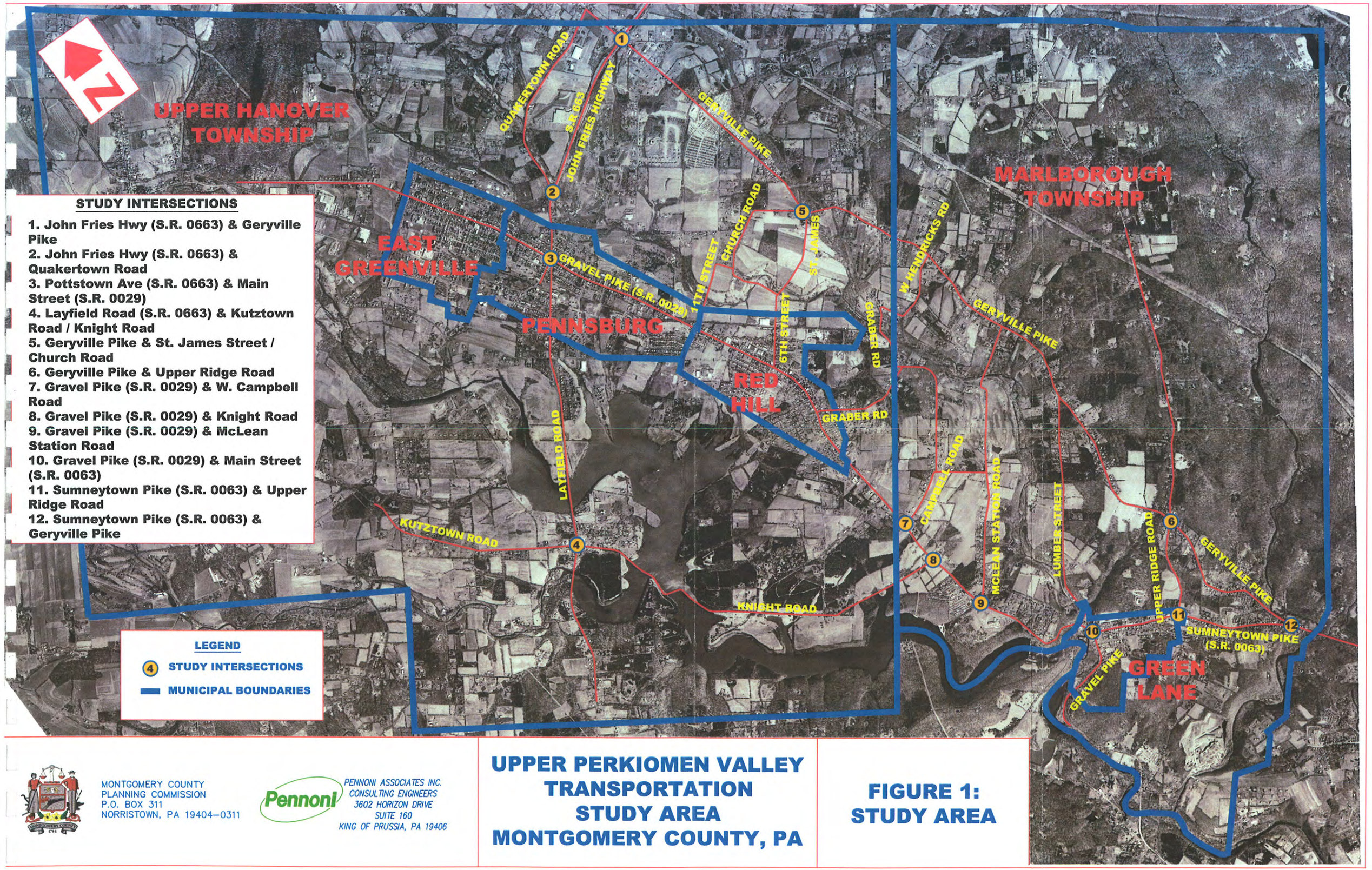
I. INTRODUCTION

This report has been prepared as required within ARTICLE V-A, entitled "Municipal Capital Improvement", Act 209 of the Pennsylvania Municipalities Planning Code on behalf of the Upper Perkiomen Valley Regional Planning Commission and the Montgomery County Planning Commission for the Upper Perkiomen Valley Regional Transportation Study Area in Montgomery County, PA. Preceding this report were the preparation of a Land Use Assumption Report (LUAR) and a Roadway Sufficiency Analysis (RSA) for the study area.

The Upper Perkiomen Valley Regional Planning Commission is comprised of six (6) municipalities (East Greenville Borough, Pennsburg Borough, Red Hill Borough, Green Lane Borough, Upper Hanover Township and Marlborough Township). The preparation of this report is unique in that these municipalities have joined together with the County and State to address existing and future traffic issues on a regional level, not only on a local level.

The limits of the Upper Perkiomen Valley Regional Transportation Study Area include East Greenville Borough, Pennsburg Borough, Red Hill Borough, Green Lane Borough, Upper Hanover Township, and Marlborough Township. More specifically, the study area includes the length of John Fries Highway (SR 0663) from Geryville Pike to Knight Road/Kutztown Road (SR 1033), the length of Gravel Pike (SR 0029) from Pottstown Avenue (SR 0663) to Sumneytown Pike (SR 0063), the length of Sumneytown Pike (SR 0063) from Gravel Pike (SR 0029) to Geryville Pike, and the length of Geryville Pike from John Fries Highway (SR 0663) to Sumneytown Pike (SR 0063). As noted, the primary roadways within the study area are State Routes (SR).

This report addresses the program of traffic related improvements from the Roadway Sufficiency Analysis (RSA). As part of this Capital Improvements Plan phase, project descriptions and project cost estimates have been defined to address existing, on-going regional growth (Pass-through traffic) and expected Total Future traffic (including expected development within the study area) demand at twelve (12) key intersections within the study area. Furthermore, a traffic impact fee has been estimated for the study area from analysis of anticipated development trip generation and attributable improvement costs. **FIGURE 1** illustrates the location of the study intersections within the County.



STUDY INTERSECTIONS

1. John Fries Hwy (S.R. 0663) & Geryville Pike
2. John Fries Hwy (S.R. 0663) & Quakertown Road
3. Pottstown Ave (S.R. 0663) & Main Street (S.R. 0029)
4. Layfield Road (S.R. 0663) & Kutztown Road / Knight Road
5. Geryville Pike & St. James Street / Church Road
6. Geryville Pike & Upper Ridge Road
7. Gravel Pike (S.R. 0029) & W. Campbell Road
8. Gravel Pike (S.R. 0029) & Knight Road
9. Gravel Pike (S.R. 0029) & McLean Station Road
10. Gravel Pike (S.R. 0029) & Main Street (S.R. 0063)
11. Sumneytown Pike (S.R. 0063) & Upper Ridge Road
12. Sumneytown Pike (S.R. 0063) & Geryville Pike

LEGEND

4 STUDY INTERSECTIONS

MUNICIPAL BOUNDARIES

MONTGOMERY COUNTY
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P.O. BOX 311
NORRISTOWN, PA 19404–0311

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UPPER PERKIOMEN VALLEY TRANSPORTATION STUDY AREA MONTGOMERY COUNTY, PA

FIGURE 1: STUDY AREA

BACKGROUND

According to ARTICLE V-A, as enabled by PA Act 209 (effective 12/19/1990), traffic impact fee ordinances must be systematically developed, based upon and directed toward traffic related improvements attributable to new land development related traffic within a study area. Traffic related improvements that are presently required or which would result from on-going regional development (beyond the boundary of the study area) must be financed with sources other than impact fees.

Preceding the preparation of this report, a Land Use Assumptions Report was prepared by the Montgomery County Planning Commission and commissioned for the purpose of predicting the most realistic future development scenario anticipated for the Upper Perkiomen Valley Regional Transportation Study Area within Montgomery County. A Roadway Sufficiency Analysis (RSA) was also prepared, which establishes the existing and future traffic engineering needs within the study area based upon the Preferred Level of Service for the area. The incremental traffic improvements identified to accommodate existing, on-going regional growth (i.e., pass-through traffic, without specific development in the study area) and expected future traffic demand (including expected development specifically within the study area) were identified in the RSA report. This Capital Improvements Plan (CIP) will establish conceptual cost estimates for each project recommended to mitigate the various study intersection deficiencies.

Continued surveillance of traffic and land use conditions should be regularly undertaken, over the life of the CIP, to monitor actual conditions. When needed, the plan should be revised to stay current.

The remaining activity following this report, necessary to complete the Act 209 process and implement a traffic impact fee ordinance is the drafting/passage of the actual Transportation Impact Fee Ordinance. The Impact Fee Ordinance synthesizes the elements of all preceding phases, focusing on expected new development traffic impact, legally enabling each municipality to collect and use impact fees for transportation network improvements.

II. IMPROVEMENTS PROJECTS

A summary of necessary physical improvements to accommodate Existing and Pass-through traffic volumes, and Total Future traffic volumes improvements as presented in the Roadway Sufficiency Analysis are represented in **TABLE 1** below.

Conceptual illustrations of these improvements are provided in ***APPENDIX A.*** Improvements shown or listed for the 2016 Total Future traffic condition scenario may be financed, in part, by impact fees. Improvements satisfying Existing and Pass-through traffic conditions require financing through other sources.

TABLE 1
SUMMARY OF RECOMMENDED IMPROVEMENTS

	INTERSECTION	TRAFFIC CONDITION SCENARIO		
		EXISTING	PASS-THROUGH (2016)	TOTAL FUTURE (2016)
1	John Fries Highway (S.R. 0663) & Geryville Pike	NA	▪ Left turn lanes on each approach ▪ Left turn arrows on Westbound approach of John Fries Highway (S.R. 0063) and Southbound approach of Geryville Pike	▪ Add a through lane on Eastbound and Westbound approaches of John Fries Highway (S.R. 0663)
2	John Fries Highway (S.R. 0663) & Quakertown Road	NA	NA	NA
3	Pottstown Avenue (S.R. 0663) & Gravel Pike (S.R. 0029)	NA	▪ Right turn lanes on Eastbound approach of Pottstown Avenue (S.R. 0663) and Northbound approach of Gravel Pike (S.R. 0029)	▪ Add a through lane at Northbound and Southbound approaches of Gravel Pike (S.R. 0029)
4	Layfield Road (S.R. 0663) & Knight Road/Kutztown Road	NA	NA	NA
5	Geryville Pike & St. James Street/Church Road	NA	NA	▪ Install traffic signal ▪ Realign Church Road
6	Geryville Pike & Upper Ridge Road	NA	NA	NA
7	Gravel Pike (S.R. 0029) & West Campbell Road	NA	NA	NA
8	Gravel Pike (S.R. 0029) & Knight Road	▪ Install traffic signal	NA	NA
9	Gravel Pike (S.R. 0029) & McLean Station Road	NA	▪ Install traffic signal ▪ Realign McLean Station Road	NA
10	Gravel Pike (S.R. 0029) & Main Street (S.R. 0063)	▪ Install traffic signal	▪ Separate right and left turn lanes at Westbound approach of Main Street (S.R. 0063)	▪ Separate through and right lanes at Northbound approach of Gravel Pike (S.R. 0029)
11	Sumneytown Pike (S.R. 0063) & Upper Ridge Road	▪ Install traffic signal	NA	NA

12	Sumneytown Pike (S.R. 0063) & Geryville Pike	▪ Install traffic signal ▪ Restrict Eastbound left turns on Sumneytown Pike (S.R. 0063)	▪ Add a through lane at Eastbound approach of Sumneytown Pike (S.R. 0063)	▪ Add a right lane at Westbound approach of Sumneytown Pike (S.R. 0063)

It is important to note that restrictions upon the recommended improvements, as outlined in **TABLE 1,** exist due to limited space for widening along many of the study area roadways and the need to acquire right of way. The recommended improvements defined above are the necessary measures to achieve Levels of Service at or above the Preferred Levels of Service criteria as defined in the Roadway Sufficiency Analysis.

At the intersection of Pottstown Avenue (S.R. 0663) & Gravel Pike (S.R. 0029), the widening necessary to install right turn lanes at the Eastbound approach of Pottstown Avenue (S.R. 0663) and at the Northbound approach of Gravel Pike (S.R. 0029) under the 2016 Pass-Through scenario, along with the widening necessary to install a through lane at the Northbound and Southbound approaches of Gravel Pike (S.R. 0029) under the 2016 Total Future scenario would require the acquisition of several business properties along Pottstown Avenue (S.R. 0663) and Gravel Pike (S.R. 0029). To acquire these properties would be extremely costly and is unrealistic due to their role within Pennsburg Borough. The recommended improvements for this intersection, as provided in **TABLE 1**, are the required improvements to mitigate the unacceptable levels of service and delay at the intersection. In order to improve the intersection, it is recommended that other methods are investigated such as providing a bypass route to the intersection.

It should be noted that the widening at the intersection of Sumneytown Pike (S.R. 0063) & Geryville Pike would also require the acquisition of several private properties.

It should also be noted that the realignment of Church Road and McLean Station Road at the intersections of Geryville Pike & St. James Street/Church Road and Gravel Pike (S.R. 0029) & McLean Station Road, respectively, would require the acquisition of a significant amount of right of way. For example, the conceptual realignment of Church Road requires the acquisition of the property adjacent to the intersection to allow for the demolition of the existing barn at the intersection.

III. SOURCES OF FUNDING

Three major sources are cited in financing and implementing the Capital Improvements Plan: the State/Federal Government, the municipalities that comprise the Upper Perkiomen Valley Regional Planning Commission (East Greenville Borough, Pennsburg Borough, Red Hill Borough, Green Lane Borough, Upper Hanover Township, and Marlborough Township) and define the study area, and the development community.

The State is a major participant because most of the recommended improvements involve or impact State-owned highways. It should be noted that traffic impact fees can only fund a maximum of 50% of the cost for improvements on State Routes.

The study area municipalities are also responsible in financing and implementing the recommended improvements since they would be prime sponsor and administrator of the Capital Improvements Plan and will (through the successful completion of employing an Act 209) collect and expend traffic impact fees for the betterment of the regional roadway infrastructure system.

Finally, the development community has an active role in financing and implementing the recommended improvements due to the fact that through its contributions (traffic impact fees) or provision of in-kind services (dedication of right-of-way and/or construction activities) it can directly advance a project toward or through implementation.

IV. OPINION OF PROBABLE COST TO IMPLEMENT IMPROVEMENTS PROJECTS

Preliminary opinions of probable project related costs have been formulated to provide a sense of expenditure necessary to realize the recommended plan improvements. The opinions of probable cost have been estimated for the following project components with the criteria noted below:

1. Engineering Design – 20% of total construction costs.

2. Utility Pole Relocation & Inlet Relocation - $4,000/pole & $5,000/inlet

3. Construction Costs – based upon field views, estimated quantities taken from sketch plans, and unit prices obtained from recent bid packages for similar projects received by PennDOT. Construction cost estimate totals include:

   - Bituminous Pavement including excavation - $60/S.Y.
   - Shoulders including excavation - $50/S.Y.
   - Curbing - $20/L.F.
   - Concrete Sidewalk/Concrete Island (excluding curbing around the island) - $40/S.Y.
   - 1 ½" Bituminous Overlay - $5/S.Y.
   - Lump Sum Cost for traffic signal per intersection - $95,000
   - Mobilization & Insurance – 5% of construction cost.
   - Maintenance & Protection of Traffic – 10% of construction cost.
   - Construction Contingencies – 20% of construction cost/mobilization/insurance/maintenance & protection of traffic
   - Construction Inspection – 10% of construction cost/mobilization/insurance/maintenance & protection of traffic/contingencies

It should be noted that the estimated cost for each of the recommended improvements does not include the cost to purchase additional right-of-way as this is the realm of the real estate profession.

TABLE 2 presents the recommended Ten (10) Year Transportation Capital Improvements Plan for the Upper Perkiomen Regional Transportation Study Area along with an opinion of probable cost.

A breakdown of the conceptual estimate for each recommended improvement is provided in ***APPENDIX B, APPENDIX C,*** and ***APPENDIX D***, for Existing Conditions, 2016 Pass-Through Conditions, and 2016 Total Future Conditions, respectively.

TABLE 2
UPPER PERKIOMEN VALLEY REGIONAL TRANSPORTATION STUDY AREA
CAPITAL IMPROVEMENTS PLAN SUMMARY

LOCATION	TRAFFIC CONDITION SCENARIO			IMPROVEMENT COSTS		
	EXISTING	PASS-THROUGH (2016)	TOTAL FUTURE (2016)	EXISTING	PASS-THROUGH (2016)	TOTAL FUTURE (2016)
John Fries Highway (S.R. 0663) & Geryville Pike	NA	▪ Left turn lanes on each approach ▪ Left turn arrows on Westbound approach of John Fries Highway (S.R. 0663) and Southbound approach of Geryville Pike	▪ Add a through lane on Eastbound and Westbound approaches of John Fries Highway (S.R. 0663)	NA	$231,000	$646,000
Pottstown Avenue (S.R. 0663) & Gravel Pike (S.R. 0029)	NA	▪ Right turn lanes on Eastbound approach of Pottstown Avenue (S.R. 0663) and Northbound approach of Gravel Pike (S.R. 0029)	▪ Add a through lane on Northbound and Southbound approaches of Gravel Pike (S.R. 0029)	NA	$54,000	$617,000
Geryville Pike & St. James Street/Church Road	NA	NA	▪ Install traffic signal ▪ Realign Church Road	NA	NA	$378,000
Gravel Pike (S.R. 0029) & Knight Road	▪ Install traffic signal	NA	NA	$95,000	NA	NA
Gravel Pike (S.R. 0029) & McLean Station Road	NA	▪ Install traffic signal ▪ Realign McLean Station Road	NA	NA	$267,000	NA
Gravel Pike (S.R. 0029) & Main Street (S.R. 0063)	▪ Install traffic signal	▪ Separate right and left turn lanes on Westbound approach of Main Street (S.R. 0063)	▪ Separate through and right lanes on Northbound approach of Gravel Pike (S.R. 0029)	$203,000	$31,000	$75,000
Sumneytown Pike (S.R. 0063) & Upper Ridge Road	▪ Install traffic signal	NA	NA	$95,000	NA	NA
Sumneytown Pike (S.R. 0063) & Geryville Pike	▪ Install traffic signal	▪ Add a through lane on Eastbound approach of Sumneytown Pike (S.R. 0063)	▪ Add a right lane on Westbound approach of Sumneytown Pike (S.R. 0063)	$167,000	$358,000	$31,000
TOTAL				**$560,000**	**$941,000**	**$1,747,000**

In summary, if the Upper Perkiomen Valley Regional Planning Commission proceeds with adopting a formal Act 209 Impact Fee Ordinance, **TABLE 3** is a cost breakdown for the recommended improvements which can and cannot be funded through impact fees obtained from developers.

TABLE 3
COST BREAKDOWN FOR RECOMMENDED IMPROVEMENTS

	COST
Total Cost for Recommended Improvements at Eight (8) Study Intersections in Existing Conditions, 2016 Pass-Through Conditions, and 2016 Total Future Conditions	$3,248,000
Total Cost for Recommended Improvements at Five (5) Study Intersections Attributable to Future Development (2016 Total Future Conditions)	$1,747,000
Total Cost for Recommended Improvements at Five (5) Study Intersections Attributable to Future Development, *which can be Funded through Impact Fees*[1]	$1,062,500
Total Cost for Recommended Improvements at Five (5) Study Intersections Attributable to Future Development, *which must be Funded from Sources other than Impact Fees*	$ 684,500
Total Cost for Recommended Improvements at Eight (8) Study Intersections in Existing Conditions, 2016 Pass-Through Conditions, and 2016 Total Future Conditions, *which must be Funded from Sources other than Impact Fees*	$ 2,185,500

[1] Due to 50% limit on impact fee contributions towards improvements on State highways (as set by Act 209)

V. TRAFFIC IMPACT FEES

According to Pennsylvania Act 209: "the impact fee for transportation capital improvements shall be based upon the total costs of the roadway improvements included in the adopted capital improvements plan within a given transportation service area attributable to and necessitated by new development within the service area...".

If the Upper Perkiomen Valley Regional Planning Commission decides to proceed with the implementation of an Act 209 Impact Fee Ordinance, the approximately 36 square mile study area analyzed in the Roadway Sufficiency Analysis and Capital Improvements Plan must be broken down into several transportation service areas that are no more than seven (7) square miles each, as set by the Act 209. Once the transportation service areas have been defined, a traffic impact fee for each service area will be calculated based on the total cost for improvements attributable to new development within the service area, along with the peak hour trips generated by the new development within the service area.

Calculation of the impact fee, express as a cost per peak hour trip, is accomplished with the following formula:

$$\text{Impact Fee (Per trip within TSA)} = \frac{\text{Total Cost of improvements attributable to new development within the Transportation Service Area}}{\text{Peak hour trips generated by new development within Transportation Service Area}}$$

In the case of the Upper Perkiomen Valley Regional Planning Commission, the impact fee is based upon the total (new) vehicular trips created by development during the typical weekday afternoon (PM) peak hour. PM peak hour trips were used since the PM peak hour is typically the highest total volume hour give existing and projected total future traffic volumes scenarios, is the hour which typically generates higher traffic levels for individual developments and the aggregated future development scenario portrayed in the Land Use Assumptions Report and the Roadway Sufficiency Analysis. In addition, the PM peak hour typically represents the period during which more constrained traffic operations are calculated, necessitating improved roadway design and/or control measures.

TABLE 4 summarizes the foreseen development per municipality within the next ten (10) years. **TABLE 5** summarizes the associated anticipated trip generation for each development during the AM and PM peak hours.

TABLE 4
ANTICIPATED FUTURE DEVELOPMENT
IN THE UPPER PERKIOMEN VALLEY TRANSPORTATION STUDY AREA

MUNICIPALITY	RESIDENTIAL DEVELOPMENT (DWELLING UNITS)	NON-RESIDENTIAL DEVELOPMENT (SQUARE FOOTAGE)
East Greenville Borough	45	3,600
Pennsburg Borough	270	28,800
Red Hill Borough	99	64,440
Green Lane Borough	4	0
Upper Hanover Township	377	56,700
Marlborough Township	104	26,460
Total	**899**	**180,000**

TABLE 5
TRIP GENERATION
IN THE UPPER PERKIOMEN VALLEY TRANSPORTATION STUDY AREA

MUNICIPALITY	RESIDENTIAL DEVELOPMENT TRIPS		NON-RESIDENTIAL DEVELOPMENT TRIPS	
	AM	PM	AM	PM
East Greenville Borough	23	30	6	6
Pennsburg Borough	141	177	115	116
Red Hill Borough	56	71	100	96
Green Lane Borough	4	4	0	0
Upper Hanover Township	284	381	108	103
Marlborough Township	79	105	37	49
Total	**587**	**768**	**366**	**370**

As seen in **TABLE 5** above, the total anticipated new vehicular trips during the PM peak hour is **1138 trips.** Estimating the Traffic Impact Fee utilizing the 36 square mile study area as one large transportation service area results in the calculation, as summarized in **TABLE 6.**

TABLE 6
TRAFFIC IMPACT FEE
PER PM PEAK HOUR TRIP CALCULATION

Total Cost of Development Attributable Improvements	Anticipated PM Peak Hour Trips	Impact Fee (Per Trip)
$1,062,500	1138	$933.66

As mentioned previously, the traffic impact fee outlined in **TABLE 6** is an estimate, assuming the 36 square mile study area as one large transportation service area for all of the projected new development in the study area, as defined in the Roadway Sufficiency Analyses. If the Upper Perkiomen Valley Regional Planning Commission decides to proceed with the implementation of an Act 209 Impact Fee Ordinance, transportation service areas that do not exceed seven (7) square miles must be defined and a traffic impact fee must be calculated for each service area.

VI. SUMMARY & CONCLUSIONS

This report serves as an integral element in the preparation of a Traffic Impact Fee Ordinance for the Upper Perkiomen Valley Regional Transportation Service Area as required within Article V-A, "Municipal Capital Improvement" of the Pennsylvania Municipalities Planning Code.

This report addresses the program of traffic related improvements which are recommended for the Upper Perkiomen Valley Regional Planning Commission to pursue over the next ten (10) years. As part of this Capital Improvements Plan phase, project descriptions and opinions of probable project costs have been provided to address existing, on-going regional growth (pass-through traffic) and expected Total Future traffic (including expected study area development) demand at twelve (12) key intersections within the Upper Perkiomen Valley Regional Transportation Study Area. Furthermore, a traffic impact fee has been estimated from analysis of development trip generation and attributable improvement costs.

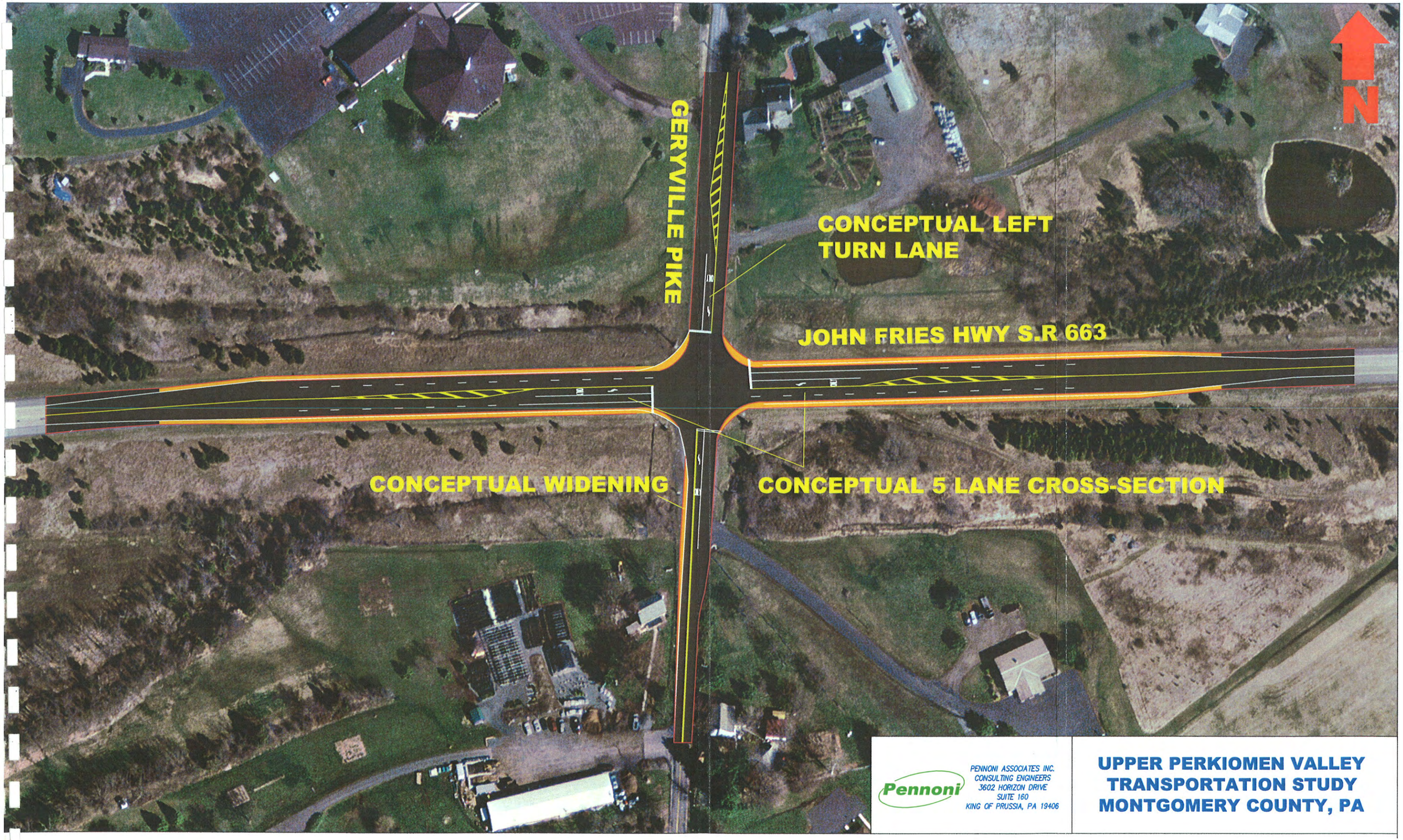
Traffic impact fees alone will not be sufficient to implement the entire recommended improvements plan (estimated to **$ 3,248,000**). Implementation will require the resources of the six (6) municipalities that comprise the Upper Perkiomen Valley Regional Planning Commission as well as the participation and cooperation of the State government.

Activities following the preparation of this plan that are necessary in developing a traffic impact fee ordinance include the drafting and passage of the actual ordinance. The Impact Fee Ordinance synthesizes the elements of preceding phases, focusing on expected new development traffic impact, legally enabling the Upper Perkiomen Valley Regional Planning Commission to collect and use impact fees.

Continued surveillance of traffic and land use conditions should be regularly undertaken over the life of the recommended improvement plan, if implemented by the Upper Perkiomen Valley Regional Planning Commission, to monitor actual conditions.

APPENDIX A

Conceptual Illustrations of Recommended Improvements



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UPPER PERKIOMEN VALLEY TRANSPORTATION STUDY MONTGOMERY COUNTY, PA

MAIN STREET (S.R. 0029)

POTTSTOWN RD S.R. 663

CONCEPTUAL WIDENING

CONCEPTUAL WIDENING

Pennoni

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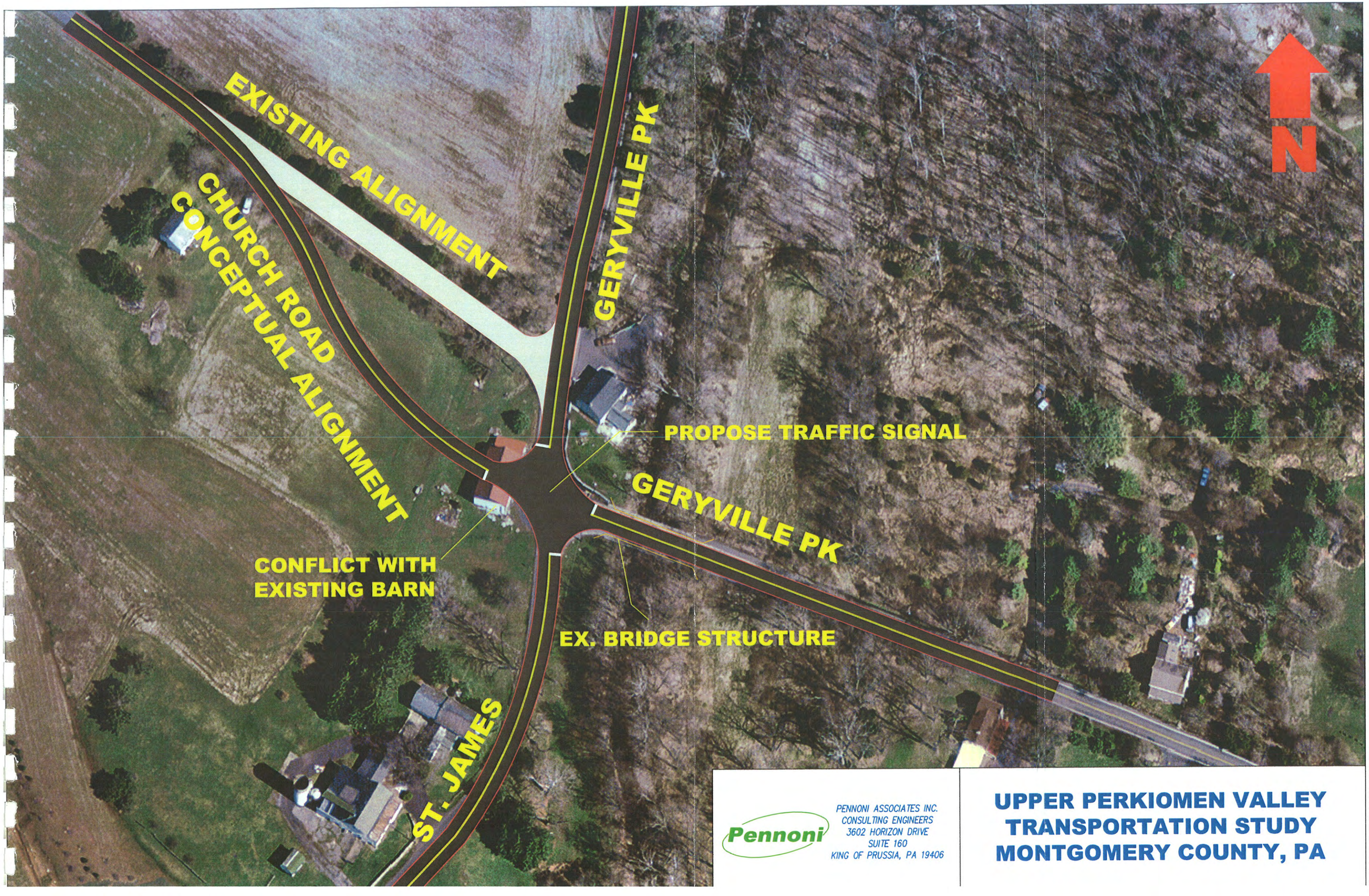
UPPER PERKIOMEN VALLEY TRANSPORTATION STUDY
MONTGOMERY COUNTY, PA



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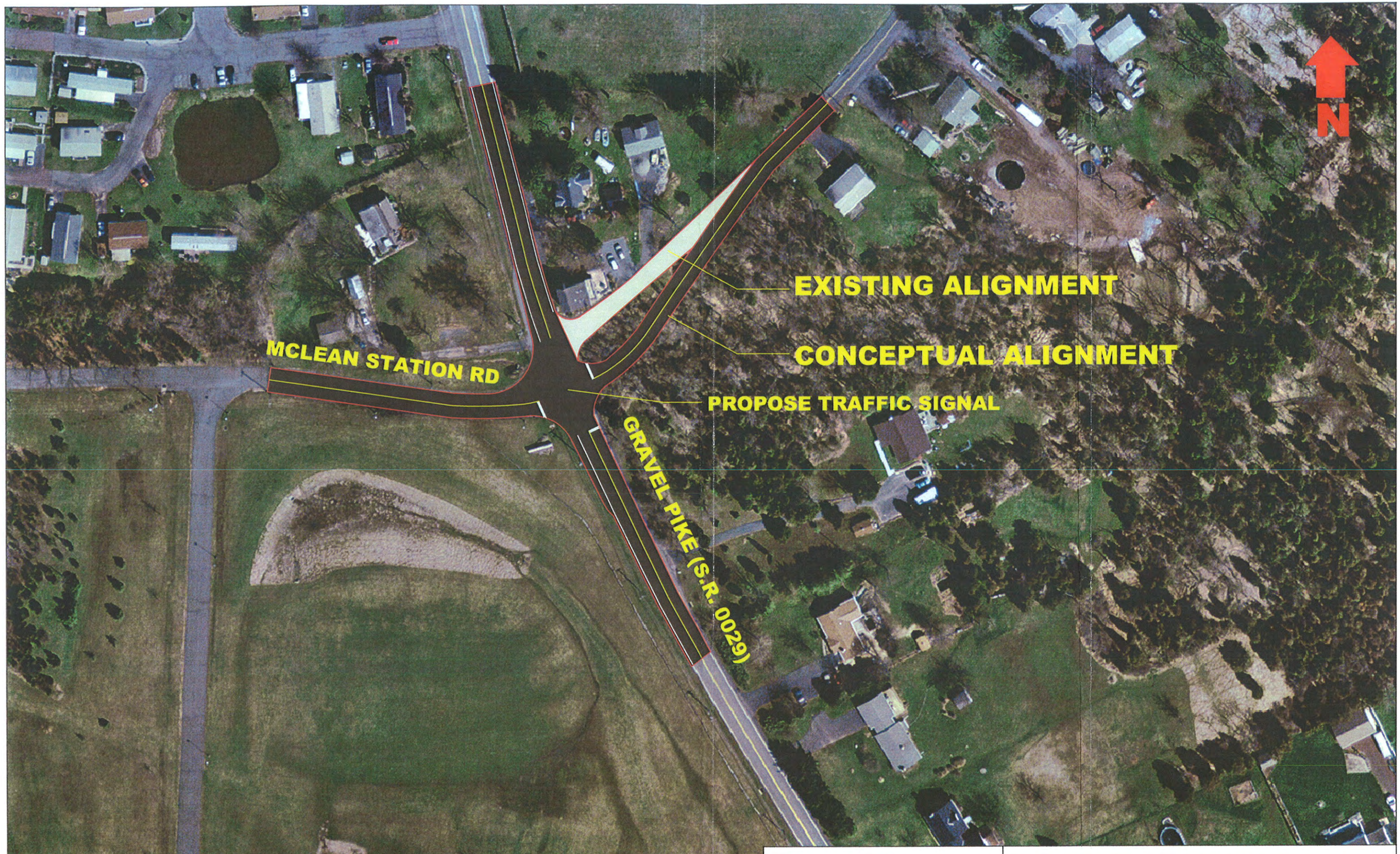

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UPPER PERKIOMEN VALLEY TRANSPORTATION STUDY
MONTGOMERY COUNTY, PA

APPENDIX B

Breakdown of Conceptual Estimates for Recommended Improvements Existing Conditions

Conceptual Cost Estimate for Transportation Improvements

Intersection: Gravel Pike (S.R. 0029) & Main Street (S.R. 0063)
Location: Green Lane Borough
Traffic Scenario: Existing Conditions

Item #	Description		Estimated Cost
1	$20/L.F. for curbing		$ 6,200.00
2	$40/S.Y. for Concrete Sidewalk		$ 6,880.00
3	$5/S.Y. for 1 1/2" Bituminous Overlay		$ 7,515.00
4	Lump Sum Cost for traffic signal per intersection		$ 95,000.00
Construction cost			$ 115,595.00
5	Maintenance and protection of traffic	10% of construction cost	$ 11,559.50
6	Mobilization and insurance	5% of construction cost	$ 5,779.75
7	Contingencies for the conceptual estimate	20% of construction cost	$ 23,119.00
Construction and contingencies cost			$ 156,053.25
8	Engineering	20% of total cost	$ 31,210.65
9	Inspection	10% of total cost	$ 15,605.33
Total Cost Estimate for entire intersection*			**$ 202,869.23**

* The Right of Way costs can not be determined since this is in the realm of the real estate profession.
* The above costs are indicated in 2007 dollars and have not been escalated to allow for future inflation.
* All costs are estimated from aerial photographs; if improvement is implemented, a detailed survey of the intersection must be completed.

Conceptual Cost Estimate for Transportation Improvements

Intersection: Sumneytown Pike (S.R. 0063) & Geryville Pike
Location: Marlborough Township
Traffic Scenario: Existing Conditions

Item #	Description		Estimated Cost
1	Lump Sum Cost for traffic signal per intersection		$ 95,000.00
2	$40/S.Y. Concrete Island		$ 360.00
Construction cost			$ 95,360.00
3	Maintenance and protection of traffic	10% of construction cost	$ 9,536.00
4	Mobilization and insurance	5% of construction cost	$ 4,768.00
5	Contingencies for the conceptual estimate	20% of construction cost	$ 19,072.00
Construction and contingencies cost			$ 128,736.00
6	Engineering	20% of total cost	$ 25,747.20
7	Inspection	10% of total cost	$ 12,873.60
Total Cost Estimate for entire intersection*			**$ 167,356.80**

* The Right of Way costs can not be determined since this is in the realm of the real estate profession.
* The above costs are indicated in 2007 dollars and have not been escalated to allow for future inflation.
* All costs are estimated from aerial photographs; if improvement is implemented, a detailed survey of the intersection must be completed.

APPENDIX C

Breakdown of Conceptual Estimates for Recommended Improvements 2016 Pass-Through Conditions

Conceptual Cost Estimate for Transportation Improvements

Intersection: John Fries Highway (S.R. 0663) & Geryville Pike
Location: Upper Hanover Township
Traffic Scenario: 2016 Pass-Through Conditions

Item #	Description		Estimated Cost
1	$60/S.Y. for Bituminous Pavement including excavation		$ 98,520.00
2	$5/S.Y. for 1 1/2" Bituminous Overlay		$ 30,055.00
3	Five Section Signal Head ($1,400/signal head)		$ 2,800.00
Construction cost			$ 131,375.00
4	Maintenance and protection of traffic	10% of construction cost	$ 13,137.50
5	Mobilization and insurance	5% of construction cost	$ 6,568.75
6	Contingencies for the conceptual estimate	20% of construction cost	$ 26,275.00
Construction and contingencies cost			$ 177,356.25
7	Engineering	20% of total cost	$ 35,471.25
8	Inspection	10% of total cost	$ 17,735.63
Total Cost Estimate for entire intersection*			**$ 230,563.13**

* The Right of Way costs can not be determined since this is in the realm of the real estate profession.
* The above costs are indicated in 2007 dollars and have not been escalated to allow for future inflation.
* All costs are estimated from aerial photographs; if improvement is implemented, a detailed survey of the intersection must be completed.

Conceptual Cost Estimate for Transportation Improvements

Intersection: Pottstown Avenue (S.R. 0663) & Gravel Pike (S.R. 0029)
Location: Pennsburg Borough
Traffic Scenario: 2016 Pass-Through Conditions

Item #	Description		Estimated Cost
1	$20/L.F. for Curbing		$ 9,000.00
2	$40/S.Y. for Concrete Sidewalk		$ 11,000.00
3	$5/S.Y. for 1 1/2" Bituminous Overlay		$ 2,500.00
4	Utility Pole Relocation ($4,000/pole)		$ 8,000.00
Construction cost			$ 30,500.00
5	Maintenance and protection of traffic	10% of construction cost	$ 3,050.00
6	Mobilization and insurance	5% of construction cost	$ 1,525.00
7	Contingencies for the conceptual estimate	20% of construction cost	$ 6,100.00
Construction and contingencies cost			$ 41,175.00
8	Engineering	20% of total cost	$ 8,235.00
9	Inspection	10% of total cost	$ 4,117.50
Total Cost Estimate for entire intersection*			**$ 53,527.50**

* The Right of Way costs can not be determined since this is in the realm of the real estate profession.
* The above costs are indicated in 2007 dollars and have not been escalated to allow for future inflation.
* All costs are estimated from aerial photographs; if improvement is implemented, a detailed survey of the intersection must be completed.

Conceptual Cost Estimate for Transportation Improvements

Intersection: Gravel Pike (S.R. 0029) & McLean Station Road
Location: Marlborough Township
Traffic Scenario: 2016 Pass-Through Conditions

Item #	Description		Estimated Cost
1	$60/S.Y. for Bituminous Pavement including excavation		$ 49,260.00
2	Utility Pole Relocation ($4,000/pole)		$ 8,000.00
3	Lump Sum Cost for traffic signal per intersection		$ 95,000.00
Construction cost			$ 152,260.00
4	Maintenance and protection of traffic	10% of construction cost	$ 15,226.00
5	Mobilization and insurance	5% of construction cost	$ 7,613.00
6	Contingencies for the conceptual estimate	20% of construction cost	$ 30,452.00
Construction and contingencies cost			$ 205,551.00
7	Engineering	20% of total cost	$ 41,110.20
8	Inspection	10% of total cost	$ 20,555.10
Total Cost Estimate for entire intersection*			**$ 267,216.30**

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* All costs are estimated from aerial photographs; if improvement is implemented, a detailed survey of the intersection must be completed.

Conceptual Cost Estimate for Transportation Improvements

Intersection: Gravel Pike (S.R. 0029) & Main Street (S.R. 0063)
Location: Green Lane Borough
Traffic Scenario: 2016 Pass-Through Conditions

Item #	Description		Estimated Cost
1	$20/L.F. for Curbing		$ 8,000.00
2	$40/S.Y. for Concrete Sidewalk		$ 1,360.00
3	$5/S.Y. for 1 1/2" Bituminous Overlay		$ 8,160.00
Construction cost			$ 17,520.00
4	Maintenance and protection of traffic	10% of construction cost	$ 1,752.00
5	Mobilization and insurance	5% of construction cost	$ 876.00
6	Contingencies for the conceptual estimate	20% of construction cost	$ 3,504.00
Construction and contingencies cost			$ 23,652.00
7	Engineering	20% of total cost	$ 4,730.40
8	Inspection	10% of total cost	$ 2,365.20
Total Cost Estimate for entire intersection*			**$ 30,747.60**

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* All costs are estimated from aerial photographs; if improvement is implemented, a detailed survey of the intersection must be completed.

Conceptual Cost Estimate for Transportation Improvements

Intersection: Sumneytown Pike (S.R. 0063) & Geryville Pike
Location: Marlborough Township
Traffic Scenario: 2016 Pass-Through Conditions

Item #	Description		Estimated Cost
1	$60/S.Y. for Bituminous Pavement including excavation		$ 120,540.00
2	$5/S.Y. for 1 1/2" Bituminous Overlay		$ 22,460.00
3	Utility Pole Relocation ($4,000/pole)		$ 40,000.00
4	$50/S.Y. for shoulders including excavation		$ 21,200.00
Construction cost			$ 204,200.00
5	Maintenance and protection of traffic	10% of construction cost	$ 20,420.00
6	Mobilization and insurance	5% of construction cost	$ 10,210.00
7	Contingencies for the conceptual estimate	20% of construction cost	$ 40,840.00
Construction and contingencies cost			$ 275,670.00
8	Engineering	20% of total cost	$ 55,134.00
9	Inspection	10% of total cost	$ 27,567.00
Total Cost Estimate for entire intersection*			**$ 358,371.00**

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* All costs are estimated from aerial photographs; if improvement is implemented, a detailed survey of the intersection must be completed.

APPENDIX D

Breakdown of Conceptual Estimates for Recommended Improvements 2016 Total Future Conditions

Conceptual Cost Estimate for Transportation Improvements

Intersection: John Fries Highway (S.R. 0663) & Geryville Pike
Location: Upper Hanover Township
Traffic Scenario: 2016 Future Conditions

Item #	Description		Estimated Cost
1	$60/S.Y. for Bituminous Pavement including excavation		$ 248,040.00
2	$5/S.Y. for 1 1/2" Bituminous Overlay		$ 33,875.00
3	$50/S.Y. for shoulders including excavation		$ 86,200.00
Construction cost			$ 368,115.00
4	Maintenance and protection of traffic	10% of construction cost	$ 36,811.50
5	Mobilization and insurance	5% of construction cost	$ 18,405.75
6	Contingencies for the conceptual estimate	20% of construction cost	$ 73,623.00
Construction and contingencies cost			$ 496,955.25
7	Engineering	20% of total cost	$ 99,391.05
8	Inspection	10% of total cost	$ 49,695.53
Total Cost Estimate for entire intersection*			**$ 646,041.83**

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Conceptual Cost Estimate for Transportation Improvements

Intersection: Pottstown Avenue (S.R. 0663) & Gravel Pike (S.R. 0029)
Location: Pennsburg Borough
Traffic Scenario: 2016 Future Conditions

Item #	Description		Estimated Cost
1	$60/S.Y. for Bituminous Pavement including excavation		$ 198,780.00
2	$5/S.Y. for 1 1/2" Bituminous Overlay		$ 27,890.00
3	$20/L.F. for Curbing		$ 42,000.00
4	$40/S.Y. for Concrete Sidewalk		$ 46,720.00
5	Utility Pole Relocation ($4,000/pole)		$ 36,000.00
Construction cost			$ 351,390.00
5	Maintenance and protection of traffic	10% of construction cost	$ 35,139.00
6	Mobilization and insurance	5% of construction cost	$ 17,569.50
7	Contingencies for the conceptual estimate	20% of construction cost	$ 70,278.00
Construction and contingencies cost			$ 474,376.50
8	Engineering	20% of total cost	$ 94,875.30
9	Inspection	10% of total cost	$ 47,437.65
Total Cost Estimate for entire intersection*			**$ 616,689.45**

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Conceptual Cost Estimate for Transportation Improvements

Intersection: Geryville Pike & St. James Street/Church Road
Location: Upper Hanover Township
Traffic Scenario: 2016 Future Conditions

Item #	Description		Estimated Cost
1	$60/S.Y. for Bituminous Pavement including excavation		$ 104,220.00
2	Utility Pole Relocation ($4,000/pole)		$ 16,000.00
3	Lump Sum Cost for traffic signal per intersection		$ 95,000.00
Construction cost			$ 215,220.00
4	Maintenance and protection of traffic	10% of construction cost	$ 21,522.00
5	Mobilization and insurance	5% of construction cost	$ 10,761.00
6	Contingencies for the conceptual estimate	20% of construction cost	$ 43,044.00
Construction and contingencies cost			$ 290,547.00
7	Engineering	20% of total cost	$ 58,109.40
8	Inspection	10% of total cost	$ 29,054.70
Total Cost Estimate for entire intersection*			**$ 377,711.10**

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* All costs are estimated from aerial photographs; if improvement is implemented, a detailed survey of the intersection must be completed.

Conceptual Cost Estimate for Transportation Improvements

Intersection: Gravel Pike (S.R. 0029) & Main Street (S.R. 0063)
Location: Green Lane Borough
Traffic Scenario: 2016 Future Conditions

Item #	Description		Estimated Cost
1	$60/S.Y. for Bituminous Pavement including excavation		$ 14,040.00
2	$5/S.Y. for 1 1/2" Bituminous Overlay		$ 11,000.00
3	$40/S.Y. for Concrete Sidewalk		$ 9,360.00
4	$20/L.F. for Curbing		$ 8,400.00
Construction cost			$ 42,800.00
5	Maintenance and protection of traffic	10% of construction cost	$ 4,280.00
6	Mobilization and insurance	5% of construction cost	$ 2,140.00
7	Contingencies for the conceptual estimate	20% of construction cost	$ 8,560.00
Construction and contingencies cost			$ 57,780.00
8	Engineering	20% of total cost	$ 11,556.00
9	Inspection	10% of total cost	$ 5,778.00
Total Cost Estimate for entire intersection*			**$ 75,114.00**

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* All costs are estimated from aerial photographs; if improvement is implemented, a detailed survey of the intersection must be completed.

Conceptual Cost Estimate for Transportation Improvements

Intersection: Sumneytown Pike (S.R. 0063) & Geryville Pike
Location: Marlborough Township
Traffic Scenario: 2016 Future Conditions

Item #	Description		Estimated Cost
1	$60/S.Y. for Bituminous Pavement including excavation		$ 15,000.00
2	$50/S.Y. for shoulders including excavation		$ 2,500.00
Construction cost			$ 17,500.00
4	Maintenance and protection of traffic	10% of construction cost	$ 1,750.00
5	Mobilization and insurance	5% of construction cost	$ 875.00
6	Contingencies for the conceptual estimate	20% of construction cost	$ 3,500.00
Construction and contingencies cost			$ 23,625.00
7	Engineering	20% of total cost	$ 4,725.00
8	Inspection	10% of total cost	$ 2,362.50
Total Cost Estimate for entire intersection*			**$ 30,712.50**

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* All costs are estimated from aerial photographs; if improvement is implemented, a detailed survey of the intersection must be completed.