

Somerset Small Urban Area Study

Summary of **Findings and Recommendations**

Prepared for:

Kentucky Transportation Cabinet

Prepared by:



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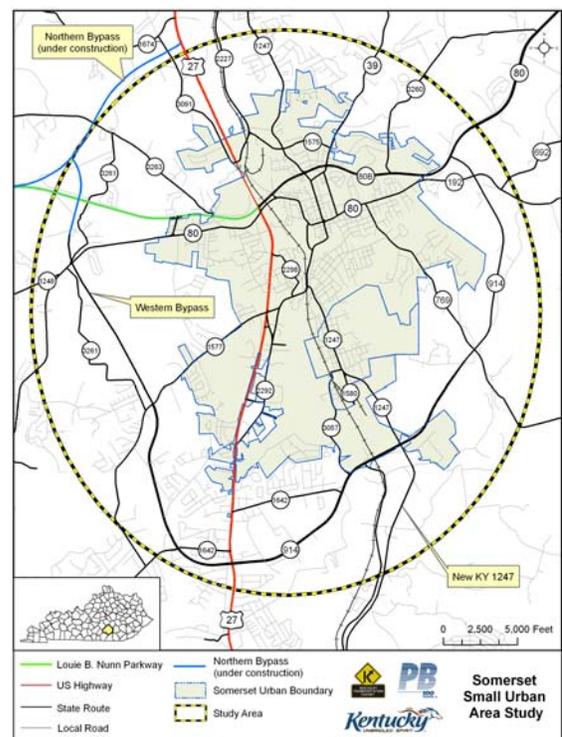
Executive Summary – Somerset SUA Study**Introduction and Study Area**

The Kentucky Transportation Cabinet (KYTC) identified the need to perform a small urban area (SUA) study for the City of Somerset, Kentucky and a portion of the surrounding unincorporated area of Pulaski County. The purpose of an SUA is to identify and examine transportation issues related to traffic safety, congestion, and operations in an urban area or city and its surrounding area, and to develop a list of projects to improve those conditions in the study area. The study area for the Somerset SUA is shown on **Figure ES 1** below and includes the City of Somerset and some of Pulaski County.

Existing Conditions

Existing highway characteristics and geometrics, traffic volumes, truck traffic, speed, levels of service (LOS), and crash numbers, rates and types were all evaluated as part of the existing conditions analysis. The key transportation issues identified from this analysis are summarized below:

- Major roadways in the study area, such as US 27 and KY 80B currently have high traffic volumes.
- Roads such as US 27, Louie B. Nunn Parkway, and KY 914 have high truck percentages.
- Sections of KY 80, KY 1247, and KY 39 currently operate at a LOS E or F.
- The majority of roadways in the study area have segments with a critical crash rate factor greater than one.
- Rear end crashes are the most common type of crash in the study area, especially on US 27.

Figure ES 1: Study Area Map

Both human and natural environment overviews were performed respectively as part of the existing conditions analysis. Aquatic resources such as rivers, creeks and floodplains, as well as natural wetlands exist in the study area. There is also the potential for karst topography. There are also several species of bats and mussels that are threatened, rare and/or endangered that occur in the study area. There are 25 locations listed on the National Register of Historic Places in Somerset. Because the majority of project types under evaluation are improvements to existing transportation facilities, it is unlikely that there will be many additional impacts to either the natural or human environments that would prevent one or more of the identified projects from proceeding in further project development phases.

The Environmental Justice (EJ) review showed that there are several areas within the study area with significant minority, low-income and / or elderly populations. At this time, the EJ populations are not expected to bear disproportionate adverse affects due to the implementation of one or more of the identified projects. However, more in-depth study during the next phases of project implementation is necessary to confirm this.

The geotechnical review noted that karst features and sinkholes may be encountered in the study area, as well as faulted areas. These features could impact some of the identified projects, but are not so adverse as to preclude further project development stages.

Public Involvement

The Public Involvement Program for the Somerset SUA Study was comprised of several elements. These included the development and participation of a Project Advisory Committee (PAC) during two (2) meetings as well as the use of a Project Development Team (PDT) and its meetings.

The PAC was made up of community officials and stakeholders in Somerset and Pulaski County. This group was created to provide feedback regarding the study. Two (2) meetings were held with the PAC. The first meeting solicited feedback regarding potential transportation issues in the study area. The second meeting was held to present the list of projects designed to address the transportation needs of the area and to gain feedback regarding prioritization of these projects.

Several meetings were also held with the PDT which consisted of staff from the KYTC, the City of Somerset, the Lake Cumberland Area Development District (LCADD), and the Consultant (PB). The purpose of the PDT was to discuss project issues, make project decisions, discuss the development, evaluation and prioritizations of projects, and to generally keep the project on schedule.

Alternatives Development and Evaluation

Based on (1) the input of the PAC and the PDT, (2) field reviews, and (3) the existing conditions, area transportation issues were identified such as poor sight distance, drivers unfamiliar with the area, lack of or unclear signage, poor aesthetics, congestion, high crash rate spots an segments, lack of turn lanes, poor lane utilization and signal timings. Locations where these issues occurred were also identified and a list of appropriate projects addressing them was developed. Projects were classified as either L - local (to be funded using local funds), ST - short-term (could be completed quickly with safety, maintenance, or other funds / combinations) or LT - long-term (could be considered for inclusion in the KYTC's Six-Year Plan). These projects recommended geometric realignment / reconfiguration, aesthetic treatments, sidewalks, traffic signal adjustment, signage, signal timing, additional study, safety improvements, major widening, new road construction, turn lanes, access management and/or community education / communication. **Table ES 1** lists the projects that were developed as part of this study. Project sheets were developed for each project. **Figure ES 2** shows an example project sheet.

Table ES-1: List of Projects

Project ID	Description
L-A	Geometric realignment of airport entrance access
L-B	Geometric realignment of S. Central Ave., Marydale Ave. and Bourne Ave.
L-C	Addition of aesthetic gateway treatments to US 27 corridor
L-D	Addition of sidewalk along KY 3261
L-E	Installation of grass median along US 27
ST-A	Evaluate US 27 / KY 80 / KY 80B signal timings and coordination after bypass completion
ST-B	Safety improvement of vertical curve near Gover Mill Rd.
ST-C	Safety improvements at KY 80 / Ohio St. / Limestone St. intersection
LT-A	Widen KY 914 from KY 80 to just south of KY 769 to four lanes
LT-B	Extension of KY 3263
LT-C	Addition of left turn lanes along KY 39 near schools
LT-D	Addition of right turn lanes along US 27
LT-E	Install separate left turn lanes along KY 1247 at intersection with KY 1575
LT-F	Add turn lanes along KY 1247 for SB left and NB right turns onto Bourne Ave.
LT-G	Extend EB left turn lane and acceleration lane along KY 80B in the WB direction at KY 39
LT-H	Further study of signal timings along US 27
LT-I	Add SB right turn lane from US 27 onto Washington Dr.
LT-J	Add SB right turn lane from US 27 onto KY 1577 and limit access to adjacent business
LT-K	Planning study to determine best solutions for KY 1577 / KY 3261 intersection
LT-L	Coordinate with local agencies to communicate to public transportation network master plan
LT-M	Identify destination sites and preferred paths and conduct a wayfinding study
LT-N	Regional traffic flow study in conjunction with I-66 project

Each of the projects were evaluated with respect to traffic, safety, natural and human environment impacts, community impacts, and costs. An evaluation matrix that lists each of the local, short-term and long-term projects in rows and each of the evaluation criteria in columns was developed to visually display how each project performed relative to the others as well as display the information gathered for each project. Not all categories were applicable to all projects as some projects for instance had few, if any, negative impacts relative to the environment or community.

Following the project evaluation phase, recommendations were made as to which projects would be advanced for future project development. Several projects were removed from the list as KYTC was able to either address the issue or is in the process of evaluating the issue. These projects include: ST-A and ST-B. In addition, LT-N was removed from further consideration following a meeting with the PAC since given the uncertainty of the I-66 project it was determined that this project may need to be revised once other, overall I-66 project decisions are made.

Figure ES-2: Example Project Sheet

SOMERSET SUA	Airport Entrance Access	Project #L-A
PROBLEM		
<p>Project Background: Somerset airport currently expanding flight operations, including scheduled services.</p> <p>Project Issues:</p> <ul style="list-style-type: none"> • SAFETY • Airport entrance is in a curve off of Kit Cowan Rd. • Poor sight distance at airport entrance • Heavy truck traffic on Kit Cowan Rd. (Garner, CoreTrans, and Coca Cola all have facilities off of this road) 		 <p style="text-align: center;"><i>Kit Cowan Rd. Looking WB</i></p>  <p style="text-align: center;"><i>Kit Cowan Rd. Looking NB</i></p>
SOLUTION		
<p>Project Type: Geometric Realignment</p> <p>Project Solution: Realign curve and entrance</p> <p>Project Estimate: \$160,000 (construction only – ROW mapping not available)</p> <p>Project Priority: _____</p>		
		Page 1

Prioritization

Based on the evaluation matrix and meetings with the PAC and the PDT, the local, short-term and long-term projects were prioritized as outlined in the following table (Table ES-2).

Table ES-2: Project Recommendation and Prioritization

Project Type	Project ID	Project Description	Priority Rank
Local	L-B	Geometric realignment of S. Central Ave., Marydale Ave. and Bourne Ave.	1
	L-A	Geometric realignment of airport entrance access	2
	L-E	Installation of grass median along US 27	2
	L-C	Addition of aesthetic gateway treatments to US 27 corridor	4
	L-D	Addition of sidewalk along KY 3261	5
Short-Term	ST-B	Safety improvement of vertical curve near Gover Mill Rd.	1
	ST-C	Safety improvements at KY 80 / Ohio St. / Limestone St. intersection	2
	ST-A	Evaluate US 27 / KY 80 / KY 80B signal timings and coordination after bypass completion	see below
Long-Term	LT-A	Widen KY 914 from KY 80 to just south of KY 769 to four lanes	1
	LT-B	Extension of KY 3263	2
	LT-C	Addition of left turn lanes along KY 39 near schools	3
	LT-E	Install separate left turn lanes along KY 1247 at intersection with KY 1575	4
	LT-G	Extend EB left turn lane and acceleration lane along KY 80B in the WB direction at KY 39	5
	LT-I	Add SB right turn lane from US 27 onto Washington Dr.	6
	LT-F	Add turn lanes along KY 1247 for SB left and NB right turns onto Bourne Ave.	7
	LT-L	Coordinate with local agencies to communicate to public transportation network master plan	8
	LT-D	Addition of right turn lanes along US 27	9
	LT-J	Add SB right turn lane from US 27 onto KY 1577 and limit access to adjacent business	10
	LT-K	Planning study to determine best solutions for KY 1577 / KY 3261 intersection	11
	LT-H	Further study of signal timings along US 27	see below
	LT-M	Identify destination sites and preferred paths and conduct a wayfinding study	see below

Note: ST-A, LT-H, and LT-M already in works to be done, and therefore, not ranked.

1.0 INTRODUCTION

1.1 Study Background and Purpose

This project is a Small Urban Area (SUA) study for the City of Somerset, Kentucky and a portion of the surrounding unincorporated area of Pulaski County. SUA studies are conducted for locations with populations between 5,000 and 50,000 people. The incorporated area of Somerset is comprised of 12,449 persons as of 2009 according to the Kentucky State Data Center¹. The Somerset area is also unique in that it is the close to Lake Cumberland, a major recreation destination in Kentucky and the surrounding region. Therefore, understanding and evaluating the impacts and relationship of transportation, tourism and economic development are critical elements of this study.

The purpose of an SUA is to identify and examine transportation issues related to safety, congestion and operations in the study area and surrounding region. Both short-term and long-term improvement alternatives were considered and prioritized for future project development.

The Kentucky Transportation Cabinet (KYTC) contracted with the consulting firm of Parsons Brinckerhoff (PB) to perform the study through their Statewide Planning Services contract. The Project Development Team (PDT) consisted of: KYTC Central Office Division of Planning, KYTC District 8, the Lake Cumberland Area Development District (LCADD) and PB.

1.2 Study Area

The initial study area was an oval boundary which was intended to encompass the incorporated limits of the City of Somerset as well as the KY 914 bypass. The initial study area was agreed upon by the PDT and adjusted slightly following the first meeting with the Project Advisory Committee (PAC) to include the proposed I-66 interchange north of Somerset and the new Burnside interchange south of Somerset. **Figure 1** on the following page depicts the agreed upon study area. Given such a broad boundary, the study area roadways included in the analysis were primarily state-maintained roadways to help narrow the scope of the project.

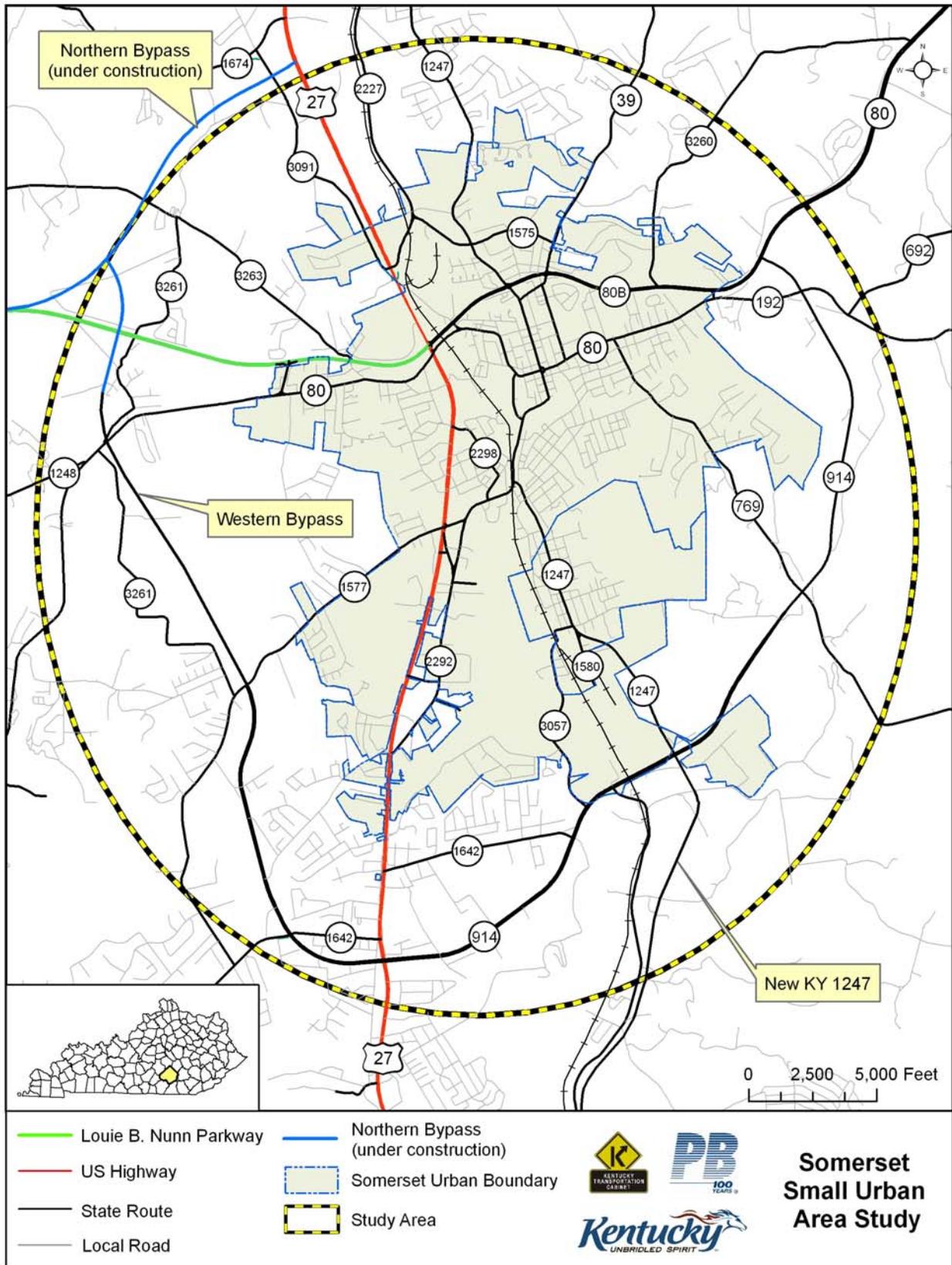
1.3 Study Process

In order to meet the project purpose of identifying and examining transportation issues related to safety, congestion and operations within the project area, the following tasks were completed.

- Existing Conditions Analysis

¹ Kentucky State Data Center: <http://ksdc.louisville.edu/>

Figure 1: Study Area



- Alternatives Development
- Alternatives Evaluation
- Alternatives Recommendation
- Alternatives Prioritization

An existing conditions analysis was performed to identify any transportation issues / deficiencies as well as to provide a baseline for comparison when evaluating alternatives.

Alternatives considered for this study included both short-term improvements that could be quickly and effectively implemented at both an individual intersection level and on a larger corridor-wide level. Longer-term improvement options were also studied to address overall future system needs. Associated planning-level cost estimates in current year dollars were provided for the list of recommended projects. The prioritized list given to the KYTC, City of Somerset, and Pulaski County will provide these implementing agencies with the information they need for further project development and implementation.

Agency and elected officials' input played a role throughout the project development, identification and prioritization processes. The aforementioned PAC, consisting of local elected officials and stakeholders, was formed to provide input on project issues, alternatives development, alternatives evaluation, and alternatives prioritization. While the PAC was not the final decision-making body, their input formed an essential link in the planning process, ensuring the needs of the community were taken into account.

The subsequent chapters of this report document these project tasks thereby providing a complete record of the project process and outcomes.

2.0 EXISTING CONDITIONS

The existing conditions analysis was conducted to create a baseline of known information within the study area. Evaluations were conducted for the following:

- On-Going / Planned Transportation Projects
- Traffic and Safety Operations
- Human Environment
- Natural Environment
- Geotechnical

More detail on each is provided in the following sections.

2.1 Review of On-Going / Planned Transportation Projects

The Somerset area already has a number of projects either on-going or currently planned. These improvements were identified from the following:

- KYTC Six Year Highway Plan (2008 – 2014)
- KYTC Statewide Transportation Improvement Program (2006)
- KYTC Unscheduled Projects List / Project Identification Form

Projects from the Six Year Highway Plan include several that are in the Somerset area but do not fall completely within the study area. These projects include:

- Construct northern bypass of Somerset, KY and I-66 from the Cumberland Parkway west of Somerset, KY to I-75 south of London, KY (Item No. 08-59.01)
- I-66 Somerset to London (Item No. 08-59.11)
- I-66 northern bypass around Somerset (Item No. 08-59.21)
- Somerset Downtown Revitalization Project (Item No. 08-123.03 and 08-123.04)
- Somerset-London Road (KY 80) pavement rehabilitation, westbound lanes only, from KY 80 bypass (MP 21.579) to KY 461 (MP 28.119) (Item No. 08-2007.00)

Several projects from the Statewide Transportation Improvement Program are similar to those listed in the Six Year Highway Plan. They include the I-66 Somerset to London project as well as the Somerset Downtown Revitalization Project. Some additional projects include:

- Somerset northern bypass (I-66) section 3; from west of the bridge over US 27 and the Southern Railroad, east to KY 39 north of Broyles Road (includes interchange at KY 39). Additional funding for right-of-way phase. (Item No. 08-59.51)

- Somerset northern bypass (I-66) section 4; from east of the KY 39 interchange, east to KY 80 east of Somerset (includes interchange at KY 80). Funding for utility work. (Item No. 08-59.6)
- Somerset southwest bypass section 1; from US 27 opposite the existing east bypass, west to 300 feet north of Oak Hill Road. Funding for construction. (Item No. 08-259.1)
- Somerset southwest bypass section 2; from 300 feet north of Oak Hill Road northwesterly to KY 80. Funding for construction (Item No. 08-259.5)

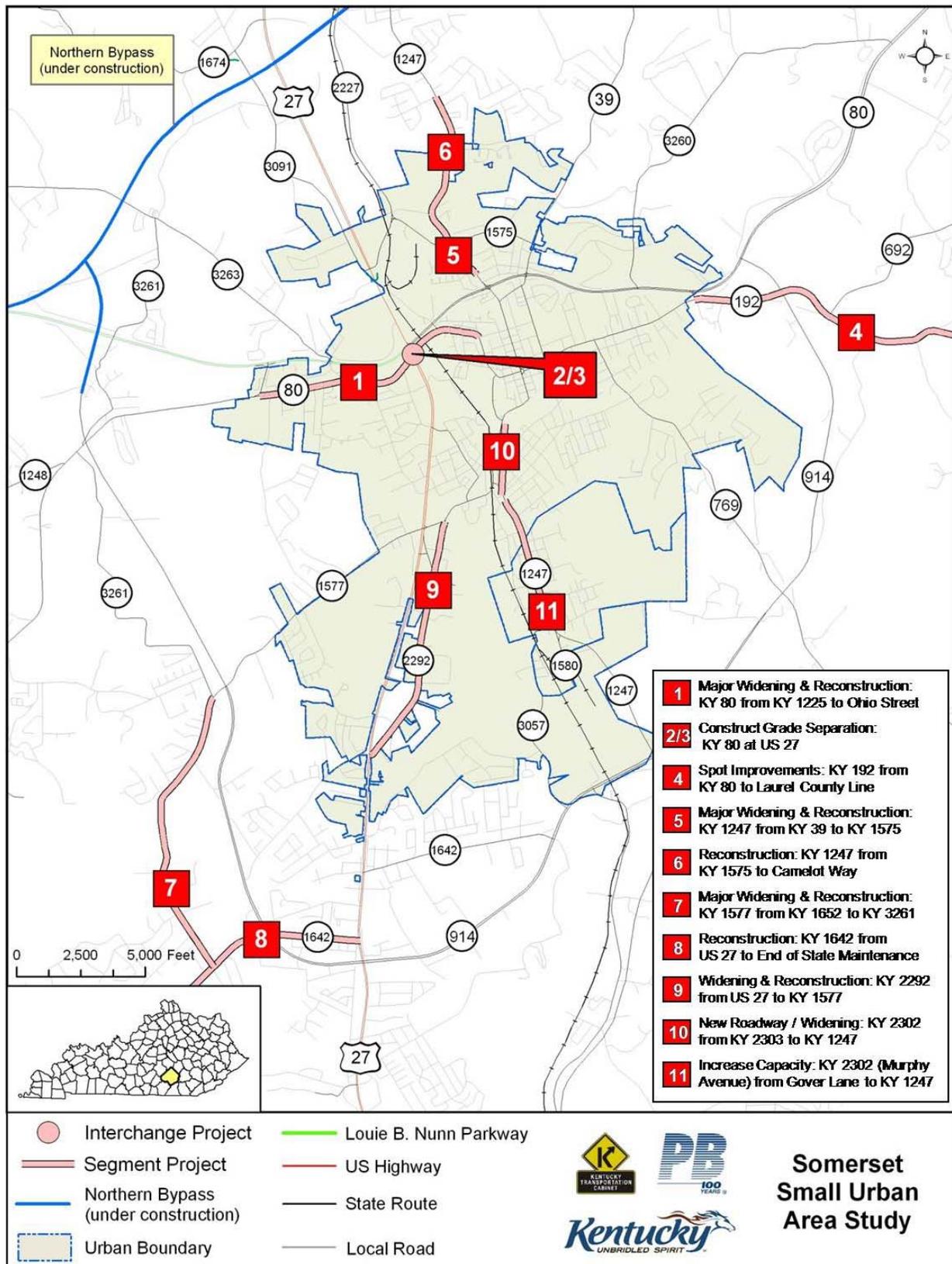
From the Unscheduled Projects List / Project Identification Form (PIF), there are currently 11 planned improvements by the KYTC within the actual Somerset study area. **Figure 2** shows the locations of these improvements as well as a brief description.

At the first PAC meeting held on June 10, 2009, local officials also provided comments on planned improvements that were not included in these lists. It was noted that the City of Somerset is currently updating their Comprehensive Plan and have conceptually compiled the transportation master plan component. Two projects of importance were identified:

- Bogle Street Connector (referred to as extension of KY 3263 later in report) – This is a proposed new connector roadway to go from Oak Hill Road to KY 80. This is approximately a six million dollar project currently in the design plan phase.
- East / West Connector – This is a new roadway that would conceptually tie into US 27 north of KY 1577, cross the proposed Bogle Street Connector, and end at KY 914 between KY 1577 and KY 80.

As all of the projects listed above are currently on planning documents, they will not be included in the list of proposed improvement alternatives from this study. As directed by KYTC, areas identified for improvement based on the traffic and safety analysis as part of this SUA study that overlap with these planned projects will not be considered for future study if the currently planned projects address the identified issues.

Figure 2: Planned Improvements from PIF (KYTC)



2.2 Existing Transportation Network and Operations Overview

As mentioned at the outset of the study, given the broad nature of the study area and scope of work, the analysis primarily focused on state-maintained routes within the study area. The following lists include the list of roadways evaluated.

Within the study area, major roadways include:

- US 27
- Louie B. Nunn Pkwy
- KY 80
- KY 80B
- KY 1247
- KY 39
- KY 914

Other state maintained roads that were evaluated as part of this study included:

- KY 3260
- KY 192
- KY 769
- KY 1642
- KY 2292
- KY 1577
- KY 3261
- KY 3263
- KY 1674 (3091)
- KY 1575
- KY 2299
- KY 2298
- KY 1580
- KY 2227
- KY 2297

2.2.1 Geometrics

Using KYTC's Highway Information System (HIS) online database, various highway characteristics were collected, including functional class, number of lanes, lane width, shoulder width, median type, median width and posted speed limit. The roadways were broken up into segments based on changes in highway characteristics and/or count stations, and the findings are summarized in **Table 1**.

2.2.2 Average Daily Traffic Volumes

The average daily traffic (ADT) volumes used for this project included traffic counts from the KYTC CTS database². These counts were conducted during the years of 2006 – 2009. The two northern-most segments of US 27 have counts from the year 2005; however, this is because US 27 has a new alignment at the northern end of the study area and new counts were not available at the time of the analysis. **Table 1** shows the most recent ADTs along with the corresponding count station while **Figure 3** shows the most recent ADTs on a map.

Truck percentages were determined from the KYTC vehicle classification database where data was available. If truck percentages were not available for a specific roadway section, then a truck percentage was assumed based on the 2008 Traffic Forecasting Report developed by the Kentucky Transportation Center³. Truck percentages are shown in **Table 1**.

² KYTC CTS Database – <http://www.planning.kytc.ky.gov/data/cts/cts.asp>

³ Traffic Forecasting Report – 2008, Kentucky Transportation Center Research Report KTC-07-06/PL14-07-01F

Table 1: Study Area Highway Characteristics Summary

Route	Section	Begin Milepoint	End Milepoint	Section Length (miles)	Functional Class	Facility Type	Lane Width (feet)	Shoulder Width (feet)	Median Type	Median Width (feet)	% No Passing Zones	Posted Speed Limit (MPH)	Truck Percentage*	Most Recent ADT	Count Station	Year		
US 27	1	11.825 (S. Horseshoe Dr.)	12.195 (KY 914)	0.370	Urban Principal Arterial	6 Lanes	12	2	Depressed	16	N/A	45	9.0%	25,000	B90	2007		
	2	12.195 (KY 914)	13.727 (KY 2292)	1.532									8.0%	28,600	B74	2009		
	3	13.727 (KY 2292)	15.461 (KY 1577)	1.734									8.0%	31,000	A65	2009		
	4	15.461 (KY 1577)	16.155 (KY 2298)	0.694									3.0%	32,700	A05	2009		
	5	16.155 (KY 2298)	16.782 (KY 80)	0.627									8.0%	33,900	B08	2009		
	6	16.782 (KY 80)	16.854 (KY 80B)	0.072									8.0%	31,100	B06	2009		
	7	16.854 (KY 80B)	17.368 (KY 1674)	0.514									28.0%	20,500	B31	2007		
	8	17.368 (KY 1674)	17.873 (KY 1575)	0.505	Rural Principal Arterial	4 Lanes	12	12	Depressed	28	55	17.0%	17,100	B04	2005			
	9	17.873 (KY 1575)	19.483 (Racetrack Rd.)	1.610								17.0%	14,600	B24	2005			
Louie B. Nunn Pkwy	1	86.291 (KY 3261)	87.462 (W. Urban Limits)	1.171	Rural Principal Arterial	4 Lanes	12	10	Depressed	24	N/A	70	16.0%	7,540	821	2009		
	2	87.462 (W. Urban Limits)	88.547 (US 27/KY 80B)	1.085	Urban Freeways & Expressways				Raised Non Mountable	16		45	16.0%	9,270	B54	2009		
KY 80	1	16.205 (KY 1248)	17.794 (W. Urban Limits)	1.589	Rural Major Collector	2 Lanes	10	3	None	N/A	N/A	45	10.0%	9,650	2	2007		
	2	17.794 (W. Urban Limits)	18.891 (Langdon Street)	1.097	Urban Minor Arterial Street	2 Lanes	11	4				25	6.0%	9,860	B15	2008		
	3	18.891 (Langdon Street)	19.016 (US 27)	0.125								9.0%	8,850	B09	2007			
	4	19.016 (US 27)	19.600 (W. Limestone Street)	0.584								9.0%	7,990	B29	2008			
	5	19.600 (W. Limestone Street)	19.909 (KY 2303)	0.309								9.0%	6,920	A34	2009			
	6	19.909 (KY 2303)	20.108 (KY 1247)	0.199								9.0%	7,030	A53	2007			
	7	20.108 (KY 1247)	20.710 (KY 769)	0.602								2 Lanes	14	45	4.0%	7,760	B50	2008
	8	20.710 (KY 769)	21.521 (KY 192)	0.811											4.0%	6,880	B34	2009
	9	21.521 (KY 192)	21.579 (KY 80B)	0.058											4.0%	2,790	B60	2008
	10	21.579 (KY 80B)	21.903 (E. Urban Limits)	0.324								Urban Principal Arterial	4 Lanes	12	10	Raised Non Mountable	16	55
	11	21.903 (E. Urban Limits)	22.015 (Garner Rd.)	0.112	Rural Principal Arterial	7.0%												

*Truck percentages in regular font from 12/31/07 Classification Database. Other truck percentages in italics assumed from Table 6 of 2008 Traffic Forecasting Report.

Table 1: Study Area Highway Characteristics Summary (Cont.)

Route	Section	Begin Milepoint	End Milepoint	Section Length (miles)	Functional Class	Facility Type	Lane Width (feet)	Shoulder Width (feet)	Median Type	Median Width (feet)	% No Passing Zones	Posted Speed Limit (MPH)	Truck Percentage*	Most Recent ADT	Count Station	Year
KY 80 B	1	0.000 (US 27)	0.754 (KY 1247)	0.754	Urban Principal Arterial	4 Lanes	12	10	Raised Non Mountable	16	N/A	45	8.0%	21,600	B37	2009
	2	0.754 (KY 1247)	1.087 (KY 39)	0.333									8.0%	18,900	B38	2009
	3	1.087 (KY 39)	2.315 (KY 80)	1.228									8.0%	16,600	B61	2008
KY 1247	1	2.149 (Dry Brach Rd.)	3.745 (KY 914)	1.596	Rural Major Collector	2 Lanes	10	2	None	N/A	N/A	55	8.0%	3,250	251	2007
	2	3.745 (KY 914)	5.000 (Gover Lane / KY 3057)	1.255	Urban Minor Arterial Street	2 Lanes	11						10.0%	3,490	C08	2009
	3	5.000 (Gover Lane / KY 3057)	6.159 (KY 2292)	1.159									9.0%	5,460	B81	2008
	4	6.159 (KY 2292)	6.632 (KY 2303)	0.473								35	6.0%	10,900	A11	2009
	5	6.632 (KY 2303)	8.195 (KY 1575)	1.563								7.0%	8,080	B17/A30/A26/A24	2008-2009	
	6	8.195 (KY 1575)	9.029 (N. Urban Limits)	0.834	Urban Collector Street	2 Lanes	10					45	7.0%	5,920	B25	2007
	7	9.029 (N. Urban Limits)	9.676 (Leaf Lane)	0.647	Rural Minor Collector							9.0%				
KY 39	1	0.000 (KY 1247)	0.286 (KY 80B)	0.286	Urban Minor Arterial Street	2 Lanes	11	0	None	N/A	N/A	35	5.0%	2,560	A22	2007
	2	0.286 (KY 80B)	0.525 (KY 1575)	0.239									9.0%	8,830	B62	2008
	3	0.525 (KY 1575)	1.569 (Gover Mill Rd.)	1.044									Rural Major Collector	10	45	10.0%
KY 3260	1	0.000 (KY 80B)	0.387 (E. Somerset Church Rd.)	0.387	Urban Local	2 Lanes	10	3	None	N/A	N/A	45	8.0%	3,030	B95	2009
	2	0.387 (E. Somerset Church Rd.)	1.302 (Pine St.)	0.915	Rural Local								10.0%	1,420	246	2009
KY 192	1	0.000 (KY 80)	0.215 (CR 1698D)	0.215	Urban Minor Arterial Street	2 Lanes	10	2	None	N/A	N/A	45	9.0%	3,290	B00	2009
	2	0.215 (CR 1698D)	1.076 (KY 692)	0.861	Rural Major Collector			6					55	10.0%	4,490	010
KY 914	1	0.000 (KY 1577)	9.645	9.645	Rural Principal Arterial	4 Lanes	12	10	Depressed	28	N/A	55	16.0%	10,070	C00/C03/C04/C05/C06	2007-2009
	2	9.645	10.408 (Rush Branch Creek Bridge)	0.763		3 Lanes		12		18			16.0%			
	3	10.408 (Rush Branch Creek Bridge)	13.301 (KY 80)	2.893		2 Lanes		None		N/A			16.0%			
KY 769	1	6.790 (Elihu-Rush Br. Rd.)	8.599 (SE Urban Limits)	1.809	Rural Minor Collector	2 Lanes	9	4	None	N/A	N/A	55	9.0%	2,110	282/377	2008-2009
	2	8.599 (SE Urban Limits)	9.765 (KY 80)	1.166	Urban Minor Arterial Street							35	5.0%	4,800	B53	2009

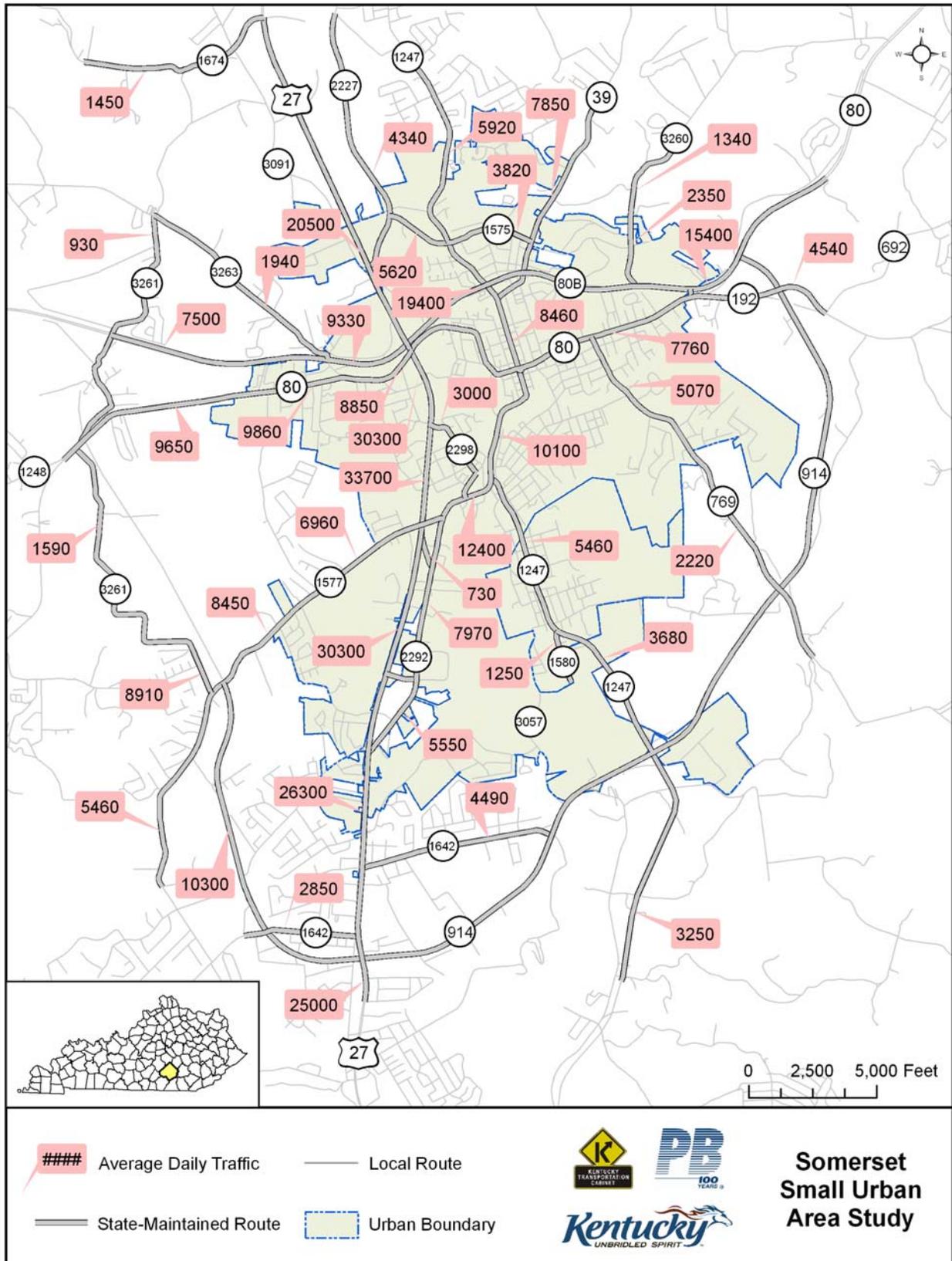
*Truck percentages in regular font from 12/31/07 Classification Database. Other truck percentages in italics assumed from Table 6 of 2008 Traffic Forecasting Report.

Table 1: Study Area Highway Characteristics Summary (Cont.)

Route	Section	Begin Milepoint	End Milepoint	Section Length (miles)	Functional Class	Facility Type	Lane Width (feet)	Shoulder Width (feet)	Median Type	Median Width (feet)	% No Passing Zones	Posted Speed Limit (MPH)	Truck Percentage*	Most Recent ADT	Count Station	Year
KY 1642	1	3.782 (Bourbon Rd.)	4.621 (SW Urban Limits)	0.839	Rural Minor Collector	2 Lanes	10	2	None	N/A	N/A	45	9.0%	3,240	B87	2009
	2	4.621 (SW Urban Limits)	6.035 (KY 914)	1.414	Urban Minor Arterial Street								10.0%	3,610	B75	2009
KY 2292	1	0.000 (US 27)	0.508 (KY 2291)	0.508	Urban Collector Street	2 Lanes	10	3	None	N/A	N/A	45	7.0%	5,260	B46	2009
	2	0.508 (KY 2291)	1.420 (KY 2444)	0.912									7.0%	6,670	A64	2008
	3	1.420 (KY 2444)	1.870 (KY 1577)	0.450									7.0%	10,800	A69	2007
	4	1.870 (KY 1577)	2.361 (KY 1247)	0.491	Urban Minor Arterial Street		9	2	9.0%	13,200	A06	2009				
KY 1577	1	0.662 (Oak Valley Rd.)	2.213 (KY 3261)	1.551	Rural Major Collector	2 Lanes	10	2	None	N/A	N/A	45	10.0%	4,340	304	2009
	2	2.213 (KY 3261)	2.922 (Grand Central Blvd.)	0.709									10.0%	9,340	274	2008
	3	2.922 (Grand Central Blvd.)	4.395 (KY 2292)	1.473	Urban Minor Arterial Street		12	35	4.0%	6,960	A67/A68	2008				
KY 3261	1	0.000 (KY 1577)	0.166 (Patterson Branch Rd.)	0.166	Rural Minor Collector	2 Lanes	9	4	None	N/A	N/A	55	9.0%	6,310	252	2009
	2	0.166 (Patterson Branch Rd.)	2.502 (KY 80)	2.336									9.0%	1,590	301	2007
	3	2.502 (KY 80)	4.533 (KY 3263)	2.031	Rural Local			2	35	10.0%	930	134/135	2007-2008			
KY 3263	1	1.800 (KY 3261)	3.489 (Louie B. Nunn Pkwy)	1.689	Rural Local	2 Lanes	9	3	None	N/A	N/A	35	10.0%	1,940	003	2008
KY 1674 (3091)	1	0.000 (US 27)	0.344 (KY 3091)	0.344	Urban Collector Street	2 Lanes	12	1	None	N/A	N/A	35	7.0%	1,880	C11	2009
	2	0.344 (KY 3091)	1.538 (Wilson Rd.)	1.175	Rural Minor Collector								9	9.0%	1,610	090
KY 1575	1	0.000 (KY 2227)	0.490 (KY 1247)	0.490	Urban Minor Arterial Street	2 Lanes	10	4	None	N/A	N/A	35	9.0%	5,620	B03	2007
	2	0.490 (KY 1247)	1.151 (KY 39)	0.661									9.0%	4,000	A25	2009
KY 2299	1	0.000 (KY 2292)	0.286 (US 27)	0.286	Urban Local	2 Lanes	11	6	None	N/A	N/A	45	8.0%	730	A66	2007
KY 2298	1	0.000 (KY 2292)	0.210 (Old Monticello St.)	0.210	Urban Local	2 Lanes	11	4	None	N/A	N/A	25	8.0%	4,630	A10	2009
	2	0.210 (Old Monticello St.)	0.736 (US 27)	0.526									8.0%	3,000	B13	2006
KY 1580	1	0.000 (Crane Factory)	0.395 (KY 1247)	0.395	Urban Local	2 Lanes	11	2	None	N/A	N/A	35	8.0%	1,040	A63	2009
KY 2227	1	0.000 (US 27)	0.411 (KY 1575)	0.411	Urban Collector Street	2 Lanes	12	6	None	N/A	N/A	45	7.0%	5,750	B04	2009
	2	0.411 (KY 1575)	2.021 (E. Racetrack Rd.)	1.610	Rural Minor Collector								55	9.0%	4,340	B24
KY 2297	1	0.000 (US 27)	0.222 (KY 2292)	0.222	Urban Local	2 Lanes	12	10	None	N/A	N/A	35	8.0%	1,110	B71	2006

*Truck percentages in regular font from 12/31/07 Classification Database. Other truck percentages in italics assumed from Table 6 of 2008 Traffic Forecasting Report.

Figure 3: Current Average Daily Traffic Volumes



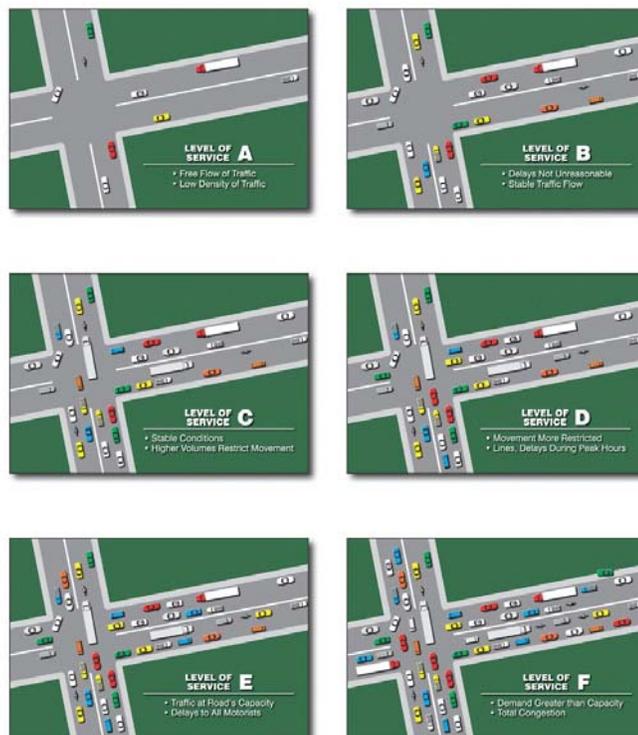
2.2.3 Level of Service Analysis

2.2.3.1 Methodology

Using the gathered geometric and existing highway information, the Highway Capacity Software Plus (HCS+) was used to determine level of service (LOS). LOS is used to provide a rating scale for congestion and operations of a roadway.

LOS A represents a free flowing facility with little time spent following another vehicle and plenty of opportunities for passing on a two-lane facility. Percent time following increases and opportunities to pass and travel speeds decrease with level of service down to LOS F which represents a congested roadway that is over capacity with no opportunities to pass and low travel speeds. Refer to **Figure 4** for a graphical representation of what each LOS looks like from a capacity perspective.

Figure 4: Levels of Service



Presentation Based On HIGHWAY CAPACITY MANUAL,
Special Report 209, Transportation Research Board, 1985

LOS D is the threshold for desirable traffic operations in this study, based on guidance from the AASHTO Policy on Geometric Design of Highways and Streets⁴. While there are various roadway types in the study area, including urban and suburban freeways and arterials, as well as rural freeways, (which have a desired LOS of B or C), the majority of roadways fall under the categories of urban and suburban collector and local roads, as well as rural rolling local roads, which have a desired LOS of D. It was determined that all roadways should be evaluated using the same criteria and that operations below this threshold should be noted as undesirable and warrant improvement.

Two-Lane Highway Analysis

For the two-lane highways (refer to **Table 1** for a list of two-lane highways), a corridor LOS analysis was prepared using the HCS+ two-lane road analysis module. This is based on the Highway Capacity Manual 2000 (HCM)⁵. For this method, there are two

⁴ **Policy on Geometric Design of Highways and Streets**, AASHTO.

⁵ **Highway Capacity Manual 2000**, Transportation Research Board.

classes of roadways: Class I highways which include higher speed arterials and daily commuter routes, and Class II highways which include lower speed collector roadways, and roads primarily designed to provide access. Driver expectations regarding speed and flow are important in determining a highway's class, and thus its desired LOS. All major study area state maintained two-lane routes were classified as a Class I facility which includes:

- KY 80
- KY 914 (two-lane section only)
- KY 1247
- KY 39

Facilities identified as Class II roadways included:

- KY 3260
- KY 192
- KY 769
- KY 1642
- KY 2292
- KY 1577
- KY 3261
- KY 3263
- KY 1674 (3091)
- KY 1575
- KY 2299
- KY 2298
- KY 1580
- KY 2227
- KY 2297

Levels of service for Class I highways are based on the estimated average travel speeds and percent time vehicles spend following other vehicles as shown in **Table 2**. Levels of service for Class II highways are defined only in terms of the percent time vehicles spend following other vehicles. Average travel speed is not considered since drivers typically will tolerate lower speeds on a Class II facility because of its function as an access roadway (serving shorter trips and fewer through trips). Refer to the HCM for more details.

Table 2: LOS Criteria for Two-Lane Highways

LOS	Class I Highways		Class II Highways
	Percent Time Spent Following	Average Travel Speed	Percent Time Spent Following
A	≤ 35	>55	≤ 40
B	>35 – 50	>50 – 55	>40 – 55
C	>50 – 65	>45 – 50	>55 – 70
D	>65 – 80	>40 – 45	>70 – 85
E	>80	≤40	>85
F	LOS F applies whenever the flow rate exceeds the capacity		

Source: Highway Capacity Manual (2000)

For Class I highways, the LOS D threshold corresponds to an average travel speed of > 40 miles per hour with ≤ 80 percent time spent following another vehicle. For a Class II highway, the LOS D threshold corresponds to ≤ 85 percent time spent following another vehicle.

Multilane Highway Analysis

To analyze traffic operations for the four-lane or greater highway sections (KY 80B, KY 914 and US 27), the HCS+ multilane analysis package was used. This is also based on the HCM methodology.

Levels of service for multilane highway sections are based on density in terms of passenger cars per mile per lane (pc/mi/ln) as shown in **Table 3**. Density is used to define level of service because it is an indicator of freedom to maneuver within the traffic stream and the proximity to other vehicles. Speed in terms of mean passenger-car speed and volume-to-capacity (v/c) ratios are interrelated with density and can be used to characterize a multilane highway segment. Similar to the two-lane highway analysis, LOS D is the threshold for desirable traffic operations used in this study.

For multilane highways, a LOS D corresponds to a density between 26 and 35 passenger cars per mile per lane. (Refer to the HCM for more specific information.)

Table 3: LOS Criteria for Multilane Highways

LOS	Density Range (pc/mi/ln)
A	0 – 11
B	> 11 – 18
C	> 18 – 26
D	>26 – 35
E	> 35 – 45
F	> 45

Source: Highway Capacity Manual (2000)

Freeway Analysis

To analyze peak hour traffic operations for the Louie B. Nunn Parkway, the HCS+ freeway analysis package was used, also based on the HCM. Levels of service for freeway sections are based on density in terms of passenger cars per mile per lane (pc/mi/ln), similar to the multilane highway analysis. Again, LOS D is the threshold for desirable traffic operations used in this study, which corresponds to a density between 26 and 35 passenger cars per mile per lane. (Refer to the HCM for more specific information.)

2.2.3.2 Current Levels of Service

The most recent 24-hour KYTC traffic counts shown in **Table 1** were used to evaluate corridor operating conditions. Peak hour traffic volumes for highway segments were estimated based on the average daily traffic volumes for those segments using K-factors (factor based on the 30th highest hour of the year) derived from the KYTC counts. The current lane widths, shoulder widths, percent passing and other design factors were also used. The segment levels of service are listed in **Table 4** and are shown in **Figure 5**.

Table 4: Current Levels of Service

Route	Section	Begin Milepoint	End Milepoint	Section Length (miles)	ADT	K-Factor	DHV	Peak Direction %	Off Peak Direction %	Posted Speed Limit (MPH)	% Trucks	Estimated Travel Speed (MPH)	% Time Spent Following	Density (pc/mi/ln)	LOS
US 27	1	11.825 (S. Horseshoe Dr.)	12.195 (KY 914)	0.370	25,000	0.095	2,380	57.9	42.1	45	9.0%	-	-	11.8	B
	2	12.195 (KY 914)	13.727 (KY 2292)	1.532	28,600	0.095	2,720	57.9	42.1	45	8.0%	-	-	13.5	B
	3	13.727 (KY 2292)	15.461 (KY 1577)	1.734	31,000	0.095	2,950	57.9	42.1	45	8.0%	-	-	14.6	B
	4	15.461 (KY 1577)	16.155 (KY 2298)	0.694	32,700	0.095	3,110	57.9	42.1	45	3.0%	-	-	15.0	B
	5	16.155 (KY 2298)	16.782 (KY 80)	0.627	33,900	0.095	3,220	57.9	42.1	45	8.0%	-	-	15.9	B
	6	16.782 (KY 80)	16.854 (KY 80B)	0.072	31,100	0.095	2,950	57.9	42.1	45	8.0%	-	-	15.9	B
	7	16.854 (KY 80B)	17.368 (KY 1674)	0.514	20,500	0.095	1,950	57.9	42.1	45	28.0%	-	-	15.7	B
	8	17.368 (KY 1674)	17.873 (KY 1575)	0.505	17,100	0.107	1,830	56.9	43.1	55	17.0%	-	-	11.4	B
	9	17.873 (KY 1575)	19.483 (Racetrack Rd.)	1.610	14,600	0.107	1,560	56.9	43.1	55	17.0%	-	-	9.7	A
KY 80	1	16.205 (KY 1248)	17.794 (W. Urban Limits)	1.589	9,650	0.111	1,070	56.1	43.9	45	10.0%	28.6	73.2	-	E
	2	17.794 (W. Urban Limits)	18.891 (Langdon Street)	1.097	9,860	0.098	970	53.7	46.3	25	6.0%	19.9	71.0	-	E
	3	18.891 (Langdon Street)	19.016 (US 27)	0.125	8,850	0.098	870	53.7	46.3	25	9.0%	20.5	68.3	-	E
	4	19.016 (US 27)	19.600 (W. Limestone Street)	0.584	7,990	0.098	780	53.7	46.3	25	9.0%	21.1	65.4	-	E
	5	19.600 (W. Limestone Street)	19.909 (KY 2303)	0.309	6,920	0.098	680	53.7	46.3	25	9.0%	21.8	62.3	-	E
	6	19.909 (KY 2303)	20.108 (KY 1247)	0.199	7,030	0.098	690	53.7	46.3	25	9.0%	21.7	62.5	-	E
	7	20.108 (KY 1247)	20.710 (KY 769)	0.602	7,760	0.098	760	53.7	46.3	45	4.0%	31.0	64.6	-	E
	8	20.710 (KY 769)	21.521 (KY 192)	0.811	6,880	0.098	670	53.7	46.3	45	4.0%	31.6	62.0	-	E
	9	21.521 (KY 192)	21.579 (KY 80B)	0.058	2,790	0.098	270	53.7	46.3	45	4.0%	34.8	42.8	-	E
	10	21.579 (KY 80B)	21.903 (E. Urban Limits)	0.324	15,400	0.095	1,460	57.9	42.1	55	8.0%	37.4	81.2	-	E
	11	21.903 (E. Urban Limits)	22.015 (Garner Rd.)	0.112	15,400	0.107	1,650	56.9	43.1	55	17.0%	37.7	84.2	-	E
KY 80 B	1	0.000 (US 27)	0.754 (KY 1247)	0.754	21,600	0.095	2,050	57.9	42.1	45	8.0%	-	-	15.2	B
	2	0.754 (KY 1247)	1.087 (KY 39)	0.333	18,900	0.095	1,800	57.9	42.1	45	8.0%	-	-	13.4	B
	3	1.087 (KY 39)	2.315 (KY 80)	1.228	16,600	0.095	1,580	57.9	42.1	45	8.0%	-	-	11.7	B
Louie B. Nunn Pkwy	1	86.291 (KY 3261)	87.462 (W. Urban Limits)	1.171	7,540	0.107	810	56.9	43.1	70	16.0%	-	-	4.0	A
	2	87.462 (W. Urban Limits)	88.547 (US 27/KY 80B)	1.085	9,270	0.100	930	54.6	45.4	45	16.0%	-	-	5.5	A
KY 914	1	0.000 (KY 1577)	9.645	9.645	10,070	0.107	1,080	56.9	43.1	55	16.0%	-	-	7.0	A
	2	9.645	10.408 (Rush Branch Creek Bridge)	0.763	10,070	0.107	1,080	56.9	43.1	55	16.0%	-	-	-	-
	3	10.408 (Rush Branch Creek Bridge)	13.301 (KY 80)	2.893	10,070	0.107	1,080	56.9	43.1	55	16.0%	42.2	73.3	-	D

Notes:

ADT = 2005 – 2009 Average Daily Traffic (count or estimate) from CTS

K-Factor = Design Hour Factor obtained from KYTC 2008 Traffic Forecasting Report

DHV = 2009 Design Hour Volume (Average Daily Traffic x K-Factor)

Posted Speed Limit obtained from Highway Information System

% Trucks obtained from 2007 Vehicle Classification System Database. Roadways where data did not exist were estimated using the KYTC 2008 Traffic Forecasting Report, and are italicized.

Level of Service (LOS) and % Time Spent Following calculated using Highway Capacity Software Plus (HCS+)

% RVs were obtained from Exhibit 12-14 of the HCM

Number of access points per mile were obtained from Exhibit 12-4 of the HCM

45 mph was used as the posted speed since that is the lowest value HCS+ accepts for two-lane highway analysis.

Lane widths less than 9 ft were entered in as 9 ft since that is the HCS+ minimum.

Table 4: Current Levels of Service (Cont.)

Route	Section	Begin Milepoint	End Milepoint	Section Length (miles)	ADT	K-Factor	DHV	Peak Direction %	Off Peak Direction %	Posted Speed Limit (MPH)	% Trucks	Estimated Travel Speed (MPH)	% Time Spent Following	Density (pc/mi/ln)	LOS
KY 1247	1	2.149 (Dry Brach Rd.)	3.745 (KY 914)	1.596	3,250	0.111	360	56.1	43.9	55	8.0%	43.0	49.2	-	D
	2	3.745 (KY 914)	5.000 (Gover Lane / KY 3057)	1.255	3,490	0.098	340	53.7	46.3	55	10.0%	41.8	48.3	-	D
	3	5.000 (Gover Lane / KY 3057)	6.159 (KY 2292)	1.159	5,460	0.098	540	53.7	46.3	35	9.0%	27.6	58.4	-	E
	4	6.159 (KY 2292)	6.632 (KY 2303)	0.473	10,900	0.098	1,070	53.7	46.3	35	6.0%	24.3	73.4	-	E
	5	6.632 (KY 2303)	8.195 (KY 1575)	1.563	8,080	0.098	790	53.7	46.3	35	7.0%	26.1	65.7	-	E
	6	8.195 (KY 1575)	9.029 (N. Urban Limits)	0.834	5,920	0.109	650	53.9	46.1	45	7.0%	29.3	61.5	-	E
	7	9.029 (N. Urban Limits)	9.676 (Leaf Lane)	0.647	5,920	0.117	690	62.7	37.3	45	9.0%	31.0	61.8	-	E
KY 39	1	0.000 (KY 1247)	0.286 (KY 80B)	0.286	2,560	0.098	250	53.7	46.3	35	5.0%	30.4	41.2	-	E
	2	0.286 (KY 80B)	0.525 (KY 1575)	0.239	8,830	0.098	870	53.7	46.3	35	9.0%	25.5	68.3	-	E
	3	0.525 (KY 1575)	1.569 (Gover Mill Rd.)	1.044	8,620	0.111	960	56.1	43.9	45	10.0%	32.5	70.7	-	E
KY 3260	1	0.000 (KY 80B)	0.387 (E. Somerset Church Rd.)	0.387	3,030	0.100	300	50.0	50.0	45	8.0%	31.8	45.7	-	B
	2	0.387 (E. Somerset Church Rd.)	1.302 (Pine St.)	0.915	1,420	0.100	140	50.0	50.0	45	10.0%	36.4	31.1	-	A
KY 192	1	0.000 (KY 80)	0.215 (CR 1698D)	0.215	3,290	0.098	320	53.7	46.3	55	9.0%	31.4	46.8	-	B
	2	0.215 (CR 1698D)	1.076 (KY 692)	0.861	4,490	0.111	500	56.1	43.9	55	10.0%	44.6	56.5	-	C
KY 769	1	6.790 (Elihu-Rush Br. Rd.)	8.599 (SE Urban Limits)	1.809	2,110	0.117	250	62.7	37.3	55	9.0%	44.7	41.6	-	B
	2	8.599 (SE Urban Limits)	9.765 (KY 80)	1.166	4,800	0.098	470	53.7	46.3	35	5.0%	28.0	55.2	-	C
KY 1642	1	3.782 (Bourbon Rd.)	4.621 (SW Urban Limits)	0.839	3,240	0.117	380	62.7	37.3	45	9.0%	32.8	49.8	-	B
	2	4.621 (SW Urban Limits)	6.035 (KY 914)	1.414	3,610	0.098	350	53.7	46.3	45	10.0%	31.0	49.1	-	B
KY 2292	1	0.000 (US 27)	0.508 (KY 2291)	0.508	5,260	0.109	570	53.9	46.1	45	7.0%	29.7	59.3	-	C
	2	0.508 (KY 2291)	1.420 (KY 2444)	0.912	6,670	0.109	730	53.9	46.1	45	7.0%	28.8	63.6	-	C
	3	1.420 (KY 2444)	1.870 (KY 1577)	0.450	10,800	0.109	1,180	53.9	46.1	45	7.0%	25.9	75.5	-	D
	4	1.870 (KY 1577)	2.361 (KY 1247)	0.491	13,200	0.098	1,290	53.7	46.3	45	9.0%	24.0	77.6	-	D
KY 1577	1	0.662 (Oak Valley Rd.)	2.213 (KY 3261)	1.551	4,340	0.111	480	56.1	43.9	45	10.0%	32.1	55.6	-	C
	2	2.213 (KY 3261)	2.922 (Grand Central Blvd.)	0.709	9,340	0.110	1,030	56.1	43.9	45	10.0%	28.8	72.2	-	D
	3	2.922 (Grand Central Blvd.)	4.395 (KY 2292)	1.473	6,960	0.098	680	53.7	46.3	35	4.0%	26.8	62.2	-	C

Notes:

ADT = 2005 – 2009 Average Daily Traffic (count or estimate) from CTS

K-Factor = Design Hour Factor obtained from KYTC 2008 Traffic Forecasting Report

DHV = 2009 Design Hour Volume (Average Daily Traffic x K-Factor)

Posted Speed Limit obtained from Highway Information System

% Trucks obtained from 2007 Vehicle Classification System Database. Roadways where data did not exist were estimated using the KYTC 2008 Traffic Forecasting Report, and are italicized.

Level of Service (LOS) and % Time Spent Following calculated using Highway Capacity Software Plus (HCS+)

% RVs were obtained from Exhibit 12-14 of the HCM

Number of access points per mile were obtained from Exhibit 12-4 of the HCM

45 mph was used as the posted speed since that is the lowest value HCS+ accepts for two-lane highway analysis.

Lane widths less than 9 ft were entered in as 9 ft since that is the HCS+ minimum.

Table 4: Current Levels of Service (Cont.)

Route	Section	Begin Milepoint	End Milepoint	Section Length (miles)	ADT	K-Factor	DHV	Peak Direction %	Off Peak Direction %	Posted Speed Limit (MPH)	% Trucks	Estimated Travel Speed (MPH)	% Time Spent Following	Density (pc/mi/ln)	LOS
KY 3261	1	0.000 (KY 1577)	0.166 (Patterson Branch Rd.)	0.166	6,310	0.117	740	62.7	37.3	55	9.0%	38.9	72.6	-	D
	2	0.166 (Patterson Branch Rd.)	2.502 (KY 80)	2.336	1,590	0.117	190	62.7	37.3	55	9.0%	45.7	37.4	-	A
	3	2.502 (KY 80)	4.533 (KY 3263)	2.031	930	0.100	90	50.0	50.0	35	10.0%	33.2	26.1	-	A
KY 3263	1	1.800 (KY 3261)	3.489 (Louie B. Nunn Pkwy)	1.689	1,940	0.100	190	50.0	50.0	35	10.0%	31.2	35.9	-	A
KY 1674 (3091)	1	0.000 (US 27)	0.344 (KY 3091)	0.344	1,880	0.109	200	53.9	46.1	35	7.0%	31.1	37.1	-	A
	2	0.344 (KY 3091)	1.538 (Wilson Rd.)	1.175	1,610	0.117	190	62.7	37.3	35	9.0%	31.2	37.4	-	A
KY 1575	1	0.000 (KY 2227)	0.490 (KY 1247)	0.490	5,620	0.098	550	53.7	46.3	35	9.0%	27.5	58.7	-	C
	2	0.490 (KY 1247)	1.151 (KY 39)	0.661	4,000	0.098	390	53.7	46.3	35	9.0%	28.4	51.3	-	B
KY 2299	1	0.000 (KY 2292)	0.286 (US 27)	0.286	730	0.100	70	50.0	50.0	45	8.0%	39.2	24.0	-	A
KY 2298	1	0.000 (KY 2292)	0.210 (Old Monticello St.)	0.210	4,630	0.100	460	50.0	50.0	25	8.0%	23.0	55.2	-	C
	2	0.210 (Old Monticello St.)	0.736 (US 27)	0.526	3,000	0.100	300	50.0	50.0	25	8.0%	24.5	45.7	-	B
KY 1580	1	0.000 (Crane Factory)	0.395 (KY 1247)	0.395	1,040	0.100	100	50.0	50.0	35	8.0%	33.0	27.1	-	A
KY 2227	1	0.000 (US 27)	0.411 (KY 1575)	0.411	5,750	0.109	630	53.9	46.1	45	7.0%	33.1	61.0	-	C
	2	0.411 (KY 1575)	2.021 (E. Racetrack Rd.)	1.610	4,340	0.117	510	62.7	37.3	55	9.0%	45.8	56.9	-	C
KY 2297	1	0.000 (US 27)	0.222 (KY 2292)	0.222	1,110	0.100	110	50.0	50.0	35	8.0%	32.8	28.1	-	A

Notes:

ADT = 2005 – 2009 Average Daily Traffic (count or estimate) from CTS

K-Factor = Design Hour Factor obtained from KYTC 2008 Traffic Forecasting Report

DHV = 2009 Design Hour Volume (Average Daily Traffic x K-Factor)

Posted Speed Limit obtained from Highway Information System

% Trucks obtained from 2007 Vehicle Classification System Database. Roadways where data did not exist were estimated using the KYTC 2008 Traffic Forecasting Report, and are italicized.

Level of Service (LOS) and % Time Spent Following calculated using Highway Capacity Software Plus (HCS+)

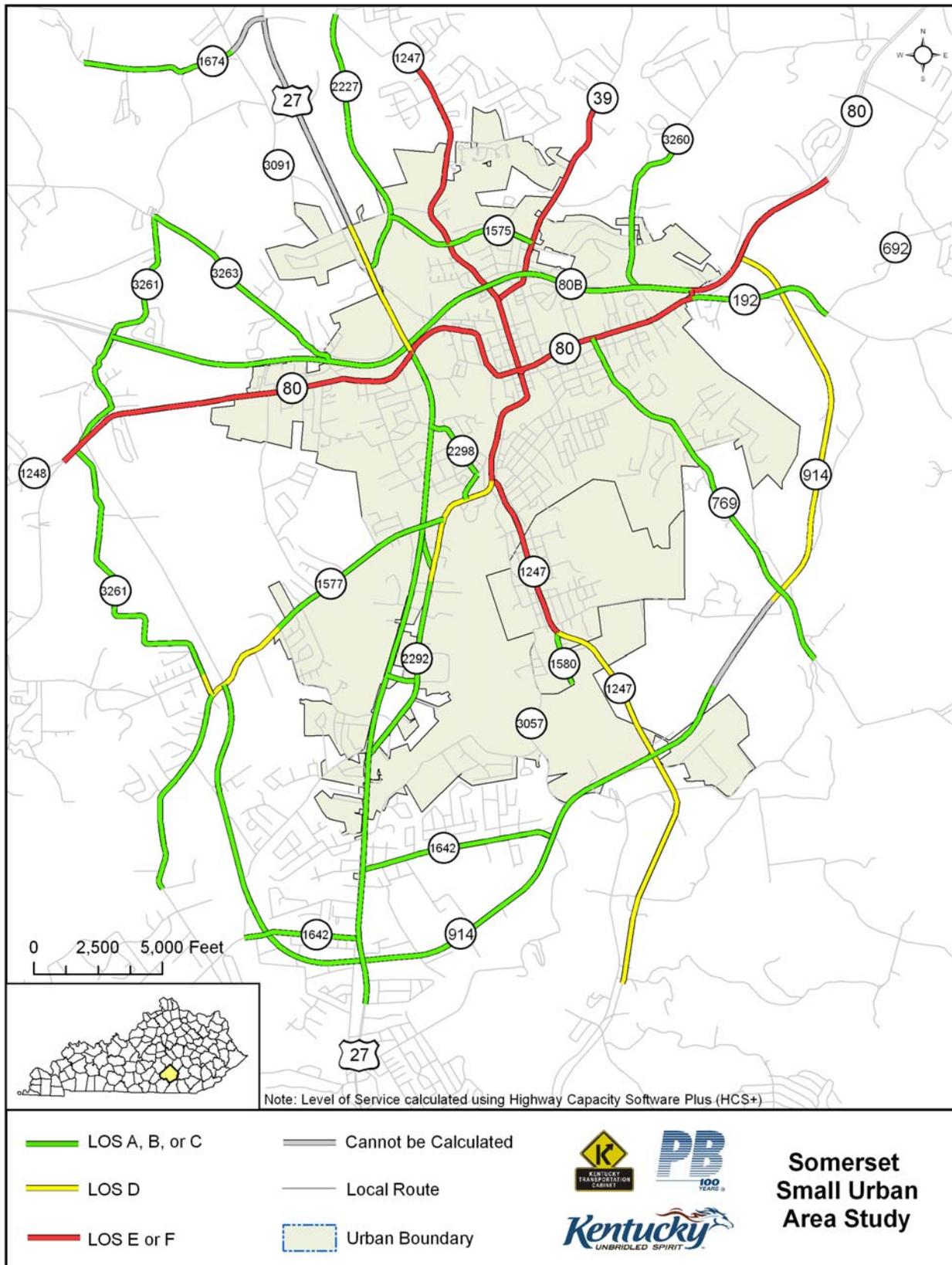
% RVs were obtained from Exhibit 12-14 of the HCM

Number of access points per mile were obtained from Exhibit 12-4 of the HCM

45 mph was used as the posted speed since that is the lowest value HCS+ accepts for two-lane highway analysis.

Lane widths less than 9 ft were entered in as 9 ft since that is the HCS+ minimum.

Figure 5: Current Levels of Service



2.2.4 Crash Analysis

2.2.4.1 Crash Analysis Methodology

The KYTC provided crash data for a three-year period from April 1, 2006 through March 31, 2009. The locations of these crashes by crash type (fatality, injury or property damage only) are shown for each roadway in **Appendix A**.

Crash rates were computed for specific segments of each major study area highway using the methodology provided in the crash analysis report periodically published by the Kentucky Transportation Center (KTC)⁶. The section crash rates are based on the number of crashes on a specified section, the ADT on the roadway, the time frame of analysis, and the length of the section. They are expressed in terms of crashes per 100 million vehicle-miles. A section's crash rate was then compared to a statewide critical crash rate⁷ derived from critical crash rate tables for highway sections in the KTC crash report (Appendix D of KTC crash report). This comparison is expressed as a ratio of the section crash rate to the critical crash rate and is referred to as the critical crash rate factor. Sections with a critical crash rate factor greater than one indicate a notable safety concern.

The section crash rate is also compared directly to the statewide average crash rate presented in the KTC crash report. The statewide averages consider all crashes for a specified period that are listed in the Collision Report Analysis for Safer Highways (CRASH) database maintained by the Kentucky State Police and stratified by functional classification (Table B-2 in KTC crash report). Section rates that exceed the statewide average crash rate but not the critical crash rate may be problem areas, but they are not statistically proven to be higher crash areas. Therefore, this second comparison is used to identify a second tier of highway sections that may have crash problems and could be considered for safety improvements if warranted based on further analysis.

2.2.4.2 Section Crash Analysis

For the major roadways within the study area, many of the observed section crash rates exceed the critical crash rate for that roadway type. The critical crash rate factors range from 0.06 to 9.43. All sections of US 27 and KY 39 and multiple other roadway sections have critical crash rates that exceed the statewide critical rate. There are many other sections that are not confirmed high crash rate sections (i.e. they do not exceed the critical crash rate), but the current crash rates exceed the statewide average crash rate. **Table 5** shows the crash statistics for the segments analyzed and **Figure 6** shows the segments on a map.

⁶ Analysis of Traffic Crash Data in Kentucky (2004 – 2008), Kentucky Transportation Center Research Report KTC-07-26/KSP2-07-1F.

⁷ The critical crash rate is the threshold above which an analyst can be statistically certain (at a 99.5% confidence level) that the section crash rate exceeds the average crash rate for a similar roadway and is not mistakenly shown as higher than the average due to randomly occurring crashes.

Table 5: Crash Rates by Segment

Route	Section	Begin Milepoint	End Milepoint	Total Crashes	Average Daily Traffic	Section Length (miles)	Exposure "M" (100 or 1 MVM)	Statewide Average Crash Rate	Section Crash Rate	Statewide Critical Crash Rate	Critical Crash Rate Factor	Manner of Collision	Light Condition	Weather
US 27	1	11.825 (S. Horseshoe Dr.)	12.195 (KY 914)	41	25,000	0.370	0.101	305	405	368	1.10	Angle (44%)	Daylight (83%)	Clear (68%)
	2	12.195 (KY 914)	13.727 (KY 2292)	214	28,600	1.532	0.480	305	446	329	1.36	Rear-End (61%)	Daylight (82%)	Clear (71%)
	3	13.727 (KY 2292)	15.461 (KY 1577)	233	31,000	1.734	0.589	305	396	322	1.23	Rear-End (55%)	Daylight (84%)	Clear (65%)
	4	15.461 (KY 1577)	16.155 (KY 2298)	135	32,700	0.694	0.248	305	543	346	1.57	Rear-End (61%)	Daylight (82%)	Clear (67%)
	5	16.155 (KY 2298)	16.782 (KY 80)	149	33,900	0.627	0.233	305	640	352	1.82	Rear-End (50%)	Daylight (83%)	Clear (72%)
	6	16.782 (KY 80)	16.802 (KY 80B)	23	31,100	0.020	0.007	305	3394	360	9.43	Rear-End (65%)	Daylight (78%)	Clear (70%)
	7	16.802 (KY 80B)	17.841 (N. Urban Limits)	145	20,500	1.039	0.233	305	622	533	1.17	Rear-End (57%)	Daylight (78%)	Clear (68%)
	8	17.841 (N. Urban Limits)	19.502 (W. Racetrack Rd.)	53	14,600	1.661	0.266	91	200	147	1.36	Rear-End (51%)	Daylight (89%)	Clear (58%)
Louie B. Nunn Parkway	1	86.291 (KY 3261)	87.462 (W. Urban Limits)	4	7,540	1.171	0.097	91	41	116	0.36	Single Vehicle (50%)	Daylight (50%)	Clear (50%)
	2	87.462 (W. Urban Limits)	88.547 (US 27/KY 80B)	21	9,270	1.085	0.110	98	191	176	1.08	Angle / Rear-End (33%)	Daylight (76%)	Cloudy (38%)
KY 3260	1	0.000 (KY 80B)	0.387 (E. Somerset Church Rd.)	3	3,030	0.387	0.013	257	234	591	0.40	Single Vehicle (67%)	Daylight (100%)	Clear (67%)
	2	0.387 (E. Somerset Church Rd.)	1.302 (Pine St.)	2	1,420	0.915	0.014	187	141	519	0.27	Sideswipe / Single Vehicle (50%)	Dark (Hwy Lighted) / Dawn (50%)	Cloudy (100%)
KY 39	1	0.000 (KY 1247)	0.286 (KY 80B)	13	2,560	0.286	0.008	241	1622	570	2.84	Rear-End (54%)	Daylight (85%)	Clear (69%)
	2	0.286 (KY 80B)	0.738 (N. Urban Limits)	31	8,830	0.452	0.044	241	709	439	1.62	Rear-End (42%)	Daylight (84%)	Clear (48%)
	3	0.738 (N. Urban Limits)	1.826 (Heritage Place Dr.)	63	8,620	1.088	0.103	197	614	324	1.89	Rear-End (49%)	Daylight (87%)	Raining (38%)

Critical Crash Rate Factor >1, Section Crash Rate Exceeds Statewide Critical Rate (High Crash Rate Section)
 Critical Crash Rate Factor <1, Section Crash Rate Exceeds Statewide Average Rate
 Critical Crash Rate Factor <1, Section Crash Rate Lower Than Statewide Average Rate

Notes:

Analysis Period: 3 Years (4/1/2006 to 3/31/2009)

Crash rates are expressed in crashes per 100 MVM (100 million vehicle miles traveled)

Exposure (M) = [(ADT) x (365) x (Time Frame of Analysis (Years)) x (Section Length)] / 100,000,000

Section Crash Rate = Total Crashes / Exposure

Critical Crash Rate Factor = Section Crash Rate / Statewide Critical Crash Rate

ADT = Average Daily Traffic, MVM = Million Vehicle Miles

For the Manner of Collision, Light Condition, and Weather, the type and percentage reflect the most commonly occurring type

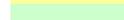
Sources:

Crash data for 4/1/2006 to 3/31/2009 from KYTC Data

Statewide Rates from KTC Research Report KTC-07-26/KSP2-07-1F, Analysis of Traffic Crash Data in Kentucky (2004 – 2008)

Table 5: Crash Rates by Segment (Cont.)

Route	Section	Begin Milepoint	End Milepoint	Total Crashes	Average Daily Traffic	Section Length (miles)	Exposure "M" (100 or 1 MVM)	Statewide Average Crash Rate	Section Crash Rate	Statewide Critical Crash Rate	Critical Crash Rate Factor	Manner of Collision	Light Condition	Weather
KY 80	1	16.205 (KY 1248)	17.794 (W. Urban Limits)	43	9,650	1.589	0.168	197	256	299	0.86	Rear-End (60%)	Daylight (84%)	Clear (81%)
	2	17.794 (W. Urban Limits)	19.016 (US 27)	72	9,860	1.222	0.132	241	546	366	1.49	Rear-End (49%)	Daylight (86%)	Clear (60%)
	3	19.016 (US 27)	20.183 (Maple St./N. Maple St.)	66	7,990	1.167	0.102	241	646	364	1.78	Rear-End (38%)	Daylight (86%)	Clear (67%)
	4	20.183 (Maple St./N. Maple St.)	21.579 (KY 80B)	66	7,760	1.396	0.119	241	556	373	1.49	Rear-End (44%)	Daylight (92%)	Clear (58%)
	5	21.579 (KY 80B)	22.920 (Garner Rd.)	37	15,400	1.341	0.226	91	164	158	1.04	Rear-End (59%)	Daylight (78%)	Clear (54%)
KY 80 B	1	0.000 (US 27)	2.315 (KY 192)	23	16,600	2.315	0.421	305	55	326	0.17	Rear-End (43%)	Daylight (74%)	Clear (61%)
KY 1247	1	2.149 (Dry Brach Rd.)	3.745 (KY 914)	28	3,250	1.596	0.057	197	493	359	1.37	Single Vehicle (39%)	Daylight (75%)	Clear (57%)
	2	3.745 (KY 914)	4.922 (KY 1580)	6	3,490	1.177	0.045	241	133	439	0.30	Rear-End (50%)	Daylight (67%)	Clear (100%)
	3	4.922 (KY 1580)	6.159 (KY 2292)	11	5,460	1.237	0.074	241	149	400	0.37	Angle (45%)	Daylight (82%)	Clear (82%)
	4	6.159 (KY 2292)	6.632 (KY 2303)	10	10,900	0.473	0.056	241	177	415	0.43	Angle / Sideswipe (30%)	Daylight (90%)	Clear (70%)
	5	6.632 (KY 2303)	8.195 (KY 1575)	82	8,080	1.563	0.138	241	593	363	1.63	Rear-End (41%)	Daylight (89%)	Clear (66%)
	6	8.195 (KY 1575)	9.836 (E. Racetrack Rd.)	52	5,920	1.641	0.106	116	489	379	1.29	Rear-End (29%)	Daylight (83%)	Clear (42%)
KY 914	1	0.000 (KY 1577)	13.301 (KY 80)	111	10,070	13.301	1.467	91	76	131	0.58	Angle (32%)	Daylight (69%)	Clear (60%)
KY 769	1	6.790 (Elihu-Rush Br. Rd.)	8.599 (SE Urban Limits)	10	2,110	1.809	0.042	220	239	377	0.63	Single Vehicle (70%)	Daylight (40%)	Clear (70%)
	2	8.599 (SE Urban Limits)	9.765 (KY 80)	14	4,800	1.166	0.061	241	228	407	0.56	Angle / Sideswipe / Single Vehicle (29%)	Daylight (71%)	Clear (64%)

 Critical Crash Rate Factor >1, Section Crash Rate Exceeds Statewide Critical Rate (High Crash Rate Section)
 Critical Crash Rate Factor <1, Section Crash Rate Exceeds Statewide Average Rate
 Critical Crash Rate Factor <1, Section Crash Rate Lower Than Statewide Average Rate

Notes:

Analysis Period: 3 Years (4/1/2006 to 3/31/2009)

Crash rates are expressed in crashes per 100 MVM (100 million vehicle miles traveled)

Exposure (M) = [(ADT) x (365) x (Time Frame of Analysis (Years)) x (Section Length)] / 100,000,000

Section Crash Rate = Total Crashes / Exposure

Critical Crash Rate Factor = Section Crash Rate / Statewide Critical Crash Rate

ADT = Average Daily Traffic, MVM = Million Vehicle Miles

For the Manner of Collision, Light Condition, and Weather, the type and percentage reflect the most commonly occurring type

Sources:

Crash data for 4/1/2006 to 3/31/2009 from KYTC Data

Statewide Rates from KTC Research Report KTC-07-26/KSP2-07-1F, Analysis of Traffic Crash Data in Kentucky (2004 – 2008)

Table 5: Crash Rates by Segment (Cont.)

Route	Section	Begin Milepoint	End Milepoint	Total Crashes	Average Daily Traffic	Section Length (miles)	Exposure "M" (100 or 1 MVM)	Statewide Average Crash Rate	Section Crash Rate	Statewide Critical Crash Rate	Critical Crash Rate Factor	Manner of Collision	Light Condition	Weather
KY 192	1	0.000 (KY 80)	1.076 (KY 692)	11	4,490	1.076	0.053	197	208	363	0.57	Single Vehicle (45%)	Daylight (91%)	Clear (55%)
KY 1642	1	3.782 (Bourbon Rd.)	4.621 (SW Urban Limits)	16	3,240	0.839	0.030	220	538	427	1.26	Angle (44%)	Daylight (69%)	Clear (88%)
	2	4.621 (SW Urban Limits)	6.035 (KY 914)	20	3,610	1.414	0.056	241	358	408	0.88	Rear-End (45%)	Daylight (80%)	Clear (55%)
KY 2292	1	0.000 (US 27)	0.508 (KY 2291)	17	5,260	0.508	0.029	116	581	470	1.24	Rear-End (41%)	Daylight (82%)	Clear (59%)
	2	0.508 (KY 2291)	1.420 (KY 2444)	19	6,670	0.912	0.067	116	285	394	0.72	Angle (42%)	Daylight (84%)	Clear (47%)
	3	1.420 (KY 2444)	1.870 (KY 1577)	10	10,800	0.450	0.053	116	188	411	0.46	Rear-End (70%)	Daylight (100%)	Clear (70%)
	4	1.870 (KY 1577)	2.361 (KY 1247)	5	13,200	0.491	0.071	241	70	402	0.18	Single Vehicle (40%)	Daylight (80%)	Clear / Cloudy (40%)
KY 1577	1	0.662 (Oak Valley Rd.)	4.395 (KY 2292)	48	6,960	3.733	0.284	197	169	285	0.59	Rear-End (52%)	Daylight (71%)	Clear (48%)
KY 3261	1	0.000 (KY 1577)	0.166 (Patterson Branch Rd.)	7	6,310	0.166	0.011	220	610	363	1.68	Sideswipe (43%)	Daylight (100%)	Cloudy (43%)
	2	0.166 (Patterson Branch Rd.)	2.502 (KY 80)	31	1,590	2.336	0.041	220	762	384	1.99	Single Vehicle (48%)	Daylight (90%)	Raining (35%)
	3	2.502 (KY 80)	4.533 (KY 3263)	6	930	2.031	0.021	187	290	449	0.65	Angle (50%)	Daylight (83%)	Cloudy (67%)
KY 1674 (3091)	1	0.000 (US 27)	1.538 (Wilson Rd.)	15	1,610	1.538	0.027	220	553	436	1.27	Single Vehicle (40%)	Daylight (73%)	Clear (53%)
KY 3263	1	1.800 (KY 3261)	3.489 (Louie B. Nunn Pkwy)	18	1,940	1.689	0.036	187	502	395	1.27	Angle (35%)	Daylight (71%)	Clear (71%)
KY 1575	1	0.000 (KY 2227)	0.490 (KY 1247)	11	5,620	0.490	0.030	241	365	467	0.78	Angle / Rear-End (36%)	Daylight (91%)	Clear (73%)
	2	0.490 (KY 1247)	1.151 (KY 39)	12	4,000	0.661	0.029	241	415	498	0.83	Angle / Rear-End (42%)	Daylight (92%)	Clear (83%)

Critical Crash Rate Factor >1, Section Crash Rate Exceeds Statewide Critical Rate (High Crash Rate Section)
 Critical Crash Rate Factor <1, Section Crash Rate Exceeds Statewide Average Rate
 Critical Crash Rate Factor <1, Section Crash Rate Lower Than Statewide Average Rate

Notes:

Analysis Period: 3 Years (4/1/2006 to 3/31/2009)

Crash rates are expressed in crashes per 100 MVM (100 million vehicle miles traveled)

Exposure (M) = [(ADT) x (365) x (Time Frame of Analysis (Years)) x (Section Length)] / 100,000,000

Section Crash Rate = Total Crashes / Exposure

Critical Crash Rate Factor = Section Crash Rate / Statewide Critical Crash Rate

ADT = Average Daily Traffic, MVM = Million Vehicle Miles

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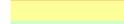
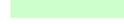
Sources:

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Table 5: Crash Rates by Segment (Cont.)

Route	Section	Begin Milepoint	End Milepoint	Total Crashes	Average Daily Traffic	Section Length (miles)	Exposure "M" (100 or 1 MVM)	Statewide Average Crash Rate	Section Crash Rate	Statewide Critical Crash Rate	Critical Crash Rate Factor	Manner of Collision	Light Condition	Weather
KY 2299	1	0.000 (KY 2292)	0.286 (US 27)	1	730	0.286	0.002	257	437	896	0.49	Sideswipe (100%)	Dawn (100%)	Clear (100%)
KY 2298	1	0.000 (KY 2292)	0.736 (US 27)	21	3,000	0.736	0.024	257	869	502	1.73	Angle (38%)	Daylight (71%)	Clear (48%)
KY 1580	1	0.000 (Crane Factory)	0.395 (KY 1247)	1	1,040	0.395	0.004	257	222	735	0.30	Backing (100%)	Daylight (100%)	Clear (100%)
KY 2227	1	0.000 (US 27)	2.021 (E. Racetrack Rd.)	2	4,340	2.021	0.096	220	21	322	0.06	Angle / Backing (50%)	Daylight (100%)	Clear / Cloudy (50%)

 Critical Crash Rate Factor >1, Section Crash Rate Exceeds Statewide Critical Rate (High Crash Rate Section)
 Critical Crash Rate Factor <1, Section Crash Rate Exceeds Statewide Average Rate
 Critical Crash Rate Factor <1, Section Crash Rate Lower Than Statewide Average Rate

Notes:

Analysis Period: 3 Years (4/1/2006 to 3/31/2009)

Crash rates are expressed in crashes per 100 MVM (100 million vehicle miles traveled)

Exposure (M) = [(ADT) x (365) x (Time Frame of Analysis (Years)) x (Section Length)] / 100,000,000

Section Crash Rate = Total Crashes / Exposure

Critical Crash Rate Factor = Section Crash Rate / Statewide Critical Crash Rate

ADT = Average Daily Traffic, MVM = Million Vehicle Miles

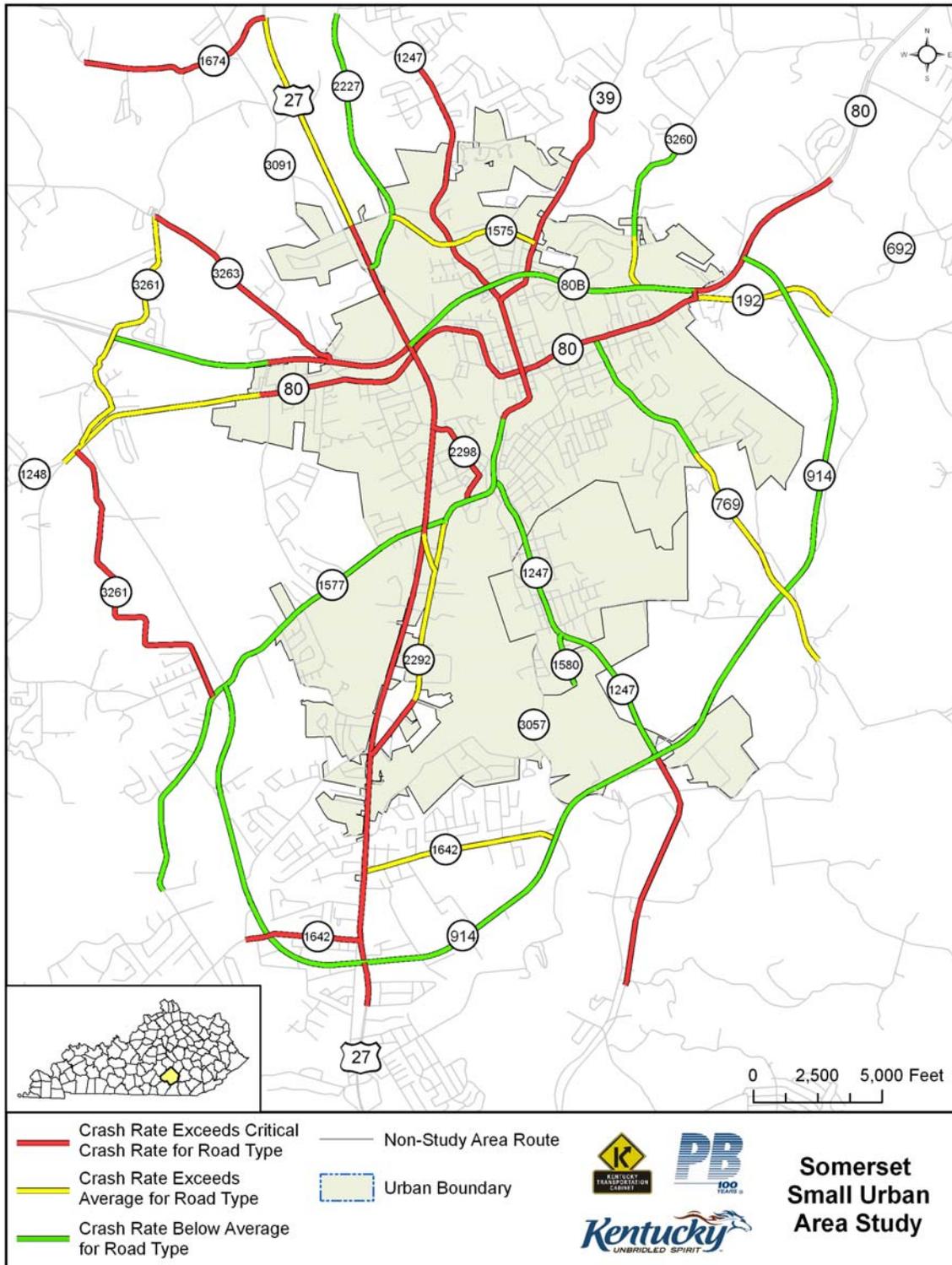
For the Manner of Collision, Light Condition, and Weather, the type and percentage reflect the most commonly occurring type

Sources:

Crash data for 4/1/2006 to 3/31/2009 from KYTC Data

Statewide Rates from KTC Research Report KTC-07-26/KSP2-07-1F, Analysis of Traffic Crash Data in Kentucky (2004 – 2008)

Figure 6: Crash Rates by Segment



2.2.4.3 Crash Type Analysis

Due to the number of crashes within the primary study area, an additional crash analysis was conducted to look at severity and crash type.

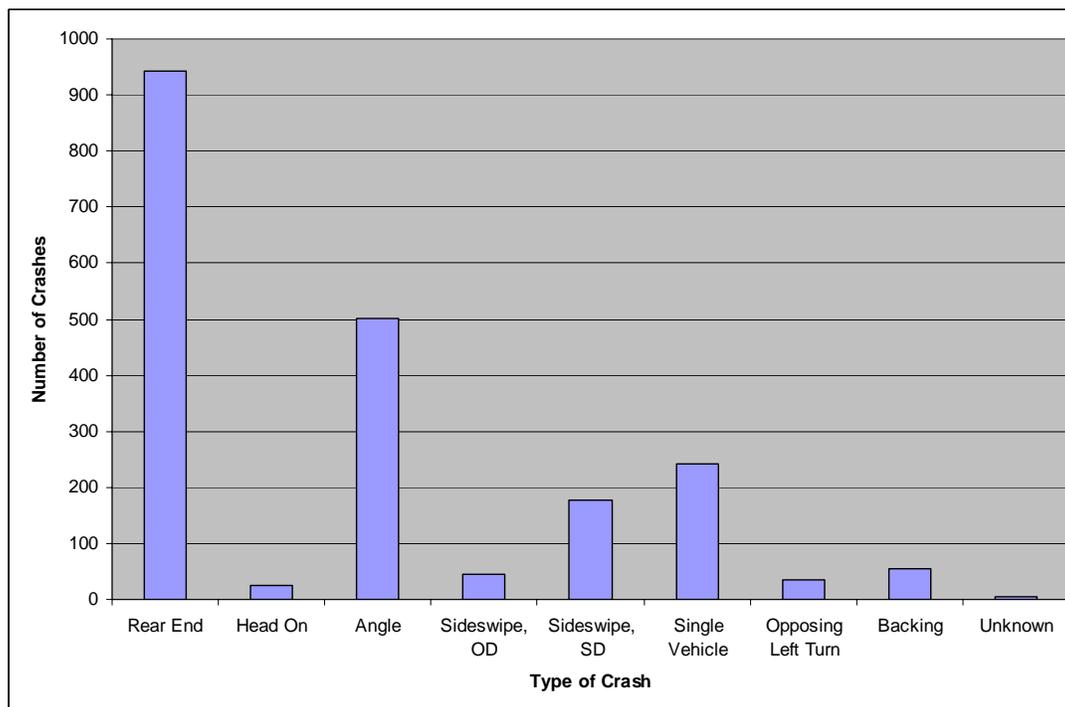
A breakdown of the crash severity for the entire area is provided below.

<u>Severity</u>	<u>Number of Crashes</u>	<u>Percentage</u>
Property Damage Only	1,671	82.3%
Injury	349	17.2%
Fatality	10	0.5%
	<u>2,030</u>	<u>100.0%</u>

The majority of crashes were property damage only (PDO) crashes (1,671). Almost one-fifth of the crashes involved at least one injury, and ten fatal crashes occurred between April 1, 2006 and March 31, 2009. Of the 10 crashes that involved a fatality, four took place on KY 914. Four of the 10 fatal crashes were angle crashes, three were single vehicle crashes, one was a head on crash, one was an opposing left turn crash and one was a rear end crash. The weather was not a contributing factor in the majority of these crashes.

A review of all crash types for the study area was performed to determine the most frequent type. **Figure 7** shows the results.

Figure 7: Crash Types (April 2006 – March 2009)



The majority of crashes were rear end crashes (approximately 46%), although there were also a significant number of angle, sideswipe, and single vehicle crashes.

The crash data for manner of collision, light condition, and weather was further stratified for each section and analyzed to determine the most commonly occurring type. This is listed in **Table 5** following the crash rate calculations. For a graphical depiction of primary manner of collision by roadway, refer to the graphics included in **Appendix A**.

2.2.5 Multimodal Facilities (Transit, Bicycle and Pedestrian)

There are currently no fixed-route transit services or facilities in the study area, nor are there any plans to add them to the area.

The Lake Cumberland Community Action Agency (LCCAA) provides some limited transportation for senior adults living in Pulaski County, typically through an established senior center. Also, the Rural Transit Enterprises Coordinated, Inc. (RTEC) a non-profit corporation providing transportation services in Pulaski County provides demand response public transit services for the elderly and the disabled, as well as intercity routes providing access to larger areas such as Lexington, rides for jobs access and new freedom rides also for the elderly / disabled.

There are no bicycle facilities currently in the study area; however, the City of Somerset has plans to develop and construct a bicycle trail in the future.

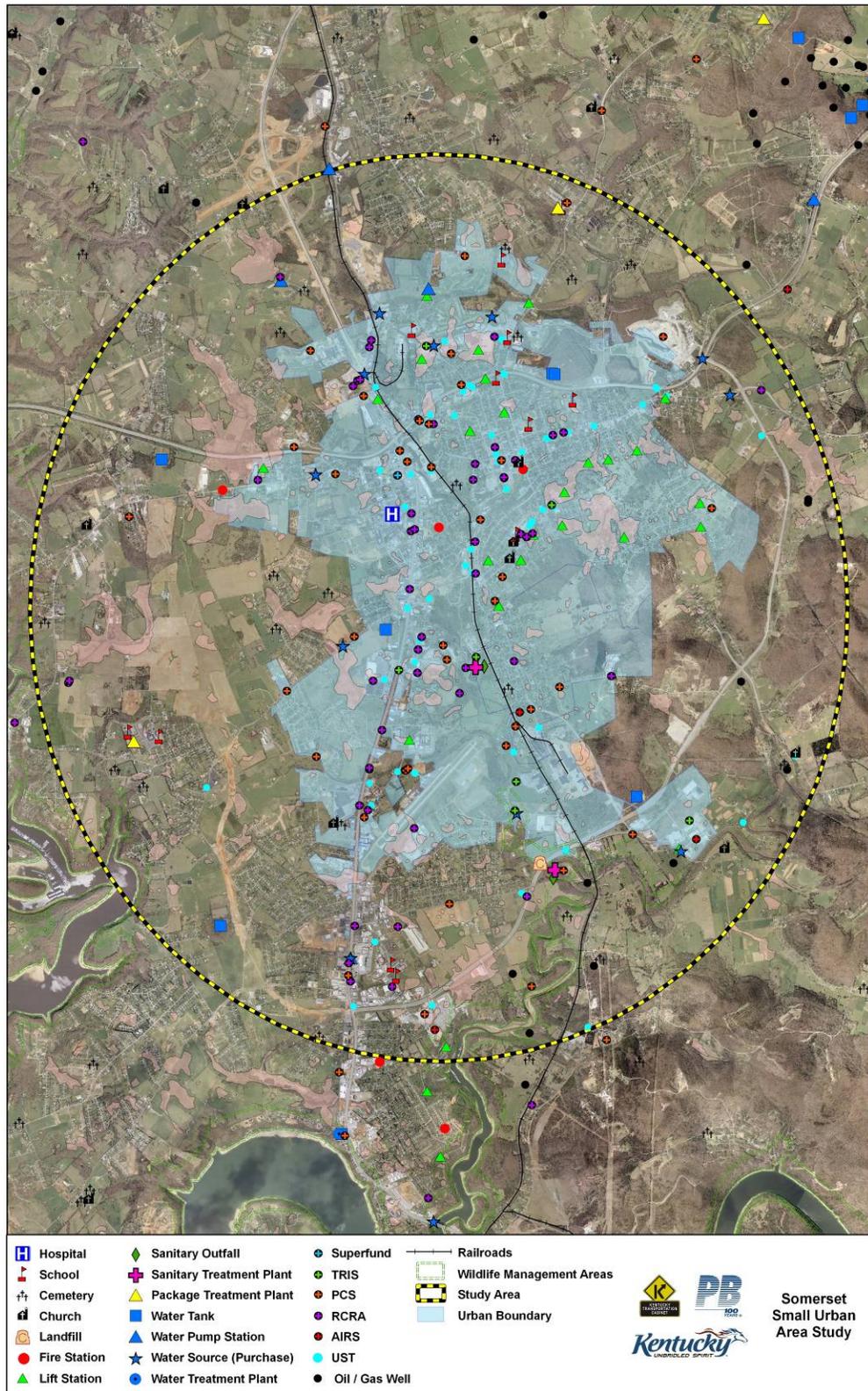
Pedestrian facilities are intermittent throughout the study area, with some roadways having sidewalks. At initial project meetings, there was some discussion about adding sidewalks and crosswalks along US 27. The PDT decided that such features would not be advisable for the following reasons:

- Unsafe for pedestrians given high traffic volumes spread over a 6-lane arterial roadway
- Increase traffic congestion due to the need to adjust traffic signal timings, allowing enough green time to side streets to allow pedestrians to cross the 6-lane facility, as well as eliminate right turns on red.

2.3 Human Environment Overview

An overview was conducted to determine the general characteristics of the human environment in the study area. The analysis addressed: general socioeconomic characteristics, Environmental Justice, underground storage tanks and other hazardous materials sites, and cultural / historic and archaeological characteristics. The following sections provide a summary of findings. The full environmental overview is included in **Appendix B**. **Appendix C** contains the Environmental Justice assessment performed by the LCADD. **Figure 8** depicts on a map many of the human environment characteristics relevant to this study.

Figure 8: Human Environment Characteristics



2.3.1 Socioeconomic Profile

2.3.1.1 Population Growth

The City of Somerset and the surrounding areas of Pulaski County are growing populated areas. **Table 6** shows population data from the 1990 and 2000 United States Census Bureau for Pulaski County. The 2000 US Census shows the City of Somerset having a population of 11,352. Based on population growth, the study area is growing rapidly and is expected to continue to grow at a significant pace in the future, warranting continued monitoring of the transportation system.

Table 6: Study Area Populations

	1990	2000	2030	% Growth (1990 – 2000)	% Growth (2000 – 2030)
Pulaski County	49,789	56,217	74,143	13.30%	31.90%

Source: US Census Bureau

2.3.1.2 Local Economy

Unemployment information was obtained from the Kentucky Education and Workforce Development Cabinet⁸. In January 2010, Pulaski County's unemployment rate was 12.1%, which is higher than the January 2010 rate for Kentucky which was at 10.7%.

The highest percentage of employees in Pulaski County is in the Trade, Transportation, and Utilities industry as shown on **Table 7**. As shown in **Table 8**, large private employers in the area include: Toyotetsu America, Inc., Super Service, Armstrong Wood Products, and Eagle Hardwoods, Inc.

Table 7: Pulaski County Employment by Major Industry (2008)

Pulaski County	Employment	Percent
Agriculture, Forestry, Fishing and Hunting	0	0.0
Mining	0	0.0
Construction	1,058	4.2
Manufacturing	3,565	14.1
Trade, Transportation, and Utilities	5,951	23.5
Information	240	0.9
Financial Activities	883	3.5
Services	4,520	17.9
Public Administration	900	3.6
Other	28	0.1
All Industries	25,320	100.0

Source: US Department of Labor, Bureau of Labor Statistics

⁸ Kentucky Education and Workforce Development Cabinet. <http://workforce.ky.gov/Jan10charts.pdf>. 03/22/10.

Table 8: Major Employers in Pulaski County

Firm	Product(s)/Service(s)	Emp.	Year Established
Armstrong Wood Products	Hardwood flooring	380	1989
Coretrans	Trucking, long distance carriers	112	2002
Crane/FIAT/Sanymetal	Steel restroom partitions & plastic bathtubs, showers, shower floors & bathroom fixtures	118	1992
Eagle Hardwoods, Inc.	Hardwood flooring, wood pellet fuel	265	1994
GE Somerset Glass Plant	Pressed glassware (headlights)	123	1959
H T Hackney	Wholesale / Distribution	61	1977
Hinkle Contracting – Cumberland Paving	Asphalt paving products	70	1971
Kentucky Hardwood Lumber Co.	Hardwood lumber	68	1978
Mac Metals	Metal roofing and siding	70	1988
New Life Industries, Inc.	Silk screen printing, embroidery, and transfers on sportswear. Applique and laser etching as well as pad printing	80	1979
Presidium	Software technical support center	100	2007
Sharpe Marine, Inc.	Aluminum and luxury houseboats	85	1998
Somerset Energy Refining, LLC	Gasoline, kerosene, diesel and industrial fuels	68	2008
Somerset Food Service	Food distributor	130	1988
Somerset Recycling Service, Inc.	Cardboard and plastic recycling; waste reduction programs, recycling equipment, colorant	85	1984
Southern Belle Dairy Co, LLC	Liquid milk, juice drinks, and 100% orange juice from concentrate	235	1951
Super Service	Truckload interstate carrier	613	1987
Toyotetsu America, Inc.	Structural automotive components and stampings	750	1995
UGN, Inc.	Manufacture automotive sound proofing	172	2005
Wonderfuel, LLC	Fireplace logs	60	N/A

Source: Kentucky Cabinet for Economic Development

2.3.2 Environmental Justice

The Environmental Justice (EJ) assessment prepared by the LCADD examined potential disproportionate adverse community impacts on selected groups (minority, low-income and elderly) within the defined project study area for the proposed transportation improvement(s). A summary of the assessment is provided below. For a more in-depth analysis, refer to **Appendix C** which contains the entire EJ analysis report.

The LCADD's purpose of the assessment was to assist the Kentucky Transportation Cabinet in carrying out the Division of Planning's mission "...to collect, maintain, analyze and report accurate data for making sound fiscally responsible recommendations regarding the maintenance, operation and improvement of our transportation network" and to fulfill applicable federal Environmental Justice commitments. KYTC's purpose for assessing Environmental Justice impacts is to identify minority, low-income, or elderly, or disabled populations that may be affected by recommended projects.

The assessment focused on identifying, through a demographic analysis, the extent to which EJ populations and other groups of concern reside in or near the study area and may be impacted by improvement projects. Subsequent actions (determination of disproportionately high and / or adverse effects; proposing measures to avoid, minimize, and/or mitigate such effects; and providing specific opportunities for public involvement) may be undertaken, as appropriate, contingent upon the results of the demographic analysis.

For reference, there are 24 Block Groups within 5 Census Tracts within the study area.

Population by Race

Pulaski County's population by race percentages is lower than the national and state averages. There are some locations within the study area that merit further discussion. In the Block Groups along and east of US 27 and along and south of KY 80B, there are higher than state (but lower than national) percentages of black populations. In Block Groups along the west side of US 27, south of KY 914, and along and south of KY 80B, there are Hispanic populations higher than county percentages but comparable with state and national percentages. Field observations and discussion with local community members revealed that projects being evaluated as part of this study should not adversely affect the minority populations.

Population by Poverty

Within the study area, there are elevated percentages in the populations below poverty level that might be indicative of concentrations throughout the study area. In particular, the Census Tract along and east of US 27 has the highest percentage below the poverty level in Pulaski County (22.6%). However, based on the economic status of this rural depressed county, these percentages are not uncommon for this area.

A subsequent review of poverty data within affected Census divisions should be undertaken to determine if particular concentrations of population below the poverty level exist in the study area, and if so, proactive measures be undertaken to ensure that these groups are not disproportionately affected by any projects.

Population by Persons 65 and Over

The findings of this assessment indicate that there is a concentration of populations over 65 years of age in Somerset. Generally, the aging characteristics and percentages for the study area are similar to other Census Tracts in the county, the state, and the nation. The areas where there are elevated percentages are centered on older subdivisions, older homes in the downtown area, and a large nursing home. It is anticipated that the implementation of projects would not have a disproportionate effect on the population of persons age 65 and over residing in the study area.

2.3.3 Underground Storage Tanks and Hazardous Materials

There are 673 underground storage tank (UST) sites identified within the Somerset Corporate limits. Of the 673 UST sites, only 327 were within the defined study area and had accurate location information for mapping purposes. 93 of those tanks are currently active.

According to the Kentucky Division of Waste Management, there is one active landfill near Somerset; however, it is located to the southeast of the study area. In addition to the landfill, there is a recycling facility on-site at the landfill.

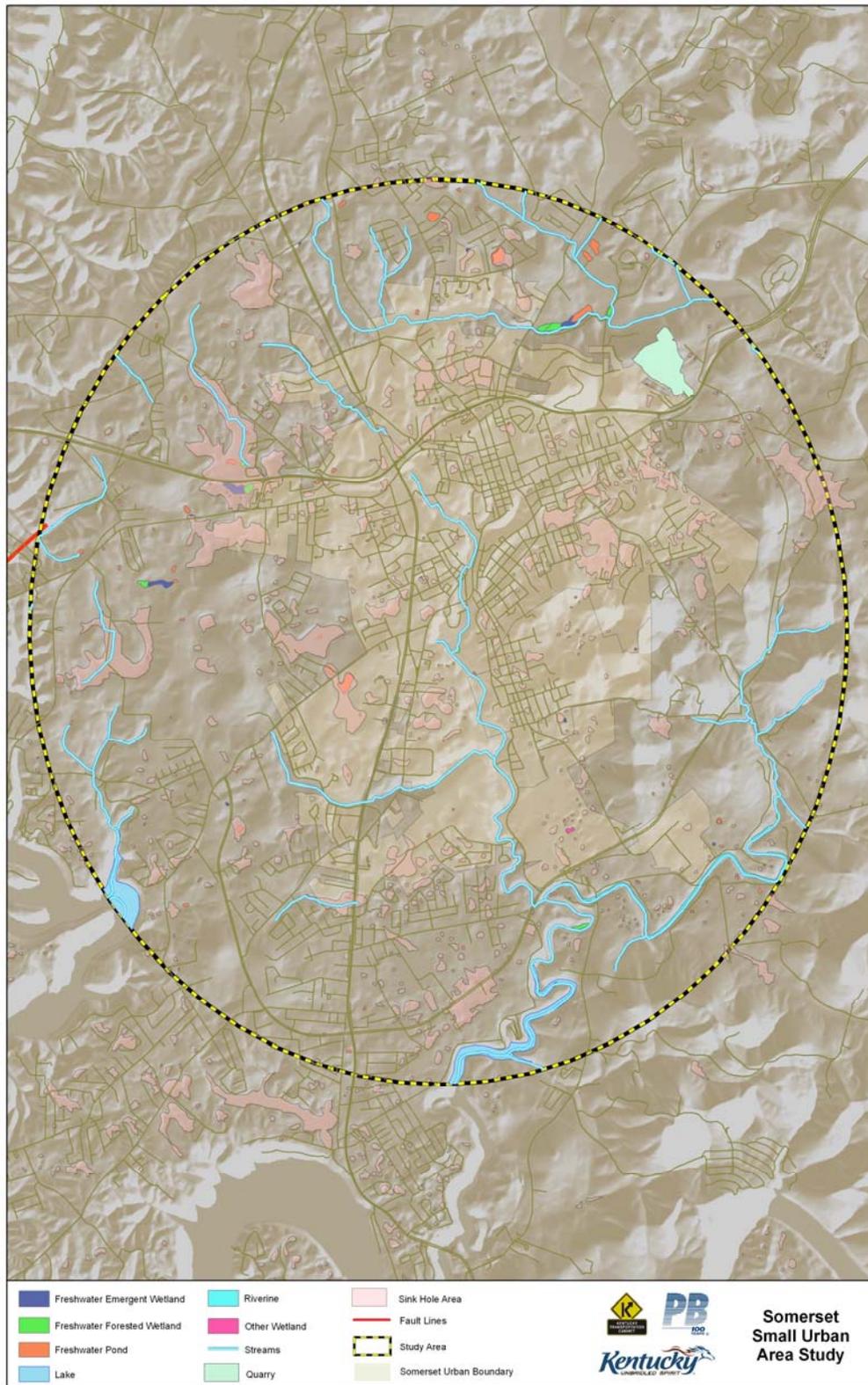
2.3.4 Previously Documented Cultural Historic and Archaeological Sites

There are 25 locations listed on the National Register of Historic Places in Somerset. The list includes Harvey's Hill Historic District, North Main Street Historic District, Somerset Downtown Commercial District, South Courthouse Square Historic District and West Columbia District. In addition to these districts there are 18 historic districts and 2 historic monuments. There are likely many more sites within the study area that have potential to be nationally registered. This study recommends few new roadways; therefore, it is unlikely that any potential historic locations will be affected. It is suggested that further study and documentation be completed to avoid or mitigate impacts if any recommended project exists in areas where there may be impacts to potential sites.

2.4 Natural Environment Overview

A broad environmental overview was conducted to determine the characteristics of the natural environment in the study area. Resources addressed included aquatic resources such as rivers and creeks, wetlands, floodplains and potential for karst topography, as well as threatened, rare and/or endangered species. Also addressed is air quality and traffic noise. The following sections and figure (**Figure 9**) provide a summary of impacts. Refer to **Appendix B** for the complete environmental overview.

Figure 9: Natural Environment Characteristics



2.4.1 Aquatic Resources

The study area is located in the Upper Cumberland – Lake Cumberland sub-basin (HUC# 05130103) in the Pitman Creek Watershed. Pitman Creek flows from the western side of the study area south to Lake Cumberland. Other creeks in the area include Allen Branch, Spring Creek, Caney Fork and Dry Branch.

2.4.2 Wetlands

According to National Wetlands Inventory data, there are 108 palustrine wetlands in the study area.

2.4.3 Floodplains

Floodplains in the study area were examined from historic Flood Insurance Rate Maps (FIRMs) produced by FEMA. Because many of the improvements are to transportation infrastructure, there are likely to be minimal to no impacts on the adjacent tributaries, streams, rivers, etc. Where these improvements occur within an existing floodplain, they present minimal additional risk since they augment or replace the existing infrastructure that is already at risk.

2.4.4 Karst Topography

The area does have a high potential for karst (sinkhole) features which should be taken into account for each project that is recommended. Refer to **Figure 9** for specific locations where karst topography may exist.

2.4.5 Threatened, Rare, and Endangered Species

There are 13 federally listed species in Pulaski County listed by the United State Fish and Wildlife Service that are threatened or endangered. The list includes two mammals, nine mussels, one plant and one fish species.

2.4.6 Air Quality

Pulaski County is currently designated in attainment status for air quality. As mentioned previously, because this study looks to improve existing transportation infrastructure and does not add substantial new capacity, it is not expected that any projects as a result of this study would have a negative impact on the current attainment status of Pulaski County.

2.4.7 Traffic Noise

A specific noise analysis was not conducted for this study. While there are potentially sensitive noise receptors such as churches, schools, cemeteries, etc., throughout the

study area, projects suggested as a result of this study are not likely to increase substantially the existing level of traffic noise in the study area.

2.5 Geotechnical Overview

The Geotechnical Branch of KYTC completed a review of the project study area. A summary of the findings is given below:

The study area is located within the Somerset and Delmar Geologic Quadrangle Maps. It is underlain by Quaternary age Alluvium, Mississippian Age bedrock of the Monteagle Limestone, St. Louis Limestone, Salem and Warsaw Formation and the Muldraugh Member of the Borden Formation.

In addition to giving a background on the geologic features of the area, the memorandum lists geotechnical concerns with some of the proposed projects. Encountering sinkholes is the main concern with the majority of the projects. The specific geotechnical concerns that are associated with each project are noted in the alternatives evaluation section of the report.

For the full geotechnical documentation, refer to **Appendix D**.

3.0 PUBLIC INVOLVEMENT

Public involvement for this study was comprised of several elements designed to encourage participation and obtain feedback from the stakeholders in Somerset and Pulaski County. These include:

- Development of PAC / Meetings with PAC
- Multiple meetings with the PDT

These components are discussed further in this section with the results and feedback incorporated into the entire report, particularly the development of alternatives. Copies of the meeting summaries are included in **Appendix E** for reference.

3.1 Project Advisory Committee Meetings

For the Somerset SUA Study, a PAC was formed to provide input on project issues, improvement alternatives, and project rankings. The PAC was composed of local officials and stakeholders that represented the community of Somerset and Pulaski County. Two meetings with the PAC were held to encourage participation and obtain feedback from the community officials and stakeholders.

The first PAC meeting was held on June 10, 2009 at the KYTC District 8 office. The purpose of this meeting was to define the role of the PAC, present the existing conditions information, and solicit preliminary feedback regarding potential transportation issues and possible solutions.

The second PAC meeting was held on February 18, 2010 at the KYTC District 8 office. The purpose of this meeting was to present the proposed projects to the PAC and obtain feedback, specifically regarding prioritization of the projects. Meeting minutes from both meetings can be found in **Appendix E**.

3.2 Project Development Team Meetings

Three official meetings were also held with the PDT which consisted of KYTC, the LCADD, and PB. These meetings were held to discuss project issues, make project decisions, discuss the development, evaluation and prioritization of projects and generally keep the project on schedule. Copies of all meeting summaries are included in **Appendix E** for reference.

4.0 ALTERNATIVES DEVELOPMENT AND EVALUATION

A detailed, multi-step process was used to develop and evaluate potential projects for the Somerset area. The process included technical analysis from the existing conditions review, input from the PDT, input from the PAC, and field reviews. The framework for developing and evaluating improvement projects is shown in **Figure 10** below.

Figure 10: Project Development Steps

4.1 Identification of Issues

The first step in the project development process was to identify transportation issues related to safety, congestion and operations in the Somerset area. These issues could range from specific spot locations where transportation improvements could be warranted, to broader system perspective needs. Input from multiple sources was used to determine transportation issues within the study area. These include the following:

- PDT Meeting #1 – April 14, 2009
- Field Review – April 14, 2009
- PAC Meeting #1 – June 10, 2009
- On-going Technical Analysis

At the first PDT meeting, several issues were identified regarding the overall transportation network in Somerset as well as specific spot locations. These issues are listed on **Table 9**. Additional locations with transportation issues were identified during the field review following the PDT meeting. These too are listed on **Table 9**. Finally, several additional issues were discussed and added to the list from the first PAC meeting. Generally, all issues mentioned from these meetings were added to the list for evaluation. Additional detail about each issue can be found in the specific meeting minutes in **Appendix E**.

Based on the technical analysis discussed in the existing conditions section, areas / spots with poor levels of service and / or high crash rates were also included in the list of issues.

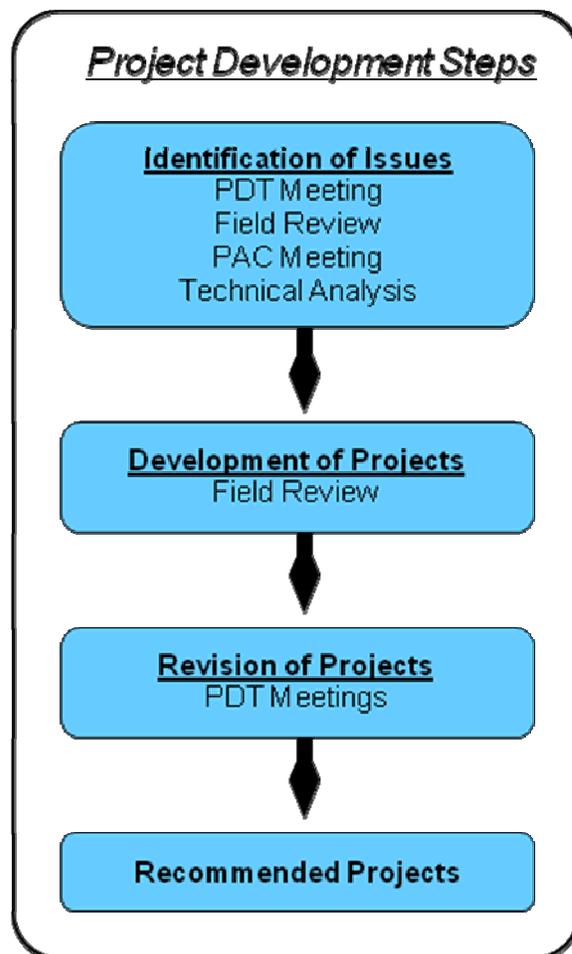


Table 9: Development of Projects

PDT Meeting #1 List of Issues	Initial List of Improvement Projects		Revised List of Improvement Projects	
	Project #	Improvement Project	Project #	Improvement Project
Overall transportation network improvement plan needed for public to understand interrelation of on-going and planned projects	→ LT-H	Coordinate with local agencies to communicate to public transportation network master plan	→ LT-L	Coordinate with local agencies to communicate to public transportation network master plan
Signage / wayfinding improvements	→ LT-I	Identify destination sites and preferred paths and conduct a wayfinding study	→ LT-M	Identify destination sites and preferred paths and conduct a wayfinding study
Traffic signal cycle length reduction along US 27 with permitted / protected left turn phasing	→ LT-E	Evaluate traffic signal cycle lengths on US 27	→ LT-H	Further study of signal timings along US 27
KY 1247 / KY 1575 (4-way STOP at University Dr.)	→ ST-A	Geometric reconfiguration or signalization for KY 1247 and KY 1575	→ LT-E	Install separate left turn lanes along KY 1247 at intersection with KY 1575
KY 1642 / Slate Branch Road	→ N/A	Improvement projects currently planned by KYTC	→	N/A
KY 914 / US 27 / KY 80 (potential for development)	→ LT-B	Provide "smart growth" plan for KY 914 between US 27 and KY 80	→ LT-B	Extension of KY 3263
Monticello Street / Campus 4-way STOP	→ N/A	Improvement projects currently planned by KYTC	→	N/A
Airport access area	→ L-A	Geometric realignment of airport entrance access	→ L-A	Geometric realignment of airport entrance access
Left Turn from Monticello St. onto Bourne Ave. / toward Ferguson	→ ST-B	Add SB left turn lane and NB right turn lane along KY 1247 onto Bourne Ave.	→ LT-F	Add turn lanes along KY 1247 for SB left and NB right turns onto Bourne Ave.
KY 1247 (Monticello Street)	→ N/A	Improvement projects currently planned by KYTC	→	N/A
Oak Hill Road / WTLO (KY 3261) (close signals / schools)	→ ST-C	Realign KY 3261	→ LT-K	Planning study to determine best solutions for KY 1577 / KY 3261 intersection
PAC Meeting #1 List of Issues				
Separate through traffic from right turn traffic along US 27	→ LT-F	Add right turn lanes along US 27 at major intersections (maintain 6 lanes)	→ LT-D	Addition of right turn lanes along US 27
Lane continuity along KY 914	→ LT-A	Widen KY 914 from KY 80 to just south of KY 769	→ LT-A	Widen KY 914 from KY 80 to just south of KY 769 to four lanes
I-66 project relation to Somerset	→ LT-J	Regional traffic flow study in conjunction with I-66 project	→ N/A	Removed due to no interest in further pursuit at this time
US 27 aesthetic improvements	→ LT-G	Provide curb and gutter median with landscaping along US 27	→ L-E	Installation of grass median along US 27
US 27 transitional gateways	→ L-C	Addition of aesthetic gateway treatments to US 27 corridor	→ L-C	Addition of aesthetic gateway treatments to US 27 corridor
Difficult to see traffic signal at US 27 / KY 2227 / KY 3091 at night	→ ST-D	Improve visibility of first traffic signal	→ N/A	Removed due to completion by KYTC
Improved signage to Somerset airport	→ ST-E	Install largers signs on US 27 for airport access	→ N/A	Removed due to completion by KYTC
Bicycling and walking improvements	→ LT-D	Provide sidewalk along KY 3261 on way to elementary and high schools	→ L-D	Addition of sidewalk along KY 3261
Field Review Issues				
S. Central Ave. / Marydale Ave. / Bourne Ave.	→ L-B	Geometric realignment of S. Central Ave., Marydale Ave., and Bourne Ave.	→ L-B	Geometric realignment of S. Central Ave., Marydale Ave., and Bourne Ave.
KY 80 / Ohio St. / Limestone St.	→ N/A	Improvement not developed during this stage	→ ST-C	Safety improvements at KY 80 / Ohio St. / Limestone St. intersection
Technical Analysis				
US 27 / KY 80 and US 27 / KY 80B Intersections	→ ST-F	Evaluate US 27 / KY 80 / KY 80B signal timings and coordination after bypass completion	→ ST-A	Evaluate US 27 / KY 80 / KY 80B signal timings and coordination after bypass completion
US 27 / Washington Dr. Intersection	→ ST-G	Add SB right turn lane from US 27 onto Washington Ave.	→ LT-I	Add SB right turn lane from US 27 onto Washington Dr.
US 27 / Oak Hill Rd. (KY 1577) Intersection	→ ST-H	Add SB right turn lane from US 27 onto KY 1577 and limit access to adjacent business	→ LT-J	Add SB right turn lane from US 27 onto KY 1577 and limit access to adjacent business
KY 80 / KY 914 Intersection	→ ST-I	Improve signage instructing drivers to turn left on KY 914 for Lake Cumberland access	→ N/A	KYTC currently coordinating with other agencies to explore options to improve tourist signage
KY 39 / KY 80B Intersection	→ ST-J	Extend acceleration lanes on KY 80B and address traffic signal sight distance issue	→ LT-G	Extend EB left turn lane and acceleration lane along KY 80B in the WB direction at KY 39
KY 80	→ N/A	Improvement projects currently planned by KYTC	→	N/A
KY 39	→ LT-C	Improve geometrics along KY 39	→ LT-C	Addition of left turn lanes along KY 39 near schools
			→ ST-B	Safety improvement of vertical curve near Gover Mill Rd.

4.2 Development of Projects

A list of projects was developed to address these issues if possible. Each issue (if possible) was evaluated during a field review held on August 20, 2009. Members of KYTC, LCADD, and PB participated in the field review. The field review combined with previous technical analysis led to the initial list of projects. As directed at the outset of the study, projects were initially categorized by implementation type, i.e. local (L), short-term (ST) and long-term (LT). More specifically:

- Local projects are projects that were identified but need to be funded using local funding.
- Short-term projects are projects that the state can fund, can be completed relatively quickly, and can be funded using safety or maintenance money, (i.e. they do not need to be put into the Six-Year Plan).
- Long-term projects are projects funded by the state, but require a more significant amount of time to complete and require more funding, and therefore will be considered for addition to the Six-Year Plan.

Therefore, each project was assigned a project number beginning with the implementation type and then a letter in alphabetical order. It should be noted that the initial letter designation was **not** a reflection of priority. **Table 9** shows the developed list of projects that resulted from the initial list of issues. The issue is listed in the first column with the resulting project listed in the middle column next to it.

In some cases, projects were not recommended for an identified issue. In the current planning and program documents from KYTC, projects are already developed for KY 80, KY 1247, and KY 1642. As such, it was determined that no additional improvement projects are needed at this time to address existing issues along these highways. In the case of the KY 80 / Ohio Street / Limestone Street intersection, a project was not developed at this time. This intersection was discussed later in the planning process for this study with a project identified near the end of the study.

For the KY 1247 / KY 1575 intersection, multiple alternatives were developed as there was not enough information to determine the appropriate improvement. These included the addition of turn lanes, signalization of the intersection, and re-construction of the intersection to a roundabout.

4.3 Revision of Projects

Following the initial development of improvement projects, additional work was completed to determine the resulting impacts. This detailed analysis considered:

- Traffic impacts
- Safety impacts
- Human and natural environment impacts
- Community impacts
- Costs

Improvement projects also were re-categorized as more information was determined for each. An example of such would be that the geometric reconfiguration of the KY 1247 / KY 1575 intersection was initially classified as a short-term project, however, once more detailed analysis was completed with an assessment of impacts and costs, this project was determined to be a long-term project. In addition, the intersection of KY 1247 / KY 1575 initially had multiple improvement options (additional lanes, signalization, re-construction to provide a roundabout). Through an evaluation of traffic operations and signal warrants, a recommendation was made for this project to initially construct additional turn lanes along KY 1247 to improve traffic flow. Detailed analysis used in making the determination of the appropriate recommendation can be found in **Appendix F**.

Discussions with the PDT also helped with the revision / re-categorization of projects. The final list of improvement projects is provided in **Table 9** (furthest column on the right). As shown, it is possible to see on this table the evolution of a project from its origin – to its final project recommendation. **Tables 10 – 12** show the detailed analysis completed to assist with the finalization of improvement projects.

Table 10: Local Projects Evaluation Matrix

Project	Description	Traffic Evaluation				Safety Evaluation		Natural Environmental Impacts		Human Environmental Impacts		Community Impacts				Cost Estimate*				
		2009 ADT	2009 LOS	2030 ADT	2030 LOS	Access	CCRF	Safety Improvements	Wetlands	Karst Topography	Environmental Justice	Landfills / USTs	Impacts to Businesses	Impacts to Residences	Impacts to Schools / Community Facilities		Stakeholder / Elected Official Ratings			
L-A	Geometric realignment of airport entrance access	Data Not Available at Local Level				Improves through enhanced visibility	Data Not Available at Local Level	Improves sight distance	None	Some Nearby	No impacts	None	Improves access to airport / other businesses along this road	None	None	Tied for 2nd	\$316,000			
L-B	Geometric realignment of S. Central Ave., Marydale Ave., and Bourne Ave.					Restricts access to Marydale Ave.; other access to Marydale Ave. available	Data Not Available at Local Level	Improves sight distance on Bourne Ave. and intersecting traffic on S. Central Ave.	None	Some Nearby	Potential impacts to Elderly Populations	None	None	None	Restricts access to homes on Marydale Ave.	None	None	1st	\$50,000	
L-C	Addition of aesthetic gateway treatments to US 27 corridor					Provides drivers with visual clues as to driving in urban area	N/A	May reduce driver speeds related to driver behavior	None	Karst area at the southern boundary of city limits	No impacts	None	None	None	None	None	None	4th	\$33,000	
L-D	Addition of sidewalk along KY 3261					Would provide pedestrian facilities	N/A	Improves pedestrian safety	None	None	No impacts	None	None	None	May impact residences adjacent to KY 3261	Improves connectivity to elementary and high schools	None	None	5th	\$815,000
L-E	Installation of grass median along US 27					N/A	N/A	May reduce driver speeds related to driver behavior	None	Karst area sporadically along corridor	Potential impacts to Low-Income Populations	Several water sources and a lift station along corridor	None	None	None	None	None	Tied for 2nd	\$616,000	

Notes:
ADT = Average Daily Traffic
CCRF = Critical Crash Rate Factor
UST = Underground Storage Tank

*Planning-level cost estimate in 2010 dollars. Includes ROW, Utilities, Construction, and Design costs.

Table 11: Short-Term Projects Evaluation Matrix

Project	Description	Traffic Evaluation				Safety Evaluation		Natural Environmental Impacts		Human Environmental Impacts		Community Impacts				Cost Estimate*		
		2009 ADT	2009 LOS	2030 ADT	2030 LOS	Access	Spot CCRF	Safety Improvements	Wetlands	Karst Topography	Environmental Justice	Landfills / USTs	Impacts to Businesses	Impacts to Residences	Impacts to Schools / Community Facilities		Stakeholder / Elected Official Ratings	
ST-A	Evaluate US 27 / KY 80 / KY 80B signal timings and coordination after bypass completion	31,100	B	Not Applicable for Short-Term Projects		N/A	3.50	Improved signal timing may reduce red light running and rear-end crashes	None	Karst areas near intersections	No impacts	None	None	None	None	Tied for 2nd	N/A	
ST-B	Safety improvement of vertical curve near Gover Mill Rd.	8,620	E			N/A	1.89	Special pavement mixture overlay will increase roadway friction when pavement is wet	None	None	No impacts	None	None	None	None	None	1st	\$70,400
ST-C	Safety improvements at KY 80 / Ohio St. / Limestone St. intersection	6,920	E			Limits access to NB direction only on Ohio St.	0.72	Improves safety by removing a conflicting movement from the intersection and sight distance by limiting parking	None	None	Potential impacts to Minority Populations	None	None	None	Will remove some on-street parking in front of four houses	None	Tied for 2nd	\$3,000

Notes:
ADT = Average Daily Traffic
CCRF = Critical Crash Rate Factor for Spot Location
UST = Underground Storage Tank

*Planning-level cost estimate in 2010 dollars. Includes ROW, Utilities, Construction, and Design costs.

Table 12: Long-Term Projects Evaluation Matrix

Project	Description	Traffic Evaluation				Safety Evaluation		Natural Environmental Impacts		Human Environmental Impacts		Community Impacts				Cost Estimate*	
		2009 ADT	2009 LOS	2030 ADT	2030 LOS	Access	CCRF	Safety Improvements	Wetlands	Karst Topography	Environmental Justice	Landfills / USTs	Impacts to Businesses	Impacts to Residences	Impacts to Schools / Community Facilities		Stakeholder / Elected Official Ratings
LT-A	Widen KY 914 from KY 80 to just south of KY 769 to four lanes	10,480	D	11,630	A**	Provides increased access to Lake Cumberland from the east	0.58	No major change	4 minor ponds	Several small areas near beginning and end	No impacts	3 oil and gas wells	None	None	None	2nd	\$11,730,000
LT-B	Extension of KY 3263	Not available for new roadway				Provides increases access west of US 27 between KY 1577 and Ringold Rd.	N/A	No major change	None	Several areas through proposed corridor	No impacts	None	Will provide access to additional developable area	None	May alleviate traffic near Lake Cumberland Hospital	1st	\$5,270,000
LT-C	Addition of left turn lanes along KY 39 near schools	8,960	E	9,950	E	NB left turn lanes provide increased access to Northern Middle School and Pulaski County High School	1.62	Improves sight distance / reduces rear end crashes by providing a separate turn lane	1 nearby	None	No impacts	None	None	Minor impacts	Improves access to schools	Tied for 3rd	\$624,000
LT-D	Addition of right turn lanes along US 27	20,710 - 33,900	B	24,480 - 40,070	B - C	Provides increased access to shopping / businesses along US 27	1.10 - 9.43	Reduces rear end crashes	None	Karst area sporadically along corridor	Potential impacts to Low-Income Populations	None	Minor to moderate impacts depending on ROW limits	None	None	5th	\$924,000
LT-E	Install separate left turn lanes along KY 1247 at intersection with KY 1575	7,670	E (Intersection LOS)	8,520	C** (Intersection LOS)	Improves access for school traffic through intersection	0.70 (spot rate)	Separates turning movements along KY 1247	None	Several areas around intersection	No impacts	None	Impacts to nearby gas station possible	Minor impacts	May improve traffic flow for school traffic	6th	\$868,000
LT-F	Add turn lanes along KY 1247 for SB left and NB right turns onto Bourne Ave.	5,570	E	6,180	E	Improves access to industrial businesses along Bourne Ave.	0.60 (spot rate)	Reduces rear end crashes	None	None	No impacts	None	None	Minor impacts to 2 homes	None	Tied for 9th	\$350,000
LT-G	Extend EB left turn lane and acceleration lane along KY 80B in the WB direction at KY 39	18,900	B	20,990	B	No major change	2.14 (spot rate)	Improves safety through increased sight distance and traffic signal visibility	None	One small area west of KY 39	No impacts	None	None	Minor impacts - most improvements within ROW	None	Tied for 7th	\$561,000
LT-H	Further study of signal timings along US 27	20,710 - 33,900	B	24,480 - 40,070	B - C	May improve traffic flow along the primary corridor through Somerset	1.10 - 9.43	Reducing cycle lengths during off-peak periods may reduce red light running	None	None	None	None	None	None	None	Tied for 11th	\$75,000
LT-I	Add SB right turn lane from US 27 onto Washington Dr.	31,000	B	36,650	B	Improves access to Wal-mart / Lowe's / post office / shopping complex	2.40	May reduce rear-end crashes by separating turning vehicles from through traffic	None	None	Potential impacts to Low-Income Populations	None	May impact frontage business slightly; improves access to shopping center	None	None	Tied for 7th	\$147,900
LT-J	Add SB right turn lane from US 27 onto KY 1577 and limit access to adjacent business	32,700	B	38,660	B	Limits access points on US 27 near intersection	1.58	Improves safety by limiting access points	None	None	Potential impacts to Low-Income Populations	None	Will limit access to business on NW corner of the intersection	None	None	Tied for 9th	\$221,800
LT-K	Planning study to determine best solutions for KY 1577 / KY 3261 intersection	6,310	D	15,900	E	May impact access to neighboring daycare and gas station	1.74	Improves sight distance at intersection	None	None	No impacts	None	Will impact gas station and daycare access at intersection	Potential minor impacts to 2-3 homes	None	13th	\$25,000
LT-L	Coordinate with local agencies to communicate to public transportation network master plan	Projects focus on regional scale - evaluation categories not applicable														Tied for 11th	\$150,000
LT-M	Identify destination sites and preferred paths and conduct a wayfinding study															Tied for 3rd	\$150,000

Notes:
ADT = Average Daily Traffic
CCRF = Critical Crash Rate Factor for Section (unless otherwise noted in box)
UST = Underground Storage Tank

*Planning-level cost estimate in 2010 dollars. Includes ROW, Utilities, Construction, and Design costs.

**LOS includes consideration of geometric improvement

4.3.1 Traffic Evaluation

For all short-term and long-term projects, traffic was evaluated by looking at current year 2009 ADT and LOS. Traffic operations (volume and LOS) were not evaluated for the local projects as detailed information was not available for them.

For some project locations, 2009 traffic counts were available through KYTC's CTS Counts program. However, for others, the counts had not been updated for several years. Therefore, 2009 ADT volumes for some projects had to be calculated. This was performed using historical growth rates for each segment from historical traffic counts from the CTS database (counts date back to 1963) and the KYTC spreadsheet that calculates growth rates based on exponential and trend line analyses. Historical growth rates were found for each highway segment, and then averaged to determine a growth rate for the entire road. Per year growth rates ranged from 0.50% on KY 80B to 4.50% on KY 3261. The per year growth rate was applied to the most current year ADT and forecasted to the year 2009. These ADT volumes, along with current lane widths, shoulder widths, percent passing and other design factors, were used to determine 2009 LOS.

For the long-term projects, the same process that was used to forecast the most recent traffic counts to a 2009 ADT was also used to forecast the 2009 ADT volumes to 2030 ADT volumes.

Project LT-E was the only project that had turning movement counts; therefore, for this project, rather than evaluating it with respect to segment ADT volumes and LOS, the 2009 intersection LOS was calculated as well as the 2030 intersection LOS (with the proposed improvements used in the calculation).

For all local, short-term and long-term projects, the project's effect on access was also evaluated.

4.3.2 Safety Evaluation

To evaluate safety impacts for each of the proposed projects, a qualitative assessment of the project's improvements with respect to safety was performed, along with the calculation of a critical crash rate factor for that project.

Data used to calculate critical crash rate factors was not available for local projects; therefore, this was only used as an evaluation method for short-term and long-term projects. For short-term and long-term projects, the critical crash rate factor was calculated for the segment if the project was corridor-wide or a spot if the project was at a specific location.

4.3.3 Environmental Impact – Natural and Human

Each project's impacts on both the human and natural environment were evaluated. Impacts with regards to wetlands, karst topography, Environmental Justice and landfills / USTs were evaluated. The primary concern with respect to the environmental assessment is the potential for encountering sinkholes (as shown by the karst topography).

4.3.4 Community Impact

Each project's impacts on the community, such as impacts to businesses, residences, schools and community facilities were evaluated qualitatively. Input from the Project Advisory Committee (PAC) was included in this category with regard to project significance (project ranking).

4.3.5 Construction Costs

Cost estimates of each project were developed in constant 2010 dollars. Where necessary, right-of-way costs and utility costs were included in the cost estimate. PB developed the construction and design costs based on design experience and KYTC's unit prices. The KYTC District 8 staff calculated right-of-way and utility relocation costs where applicable.

5.0 RECOMMENDATION AND PRIORITIZATION

5.1 Recommended Projects

Based on all input from the PDT, the PAC, field reviews, and technical analysis (as shown in the evaluation matrices), 21 projects were recommended as a result of this study.

- 5 Local
- 3 Short-Term
- 13 Long-Term

These projects are summarized in the evaluation matrices (**Tables 10 – 12**). Detailed project sheets are provided on the following pages (Pages 44 – 64). Each project sheet contains the issues related to the project as well as the improvement, cost estimate, and project priority. The sheets were developed with the intention of providing stand-alone project information that can be used for future project development.

During the course of the study, several projects were initially included in the list of recommended projects, but were removed prior to the final recommendation generally as KYTC was able to address the issues during the course of the study. Projects initially listed and then removed from the recommendation include:

- Improve visibility of traffic signal at US 27 / KY 2227 / KY 3091 – reflective backplates were installed by KYTC during this study.
- Install larger signs on US 27 for airport access – upgraded signage was procured by KYTC and installed.
- Consolidation of signage at KY 80 / KY 914 intersection – KYTC must work in conjunction with the Kentucky Department of Travel on changing / consolidating tourist-related signage. A meeting to discuss these options was scheduled for May 2010.
- Regional traffic flow study in conjunction with I-66 project – Based on input received from the PAC and PDT and the uncertainty of the I-66 project, this recommendation for additional study was determined to not be a worthwhile recommendation at this time.

The remaining projects recommended by this study were prioritized to determine the order in which to procure funding for additional project development.

PROBLEM

Project Background:

Somerset airport currently expanding flight operations, including scheduled services.

Project Issues:

- **SAFETY**
- Airport entrance is in a curve off of Kit Cowan Rd.
- Poor sight distance at airport entrance
- Heavy truck traffic on Kit Cowan Rd. (Garner, CoreTrans, and Coca Cola all have facilities off of this road)



Kit Cowan Rd. Looking WB



Kit Cowan Rd. Looking NB

SOLUTION

Project Type:

Geometric Realignment

Project Solution:

Realign curve and entrance

Project Cost Estimate:

Design:	\$30,000
ROW:	\$25,000
Utilities:	\$115,000
Construction:	<u>\$160,000</u>
Total:	\$340,000

Project Priority:

Tied for 2nd out of 5



PROBLEM

Project Background:

Unconventional intersection with sight distance issues.

Project Issues:

- **SAFETY**
- High speeds on Bourne Ave.
- Poor sight distance at side street approach (Marydale Ave.)



Looking Toward Marydale Ave.



View of Bourne Ave. from Marydale Ave.

SOLUTION

Project Type:

Geometric Realignment

Project Solution:

Close Marydale Ave. approach and realign intersection with Bourne Ave. as major street. Consider widening adjacent streets (Haley St.) that may receive Marydale Ave. traffic.

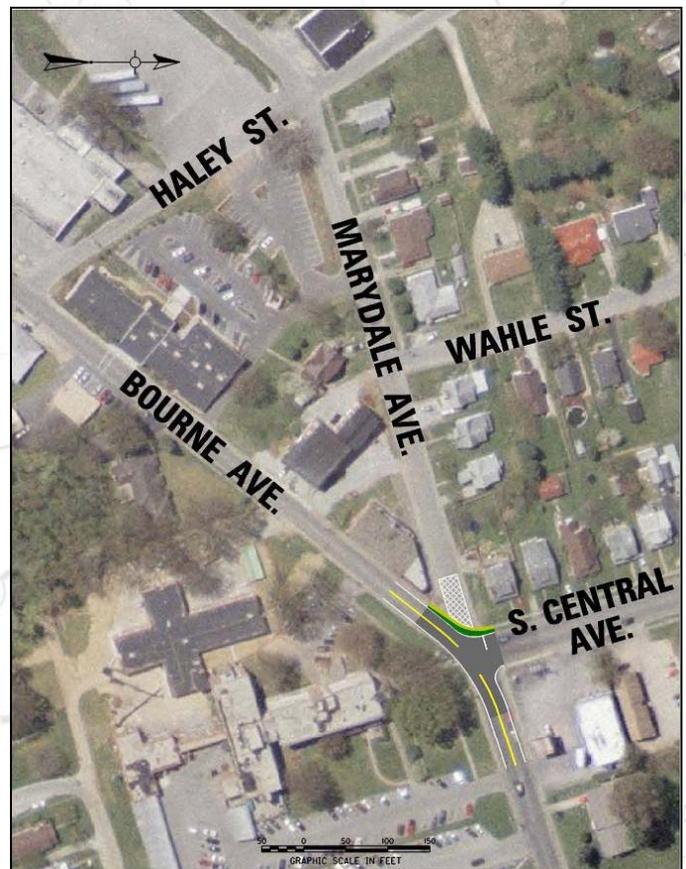
Project Cost Estimate:

Design: \$10,000
Construction: \$45,000
Total: \$55,000

(improvements within existing ROW)

Project Priority:

1 of 5



PROBLEM

Project Background:

Recreational traffic and drivers unfamiliar with the area do not always recognize they are in an urban area as there is no specific delineation.

Project Issues:

- **SAFETY**

- Drivers travel at higher speeds than they would normally in an urbanized area (speed limit along US 27 is 45 mph)
- Northern city limits are located on a big fill zone and southern area is heavily developed with little room for additional signage
- New bypass (KY 914) and expansion of city may cause city limits to change in the next few years



Current Somerset welcome sign along US 27 at the intersection with KY 80

SOLUTION

Project Type:

Aesthetic Gateway Treatments

Project Solution:

At city limits, install appropriate signage to identify the Somerset city limits once new bypass (KY 914) is completed.

Project Cost Estimate:

Design: \$3,000
Construction: \$30,000
Total: 33,000

(improvements within existing ROW)

Project Priority:

4 of 5



PROBLEM

Project Background:

KY 3261 is primarily residential between KY 1577 and Oak Hill Elementary and Southwestern High School.

Project Issues:

- **SAFETY**
- No sidewalks for children walking to school or for other pedestrians in the area



*View looking NB along
KY 3261*



School Access

SOLUTION

Project Type:

Sidewalks

Project Solution:

Provide sidewalk along KY 3261 between KY 1577 and Oak Hill Elementary School / Southwestern High School. Potential candidate for Safe Routes to School Program.

Project Cost Estimate:

Design:	\$60,000
ROW:	\$125,000
Utilities:	\$85,000
Construction:	<u>\$550,000</u>
Total:	\$820,000

Project Priority:

5 of 5



PROBLEM

Project Background:

US 27 is a primary route to one of Kentucky's major recreation destinations (Lake Cumberland). The current typical section along US 27 includes a divided median without any aesthetic treatments (currently depressed aggregate with seal coat).

Project Issues:

- No distinguishing features along primary route
- Driver behavior not always reflective of an urban setting (i.e. speeding)
- City of Somerset currently testing a grass median at Langdon St.



Median along US 27

SOLUTION

Project Type:

Aesthetic

Project Solution:

Coordination with City of Somerset to provide grass median (sod only – no curb and gutter).

Project Cost Estimate:

Design: \$56,000
Construction: \$560,000
Total: \$616,000

(improvements within existing ROW)

Project Priority:

Tied for 2nd out of 5



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www.yahoo.com



PROBLEM

Project Background:

Two adjacent traffic signals on the primary north/south road through Somerset are in close proximity.

Project Issues:

- **SAFETY**
- High Crash Rate (Spot Critical Crash Rate Factor = 3.50)
- Currently operate on separate controllers
- Heavy traffic volumes through these intersections (~30,000 vehicles per day on US 27 through these intersections)



US 27 / KY 80 intersection SB



US 27 / KY 80B intersection NB

SOLUTION

Project Type:

Signal Timing / Further Study

Project Solution:

Completion of the northern bypass may reduce traffic volumes through these intersections. Signal timings and coordination should be evaluated after bypass completion.

Project Cost Estimate:

N/A

Project Priority:

In Progress



*Signal System to Re-evaluate
(NB view along US 27)*

PROBLEM

Project Background:

Vertical curve on KY 39 near Gover Mill Rd. has identified safety issues.

Project Issues:

- **SAFETY**
- High crash rate (Section Critical Crash Rate Factor = 1.89)
- Primary type of crash is single vehicle crashes (ran off roadway)
- Majority of crashes occur when pavement is wet.



View looking SB along KY 39

SOLUTION

Project Type:

Safety Improvement

Project Solution:

Add special pavement mixture overlay to increase roadway friction when the pavement is wet.

Project Cost Estimate:

Design: \$6,400
Construction: \$64,000
Total: \$70,400

(improvements within existing ROW)

Project Priority:

1 of 3



New KY 1247

0 2,500 5,000 Feet

PROBLEM

Northern Bypass
(under construction)

Project Background:

Unconventional intersection with sight distance issues.

Project Issues:

- **SAFETY**
- Several crashes have occurred during the past three years though not a high crash rate section
- Crash types included sideswipes and rear-end collisions
- Parking along KY 80 in NB direction obscures sight distance



SB View from Ohio St.



NB View from Ohio St.

SOLUTION

Project Type:

Safety Improvement

Project Solution:

Convert Ohio St. to one way operations (NB direction). Extend "No Parking Zone" along KY 80 NB. Prohibit left turns from KY 80 SB to Ohio Street via signage and curb reinforcement.

Project Cost Estimate:

Design: \$500
 Construction: \$2,500
 Total: \$3,000
 (improvements within existing ROW)

Project Priority:

2 of 3



PROBLEM

Project Background:

KY 914 ranges between 2 and 4 lanes around Somerset.

Project Issues:

• **CONGESTION**

- Current portions of bypass constructed as 4 lanes; previous portion between KY 80 and just south of KY 769 constructed as 2 lanes
- Lane continuity would provide drivers with a consistent roadway expectation and increase capacity
- Provides access to Lake Cumberland and as a result has a substantial portion of recreation / tourist traffic

SOLUTION

Project Type:

Major Widening

Project Solution:

Widen to 4 lanes (from KY 80 to just south of KY 769).

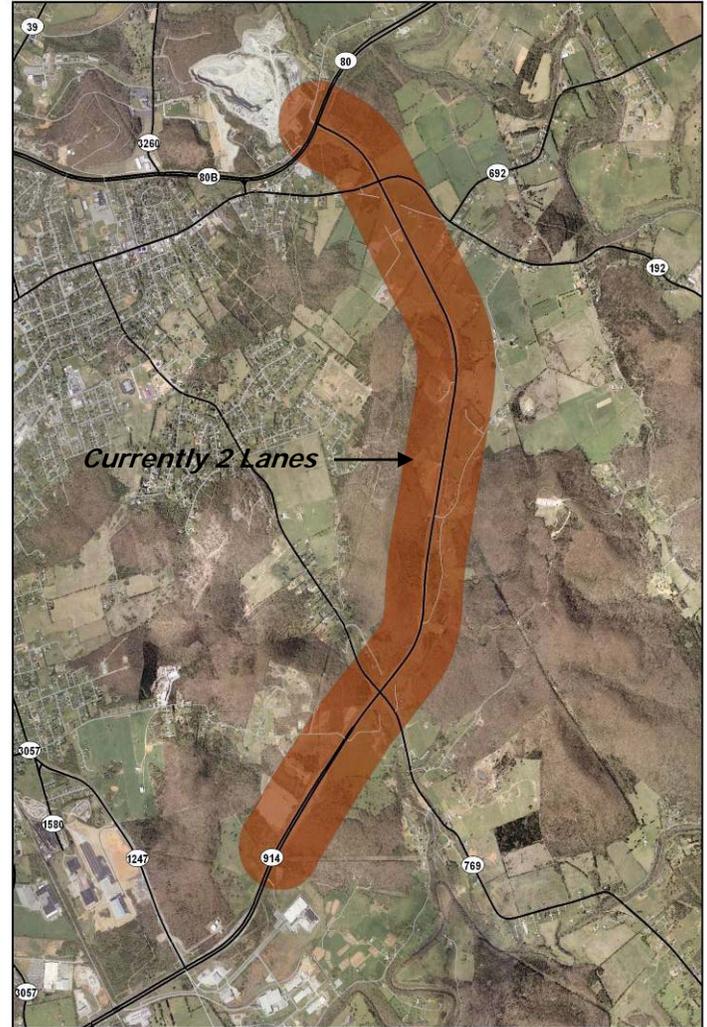
Project Cost Estimate:

Design: \$930,000
Utilities: \$1,500,000
Construction: \$9,300,000
Total: \$11,730,000

(improvements within existing ROW)

Project Priority:

1 of 13



New KY 1247

0 2,500 5,000 Feet

PROBLEM

Project Background:

New segment of roadway connecting KY 1577 and KY 3263.

Project Issues:

- **CONGESTION**
- A connector in this western part of Somerset could alleviate some traffic on existing Bogle Street, near Lake Cumberland Hospital as well as on US 27 between KY 1577 and the Cumberland Parkway.
- The City of Somerset has already began right-of-way plans for this project.

SOLUTION

Project Type:

New Road Construction

Project Solution:

Extend KY 3263 from KY 1577 to Ringgold Road (KY 3263). Typical section to include 12' traffic lanes, 4' bike lanes, and 4' sidewalks on both sides.

Project Cost Estimate:

Total: \$5,270,000
(includes construction, ROW, and design fees)

Project Priority:

2 of 13



New KY 1247



PROBLEM

Northern Bypass
(under construction)

Project Background:

KY 39 between KY 1247 and the study area boundary (Heritage Place Drive) has identified safety and congestion issues.

Project Issues:

- **SAFETY**
- **CONGESTION**
- High crash rate (Section Critical Crash Rate Factor = 1.62)
- Primary type of crash is rear-end crashes
- Poor Level of Service (currently LOS E for corridor)
- Several schools are located along this corridor



KY 39 / Oak Leaf Lane Intersection



KY 39 SB direction near Pulaski Co. High School

SOLUTION

Project Type:

Geometric Improvement

Project Solution:

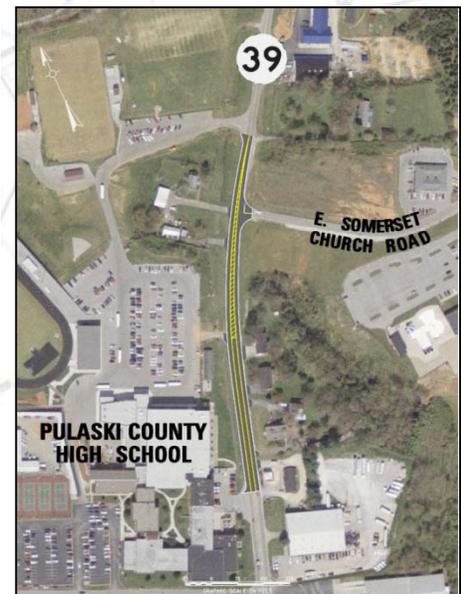
Add NB left turn lanes into Northern Middle School (Oak Leaf Lane) and Pulaski County High School.

Project Cost Estimate:

Design:	\$100,000
ROW:	\$100,000
Utilities:	\$150,000
Construction:	<u>\$340,000</u>
Total:	\$690,000

Project Priority:

3 of 13



PROBLEM

Project Background:

US 27 through Somerset is primarily three lanes per direction. Through vehicles travel in the outermost lane conflicting with right turning traffic.

Project Issues:

- **SAFETY**
- **CONGESTION**
- Lane utilization



Vehicles traveling in right lane on US 27.

SOLUTION

Project Type:

Turn Lanes

Project Solution:

Provide separate right turn lanes along US 27 at major intersections while maintaining three-lane (six-lane total) typical section.

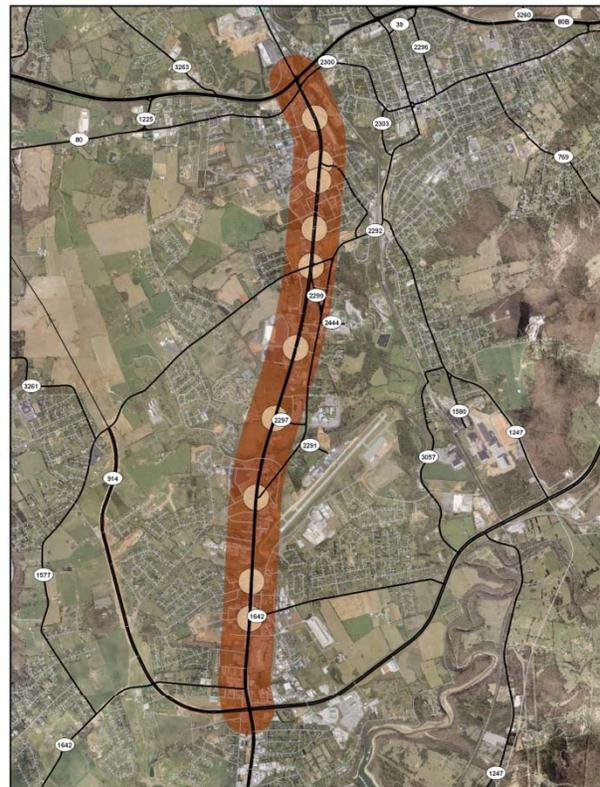
Project Cost Estimate:

Design: \$84,000
Construction: \$840,000
Total: \$924,000

(improvements generally within existing ROW)

Project Priority:

9 of 13



5,000 Feet

PROBLEM

Project Background:

4-way stop controlled intersection located near several schools.

Project Issues:

- **SAFETY**
- **CONGESTION**
- No turn lanes
- Limited space for expansion (i.e. buildings / gas station)
- Utilities close to roadway (poles on 3 corners / gas station on 4th corner)
- Intersection located in a karst area



View along KY 1575 looking west



View along KY 1247 looking south

SOLUTION

Project Type:

Geometric Reconfiguration

Project Solution:

Install separate turn lanes
(SB left and NB left along KY 1247)

Project Cost Estimate:

Design:	\$100,000
ROW:	\$100,000
Utilities:	\$350,000
Construction:	<u>\$400,000</u>
Total:	\$950,000

Project Priority:

4 of 13



5,000 Feet

PROBLEM

Project Background:

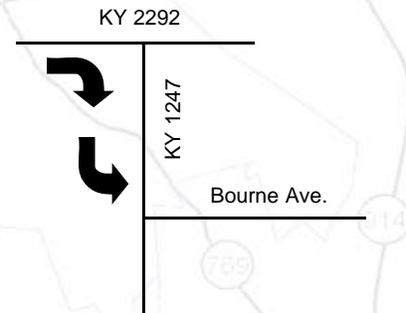
Left turn from KY 1247 onto Bourne Avenue is a heavy movement with substantial truck traffic. The distance between KY 2292 and Bourne Avenue is very short leaving little room for vehicles turning right onto KY 1247 then left onto Bourne Avenue.



Looking North Along KY 1247

Project Issues:

- **SAFETY**
- **CONGESTION**
- Heavy truck traffic – Southern Dairy located off of Bourne Ave.
- KY 1247 is being realigned to the south to connect with KY 90, which will add additional traffic to KY 1247
- Major gas line (4" high pressure) along KY 1247



SOLUTION

Project Type:

Turn Lanes

Project Solution:

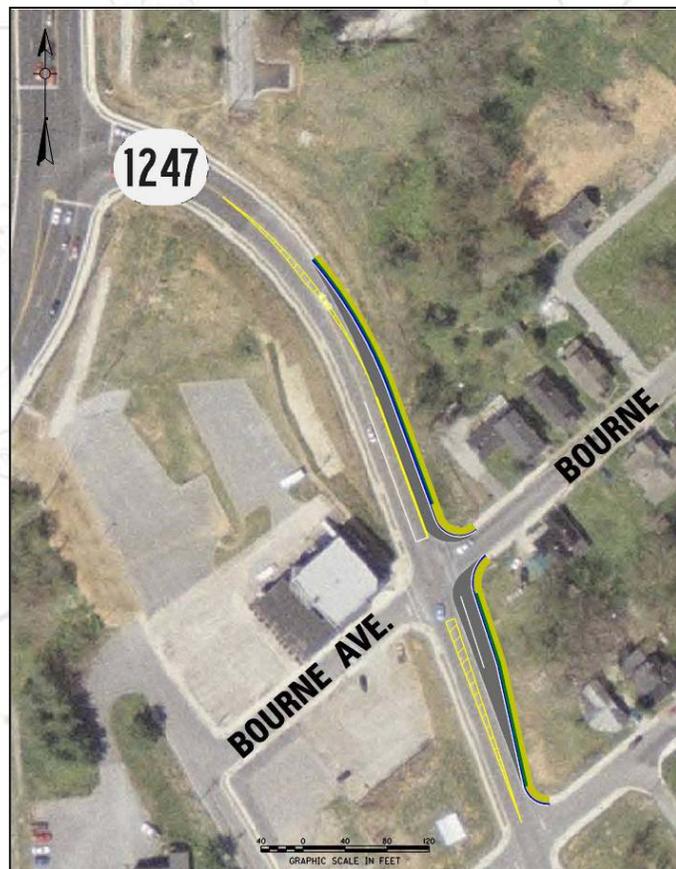
Add SB left turn lane along KY 1247 onto Bourne Avenue. Add NB right turn lane along KY 1247 onto Bourne Avenue (to accommodate displaced traffic).

Project Cost Estimate:

Design:	\$15,000
ROW:	\$30,000
Utilities:	\$155,000
Construction:	<u>\$150,000</u>
Total:	\$350,000

Project Priority:

7 of 13



5,000 Feet

PROBLEM

Project Background:

Intersection with sight distance issues and a history of numerous crashes (one occurred during a site visit for the project).

Project Issues:

• **SAFETY**

- High crash rate (Spot Critical Crash Rate Factor = 2.14)
- Traffic signal on pole in EB direction along KY 80B difficult to see
- Pedestrian bridge on EB approach restricts sight distance to traffic signals
- Short acceleration lanes on KY 80B from KY 39



View along KY 80B EB



Crash at Intersection

SOLUTION

Project Type:

Turn Lane

Project Solution:

Extend acceleration lane on KY 80B WB direction. Extend EB left turn lane.

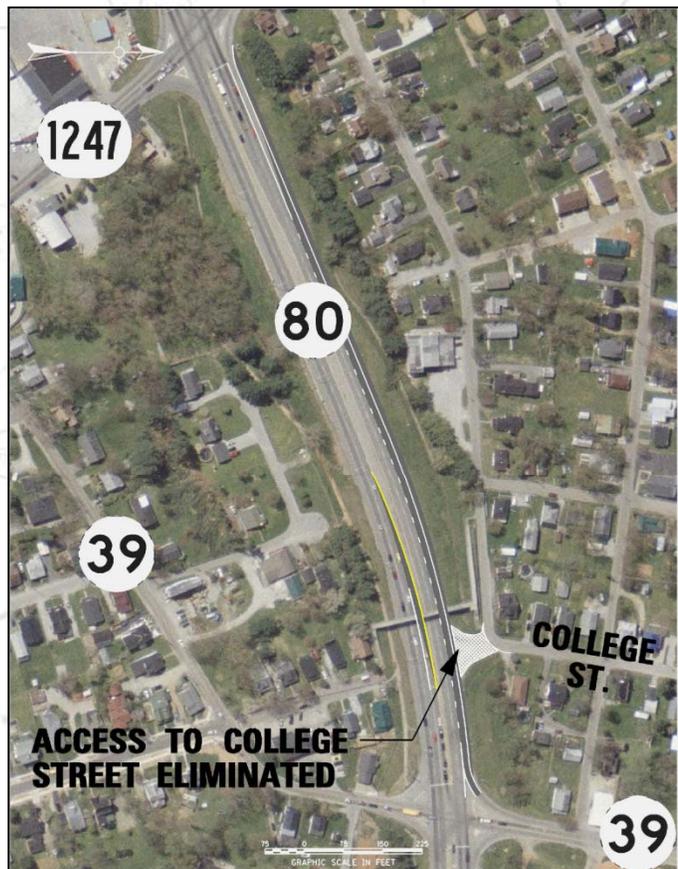
Project Cost Estimate:

Design: \$51,000
Construction: \$510,000
Total: \$561,000

(improvements within existing ROW)

Project Priority:

5 of 13



PROBLEM

Project Background:

Current KYTC policy is not to allow permitted / protected left turns on highways with three lanes or greater per direction.

Project Issues:

• **CONGESTION**

- Traffic signal cycle lengths are currently running at 130 seconds.
- US 27 has been identified as having high crash rates (critical crash rate factor greater than 1.0)
- Traffic signals are controlled by KYTC Central Office – new cycle lengths may become necessary as a result of changes to minimum pedestrian crossing time standards.



Left turn on green arrow only

SOLUTION

Project Type:

Signal Timing

Project Solution:

Continue policy on left turns.

Develop new timing plans or adjust minimum / maximum greens in off-peaks to increase capacity.

If left-turn phasing is determined to be warranted, protected-only phasing shall be used on all approaches where any one of the following conditions exists:

- Left-turn movement must cross three or more opposing lanes
- Traffic can turn from more than one lane on the same approach
- Sight distance is insufficient based on engineering judgment. Sight distance obstructions caused by vehicles in opposing left-turn lanes are not typically considered inadequate sight distance.

Protected-permitted left-turn phasing may be used at all other locations that warrant left-turn phasing.

* From KYTC Traffic Operations Guidance Manual

Project Cost Estimate:

Study Only: \$75,000

Project Priority:

In Progress

New KY 1247

0 2,500 5,000 Feet

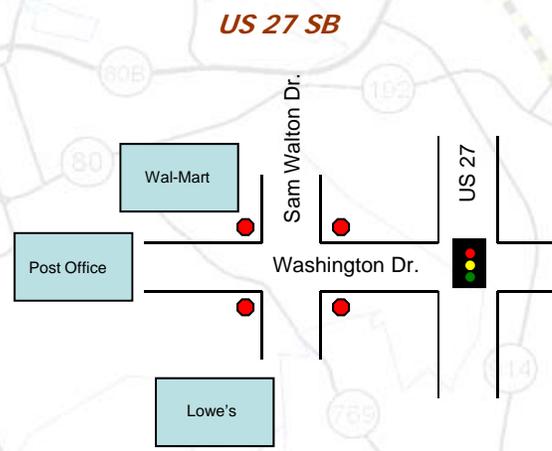
PROBLEM

Project Background:

Primary intersection for shopping center (Wal-mart) with history of crashes.

Project Issues:

- **SAFETY**
- **CONGESTION**
- High Crash Rate (Spot Critical Crash Rate Factor = 2.40)
- Primary type of crash is rear-end crashes
- Washington Dr. is heavily developed (i.e. provides access to Wal-mart, Lowe's, Post Office, and several restaurants)
- 4-way stop intersection located just west US 27 / Washington Dr. intersection – long traffic queues turning onto Washington Dr. from Wal-mart
- Side street signs are small and hard to read off of US 27



SOLUTION

Project Type:

Turn Lane

Project Solution:

Add a SB right turn lane from US 27 onto Washington Dr.

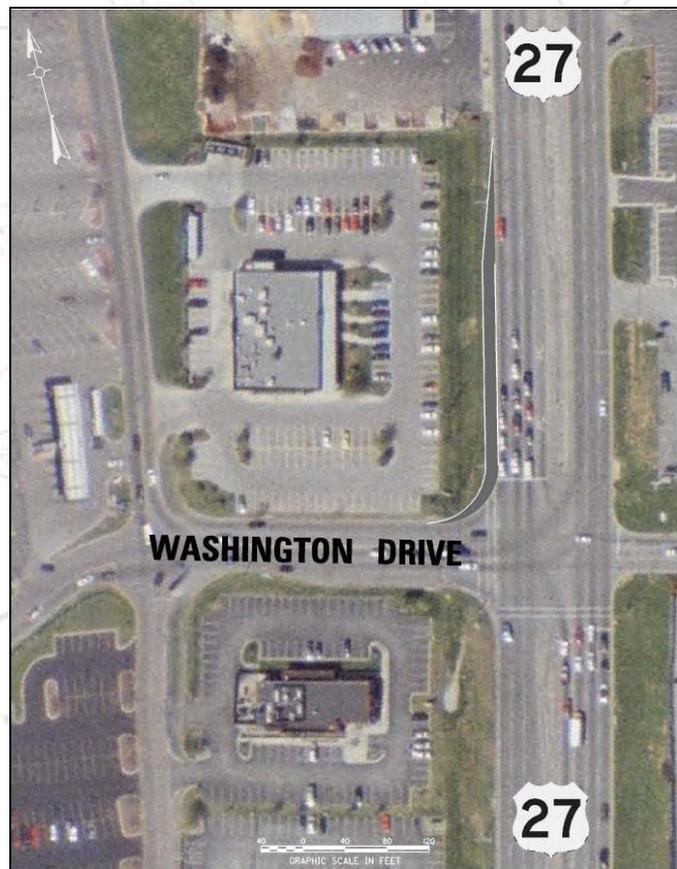
Project Cost Estimate:

Design:	\$10,000
Utilities:	\$50,000
Construction:	<u>\$100,000</u>
Total:	\$160,000

(improvements within existing ROW)

Project Priority:

6 of 13



PROBLEM

Project Background:

Intersection located along US 27 with a high crash history and numerous business access points near intersection.

Project Issues:

- **SAFETY**
- High Crash Rate (Spot Critical Crash Rate Factor = 1.58)
- No SB exclusive right turn lane
- Access issues (entrance / exit of businesses on US 27 close to intersection)



Overall intersection view



Access issue to business on SW corner

SOLUTION

Project Type:

Turn Lane / Access Management

Project Solution:

Add a SB right turn lane from US 27 onto KY 1577. Limit access points to business located adjacent to the intersection - right-in, right-out (RIRO) along SB US 27, full access along KY 1577.

Project Cost Estimate:

Design: \$10,000
Utilities: \$125,000
Construction: \$100,000
Total: \$235,000
(improvements within existing ROW)

Project Priority:

10 of 13



5,000 Feet

PROBLEM

Project Background:

Intersection near schools with safety and sight distance issues.

Project Issues:

- **SAFETY**
- High Crash Rate (Spot Critical Crash Rate Factor = 1.74)
- Traffic signals are close together (near KY 914 / KY 1577 intersection)
- Poor sight distance at intersection
- Constrained right-of-way (gas station and cemetery located adjacent to intersection)
- KYTC may give KY 3261 to Pulaski County in the future



*View looking east toward
KY 914 / KY 1577 intersection*



View from KY 3261 approach

SOLUTION

Project Type:

Planning Study

Project Solution:

Planning Study to determine the best solutions based on new traffic patterns due to the opening of the bypass.

Project Cost Estimate:

Study Only: \$25,000

Project Priority:

11 of 13



PROBLEM

Project Background:

Numerous roadway construction projects have been completed (or are on-going) in and around Somerset. There are also multiple projects currently in the planning phase including I-66.

Project Issues:

- **CONGESTION**
- **SAFETY**
- Public is not aware of how area transportation projects relate.

SOLUTION

Project Type:

Education / Communication

Project Solution:

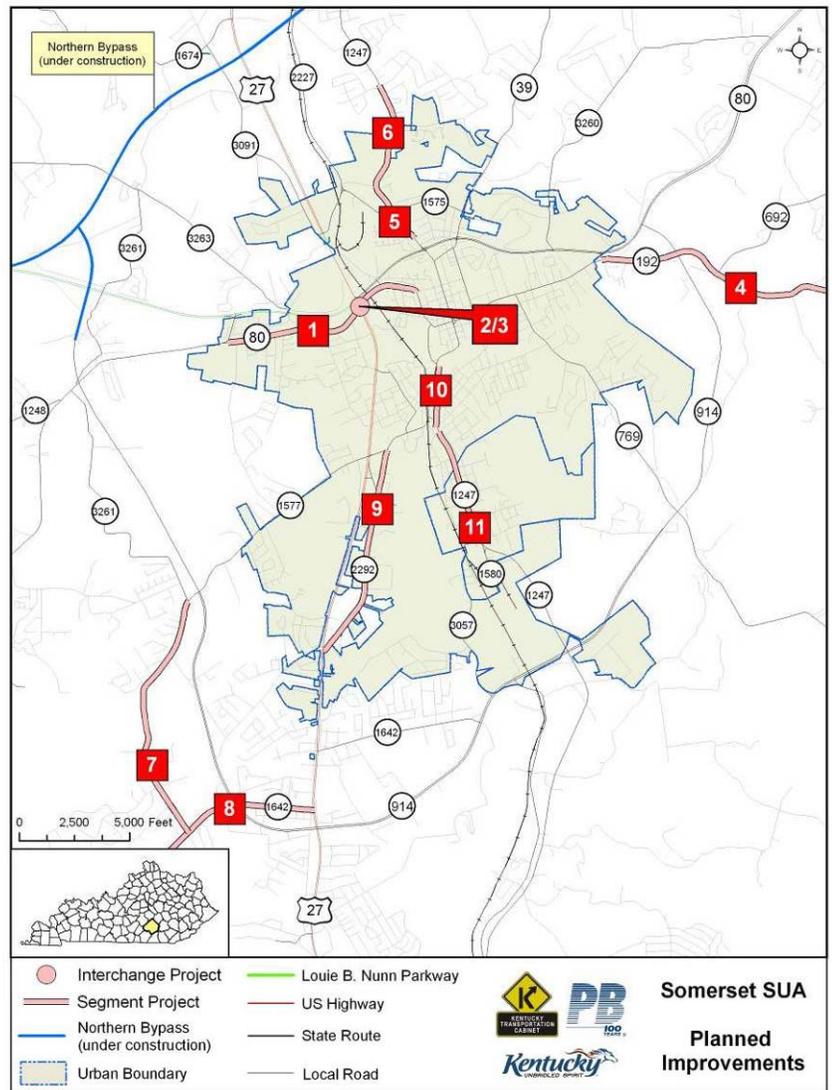
KYTC to coordinate with City of Somerset / Chamber of Commerce / Media to communicate to public transportation network master plan.

Project Cost Estimate:

Study Only: \$150,000

Project Priority:

8 of 13



PROBLEM

Project Background:

Tourism is a major part of the economy for the City of Somerset / Pulaski County. US 27 is viewed as the primary route to Lake Cumberland, though there are other routes that can be utilized.

Project Issues:

- Limited signage directing visitors / drivers to preferred paths for destination centers
- Existing street signs on US 27 are difficult to see / read

SOLUTION

Project Type:

Additional Study

Project Solution:

Wayfinding study recommended.

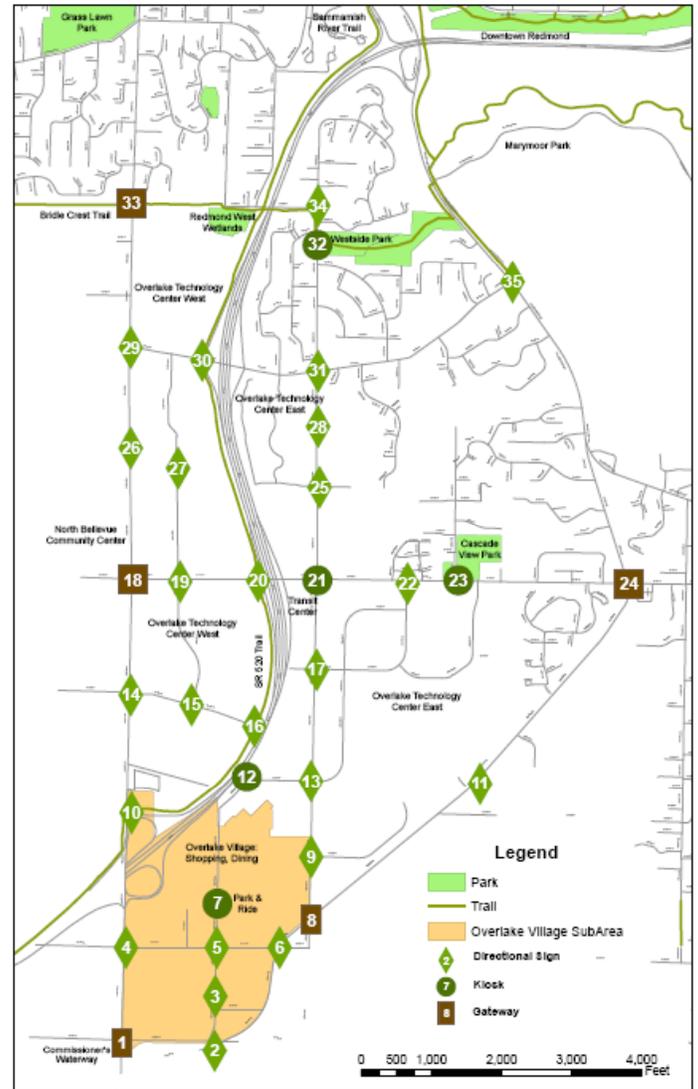
KYTC to coordinate with City of Somerset / Chamber of Commerce on identifying destination sites and preferred paths.

Project Cost Estimate:

Study Only: \$150,000

Project Priority:

In Progress



City of Redmond, WA

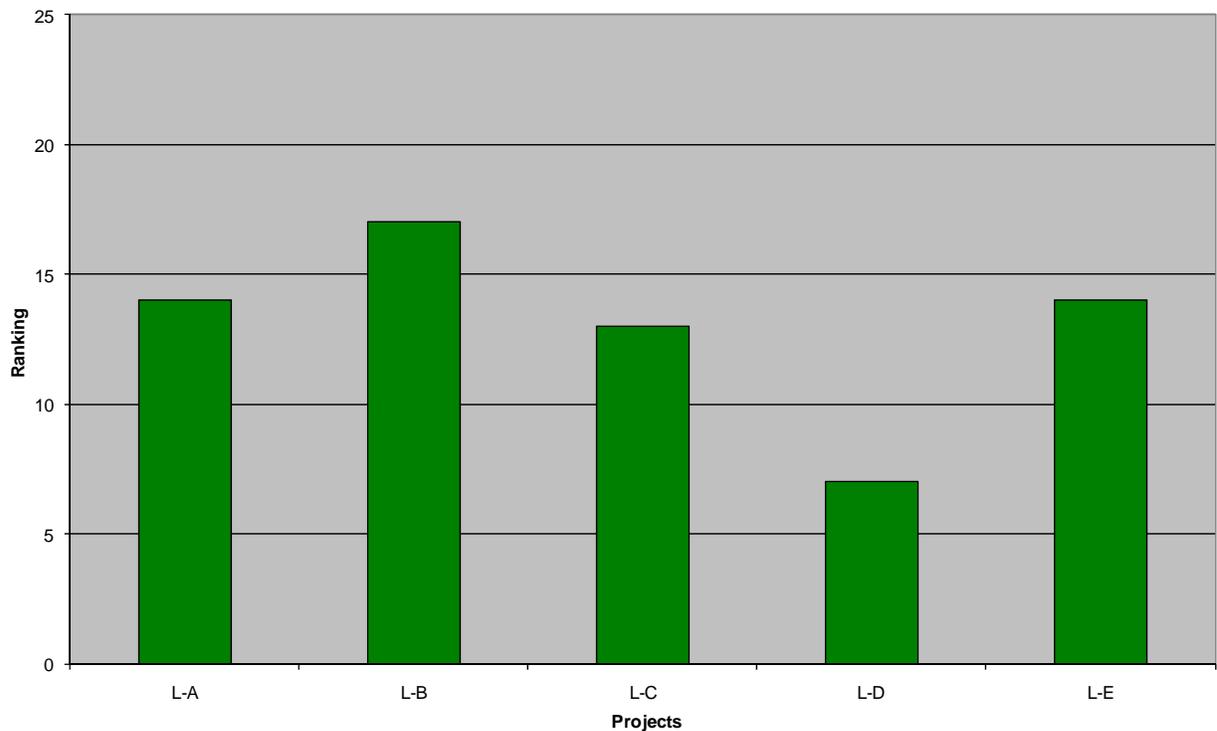
New KY 1247



5.2 Project Prioritization

At this time, additional funding is not available for any future project development. To assist with future project steps (such as listing long-term projects in the Six-Year Plan), projects were ranked within each category (local, short-term, and long-term). An initial discussion of project ranking was held with the PDT. This discussion primarily focused on assigning a ranking of low, medium, and high importance to projects. A more refined discussion was held with the PAC during the meeting held on February 18, 2010. During that meeting, each project was discussed with the PAC, after which the PAC was given the opportunity to rank all the projects. Results were compiled and presented to the group. Generally the group agreed with the summation of individual project rankings. **Figures 11 – 13** display the PAC rankings.

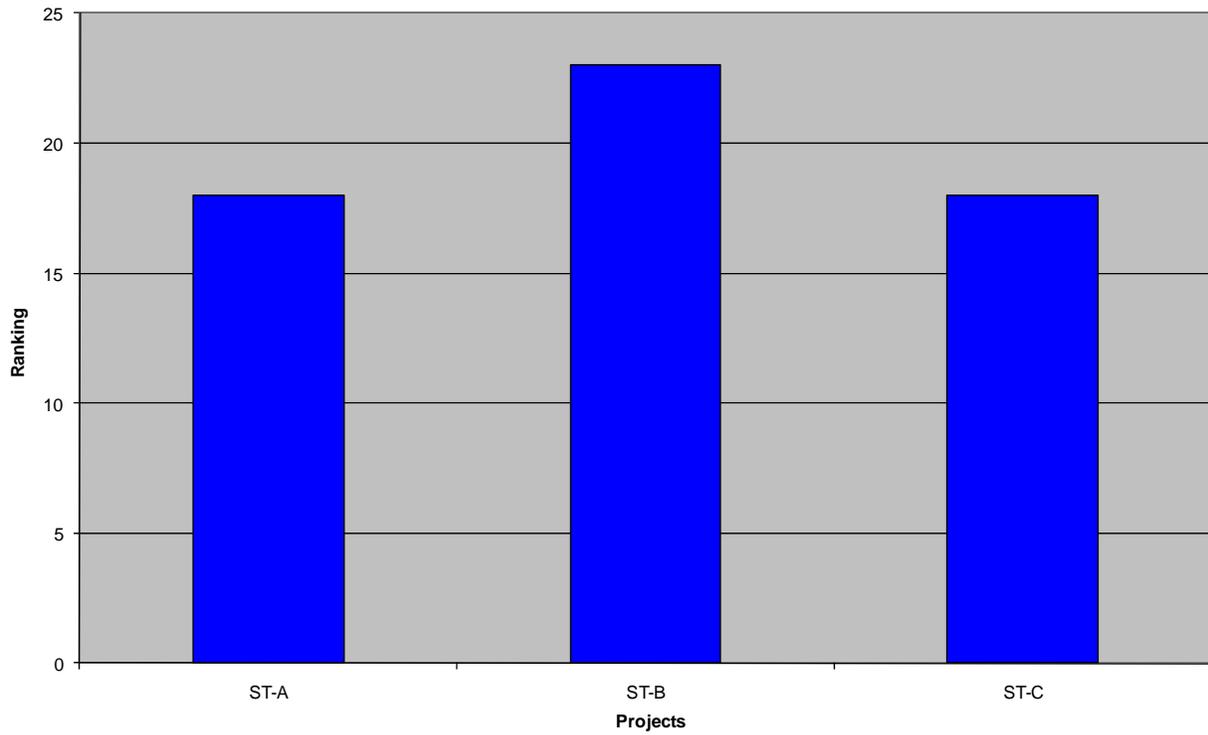
Figure 11: PAC Local Project Rankings



Key:

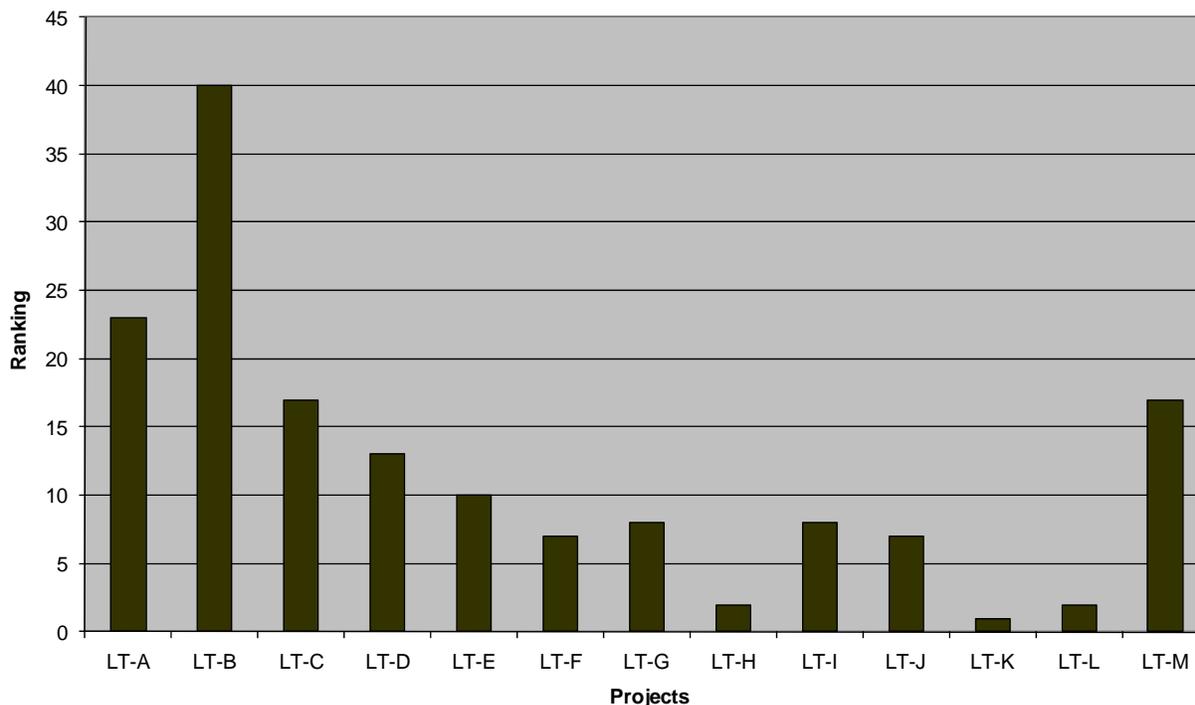
- L-A: Geometric realignment of airport entrance access
- L-B: Geometric realignment of S. Central Ave., Marydale Ave., and Bourne Ave.
- L-C: Addition of aesthetic gateway treatments to US 27 corridor
- L-D: Addition of sidewalk along KY 3261
- L-E: Addition of grass median along US 27

Figure 12: PAC Short-Term Project Rankings



Key:

- ST-A: Evaluate US 27 / KY 80 / KY 80B signal timings and coordination after bypass completion
- ST-B: Safety improvement of vertical curve near Gover Mill Rd.
- ST-C: Safety improvements at KY 80 / Ohio St. / Limestone St. intersection

Figure 13: PAC Long-Term Project Rankings**Key:**

- LT-A: Widen KY 914 from KY 80 to just south of KY 769 to four lanes
- LT-B: Extension of KY 3263
- LT-C: Addition of left turn lanes along KY 39 near schools
- LT-D: Addition of right turn lanes along US 27
- LT-E: Install separate left turn lanes along KY 1247 at intersection
- LT-F: Add turn lanes along KY 1247 for SB and NB right turns onto Bourne Ave.
- LT-G: Extend EB left turn lane and acceleration lane along KY 80B in the WB direction
- LT-H: Further study of signal timings along US 27
- LT-I: Add SB right turn lane from US 27 onto Washington Ave.
- LT-J: Add SB right turn lane from US 27 onto KY 1577 and limit access to adjacent business
- LT-K: Planning study to determine best solutions for KY 1577 / KY 3261 intersection
- LT-L: Coordinate with local agencies to communicate to public transportation network master plan
- LT-M: Identify destination sites and preferred paths and conduct a wayfinding study

Following the PAC meeting, the PDT agreed that the rankings determined by the PAC for the local and short-term projects would be the final prioritization rankings for these categories. The stakeholders and elected officials that participated in the ranking process would ultimately be the parties responsible for further implementation of the local projects; therefore it seemed reasonable to use their rankings. As there were only three short-term projects, the PDT agreed with the rankings from the PAC.

Overall, the rankings developed by the PAC for the long-term projects agreed with the general rankings previously determined for projects by the PDT, though there were some discrepancies. To determine a final list of project prioritization for the long-term projects, KYTC District 8 performed a final review and provided the rankings for the long-term projects as they would be the executing body for further project development.

The following table, (**Table 13**) displays the final project prioritization for all projects. The final project priority numbers are also included on the project sheets shown on the previous pages.

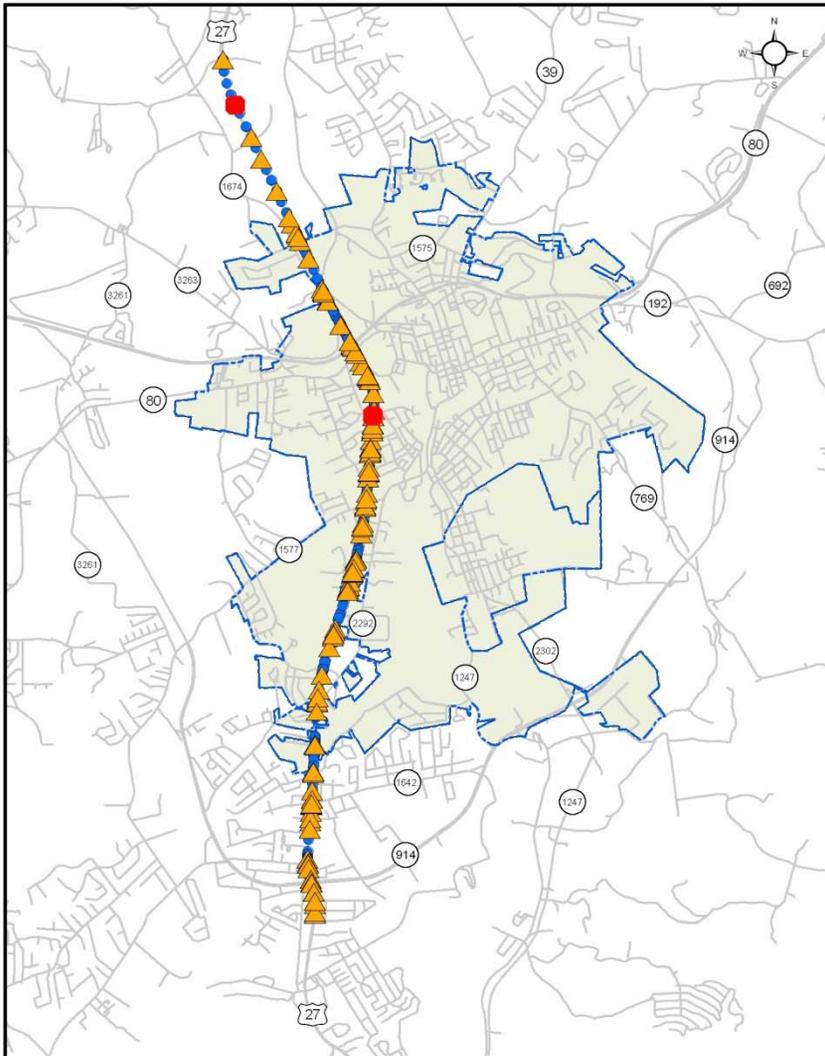
Table 13: Project Recommendation and Prioritization

Project Type	Project ID	Project Description	Priority Rank
Local	L-B	Geometric realignment of S. Central Ave., Marydale Ave. and Bourne Ave.	1
	L-A	Geometric realignment of airport entrance access	2
	L-E	Installation of grass median along US 27	2
	L-C	Addition of aesthetic gateway treatments to US 27 corridor	4
	L-D	Addition of sidewalk along KY 3261	5
Short-Term	ST-B	Safety improvement of vertical curve near Gover Mill Rd.	1
	ST-C	Safety improvements at KY 80 / Ohio St. / Limestone St. intersection	2
	ST-A	Evaluate US 27 / KY 80 / KY 80B signal timings and coordination after bypass completion	see below
Long-Term	LT-A	Widen KY 914 from KY 80 to just south of KY 769 to four lanes	1
	LT-B	Extension of KY 3263	2
	LT-C	Addition of left turn lanes along KY 39 near schools	3
	LT-E	Install separate left turn lanes along KY 1247 at intersection with KY 1575	4
	LT-G	Extend EB left turn lane and acceleration lane along KY 80B in the WB direction at KY 39	5
	LT-I	Add SB right turn lane from US 27 onto Washington Dr.	6
	LT-F	Add turn lanes along KY 1247 for SB left and NB right turns onto Bourne Ave.	7
	LT-L	Coordinate with local agencies to communicate to public transportation network master plan	8
	LT-D	Addition of right turn lanes along US 27	9
	LT-J	Add SB right turn lane from US 27 onto KY 1577 and limit access to adjacent business	10
	LT-K	Planning study to determine best solutions for KY 1577 / KY 3261 intersection	11
	LT-H	Further study of signal timings along US 27	see below
	LT-M	Identify destination sites and preferred paths and conduct a wayfinding study	see below

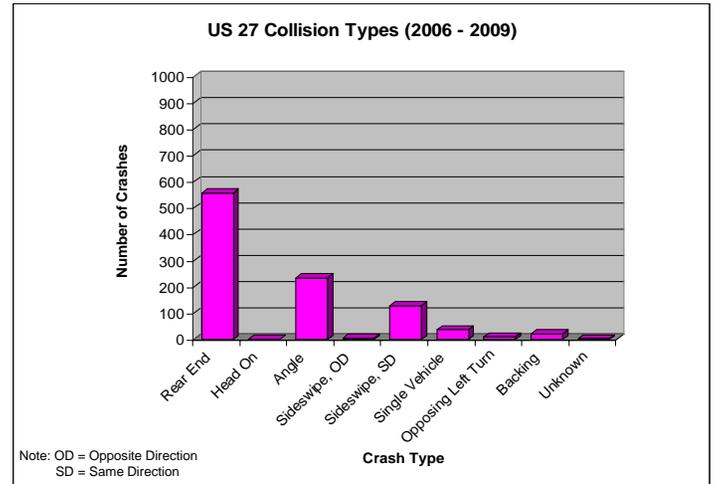
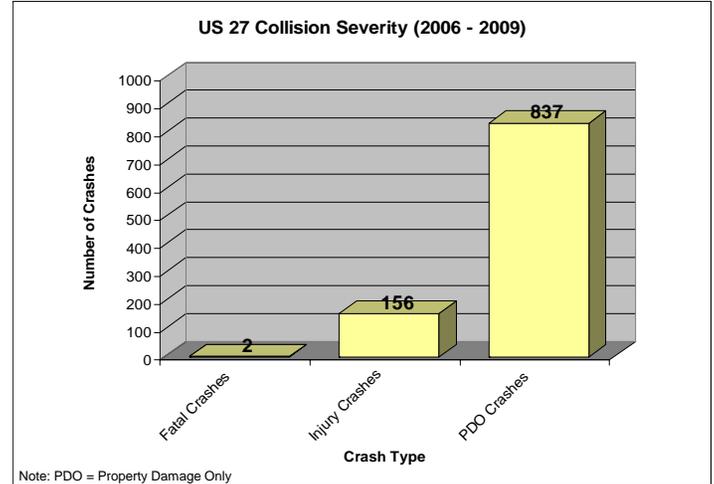
Note: ST-A, LT-H, and LT-M already in works to be done, and therefore, not ranked.

Appendix A:

Crash Data

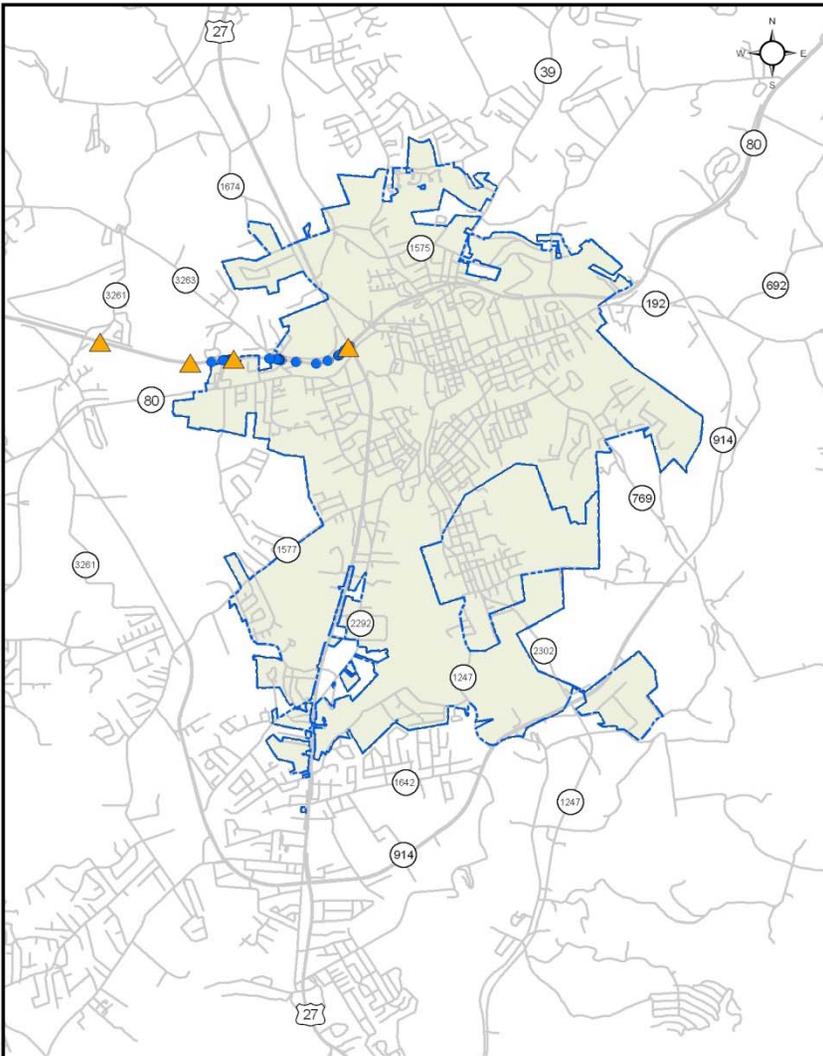


- Fatal Crash
- ▲ Injury Crash
- PDO Crash



Route: US 27
 High Crash Segments: 7
 Primary Collision Type: Rear End

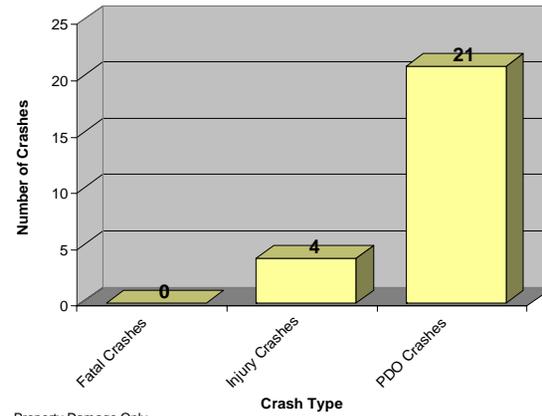
Somerset SUA
Crash Analysis



- Fatal Crash
- ▲ Injury Crash
- PDO Crash

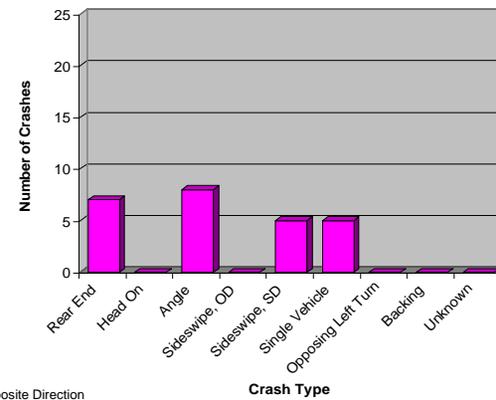


Louie B. Nunn Pkwy Collision Severity (2006 - 2009)



Note: PDO = Property Damage Only

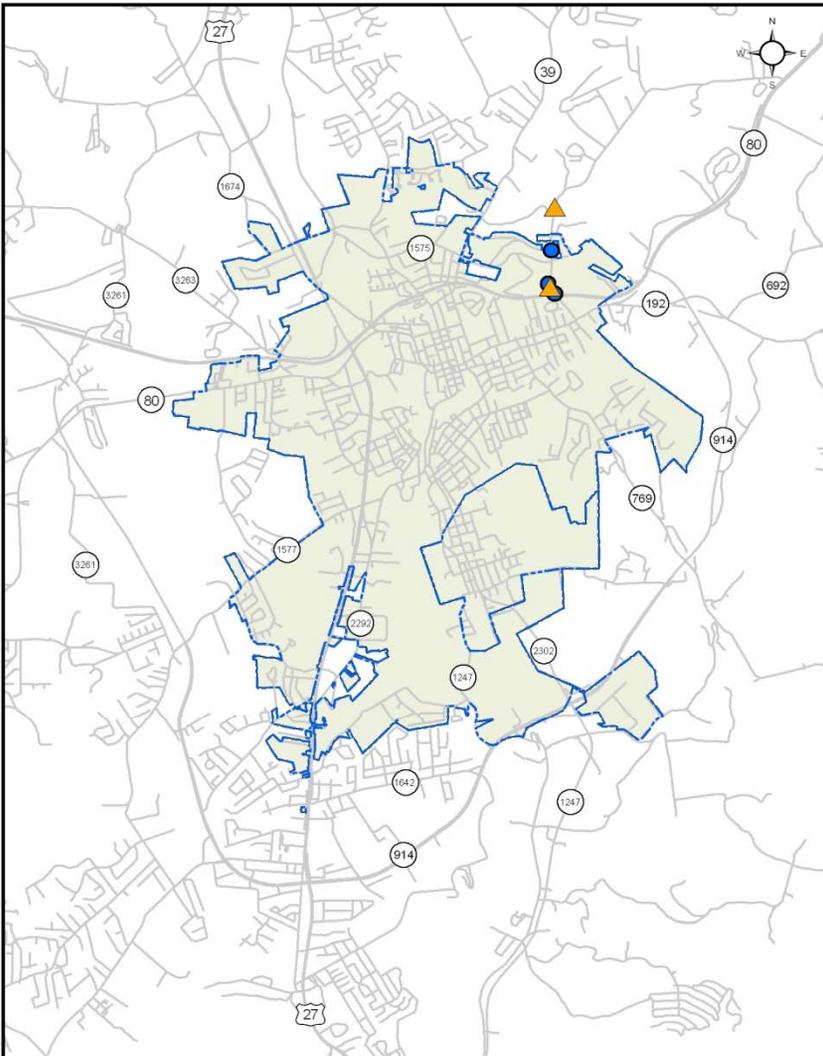
Louie B. Nunn Pkwy Collision Types (2006 - 2009)



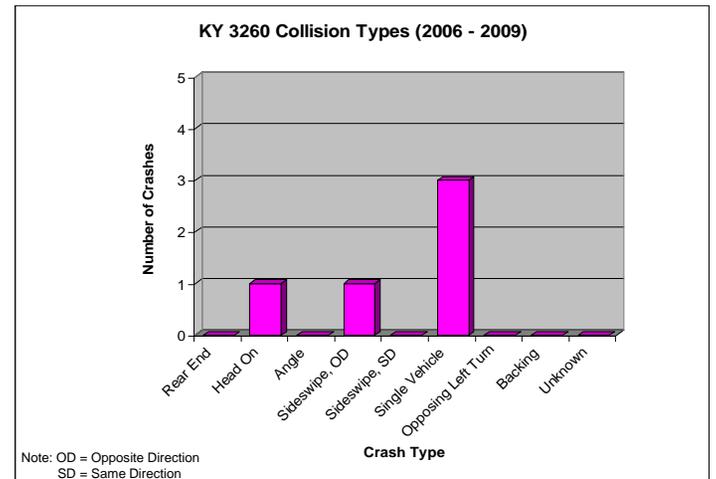
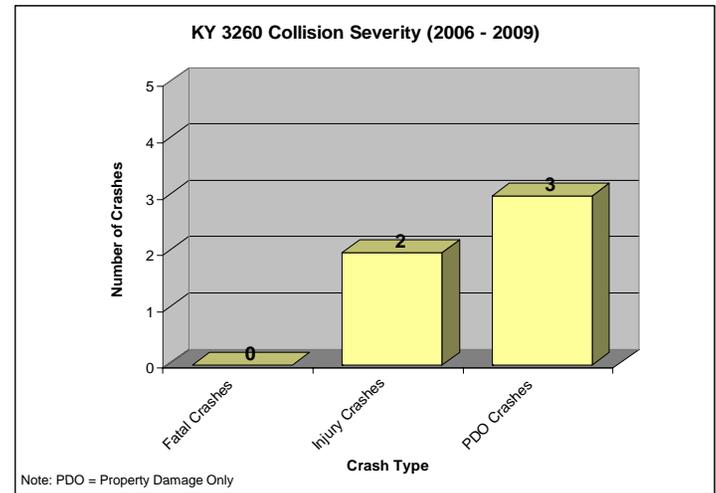
Note: OD = Opposite Direction
SD = Same Direction

Route: Louie B. Nunn Parkway
 High Crash Segments: 1
 Primary Collision Type: Angle

Somerset SUA
Crash Analysis



- Fatal Crash
- ▲ Injury Crash
- PDO Crash



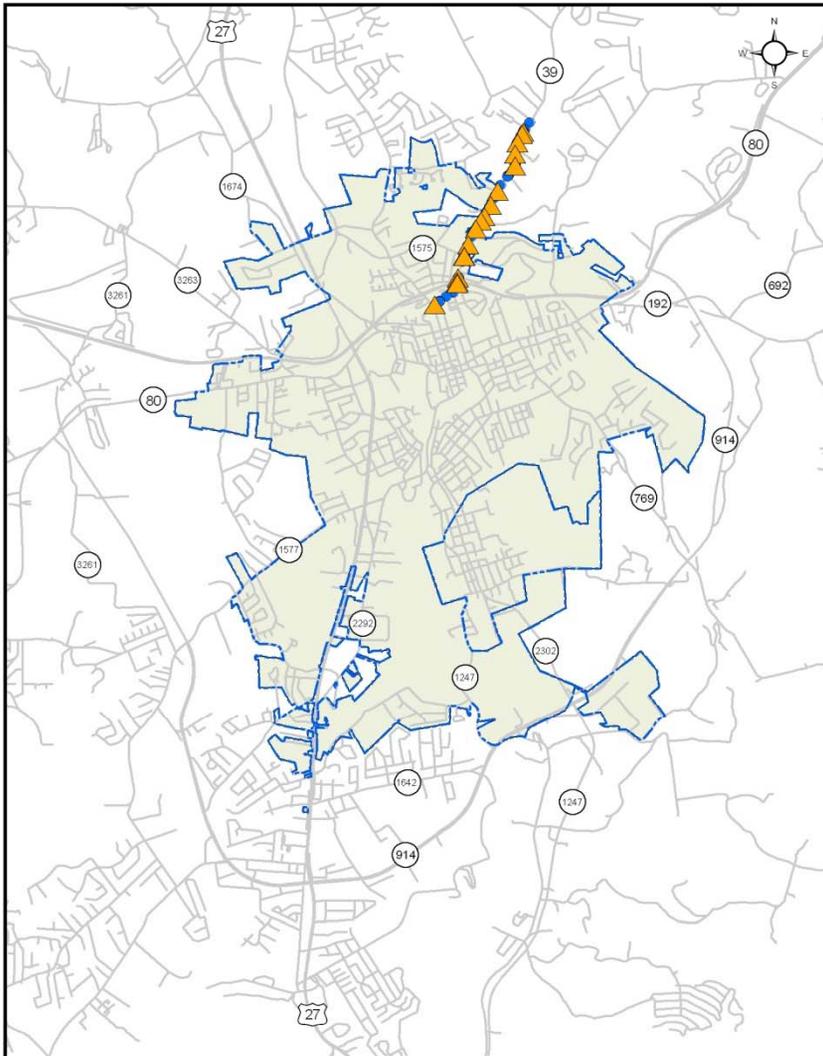
Route: KY 3260

High Crash Segments: 0

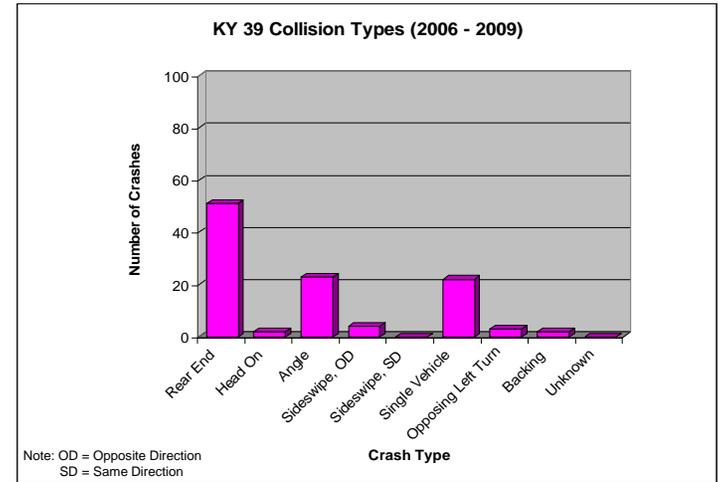
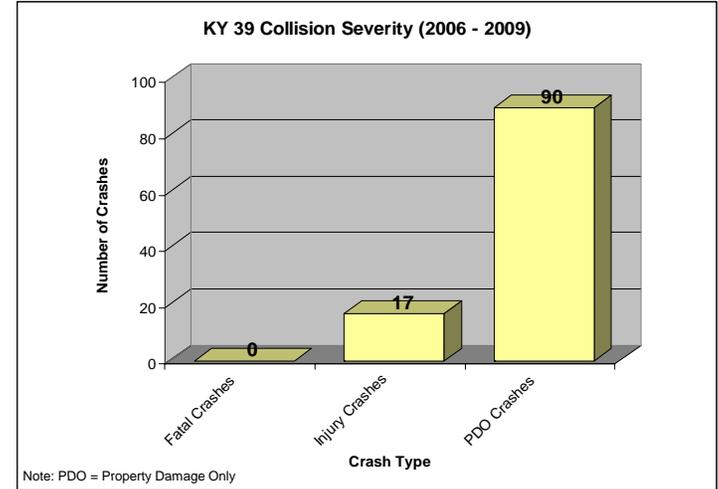
Primary Collision Type: Single Vehicle

Somerset SUA

Crash Analysis

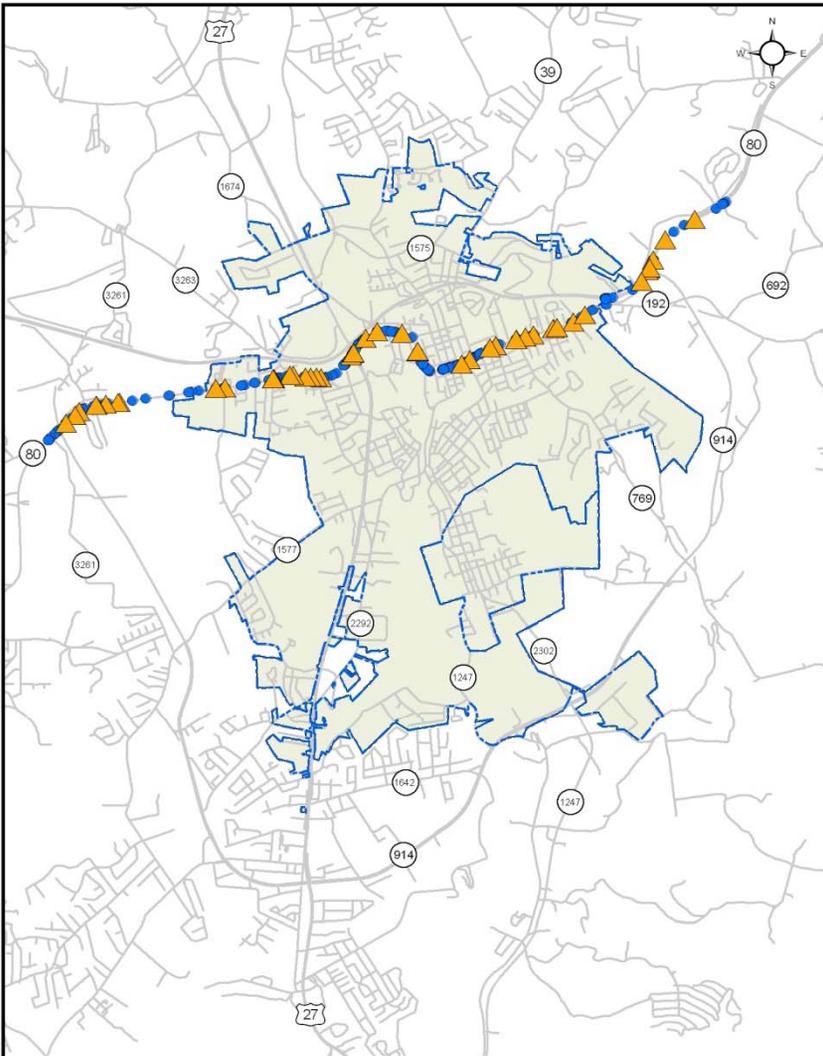


- Fatal Crash
- ▲ Injury Crash
- PDO Crash

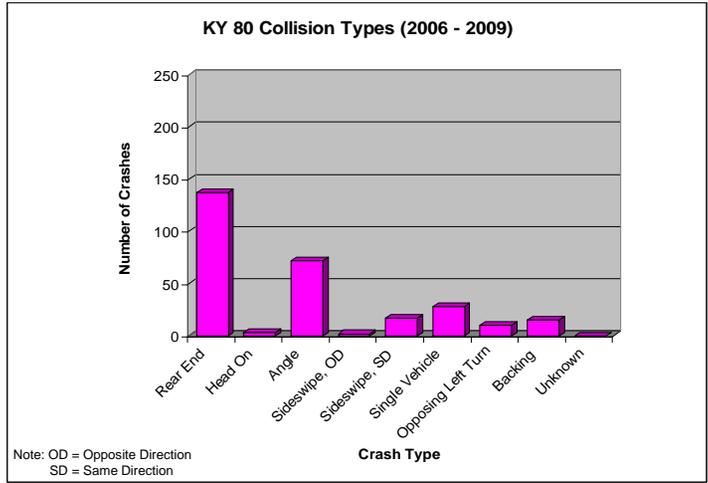
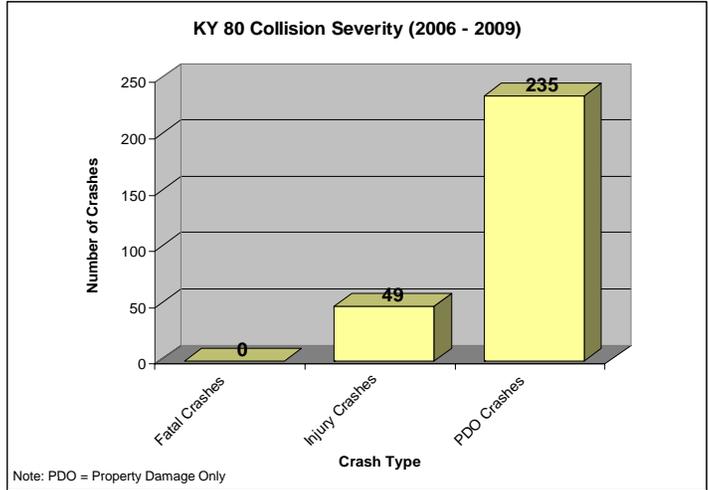


Route: KY 39
High Crash Segments: 3
Primary Collision Type: Rear End

Somerset SUA
Crash Analysis

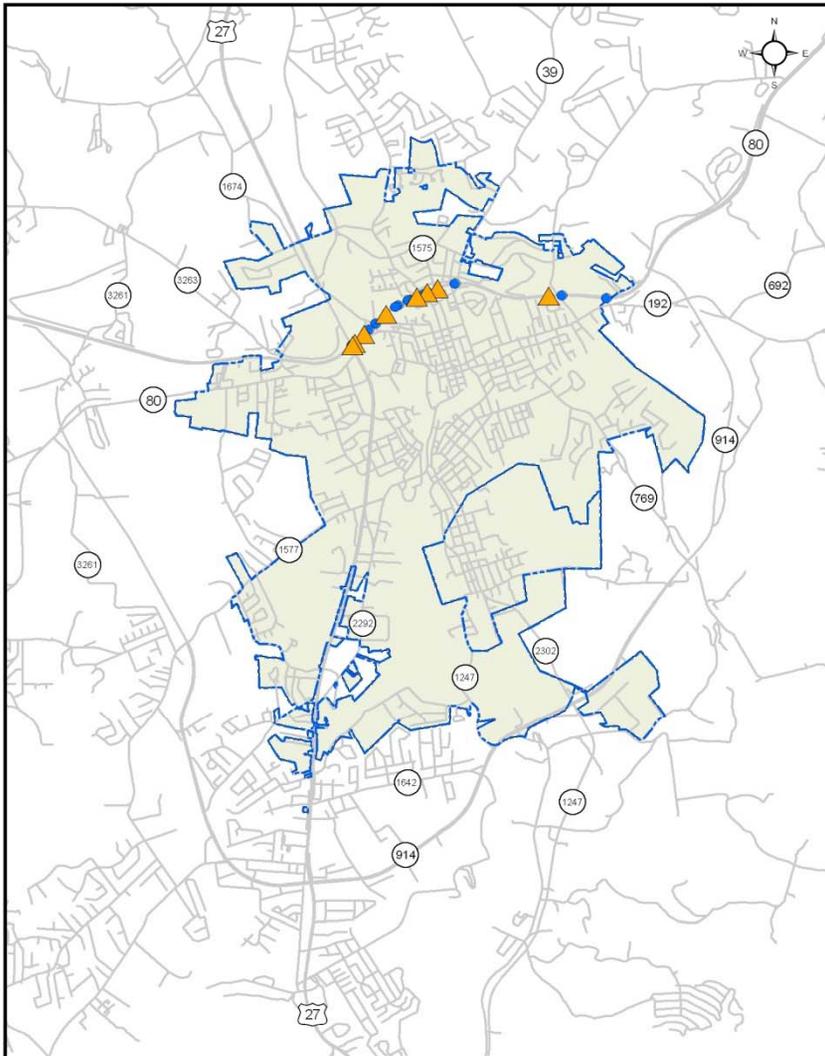


- Fatal Crash
- ▲ Injury Crash
- PDO Crash

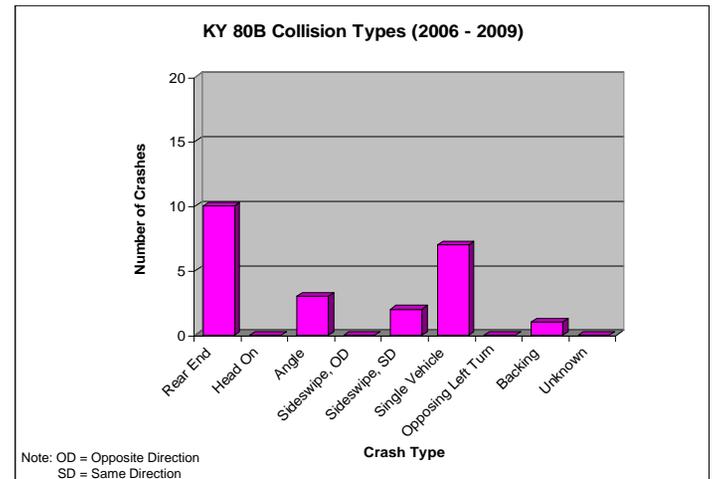
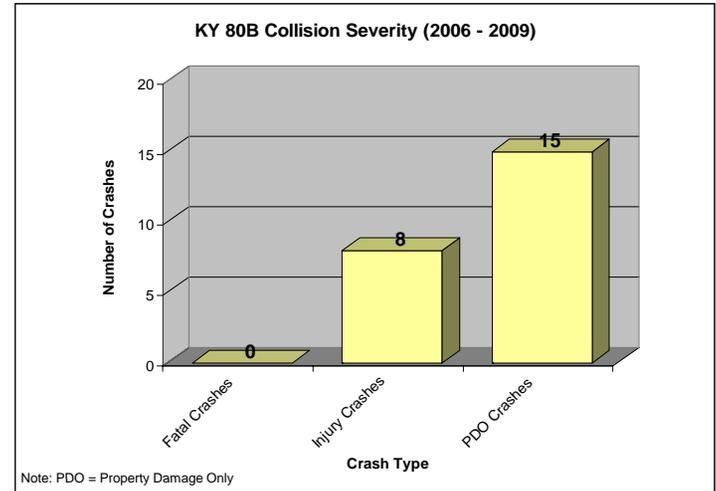


Route: KY 80
High Crash Segments: 4
Primary Collision Type: Rear End

Somerset SUA
Crash Analysis

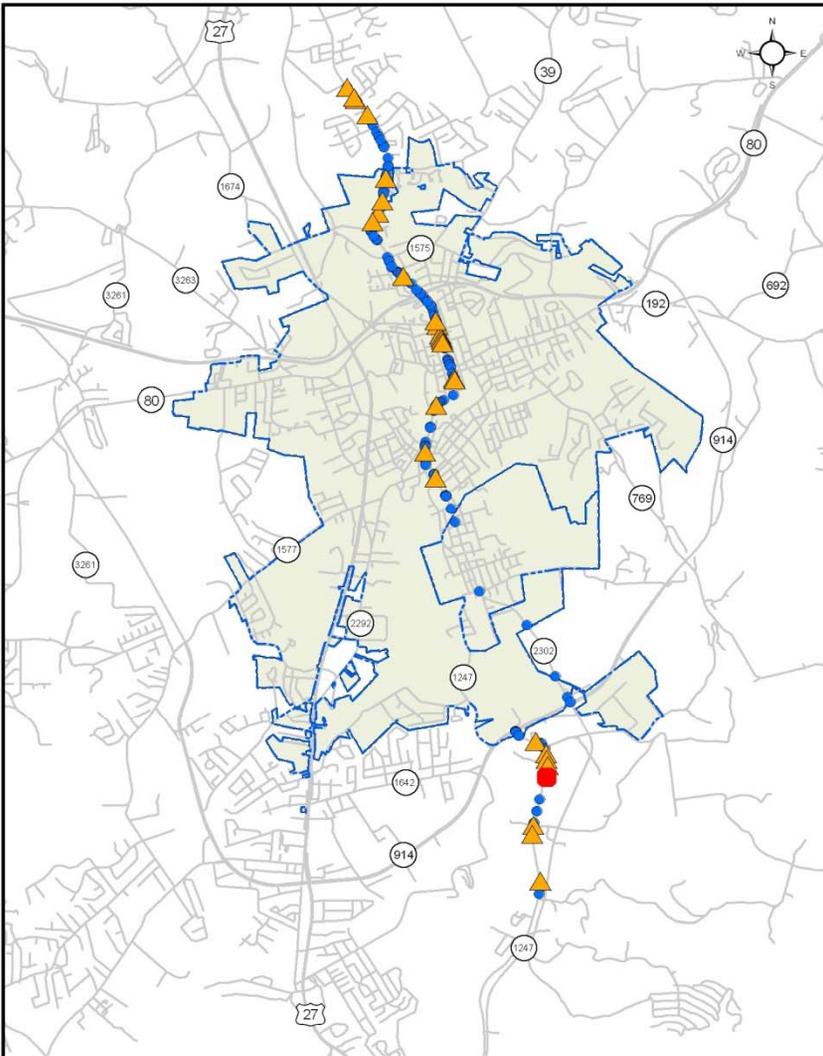


- Fatal Crash
- ▲ Injury Crash
- PDO Crash

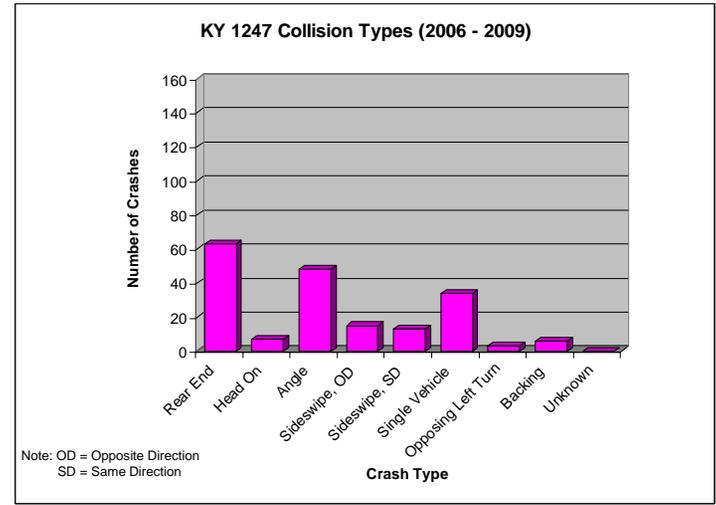
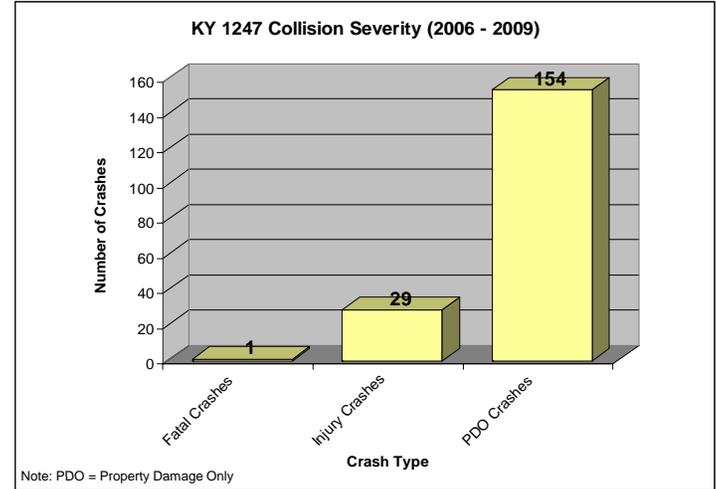


Route: KY 80B
High Crash Segments: 0
Primary Collision Type: Rear End

Somerset SUA
Crash Analysis

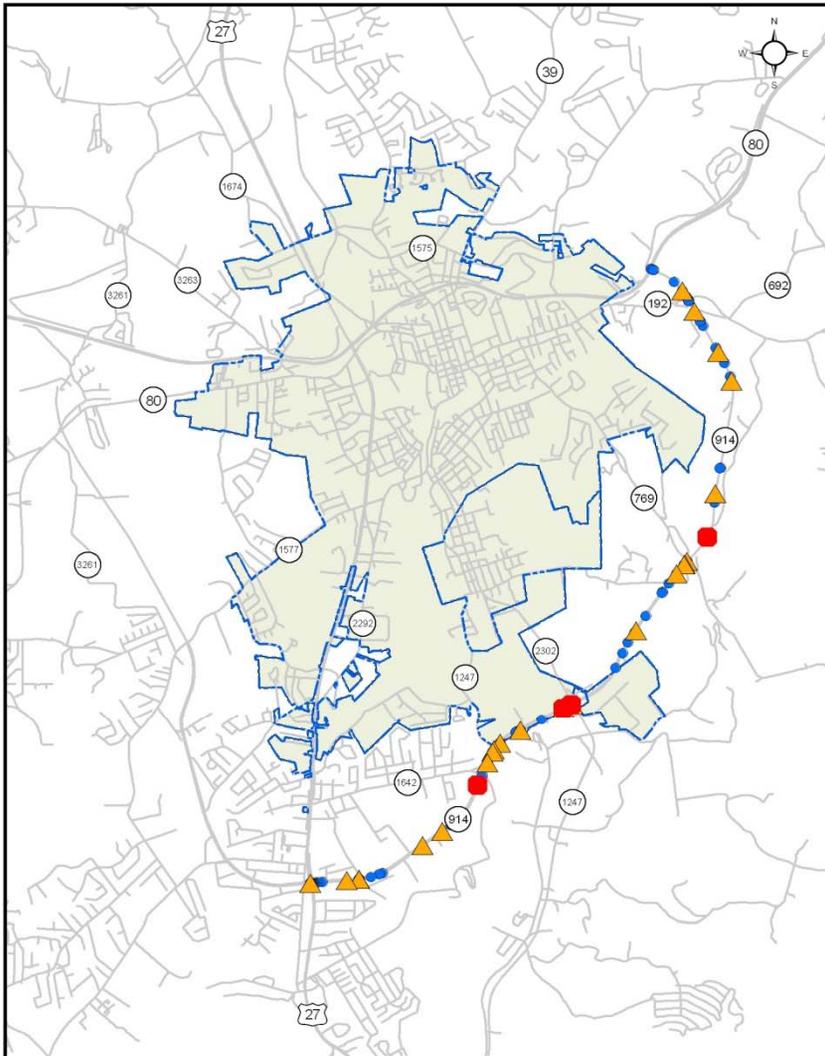


- Fatal Crash
- ▲ Injury Crash
- PDO Crash



Route: KY 1247
High Crash Segments: 3
Primary Collision Type: Rear End

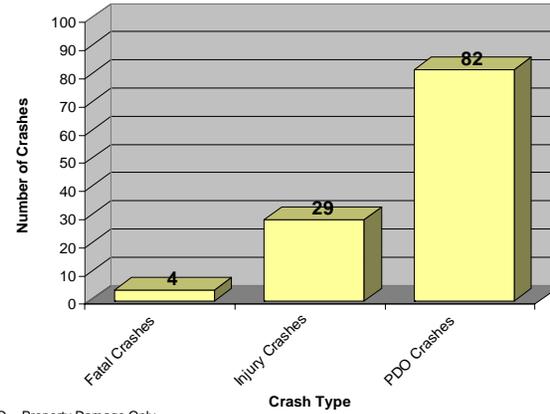
Somerset SUA
Crash Analysis



- Fatal Crash
- ▲ Injury Crash
- PDO Crash

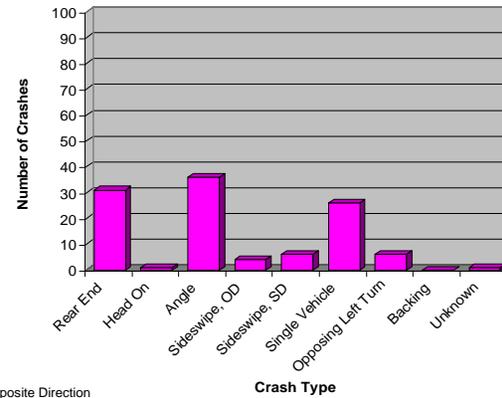


KY 914 Collision Severity (2006 - 2009)



Note: PDO = Property Damage Only

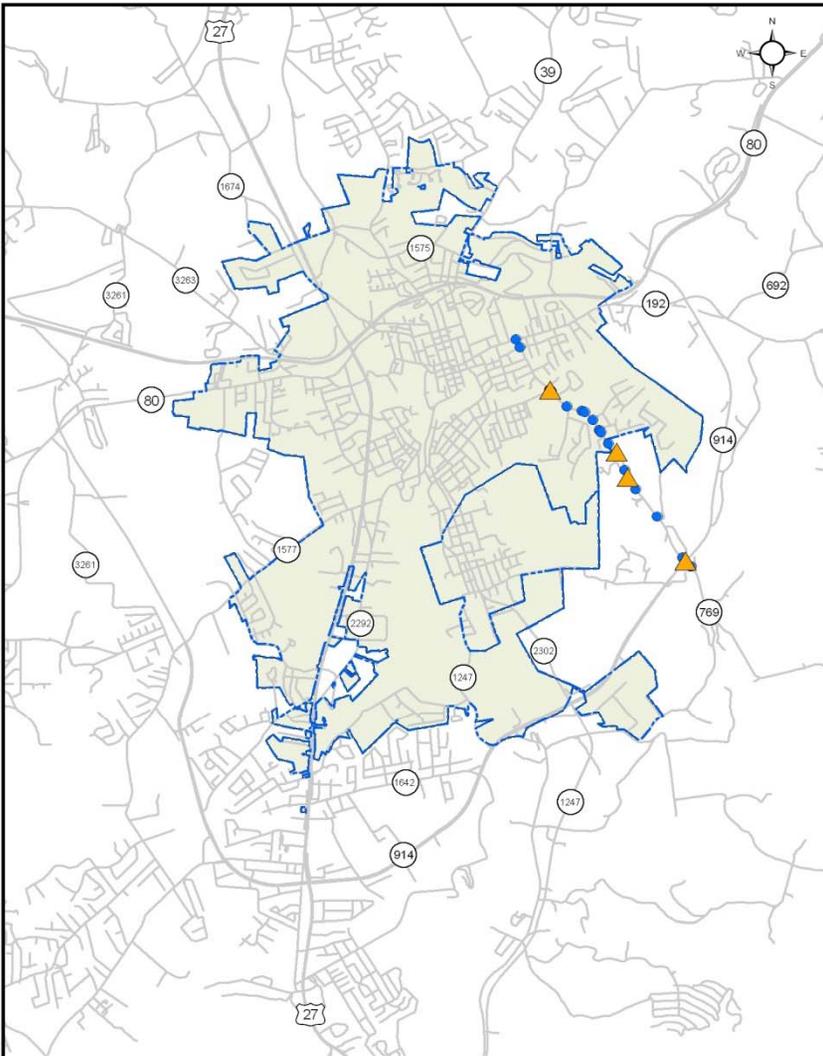
KY 914 Collision Types (2006 - 2009)



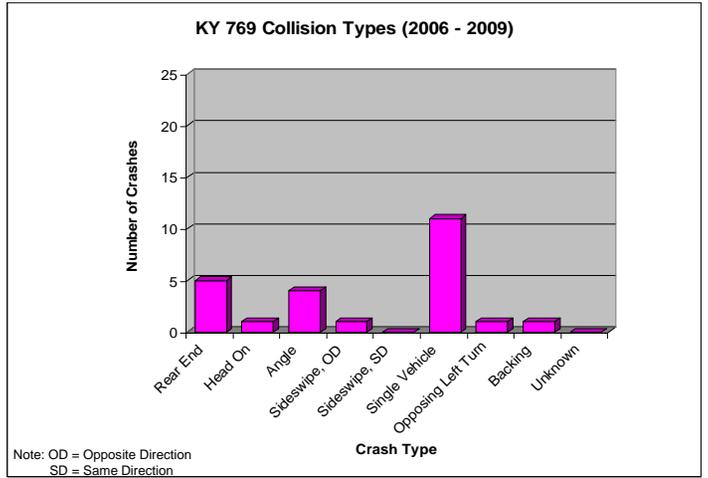
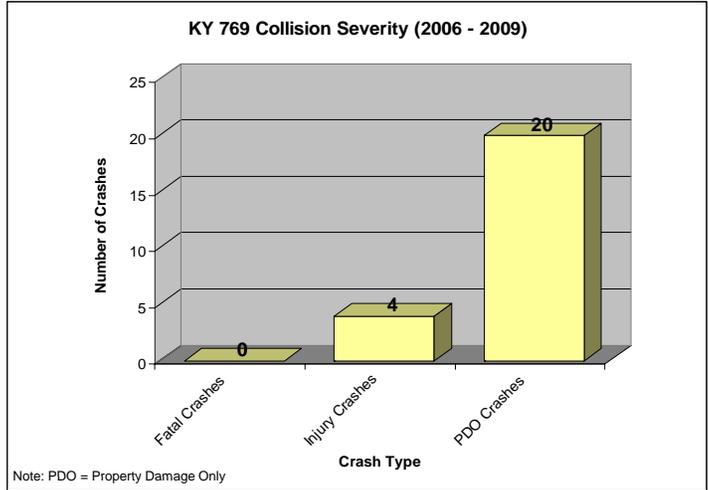
Note: OD = Opposite Direction
SD = Same Direction

Route: KY 914
 High Crash Segments: 0
 Primary Collision Type: Angle

Somerset SUA
Crash Analysis



- Fatal Crash
- ▲ Injury Crash
- PDO Crash



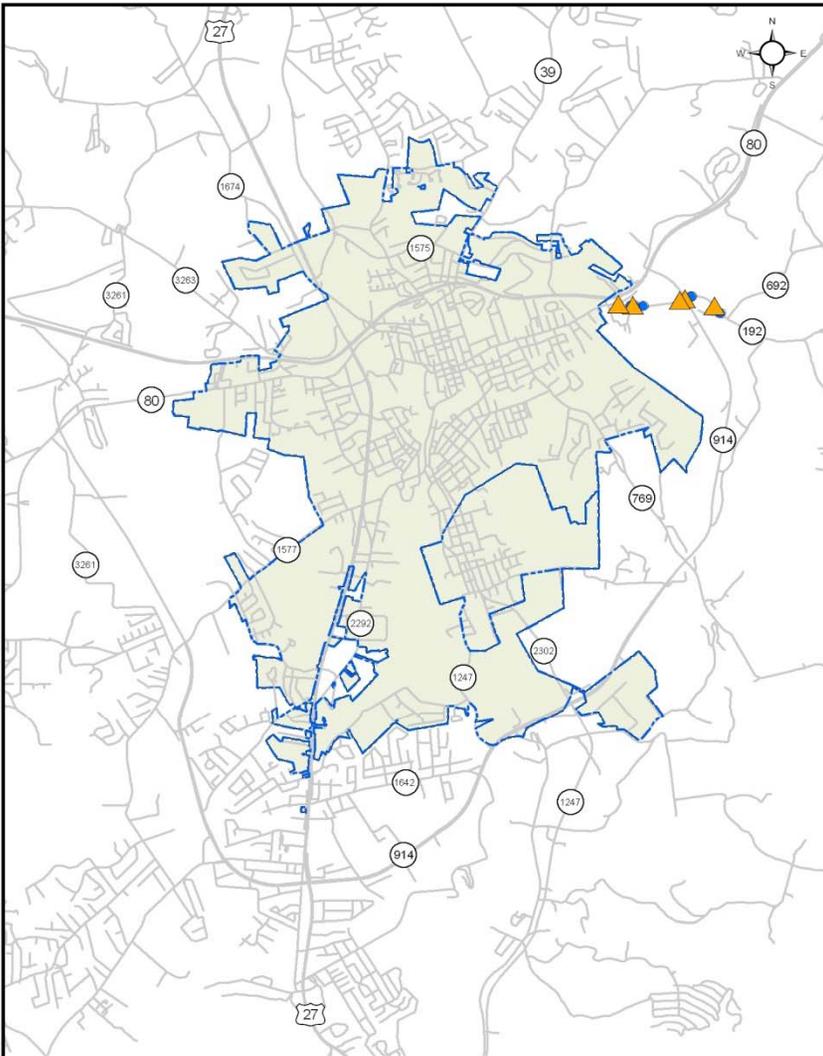
Route: KY 769

High Crash Segments: 0

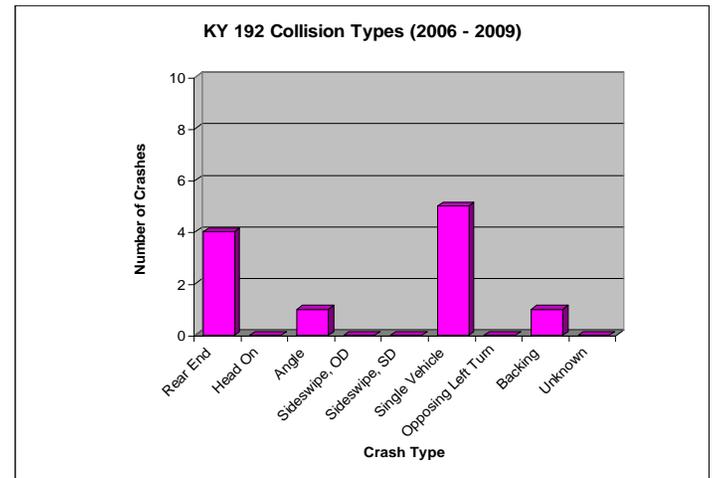
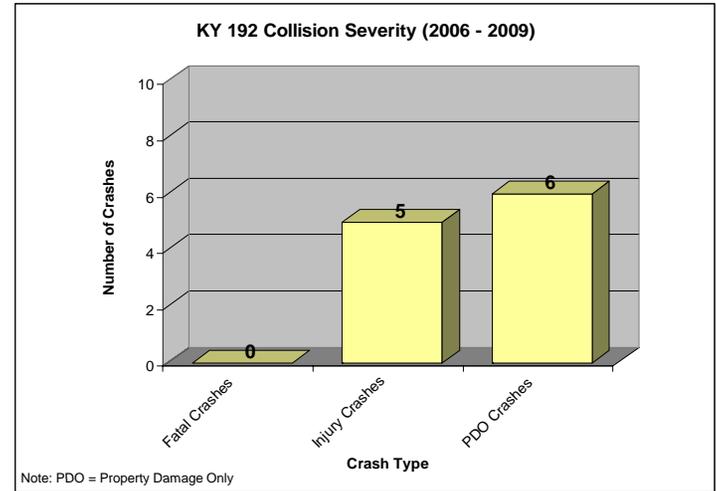
Primary Collision Type: Single Vehicle

Somerset SUA

Crash Analysis



- Fatal Crash
- ▲ Injury Crash
- PDO Crash



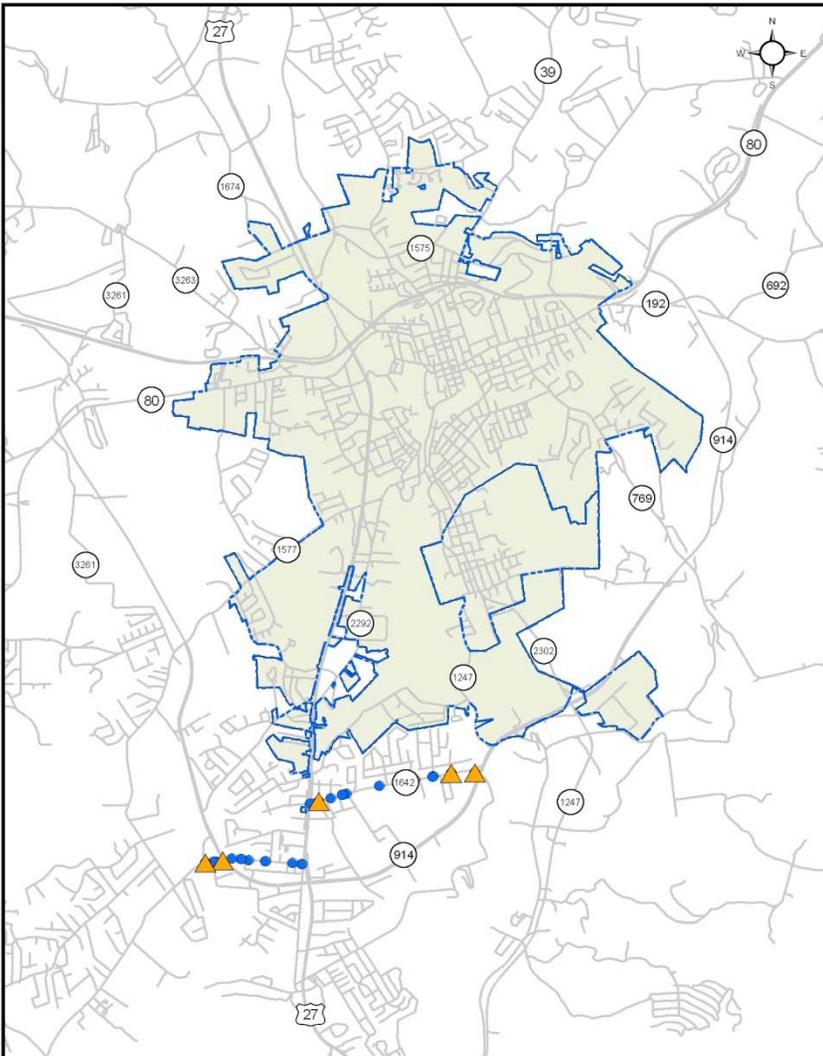
Route: KY 192

High Crash Segments: 0

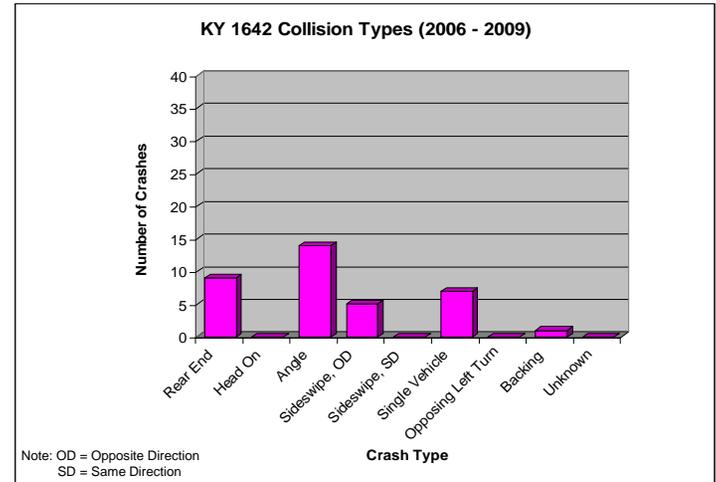
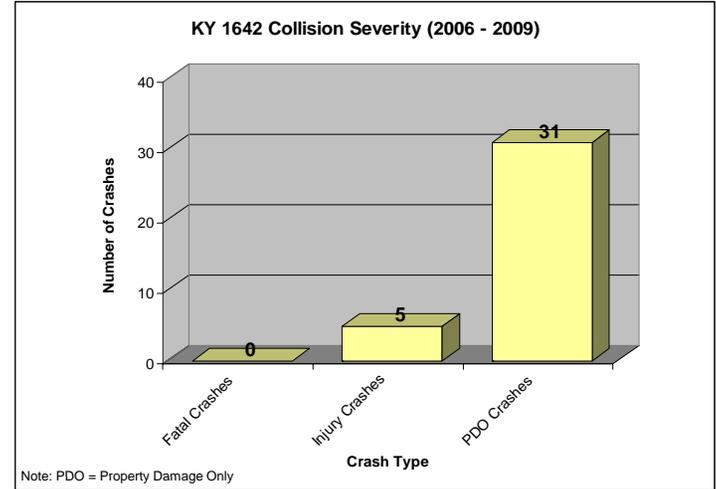
Primary Collision Type: Single Vehicle

Somerset SUA

Crash Analysis

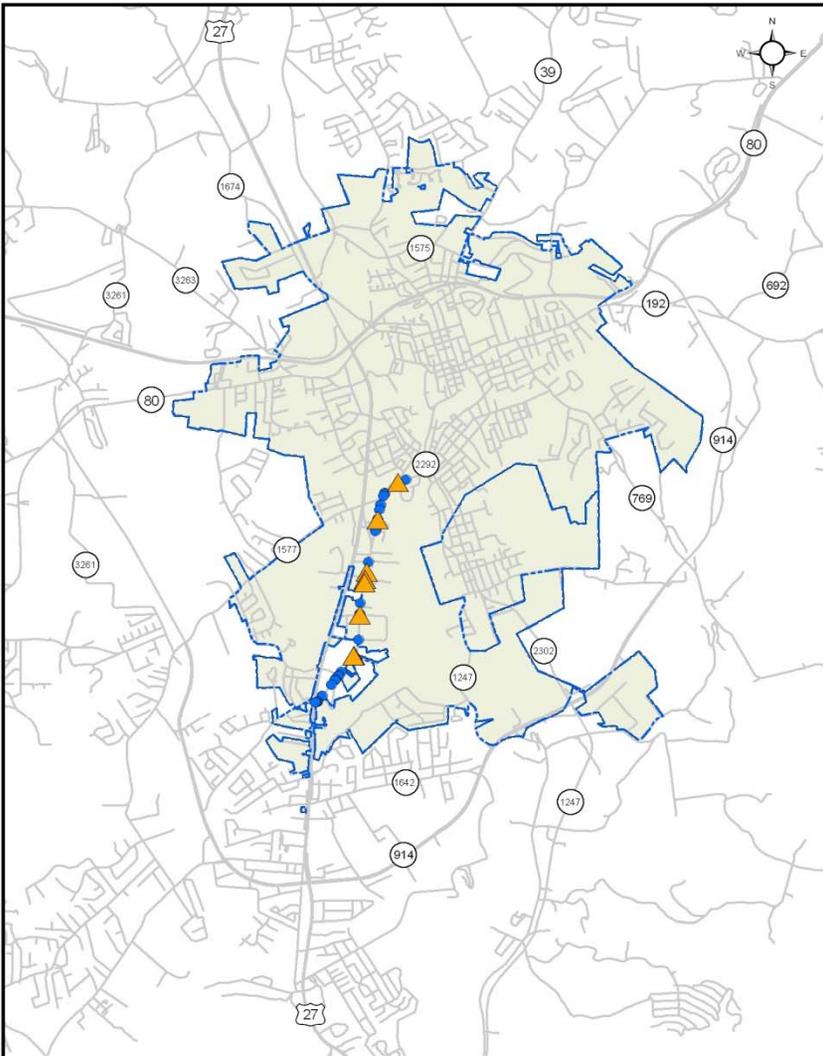


- Fatal Crash
- ▲ Injury Crash
- PDO Crash

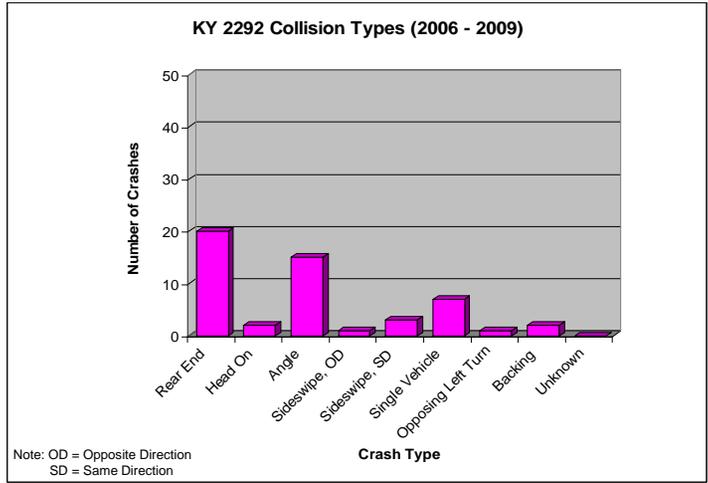
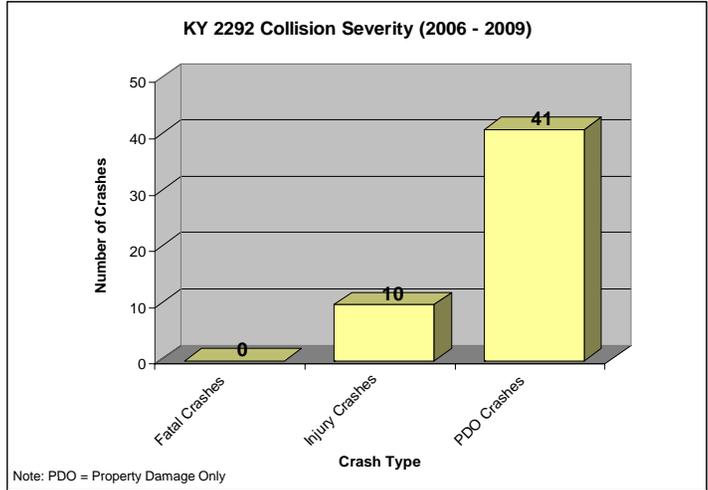


Route: KY 1642
 High Crash Segments: 1
 Primary Collision Type: Angle

Somerset SUA
Crash Analysis

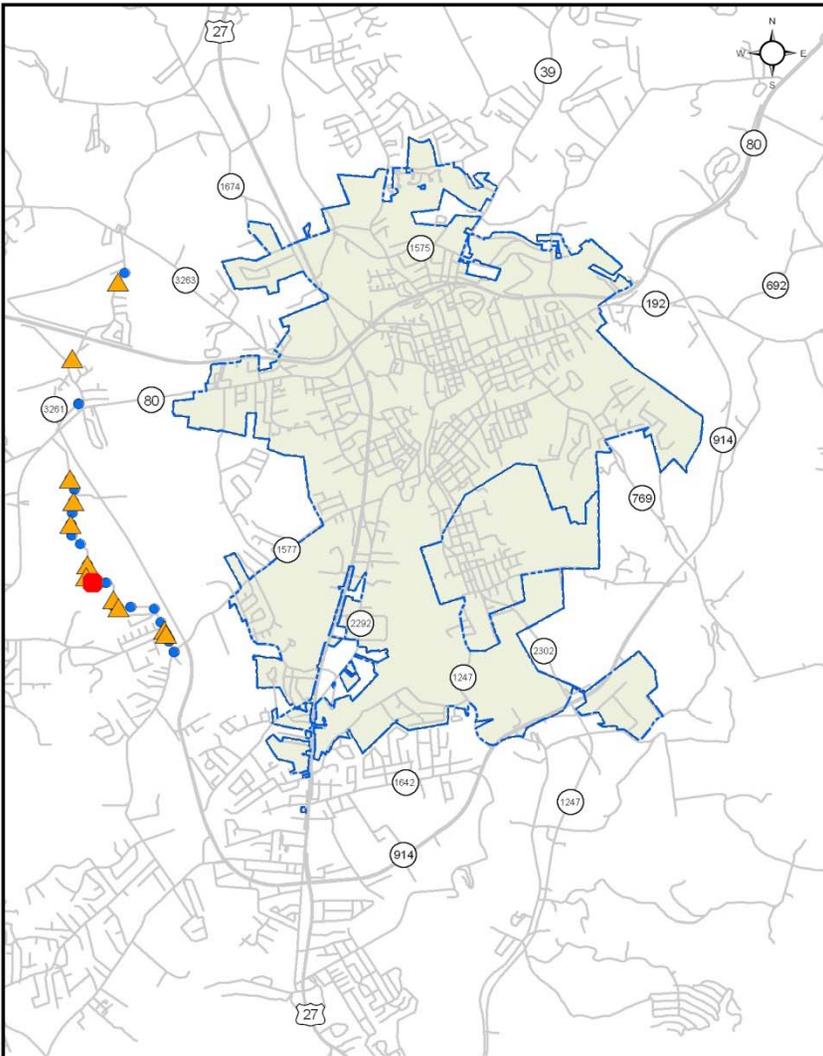


- Fatal Crash
- ▲ Injury Crash
- PDO Crash

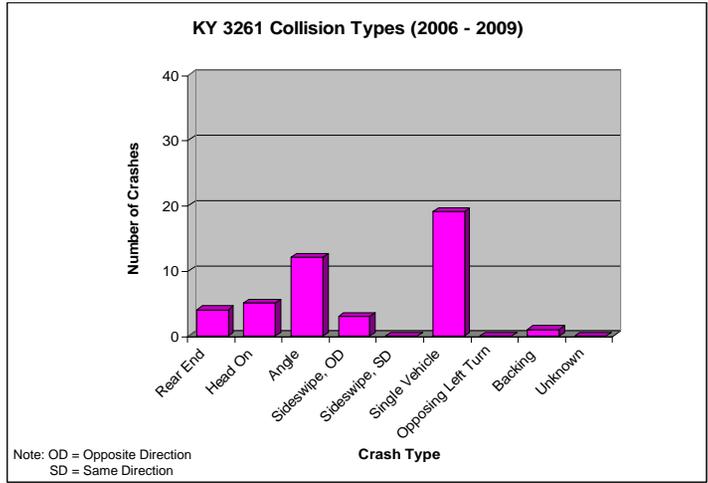
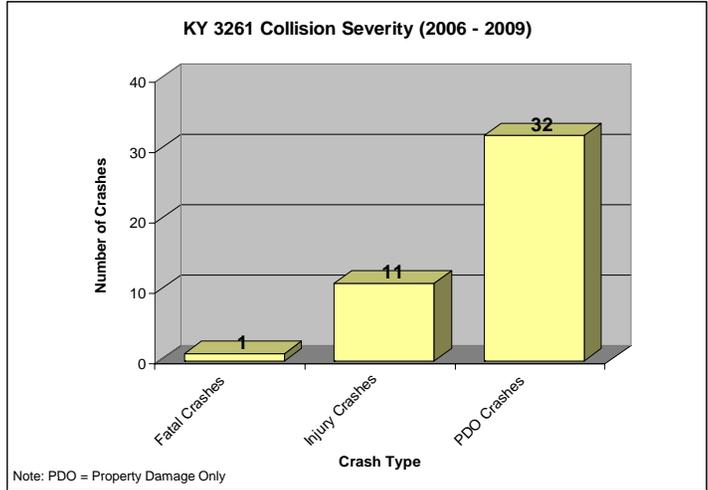


Route: KY 2292
High Crash Segments: 1
Primary Collision Type: Rear End

Somerset SUA
Crash Analysis



- Fatal Crash
- ▲ Injury Crash
- PDO Crash



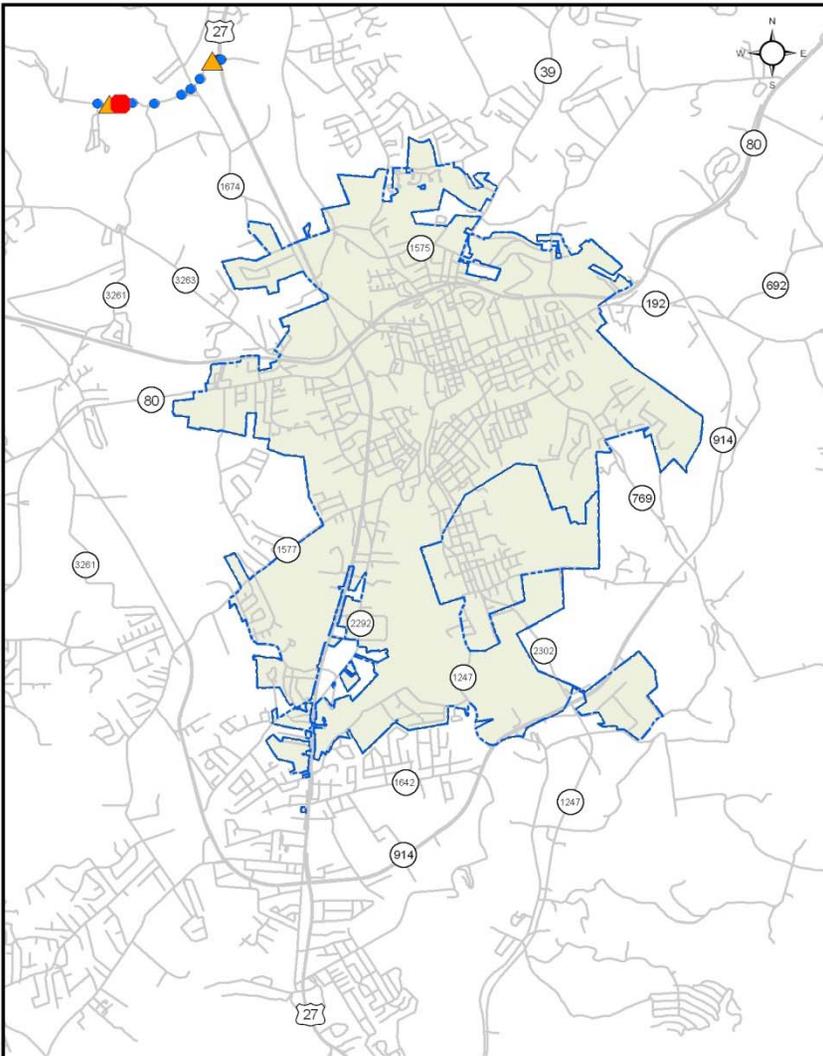
Route: KY 3261

High Crash Segments: 2

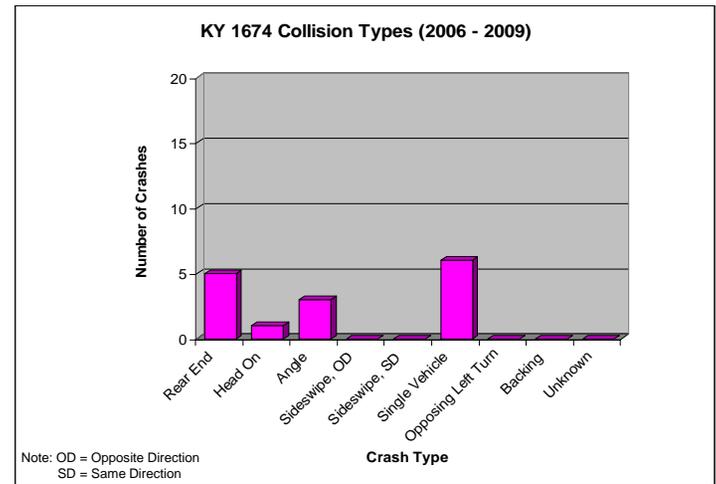
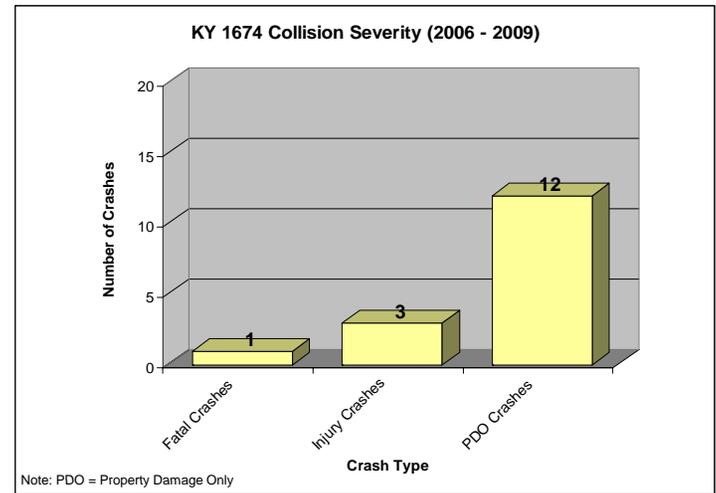
Primary Collision Type: Single Vehicle

Somerset SUA

Crash Analysis



- Fatal Crash
- ▲ Injury Crash
- PDO Crash



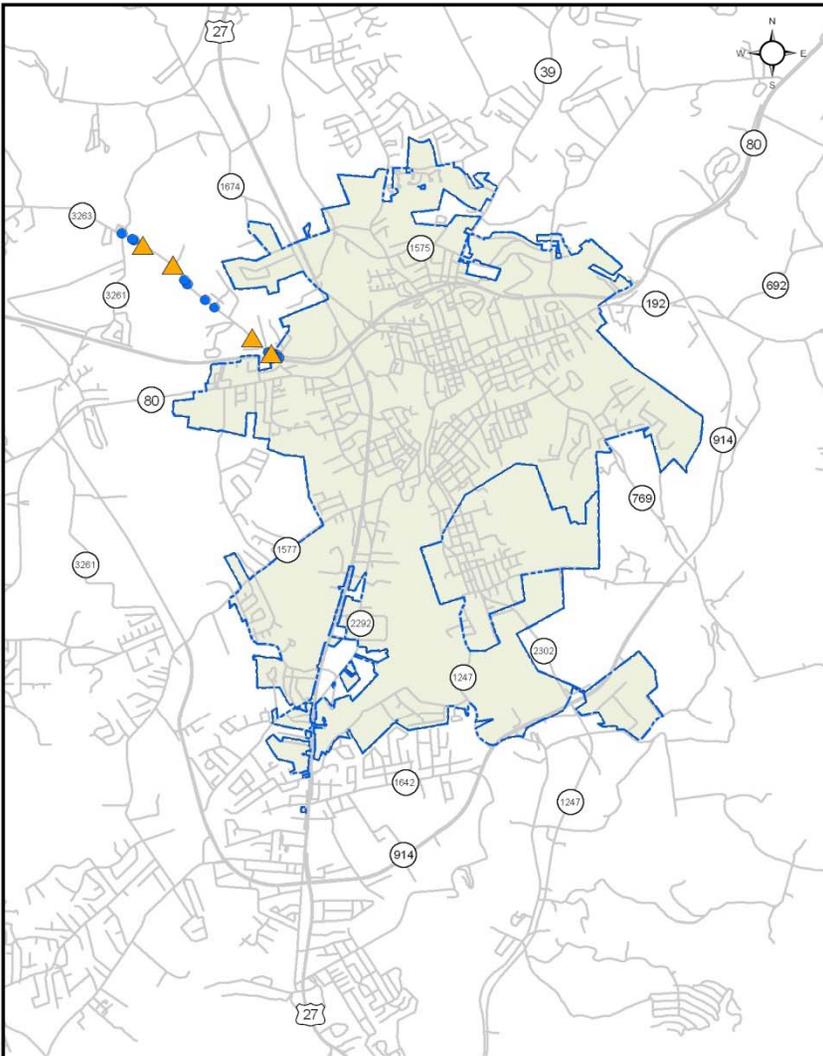
Route: KY 1674

High Crash Segments: 1

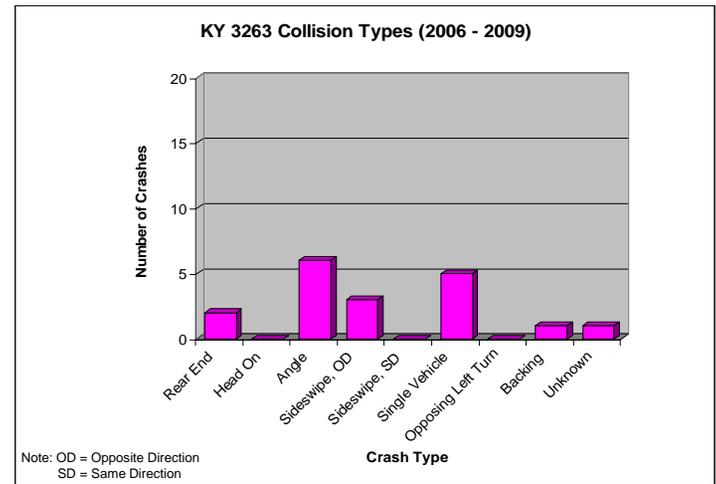
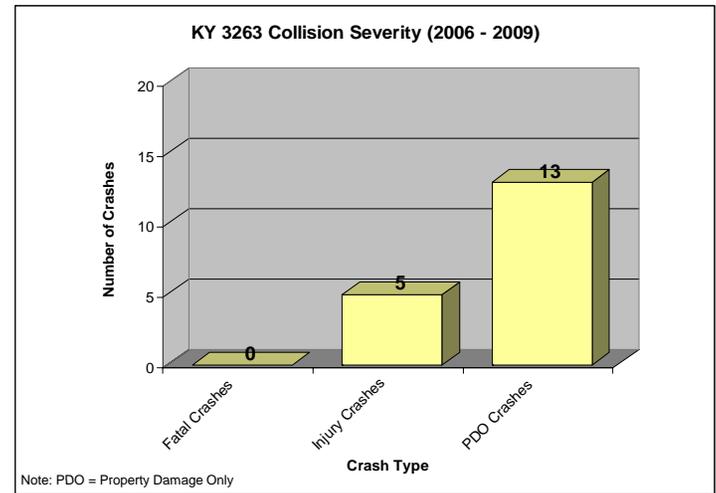
Primary Collision Type: Single Vehicle

Somerset SUA

Crash Analysis

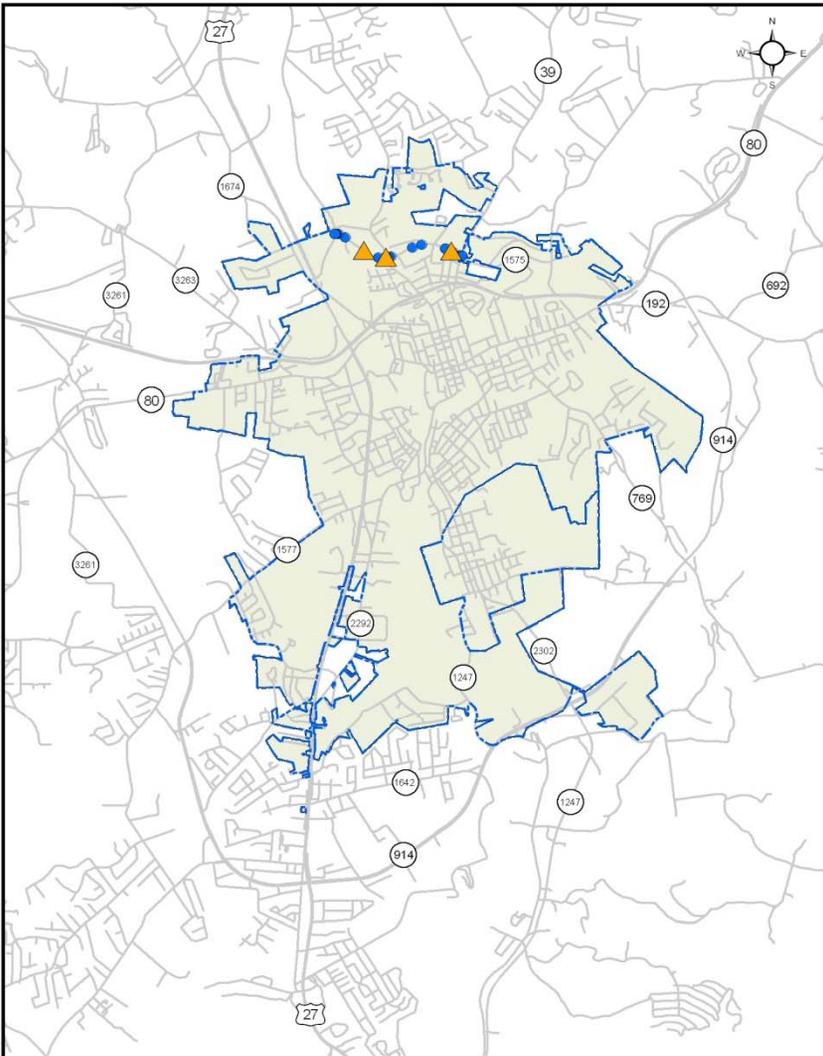


- Fatal Crash
- ▲ Injury Crash
- PDO Crash

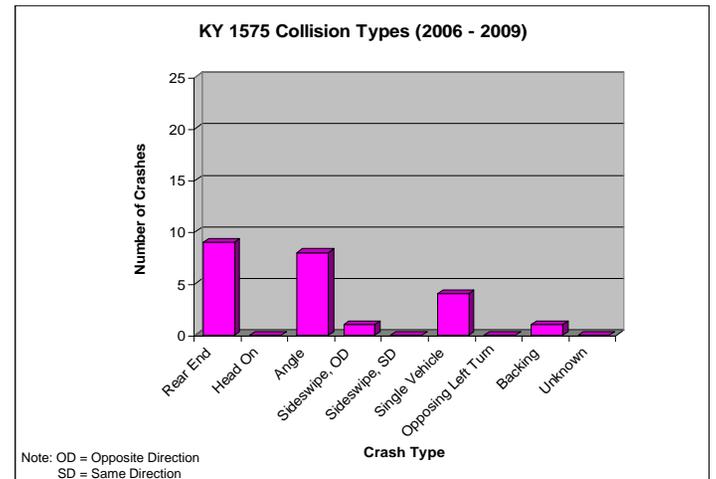
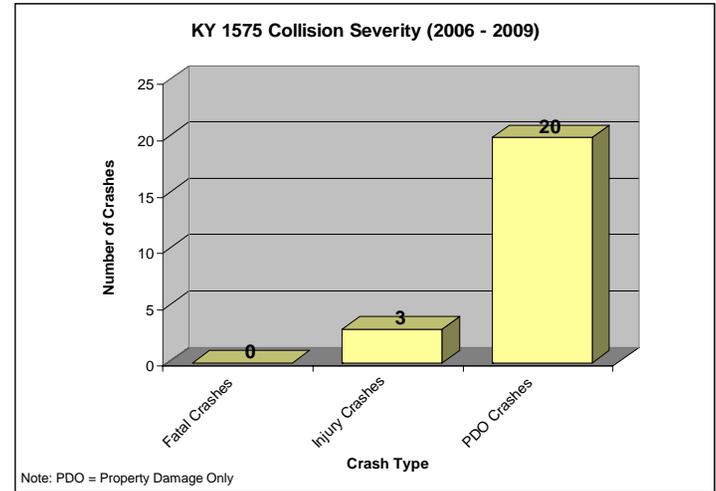


Route: KY 3263
High Crash Segments: 1
Primary Collision Type: Angle

Somerset SUA
Crash Analysis

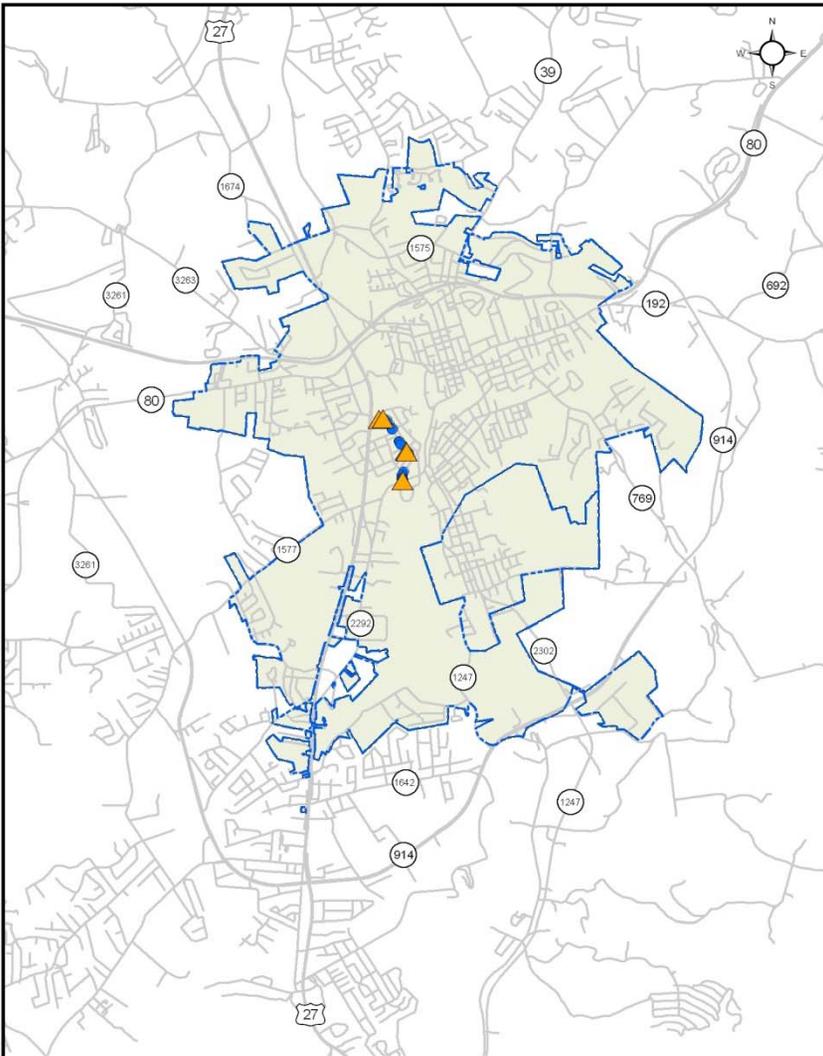


- Fatal Crash
- ▲ Injury Crash
- PDO Crash

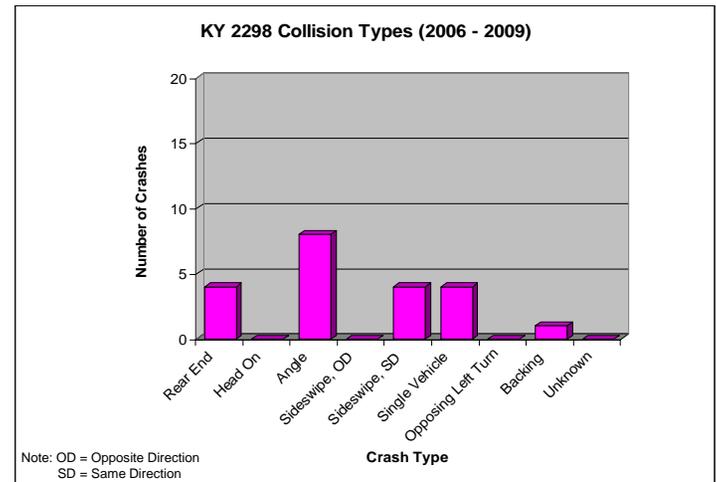
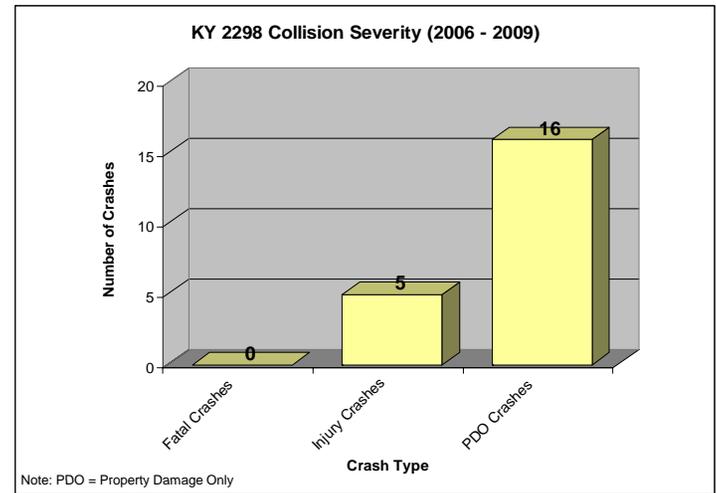


Route: KY 1575
High Crash Segments: 0
Primary Collision Type: Rear End

Somerset SUA
Crash Analysis



- Fatal Crash
- ▲ Injury Crash
- PDO Crash



Route: KY 2298
High Crash Segments: 1
Primary Collision Type: Angle

Somerset SUA
Crash Analysis

Appendix B:

Environmental Overview

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1.0 Introduction

Parsons Brinckerhoff (PB) is performing a Small Urban Area (SUA) study for the City of Somerset in Pulaski County, Kentucky. The purpose of a SUA is to identify and examine transportation issues related to safety and congestion in the city and its surrounding area. The result of the study will be a list of projects that will help improve safety, congestion and mobility in the study area. As part of the study, PB conducted an environmental overview (EO) that will identify potential environmental concerns in the study area.

2.0 Environmental Setting

The study area encompasses the City of Somerset, Kentucky and a portion of the surrounding unincorporated area of Pulaski County. The City of Somerset is well developed, however there are undeveloped areas surrounding the city. US 27 is the main roadway that runs north-south through the city. Somerset can also be accessed from I-75 via KY 80. The Somerset area is unique in that it is close to Lake Cumberland, a major recreation destination in Kentucky.

3.0 Human Environment

Figure B-1 depicts on a map many of the human environment characteristics.

3.1 Underground Storage Tanks / Hazardous Materials

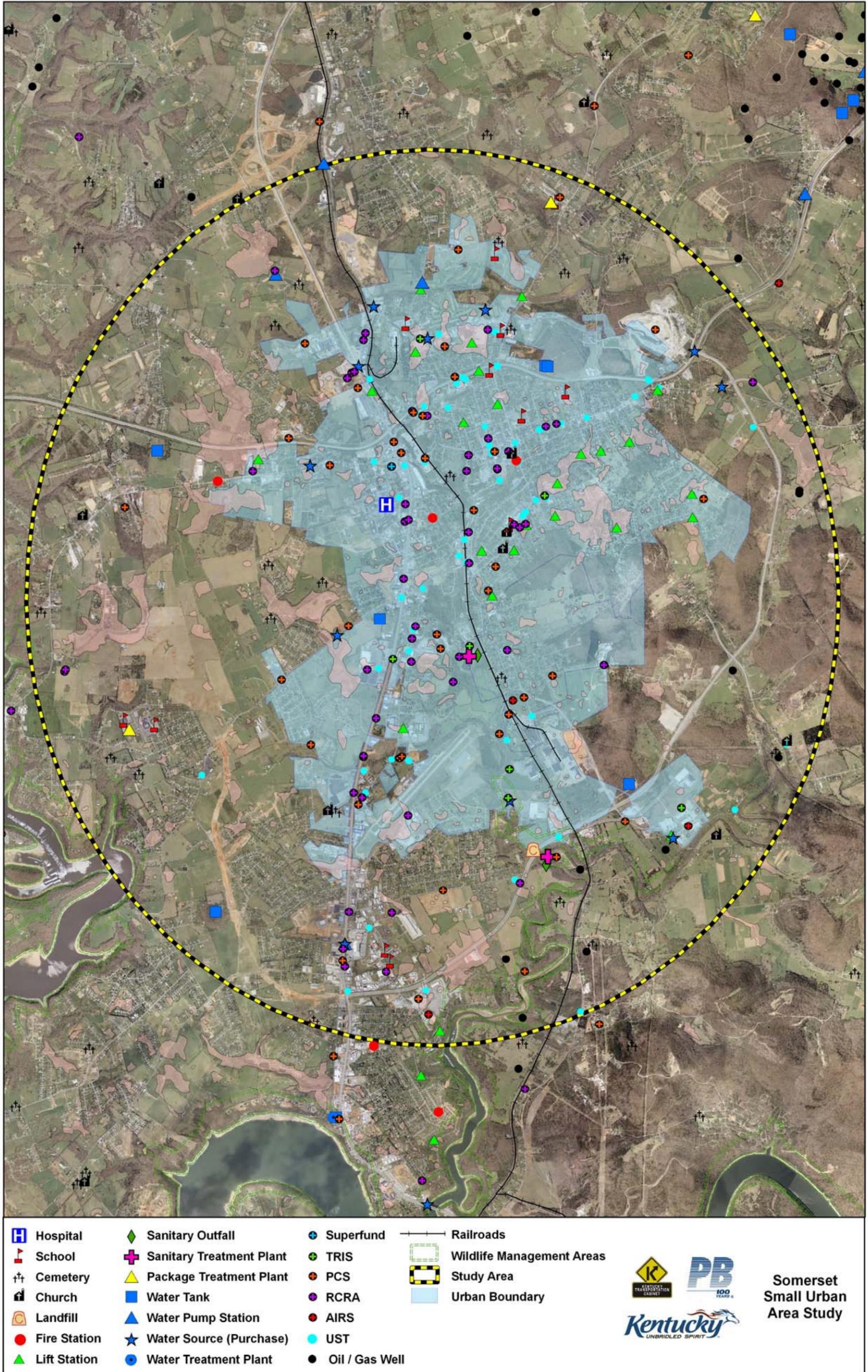
There are 673 underground storage tank (UST) sites identified within the Somerset Corporate limits. Of the 673 UST sites, only 327 were within the defined study area and had accurate location information for mapping purposes. 93 of those tanks are currently active.

According to the Kentucky Division of Waste Management, there is one active landfill near Somerset; however, it is located to the southeast of the study area. In addition to the landfill, there is a recycling facility on-site at the landfill.

With respect to other potential hazardous locations, the United States Environmental Protection Agency (EPA) maintains records on point sources of pollution and other harmful features within an area. In the study area, the following were identified:

- Aerometric Information Retrieval System (AIRS): 8
- Permit Compliance System (PCS): 46
- Resource Conservation and Recovery Act (RCRA): 66
- Superfund: 1
- Toxics Release Inventory System (TRIS): 7

Figure B-1: Human Environment Map



3.2 Previously Documented Cultural – Historic Sites

There are 25 locations listed on the National Register of Historic Places in Somerset. The list includes Harvey's Hill Historic District, North Main Street Historic District, Somerset Downtown Commercial District, South Courthouse Square Historic District and West Columbia District. In addition to these districts, there are 18 historic districts and 2 historic monuments.

There are likely many more sites within the study area that have potential to be nationally registered. It is suggested that further study and documentation be completed to avoid or mitigate impacts if any recommended project exists in areas where there may be impacts to potential sites.

3.3 Churches and Cemeteries

There are multiple churches and cemeteries located within the study area. Based upon the data available for this project, 18 cemeteries and 7 churches were identified.

4.0 Natural Environment

Figure B-2 depicts on a map many of the natural environment characteristics.

4.1 Aquatic Resources

4.1.1 Creeks / Streams

The study area is located in the Upper Cumberland – Lake Cumberland sub-basin (HUC# 05130103) in the Pitman Creek Watershed. Pitman Creek flows from the western side of the study area south to Lake Cumberland. Other creeks / streams in the area include:

- Allen Branch
- Caney Fork
- Dry Branch
- Fishing Creek
- Gilmore Branch
- Patterson Branch
- Rush Branch
- Sinking Creek

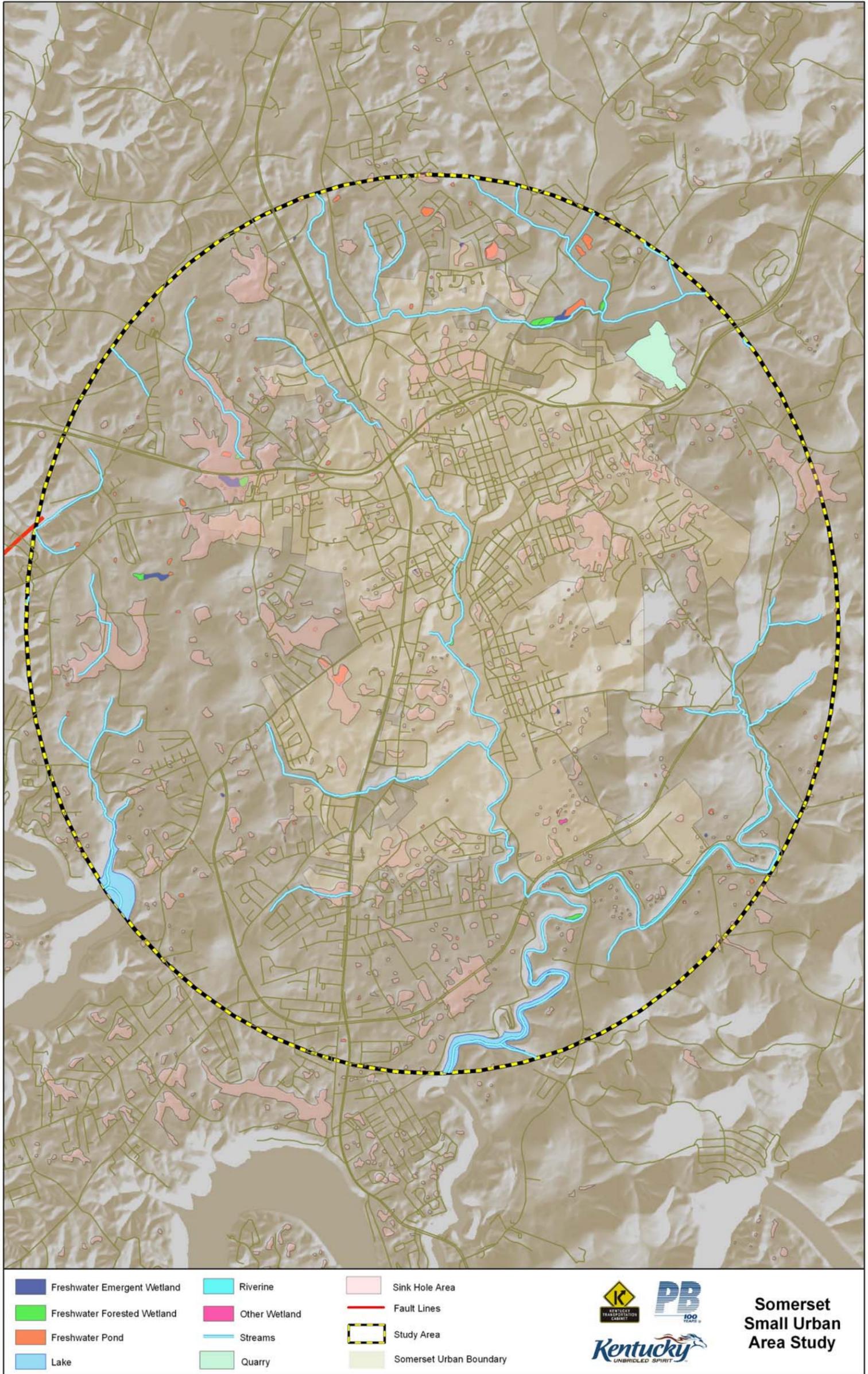
4.1.2 Wetlands

According to National Wetlands Inventory data, there are 108 palustrine wetlands in the study area.

4.1.3 Floodplains

Floodplains in the study area were examined from historic Flood Insurance Rate Maps (FIRMs) produced by FEMA. The maps are from 1990 and cover unincorporated areas of Pulaski County and the City of Somerset and the City of Ferguson.

Figure B-2: Natural Environment Map



According to the maps, most of the study area is in Zone X, which is a low to moderate risk zone. Zone X is defined as an “area of minimal flood hazard, usually depicted on FIRMs as above the 500-year flood level. Zone X is the area determined to be outside the 500-year flood and protected by levee from 100-year flood.” There are also some areas of Zone A, which are areas of high risk, typically closer to tributaries, streams, and rivers. Zone A is defined as “areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.” Mandatory flood insurance is required for structures within the high risk zones.

Because many of the improvements are to transportation infrastructure, there is likely to be minimal to no impacts on the adjacent tributaries, streams, rivers, etc. Where these improvements occur within an existing floodplain, they present minimal additional risk since they augment or replace the existing infrastructure that is already at risk.

Because the updated FIRMs maps are not in digital format, the revised floodplain boundaries were not incorporated into the environmental base mapping.

4.1.4 Karst Topography

Much of the study area is underlain by bedrock with high potential for karst development. The KYTC Division of Environmental Analysis authored Design Memorandum No. 12-05 which gives best management practices to be used during construction and maintenance and operation of roads located in karst areas. The best management practices of this memo must be followed when making improvements to roadways.

4.1.5 Aquatic Resource Summary

It is unlikely that there will be impacts on aquatic resources as the purpose of the study is to make improvements to existing transportation infrastructure, not propose substantial new construction. However if any proposed projects include improvements to existing stream crossings that might create temporary or permanent impacts, U.S. Army Corps of Engineers Section 404 and Kentucky Division of Water Section 401 permits may be required.

4.2 Threatened and Endangered Species

Data to determine threatened, rare and /or endangered species that may occur within the study area was compiled from the United States Fish and Wildlife Service, the Kentucky State Nature Preserves Commission, and the Kentucky Ecological Services. There are 13 federally listed species in Pulaski County listed by the United State Fish and Wildlife Service that are threatened or endangered. The list includes two mammals, nine mussels, one plant and one fish species. All are listed as federally endangered. More information includes:

- The two mammal species that are endangered are the Gray Bat and the Indiana Bat. The Gray Bat became federally listed on April 28, 1976. They can be found in the central and southern United States. The Gray Bat roosts in caves, but very few caves are acceptable. In the winter months, during hibernation, the bats roost in deep vertical caves with domed walls. In the summer time, caves that trap warm air and provide restricted rooms or domed ceilings are used. Maternity caves usually have a stream flowing through them and differ from caves that males use during the summer.
- Mating occurs between September and October. Soon after mating, females enter hibernation, followed several weeks later by males and juveniles. Females become pregnant when they emerge from hibernation in late March to early April. Males emerge from hibernation in mid-April to mid-May. Young are born in late May to early June. It is most successful if the young are raised in colonies. Summer colonies are made up of several roosting caves along river or reservoir borders. Migration between summer and winter habitats occurs before and after hibernation.
- The Gray Bat's diet consists mostly of flying insects, including mayflies and beetles. The main reason for decline of the species is cave disturbance, although cave protection has greatly reduced this threat. The use of crop pesticides and forestry insecticides near riparian corridors where they forage can reduce prey and kill bats that eat the contaminated insects.
- The Indiana Bat was federally listed on March 11, 1967. The Indiana Bat occurs in the eastern half of the US and population decline is due to loss and degradation of habitat as well as human impact on habitat. The Indiana Bat hibernates in clusters in caves in the winter. They prefer medium sized limestone caves with large, shallow passageways that also have pools. The bats generally hibernate from September or October to April, with females hibernating after mating and males remaining active for several weeks. Summer maternity sites are located behind the loose bark of dead or dying trees or in tree cavities. The Indiana bat forages in riparian areas, and upland forests, ponds and fields. They eat mostly flying insects.
- The nine mussels that are endangered in the study area are the purple catspaw pearlymussel, the Cumberland bean pearlymussel, the Cumberland elktoe, the Cumberlandian combshell, the littlewing pearlymussel, the oyster mussel, the ring pink, the rough pigtoe and the fanshell.
- The purple catspaw pearlymussel became listed on July 10, 1990. It occurs in several Midwestern and southern states. They live in freshwater and are found primarily in large rivers in sand and gravel substrates in runs and riffles. The species is severely declining due to siltation, drainage of bottomland lakes, swamps and prairie marshes, desiccation during drought, species introduction, pollution, impoundments and increased water temperatures.
- The Cumberland bean pearlymussel was listed as endangered on June 14, 1976. They can be found in several southern states and live in freshwater, mostly in depths of less than 1 meter with moderate to swift currents in sand, gravel and cobblestone substrates. They are in severe decline due to impoundment, siltation and pollution

- The Cumberland elktoe was listed on January 10, 1997. They can be found in Kentucky and Tennessee, in freshwater small creeks to medium sized rivers. They prefer finer particle substrates and slow moving currents with shallow flats or pools. This mussel is very rapidly declining due to habitat alteration causes by impoundments, channelization, pollution and sedimentation.
- The Cumberlandian combshell was listed January 10, 1997. They can be found in several southern states in freshwater ranging in size from large creeks to large rivers. They generally live in substrates ranging from coarse sand to mixtures of gravel, cobble and boulder-sized particles at depths of less than a meter. The population is severely declining due to habitat alternation caused by impoundments, channelization, pollution and sedimentation.
- The littlewing pearlymussel was listed November 14, 1988 and can be found in several southern states. They are found in freshwater small, cool streams, most commonly at riffle heads, although they can also be found in and below riffles on sand and gravel substrates with scattered cobbles. The population is very rapidly declining due to the deterioration of water quality, particularly from acid mine drainage.
- The oyster mussel was listed January 10, 1997 and can be found in various southern states. They live in freshwater ranging in size from large creeks to small to medium sized rivers with moderate to swift currents. The population is severely declining due to habitat alterations caused by impoundments, channelization, pollution and sedimentation.
- The rough pink became listed as endangered on September 29, 1989. They are located in some Midwestern and southern states. They prefer larges rivers with gravel and sand bars and are severely declining due to loss of habitat caused by impoundments, gravel dredging channel maintenance and incidental take from commercial mussel harvesting.
- The rough pigtoe was listed June 14, 1976 and is located in several Midwestern and southern states. These mussels can be found in medium to larger rivers, usually in sand, gravel and cobble substrates in shoals. The population is severely declining due to siltation, drainage of bottomland lakes, swamps, and prairie marshes, desiccation during drought, species introduction, pollution, impoundments and increased water temperature.
- The fanshell mussel became federally listed as endangered on Jun 21, 1990. They can be found in various Midwestern and southern states in medium to large freshwater streams with strong currents, as well as river habitats with gravel substrates. The fanshell is severely declining due to siltation, drainage of bottomland lakes, swamps and prairie marshes, desiccation during drought, species introduction, pollution, impoundments and increased water temperatures.
- The endangered plant species is the Virginia spiraea. The Virginia spiraea is a perennial shrub of the rose family that grows 2 – 10 feet tall with arching, upright stems. The flowers grow in flat-topped clusters at the ends of a branching stalk. Petals are white, occasionally pink. Flowering occurs late in May – July. Typical habitat is floodscoured, high-gradient rocky riverbanks; braided areas of lower stream reaches, gorges, and canyons; as well as disturbed rights-of-way.

- The endangered fish species is the blackside dace. They are small fish, usually less than 3 inches long. They have olive or gold colored backs and are silver-white or red along the underside. Two dark stripes run along each side of the fish's body. During the breeding season, the bellies of the males are bright red while the fins are bright yellow and trimmed in silver. Within this region, they are typically found in the upper Cumberland River drainage, mostly above Cumberland Falls.

Because it is anticipated that few new roadways would be built as a result of this study, it is unlikely that Gray or Indiana Bat habitats would be affected. If any projects that are a result of this study occur near any bodies of water, any negative impacts that could result from the project should be mitigated to avoid having an adverse impact on mussel habitats.

Based on the mapping, there is a wildlife management area in the southern portion of the study area. There are no wildlife refuges nature preserves, or other managed areas in the study area.

4.3 Air Quality

Pulaski County is currently designated in attainment status for air quality. As mentioned previously, because this study looks to improve existing transportation infrastructure and not many new roads, it is not expected that any projects that are suggested as a result of this study would have a negative impact on the attainment status of Pulaski County.

4.4 Traffic Noise

There has not been a specific noise analysis conducted for this study. While there are potentially sensitive noise receptors such as churches, schools, cemeteries, etc., throughout the study area, projects suggested as a result of this study are expected to increase noise substantially over baseline levels.

REFERENCES

Kentucky Cabinet for Economic Development – Industrial Tracts and Industrial Points. <ftp://ftp.ced.ky.gov/Download/KYGeonet/sitetract.zip>. July 2009.

Kentucky Division for Air Quality: 2007 Annual Ambient Air Quality Report. http://www.air.ky.gov/NR/rdonlyres/8DFAF85F-9C91-4CES-B759-2E267DB1F91E/0/FY2007_AnnualAirMonitoringReport.pdf.

Kentucky Division of Geographic Information – Hospitals. <ftp://ftp.kymartian.ky.gov/health/Hospitals.zip>. June 2009.

Kentucky Division of Geographic Information – Correctional Facilities. ftp://ftp.kymartian.ky.gov/hsip/Correctional_Institutions_2008.zip. June 2008.

Kentucky Division of Geographic Information – Colleges and Universities. ftp://ftp.kymartian.ky.gov/hsip/College_Universities_2007.zip. June 2008.

Kentucky Division of Geographic Information – Airports. <ftp://ftp.kymartian.ky.gov/hls/airports.zip>. November, 2007.

Kentucky Division of Geographic Information – Primary Schools. ftp://ftp.kymartian.ky.gov/hls/primary_schools.zip. November 2007.

Kentucky Division of Geographic Information – Wildlife Management Areas. ftp://ftp.kymartian.ky.gov/kdfwr/Wildlife_Management_Areas.zip. December 2008.

Kentucky Geological Survey – Sinkhole Data by County. <http://www.uky.edu/KGS/gis/sinkpick.htm>. April 2005.

Kentucky Geological Survey – Kentucky Geologic Map Information Services. <http://kgsmmap.uky.edu/website/KGSGeology/viewer.asp>. July 2009.

Kentucky Infrastructure Authority – Water Treatment Plant, Water Pump Station, Water Tanks, Water Source (Purchase), Wastewater Outfall, Wastewater Treatment Plant, Package Treatment Plant, and Lift Station. <http://kia.ky.gov/wris/data.htm>. June 2008.

Kentucky Watershed Viewer. <http://eppcmaps.ky.gov/website/watershed/viewer.htm?ActiveLayer=huc11&Query=NAME='Pitman%20Creek'&QueryZoom=Yes>.

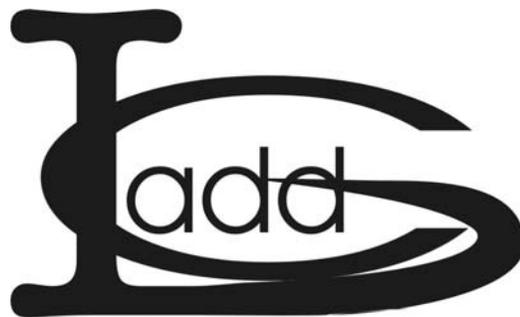
National Park Service – National Register of Historic Places. <http://www.nr.nps.gov/>. April 2008.

United States Environmental Protection Agency – Facility Registry System Query: AIRS/AFS, CERCLIS, RCRAInfo, PCS, and TRIS systems. http://www.epa.gov/enviro/html/fii/fii_query_java.html. June 2009.

Appendix C:

**Environmental Justice
Report**

**SOMERSET
SMALL URBAN AREA
TRANSPORTATION STUDY
Environmental Justice Report**



**Prepared By:
Lake Cumberland Area Development District
P.O. Box 1570
Russell Springs, KY. 42642**



Division Of Planning

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Appendices

Appendix A. Census Tracts and Block Groups (Maps)
Population by Black or African American (Map 1)
Population by Hispanic (Map 2)
Population by Poverty Level (Map 3)
Population by Persons 65 and over (Map 4)

Appendix B. Census Tracts and Block Groups (Table)

1.0 Introduction

This document assesses the community demographics involved in the Small Urban Area Transportation Study for the City of Somerset. The Lake Cumberland Area Development District has analyzed and prepared the following document to identify any concentration of population that could be displaced or segmented as result. The data displayed in this report has been compiled from a number of sources including the U.S. Census Bureau, Kentucky State Data Center, Kentucky Transportation Cabinet (KYTC) Division of Planning, local elected officials, community leaders, and field observations of the study area. The information and results are intended to assist the Kentucky Transportation Cabinet in making informed and prudent transportation decisions in the study area, especially as it pertains to the requirements of Executive Order 12898¹, to ensure equal protection to all groups potentially impacted by this study.

This report includes maps and tables of statistical comparisons of the study area based on US Census 2000 tracts and block groups with regard to minority, low income, and aging populations for the United States, Kentucky and Pulaski County. The study area includes tracts and block groups directly in and around portions of the defined area.

2.0 Study Findings / Study Area

This Environmental Justice and Community Impact Report should be utilized as a component of the planning study being conducted by Kentucky Transportation Cabinet's Division of Planning, for the City of Somerset.

This study is intended to help define the location and purpose of the project and meet federal requirements regarding consideration of environmental issues as defined in the National Environmental Policy Act (NEPA).

The Somerset Small Urban Area Transportation Study area contains 24 Block Groups within five Census Tracts. The Census Tracts and Block Groups are listed below. (*Appendix A* includes maps). Detailed data of Census Tracts and Block Groups are located in *Appendix B* of this document.

Pulaski County:

Census Tract: 9904
Block Group: 1, 2, 3, 4 & 5

Census Tract: 9906
Block Group: 1, 2, 3 & 4

Census Tract: 9908
Block Group: 1, 2, 3 & 4

Census Tract: 9905
Block Group: 1, 2, 3, 4 & 5

Census Tract: 9907
Block Group: 1, 2, 3, 4, 5 & 6

¹ Executive Order 12898 signed on February 11, 1994 states "...each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations..."

3.0 Study Findings / Population by Race

The defined study area within Somerset encompasses portions of the following Census Tracts: 9904, 9905, 9906, 9907 and 9808. Pulaski County's population by race percentages are lower than the national and state averages. However, there are some particular Block Groups in the study area that warrant further discussion. Tract 9906 Block Group 4 and Tract 9907 Block Groups 1, & 3, indicates higher percentages of black population than the state. However, the Block Groups have lower percentages compared to national levels. Tract 9905 Block Group 5 and Tract 9907 Block Groups 1, & 3, indicate higher percentages of Hispanic population than the county, but are comparable with the state and fall well below the national percentages. Field observations and discussion with local community members revealed that the planned projects should not adversely affect the minority population.

4.0 Study Findings / Population by Poverty Level

The defined study area within Somerset encompasses portions of the following Census Tracts: 9904, 9905, 9906, 9907 and 9808.

Two of the five Census Tracts within the study area are comparable or below the state and national average, Census Tracts: 9904, and 9905. However, there are block groups in those tracts that are higher than the state and national averages. They include Block Group 1, and Block Group 2, of Census Tract 9904, and Block Group 1, and Block Group 2, of Census Tract 9905. Both Tracts remain consistent with other percentages in the region.

Census Tract 9906 has the highest percentage of the population below poverty level in the Pulaski County study area at 22.62 percent. That percent is almost double the national average. Block Group 1, Block Group 2 and Block Group 3, range from a low of 15.03 percent to a high of 20.94 percent and is comparable to the state and regional averages. Block Group 4, (35.52%) has a higher average of population that is below poverty level.

Census Tract 9907 and 9908 are higher than the state and national averages, however they remain consistent with other percentages in the region. Both tracts have Block Groups that range from as low as 4.57% and as high as 39.24%. However most Block Group in these two tracts is consistent with other percentages in the region. Careful consideration should be taken in Block Group 1 of tract 9907, and Block Group 3 of tract 9908 which have the highest percentages.

A subsequent review of poverty data within affected Census divisions should be undertaken to determine if particular concentrations of population below the poverty level exist in the study area; and if so, proactive measures be undertaken to insure that these groups are not disproportionately affected by any projects.

5.0 Study Findings / Population by Persons 65 and Over

The study area within Somerset encompasses portions of the following Census Tracts: 9904, 9905, 9906, 9907 and 9808. The aging characteristics and percentages for the study area are similar to other Census Tracts in the county, the state and the nation. However, there are some elevated percentages of 65 and over age groups in some Block Groups. In Census Tract 9904 Block Group 3, Census Tract 9905 Block Group 3, Census Tract 9908 Block Group 4, these Block Groups have older subdivisions and a large rural area. Census Tract 9906 Block Group 4, Census Tract 9907 Block Groups 1, 2, and 3, this is the downtown area with older home and a higher number of the aging community. A large nursing home located in Census Tract 9906 Block Group 1 is the main reason for 41.35% person 65 and over within this block. After discussions with other community members, it appears that the higher percentages are the result of older sections of the City of Somerset. It is anticipated that the implementation of projects would not have a disproportionate effect on the population of persons age 65 and over residing in the study area.

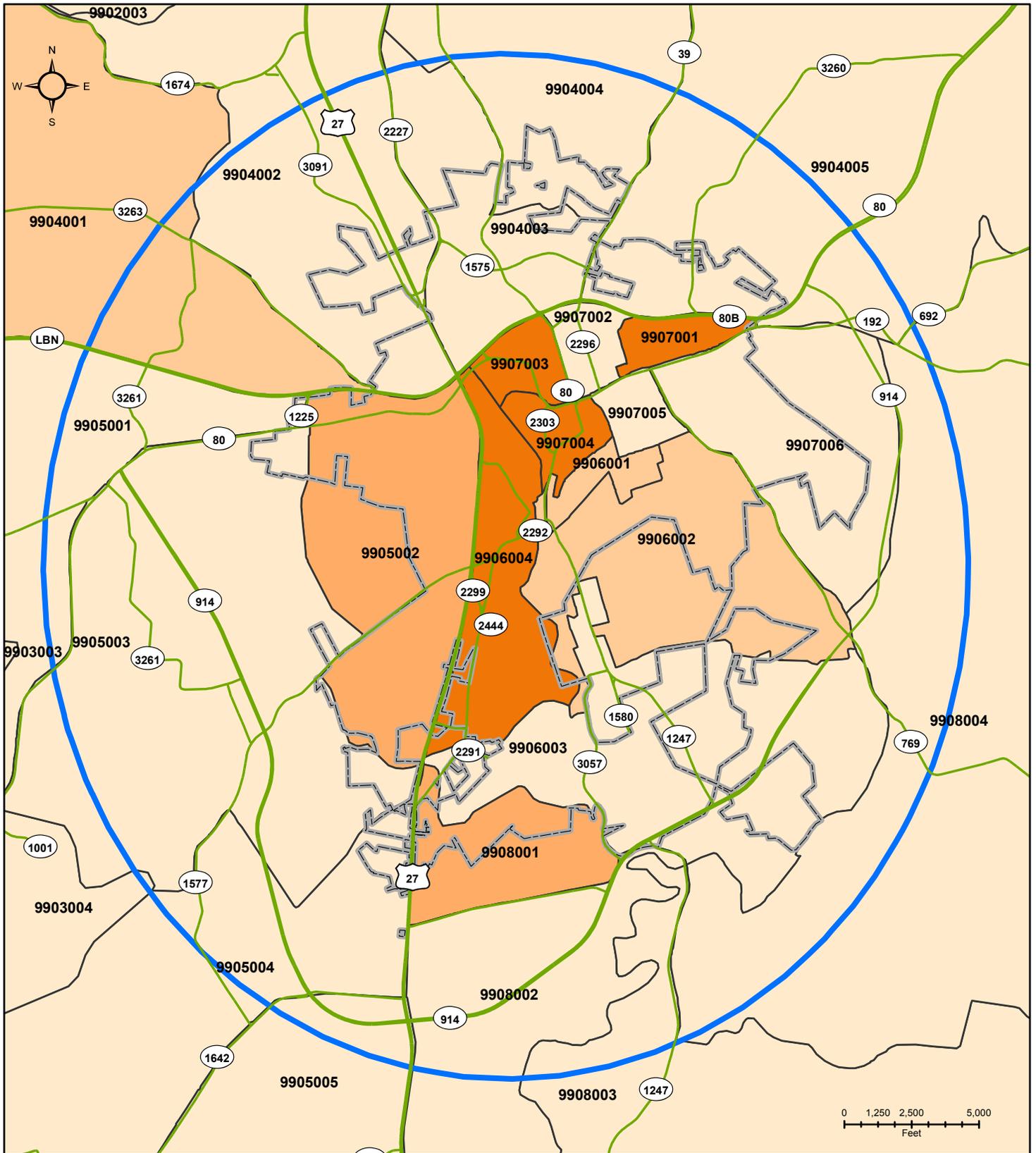
6.0 Conclusion

Based on data obtained from the U.S. Census Bureau for income, race and age, discussions with local officials and field observations; it appears there is a concentration of populations over 65 years of age in Somerset. The concentrations identified in Somerset should not be affected.

Analysis of the minority population data showed several of the block groups as having an identified concentration of some sort. Some were significant, some were only minor. The more significant concentrations identified were noted in the narrative analysis. All areas within this study should be given full consideration in the planning process to achieve the goals put forth by the U. S. Department of Transportation. The concentrations identified should not be adversely affected by improvements.

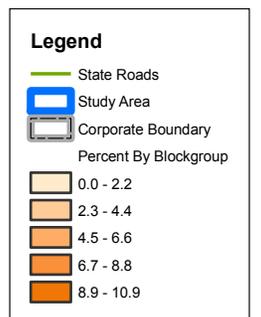
The elevated percentages in the populations below poverty level might be indicative of concentrations throughout the study area. However, based on the economic status of this rural depressed county, these percentages are not uncommon for this area.

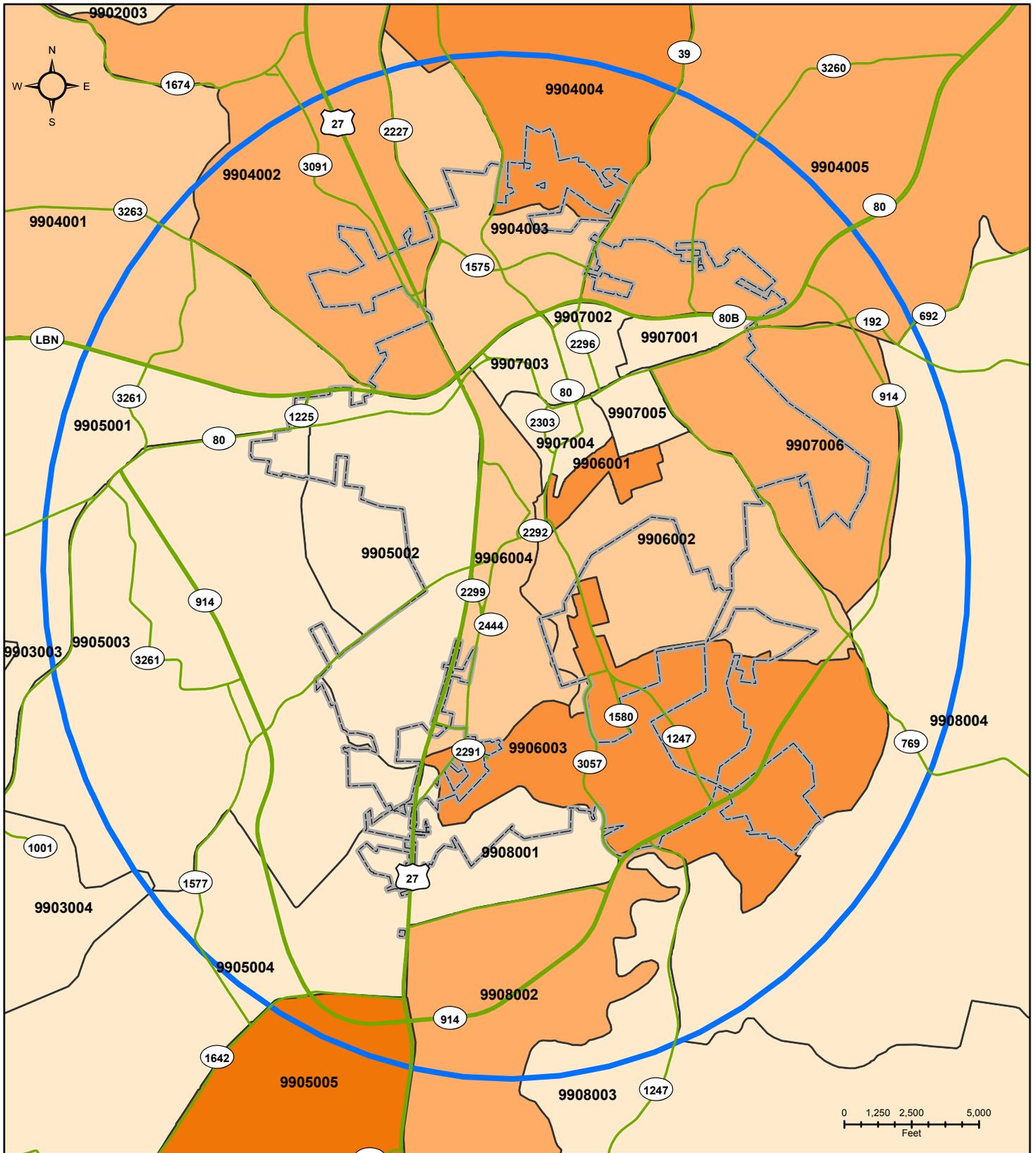
Though the projects in this study should have no adverse effects on the minority, elderly, or low income populations, further consideration should be given to above flagged areas.



Appendix A Map 1

Population by Black or African American





Appendix A Map 2

Population by Hispanic

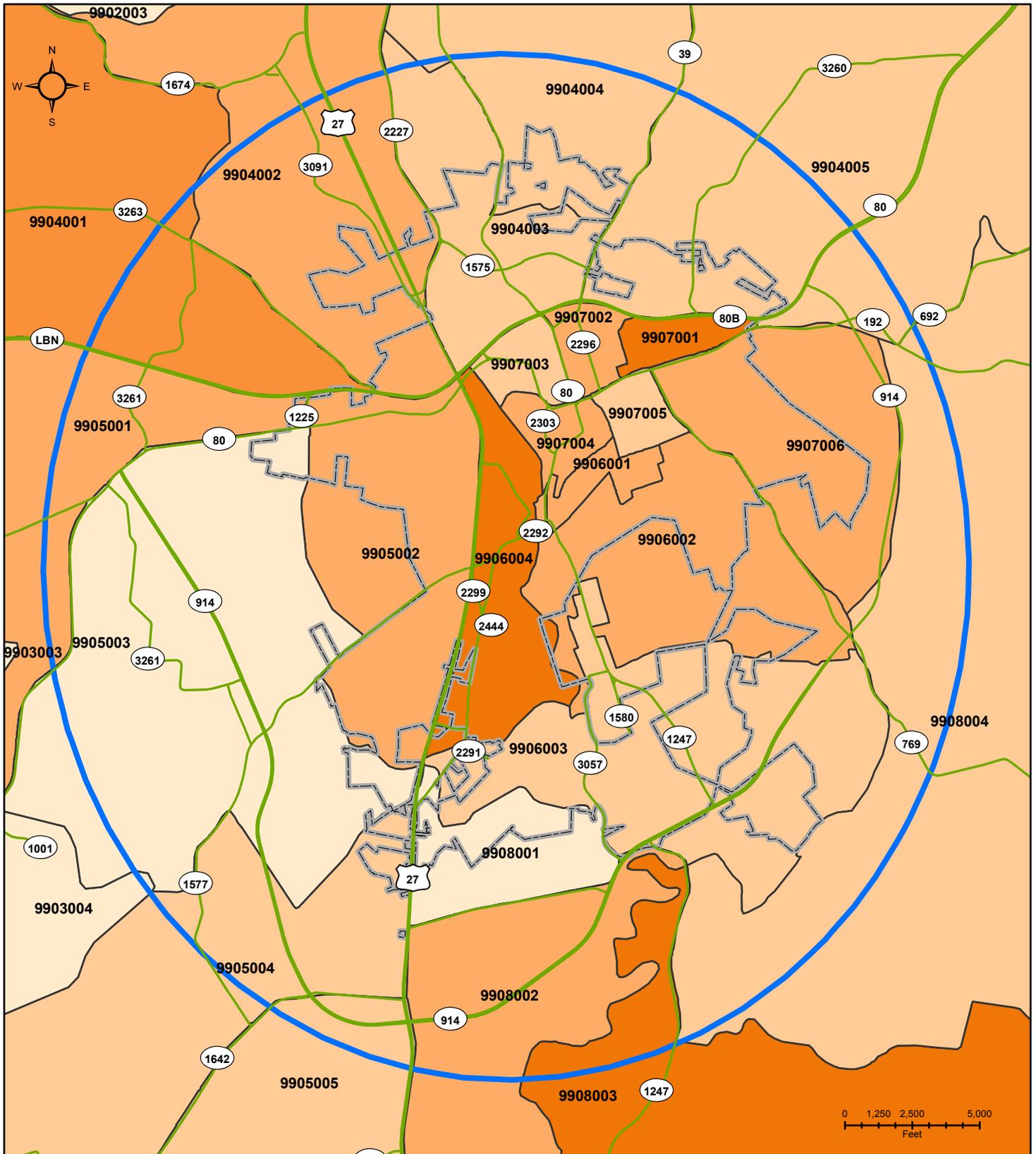


Legend

- State Roads
- Study Area
- Corporate Boundary
- Percent By Blockgroup

PHISP

- 0.00
- 0.01 - 0.41
- 0.42 - 0.82
- 0.83 - 1.22
- 1.23 - 2.75



Appendix A Map 3

Population by Poverty Level

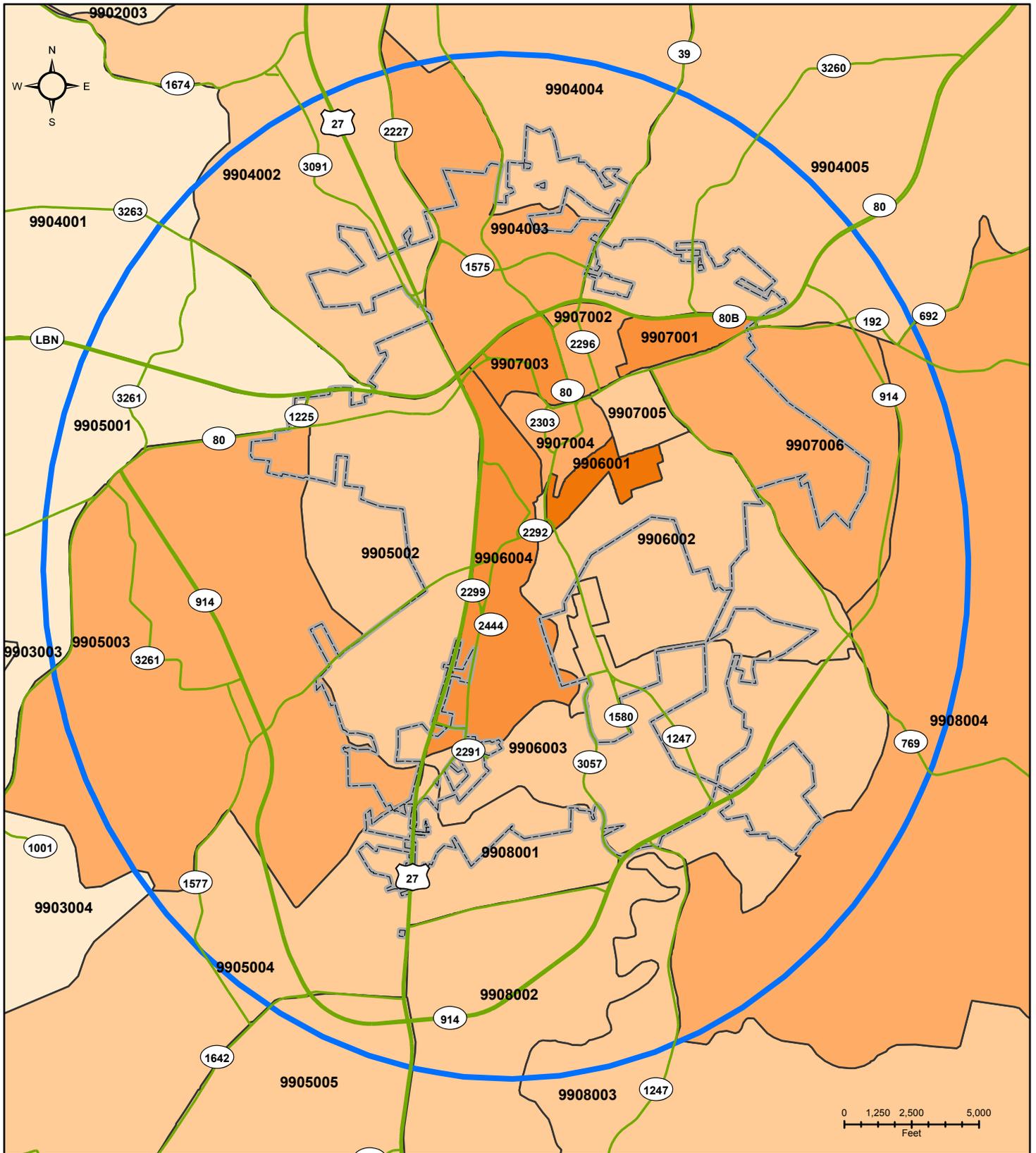


Legend

- State Roads
- Study Area
- Corporate Boundary
- Percent By Blockgroup

PPOVERTY

- 0.00 - 7.85
- 7.86 - 15.70
- 15.71 - 23.54
- 23.55 - 31.39
- 31.40 - 39.24



Appendix A Map 4

Population by Persons Age 65 And Older



Legend

- State Roads
- Study Area
- Corporate Boundary

POLD

	0.00 - 8.27
	8.28 - 16.54
	16.55 - 24.81
	24.82 - 33.08
	33.09 - 41.35

PULASKI COUNTY											
REGION	TOTAL POPULATION	WHITE ALONE	PERCENT WHITE ALONE	BLACK OR AFRICAN AMERICAN ALONE	PERCENT BLACK OR AFRICAN AMERICAN ALONE	AMERICAN INDIAN AND ALASKA NATIVE ALONE	PERCENT AMERICAN INDIAN AND ALASKA NATIVE ALONE	ASIAN ALONE	PERCENT ASIAN ALONE	NATIVE HAWAIIAN AND OTHER PACIFIC ISLANDER ALONE	PERCENT NATIVE HAWAIIAN AND OTHER PACIFIC ISLANDER ALONE
United States	281,421,906	211,353,725	75.10%	34,361,740	12.21%	2,447,989	0.87%	10,171,820	3.61%	378,782	0.13%
Kentucky	4,041,769	3,639,168	90.04%	293,915	7.27%	9,080	0.22%	28,994	0.72%	1,155	0.03%
Pulaski Co.	56,217	54,564	97.06%	746	1.33%	103	0.18%	284	0.51%	29	0.05%
Census Tract 9904	7,581	7,425	97.94%	71	0.94%	9	0.12%	27	0.36%	0	0.00%
Block Group 1	1,225	1,167	95.27%	31	2.53%	0	0.00%	27	2.20%	0	0.00%
Block Group 2	1,102	1,084	98.37%	18	1.63%	0	0.00%	0	0.00%	0	0.00%
Block Group 3	1,125	1,103	98.04%	22	1.96%	0	0.00%	0	0.00%	0	0.00%
Block Group 4	1,529	1,510	98.76%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Block Group 5	2,600	2,561	98.50%	0	0.00%	9	0.35%	0	0.00%	0	0.00%
Census Tract 9905	10,011	9,665	96.54%	130	1.30%	12	0.12%	96	0.96%	0	0.00%
Block Group 1	767	767	100.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Block Group 2	2,462	2,270	92.20%	114	4.63%	12	0.49%	34	1.38%	0	0.00%
Block Group 3	2,052	2,038	99.32%	7	0.34%	0	0.00%	0	0.00%	0	0.00%
Block Group 4	3,604	3,512	97.45%	0	0.00%	0	0.00%	53	1.47%	0	0.00%
Block Group 5	1,126	1,078	95.74%	9	0.80%	0	0.00%	9	0.80%	0	0.00%
Census Tract 9906	4,342	4,012	92.40%	216	4.97%	0	0.00%	51	1.17%	0	0.00%
Block Group 1	1,064	1,027	96.52%	31	2.91%	0	0.00%	0	0.00%	0	0.00%
Block Group 2	1,380	1,253	90.80%	58	4.20%	0	0.00%	51	3.70%	0	0.00%
Block Group 3	772	764	98.96%	8	1.04%	0	0.00%	0	0.00%	0	0.00%
Block Group 4	1,126	968	85.97%	119	10.57%	0	0.00%	0	0.00%	0	0.00%
Census Tract 9907	4,692	4,347	92.65%	172	3.67%	5	0.11%	43	0.92%	0	0.00%
Block Group 1	576	513	89.06%	63	10.94%	0	0.00%	0	0.00%	0	0.00%
Block Group 2	929	886	95.37%	0	0.00%	0	0.00%	43	4.63%	0	0.00%
Block Group 3	761	689	90.54%	72	9.46%	0	0.00%	0	0.00%	0	0.00%
Block Group 4	537	475	88.45%	35	6.52%	0	0.00%	0	0.00%	0	0.00%
Block Group 5	731	711	97.26%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Block Group 6	1,158	1,073	92.66%	2	0.17%	5	0.43%	0	0.00%	0	0.00%
Census Tract 9908	4,877	4,752	97.44%	94	1.93%	11	0.23%	3	0.06%	13	0.27%
Block Group 1	1,028	943	91.73%	61	5.93%	11	1.07%	0	0.00%	13	1.26%
Block Group 2	1,898	1,878	98.95%	20	1.05%	0	0.00%	0	0.00%	0	0.00%
Block Group 3	999	992	99.30%	0	0.00%	0	0.00%	3	0.30%	0	0.00%
Block Group 4	952	939	98.63%	13	1.37%	0	0.00%	0	0.00%	0	0.00%

PULASKI COUNTY								
REGION	TWO OR MORE RACES	PERCENT TWO OR MORE RACES	HISPANIC OR LATINO ORIGIN	PERCENT HISPANIC OR LATINO ORIGIN	PERSONS 65 AND OVER	PERCENT PERSONS 65 AND OVER	PERSONS BELOW POVERTY LEVEL	PERCENT PERSONS BELOW POVERTY LEVEL
United States	7,270,926	2.58%	35,238,481	12.52%	34,978,972	12.43%	33,899,812	12.05%
Kentucky	47,341	1.17%	59,939	1.48%	488,248	12.08%	621,096	15.37%
Pulaski Co.	396	0.70%	295	0.52%	8456	15.04%	10471	18.63%
Census Tract 9904	40	0.53%	52	0.69%	1029	13.57%	1268	16.73%
Block Group 1	0	0.00%	5	0.41%	85	6.94%	378	30.86%
Block Group 2	0	0.00%	9	0.82%	174	15.79%	206	18.69%
Block Group 3	0	0.00%	2	0.18%	267	23.73%	152	13.51%
Block Group 4	10	0.65%	17	1.11%	208	13.60%	226	14.78%
Block Group 5	30	1.15%	19	0.73%	295	11.35%	306	11.77%
Census Tract 9905	79	0.79%	31	0.31%	1315	13.14%	1229	12.28%
Block Group 1	0	0.00%	0	0.00%	35	4.56%	154	20.08%
Block Group 2	23	0.93%	0	0.00%	225	9.14%	465	18.89%
Block Group 3	7	0.34%	0	0.00%	465	22.66%	53	2.58%
Block Group 4	39	1.08%	0	0.00%	473	13.12%	392	10.88%
Block Group 5	10	0.89%	31	2.75%	117	10.39%	165	14.65%
Census Tract 9906	25	0.58%	28	0.64%	1031	23.74%	982	22.62%
Block Group 1	0	0.00%	13	1.22%	440	41.35%	177	16.64%
Block Group 2	15	1.09%	5	0.36%	205	14.86%	289	20.94%
Block Group 3	0	0.00%	8	1.04%	91	11.79%	116	15.03%
Block Group 4	10	0.89%	2	0.18%	295	26.20%	400	35.52%
Census Tract 9907	109	2.32%	8	0.17%	1010	21.53%	885	18.86%
Block Group 1	0	0.00%	0	0.00%	171	29.69%	226	39.24%
Block Group 2	0	0.00%	0	0.00%	190	20.45%	199	21.42%
Block Group 3	0	0.00%	0	0.00%	195	25.62%	118	15.51%
Block Group 4	27	5.03%	0	0.00%	107	19.93%	98	18.25%
Block Group 5	10	1.37%	0	0.00%	116	15.87%	61	8.34%
Block Group 6	72	6.22%	8	0.69%	231	19.95%	183	15.80%
Census Tract 9908	4	0.08%	15	0.31%	708	14.52%	960	19.68%
Block Group 1	0	0.00%	0	0.00%	168	16.34%	47	4.57%
Block Group 2	0	0.00%	15	0.79%	245	12.91%	429	22.60%
Block Group 3	4	0.40%	0	0.00%	95	9.51%	347	34.73%
Block Group 4	0	0.00%	0	0.00%	197	20.69%	137	14.39%

Source: www.census.gov

Summary File 3 (SF3)

Detailed Tables:

P.6 & 7- Race,

P.8-Sex by Age,

P.87-Poverty Status in 1999 by Age

Appendix D:

Geotechnical Overview

MEMORANDUM

P-003-2009

TO: Keith Damron
Director
Division of Planning

FROM: Bart Asher, PE
Geotechnical Engineering
Branch Manager
Division of Structural Design

BY: Michael Blevins, PG
Geotechnical Branch

DATE: January 15, 2010

SUBJECT: Pulaski County
Small Urban Area Transportation Study
Somerset

Geological Overview

The study area is located within the Somerset and Delmar Geologic Quadrangle Maps. The projects are underlain by Quaternary age Alluvium, Mississippian Age bedrock of the Monteagle Limestone, St. Louis Limestone, Salem and Warsaw Formation and the Muldraugh Member of the Borden Formation. The formations and project locations are identified on the attached geologic map.

The Alluvium consists of silt, sand and gravel ranging in thickness from 0 to 30 feet. The Monteagle Limestone is divided into two Members, the Kidder Member (or Upper Member) and the Ste. Genevieve Limestone Member. The Kidder Member is mainly Limestone with minor amounts of interbedded siltstone and shale and can be over 100 feet in thickness. The Ste. Genevieve Limestone consists of mainly limestone ranging from 50 to 70 feet in thickness. Both Members are suitable for roadbed material. The St. Louis Limestone consists of Limestone, Siltstone and Chert. The thickness ranges from 80 to 120 feet thick. The limestone may contain chert nodules can be interbedded with siltstone. The siltstone is more common in the lower portion of the formation. The chert nodules mainly occur in the upper portion of the formation. Karst features and sinkholes are very common in the St. Louis Limestone and soil overburden depths can be quite deep. The rockline can vary drastically over a short horizontal distance. Springs and wet hill sides are common at the base of the St. Louis Limestone. Spring boxes may be required if any springs are encountered. The Salem and Warsaw Formation contains Limestone, Siltstone and Shale and has a range in thickness from 60 to 80 feet. The limestone is thick bedded to thinly laminated and cross-bedded and may be argillaceous in zones. Portions of the formation may be interbedded with silty limestone and calcareous shale. The Muldraugh Member of the Borden Formation mainly consists of a siltstone that is thin to thick bedded,

Memorandum
Keith Damron
January 15, 2010
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hackly uneven fractured and interbedded with chert. Chert beds can be 4 to 18 inches in thickness.

Geotechnical Concerns

Projects L-B, LT-D & LT-G; The Branch has no geotechnical concerns with these projects.

Projects L-A, ST-A, ST-B, ST-C, ST-G, ST-H, ST-J & LT-F – Encountering sinkholes are the main concern with these projects. In addition to encountering sinkholes on ST-C, new cut and fill slopes associated with a realignment of the roadway may require additional right of way.

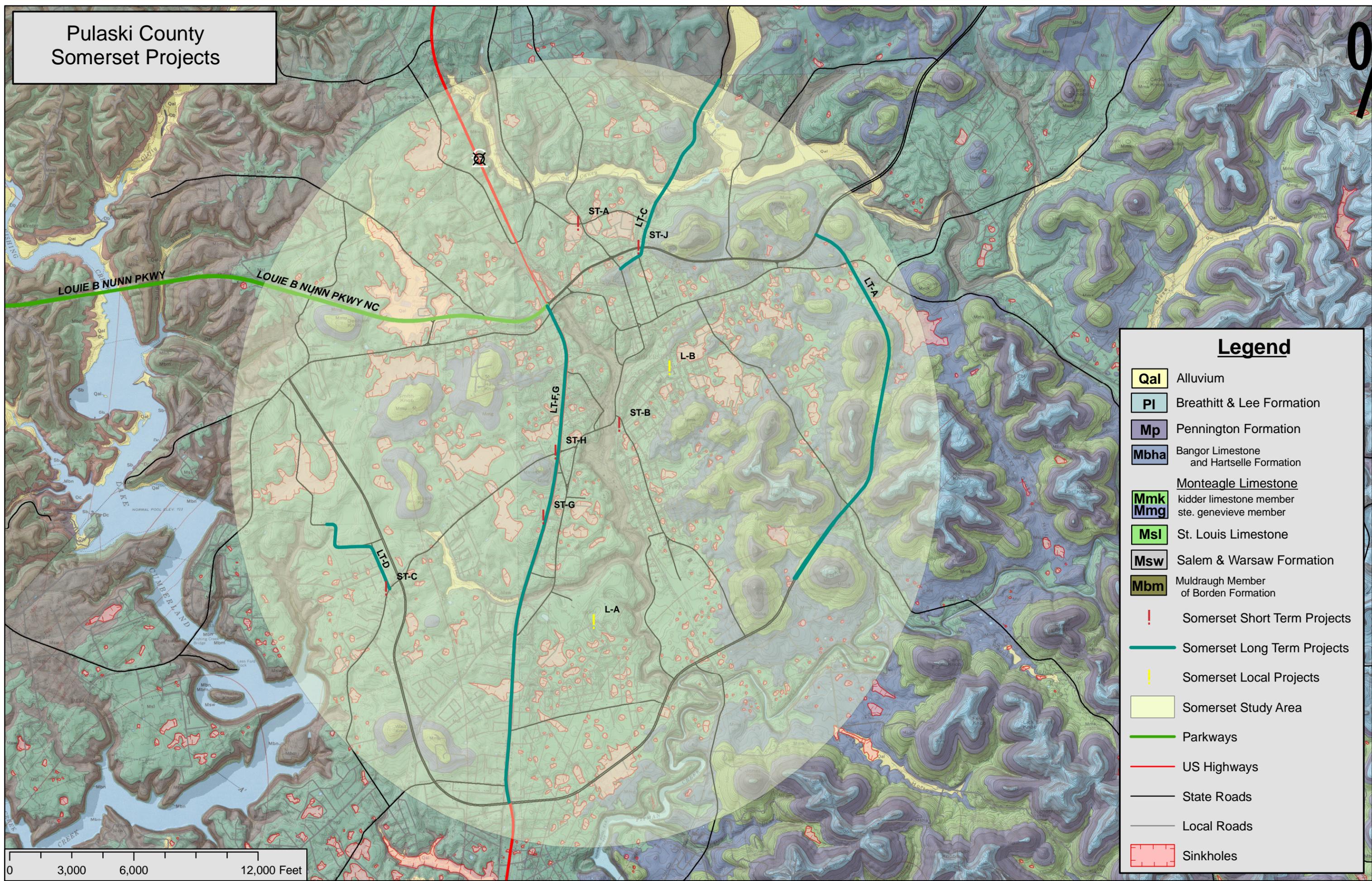
Project LT-A - A Geotechnical report was completed for this portion of By-Pass in 1991. The report included recommendations for initial and ultimate construction. No additional drilling or geotechnical investigations should be required, but a review of the plans by the Branch may be required. Any additional investigations needed should be minimal. According to the District 8 personnel, right of way is already acquired for the 4 lane ultimate. Therefore, additional right of way should not be needed. The link to the report and an addendum is as follows: <http://kgs.uky.edu/kgsweb/KYTC/Reports/R-014-1991.pdf>.

Project LT-C - Encountering Sinkholes are the main concern with this project where it traverses over through the St. Louis Limestone. Springs may be present at the base of the St. Louis Limestone and wet hill sides may also be encountered along the West side of the existing roadway at the base of this Formation. Spring boxes may be requires if springs are encountered and flatter cut slopes and/or rock refill may be needed if wet areas are encountered. Deep foundations are not anticipated for any structures.

If there are any questions, please advise.

Pulaski County Somerset Projects

0%



Legend

- Qal Alluvium
- Pl Breathitt & Lee Formation
- Mp Pennington Formation
- Mbha Bangor Limestone and Hartselle Formation
- Mmk Mmg Monteagle Limestone
kiddier limestone member
ste. genevieve member
- Msl St. Louis Limestone
- Msw Salem & Warsaw Formation
- Mbm Muldraugh Member of Borden Formation
- ! Somerset Short Term Projects
- Somerset Long Term Projects
- Somerset Local Projects
- Somerset Study Area
- Parkways
- US Highways
- State Roads
- Local Roads
- Sinkholes



Appendix E:

**Meeting
Documentation**

FINAL Meeting Minutes

PROJECT: Somerset Small Urban Area Study

MEETING: Project Advisory Committee Meeting #1

DATE & TIME: June 10, 2009 – 10:00 AM

LOCATION: Kentucky Transportation Cabinet – District 8
Somerset, Kentucky

ATTENDEES:

NAME	AGENCY/COMPANY	Telephone	Email
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MEETING SUMMARY:

This was the first of two meetings to be held with the Project Advisory Committee (PAC) for the Somerset Small Urban Area Study (SUA). The PAC is composed of local officials and stakeholders that represent the community of Somerset. The meeting was conducted by the consulting firm of Parsons Brinckerhoff (PB) under contract to the Kentucky Transportation Cabinet (KYTC) to perform the study.

The purpose of this meeting was to define the role of the PAC, present the existing conditions information (to date), and solicit preliminary feedback regarding potential transportation issues and possible solutions.

Introductions

To familiarize everyone at the meeting, each person introduced themselves and who they represented. These included the Mayor of Somerset, Eddie Girdler and representatives from the City of Somerset (representing traffic / public works and planning), the Pulaski County Judge-Executive's office, the Somerset Police Department, the Somerset Board of Education, the Commonwealth Journal, and Coretrans. There were also representatives from the KYTC (both Central Office Planning Division and District 8) and the Lake Cumberland Area Development District (LCADD).

As the Project Manager for KYTC, Jill Asher (replacing David Martin) began the meeting by explaining what a Small Urban Area (SUA) study is, which is a planning study for communities with populations between 5,000 to 50,000 people. The ultimate goal of the study is to provide a list of safety and congestion-relief projects that can be considered for future funding and implementation. These projects are ones that are not already on the Six-Year Highway Plan and will be presented as individual project sheets with a summary of project details and planning-level cost estimates.

PAC Role / Study Area

Shawn Dikes, the PB Project Manager, continued the meeting by providing an overview of what the PAC's roles and duties are concerning this project. This is the first meeting being held with the PAC with the second (and final) to be held near the end of the study process to assist in the refinement of improvement options and provide input on prioritization. The PAC is expected to provide input throughout the study process including input on issues, alternatives, alternatives evaluation, and prioritization. However, they are an advisory body only and are needed to provide input on the final study recommendations. Ground rules were provided to assist the PAC in having a productive and organized meeting.

The focus of the meeting then shifted to the Somerset SUA project. The study area was presented which includes the City of Somerset (the incorporated areas) and extends out to roughly form a circle which encompasses the KY 914 bypass. Some comments heard regarding potential modifications to the study area include:

- The northern boundary of the study area should be expanded northward to include the proposed I-66 interchange.
- The southern boundary of the study area should be expanded southward to include the new Burnside interchange.

The expansion of the study area will be discussed by the Project Development Team (PDT) which is composed of KYTC and PB staff and a final determination of the study area boundary will be determined.

Existing Conditions

Next, the meeting focused on a discussion of the existing conditions information gathered to date. This included currently on-going or planned transportation projects, existing highway geometrics, current traffic volumes, a level of service analysis, and a crash analysis. Lindsay Walker, the PB Deputy Project Manager / Transportation Engineer led this part of the presentation.

All data presented in the existing conditions analysis (at this point) is for the state-maintained roadways within the study area. The KYTC maintains databases to assimilate the information and, given the extent of the study area and scope and the budget limits for the project, this was the most feasible way to determine the general traffic operating conditions within the study area. As part of the study, improvements to local roadways can be evaluated as appropriate.

This first part of the existing conditions presentation included an overview of on-going projects in the area or currently planned projects. These were gathered from the current KYTC Six-Year Highway Plan (2008 – 2014), the Statewide Transportation Improvement Program (2006), and the Unscheduled Projects List for KYTC. It was noted that the City of Somerset is currently updating their Comprehensive Plan and have conceptually compiled the transportation master plan component recently. Two projects of importance were identified to be included in the map of planned projects for the study area:

- Bogle Street Connector – a new connector roadway to go from Oak Hill Road to KY 80. This is approximately a six million dollar project that is currently in the design plan phase.
- East / West Connector – this new roadway would conceptually tie into US 27 north of KY 1577, cross the Bogle Street Connector, and end at KY 914 between KY 1577 and KY 80.

(Note: For clarity, the above two projects need to be distinguished from the SYP and UPL projects on any project mapping.)

From the City's perspective, these two projects combined would greatly open up the middle-western portion of the City of Somerset and provide missing connectivity in that area, particularly to the western section of KY 914 . They would provide the catalyst for development and logical extension of the City as well as alleviate transportation problems in the area. With the construction of the new judicial center downtown (currently approximately 20% constructed), these projects would provide additional transportation infrastructure to facilitate the additional generated traffic flow. KYTC / PB will coordinate with the City to obtain all required information about these projects as well as any information related to the new Comprehensive Plan in order to ensure compatibility and coordination between the City's planning and this project.

The other existing conditions data and maps were presented including:

- A table listing pertinent geometric features for each state-maintained highway
- A map depicting graphically the most recent (primarily 2007 or 2008) traffic counts in the study area
- A map depicting graphically the level of service operations for the study area based on the most recent traffic counts and the geometric features
- A map depicting crash rates for the study area
- Maps / charts highlighting crash clusters, crash severity, and crash type for each study area roadway

The PAC was asked to review this information and identify anything that appeared to be incorrect based on their knowledge and experience. Generally, the presented data appeared to match the PAC's personal experiences. There was a question about the lack of multiple traffic counts along the eastern portion of KY 914 between KY 80 and US 27. There is only one count

shown on the map; given the length, it seems likely there should be more counts available. PB will check on this. Also, the City has some local traffic volume counts which they can provide as needed. On the crash analysis map of KY 914, it was noted that the multiple fatal crashes near the intersection of KY 1247 may have been, at least in part, due to the absence of a traffic signal system at this location. Recently, one was installed to help mitigate crash problems at this location.

Transportation Issues / Concerns

The remainder of the meeting focused on a discussion of transportation issues and concerns of the PAC that are related to this study. These improvements / needs range from system-wide types of improvements to intersection / individual spot specific needs. All projects / needs discussed are listed below and will be considered during the next phase of project identification.

- US 27 is currently three lanes through town in both directions. Many drivers tend to use the outside right lane to drive in even if they are not planning on turning into any of the businesses or access points along this highway. To facilitate traffic flow, it would be beneficial to separate out the primarily through traffic movement from the right turns. This could be accomplished through signage, addition of right turn lanes, pavement markings, or other public educational methods.
- Lane continuity along KY 914 was discussed as a portion the eastern half is currently two lanes, while the newer portions being constructed are four lanes. It was thought that the KYTC most likely purchased the right-of-way for four lanes the entire length and there were various ideas presented as to why the change in number of lanes.
- The I-66 project was mentioned related to this study and there is some concern as to how the new highway will facilitate transportation from the four planned exits into Somerset.
- General wayfinding / signage was mentioned as an issue, and the need to provide better guidance for tourists as Lake Cumberland (just to the south) is a major recreation attraction in the area. There are many new projects going on in the Somerset area and the “newness” might cause some confusion – public education may play a role addressing this issue.
- US 27 is the primary corridor through and gateway to Somerset leading to Lake Cumberland and there was some discussion regarding the image of this roadway. Although beyond the scope of this SUA study, suggestions from City Officials to improve this include providing landscaped medians, and additional greenspace. Other suggestions include providing bicycle paths / sidewalks where appropriate. City officials stated that these improvements would be to slow traffic down and encourage pass-by drivers to stop and spend time / money in the Somerset area thereby boosting the local economy.
- Related to improvements along US 27, it was suggested that the transition from rural to urban be delineated such that “gateways” are made into the city along US 27 providing drivers with visual cues that they are entering an urban / downtown area and need to operate their vehicles differently.
- Also along US 27, it was mentioned that the first traffic light on US 27 southbound is hard to see at night. Drivers have difficulty distinguishing the traffic light from the other background city lights.
- Transportation and infrastructure are linked as new transportation improvements can drive the need for improvement of water / sewer lines, etc. In order for the City to plan ahead and know when / where infrastructure needs are required, City Officials requested

additional coordination between the planning agencies (including KYTC and the City of Somerset) to be established for projects not listed in the 6 year plan.

- With the new commuter routes recently added to the Somerset Airport, it was suggested that airport access signage be improved.
- Bicycling and walking is an important community consideration for the City of Somerset which currently has nine miles of multi-use trails identified. The inclusion of these travel modes in transportation projects identified from this study will be considered as well as any potential benefit to overlaps / linkage with the planned trail system.

Next Steps

The next steps in this project will be to finalize the existing conditions analysis, and complete any outstanding sections. Using input from this meeting as well as technical analysis and input from the PDT, a preliminary list of improvement alternatives will be developed. Each one will be evaluated with this information presented at the next PAC meeting. It is expected that the 2nd PAC meeting will be held in late summer / early fall of this year (2009).

The meeting was adjourned at approximately 12:00 PM.

FINAL Meeting Minutes

PROJECT: Somerset Small Urban Area (SUA) Study

MEETING: Project Advisory Committee (PAC) Meeting #2

DATE & TIME: February 18, 2010 – 11:00 AM

LOCATION: Kentucky Transportation Cabinet – District 8
Somerset, Kentucky

ATTENDEES:

NAME	AGENCY/COMPANY	Telephone	Email
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Lindsay Walker	PB	859-245-3869	walkerli@pbworld.com
Anne Warnick	PB	859-245-3877	warnick@pbworld.com

MEETING SUMMARY:

This was the second of two meetings to be held with the Project Advisory Committee (PAC) for the Somerset Small Urban Area (SUA) Study. The PAC is composed of local officials and stakeholders that represent the community of Somerset and Pulaski County. The meeting was

conducted by the consulting firm of Parsons Brinckerhoff (PB) under contract to the Kentucky Transportation Cabinet (KYTC) to perform the study.

The purpose of this meeting was to present the PAC with the progress to date of the study, answer any questions that members of the PAC may have about the project sheets, and to solicit feedback from the PAC regarding the prioritization of the various projects.

Introductions

To familiarize everyone at the meeting, each person introduced themselves and who they represented. These included representatives from the City of Somerset (representing traffic / public works and planning), the Somerset Police Department, the Somerset and Pulaski County Boards of Education, the Commonwealth Journal, Stonebrook Development and Coretrans. There were also representatives from the KYTC (both Central Office Planning Division and District 8) and the Lake Cumberland Area Development District (LCADD).

Danny Anderson began the meeting by explaining what a Small Urban Area (SUA) study is, which is a planning study for communities with populations between 5,000 to 50,000 people. The ultimate goal of the study is to provide a list of safety and congestion-relief type projects that can be considered for future funding and project implementation. These projects are ones that are not already on the KYTC's Six-Year Highway Plan and will be presented as individual project sheets with a summary of project details and planning-level cost estimates.

PAC Role / Study Area

Shawn Dikes, the PB Project Manager, continued the meeting by briefly reviewing the study purpose, map and schedule and providing an overview of what the PAC's roles and duties are concerning this project.

Discussion of Projects

The focus of the meeting then shifted to the recommended projects. Shawn described the three types of projects that were recommended:

- Local – projects that were identified but need to be funded and go through future project development phases using local funding and be sponsored by a local agency (City of Somerset and/or Pulaski County);
- Short-term – projects that the state can fund, can be completed relatively quickly, and can be accomplished using safety and/or maintenance money, (i.e. not need to be put into the Six-Year Plan); and,
- Long-term – projects ultimately funded by the state, but that require a more significant amount of time to complete and more funding, and therefore will need to be added to the Six-Year Plan.

Next, the discussion was opened to all participants to express any comments or ask questions regarding the projects. The following points summarize this portion of the meeting:

- A question was asked if there is money available for the local and short-term projects. Answer – There is for some projects that are deemed “safety” in nature. It really depends on each type of project and other factors. The goal is to accomplish as many type of these as possible.
- Some projects on the lists are already underway: ST-A is being accomplished now. The reflective striping is on back order, but the majority of the installation was being

done on the day of the meeting. The conclusion was to take this project off of the short-term list.

- ST-B is gaining momentum as well. There will be a meeting among KYTC, tourism, City of Somerset, Pulaski County, and other in early May 2010. The conclusion was to take this project off of the short-term list as well.
- Additionally, there was much interest and information exchanged concerning tourist oriented destination signs (TODS) and other signage. There was concern that if tourists are routed to use KY 914 to get to the lake they will bypass Somerset and will not patronize their businesses. It was important to many in attendance that signage would clearly indicate the direction to businesses.
- L-D: The route designation for this project may be changing. The KYTC will be consulted during the development of final project documentation.
- L-E: A question was asked about who would maintain the grass medians, and how drainage would be handled. Answer – The city will maintain the grass medians and where there is already a channel for erosion, the channel will be left in place and the grass median will begin next to it.
- The project to extend KY 3263 was deemed a needed project. Somerset has essentially two (2) economic drivers: tourism / lakes, and the hospital / medical complex. This route will further develop the later.
- KY 914 is a conduit for development. East of 914 is rocky and largely undevelopable. West of 914 is easier to develop.

After a few more general discussion items, the participants prepared for the project prioritization.

Prioritization

The prioritization process involved assigning points among the projects. For the Local projects 5 points were assigned among the projects. The only stipulation being that the points must be distributed among at least two (2) of the five projects.

The same is true among the Short Term projects. At least two (2) of the three remaining projects were to receive the 5 points.

For the 14 Long Term projects, at least two (2) of them must also share in the distribution of points. Except that for long term projects, fourteen (14) points were assigned.

See the attached matrix for project prioritization.

Next Steps

The project prioritization of the PAC will be reconciled with the information about the projects and the Project Development Team will meet to discuss the results. PB will finish up its project documentation and will prepare DRAFT and FINAL reports respectively and will conclude its work by late March 2010. Future project development will depend on the various agencies and what other priorities compete with the identified projects.

FINAL Meeting Minutes

PROJECT: Somerset Small Urban Area Study

MEETING: Project Development Team Meeting

DATE & TIME: April 14, 2009 – 9:30 AM

LOCATION: Kentucky Transportation Cabinet – District 8 Office
Somerset, Kentucky

ATTENDEES:

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Lindsay Walker	PB	859-245-3869	walkerli@pbworld.com

MEETING SUMMARY:

The purpose of this meeting with the Kentucky Transportation Cabinet (KYTC) and Parsons Brinckerhoff (PB) was to meet with the Project Development Team (PDT), including KYTC Central Office Planning, District 8 staff and PB and to familiarize them with the overall study purpose as well as to begin to discuss issues / concepts that need to be addressed as part of this study.

Introductions

As the Project Manager for KYTC, David Martin began the meeting by explaining what a Small Urban Area (SUA) study consists of which is a planning study for communities with populations between 5,000 to 50,000 people. The ultimate goal of the study is to provide a list of safety and congestion-relief projects that can be considered for future funding and implementation. These projects are ones that are not already on the Six-Year Highway Plan and will be presented as individual project sheets with a summary of project details and planning-level cost estimates.

Study Purpose / Study Area

Shawn Dikes, the PB Project Manager, continued by adding that as the consultant, we are charged with looking at what we can do to improve transportation conditions in the study area. As agreed upon by the KYTC staff prior to this meeting, the study area consists of the incorporated areas of Somerset and extends outward to include KY 914.

Tasks

To familiarize the group with the specific tasks of the study, Shawn provided a brief review of the scope of work. Some specific notes / discussion points included:

- Additional / updated mapping can be obtained through the City of Somerset as the area was recently re-flown. PB is to check with the City Engineer, Alex Godsey, to obtain the aerial mapping.
- David Martin will provide crash data pending a list of roadways and mile points received from PB.
- Entran is currently working on a traffic model for the area, though it will likely not be completed for six months. PB is to check with Scott Thomson (KYTC Central Office) to determine if any preliminary information will be helpful in preparing traffic forecasts for this study.
- For the public involvement component of this project, there will be no public meetings or resource / agency mail-outs. An advisory committee will be formed with approximately 12 – 15 stakeholders with three meetings held during the course of the study. The local newspaper (Commonwealth Journal) has a columnist (Bill Mardis) who is very active in keeping up with local transportation projects and will try to find ways to be active / kept informed of this study. He may be invited to the advisory meetings as a spectator.
- As part of the alternatives development and analysis some additional considerations will be made for other modes of transportation including bicyclists and pedestrians as well as the possibility of the incorporation of ITS technologies.
- Prioritization of projects will be provided at the end of the study to assist decision-makers and obtain proper funding for future project phases.

The general schedule for this study is for the existing conditions evaluation to be completed in May 2009, the alternatives development and initial evaluation procedures completed in August 2009, with the draft report finished in January 2010.

Current or Planned Projects / Major Issues / Field Review

In preparation for the field review following the meeting as well as to begin to identify problem locations, the District 8 staff was asked to provide their thoughts on the current transportation system, on-going projects, as well as locations that are areas of concern. Based on the ensuing discussion, the following points were made:

- In general, the public has had confusion about the network of roads and new connections for on-going projects and may have some difficulty in figuring out how the improvements relate from a system perspective.
- As Somerset receives a significant number of tourists with its close proximity to Lake Cumberland, signage / way finding is very important. Improvements could be made, particularly to the east, to prevent motorists from using US 27 as their focal point and utilizing other area roadways (such as KY 914) if US 27 is not integral to their travel path.

- In order to reduce cycle lengths / phase time it would be desirable to allow protected / permitted left turns along US 27 as currently they are protected only. The current state policy does not allow protected / permitted on facilities with greater than four lanes (two lanes per direction).
- At some other signal locations, the “left turn yield on green” has been added due to safety concerns. One intersection in particular was listed (KY 914 / KY 1642). The crash data will be checked to determine the history of crashes at this intersection as well as locations that currently have this condition to determine if there is an issue with safety.
- A few locations were mentioned by the District 8 staff as having possible safety and / or congestion issues. The locations include the following:
 - KY 1247 / KY 1575 (4-way STOP at University Drive)
 - KY 1642 / Slate Branch Road
 - KY 914 / US 27 / KY 80 (potential for development)
 - Monticello Street / Campus 4-way STOP
 - Airport access area
 - Left Turn from Monticello Street onto Bourne Avenue / toward Ferguson
 - KY 1247 (Monticello Street)
 - Oak Hill Road / WTLO (KY 3261) (close signals / schools)

Current projects underway by the city include a new road proposed by the City of Somerset in the Bogle Road / Oak Hill Road area. It is expected that the City of Somerset will also have some project ideas / input in this process. Representatives will be invited to participate on the Advisory Committee.

Next Steps / Future Meeting

Following the project discussion, the meeting ended with a discussion of the next steps. A field review with everyone in attendance that was able to go was going to be held directly following the meeting.

The Advisory Committee needs to be set up, and KYTC will provide input on the list of potential members. Once the list is determined, invitations to participate on the committee will be distributed with the potential for a meeting in June 2009.

The meeting was adjourned at approximately 10:45 AM.

FINAL Meeting Minutes

PROJECT: Somerset Small Urban Area Study

MEETING: Project Development Team Meeting #2

DATE & TIME: September 14, 2009 – 10:00 AM

LOCATION: Kentucky Transportation Cabinet – District 8
Somerset, Kentucky

ATTENDEES:

NAME	AGENCY/COMPANY	Telephone	Email
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Barbara Michael	PB	502-479-9301	michael@pbworld.com
Shawn Dikes	PB	502-479-9312	dikes@pbworld.com
Lindsay Walker	PB	859-245-3869	walkerli@pbworld.com

MEETING SUMMARY:

This was the second meeting of the Project Development Team (PDT) for the Somerset Small Urban Area Study (SUA). The meeting was conducted by the consulting firm of Parsons Brinckerhoff (PB) under contract to the Kentucky Transportation Cabinet (KYTC) to perform the study.

The purpose of this meeting was to present the initial concept alternatives developed for the study as well as the layout for the project listings in the report and to solicit feedback from the PDT on these discussion items.

Introductions

To familiarize everyone at the meeting, each person introduced themselves and who they represented. One change from the previous PDT meeting was that Tammy Wilson had been promoted since the last meeting and Conley Moren would be taking her place as the District 8 Traffic Engineer. Also, Jill Asher is the current Project Manager for KYTC, though she did propose changing that responsibility to Danny Anderson with District 8. A decision will be made at a later date if the KYTC Project Manager should be changed.

Progress to Date

Shawn Dikes, the PB Project Manager, continued the meeting by providing an overview of project steps completed to date. Previously, the PDT had met to kick-off the study and a subsequent meeting with area stakeholders and elected officials had been held to solicit

feedback on possible project locations and area transportation issues. A field review had also been held to review potential project locations. An overview of the existing transportation network has been completed and this was used in conjunction with the previous meeting discussions to identify potential project locations and improvement solutions.

Alternatives

Next, the meeting focused on a discussion of the proposed project locations and improvement solutions. Lindsay Walker, with PB, led this part of the meeting.

As directed by KYTC, PB developed transportation projects that fall into three categories:

- Local
- Short-Term
- Long-Term

To assist with the presentation / organization, these alternatives were coded based on their type as described above and assigned a letter in alphabetical order (the alternatives themselves are in no particular order). This system resulted in a labeling of alternatives as Local (L-A), Short-Term (ST-A), and Long-Term (LT-A). Color codes were also used to distinguish alternatives on the overall map and each project sheet (i.e. green for Local, blue for Short-Term, and brown for Long-Term).

On each project sheet the location / project problem was identified along with a potential solution (or for some projects multiple solutions). As the purpose of this study is to improve safety and congestion in the Somerset area, each project was also labeled as a "Safety" or "Congestion" project.

Discussion ensued about the layout of the sheets as well as the individual projects. Specific comments are listed below.

Overall Project Sheet Comments:

- To provide more detail and assistance in project prioritization, include under the Project Issues section specific crash rates and LOS if applicable.
- Re-consider project labeling for certain projects as they may better fit in a different category. According to KYTC, short-term projects have been considered as projects that can be completed in one year or less and have an associated cost of approximately \$15,000 or less.

Individual Project Comments:

- L-B: Need to show / discuss that there is adequate alternate access if Marydale Ave. is closed at the intersection. Perhaps consider widening other adjacent streets that would receive Marydale Ave. traffic. Also look at specific end treatments for the closure (i.e. guardrail only, or pavement removal, and/or curb / gutter installation perhaps with landscaping).
- L-C: Currently there is difficulty in locating city limits signs along US 27 as the northern limits are located in a big fill zone and the southern section is heavily developed with little room for additional signage. Also, with the construction / expansion of the city and the new bypass (KY 914) the city limits may change within the next few years. It may be

advantageous to wait until additional roadway infrastructure is in place and then place new signage.

- ST-A: It was noted that with the signal installation option intersection reconfiguration may be necessary. This should be evaluated. The roundabout option seemed feasible – though more detailed information is necessary to make a decision about the appropriate recommendation for this intersection, including cost.
- ST-B: KY 1247 is being re-aligned in the south to connect to KY 90. With this connection, KY 1247 becomes a primary access route to downtown Somerset. The additional traffic needs to be considered with the possibility of an additional turn lane (right turn onto Bourne Ave. from NB KY 1247).
- ST-C: KYTC is considering giving parts of KY 3261 to the county but nothing official has been decided.
- ST-D: KYTC is already looking into the purchase of retroreflective backplates for these signals.
- ST-E: The current airport signs on US 27 were the only ones available when they were installed. It was agreed that different / larger signage would be more appropriate. KYTC is looking into this currently. Also need to find clearer graphic for bottom of project sheet.
- ST-F: Substantial changes are being made in the Somerset area such that traffic volumes will likely be affected at these intersections. KYTC provided a map and cd with the proposed changes that are scheduled to be completed within 1 – 2 years. These include re-routing the Louie B. Nunn Parkway traffic and traffic associated with the extension of the northern bypass (KY 914) between KY 80 and the current parkway. The timings for these signals are controlled by a master controller in Frankfort, and evaluation of traffic impacts / timings should be made once the other roadway projects are completed and traffic volumes evaluated.
- ST-H: If possible, shift access point north to avoid cross-over traffic in the turn lane.
- ST-I: The need to consolidate / install at an appropriate distance new signage was reiterated.
- ST-J: Need to include primary manner of collision under Project Issues. Also, need to determine appropriate recommendation for improving sight distance to traffic signals in the EB direction along KY 80B. If pole-mounted signal is removed, need to determine what can be done with other signals to make them more conspicuous beyond the pedestrian bridge. A similar situation exists in Versailles, KY and it was suggested to review what had been done there for project ideas.
- LT-A: Currently PB stated the need to evaluate the widening of KY 914 to 4-lanes at this location. KYTC suggested changing that to a recommendation of widening instead of further evaluation.
- LT-C: A new right turn from the NB direction on KY 39 has just been installed into a church parking lot. Under current consideration is a new left turn lane into the school parking lot in the NB direction along KY 39. Also of particular concern is a sharp vertical curve in the northern part of the corridor. Additional refinement to incorporate these projects / locations is necessary to define this alternative.
- LT-D: As the city would have to apply for Safe Routes to School funding, this project should be sifted to the Local project category.
- LT-E: The master timing along the corridor is under current evaluation, but it was noted that cycle lengths are dictated by minimum pedestrian crossing times (which are being lengthened with new standards).
- LT-F: While adding turn lanes is an ultimate solution, the possibility of adding signage and/or pavement markings to reduce through travel in the right lane was proposed as an

interim solution. This will be evaluated; however, initial review did not show appropriate signage by the MUTCD as well as US 27 already has a substantial amount of roadside development and signage.

- LT-G: This project should be shifted to a Local project. A test area is currently underway by the city for median improvements.

Next Steps

The next steps in this project include the following:

- Send the meeting materials from this meeting to those unable to attend (including Somerset City Engineer and the LCADD representative). Comments should be received back to KYTC by October 2, 2009.
- Refine the alternatives and complete detailed analysis for use in project prioritization (including cost estimates / right-of-way impacts).
- Provide traffic count at KY 1575 / KY 1247 to both District 8 and Central Office KYTC staff.
- Provide list / map of locations for the Geotechnical Review to KYTC.

The meeting schedule for completing this study is as follows:

- Hold 3rd PDT meeting in December 2009 / January 2010 to discuss results of detailed analysis.
- Hold 2nd PAC meeting in January / February 2010 to discuss alternatives and project prioritization.
- Hold 4th PDT meeting following PAC meeting to discuss project recommendations.
- Complete study in March 2010.

The meeting was adjourned at approximately 11:30 AM.

FINAL Meeting Minutes

PROJECT: Somerset Small Urban Area Study

MEETING: Project Development Team Meeting #3

DATE & TIME: January 10, 2010 – 10:00 AM

LOCATION: Kentucky Transportation Cabinet – District 8
Somerset, Kentucky

ATTENDEES:

NAME	AGENCY/COMPANY	Telephone	Email
Danny Anderson	KYTC – D8 Planning	606-677-4017	danny.anderson@ky.gov
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Lindsay Walker	PB	859-245-3869	walkerli@pbworld.com

MEETING SUMMARY:

This was the third meeting of the Project Development Team (PDT) for the Somerset Small Urban Area Study (SUA). The meeting was conducted by the consulting firm of Parsons Brinckerhoff (PB) under contract to the Kentucky Transportation Cabinet (KYTC) to perform the study.

The purpose of this meeting was to present the draft list of concept alternatives developed for the study and to solicit feedback from the PDT, an potentially rank of importance on these discussion items.

To familiarize everyone at the meeting, each person introduced themselves and who they represented.

Project Sheets

Shawn Dikes, the PB Project Manager, turned the meeting over to Lindsay Walker, to discuss the project sheets that have been developed that outline the various local, short term and long term projects recommended for the area. Each project was discussed so that the project development team could provide feedback. Lindsay mentioned that there was some uncertainty as to whether some projects should be considered short term or long term. Jill Asher explained that short term projects are projects that could be funded with safety or maintenance funds, while long term projects would need to go in the 6-year plan. The following notes were made during the discussion of the individual projects:

Local Projects

L-B – S. Central Ave. / Marydale Ave. / Bourne Ave.

- Alex Godsey said that closing off Marydale would be supportable, and suggested that the area could be turned into a park. It was determined that there may not be enough space, therefore funds would not be allocated for that at this point, however it could be considered after Marydale is closed.

L-E – US 27 Grass Median

- The city is going to start a pilot project in the spring. The city plans on moving forward with this project regardless of whether or not it is included in this study.
- Curb and gutter will not be added, the only change will be adding grass to the medians.
- Langdon Street is the initial test section.
- The city estimates that a 300' section will cost \$10,000 - \$15,000.

There were no comments made regarding projects L-A, L-C and L-D. All in attendance agreed that these projects should be kept as recommendations.

A question was asked about whether a project to add sidewalks to US 27 should be included. It was determined that due to existing safety issues, right turn on reds, and the change in phasing that would be necessary to accommodate pedestrian signals, that adding sidewalks may not be a good idea.

After discussing the local projects, the PDT was asked to prioritize them. It was agreed that safety projects would be a higher priority than aesthetic projects. It was also mentioned that the prioritization discussed in this meeting is not final, and that the Project Advisory Committee (PAC) will get a chance to discuss prioritization, and another PDT meeting will be held to finalize it. The local projects were prioritized as follows:

1. L-B
2. L-D
3. L-A
4. L-E
5. L-C

Short Term Projects

ST-A – First Traffic Light in SB Direction on US 27

- The district has submitted a request to Frankfort for retro reflective back plates, and is awaiting a response.
- Due to a lack of evidence of crashes at this location, advance warning devices will not be placed at this location or included in this recommendation.

ST-B – Airport Access off of US 27

- The district said that the airport signs were replaced several months ago, therefore this project no longer needs to be included.

ST-C – KY 80 / KY 914 Intersection

- The district does not have the authority to post the types of signs recommended for this project.
- The recommendation for this project will be changed to consolidating signs.

ST-D – KY 1577 (Oak Hill Road) / KYU 3261 (WTLO)

- Because of the bypass a lot of traffic has been taken away from this intersection, however a lot of people still use it.
- There isn't enough information known about new traffic patterns here, therefore a study of this location will be recommended as a long term project.

ST-F – US 27 / Washington Drive Intersection

- This project was studied 5-6 years ago and never was built.
- One major issue is the 3-way stop in front of Wal-Mart. The city can recommend that this be changed to a 4 way stop, however it is not known whether the street in front of Wal-Mart is a city street or if Wal-Mart owns it.
- This project needs to be moved to long term.

ST-G – US 27 / Oak Hill Road (KY 1577) Intersection

- Right-of-way costs for this project could end up being very expensive, especially if it needs to be taken from the car lot.
- This project needs to be moved to long term.

For many of these projects, the construction costs seemed low to the district, however this was mostly due to the fact that right-of-way and utilities were not included in the cost estimates. It was agreed that PB would work with the district to estimate the cost of right-of-way and add it into the cost estimates.

After going through the list, only 3 short term projects remain. The group discussed this and agreed that there were no other short term projects that were missing and that the district has been proactive and already fixed most issues that could be done short-term.

Long Term Projects

LT-A – KY 914 (Eastern Bypass)

- Right-of-way has already been bought for 4-lanes, however there may be utilities that need to be moved.
- There is a sewer line on one side of the roadway, but the road was built so that it could be widened on the side where there is not a sewer line.

LT-B – KY 914 between US 27 and KY 80 (Western Bypass)

- The city would like to see a N/S and E/W connector in this area. The E/W connector is still conceptual, however the city is almost finished with the right-of-way plans for the N/S connector.
- The city does not want this project to be a coordination project, but would like for it to be a project that the state includes in the 6-year plan, as a KY 3263 extension project.

- The project sheet will be called “KY 3263 Extension” and will be a sheet for the completion of this project, and will not say anything about coordination.
- The city will send the work they have done to-date on this project to PB.

LT-C – KY 39

- Safety improvements where the vertical curve is could be separated out as an HSIP short term project.
- The left turn lane is into Northern Middle School, not Woodstock Elementary, and this could also be separated out as a separate project.
- A left turn lane into Pulaski County High School could be added as another project. There will be 3 separate spot projects instead of one corridor-wide project.

LT-D – US 27 Right Turn Lanes

- This project is not likely feasible because of all of the right-of-way that would need to be bought.
- The cost estimate does not include the 2 projects discussed in the short term projects section.
- There is no way to sign this to make the existing right lanes right turn only, because they do also carry through the intersections.
- The cost estimate would need to be increased to include right-of-way costs.
- This project will remain on the list of projects but will be a very low priority.

LT-E – KY 1247 / KY 1575

- The district has done 12-hour counts for this location and it does not meet signal warrants.
- There are a lot of utilities in this area, which would increase the cost.
- If a signal were to be added it would add delay during the off-peak times throughout the majority of the day.
- The district does not feel comfortable recommending a roundabout at this location; therefore it is no longer in consideration.
- PB should look at what improvements would be offered by adding turn lanes only and no signal.

LT-F – Left Turn from KY 1247 (Monticello St.) onto Bourne Ave.

- There is a major gas line that runs through this area.
- A lot of problems in this area occur on Bourne Ave. which is not a state road.
- This project should be left in the study but made a low priority.

LT-G – KY 39 / KY 80B Intersection

- The type of accidents that have occurred at this intersection should be revisited. The district recently split the left turns and believes that this may have solved many of the accident problems.
- The left turn lane on KY 80 in the EB direction does not have enough storage and needs to be extended.
- An acceleration lane is only needed in the WB direction, and not the EB. The access point at College St. will need to be removed if acceleration lanes are built in the WB direction.

An additional location was discussed to possibly add to the list of projects. This is an intersection at KY 80 / Ohio / Limestone. A field visit to this location was taken after the meeting to discuss potential improvements to the area. A project sheet for this location will be added.

Next Steps

PB will coordinate with the district to get updated cost estimates that include right-of-way. The project sheets will be updated based on the discussion from this meeting, and short and long term projects will be switched as recommended.

A project advisory committee meeting will need to be scheduled for the beginning of January. The updated project sheets will be presented to this group and they will be given the opportunity to prioritize the various projects. After that meeting, the PDT will have a meeting to finalize the projects and their prioritization. A final report will then be submitted.

The meeting adjourned at 12:30 pm.

Appendix F:

KY 1247 / KY 1575 Alternative Analysis

Appendix F: KY 1247 / KY 1575 Intersection Analysis

This document summarizes the steps taken to analyze the KY 1247 / KY 1575 intersection in the northern portion of the Somerset SUA study area.

1) Data

One turning movement count was performed for this intersection in the afternoon during school dismissal time (2:45 PM – 5:15 PM) on 9/9/2009.

The peak hour from the counts was 2:45 PM – 3:45 PM.

2) Existing intersection LOS

The following table shows the level of service calculations by approach and for the entire intersection based on this count.

Intersection	Type	Approach	PM (2:45-3:45)	
			Avg. Delay (sec)	LOS
KY 1247 @ KY 1575	4-way STOP controlled	Eastbound	23.3	C
		Westbound	47.9	E
		Northbound	80.3	F
		Southbound	22.4	C
		Whole Int.	43.0	E

3) Signal Warrants

There are two signal warrants that are applicable based on the available information

Warrant 1, Eight-Hour Vehicular Volume: Not enough data

Warrant 2, Four-Hour Vehicular Volume: Not enough data

Warrant 3, Peak Hour:

-Volumes **meet** criteria for Part A based on stopped time delay, approach volume, and intersection volume; however; justification of a traffic signal based on this warrant is used only in unusual cases such as an office complex, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time. None of these exist nearby.

Warrant 4, Pedestrian Volume: Not enough data, but unlikely to be met based on observations during the existing count.

Warrant 5, School Crossing: The intersection is not located close enough to a school that high volumes of school children cross here.

Warrant 6, Coordinated Signal System: No other signals exist in the vicinity to justify this warrant.

Warrant 7, Crash Experience:

-There are five reported crashes during the years 2006 and 2008 at this intersection, all of which are of the type that could be corrected by a traffic signal. However, none of them involved an injury or fatality.

-To further justify this warrant, additional data would be necessary including at a minimum an eight hour turning movement count.

Warrant 8, Roadway Network: Not enough data

4) Signalized intersection LOS

The following table shows the level of service calculations by approach and for the entire intersection based on this count.

Intersection	Type	Approach	PM (2:45-3:45)	
			Avg. Delay (sec)	LOS
KY 1247 @ KY 1575	Signalized	Eastbound	11.8	B
		Westbound	12.9	B
		Northbound	18.6	B
		Southbound	11.7	B
		Whole Int.	14.1	B

4) Comparison of alternatives

Other options to improve intersection operations include adding left turn lanes along KY 1247 (no signalization), signalization, and re-constructing the intersection to form a roundabout. As HCS+ would not analyze roundabout operations comparably to the other improvement options, this option was modeled in VISSIM. Output from both HCS+ and VISSIM is provided in the table below.

	No-Build				Turn Lanes				Signalized				Roundabout	
	HCS		VISSIM		HCS		VISSIM		HCS		VISSIM		Delay	LOS
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS		
NB	80	F	94	F	18	C	16	C	19	B	10	A	3	A
SB	22	C	21	C	20	C	17	C	12	B	8	A	5	A
EB	23	C	21	C	19	C	18	C	12	B	13	B	4	A
WB	48	E	35	D	30	D	34	D	13	B	20	C	5	A
Overall	43	E	46	E	21	C	21	C	14	B	13	B	4	A

As shown, good levels of service can be achieved with any of the three improvement options.