ROUTE 51 LAND USE & TRANSPORTATION INITIATIVE

ELIZABETH, ROSTRAVER & PERRY TOWNSHIPS

MAY 2005

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Herbert, Rowland & Grubic, Inc.
Engineering & Related Services

GRANEY, GROSSMAN, COLOSIMO & ASSOCIATES
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ELIZABETH, ROSTRAVER, AND PERRY TOWNSHIPS, PENNSYLVANIA

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MAY 2005

HRG PROJECT NUMBER: 2486.005

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICES (ATTACHED)

LIST OF TECHNICAL APPENDICES (BOUND SEPARATELY)

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INTRODUCTION

Herbert, Rowland & Grubic, Inc. (HRG), in cooperation with Graney, Grossman, Colosimo & Associates (GGCA), is pleased to present the results of the *Route 51 Land Use & Transportation Initiative*. The study area includes segments of Route 51 through Elizabeth and Forward Townships, Rostraver Township, and Perry Township in Allegheny, Westmoreland, and Fayette Counties, respectively.

The objectives of the study include identifying methods to:

- preserve the operational capacities and effectiveness of the Route 51 corridor;
- maintain and enhance the character of the communities within the study area; and
- provide opportunities for additional growth within the communities.

This was accomplished by gathering and analyzing existing traffic conditions in the study area, projecting future traffic conditions on the study roadways based on socio-economic analysis and land use projections, and recommending conceptual transportation improvements and land use policy alternatives to address the specific needs of the Route 51 corridor. This study has been conducted in accordance with the Institute of Transportation Engineers (ITE) guidelines, PennDOT criteria, and applicable municipal standards.

PROJECT ADVISORY COMMITTEE

This study was conducted with the cooperation of a Project Advisory Committee. This committee was composed of representatives from PennDOT Districts 11-0 and 12-0, Elizabeth Township, Rostraver Township, Perry Township, Allegheny County, Westmoreland County, Fayette County, the U.S. Fish & Wildlife Service, the Twin Rivers Council of Governments, and members of the local business community. The Project Advisory Committee met at strategic points throughout the study process to provide input and gain consensus during each stage of the project. Minutes from the Project Advisory Committee Meetings are included in attached Appendix A. Members of the Project Advisory Committee are listed in the acknowledgements section at the front of this report.

EXISTING TRANSPORTATION SYSTEM

Route 51 (SR 0051) is a regional north/south transportation corridor connecting the City of Pittsburgh in the north to the City of Uniontown in the south. The segments of Route 51 included in this study are located within Elizabeth and Forward Townships, Allegheny County; Rostraver Township, Westmoreland County; and Perry Township, Fayette County. The study corridor is continuous, except for the portion through Perryopolis Borough, which is not part of the study.

Generally, Route 51 is a four-lane roadway (two lanes each direction) with auxiliary turn lanes at most major intersections. The roadway is classified as a principal arterial based upon PennDOT's most recent functional classification. Posted speed limits are 45 to 50 miles per hour (mph), with lower speed limits in Elizabeth, Forward, and Rostraver Townships. Access to the highway from existing adjacent properties is generally unlimited, with no defined driveways. Prohibitive left turn treatments through the use of jersey barrier, raised medians, grass medians, and divided segments are used throughout the northern portions of the corridor. Roadway lane widths are typically twelve feet with paved shoulders. Average daily traffic volumes vary from 12,000 to 23,000 vehicles per day along the studied portion of Route 51. In order to be more specific, segments with similar characteristics were combined and a more detailed description of the Route 51 corridor was prepared.

The first segment consists of the northernmost section of the study area from the Elizabeth Borough/Township line south to the intersection with Route 48/Paydays Drive. The second segment continues south from the Route 48/Paydays Drive intersection until reaching Airport Road in Rostraver Township. The third segment contains the divided section of Route 51. The fourth segment continues from the divided section of Route 51 south to the Interstate 70 interchange. The final segment describes the Route 51 corridor south of the Interstate 70 interchange. Detailed descriptions of these segments of Route 51 are provided below.

Beginning at the Elizabeth Borough/Township line and ending at the Route 48/Paydays Drive intersection, the northernmost segment of the study corridor carries an average of 19,500 vehicles per day (vpd). The posted speed is 45 to 50 mph for this segment and jersey barrier is used to separate northbound and southbound traffic lanes. In locations where there are auxiliary turn lanes at intersections, the jersey barrier transitions to concrete medians.

Major intersections in this segment include the signalized intersections of Weigles Hill Road, Roberts Hollow Road, and Route 48/Paydays Drive. Several minor unsignalized intersections are present in this segment with Round Hill Road/Hutchinson Road being the most prominent. Auxiliary left turn lanes are present at all signalized intersections and at the unsignalized intersection with Round Hill

Road/Hutchinson Road. Developed frontage within this segment is generally commercial with limited driveway access points.

The second segment begins at the Route 48/Paydays Drive intersection and continues south to Airport Road. This section of the corridor experiences approximately 23,000 vehicles per day (vpd) and side roads convey an average volume of 4,900 vpd. The posted speed limit is generally 50 mph and left turns are prohibited by a grass median. The median is paved at several locations where auxiliary turn lanes and/or permitted left turn areas are provided. A grade separated interchange is provided with Route 136 and no traffic signals are present in this segment.

Several unsignalized intersections exist throughout this segment. Many of these roadways effectively operate as right-in/right-out only because of the left turn prohibition of the grass median. Developed frontage along this segment is mainly commercial; however large tracts of vacant land are present.

The third segment of the study corridor represents the divided section of Route 51 in Rostraver Township. The posted speed limit is 45 mph and the roadway carries approximately 23,000 vehicles per day. This divided section contains several crossovers/turn-arounds. These crossing roadways carry traffic volumes up to 5,000 vehicles per day. Webster Hollow Road/Salem Church Road and Fells Church/Gallitin Road are the major roadways that cross in this segment.

No left or right auxiliary turn lanes are provided through this segment, resulting in traffic having to slow as vehicles turn off of Route 51. All intersections in this segment are unsignalized which results in some delay on the side streets as drivers wait for acceptable gaps in traffic on Route 51. Frontage through this divided segment is a combination of commercial and residential. Several of these properties have poorly defined driveways with access to Route 51 allowed across the entire property frontage.

The fourth segment of the study corridor begins at the southern end of the divided section and continues south to the Interstate 70 interchange. This segment is primarily characterized by a prohibitive left turn treatment through the presence of a grass median, however, some raised concrete medians are present at intersections and a jersey barrier is used at the Route 201 interchange. The speed limit is posted at 45 mph and there are many crossing roadways with permitted left turns. The traffic volume in this segment is roughly 19,000 vehicles per day and side streets carry as much as 5,000 vehicles per day.

Traffic signals are present at Willowbrook/Fellsburg Roads, Willowbrook Plaza's driveway, Concord Lane/Pfile Lane, and at the Interstate 70 interchange ramps. Major unsignalized intersections include Vernon Road, McKenery Drive, Snyder Lane, and Concord Road. Auxiliary turn lanes are provided for most of these intersections. Access to Route 201 is provided via ramps at a grade separated interchange and frontage is mostly commercial with some isolated residential.

South of the Interstate 70 interchange, a center rumble strip is used to separate opposing traffic movements. The posted speed limit is 45 to 50 mph for the 12,000 vehicles that travel this portion of the corridor during an average weekday. Finley Road, Route 981, and Tony Row Road are signalized intersections along this segment and each conveys about 3,000 vehicles per day to Route 51. Left turn lanes are provided along Route 51 for access to these crossing roadways. Major unsignalized intersections provide access to Todd Farm Road, Darr Road, Harmony Church/First Christian (Church) Roads, Wick Haven Hollow Road, Wick Haven Road, River Road and Rehoboth Church Road. Few of these intersections provide auxiliary left turn lanes resulting in traffic on Route 51 having to slow and wait behind left turning vehicles. Route 201 in Perry Township is accessed via ramps at a grade separated interchange. General frontage along this segment is undeveloped with isolated commercial, residential, and agricultural uses.

Study Corridor

The study corridor, shown in Figure 1, includes all signalized intersections, interchanges, other major unsignalized intersections, and all roadway segments of Route 51 within Elizabeth and Forward Townships in Allegheny County, Rostraver Township in Westmoreland County, and Perry Township in Fayette County. The basis for study intersection selection was historical accident problems, observed operational deficiencies, and input from the Project Advisory Committee. A list of these intersections, with their locations by municipality and the type of traffic control, are listed in Table 1. The locations of the intersections are shown graphically in Figure 2.

TABLE 1: CORRIDOR INTERSECTIONS

MUNICIPALITY/ INTERSECTION	*CONDITION*
Elizabeth Township, Allegheny County:	
1. Weigles Hill Road / Giant Eagle driveway	Signalized
2. Roberts Hollow Road	Signalized
3. Hutchinson Road (SR 2011) / Round Hill Road	Unsignalized
4. PA 48 (SR 0048) / Paydays Drive	Signalized
Rostraver Township, Westmoreland County:	
5. Airport Road	Unsignalized
6. Webster Hollow Road (SR 3021)	Unsignalized
7. Salem Church Road (SR 3021)	Unsignalized
8. Fells Church Road (SR 3109)	Unsignalized
9. Gallitin Road	Unsignalized
10. Willowbrook Road/Fellsburg Road	Signalized
11. Route 51 off ramp & PA 201 (SR 0201)	Signalized
12. Vernon Drive (SR 3025)	Unsignalized
13. McKenery Drive / Business driveway	Unsignalized
14. McKenery Drive / Snyder Lane	Unsignalized
15. Concord Lane	Unsignalized
16. Concord Lane / Pfile	Signalized
17. Interstate 70 ramps	Cloverleaf
18. Interstate 70 East on-ramp / Finley Road	Signalized
19. PA 981 (SR 0981)	Signalized
20. Darr Road / Todd Farm Road	Unsignalized
Perry Township, Fayette County:	
21. Harmony Church Road (SR 4048)	Unsignalized
22. First Christian (Church) Road	Unsignalized
23. Wick Haven Hollow Road	Unsignalized
24. Wick Haven Road	Unsignalized
25. River Road	Unsignalized
26. Rehoboth Church Road	Unsignalized
27. Tony Row Road (SR 4036) / Main Street	Signalized

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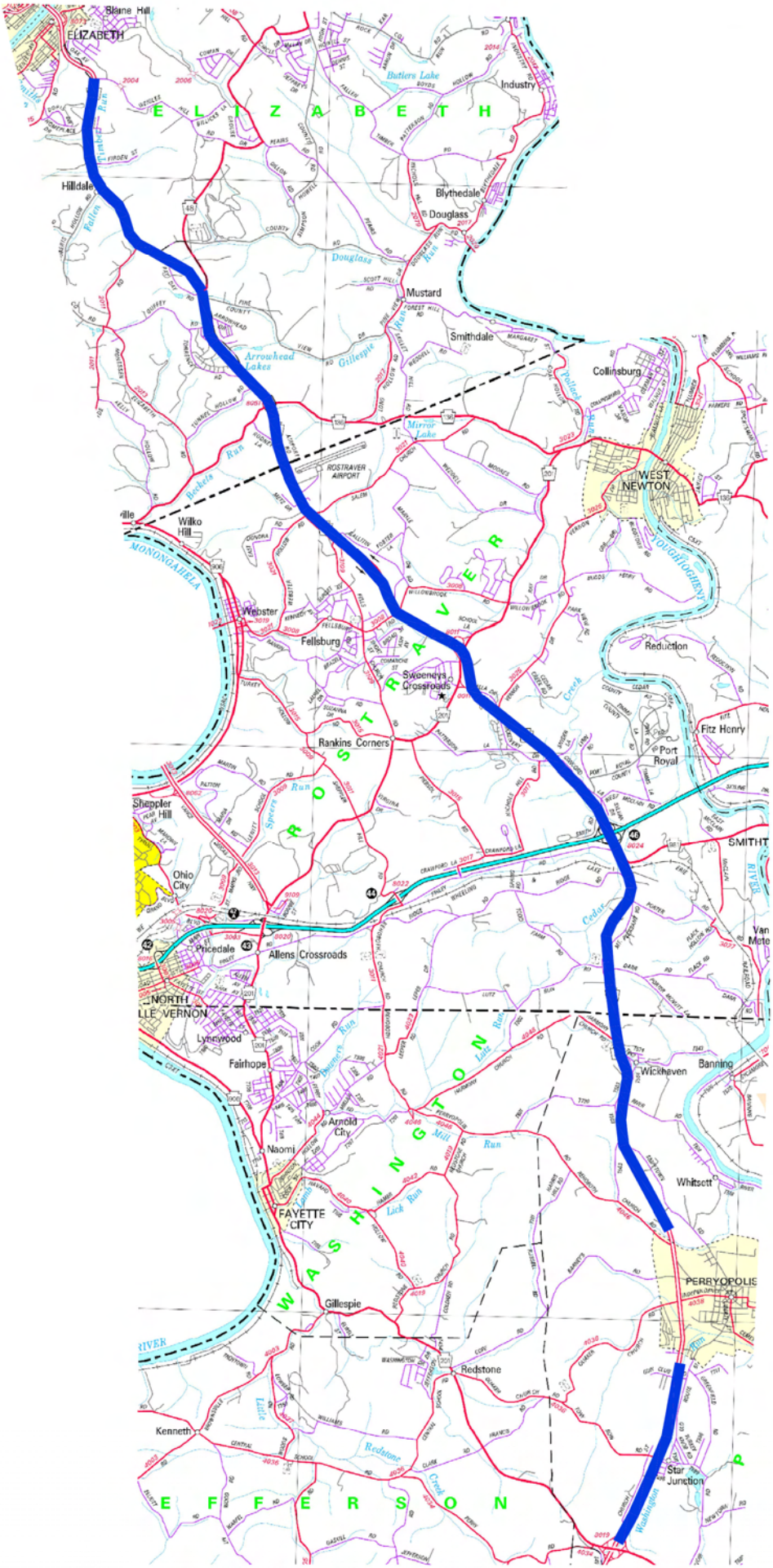

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FIGURE 1
STUDY CORRIDOR
LAND USE AND TRANSPORTATION INITIATIVE

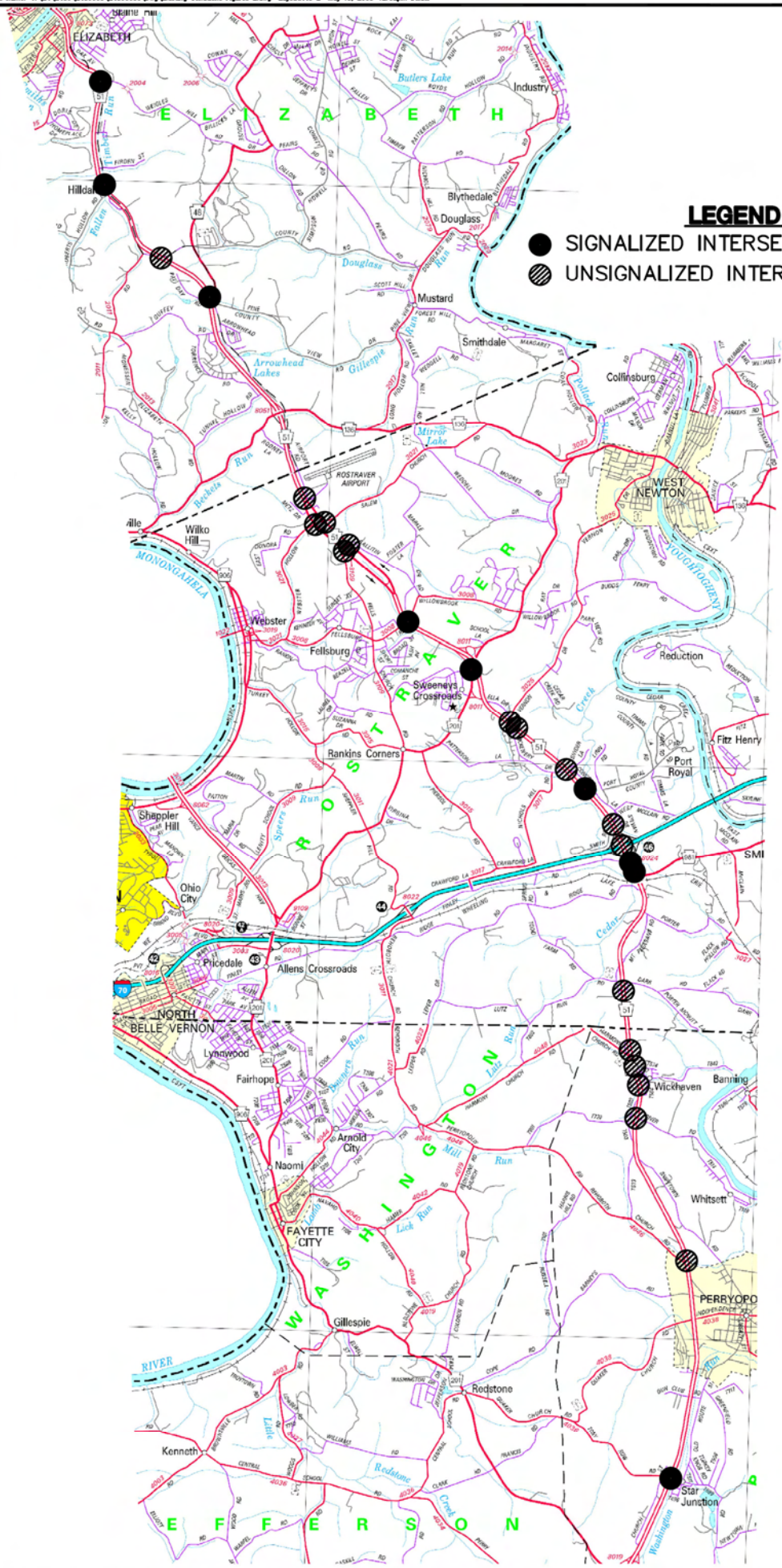

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FIGURE 2
STUDY INTERSECTIONS
LAND USE AND TRANSPORTATION INITIATIVE

Roadway Network Description

Table 2 contains a summary of the major roadways within the Route 51 study corridor, their classification, and daily traffic volumes. Functional classifications are shown graphically in Figure 3.

TABLE 2. EXISTING CORRIDOR AND LATERAL STREETS CHARACTERISTICS

Roadway	Number of Lanes	Left Turn Treatment	Average Daily Traffic	Functional Classification
Route 51 - North of Route 48/Paydays	4	Median Wall	21,000	Principal Arterial
Route 51 – Between Route 48 & Airport Road	4	Grass Median	22,500	
Route 51 – Divided section in Rostraver Twp	4	Divided	19,000	
Route 51 – Between divided section and I-70	4	Grass Median	21,000	
Route 51 – South of I-70	4	Rumble Strip*	13,500	
Hutchinson Road (SR 2011) / Round Hill Road	2	No control	550	Rural Minor Collector
Route 48 (SR 0048)	2	No control	4,100	Principal Arterial
Route 136 - East of Route 51	2	No control	4,700	Minor Arterial
Route 136 - West of Route 51	2	No control	5,900	
Webster Hollow Road (SR 3021)	2	No control	1,900	Rural Major Collector
Salem Church Road (SR 3021)	2	No control	550	Rural Major Collector
Fells Church Road (SR 3109)	2	No control	5,000	Minor Arterial
Fellsburg Road (SR 3008)	2	No control	3,300	Minor Arterial
Willowbrook Road (SR 3008)	2	No control	1,100	Local Road
Route 201 - East of Route 51	2	No control	6,800	Minor Arterial
Route 201 - West of Route 51	2	No control	7,700	
Vernon Drive (SR 3025)	2	No control	1,000	Rural Major Collector
Interstate 70 - East of Route 51	4	Median Wall	38,000	Interstate Highway
Interstate 70 - West of Route 51	4	Median Wall	32,000	

** Rumble Strip is not a prohibitive left turn treatment.*

TABLE 2 (CONT.) - EXISTING CORRIDOR AND LATERAL STREETS CHARACTERISTICS				
Roadway	**Number of Lanes**	**Left Turn Treatment**	**Average Daily Traffic**	**Functional Classification**
Route 981 (SR 0981)	2	No Control	3,000	Rural Major Collector
Darr Road/Todd Farm Road	2	No Control	250	Local Road
Harmony Church Road (SR 4048)	2	No Control	350	Rural Minor Collector
Rehoboth Church Road (SR 4046)	2	No Control	1,800	Rural Major Collector
Tony Row Road (SR 4036)	2	No Control	450	Local Road
Route 201 (SR 0201)	2	No Control	3,300	Minor Arterial
** Rumble Strip is not a prohibitive left turn treatment.*				

The current configuration of the study area roadways and intersections were assumed to remain unchanged as no current projects are on the Southwestern Pennsylvania Commission's (SPC) Transportation Improvement Program (TIP) or on the Long Range Transportation Plan.

Existing Traffic Description

This study was completed based primarily on the PM peak hour because it represents the critical hour with the highest concentration of vehicular traffic. Some AM peak hour studies were done where a need was perceived. Turning movement counts were compiled from recently completed studies, where available, or conducted during weekdays in January and February of 2005. The traffic count data can be found in the Technical Appendix. Figure 4 displays the existing peak hour traffic volumes in the study area. Please note, not all intersections were counted during the AM peak.

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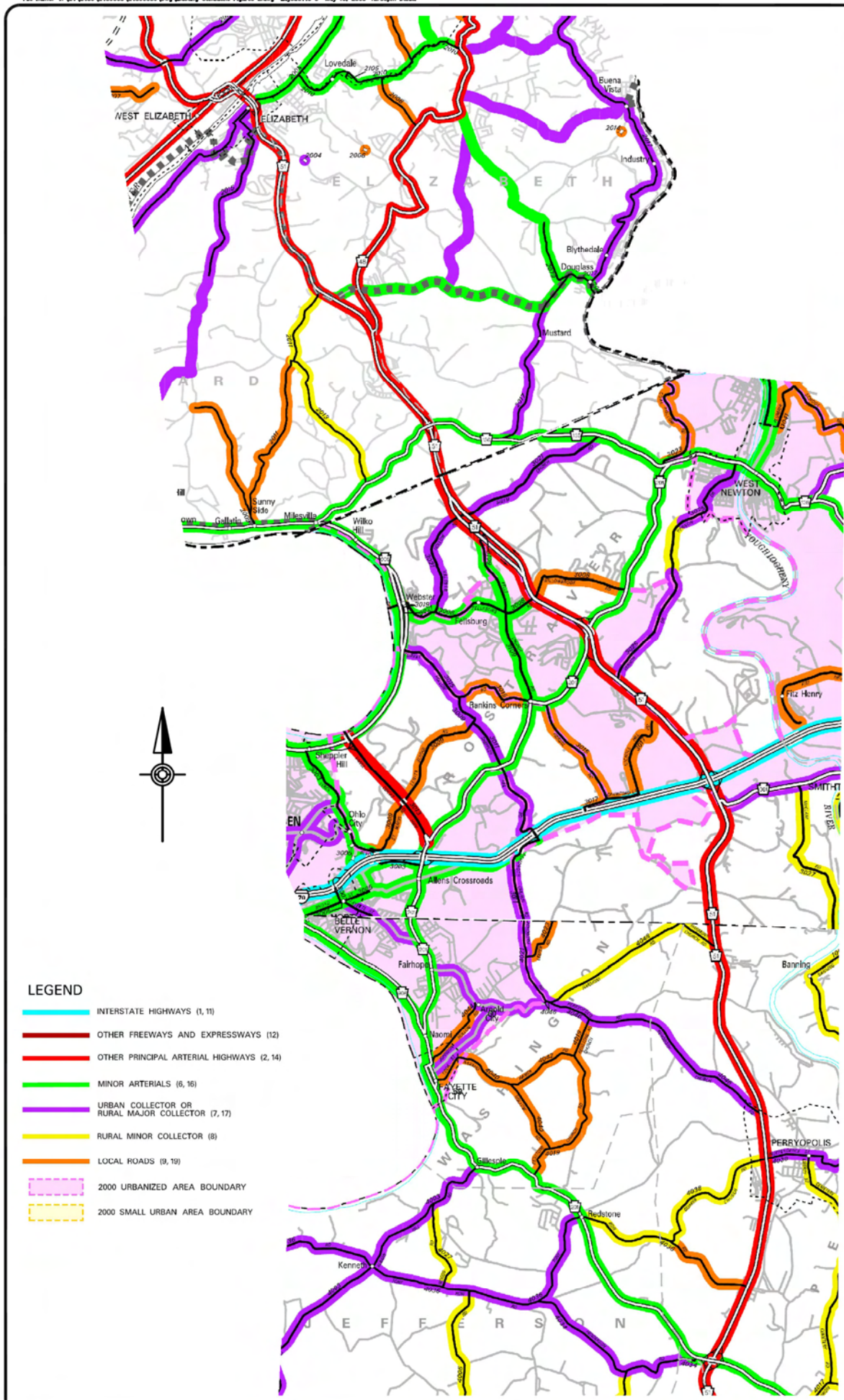

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FIGURE 3
FUNCTIONAL CLASSIFICATION
LAND USE AND TRANSPORTATION INITIATIVE

FIGURE 4
EXISTING PEAK HOUR TRAFFIC VOLUMES AND LEVEL OF SERVICE SUMMARY
LAND USE AND TRANSPORTATION INITIATIVE

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EXISTING TRANSPORTATION SYSTEM ANALYSIS

The existing transportation corridor was analyzed to document any operational and safety deficiencies present with the existing traffic volumes. Common roadway segment and intersection deficiencies may include sub-standard design, limited sight distance, over-capacity status, high crash occurrence, vehicular queuing, etc. The significance of this documentation is to provide awareness of current deficiencies that will continue to be present in the future and that typically will become worse with future traffic volumes.

Roadway segment and intersection conditions, along with the amount of traffic using the facility, determine the severity of operational and safety deficiencies. For example, a sub-standard designed curve may have critical importance if 10,000 vehicles use it, but not if 500 vehicles use it. Sub-standard design and sight distance are difficult to document as deficiencies since the only explanation is that they don't meet current design criteria. Vehicular crash experience is an easier and more accurate way to document design deficiencies. Deficiencies related to capacity and queuing are also relatively simple to determine through the use of traffic analysis software and models.

Vehicular Crash History Evaluation

Crash data was requested for all roadways in the study area from the PENNDOT Bureau of Highway Safety & Traffic Engineering. The data provided documents the location, time/date, type of crash, lighting and pavement conditions, severity, vehicle types, and contributing factors for all reportable crashes that occurred in at least the past five years. In Westmoreland and Fayette Counties, accident reports were compiled from January 1, 1997 to December 31, 2003. This data is also part of the Route 51 Needs Study currently being prepared by SP&K on behalf of PennDOT District 12-0. The District 12-0 Needs Study begins at Route 981 in Rostraver Township and continues to the Route 201 interchange in Perry Township. Crash histories from Elizabeth Township, Allegheny County, were assembled from 1997 to 2001.

With this information, a cursory evaluation was conducted to determine intersection and roadway segment crash trends. Please note that a formal crash history investigation to determine specific causes of crashes was not performed. Any intermediate or long-term improvement considered as a safety improvement should include a formal crash history investigation. Also, pursuant to 75 Pa. C.S. §3754 and 23 U.S.C §409, specific traffic engineering and safety study information cannot be disclosed or used in litigation.

Table 3 documents the historical number of crashes experienced in the identified study area and the average number of crashes per year at select intersections.

TABLE 3: CRASH TRENDS			
NO.	INTERSECTION	CRASHES	
		TOTAL	PER YEAR AVERAGE
Elizabeth Township: 65 crashes per year *			
1	Weigles Hill Road & Route 51	33	**6.6**
2	Roberts Hollow Road & Route 51	79	**15.8**
Rostraver Township: 50 crashes per year **			
6	Webster Hollow Road & Route 51 Southbound	18	2.6
8	Fells Church Road & Route 51 Southbound	17	2.4
9	Gallitin Road & Route 51 Northbound	13	1.9
12	Vernon Drive & Route 51	15	2.1
19	Route 981 & Route 51	33	4.7
20	Todd Farm Road/Darr Road & Route 51	20	2.8
Perry Township: 23 crashes per year **			
21	Harmony Church Road & Route 51	7	1.0
25	River Road & Route 51	9	1.3
26	Rehoboth Church Road & Route 51	13	1.9
27	Tony Row Road and Main Street & Route 51	16	2.3

* – Crash history from 1997 – 2001
** – Crash history from 1997 – 2003
BOLD – Crash history trend (>5 crashes per year)

Only two of the study corridor intersections experienced an average crash rate high enough to establish a significant trend. Typically, five crashes per year of the same type (i.e. angle crash, rear-end crash, left turn crash, etc.) are required to establish a trend. At the intersections of Route 51 with Weigles Hill Road and with Roberts Hollow Road in Elizabeth Township, the number of rear end crashes occurring exceeds five per year. This may be due to limited sight distance, poor signal visibility, inappropriate traffic signal timings, poor intersection geometry, or any combination of these factors. The other intersections along Route 51 have no distinguishable crash patterns.

Of the crashes that have occurred on Route 51 in the study corridor, 28% occurred during dark conditions, 34% involved heavy vehicles, 16% resulted in injury, and 1% resulted in fatalities. Overall accident rates for the corridor are at or below the statewide average for similar types of roadways. However, isolated segments of the corridor account for a majority of the crash history and exceed the statewide average when examining only these specific segments.

Summary diagrams of the crash histories are attached in Appendix B and full accident reports are contained in the Technical Appendix.

Capacity and Queuing Evaluation

In order to evaluate the study corridor for over-capacity locations and potential queuing through intersections, a Traffic Analysis and Simulation Model was used. Development of the Traffic Analysis and Simulation Model assists in the analysis of vehicular capacities, queuing, measuring of travel times and speeds, etc. This model was developed using the Synchro/SimTraffic software package. This software requires detailed input pertaining to the roadway's physical characteristics and traffic specific data. Physical roadway characteristics include items such as the number and type of lanes, lane widths, type of traffic signal or sign control, lane lengths, traffic signal phasing/timing, speed limits, etc. Traffic specific data is entered from the existing traffic count data. Number of passenger vehicles, single unit trucks and buses, and semi-trucks performing each turn, as well as arrival type and progression and various other factors are examples of traffic specific data.

In addition to using the Traffic Analysis model, other software packages are used to analyze traffic operations throughout the study area. The nationally accepted method for determining the capacity and operation of a signalized or unsignalized intersection is to follow the procedures outlined in the 2000 Highway Capacity Manual. The Highway Capacity Software, version 4.1e (HCS 4.1e) is the most common software program created to apply these procedures.

The output of these software programs is the delay experienced per vehicle and a Level of Service (LOS). The 2000 Highway Capacity Manual defines the level of service as a function of the delay encountered by motorist, which is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. Levels of service are assigned a letter grade that corresponds to a given amount of total delay per vehicle (also known as control delay). This control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The level of service criteria and characteristics for signalized intersections are described in Table 4.

TABLE 4: SIGNALIZED INTERSECTIONS – LOS CRITERIA		
LEVEL OF SERVICE	AVERAGE CONTROL DELAY (SEC/VEH)	EXPECTED DELAY TO MINOR STREET TRAFFIC
A	< 10	Very low delay. Occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all.
B	> 10 and ≤ 20	Occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A.
C	> 20 and ≤ 35	Higher delays result from fair progression and/or long cycle lengths. Individual cycle failures may begin to appear in this level. Significant numbers of vehicles stop although many still pas through the intersection without stopping.
D	> 35 and ≤ 55	Longer delays may result from unfavorable progression, long cycle lengths and/or high volume to capacity (v/c) ratios. Many vehicles stop and the proportion of vehicles not stopping declines.
E	> 55 and ≤ 80	Considered to be the limit of acceptable delay, these high delay values generally indicate poor progression, long cycle lengths and high v/c ratios. Individual cycle failures are frequent occurrences.
F	> 80	Considered to be unacceptable to most drivers, this condition often occurs with over saturation. It may also occur at high v/c ratios below 1.00 with many individual cycle failures.

Unsignalized stop controlled intersections are analyzed using unsignalized intersection capacity analyses. The Level of Service (LOS) of an unsignalized intersection is determined in a similar method to signalized intersections. Table 5 describes each unsignalized intersection level of service by average control delay and its characteristics.

TABLE 5: UNSIGNALIZED INTERSECTIONS – LOS CRITERIA		
LEVEL OF SERVICE	AVERAGE CONTROL DELAY (SEC/VEH)	EXPECTED DELAY TO MINOR STREET TRAFFIC
A	< 10	Little or no delay
B	> 10 and ≤ 15	Short traffic delays
C	> 15 and ≤ 25	Average traffic delays
D	> 25 and ≤ 35	Long traffic delays
E	> 35 and ≤ 50	Very long delays
F	> 50	Volume exceeds capacity

Levels of service can be used to describe an individual movement, an approach, or the entire intersection. At unsignalized intersections, levels of service are only available for movements that experience delay.

For example, a through movement at a two-way stop control intersection (i.e. side street stop) will not experience much delay; therefore a level of service is not calculated.

Queuing only becomes a deficiency when traffic backs up through adjacent intersections or when queues become so long that they cannot be processed through a traffic signal during a single cycle length. Capacity deficiencies are classified as any intersection operating at level of service E (LOS E) or level of service F (LOS F).

Using the two software packages described above, the existing traffic volumes were analyzed for the AM and PM peak hours. Discussion of the analysis findings and deficiencies are contained in the following sections.

Intersection Capacity Analysis

As discussed, above, intersection capacity was calculated using the Highway Capacity Software, version 4.1e. Table 6 summarizes the levels of service present at the study area intersections for the AM and PM peak hours with existing and near term traffic conditions. Please note that unsignalized intersection capacity analysis only calculates the level of service for delayed movements, therefore only those levels of service are shown. For the purpose of this analysis, a deficiency is defined as any level of service E or F (LOS E or LOS F). Discussion of deficiencies follows the summary tables.

TABLE 6: EXISTING CONDITIONS LEVEL OF SERVICE SUMMARY
2005 PM PEAK HOUR

INTERSECTION	*CONDITION*	*OVERALL LOS*
1. Weigles Hill Road / Giant Eagle driveway	Signalized	LOS C
2. Roberts Hollow Road	Signalized	LOS B
3. Hutchinson Road (SR 2011) / Round Hill Road	Unsignalized[#1]	**LOS F**[#2]
4. PA 48 (SR 0048) / Paydays Drive	Signalized	LOS C
5. Airport Road	Unsignalized	**LOS F**
6. Webster Hollow Road (SR 3021)	Unsignalized	**LOS E**
7. Salem Church Road (SR 3021)	Unsignalized	LOS C
8. Fells Church Road (SR 3109)	Unsignalized	**LOS F**
9. Gallitin Road	Unsignalized	LOS C
10. Willowbrook Road / Fellsburg Road	Signalized	LOS D
11. Route 51 off ramp & PA 201 (SR 0201)	Signalized	LOS C
12. Vernon Drive (SR 3025)	Unsignalized	**LOS F**
13. McKenery Drive / Business driveway	Unsignalized	**LOS F**
14. McKenery Drive / Snyder Lane	Unsignalized	**LOS F**

[#1] – Overall LOS on unsignalized intersections reflect the stopped side street level of service
[#2] – BOLD *– Unacceptable (LOS E or F)*
[#3] – Level of service is not applicable for yield intersections.

TABLE 6 CON'T: EXISTING CONDITIONS LEVEL OF SERVICE SUMMARY 2005 PM PEAK HOUR		
INTERSECTION	***CONDITION***	***OVERALL LOS***
15. Concord Lane	Unsignalized	LOS C
16. Concord Lane / Pfile	Signalized	LOS C
17. Interstate 70 ramps	Cloverleaf	n/a[#3]
18. Interstate 70 East on-ramp / Finley Road	Signalized	LOS D
19. PA 981 (SR 0981)	Signalized	LOS C
20. Darr Road / Todd Farm Road	Unsignalized	LOS C
21. Harmony Church Road (SR 4048)	Unsignalized	LOS C
22. First Christian (Church) Road	Unsignalized	LOS B
23. Wick Haven Hollow Road	Unsignalized	LOS B
24. Wick Haven Road	Unsignalized	LOS C
25. River Road	Unsignalized	LOS B
26. Rehoboth Church Road	Unsignalized	**LOS E**
27. Tony Row Road (SR 4036) / Main Street	Signalized	LOS C

[#1] – Overall LOS on unsignalized intersections reflect the stopped side street level of service
*[#2] – **BOLD** – Unacceptable (LOS E or F)*
[#3] – Level of service is not applicable for yield intersections.

Intersections that operate at or near capacity are likely to experience other operational deficiencies. Vehicular queuing is a common phenomenon associated with intersection movements that are at or over capacity. Increased crash experience can also occur at over capacity intersections. In addition to operational deficiencies, drivers currently utilizing near or over capacity intersections may reroute to less delayed routes. These alternative routes may include routes where increased traffic is not desired, such as local roadways that are not designed for significant traffic volumes. The following intersections have one or more movements operating at unacceptable levels of service E or F (LOS E or LOS F).

The unsignalized intersection of Hutchinson and Round Hill Roads with Route 51 experiences some failing movements (LOS F). During both the AM and PM peak hours, the eastbound Round Hill Road approach operates at level of service F (LOS F). During the PM peak hour, the westbound Hutchinson Road approach also operates at LOS F. This condition is caused by the high through volumes on northbound and southbound Route 51 and insufficient gaps in the traffic stream.

At the intersection of Route 51 with Airport Road during the PM peak hour, the westbound approach experiences unacceptable delay and operates at level of service F (LOS F). This delay is caused by a sizable number of left turning vehicles on the stop controlled Airport Road approach and minimal gaps on Route 51.

At Webster Hollow Road and southbound Route 51, a westbound approach LOS E exists during the PM peak hour. The unique aspect is that this intersection only conflicts with southbound Route 51 traffic as it is located in the divided section. Vehicles attempting to cross Route 51 and attempting to turn left are unable to be serviced while only being opposed by half of Route 51's traffic (i.e. southbound traffic is the only conflicting movement). Similarly, the intersection at Fells Church Road experiences failing operation during the PM peak hour (LOS F).

Delay is caused by vehicles turning left onto Route 51 at Snyder Lane's unsignalized westbound approach. It experiences a failing level of service (LOS F) during the PM peak hour. McKenery Drive also experiences failing levels of service (LOS F) during the AM and PM peak hour along the eastbound and westbound approaches for the same reason.

In the southern segments of Route 51, delay on the stop controlled side streets is generally not as severe. However, several intersections experience unacceptable operation and operate at level of service E (LOS E) or worse. During the PM peak hour, the westbound approaches at Rehoboth Church Road and Vernon Drive operate at an unacceptable LOS E and LOS F respectively. These conditions are caused by the amount of traffic on Route 51 and the inability of side street traffic to enter the traffic stream on Route 51.

Intersections that have one or more movements operating with unacceptable levels of service (LOS E or LOS F) are shown graphically with the traffic volumes on Figure 4. Detailed existing capacity analysis printouts are contained in the Technical Appendix.

Vehicular Queuing

Queue lengths were determined from the Synchro Traffic Analysis Model. Vehicular queues represent the average length of vehicles backed up waiting to progress through an intersection. Long queue lengths are a sign that the intersection is not operating optimally or is over capacity. Very short queue lengths represent conditions where the occasional queue averages out with times when there are no traffic backups. The critical queuing condition occurs when vehicles routinely extend beyond the available storage lane and block the through travel lanes.

Based upon the existing traffic conditions, no queues are anticipated to extend beyond the available storage length in auxiliary lanes. Backups on through lanes at signalized intersections vary, but are serviced within one cycling of the traffic signal. While the traffic signals do not experience much vehicular queuing, the stopped approach at unsignalized intersections often experience queues. These vehicular backups will continue to increase as traffic volumes on the side street increase and as traffic volumes on Route 51 reduce the number of available gaps in the traffic stream.

LAND USE REGULATIONS AND PLANNING DOCUMENTS

There is a very real connection between a community's land use policies and its traffic patterns. What is meant by the term "land use policies"? Land use policies are the goals, objectives and actions described by Comprehensive Plans and made into law by the Subdivision and Land Development Ordinance, Zoning Ordinance, and occasionally other ordinances. Ultimately, these have a great effect on the location, character, timing and intensity of various land uses throughout the community. This in turn will determine much about the speed, pace, and amount of traffic on local streets and roads. The following analysis will examine the policies in the text of local ordinances to see how standards can affect traffic and transportation. Also, there are often typical standards for a core community of neotraditional development/smart growth or typical suburban, auto-oriented, standards. The second part of the analysis will include zoning maps and comprehensive plans to examine how geographic recommendations come into play.

As previously mentioned, the basic policy documents are the Subdivision and Land Development Ordinance (or SALDO) and the Zoning Ordinance. Because both types of ordinances are present in each of the Route 51 communities, it may help to briefly describe the jurisdiction and typical function of each. The SALDO uniformly applies to the creation of new lots and legally and technically applies to the construction of new non-residential and multiple residential structures. In terms of transportation, typical SALDO establishes standards for necessary street improvements, traffic circulation, sidewalks, and coordination with any other standards. Zoning establishes use and dimensional standards by district and since zoning is not uniformly applicable (different districts have different standards), it is typically the form the community uses to regulate the number of parking spaces and loading zones.

Rostraver Township Zoning Ordinance. The presently enforced edition of the Township Zoning Ordinance was adopted in 1995. There are two agricultural districts, four residential districts, two commercial business districts, two industrial districts, and a mixed business district. The ordinance is quite thorough and has modern construction and format. An unusual (and well done) aspect of the ordinance's structure is that the use tables require different standards for individual uses. Many zoning ordinances have a district standard, and lot and setbacks are for the *district* (with the possible exceptions of some conditional uses/special exceptions), however in Rostraver these are tailored to the *use.* For example, in one district (R-2 Suburban Residential) the minimum lot area ranges from 7,500 square feet (0.17 acres) to one acre (43,560 square feet). Base density of a dwelling is about one half acre with sewer and just under one acre with on-lot sewer. None of the lot sizes in any district appear to be excessively

large. In fact, lot sizes for most uses are quite modest. The context of some lot sizes is almost to a neotraditional or core community level of density. For example, an eating and drinking establishment may be opened in the B-2 Retail Business District on a lot of 5,000 square feet.

Related to the size of lots and setbacks is the issue of parking standards. A typical suburban or rural standard requires that parking must be located on the same lot as the use. Multi-use developments must also provide all parking on-site, rather than a typical core community approach. In the township, parking lots must be at least 20 feet from the *cart way* (about the depth of a space), and parking may not be within right-of way.

Space provisions are in a narrative form. For most retail and restaurant businesses there must be six spaces per each 1,000 square feet of net floor area. Office uses are at 1:250 square feet. From a comparative perspective these are on the high average side. Likewise, the standards for loading berths are slightly higher than many western Pennsylvania communities.

There are some design standards for parking spaces, parking access lanes, and setback of parking areas. There is also a minimum standard for non-residential driveways that would result in at least 20 foot wide access lanes.

The ordinance also contains a number of environmental standards that cover earthmoving and include a setback from natural watercourses. These implement some smart growth principles by requiring developers to plan around the natural environment.

Rostraver Township Subdivision and Land Development Ordinance. It appears this ordinance has been updated a number of times and is generally consistent with changes to the PA Municipalities Planning Code. The procedures for those land developments that are not also subdivisions are difficult to discern. Section 175-19 is titled "land development requirements" but refers to "subdivisions" in the subtext. This section is unique in that it contains some front yard setback averaging requirements. There is also a detailed section of recreation land dedication or fees in lieu, which incorporate some smart growth principles.

A key factor in the SALDO as it relates to the transportation/land use connection is how the ordinance deals with new streets and sidewalks. This ordinance does not require sidewalks unless deemed necessary by the governing body. There is another standard for sidewalks under table 1 in the back of the ordinance.

Vehicular street design standards are of typical suburban design with some improvements. On one hand, alleys are prohibited which might discourage certain forms of smart growth development and there is also text to discourage through traffic in residential areas (two different references). On the other hand, there is some language to discourage dead-end streets/cul-de-sacs and street cart ways must be at least 22 feet wide with 50 foot right of ways. Curbing requirements are ambiguous, as is the level when a local street must be designed as a collector or arterial. Table 2 of the ordinance contains minimum driveway standards that are different from the zoning ordinance.

Elizabeth Township Zoning Ordinance. The Elizabeth Township Zoning Ordinance dates from 1973 but appears to have been substantially amended in 1988. This ordinance has four residential, two conservation, and two business districts. Overall the ordinance is intensely narrative, though it does contain tables of key uses and area regulations.

Overall, the district standards appear reasonable upon cursory reading. Density levels are more aligned with a core community or neotraditional ordinance rather than a highway oriented suburban community. Base density in the R-2 district is 10,500 square feet for a single-family dwelling. Business districts are higher with a standard of just under one half acre (20,000 square feet). A fairly unique feature of this ordinance is that single-family dwellings are conditional uses in conservation areas. However, there are not specific criteria for this or any other conditional use. Rather there is a general standard for all conditional uses.

Parking standards are an interesting mix. The standard of one space per every 250 feet for retail and restaurants is fairly high while the one space per two employees for manufacturing is rather low. There is a detailed table that makes parking access aisle widths consistent with the angle of the parking stalls.

The Elizabeth Township Subdivision and Land Development Ordinance. This Subdivision and Land Development ordinance dates from 1971 and is marked by brevity. There are some differences between this ordinance's structure and current Municipal Planning Code (MPC) procedures. For example, violations are per lot fines and the definition of land development is an older one. However, in spite of its age and brevity, it seems to be a fairly complete ordinance.

There are definitions of arterial, collector, and local streets. Again, residential alleys are prohibited and local streets must be designed to discourage through traffic. One standard of interest in this older ordinance is a clause under section 303.1 that prohibits a new street connecting to an arterial from being located within 500 feet of any other driveway or public or private streets. This was obviously an attempt to limit curb cuts and preserve arterial road capacity. As in Rostraver, cul-de-sacs are limited to 500 feet in length.

Pavement widths are slightly higher than Rostraver, with local streets required to have a 24 foot cart way and acute angle intersections are permitted only on local streets. Finally, the ordinance has a reserve for recreation lands but no option for fee in lieu of land. Sidewalks are not required for any land use.

Perry Township (Fayette County) Zoning Ordinance. The land use regulations which affect Perry Township are unique in a number of aspects. First, the Fayette County Zoning Ordinance controls Perry Township. Only a handful of Pennsylvania counties have adopted county zoning (Fayette, Clarion, Warren, Clinton, and Indiana). Among these few counties, Fayette County's ordinance is by far one of the more sweeping. County zoning power in Pennsylvania is unique, as the county is the only municipality empowered to leave a portion of a community un-zoned under the MPC. However, like subdivision regulations at the county level, a township, borough, or city may adopt their own zoning regulations that would automatically repeal the county ordinance. There is a paradox of both more and less enabling power. The Fayette County/Perry Township regulations are also unique because at the time of this study they are under consideration for significant amendment. The review drafts were pre-adoption drafts dated February, 2005. They are thus of very current vintage.

The zoning district regulations create nine base zoning districts and one overlay district. The base districts include an agricultural zone, a conservation zone, three density options for residential areas, a village zone, one commercial business district, and two industrial districts (one for light industry, one for heavy industry). The overlay district creates additional requirements for special areas, regardless of the underlying zoning designation. In this case it is an airport hazard overlay.

The base district regulations use a modern tabular format and confine the heart of the ordinance to only four pages. Base residential densities follow in Table 7.

TABLE 7. PERRY TOWNSHIP (FAYETTE COUNTY) RESIDENTIAL DENSITIES

District	Base Density
AR Agricultural Rural District	80,000 Square Feet (1.83 acre.)
R-1 Low Density Residential District	43,560 Square Feet (1 acre)
R-2 Moderate Density Residential District	10,890 Square Feet (1/4 acre)
R-3 High Density Residential District	5,445 square feet (1/8 acre)

This offers a very wide range of residential choices, which is necessary given the wider range of situations possible on a county level.

In terms of allowed uses, the agricultural district permits a range of small business uses appropriate to the low-density setting. In addition to agriculture and single-family dwellings, such uses as contractor's yards, auto repair/service stations, neighborhood convenience stores, and woodshop/millwork businesses are permitted, though often as a special exception. The three residentially designated districts are more restrictive, being limited to dwellings, beauty/barber shops, home occupations, and such uses as playgrounds and churches. However, mobile home parks and apartments are limited to the high-density residential district. The proposed Fayette County Zoning Ordinance allows for a cluster residential development.

An innovative aspect of this ordinance is the inclusion of a village district and the wide range of uses permitted within that designation. The village zone permits small retail businesses, dwellings at various densities, and restaurants in a mixed-use setting to allow replication of traditional small town forms of development.

The business districts and uses have established square footage standards so that impacts can be regulated as a part of zoning. For example, a retail business of less than 10,000 square feet is a permitted use in a village district. Larger sized retail buildings are special exceptions. The commercial business district and two industrial districts also allow a mixture of some industrial and retail uses within the same district.

Perry Township (Fayette County) Subdivision and Land Development Ordinance. This is also a draft ordinance of current vintage. If adopted, it would include a number of new standards that would serve the Fayette County portion of the corridor quite well.

The ordinance requires a traffic impact study under certain circumstances (300 or more peak hour vehicle trips) and sets a minimum standard for an acceptable traffic impact study. It is important to note that the county planning director may require a traffic study also where known deficiencies exist, even if peak hour trips are lower than 300. The standards for a traffic study under the ordinance appear to be complete, adequate, and comprehensive. The creation of failing levels of service by a new development in the future conditions of the traffic study must be mitigated.

The ordinance's street standards seem prepared for rural and small urban area situations. Both design and construction standards are incorporated into the ordinance. It is unclear under the construction specifications at what point a municipal standard might be substituted.

The design standards are not excessive. Minimum cart way begins at a modest 18 foot width, with a 50 foot wide minimum right-of-way. A curbed street must have a cart way width of 26 feet, which is somewhat larger than some minimums. The only unusual aspect of this for a newer ordinance is that it does not have a maximum length for cul-de-sacs or a limitation on them. From a traffic management vantage point, limitations are becoming more common to prevent level of service stress points. Overall this ordinance provides a typical modern standard and its adoption will assist in guiding growth in the Perry Township portion of the corridor.

Existing Ecological Characteristics

Rick McCoy of the U.S. Fish and Wildlife Service, and a member of the project advisory committee provided additional information pertaining to the ecological aspects of the study area. Specifically, Mr. McCoy has provided information on wetlands, wildlife habitats, and biodiversity areas within Elizabeth, Rostraver, and Perry Townships. These areas are shown graphically on Figure 5. The following is a summary of findings prepared by Mr. McCoy.

Wetlands – There were very few wetlands observed within the entire study area. Because of the steep slopes and disturbance from agriculture and development, the stream channels are all incised with limited flood plains. Occasionally a small wetland has developed on the flood plain within the incised channels or where a tributary stream has created a delta at the confluence with the main channel. One exception was a long linear wetland on Melvin silt loam (MC) between the railroad tracks and Route 981 from Sheppler Hill Road to SR 3017. Small seep wetlands also occur on some gentle to moderate forested slopes in some depressions.

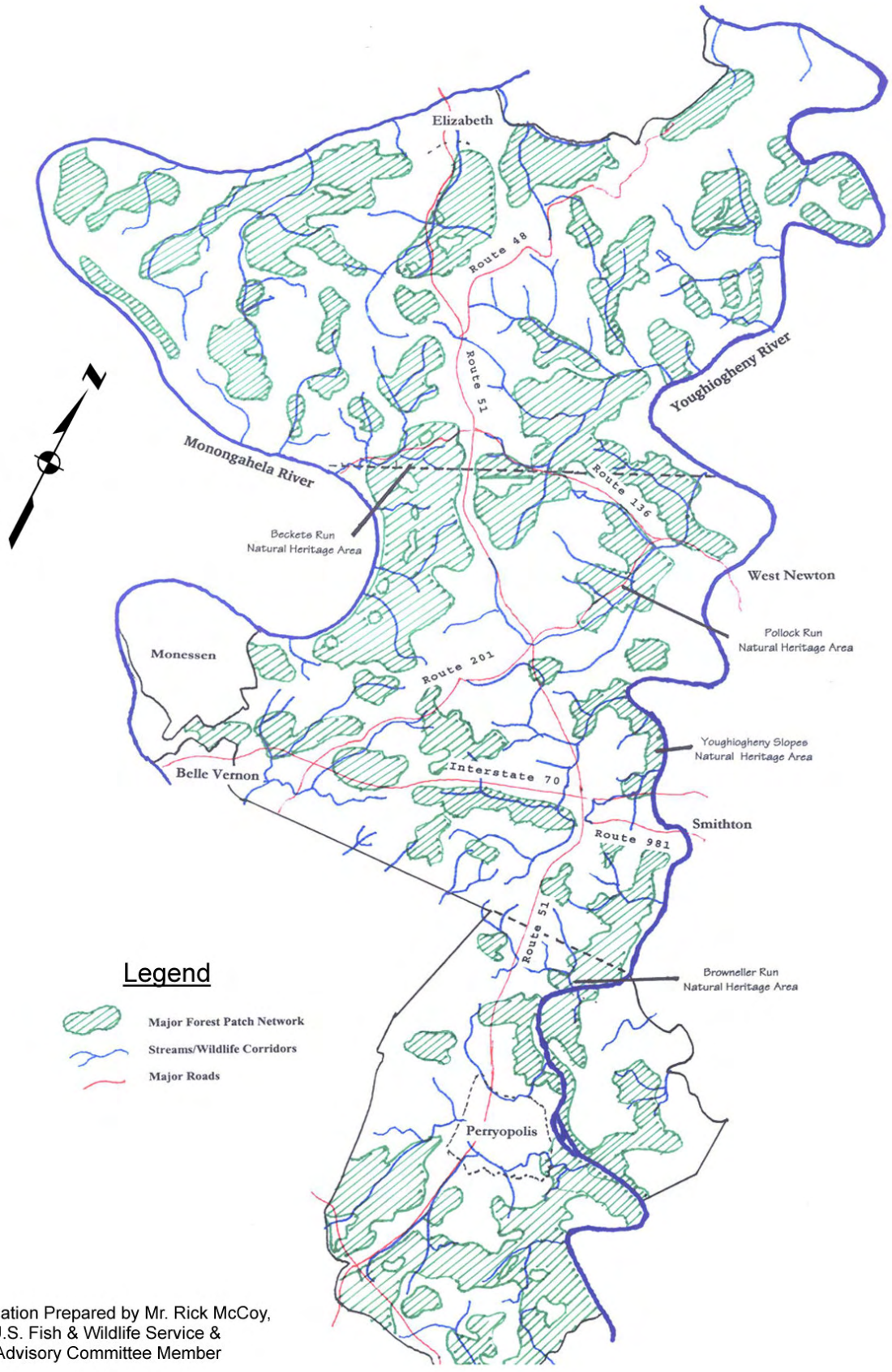
Only two larger wetlands were observed in the study area, both in Rostraver Township. One emergent and scrub-shrub wetland occurs on Melvin silt loam and Burgin silt loam along both sides of the A&L Construction Company between Route 51 and Cedar Creek. The second emergent/scrub-shrub wetland occurs in the southwest quadrant of the intersection of SR 3008 and Route 51. Both of these wetlands are large enough to have significant wildlife value.

Wildlife Habitat – The forested habitat has been fragmented from agriculture and previous development. However, there are still many large (greater than 100 acre) forested tracks of land that support a variety of wildlife species including wild turkey, white tailed deer, black bear, grey fox, raccoon, and several small mammals. These forests are also important to resident and migratory birds including many species of forest interior birds of special concern to the Fish and Wildlife Service because of declining populations. Currently, many of the forested patches are connected by the steep wooded ravines and stream channels (see Figure 5). As development continues within the study area, it will be important to maintain this connectivity through protection of green ways and stream corridors.

Biodiversity Areas – There are four areas identified by the Western Pennsylvania Conservancy as having a high diversity of plant species, including several state-rare plants: snow trillium (*trillium nivale*), blue monks hood (*Aconitum uncinatum*), harbinger-of-spring (*Erigenia bulbosa*), yellow leaf-cup (*Polymnia uvedalia*), American beakgrain (*Diarrhena obovata*), and American gromwell (*Lithospernum latifolium*). Most of these rare species live on the steep wooded slopes and along stream banks.

Mr. McCoy also noted that the larger wetlands, steep slopes within the natural heritage areas, and stream corridor connections should be protected from development if significant wildlife habitat is to remain in the corridor.

For additional information on the ecological resources in Elizabeth, Rostraver, and Perry Townships, please contact the U.S. Fish and Wildlife Service field office in State College, Pennsylvania.



* Information Prepared by Mr. Rick McCoy,
U.S. Fish & Wildlife Service &
Advisory Committee Member

Figure 5
Green Infrastructure
Along Route 51

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Existing Land Use, Comprehensive Plans and Zoning Maps

The regulations analyzed in the previous paragraphs set parameters that often reflect existing conditions. These can be reflected in the comprehensive plan if that document is consistent with zoning but is typically best seen in an analysis of zoning maps. Figure 6 illustrates the current zoning districts along the Route 51 corridor for the three townships. Perhaps what is most striking about this map is how much zoning designation varies from one community to the next and even across the corridor. Much of the corridor zoning has been a response to historic land uses, and perhaps individual desires, rather than an overall coordinated effort for growth. Pockets of residential district on frontage properties adjoin highway commercial areas. At one point, on the Rostraver/Forward/Elizabeth Township lines, there are four different zoning designations and differing standards.

Zoning maps and ordinances, however, only create a range of possible future conditions. It is also important to analyze how land has been used in the past and any aspects about that land that would discourage or encourage certain forms of development. Local planning documents were examined and geographic information system (GIS) files were analyzed after being made available by the Southwestern Pennsylvania Commission. GIS is an electronic form of mapping that allows various land features to be examined and compared simultaneously. Some of the results of this analysis are attached. The attached map (Figure 7) illustrates Natural Heritage Inventory sites within proximity to the corridor. The Natural Heritage Inventory is a planning process conducted on a countywide level by the Western Pennsylvania Conservancy, with financial assistance from the Pennsylvania Department of Conservation and Natural Resources. Its purpose is to note areas where sensitive plant communities or other unique natural areas may exist so that development could either be avoided or mitigated within these areas.

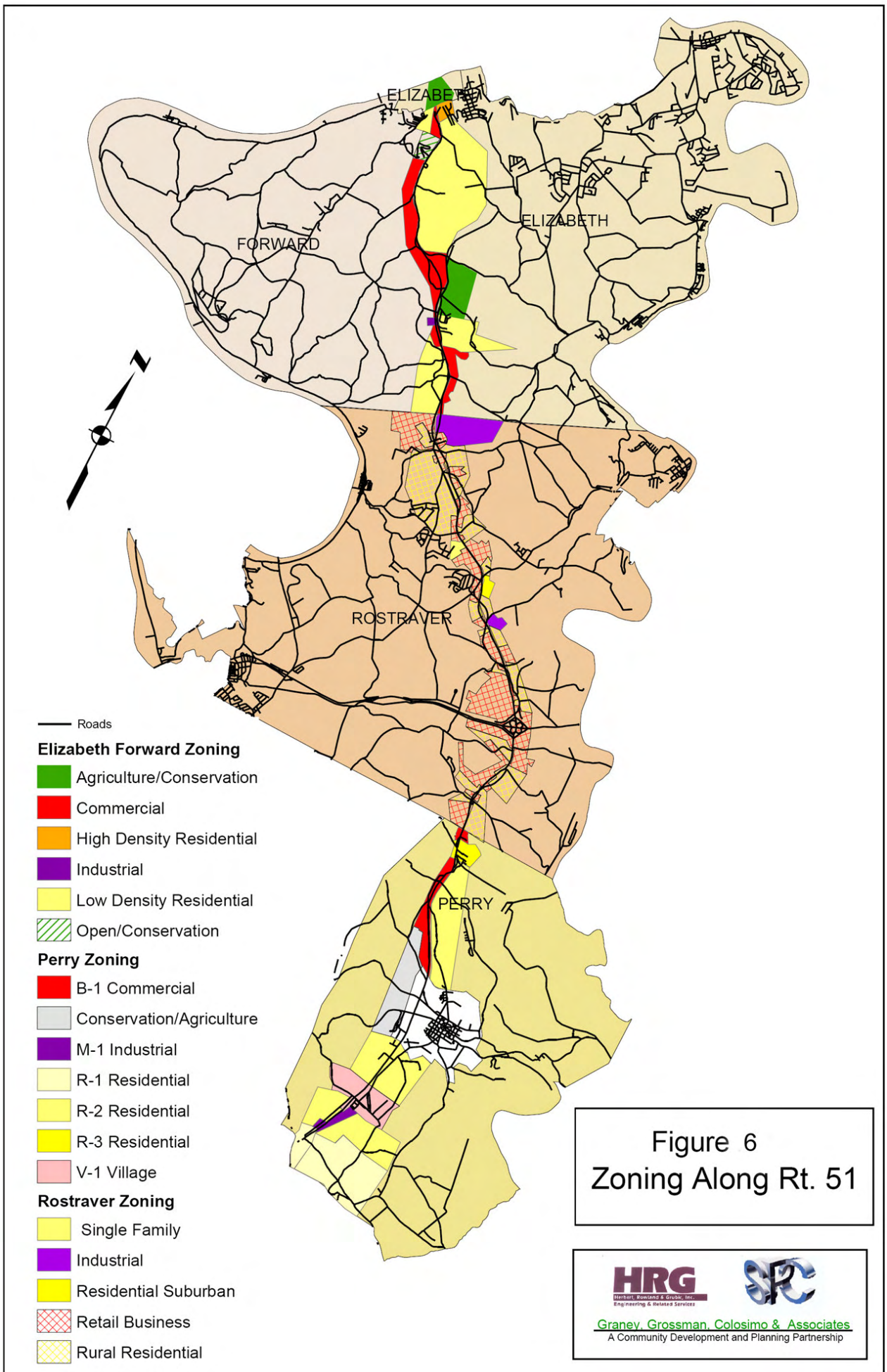

Figure 6
Zoning Along Rt. 51

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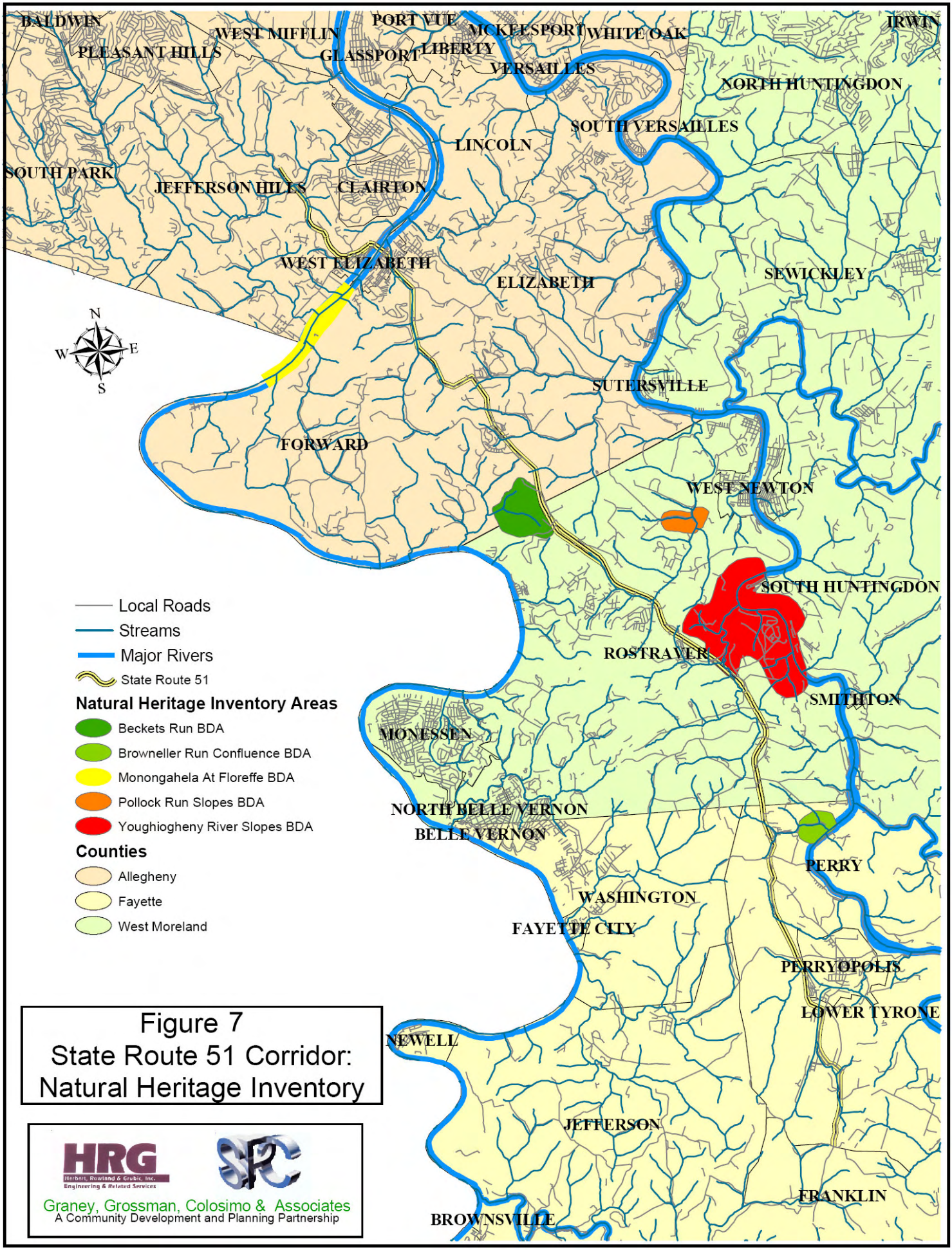

Figure 7
State Route 51 Corridor: Natural Heritage Inventory

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According to the Conservancy files, there are four biodiversity areas adjoining or within close proximity to the corridor. These are areas that have a large variety of native plant groups because of environmental circumstances. Generally, many of these areas along the corridor are also on steep slopes. The following series of three maps (Figures 8, 9, & 10) first illustrate land cover, which is a very generalized form of land utilization mapping. When this information is combined with observations made during field observations of the townships, much of the history of land use in the area of the corridor can be seen. Historically within the region, most development consisted of industrial development along the river valley areas and near available rail and river transportation. Residential and commercial developments are naturally located nearby. In fact, the typical "Pennsylvania Plan" form of town plan is riverfront industrial with parallel rail service and adjacent downtown commercial and residential neighborhoods on the upland hillsides. Variants of this form of town plan can be seen throughout the region. Beginning after World War II, housing development began to spring up in the upland areas above the river valleys. The older ones are typically nearer to the river towns. Newer low density residential clusters can be seen almost anywhere, however, growth tends to have a magnetic effect and the new clusters of residential development tend to enlarge over time. Large scale commercial tends to follow residential development and has not occurred yet in much of the corridor under study, though some nodes are visible. Perry Township is unique because a number of small scale business uses have begun in a mixed use fashion along the corridor. The larger scale residential developments seen in Rostraver and Elizabeth Township have not yet occurred.

In addition to zoning, a number of factors can encourage or discourage residential development. The next series of three maps (Figures 11, 12, & 13) depict the land cover information compared to the presence of steep slopes and public sewer service areas. Sewer service has been a magnet of development. Unlike many other areas, slope has not consistently discouraged development (except in extreme cases).

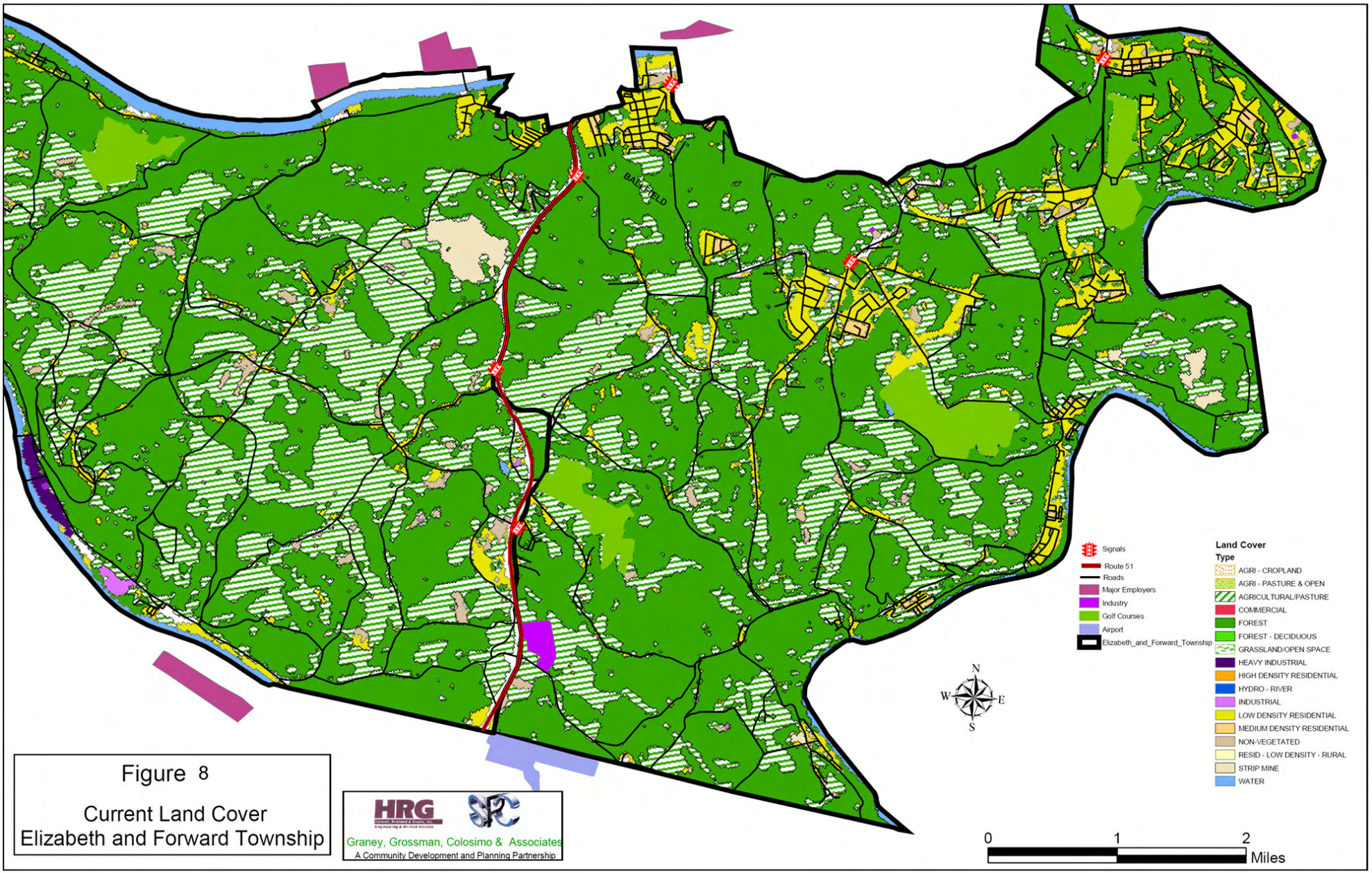

Figure 8

Current Land Cover
Elizabeth and Forward Township

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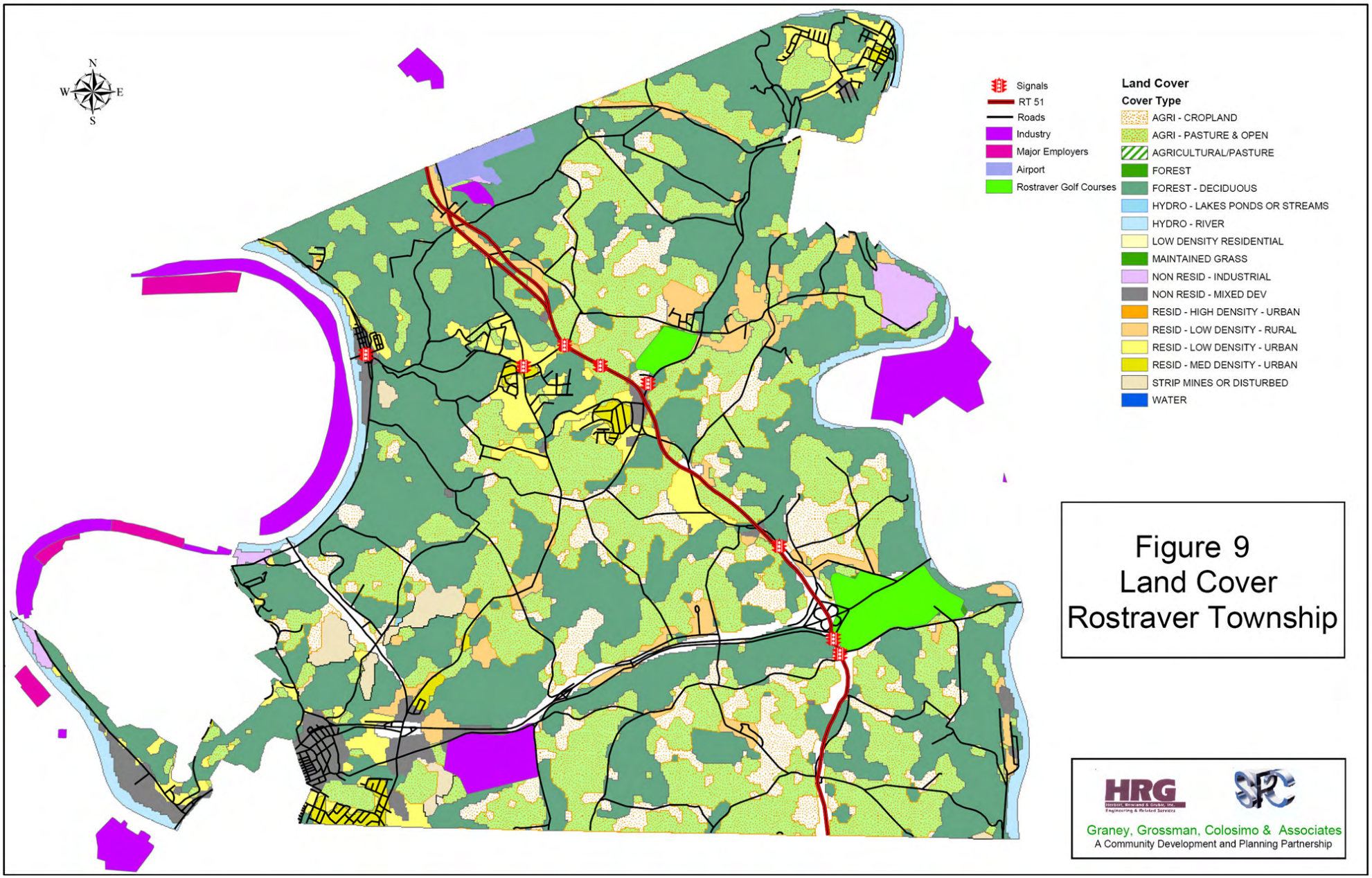

Figure 9
Land Cover
Rostraver Township

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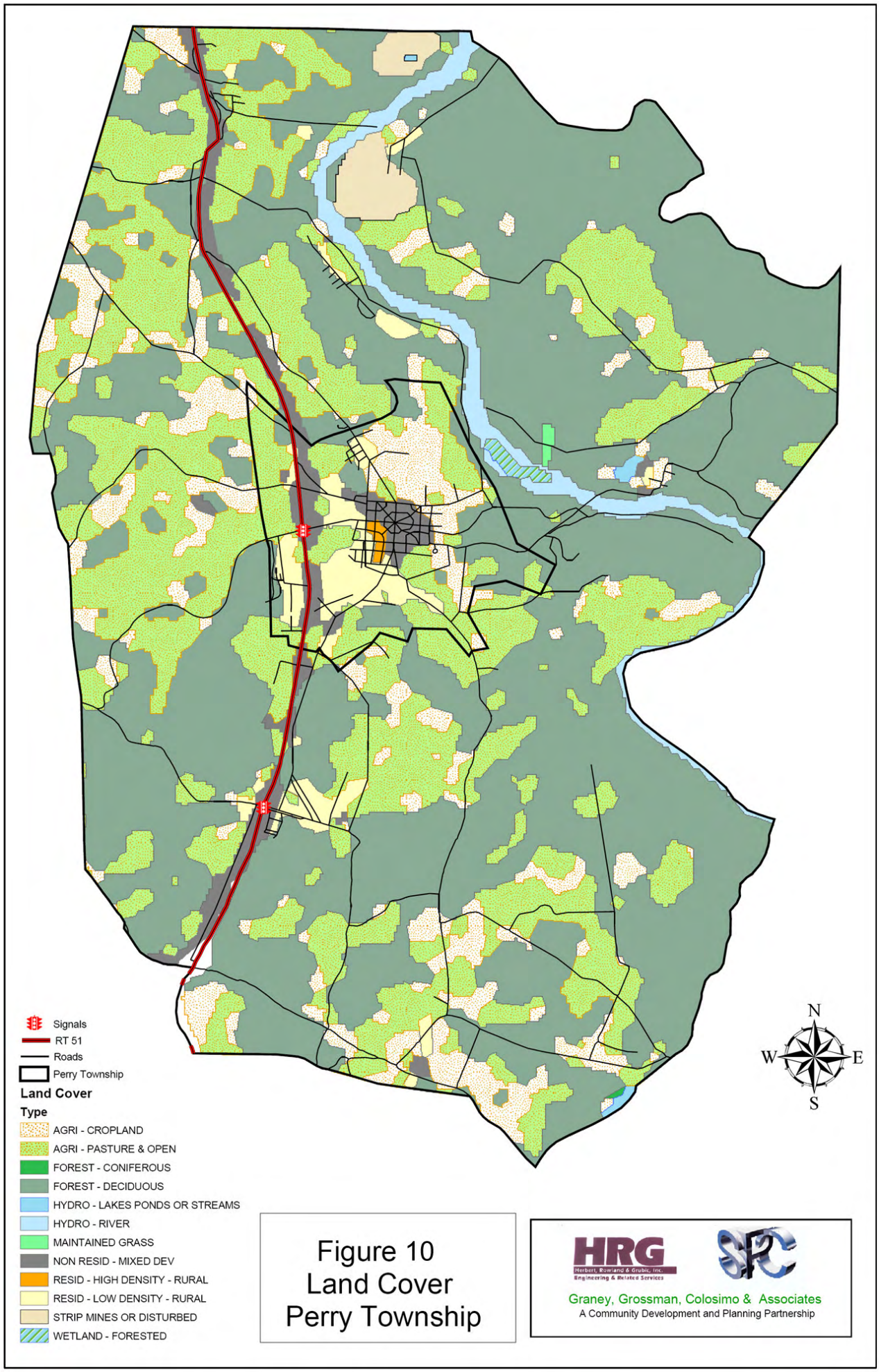

Figure 10
Land Cover
Perry Township

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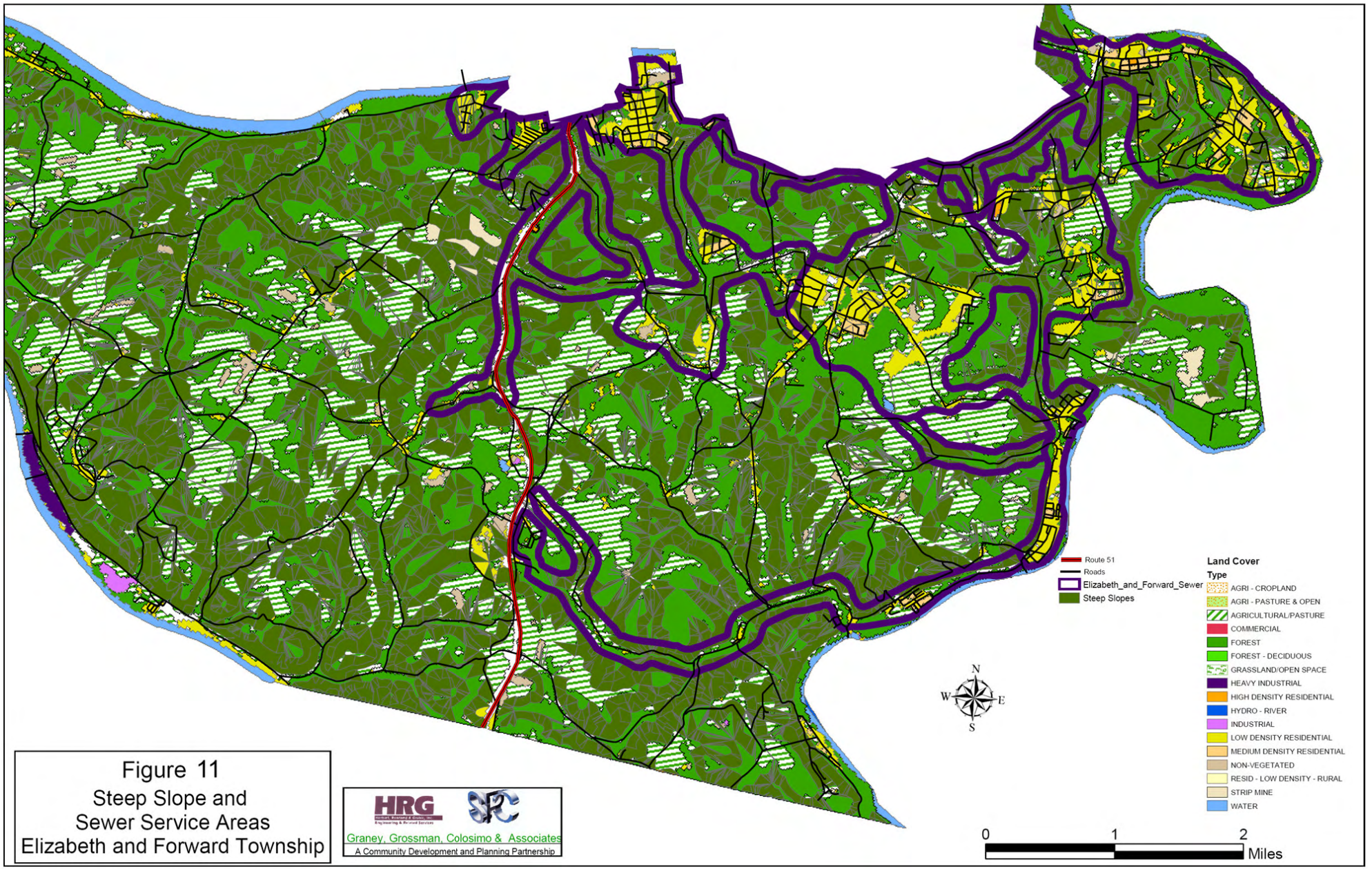

Figure 11
Steep Slope and
Sewer Service Areas
Elizabeth and Forward Township

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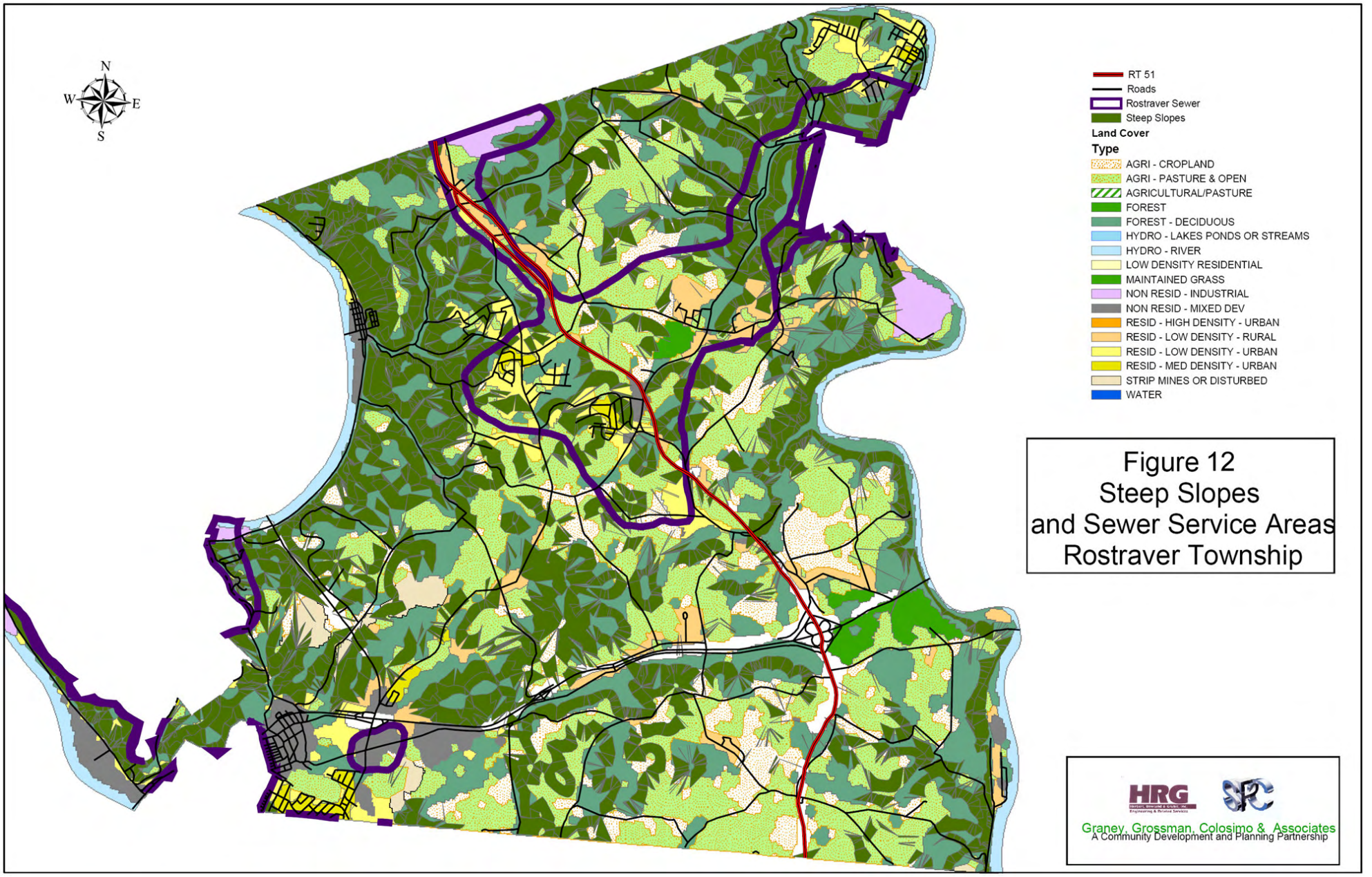

Figure 12
Steep Slopes
and Sewer Service Areas
Rostraver Township

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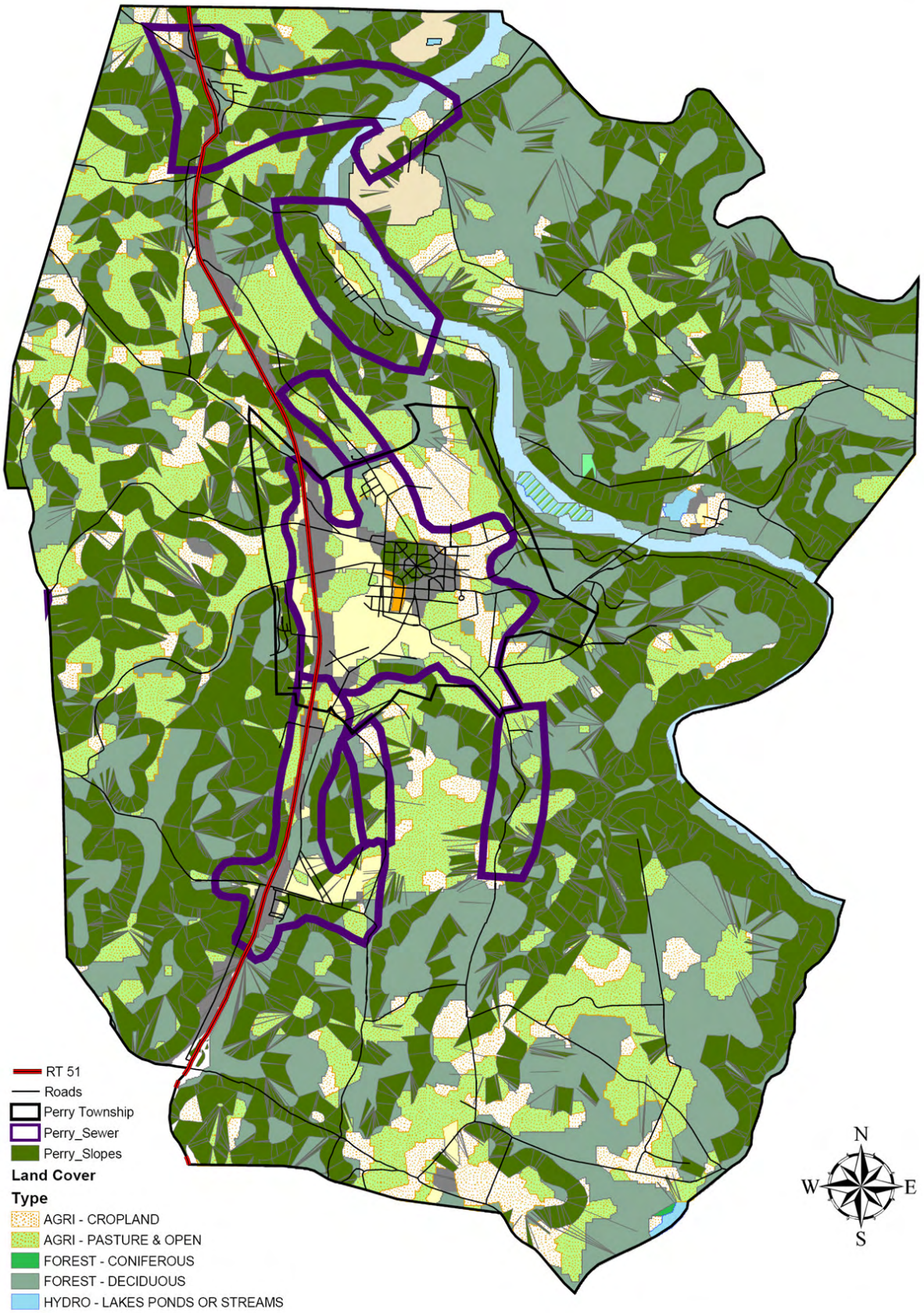

Figure 13
Steep Slopes and
Sewer Service Areas
Perry Township

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FUTURE GROWTH AND DEVELOPMENT

Demographics Trends

Zoning ordinances (with their associated map, Figure 6) and subdivision land development regulations determine *what is allowed to happen* in terms of future growth and development within the corridor. The land can also limit development or drive it to certain areas. When this regulatory information about land is combined with market conditions and population changes, planners can make an educated guess about what might *actually happen in the future*.

Past Trends: Two trends have been operating in corridor communities over the past decade. The first is some catching up from historic patterns of out-migration, typical in western Pennsylvania. As almost any long-term resident remembers, the 1980's were a time of serious economic dislocation throughout the region. Even some suburban growth communities saw a loss of young people, who left for job opportunities elsewhere. The next table (Table 8) summarizes how the corridor communities fared during the 1990's.

TABLE 8. POPULATION SUMMARY

Location	1990 Population	2000 Population	Numeric Change	Percent Change
Elizabeth Township	14,712	13,839	-873	-5.9 %
Rostraver Township	11,224	11,634	410	+3.6 %
Perry Township	2,817	2,786	-31	-1.1 %

The second trend is the fact that household sizes or the number of person per household is shrinking. This trend has actually been occurring since the turn of the century. Basically it means that fewer people require more housing units. The result is that municipalities that lost population also lost a lower ratio of households and those that gained population also gained a greater number of housing units/occupied households. Thus, many communities that the census reported as losing population saw a rise in building permits during the 1990's (There is a separate issue in some areas over alleged undercounting in both the 1990 and 2000 census, but these are difficult to quantify). Table 9 summarizes how the corridor housing fared.

TABLE 9. HOUSING UNIT SUMMARY

Location	1990 Housing Units	2000 Housing Units	Change	Percent Change
Elizabeth Township	5,480	5,467	-13	-0.2 %
Rostraver Township	4,622	4,920	+298	+6.4 %
Perry Township	1,033	1,170	+137	+13.2 %

SPC Scenarios: The Southwestern Pennsylvania Commission creates a series of uniform population household and employment forecasts for each municipality in the region. The three communities along the Route 51 corridor are anticipated to have a variety of future growth and development scenarios. Elizabeth Township is anticipated to lose overall population and gain households. This is a common scenario, as the number of persons per household has been getting smaller since the beginning of the twentieth century. Rostraver Township is projected to gain both persons ands households, though the rate of the latter will be slightly higher than the former. Perry Township is a regional anomaly, as it is projected to actually gain persons and lose households. This is most likely due to a few unusual factors in the age structure and number of older housing units. Table 10 summarizes housing units' population census from the three townships.

TABLE 10. HOUSING UNIT SUMMARY

Location	Elizabeth Twp.		Rostraver Twp.		Perry Twp.	
Year	Population	Households	Population	Households	Population	Households
2000 (Census)	13,839	5,467	11,634	4,590	2,786	1,170
2002 (Est.)	13,544	5,216	12,560	5,025	2,859	1,072
2010 (Projected)	12,448	4,909	14,605	5,956	2,959	1,124
2020	12,967	5,263	14,812	6,183	2,972	1,148
2025	13,526	5,561	14,749	6,238	2,969	1,157
Change 2000-2025	-313	+94	+3,115	+1,648	+183	-13

Generally speaking, the communities within the corridor will all likely see growth and development in some form. A typical household will generate 8-10 vehicle trips per day. Under a normal scenario, commercial growth follows residential growth. Analysis from the township building permit data indicates that growth will exceed the SPC projection scenarios. At the present time, perhaps 300-500 housing units are in some state of planning in Rostraver Township. In the past 15 years, over 700 new lots have been created, and 450 new single family building permits have been issued in the last 10 years. Presently in Elizabeth Township, about 700 residential lots or units are in various stages of planning and development. About thirty new residential lots are in the planning stage in Perry Township.

How will this level of development affect the corridor? With the nature of identified problems, Route 51 may not be able to safely and conveniently absorb the development. In Rostraver particularly, a number of major residential developments would affect the existing collector roads that intersect Route 51. This also holds true in Elizabeth. There are two other dangers. The first is that a higher standard in one township could lead to "development judo", where the developer simply finds a site in the next

community, which still affects the traffic. The second is a potential misuse of marginal properties that directly access the corridor. Understanding this, the corridor steering committee decided to engage the public in each community.

Public Validation

While a large measure of this report was based upon objective information (how land is now being used, counts of traffic, etc), in a self-governing community citizen opinions and perceptions are as important as objective data. As Pennsylvania Governor and pioneer transportation planner Gifford Pinchot once said, "Find out in advance what the public will stand for. If it is right and they won't stand for it, postpone action and educate them." For this very reason, the consultants conducted a public process before undertaking preparation of a draft plan. The central feature of this public process was a town hall meeting/open house in each municipality. These were 2-3 hour sessions intended to bring a broad base of local leaders, business and property owners, and everyday citizens into the decision making process. Route 51 committee members from each community made an effort to attract all segments of their community. News stories were run about the meetings in two local newspapers. Property and business owners were invited by letter or by direct spoken invitation. There were also posted announcements. The schedule was set up as follows:

March 29, 2005 Rostraver Township
4:00-5:00 pm Local leaders (Township Officials) session
5:00-6:00 pm Business owners and property owner's session
6:00-7:00 pm Open house for the public

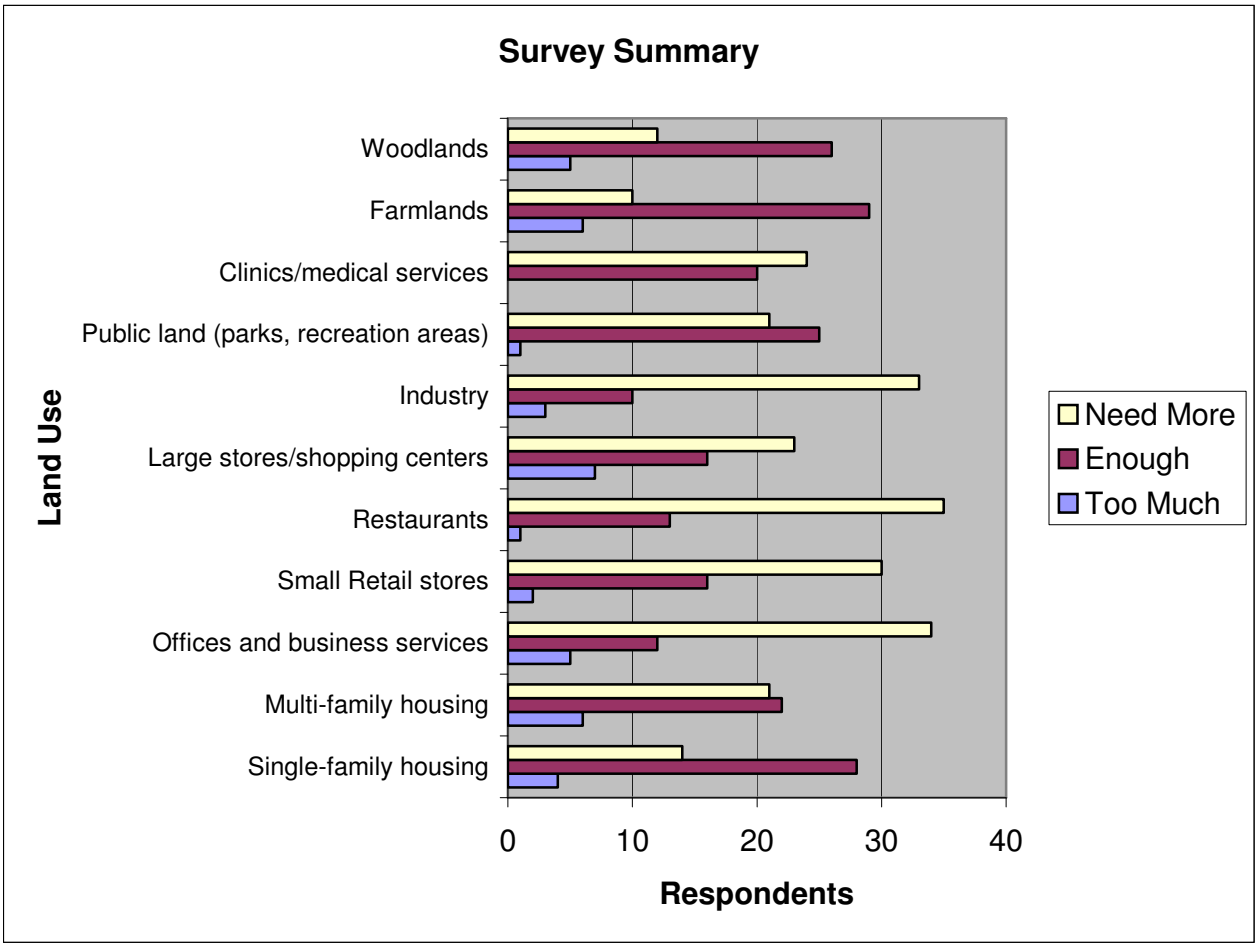
March 30, 2005 Perry Township
5:00-6:00 pm Combined local leaders, business owners and property owners
6:00-7:00 pm Open house for the public

March 31, 2005 Elizabeth Township
4:00-5:00 pm Local leaders (Township Officials) session
5:00-6:00 pm Business owners and property owner's session
6:00-7:00 pm Open house for the public

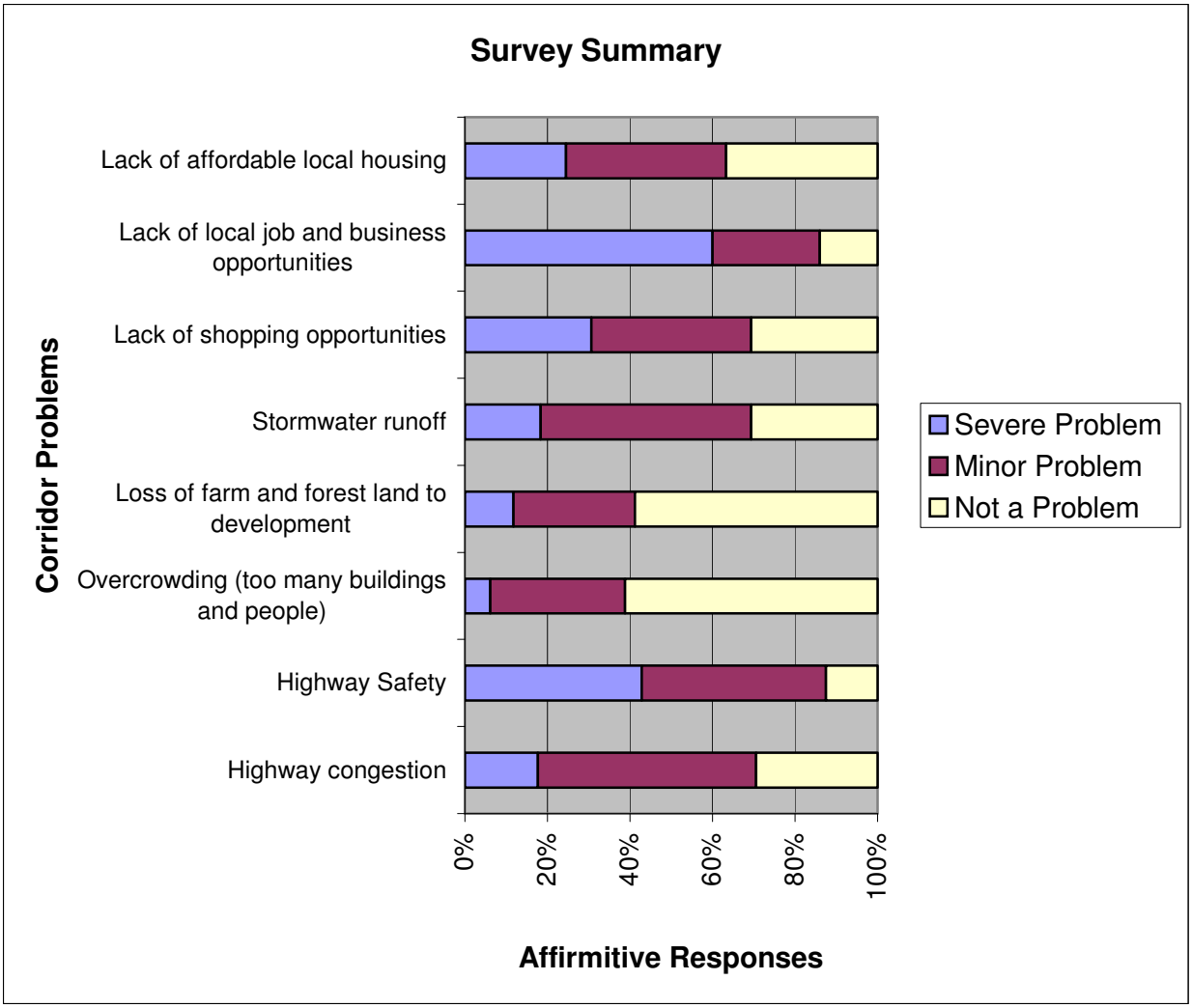
In total, about 75 total corridor stakeholders attended one of the meetings. About 41 persons attended the Rostraver meeting, about 14 attended the Perry Township meeting, and about 16 were at the Elizabeth Township session. Representatives from SPC also attended each meeting.

At each meeting, the consultants presented a brief visual demonstration that highlighted information about both transportation and land use trends within the corridor. There was also a public question, answer and comment session, as well as a more informal time where attendants could speak directly to the consultants. Finally, citizens were encouraged fill out a brief "mini-survey" about corridor conditions, and were given stickers to rate the importance of various options within a future toolbox of ideas.

Fifty-four attendees to the open house meetings completed the two page mini survey. The vast majority of persons who completed the survey (49) were either property owners or business owners along the Route 51 corridor. Half of the respondents were also Rostraver Township residents. Survey respondents were asked their opinion about the use of buildings and land along the corridor. A land use category was mentioned and their response options were "too much", "enough", or "need more" for each category.



In general, survey respondents would like to see more industry, stores/shopping centers/retail sales of all types, restaurants, and office/service businesses in the corridor. There is more ambivalence about additional housing. Consistent with these opinions, citizens identified lack of local job and business opportunities as the greatest problem in the corridor. There is strong support to develop frontage properties.



In addition to the mini-survey, five wall charts were developed to explain some of the key approaches to coordinating corridor transportation and land use. These charts included a brief explanation of each idea or approach, some illustrations, how it could be locally implemented, and who in the general region has used the approach.

There was universal support for an approach that encompassed traffic engineering and safety improvements, especially when combined with smart growth and access management. There was mixed support or opposition to the idea of either transportation impact fees or intergovernmental cooperation. However, this is where there was a divergence of opinions between participants from the different municipalities. In general, Rostraver Township meeting participants supported impact fees, Perry Township participants opposed them and Elizabeth Township residents were split. The results of the public process are attached in Appendix C.

Future Development Scenario

After listening to local leaders, the business community, and citizens, the consultant team began to analyze the most probable future growth and development scenario. This scenario assumes that growth and development will exceed the Southwestern Pennsylvania Commission projections, based upon a hybrid forecast of future households, which combines the SPC and local building permit data. In such a scenario, housing opportunities created by developers on greenfield sites will drive demographic growth. The forecast also assumes that local governments will respond positively to this opportunistic growth by amending land use ordinances (such as rezoning properties to allow more dense development) and providing public infrastructure where it is financially feasible.

The forecast estimates that the three communities will gain perhaps 4,100 housing units over the next 15-20 years. This would lead to about 135 acres of new commercial development as well, if fairly typical ratios apply (about 5 acres new commercial for every 95 acres of residential development). Significant industrial or manufacturing development will probably not happen adjacent to the Route 51 corridor because of a large number of target sites elsewhere in the area. The exception to this may be the area around the Rostraver Airport. This may attract an additional 8-10 acres of light industrial uses.

Overall, housing and commercial growth and development will affect each community in different ways. Both the level of growth and the type of development will differ slightly. This is reflected in the land use conditions in each forecast. The attached three maps (Figures 14, 15, & 16) show the Future Land Use and Current Land Cover and represent where development may be concentrated.

In the Elizabeth/Forward Townships section of the corridor, 1,510 new dwelling units/households are projected. The vast majority of these will be located in Elizabeth Township rather than within Forward Township. There are several reasons for this. First, the Twin Rivers COG Multi-Municipal Comprehensive Plan has planned a larger growth area in Elizabeth Township. There is also a much larger sewer service area in Elizabeth Township. This sewer service area corresponds well with the available developable land. Generally, Elizabeth is in a much better position to plan for and accept the projected levels of growth. While the projections did not differentiate between various forms of residential development, such as single family, townhouses or apartments, Elizabeth Township may be the community in the corridor most attractive to mixed density housing. The township could become a good location for well planned developments that contain a mix of housing forms for persons in different stages of life. For example, a new development might include some single family dwellings, some “quad” units for sale under a condominium arrangement, and rental townhouses. From a land use perspective, most of this growth will occur in the residential core in the general vicinity of Stoneybrook Park, but about 140 units are also projected in the portion of the corridor near the Rostraver Township line. Elizabeth Township may see another 40 acres of commercial development in the next 15-20 years. About ten acres of this development will be small developments opportunistically placed wherever environmental conditions allow. A larger concentration of future commercial development has been depicted in the southern portion of the Route 51 corridor, because conditions would be favorable for that form of development. No major industrial development is forecast within the township because of the wide availability of brownfield, KOZ, and various forms of subsidized sites elsewhere.

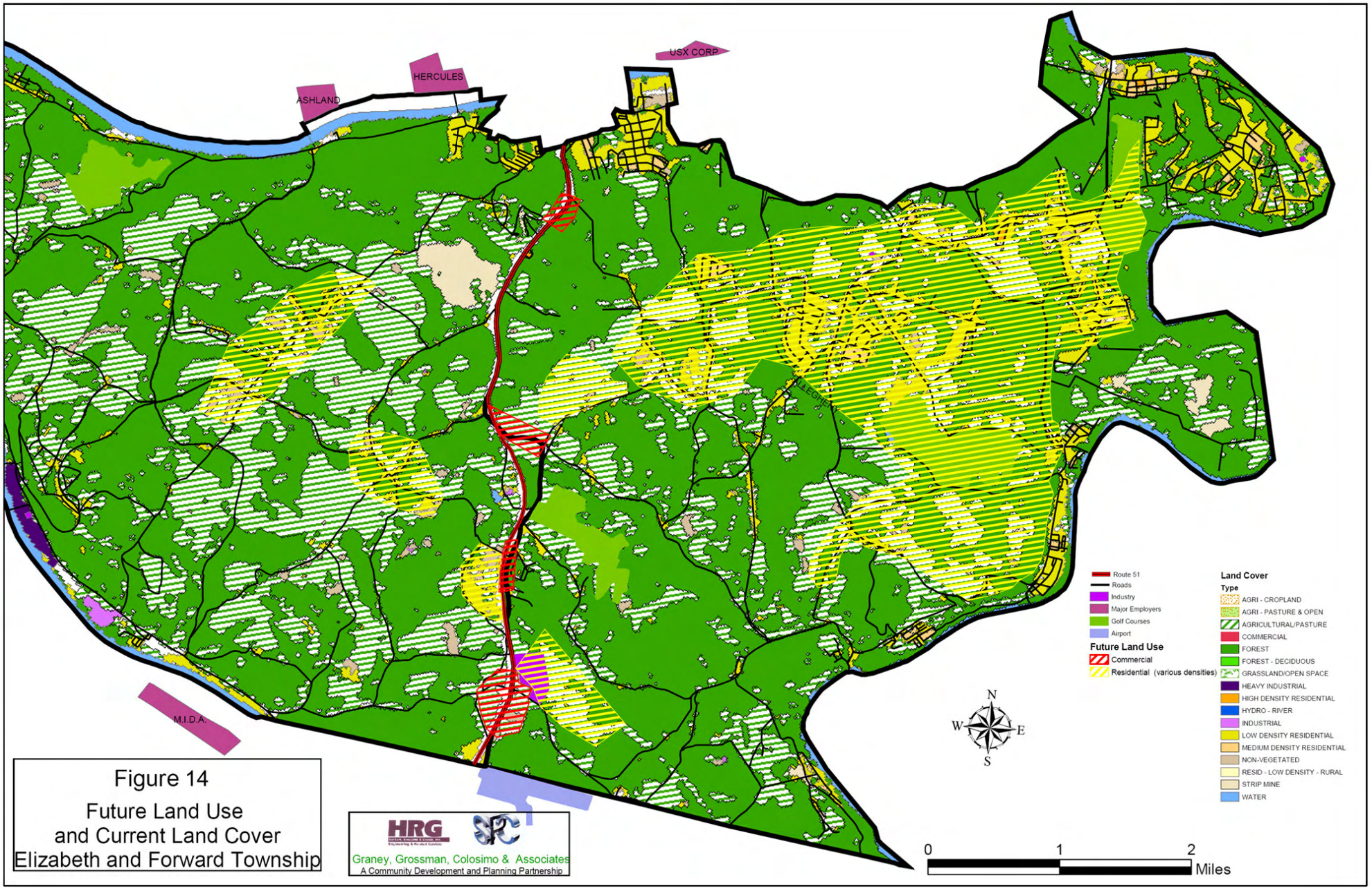


Figure 14

Future Land Use
and Current Land Cover
Elizabeth and Forward Township

HRG

Graney, Grossman, Colosimo & Associates
A Community Development and Planning Partnership

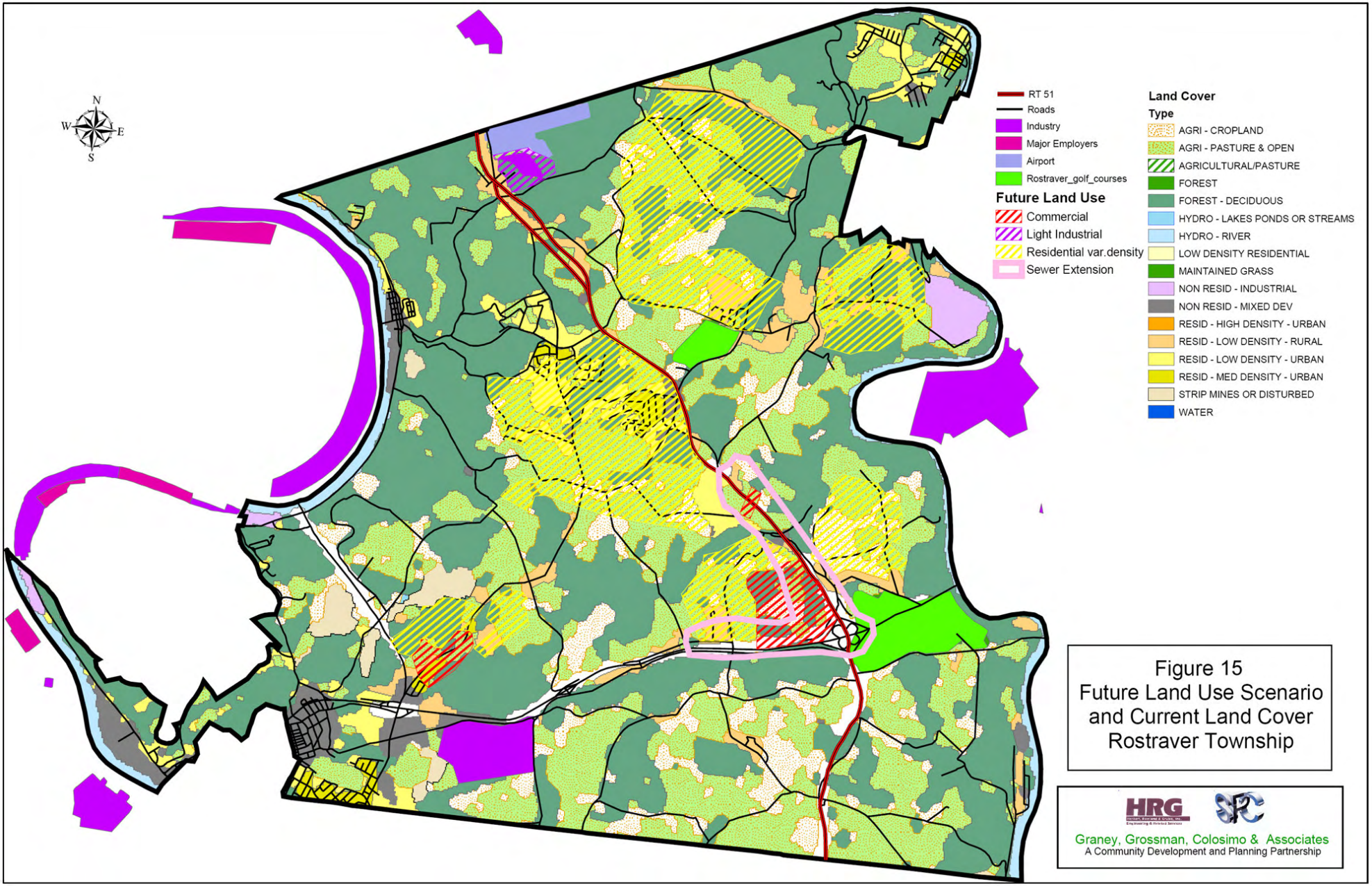


Figure 15
Future Land Use Scenario
and Current Land Cover
Rostraver Township

HRG

Graney, Grossman, Colosimo & Associates
A Community Development and Planning Partnership

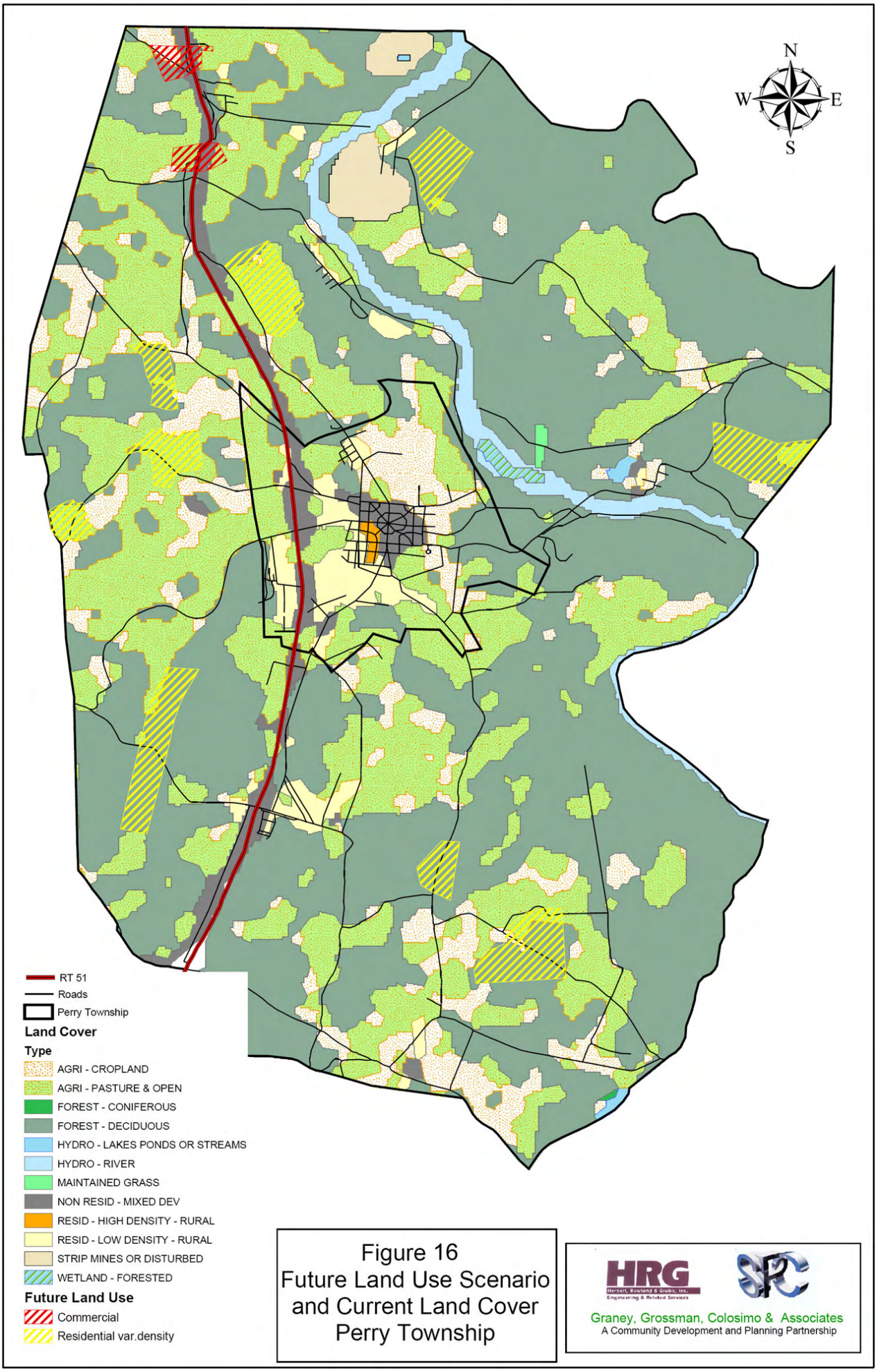


Figure 16
Future Land Use Scenario
and Current Land Cover
Perry Township

HRG
Herbert, Rowland & Grubic, Inc.
Engineering & Related Services

Graney, Grossman, Colosimo & Associates
A Community Development and Planning Partnership

Rostraver Township will most likely be the fastest growing community within the corridor. This is because of its past growth patterns and its strategic location on the Interstate 70 corridor. In the planning scenario, Rostraver is anticipated to gain about 2,500 new housing units or households over the next 15-20 years. In this scenario, Rostraver would also see about 85 acres of new commercial development. The unanswered question is how much of this will occur on the Route 51 corridor. There has been some discussion of whether out-parcels on the large retail development currently in Rostraver on Route 51 have sold as quickly as the developer might have wished.

The major retail activity center of the Township has historically been farther west on the I-70 corridor, in the Belle Vernon area. A large mixed greenfield/brownfield area north of this interchange was targeted for major retail/industrial/residential development in an economic development report prepared by Westmoreland County. It would be assumed that assistance and site development activities here by public bodies would create a favorable atmosphere for development away from Route 51. However, even if County development priorities change, the concentration of existing retail commercial activity will most likely bring more development.

The scenario assumes that Perry Township will remain the most rural of the three townships in the next 15-20 years. However, it will most likely still see growth and development. An unusual circumstance for Perry Township is the number of current housing units that will likely see turnover in the next decade (due to elderly homeowners). Most new developments will utilize existing township road frontage or short new streets and be comprised of perhaps 10-40 new lots each. Five new acres of commercial development is projected.

FUTURE TRANSPORTATION SYSTEM

Trip Generation and Distribution

Using the future development scenarios discussed in the previous section, traffic volumes were developed to represent future traffic conditions in 2025. The traffic conditions were projected for the AM and PM peak hours using the methodologies of the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, Seventh Edition. The following table (Table 11) summarizes the number of new development trips added to the local roadways within the study townships.

TABLE 11: ANTICIPATED DEVELOPMENT TRIP VOLUMES

LOCATION	AM Peak Hour Trip Generation		PM Peak Hour Trip Generation	
	Residential	**Non-Residential**	**Residential**	**Non-Residential**
Elizabeth/Forward Township	973	1,089	1,294	1,985
Rostraver Township	1,552	1,332	2,032	2,371
Perry Township	80	102	65	175
Total	**2,605**	**2,523**	**3,391**	**4,531**
	5,128		**7,922**	

Not all of the traffic volume anticipated within the study Townships will use the study intersections on Route 51. Using available traffic count information, each anticipated development's traffic was assigned to the local roadway network. Using this method, it is possible to approximate how much of the development traffic is destined to Route 51 and the study area intersections. Once on Route 51, anticipated development traffic was assigned through the Route 51 intersections based upon the manual turning movement counts collected for this project. Details of the trip distribution and assignment analyses can be found in the Technical Appendix.

Future Roadway Network

Several potential changes to the local roadway network are anticipated in the future. These include:

- Installation of a traffic signal at Concord Lane to service a private development
- Potential left turn treatments and other safety improvements from the *Route 51 Needs Study*

However, for analysis purposes, the future roadway network was assumed to be identical to that described in the *Existing Conditions Section* of this report. This was done in order to be conservative in the analysis as these future projects are not currently designed and exact implementation schedules are not known. For this reason, the future improvements will be evaluated separately.

Future Traffic Volumes

In order to establish future traffic volumes, the existing traffic volumes were factored to 2025 before considering the increased traffic volumes from anticipated developments. This increase accounts for the general trend of increasing vehicular trips that cannot be assigned to any specific development and traffic that originates outside of the study area. The Southwestern Pennsylvania Commission (SPC) provided a background growth rate of 1.0% that was applied to all existing traffic volumes.

Future 2025 traffic volumes were derived by combining the existing traffic volumes, increased traffic from background growth, and traffic from anticipated developments. Figure 17 reflects the future 2025 AM and PM peak hour traffic volumes anticipated on the Route 51 corridor within the study area. Please note that AM peak hour traffic volumes are only provided at select intersections. Refer to the Technical Appendix for anticipated development trip generation volumes.

FIGURE 17
2025 PROJECTED PEAK HOUR TRAFFIC VOLUMES AND LEVEL OF SERVICE SUMMARY
LAND USE AND TRANSPORTATION INITIATIVE

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Capacity Analyses

Capacity analyses for future conditions were performed during the 2025 AM and PM peak hours. The following table (Table 12) summarizes the levels of service for the existing conditions and with 2025 traffic volumes. The approach and intersection levels of service are also shown graphically on Figure 17. Details of the future capacity analysis are contained in the Technical Appendix.

TABLE 12: LEVEL OF SERVICE SUMMARY

INTERSECTION/ MOVEMENT	*EXISTING CONDITIONS*		*YEAR 2025 WITH ANTICIPATED DEVELOPMENT*		*DISCUSSION*
	AM	*PM*	*AM*	*PM*	
1. Weigles Hill Rd / Giant Eagle Driveway					
- Eastbound Left/Thru/Right	--	D	--	C	Will require traffic signal timing revisions to maintain acceptable operation through 2025.
- Westbound Left/Thru/Right	--	D	--	C	
- Northbound Left	--	B	--	C	
- Northbound Thru/Right	--	C	--	C	
- Southbound Left	--	A	--	B	
- Southbound Thru/Right	--	C	--	C	
- Overall	--	C	--	C	
2. Roberts Hollow Rd "Y" & Roberts Hollow Rd					
- Eastbound Left/Right	--	C	--	C	Acceptable operation through 2025
- Northbound Left	--	A	--	C	
- Northbound Thru	--	A	--	B	
- Southbound Thru/Right	--	B	--	C	
- Overall	--	B	--	B	
3. Hutchinson Rd (SR 2011) / Round Hill Rd					
- Eastbound Left/Thru/Right	**F (61.7)**	**F (453.3)**	**F (692.6)**	**F (*)**	Stop controlled side street will continue to operate with unacceptable levels of service through 2025.
- Westbound Left/Thru/Right	C	**F (67.2)**	**F (*)**	**F (*)**	
- Northbound Left	A	B	A	C	
- Southbound Left	B	A	B	B	

BOLD *indicates an unacceptable level of service.* *(##.#) represents anticipated delay*
-- Time period not selected for analysis. *– LOS not available on non-delayed movement*
** indicates delay to high to calculate.*

TABLE 12: LEVEL OF SERVICE SUMMARY (CON'T)

INTERSECTION/ MOVEMENT	*EXISTING CONDITIONS*		*YEAR 2025 WITH ANTICIPATED DEVELOPMENT*		*DISCUSSION*
	AM	*PM*	*AM*	*PM*	
4. PA 48 (SR 0048) / Paydays Dr					
- Eastbound Left/Thru/Right	--	C	--	C	Over-capacity westbound approach caused by anticipated development.
- Westbound Left/Thru/Right	--	D	--	**F (76.1)**	
- Northbound Left/Thru	--	C	--	**F (77.7)**	
- Northbound Right	--	C	--	B	
- Southbound Left	--	A	--	B	
- Southbound Thru/Right	--	D	--	C	
- Overall	--	C	--	D	
5. Airport Rd					
- Westbound Left/Right	C	**F (88.3)**	**F (298.0)**	**F (*)**	Stop controlled side street will continue to operate with unacceptable levels of service through 2025.
- Southbound Left	B	A	C	C	
6 & 7. Webster Hollow / Salem Church Crossover					
- Eastbound Thru/Right	-	D	-	**F (164.0)**	Over-capacity side streets caused by anticipated development.
- Eastbound Left/Thru	B	-	**F (934.3)**	-	
- Westbound Thru/Right	C	-	**F (170.8)**	-	
- Westbound Left/Thru	-	**E (35.5)**	-	**F (*)**	
- Northbound Left Thru	A	-	A	-	
- Southbound Left/Thru	-	A	-	A	
8 & 9. Fells Church / Gallitin Rd Crossover					
- Eastbound Right	-	**F (778.9)**	-	**F (563.0)**	Stop controlled side streets will continue to operate with unacceptable levels of service through 2025.
- Eastbound Left	C	-	**F (285.1)**	-	
- Westbound Left	-	**F (*)**	D	**F (*)**	
- Northbound Left/Thru	A	-	A	-	
- Southbound Left/Thru	-	A	-	A	

***BOLD** indicates an unacceptable level of service.* *(##.#) represents anticipated delay*
-- Time period not selected for analysis. *– LOS not available on non-delayed movement*
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TABLE 12: LEVEL OF SERVICE SUMMARY (CON'T)

INTERSECTION/ MOVEMENT	*EXISTING CONDITIONS*		*YEAR 2025 WITH ANTICIPATED DEVELOPMENT*		*DISCUSSION*
	AM	*PM*	*AM*	*PM*	
10. Willowbrook Rd / Fellsburg Rd					
- Eastbound Left/Thru/Right	--	D	--	**E (73.9)**	Over-capacity westbound approach caused by anticipated development.
- Westbound Left/Thru/Right	--	D	--	D	
- Northbound Left	--	B	--	C	
- Northbound Thru/Right	--	D	--	D	
- Southbound Left	--	C	--	D	
- Southbound Thru/Right	--	C	--	D	
- Overall	--	D	--	D	
26. PA 201 Ramps					
- Eastbound Left	--	B	--	B	Acceptable operation through 2025
- Eastbound Right	--	B	--	C	
- Northbound Left	--	A	--	A	
- Northbound Thru	--	D	--	D	
- Southbound Thru	--	B	--	B	
- Southbound Right	--	A	--	A	
- Overall	--	C	--	C	
29. Vernon Dr (SR 3025)					
- Westbound Left/Right	**F (101.5)**	**F (694.1)**	**F (604.0)**	**F (*)**	Stop controlled side street will continue to operate with unacceptable levels of service through 2025.
- Southbound Left	B	C	C	**F (62.6)**	
30. McKenery Dr / Business driveway					
- Eastbound Left/Thru/Right	**F (183.7)**	**F (97.2)**	**F (460.0)**	**F (*)**	Over-capacity side streets caused by anticipated development.
- Westbound Left/Thru/Right	**F (257.6)**	**F (128.8)**	**F (*)**	**F (*)**	
- Northbound Left	B	B	C	C	
- Southbound Left	C	B	D	C	

***BOLD** indicates an unacceptable level of service.*
-- Time period not selected for analysis.
** indicates delay to high to calculate.*
(##.#) represents anticipated delay
– LOS not available on non-delayed movement

TABLE 12: LEVEL OF SERVICE SUMMARY (CON'T)

INTERSECTION/ MOVEMENT	*EXISTING CONDITIONS*		*YEAR 2025 WITH ANTICIPATED DEVELOPMENT*		*DISCUSSION*
	AM	*PM*	*AM*	*PM*	
31. McKenery Dr / Snyder Ln					
- Eastbound Left/Thru/Right	B	C	**F (397.9)**	**F (409.0)**	Stop controlled side street will operate with unacceptable levels of service through 2025.
- Westbound Left/Thru/Right	C	**F (70.3)**	**F (171.2)**	**F (617.0)**	
- Northbound Left	A	B	B	C	
- Southbound Left	A	A	B	B	
32. Concord Ln					
- Westbound Left/Right	C	C	**F (420.9)**	**F (384.0)**	Over-capacity side streets caused by anticipated development.
- Southbound Left	B	B	C	C	
33. Concord Ln / Pfile					
- Eastbound Left/Thru/Right	D	D	C	C	Over-capacity side streets caused by anticipated development.
- Westbound Left/Thru/Right	D	D	D	**E(71.7)**	
- Northbound Left	A	B	C	D	
- Northbound Thru/Right	C	C	D	D	
- Southbound Left	A	A	C	C	
- Southbound Thru/Right	C	C	D	D	
- Overall	C	C	D	D	
35. Interstate 70 E On Ramp / Finley Rd					
- Eastbound Left/Right	**E (66.0)**	**E (63.9)**	C	D	Will require traffic signal timing revisions to mitigate existing deficiency and to maintain acceptable operation through 2025.
- Northbound Left	B	C	C	D	
- Northbound Thru	B	B	C	C	
- Southbound Thru/Right	D	D	C	D	
- Overall	C	D	C	D	

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TABLE 12: LEVEL OF SERVICE SUMMARY (CON'T)

INTERSECTION/ MOVEMENT	*EXISTING CONDITIONS*		*YEAR 2025 WITH ANTICIPATED DEVELOPMENT*		*DISCUSSION*
	AM	*PM*	*AM*	*PM*	
36. Route 981 (SR 0981)					
- Westbound Left/Right	**E (62.9)**	**E (61.8)**	C	D	Will require traffic signal timing revisions to mitigate existing deficiency and to maintain acceptable operation through 2025.
- Northbound Thru/Right	D	D	B	D	
- Southbound Left	B	B	B	D	
- Southbound Thru	B	B	B	D	
- Overall	C	C	B	D	
40. Darr Rd / Todd Farm Rd					
- Eastbound Left/Thru/Right	C	C	D	**F (207.7)**	Over-capacity side streets caused by anticipated development.
- Westbound Left/Thru/Right	B	C	C	D	
- Northbound Left/Thru	A	A	A	B	
- Southbound Left/Thru	A	A	A	B	
42. Harmony Church Rd (SR 4048)					
- Eastbound Left/Right	B	C	C	**F (57.3)**	Over-capacity side streets caused by anticipated development.
- Northbound Left/Thru	A	A	A	B	
43. First Christian (Church) Rd					
- Westbound Left/Right	B	B	C	C	Acceptable operation through 2025
- Southbound Left/Thru	A	A	A	A	
44. Wick Haven Hollow Rd					
- Westbound Left/Right	B	B	C	C	Acceptable operation through 2025
- Southbound Left/Thru	A	A	A	A	

***BOLD** indicates an unacceptable level of service.* *(##.#) represents anticipated delay*
-- Time period not selected for analysis. *– LOS not available on non-delayed movement*
** indicates delay to high to calculate.*

TABLE 12: LEVEL OF SERVICE SUMMARY (CON'T)

INTERSECTION/ MOVEMENT	*EXISTING CONDITIONS*		*YEAR 2025 WITH ANTICIPATED DEVELOPMENT*		*DISCUSSION*
	AM	*PM*	*AM*	*PM*	
46. Wick Haven Rd					
- Westbound Left/Right	C	C	C	C	Acceptable operation through 2025
- Southbound Left/Thru	A	A	A	A	
47. River Rd					
- Westbound Left/Right	B	B	**F (68.0)**	**F (231.6)**	Over-capacity side streets caused by anticipated development.
- Southbound Left/Thru	B	B	C	B	
51. Rehoboth Church Rd (SR 4046)					
- Eastbound Left/Thru/Right	A	B	C	**F (85.5)**	Stop controlled side street currently operate with unacceptable levels of service that will continue through 2025.
- Westbound Left/Thru/Right	C	**E (43.6)**	C	**F (67.2)**	
- Northbound Left/Thru	A	B	A	B	
- Southbound Left/Thru	B	A	B	A	
54. Main St / Tony Row Rd (SR 4036)					
- Eastbound Left/Thru/Right	--	D	--	D	Acceptable operation through 2025
- Westbound Left/Thru/Right	--	D	--	D	
- Northbound Left	--	A	--	A	
- Northbound Thru/Right	--	C	--	C	
- Southbound Left	--	A	--	A	
- Southbound Thru/Right	--	C	--	C	
- Overall	--	C	--	C	

***BOLD** indicates an unacceptable level of service.* *(##.#) represents anticipated delay*
-- Time period not selected for analysis. *– LOS not available on non-delayed movement*
** indicates delay to high to calculate.*

Capacity Improvement Identification

Signalized and unsignalized intersections that experience unacceptable levels of service E or F (LOS E or LOS F) were examined to determine the necessary capacity improvements to allow the intersection to operate at acceptable levels of service (LOS D or better) through 2025. Many of the descriptions mention periodic monitoring of traffic signal timings for intersection optimization. Upgrades or replacement of existing signal controllers and equipment may also be needed for full implementation of the improvements to be realized. General maintenance of controllers and equipment must also be done on a regular basis or as problems occur. Traffic signal volume warrants are located in the Technical Appendix. A brief discussion of each unacceptable intersection is as follows:

Weigles Hill Road / Giant Eagle Driveway – In year 2025 with the addition of traffic from anticipated developments, the intersection can operate an acceptable level of service. However, this will require traffic signal timing revisions as the traffic volumes increase. This intersection should be monitored and the traffic signal timings should be optimized as needed to maintain acceptable operation. Signal enhancements should be made and monitored to reduce accidents.

Hutchinson Road (SR 2011) / Round Hill Road – During existing conditions, the east and westbound stop controlled approaches operate with failing level of service (LOS F). This deficiency is caused not by high volumes on the side street, but by insufficient gaps in traffic on Route 51. This problem will continue and worsen as anticipated developments add traffic to the side streets and Route 51. The intersection is not anticipated to exceed the volume thresholds for the installation of a traffic signal and no other feasible operation will allow the intersection to operate with acceptable levels of service. This intersection should be monitored and if vehicular crash rates increase, prohibition of side street turning maneuvers may be necessary. Prohibition of left turns at the intersection of Round Hill and Hutchinson Roads can be accommodated through adjacent intersections or through the implementation of U-turn pockets in the existing grass median or jug handle type designs.

PA Route 48 / Paydays Drive – The westbound approach of Route 48 operates with a failing level of service (LOS F) with the addition of future development traffic. Signal timing optimization is unable to mitigate deficiencies anticipated due to future traffic demand and additional capacity (i.e. additional turn lanes) will be needed. With the addition of an exclusive westbound left turn lane on Route 48, the unacceptable level of service can be mitigated. To maintain proper lane alignment across the intersection, some widening may also be needed on Paydays Drive. This intersection should be monitored as additional developments are constructed to determine the exact timing for the installation of this additional lane.

Airport Road – During existing conditions, the westbound approach operates at level of service F (LOS F). With additional traffic through 2025, the delay on this stop controlled approach increases. A signal is not currently warranted, but is anticipated to be warranted with additional development in the vicinity of the airport. Installation of a traffic signal will mitigate the existing and future intersection deficiency. As developments in the vicinity of the airport continue, the intersection should be monitored to determine exactly when a traffic signal is warranted.

Webster Hollow Road / Crossover – Webster Hollow Road operates with an acceptable LOS B with existing traffic conditions. However, with traffic anticipated in 2025, the stop controlled eastbound and westbound approaches will degrade and operate at a failing level of service (LOS F). A traffic signal is anticipated to be warranted with additional development traffic in the vicinity of this intersection. The installation of a traffic signal, when warranted, will mitigate the future deficiency.

Crossover / Salem Church Road – Salem Church Road operates with an unacceptable LOS E with existing traffic conditions. That level of service degrades to a level of service F (LOS F) with projected future traffic. A traffic signal will satisfy a peak hour warrant during the AM peak hour with traffic from anticipated future developments. Installation of a traffic signal will mitigate the existing and future deficiencies and allow all intersection approaches to operate at LOS D or better. The traffic volumes traveling through this intersection should be monitored as additional developments occur near the intersection to determine when a traffic signal is warranted and should be installed.

Fells Church Road / Crossover – Similar to Salem Church Road, Fells Church Road operates with an unacceptable level of service based on existing traffic conditions and will experience more delay with future increases in traffic. A traffic signal is not currently warranted, however will be warranted as development in the area increases traffic using the intersection. Similar to Salem Church Road, traffic volumes should be monitored and a traffic signal should be installed when warranted.

Crossover / Gallitin Road – Gallitin Road operates with an acceptable LOS C under existing conditions and will degrade to an unacceptable LOS F with future development traffic. A traffic signal warrant will be satisfied during the AM peak hour of 2025. Installation of a traffic signal will mitigate the future deficient operation of this intersection.

*** While the intersections of Webster Hollow Road, Salem Church Road, Fells Church Road, and Gallitin Road all satisfy the warrants for installation of a traffic signal, a detailed determination of the practicality and efficiency of operating these four (4) traffic signals in the divided section of Route 51 will be required. Signalizing select intersections, while restricting turning maneuvers at others, may provide more efficient vehicular access to Route 51. A study focusing specifically on the divided section of Route 51 will likely be needed to determine the most advantageous method of operating this segment of Route 51.***

Vernon Drive (SR 3025) – Under existing conditions, Vernon Drive's westbound approach operates with a failing level of service (LOS F). Incorporating 20 years of development traffic will further deteriorate the operation of the intersection. A traffic signal is currently warranted during the PM peak hour. Installation of a traffic signal will provide acceptable operation for the existing conditions and the addition of a westbound left turn lane will provide for additional development traffic anticipated on Vernon Drive.

McKenery Drive – The existing side street stop controlled approach currently fails (LOS F) during the AM and PM peak hours. This condition is not caused by a high volume of traffic on the side street, but by the limited number of gaps available in the traffic stream on Route 51. Because of the low side street traffic volumes, a traffic signal is not anticipated to be warranted, even with 2025 traffic volumes. Similar to Round Hill Road, crashes at the intersection should be monitored and if a significant crash history develops, prohibition of turning movements should be considered.

McKenery Drive / Snyder Lane – The westbound Snyder Lane approach at this intersection experiences an unacceptable LOS F during existing peak hour traffic conditions. With additional growth in traffic, the eastbound McKenery Drive approach will also operate at LOS F. Based upon the anticipated development patterns in the study area, sufficient traffic volumes will most likely be present prior to 2025 for warranting a traffic signal. With new developments in the vicinity, traffic volumes should be monitored to determine when a traffic signal should be implemented. Installation of a traffic signal will mitigate all existing and anticipated future deficiencies.

Concord Lane (Unsignalized) – Under existing conditions, the westbound stop controlled approach operates with an acceptable LOS C. By 2025, traffic volume increases will cause the stopped approach to degrade to LOS F. A traffic signal is warranted by 2025 if a heavy right turn volume is included in the analysis. This traffic signal will be installed by the development

currently under construction. When this traffic signal is installed, the intersection will operate with acceptable levels of service. This intersection should be monitored and traffic signal timings should be updated as necessary.

Concord Lane / Pfile Lane – This intersection currently operates with acceptable levels of service (LOS D or better). With additional development traffic, the westbound approach (Concord Lane) will degrade to LOS E by 2025. Widening the westbound approach (Concord Lane) to provide an exclusive left turn lane will provide acceptable operation through 2025, assuming the traffic signal timing is also optimized. Simple timing optimization will likely be able to provide adequate capacity with most of the anticipated development in the next 20 years.

Finley Road – This eastbound approach at the intersection currently operates with and unacceptable LOS E. Optimization of the traffic signal timing can mitigate this existing deficiency and can provide for the anticipated future demands of this intersection

Route 981 – Similar to Finley Road, the side street operates with an unacceptable LOS E with existing traffic conditions. Traffic signal timing optimization can also mitigate this existing deficiency and provide for the future traffic demands at the intersection through 2025.

Darr Road / Todd Farm Road – The side street stop controlled approaches currently operate with acceptable levels of service. With additional development traffic, the eastbound Darr Road approach will degrade to level of service F. A traffic signal is not anticipated to be warranted at this intersection and no additional lanes will mitigate the future deficiency. This intersection is included in the *Route 51 Needs Study* and specific recommendations to improve the safety of the intersection may be recommended. If recommendations of the *Route 51 Needs Study* are not implemented, an investigation into providing left turn lanes on Route 51 and the improvement of intersection sight distance should be performed.

Harmony Church Road – The Harmony Church Road intersection is similar to the intersection of Darr Road/ Todd Farm Road in that the intersection currently operates with acceptable levels of service, but will degrade with additional development traffic. The intersection is not anticipated to satisfy warrants for the installation of a traffic signal and other geometric improvements will not likely mitigate the future deficiencies. This intersection is also included in the *Route 51 Needs Study* and specific improvements may be recommended to improve the safety of this intersection. As there are no feasible capacity improvements, the intersection should be monitored and if vehicular crash rates increase, prohibition of side street turning maneuvers should be considered. Prohibition of left turns off Harmony Church Road cannot directly be accommodated through adjacent intersections and may require a U-turn or jug handle type design to provide for northbound left turning traffic.

River Road – River Road is similar to Darr, Todd Farm, and Harmony Church Roads in operation and is also included in the *Route 51 Needs Study*. The intersection currently operates with acceptable levels of service (LOS D or better) and will degrade with the increase in traffic along Route 51. Similar to Harmony Church Road, there is no feasible mitigation as the low volume side street does not warrant a traffic signal. The crash rates at the intersection should be monitored and consideration for turn prohibitions should be investigated. No direct connection to nearby roadways will provide for left turns, so U-turn or a jug handle type design may be necessary.

Rehoboth Church Road (SR 4046) – With existing traffic volumes, the westbound approach operates with an unacceptable LOS E. With 20 years of anticipated development, both stop controlled side streets will operate with failing levels of service (LOS F). A traffic signal is not currently warranted, however will be warranted with future traffic volumes. The installation of a traffic signal will mitigate all existing and future deficiencies. Once a signal is installed, timing and equipment should be monitored and enhanced to reduce the number of accidents at the intersection.

RECOMMENDATIONS AND CONCLUSIONS

The following section includes recommended strategies and improvements from both engineering and land use planning standpoints. While each standpoint is unique, some aspects are inter-related and involve both engineering and planning strategies. These inter-related topics are discussed separately. All recommended items for the Route 51 corridor are discussed below.

Inter-related Recommendations

Access Management along the Route 51 Corridor. Access management can have both traffic engineering and land use planning components. The land use planning component is intended to manage the location and type of future access points ("curb cuts") within the planning area before development occurs. This can be done primarily through additions to the Subdivision and Land Development Ordinance and the Zoning Ordinance. Access management can also be assisted through administrative policies to foster greater coordination between PennDOT and the municipality. From a local land use standpoint, a community can treat access management in either planning ordinance. If the SALDO is to be the place where the access management regulations are to be integrated, regulations should be tied to major arterial road standards. Zoning and overlay districts have been the normal preferred means of implementation. Since only Perry Township has ever used overlay zones, some definition of the concept may help. A standard definition is as follows. "Overlay Zone: A set of zoning requirements that is superimposed upon a base zone. Overlay zones are generally used when a particular area requires special protection (as in a historic preservation district) or has a special problem (such as steep slopes, flooding or earthquake faults). Development of land subject to overlay zoning requires compliance with the regulations of both the base and overlay zones". In the case of a corridor, the overlay zone may address how new curb cuts or development is oriented in relationship to the road, without regard to the underlying zone. Thus, whether residential or commercial, new development along the corridor would have special standards for setbacks, curb cuts, and other access management tools.

Whether in a SALDO or Zoning Ordinance, access management typically accomplishes the following:

- Reserving area for future turn lanes through setbacks
- Requiring placement of new curb cuts in coordination with ones across the road.
- Setting a standard for spacing of curb cuts, and/or traffic signals
- Requiring corner lots to access from the road with the least amount of traffic
- Providing driveway design standards
- Encouraging or requiring shared access

It must be noted that while PennDOT issues highway occupancy permits, this does not prevent the municipality from exceeding this minimum standard. PennDOT does not regulate the form of development or the long-term coordination of access, only the municipality can do this. Some

Model Ordinances are attached in Appendix D. PennDOT has also prepared a publication, *Access Management Model Ordinances for Pennsylvania Municipalities Handbook*. This publication provides a useful overview of techniques and is available as a free web publication in PDF format.

One unique access management concern in the Route 51 corridor is the divided section of highway in Rostraver Township. This is an unusual situation where there is vacant developable land between the northbound and southbound lanes. The Township should either limit uses or require special regulations for directional curbing to prevent traffic from re-entering in the wrong direction. Poor design or development of these parcels could lead to a significant safety hazard.

The three communities should not adopt any model ordinances without consideration of unique local circumstances. In this case, they may be well served to create a simpler standard for low volume users, such as small businesses, with a more comprehensive standard for large scale development. The topography of the corridor provides for a few small developable parcels and many that would require significant cutting and filling.

From an engineering standpoint, access management is more of a planning study. An access management plan determines where it logically makes sense to allow traffic signals, full access drives/streets, high volume driveways, and where to limit access driveways. This allows the corridor to be developed in a planned manner to promote proper vehicular progression along the roadway. This prevents the situation where a development occurs and installs a signalized access within its frontage even if this location is not beneficial to all other users of the road.

Impact Fees. On December 19, 1990, Pennsylvania Act 209 was effectively signed into law. Under Act 209, municipalities are able to assess impact fees to new development within the municipality. Impact fees are clearly defined in Act 209 as "a fee imposed by a municipality against new development to generate revenue for funding the cost of transportation capital improvements necessitated by and attributable to new development." In order to institute the act, a four component Transportation Impact Fee Program must be developed and implemented by the municipality. The Transportation Impact Fee Program consists of a Land Use Assumptions Report, a Roadway Sufficiency Analysis, a Capital Improvement Plan and an Adoption Ordinance. The process is directed by a Transportation Impact Fee Advisory Committee, which has been established by the Board of Supervisors.

The Act 209 legislation requires the establishment of Transportation Service Areas. These areas are limited to a maximum size of seven (7) square miles. Additionally, the impact fees collected from developments in specific transportation service areas may only be applied to mitigations within that transportation service area. This process has the benefit that it can be applied to any roadway within the Transportation Service Area, either locally or state owned.

Engineering Strategies and Recommendations

Intersection Geometrics and Control. Along the Route 51 corridor, several intersections will benefit from geometric improvements to increase their capacity, reduce their delay, and maintain safety. One type of improvement is the addition of exclusive left turn lanes. A left turn lane for vehicles removes stopped vehicles from the through traffic movement; it substantially reduces crash rates and increases capacity. Occasionally, prohibiting turns may be necessary when additional lanes do not mitigate the deficiencies. Prohibiting a turning movement forces all vehicles to take a specified path through the intersection. This will require drivers to either divert to other roadways that connect to their destinations or they will need a method of safely making U-turns (either through U-turn pockets or jug-handles). In addition to adding pavement, many intersections along the Route 51 corridor will benefit from the installation of a traffic signal. In essence, a traffic signal creates an artificial gap in traffic. While this is beneficial to allow the side street to exit, it delays the through traffic on the main roadway. Intersections such as Airport Road, Webster Hollow Road, Fells Church Road, Vernon Drive, McKenery Drive / Snyder Lane, Concord Lane, and Rehoboth Church Road are intersections that could potentially benefit from the installation of a traffic signal once warranted. It is important to realize that signalized intersections must be periodically retimed to optimize their flow capacity.

Required Traffic Impact Studies. Currently only the Perry Township (Fayette County) ordinance has requirements regarding when to perform a traffic study. As additional developments occur along the Route 51 corridor, traffic impact studies should be performed to determine the impact of specific developments on adjacent intersections and roadways and to provide recommendations regarding the proper management of traffic flow at the development driveway.

Traffic Signal Optimization. One of the simplest methods of improving intersection operation and reducing delay is regular traffic signal optimization. This relatively low cost improvement can provide sizable savings in reduced user delay. Traffic signals should be optimized every 2-3 years to provide the most benefit to the traveling public. Existing traffic signal equipment may need to be modified or replaced in order to provide optimal traffic signal performance.

Intersection Safety Enhancements. Existing traffic signals in the three study area communities should be investigated for the ability to incorporate low cost safety enhancements. These enhancements include improved signal visibility by adding auxiliary signal indications, installation of brighter LED bulbs, improved roadway lighting, upgraded signing, etc.

Traffic Signal Interconnection. As more and more traffic signals are constructed along the Route 51 corridor, consideration should be given to interconnecting the traffic signals. Interconnected traffic signals provide for progression between intersections and provide a sizable reduction in the delay vehicles experience traveling the corridor when compared to investment.

Combining interconnection with access management provides a method to efficiently plan for and progress traffic along the Route 51 corridor.

Land Use Strategies and Recommendations

Integrating Smart Growth into the Route 51 Corridor. Citizens and local leaders within the study corridor generally support smart growth initiatives. The one exception to this widespread support being Perry Township, where citizens have a greater concern about current highway issues than land use policies.

Just because citizens generally support smart growth does not necessarily mean they would support every type of smart growth tool. Smart growth tools must reflect the anticipated changes in the region so that the tool fits the issue.

The history of recent growth in the region has been one where out-migration from older urban areas (cities like Monessen, McKeesport or Pittsburgh) has fueled in-migration to the corridor townships. While the rate of this trend may vary, there is no reason to expect it to change within the planning period. If growth and change are inevitable, then the task of the community is to manage growth in a fashion that does not compromise the attractive characteristics of the community.

One aspect of the corridor municipalities that should never change is their attractive appearance. This appearance includes a mixture of farm fields and forested woodlots on the landscape. A very basic principle of smart growth is the integration of natural features into planning for development. Some private sector developers are beginning to learn a number of financial advantages to this approach. For example, homes on wooded lots typically bring significant price premium over cleared lots. Recent research by the National Association of Realtors and the National Association of Homebuilders revealed a number of pertinent trends. By a significant margin, national buyers are more concerned that "houses are spread out" than with having "bigger lots". This reflects a desire to see natural open space rather than acres of house lots. The choice for "quality of neighborhoods" was more important for a majority of homebuyers than traditional decision factors such as price and features of a home. When recent homebuyers were asked to rate the importance of amenities in making their choices, their top five priorities were:

First Priority - Highway access
Second Priority - Walking/jogging/bike trails
Third Priority - Sidewalks on both sides
Fourth Priority - Parkland
Fifth Priority – Playgrounds

How can local communities plan for such amenities as part of the land development process and create high quality communities in the corridor? There are simple tools, such as steep slope

protection in local ordinances. Some examples require a higher level of design for steep slope developments; others limit the density of dwelling units in steep slope areas. Similar approaches can be used for floodplains and wetland areas, though these are a less widespread environmental limitation than steep slopes.

Generally, much of modern subdivision design is done by software programs, which tend to maximize the number of minimum size lots and configure the lots to require the least amount of new road. Open space, scenic views, and existing ground cover are left out of this equation unless the developer is savvy enough to require his design professionals to include it. Including information about these features is important to sound land use planning. It can reduce the footprint of the overall development and provide buffer areas so that neighbors are less oppositional. It can provide for some of the amenities that create a high-value neighborhood so that lots bring more money for the developer. Perhaps most important for the developer, flexible local regulations can allow him to realize the same number of salable lots and sometimes less new road than standard regulations.

There are several means to integrate various forms of smart growth provisions into an ordinance. Either the subdivision or the zoning ordinance can be used (or both, in certain approaches). Some communities provide incentives for smart growth versus conventional subdivision whereas others provide disincentives. Others have adopted an approach that makes some type of open space subdivision the main form of development. From an ordinance standpoint, implementation can be done through Planned Residential Development (PRD) as permitted by the Pennsylvania Municipalities Planning Code. Planned residential development has been used by some creative developers to mix different types of housing in a single development. However, few western PA communities have utilized it to integrate better design standards. The key to success may be in using the initial rezoning or conditional use process to identify the type, location, and form of open space. This should be planned as the focal point of the new development. A model PRD conditional use standard is attached in Appendix D. Like PRDs, some communities are using special purpose zoning to encourage good development. Rostraver has started this by preparing a flexible business park district. This is a good starting point towards a method for handling large scale development in the corridor.

In general, adopted local subdivision ordinances are not consistent with current practice. There are presently two models under local consideration. The first is the Twin Rivers COG ordinance and the second is the new Fayette County ordinance. The latter is particularly good for its traffic study standards.

Finally, consideration should be given to requiring better street interconnectivity between township roads and the Route 51 corridor. The easiest way to accomplish this is by limiting cul-de-sacs in local ordinances. Dead end streets can be limited to only serving a maximum number of lots (typically 24-40) or a maximum traffic impact (240-400 average vehicle trips per day).

Promoting Greater Intergovernmental Cooperation in the Route 51 Corridor. Within the corridor communities, citizens are somewhat skeptical of the value of intergovernmental cooperation. While a majority of total town hall meeting participants supported greater intergovernmental cooperation towards solving problems, a majority in Perry and 14 of 30 votes in Rostraver were against this tool. The greatest majority in favor was in Elizabeth Township which was likely due to their participation in the Twin Rivers Council of Governments. The Twin Rivers COG has been recognized as one of the most successful models for practical intergovernmental cooperation in Pennsylvania.

An essential part of further strategies in this area must be continued education of citizens and local property owners. The essential thrust of the educational effort must be that the policies of one community will affect the transportation efficiency of another. Certain activities cannot be effective unless planning includes more than one of the corridor communities.

The greatest intergovernmental issue facing the corridor communities is the non-participation of Forward Township. The Route 51 Corridor does not exactly follow the border between Elizabeth and Forward, but it does delineate a long section of it. Even where it deviates, the road frontage generally lies within a very short distance of the township line. In some cases, property development will be impossible without approval of both jurisdictions.

While Forward Township chose not to participate in this study, it has participated in a joint comprehensive plan with Elizabeth Township and the other Twin River COG municipalities. It is also important to note that the infrastructure service areas to the corridor originate in Elizabeth Township and extensions will likely come from there as well.

Presently, the Twin Rivers COG is preparing an intergovernmental Action Plan and model ordinances for the COG communities. Among the materials in the Action Plan is a proposed intergovernmental agreement as authorized by Section 1104 of the PA Municipalities Planning Code. This article states in part that:

> ***(a) In order to implement multimunicipal comprehensive plans, under section 1103 counties and municipalities shall have authority to enter into intergovernmental cooperative agreements.***
>
> ***Cooperative implementation agreements between a county and one or more municipalities shall:***
>
> ***Establish the process that the participating municipalities will use to achieve general consistency between the county or multimunicipal comprehensive plan and zoning ordinances, subdivision and land development, and capital improvement plans within participating municipalities, including adoption of conforming ordinances by participating municipalities***

within two years and a mechanism for resolving disputes over the interpretation of the multimunicipal comprehensive plan and the consistency of implementing plans and ordinances.

Establish a process for review and approval of developments of regional significance and impact that are proposed within any participating municipality. Subdivision and land development approval powers under this act shall only be exercised by the municipality in which the property where the approval is sought. Under no circumstances shall a subdivision or land development applicant be required to undergo more than one approval process.

Establish the role and responsibilities of participating municipalities with respect to implementation of the plan, including the provision of public infrastructure services within participating municipalities as described in subsection (d), the provision of affordable housing, and purchase of real property, including rights-of-way and easements.

Cooperative implementation agreements may designate growth areas, future growth areas and rural resource areas within the plan. The agreement shall also provide a process for amending the multimunicipal comprehensive plan and redefining the designated growth area, future growth area, and rural resource area within the plan.

This agreement will provide a vehicle for Elizabeth and Forward Townships to agree upon the circumstances that Elizabeth Township would extend infrastructure and how costs might be equitably shared. It also can provide for establishing a standard for new developments, which will become "Developments of Regional Impact and Significance" (DRIS in planner jargon). These are simply developments of such size or type of land use that they will affect more than one municipality. In some intergovernmental agreements the standard for a DRIS is the type of land use, such as a sanitary landfill or major regional mall. In other agreements, the type of the land use is less important than the size of the impacts. For example, if the proposed development would increase average daily traffic by more than 10 percent, it might be considered a DRIS.

If communities agree to establish a standard for DRIS in their cooperative agreement, all affected parties can comment on it during the approval process. Formal approval does remain with the host municipality but they could then make the comment a part of their approval. For example, if the use was a conditional use or special exception, suggestions of neighboring municipalities could be added to the approval as reasonable additional conditions as permitted under section 603(2) and 912.1 of the Planning Code.

It is essential to sound growth and traffic management in the Route 51 corridor that Elizabeth and Forward Townships enter into such an agreement. At a minimum this agreement should:

- Establish the conditions of infrastructure extension.
- Establish a level for Developments of Regional Impact and Significance based upon traffic (a suggested standard may be 300 vehicle trips per day per new Fayette County standards).
- Both communities should then amend their land use ordinances to clearly allow the imposition of reasonable additional conditions in such cases within agreed upon geographic parameters.
- Each community should finally agree to a coordinated land use approach in the corridor by either adopting an overlay zone or amending their Subdivision and Land Development Ordinances. This is further discussed under access management tools.

Beyond these essentials, the communities can go further. A discussion of Municipal Capital Improvements through the imposition of impact fees is discussed under its section in the tools. However, section 508-A of the Planning Code also explicitly permits enactment of a Joint Municipal Impact Fee Ordinance. If impact fees are pursued as a part of the long term strategy, the involvement of Rostraver, Elizabeth, and Forward Townships would probably create a greater economy of scale in establishing the ordinance and a more uniform approach to development (without any loss of local autonomy).

There is also a unique long term opportunity to very effectively manage transportation through the establishment of a Specific Plan. The Specific Plan is a new planning tool authorized by section 1106 of the Planning Code only for those communities that have adopted both multi-municipal comprehensive plans and intergovernmental agreements. The code defines a specific plan as "a detailed plan for nonresidential development of an area covered by a municipal or multi-municipal comprehensive plan which when approved and adopted by the participating municipalities through ordinances and agreements supersedes all other applications." The specific plan basically allows the municipality to file much of the preliminary plan information as an ordinance. This moves land management from a passive activity where the municipality waits to see what developers might do on a particular parcel to an active activity where the initial concepts are planned first. Developers gain the advantage of knowing what exactly is expected and gaining quick approval. The standards for a Specific Plan are wide reaching:

> ***Participating municipalities shall have authority to adopt a specific plan for the systematic implementation of a county or multimunicipal comprehensive plan for any nonresidential part of the area covered by the plan. Such specific plan shall include a text and a diagram or diagrams and implementing ordinances which specify all of the following in detail:***

The distribution, location, extent of area and standards for land uses and facilities, including design of sewage, water, drainage and other essential facilities needed to support the land uses.

The location, classification and design of all transportation facilities, including, but not limited to, streets and roads needed to serve the land uses described in the specific plan.

Standards for population density, land coverage, building intensity and supporting services, including utilities.

Standards for the preservation, conservation, development and use of natural resources, including the protection of significant open spaces, resource lands, and agricultural lands within or adjacent to the area covered by the specific plan.

A program of implementation including regulations, financing of the capital improvements and provisions for repealing or amending the specific plan. Regulations may include zoning, storm water, subdivision, and land development, highway access and any other provisions for which municipalities are authorized by law to enact. The regulations may be amended into the county or municipal ordinances or adopted as separate ordinances. If enacted as separate ordinances for the area covered by the specific plan, the ordinances shall repeal and replace any county or municipal ordinances in effect within the area covered by the specific plan and ordinances shall conform to the provisions of the specific plan.

Quite simply, a specific plan would allow the municipalities to locate new curb cuts exactly where they wish them to be. Within the Route 51 corridor communities there are two options to prepare a specific plan. The first option would be to prepare the specific plan documents and ordinances now. The second option might be to link with developers of nonresidential DRIS developments to make a specific plan the condition of a re-zoning and prepare it cooperatively.

Finally, it might be stated that while the most essential short-term cooperation must be between Elizabeth and Forward Townships, there are advantages to participation by Rostraver and Perry as well. The standards for multimunicipal plans are such that co-adoption of each others plans might suffice. Counties (such as Fayette) may also be a component to intergovernmental agreements under article 11 of the Planning Code.

Action Program

The future transportation and land use analysis resulted in the formation of specific action strategies for the project area. Table 13 provides a summary for the specific *Strategies for Action* which outlines a program for implementation. A detailed matrix is provided which outlines categories for the strategy, responsible party, estimated cost, and potential funding sources.

The strategies have been organized into two separate categories including Engineering and Land Use. The strategies are organized in order of priority to facilitate implementation. It should be noted that the cost estimates contained herein are wide-ranging and should serve only as a starting point for project evaluation. The costs are limited to study costs where indicated. Detailed costs will need to be developed as a particular project or strategy is selected for implementation.

The potential funding sources identified offer sources for providing all or partial financing for an action or project. These are not exhaustive and other possible sources should continually be sought. It will be important for the responsible party to be up-to-date on potential funding sources.

The ranking of the strategies matrix was performed by the Project Advisory Committee. The attendees were asked to rank each priority in the strategies for action according to the following letter grades:

A. Top Priority Project
B. High Priority Project
C. Priority Project
D. "Ho-Hum" Project
F. Bad Project

The individual survey and ranking results are included in Appendix C. The average of those rankings is included in the last column of the Strategies for Action table.

TABLE 13 – STRATEGIES FOR ACTION ROUTE 51 LAND USE AND TRANSPORTATION INITIATIVE STUDY			
STRATEGIES FOR ACTION	**RESPONSIBLE PARTY**	**ESTIMATED COST/ POTENTIAL FUNDING SOURCES**	**COMMITTEE RANKING**
ENGINEERING			
As a means of assessing and ranking priorities, the Townships should appoint a Transportation Review Committee (comprised of municipal, county, and public interest group representatives) to be a continuation of the Advisory Committee for the Route 51 Land Use and Transportation Initiative. This Committee will be charged with analyzing and ranking the recommended improvements in order of importance and to work towards implementation of improvements when needed. This Committee should also focus on development of a 5-year implementation schedule to design and undertake several of the priority improvements each year.	Elizabeth Township Rostraver Township Perry Township	Cost dependent on project scope	B
Conduct engineering and design analysis of select geometric improvements. Determine adequate design as well as impact on adjacent roadways and intersections. - Hutchinson Road / Round Hill Road - Route 48 / Hutchinson Road - Airport Road - Webster Hollow Road / Crossover / Salem Church Road - Fells Church Road / Crossover / Gallitin Road - Vernon Drive - McKenery Drive - McKenery Drive / Snyder Lane - Concord Lane - Concord Lane / Pfile Lane - Darr / Todd Farm Road - Harmony Church Road - River Road - Rehoboth Church Road	Elizabeth Township Rostraver Township Perry Township	$15,000 - $100,000 per study. Design cost dependant upon level of improvement Transportation Improvement Program (TIP)	B

TABLE 13 – STRATEGIES FOR ACTION ROUTE 51 LAND USE AND TRANSPORTATION INITIATIVE STUDY			
STRATEGIES FOR ACTION	**RESPONSIBLE PARTY**	**ESTIMATED COST/ POTENTIAL FUNDING SOURCES**	**COMMITTEE RANKING**
Intersections to be analyzed for potential installation of traffic signals. - Airport Road - Webster Hollow / Crossover / Salem Church Road - Fells Church / Crossover / Gallitin Road - Vernon Drive - McKenery Drive / Snyder Lane - Concord Lane - Rehoboth Church Road	Elizabeth Township Rostraver Township Perry Township	$5,000-10,000 per study TIP or Municipal Funds	B
Investigation of potential safety enhancements outside of the *Route 51 Needs Study's* study area - Weigles Hill Road/Giant Eagle Driveway - Roberts Hollow Road	PennDOT Elizabeth Township	$5,000 - $25,000 per study TIP or Municipal funds	B
Investigate coordination of traffic signals on Route 51 through an interconnected signal system. The existing traffic signal equipment may need to be upgraded. (Most applicable as more traffic signals are installed on the corridor)	Elizabeth Township Rostraver Township PennDOT	$40,000-$50,000 study of corridor $1,000-$120,000 per intersection engineering, design and construction CDBG, TIP, Municipal Funds, PENNDOT	B
Develop way-finding signage along study corridor as part of or in coordination with existing Southwestern Pennsylvania Signing Trust regional system.	Elizabeth Township Rostraver Township Perry Township PennDOT	$50,000-$150,000 CDBG, TIP, County, Municipal, Private	C
Implement advanced street name signing and upgrade existing street name signing to current standards.	Elizabeth Township Rostraver Township Perry Township	$1,000 - $2,000 per intersection Municipal Funds	B

TABLE 13 – STRATEGIES FOR ACTION ROUTE 51 LAND USE AND TRANSPORTATION INITIATIVE STUDY			
STRATEGIES FOR ACTION	**RESPONSIBLE PARTY**	**ESTIMATED COST/ POTENTIAL FUNDING SOURCES**	**COMMITTEE RANKING**
Investigate continuous or partial roadway lighting. Strong consideration should be given to intersections with high volumes or crash histories.	Elizabeth Township Rostraver Township Perry Township PennDOT	$5,000 per intersection for feasibility/warrant study Municipal Funds PennDOT	B
Implement a Crash Inventory System to annually identify high crash locations. Can be detailed, such as a GIS database, or a simple map with markers for accident locations. Locations with more markers represent more crashes and require investigation.	Elizabeth Township Rostraver Township Perry Township	Minimal cost (map) - $20,000 (Database)	B
Develop an Access Management Plan to determine acceptable locations for traffic signals, high volume driveways, turn prohibitions, etc. to preserve the functionality of the Route 51 corridor.	Elizabeth Township Rostraver Township Perry Township PennDOT	$75,000 - $200,000 for study.	B
Implement the recommendations of the *Route 51 Needs Study*	PennDOT	To be determined	A
Develop and pass an ordinance outlining when a traffic impact study is required for proposed development. Use impact study to mitigate the impact of future growth on adjacent intersections and roadways. Include review fees and mitigation in ordinance as developer's responsibility.	Elizabeth Township Rostraver Township Perry Township	Minimal cost to draft ordinance	A

TABLE 13 – STRATEGIES FOR ACTION ROUTE 51 LAND USE AND TRANSPORTATION INITIATIVE STUDY			
STRATEGIES FOR ACTION	**RESPONSIBLE PARTY**	**ESTIMATED COST/ POTENTIAL FUNDING SOURCES**	**COMMITTEE RANKING**
LAND USE			
Carefully amend the Land Development Ordinance to create additional traffic design controls.	Elizabeth Township Rostraver Township Perry Township	Minimal	B
Develop a permanent inter-municipal committee to deal with corridor land use and transportation issues.	Elizabeth, Rostraver, and Perry Townships	Minimal – But committee must have a real task	B
Consider crafting an intergovernmental agreement to allow each municipality to review "developments of regional impact and significance."	Elizabeth Township Rostraver Township Perry Township	Minimal	B
ACCESS MANAGEMENT Overall access management for corridor 1. Simplified process for smaller developments (based on earthmoving or square feet of building) 2. More comprehensive approach for major development 3. Coordinate with PennDOT Highway Occupancy Permit process 4. Integrate into SALDO or as overlay zone Adopt special regulations for divided section of Route 51 (Rostraver Township only) 1. Prevent confusion by traffic exiting into wrong directional lane 2. Limit land use types 3. Require directional curbing which functions as on/off ramps with strong directional signage	Elizabeth Township Rostraver Township Perry Township	Minimal	A

TABLE 13 – STRATEGIES FOR ACTION
ROUTE 51 LAND USE AND TRANSPORTATION INITIATIVE STUDY

STRATEGIES FOR ACTION	RESPONSIBLE PARTY	ESTIMATED COST/ POTENTIAL FUNDING SOURCES	COMMITTEE RANKING
INTERGOVERNMENTAL COOPERATION Intergovernmental Agreement for Elizabeth and Forward. 1. Coordinate access on respective sides of Route 51 to directly face each other. 2. Limit curb cuts through new traffic overlay zone 3. Joint impact fee district. Initial possibility of using impact fee funds to correct acute angle intersections and geometry on township roads. Consideration of Rostraver Township to join in intergovernmental efforts 1. Co-adoption of existing comprehensive plans rather than a new multi-municipal comprehensive plan 2. Cooperative agreement with COG communities. 3. Inter-municipal impact fee ordinance for Rostraver. 4. Similar fair standards for corridor zoning among all communities	Elizabeth Township Rostraver Township Perry Township	Minimal for agreements. $120,000 - $175,000 for Impact Fee Program Municipal Funds	B
IMPACT FEES Investigate the use of impact fees as a means of determining and funding future transportation improvements.	Elizabeth Township Rostraver Township	$100,000 - $125,000 per Township	B

TABLE 13 – STRATEGIES FOR ACTION
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STRATEGIES FOR ACTION	RESPONSIBLE PARTY	ESTIMATED COST/ POTENTIAL FUNDING SOURCES	COMMITTEE RANKING
SMART GROWTH Create new PRD standards, and encourage the PRD as the development of choice. 1. Facilitate high quality mixed density housing developments 2. Developers gain unified approval and township gains quality control. 3. Plan for open space and scenic views, first. Create new model zoning for large scale development 1. Use Rostraver Business Park District as starting point Integrate steep slope standards into local ordinances. 1. Facilitate natural management of storm water. 2. Protect natural areas from intensive development 3. Drive more intense development into areas with less slope problems (and less road geometry problems) Limit cul-de-sacs (street interconnectivity) and set new sidewalk/trail standards. 1. Meeting the needs of changing market, avoiding congestion on township roads as growth occurs 2. Limit residential cul-de-sacs, not by length but by ADT (250-400) or number of lots (24-40)	Elizabeth Township Rostraver Township Perry Township	Minimal	B
Upgrade local subdivision and land development ordinances 1. Use traffic study standards from Perry Township/Fayette County ordinance 2. Overall upgrade from Twin Rivers COG model or Fayette County	Elizabeth Township Rostraver Township Perry Township	Minimal	B