

TRUCK ROUTE ACCESS EVALUATION

Dollar General Corporation
Scottsville - Allen County
Site #2655

Report No. KTC-99-46

“Freight Movement and Intermodal Access in Kentucky”
SPR 98-189

David H. Cain

with

Ken Agent
Brian Aldridge
Lisa Aultman-Hall
Nick Stamatiadis
Joel Weber



Kentucky Transportation Center and the Department of Civil Engineering
University of Kentucky

May 1999

Table of Contents

1.0 Introduction	1
2.0 Truck Routes in Use	4
3.0 Route Data Collection and Field Inspections	5
3.1 Traffic Operations and Level of Service	6
3.2 Accident History	6
3.3 Cross Section Features	10
3.4 Curvature Features	15
3.5 Railroad Crossings	17
3.6 Bridges	17
3.7 Sight Distance	17
3.8 Other Route Features	19
4.0 Route Evaluation and Recommendations	20
4.1 Problem Truck Miles and Truck Points	20
4.2 Maintenance Improvement Locations	22
4.3 Overall Route Rating	22
4.4 Conclusions and Recommendations	23

Appendices

Appendix A Phone Surveys Conducted with Facilities	24
Appendix B: Curvature Data	25

List of Tables

Table 1: Route Designation Summary	4
Table 2: Route Features and Method of Evaluation	5
Table 3: Accident Types Along Route One (US 31E, KY 100)	8
Table 4: Accident Types Along Route Two (US 31E, KY 90, KY 70)	8
Table 5: Summary of Curvature Data	16
Table 6: Bridge Sufficiency Ratings for Route One: US 31E to KY 100 to I-65	17
Table 7: Bridge Sufficiency Ratings for Route Two: US 31E to KY 90 to KY 70 to I-65	17
Table 8: Summary of Problem Truck Miles and Truck Points for Route One	20
Table 9: Summary of Problem Truck Miles and Truck Points for Route Two	21
Table 10: Interpretation of the Overall Route Rating	22

List of Figures

Figure 1: Location of Truck Generating Site	2
Figure 2: Location of Dollar General Facility in Scottsville	3
Figure 3: Accident Locations (1995-1997)	7
Figure 4: Accident Locations Near The Dollar General Site (1995-1997).	9
Figure 5: Lane Widths	11
Figure 6: Lane Widths Near The Dollar General Site	12
Figure 7: Shoulder Widths	13
Figure 8: Shoulder Widths Near The Dollar General Site	14
Figure 9: KY 3499 at Dollar General Drive	15
Figure 10: Dollar General Drive at KY 3499	15
Figure 11: Maxwell Drive approaching US 31E	15
Figure 12: Maxwell Drive at KY 3499	15
Figure 13: US 31E SB at Maxwell Drive	16
Figure 14: US 31E NB at Maxwell Drive.	16
Figure 15: KY 3499 at Maxwell Drive	16
Figure 16: Bridge Locations	18
Figure 17: Horses-Drawn Carriage Traveling Along US 31E	19

1.0 Introduction

The Freight Movement and Intermodal Access in Kentucky Study (SPR 98-189) is being conducted by the Kentucky Transportation Center on behalf of the Kentucky Transportation Cabinet. There are two main objectives of the study: 1) evaluation of the access for trucks between intermodal or other truck generating sites and the National Highway System (NHS) and 2) furthering the understanding of freight commodity flows throughout the state. This report summarizes the access evaluation for a facility located in Allen county in the Barren River Development District (ADD) and KYTC Highway District # 3. The location of the site is shown in Figure 1. Work on other specific sites as well as the freight commodity flow task are on-going and are documented elsewhere.

The sites to be evaluated were selected from two existing databases (a truck facility survey from 1994 and the intermodal facility inventory) based on ADD and KYTC Highway District planner recommendations, geographic location, distance to the national highway system, and the number of trucks accessing the site. Consideration was also made for the freight type handled and transportation modes used. This site is located off KY 3499 near US 31E in Allen County. The National Highway System routes serving the area are US 231 north of Scottsville and US 31E south of Scottsville as shown in Figure 1.

A phone survey was conducted with the facility truck routing personnel early in the study process. The site was visited for data collection on October 27, 1998 and for video recording on December 5, 1998 . The only truck generating facility in the area is Dollar General Corporation located on Dollar General Street off KY 3499 east of Scottsville. The approximate location is shown in Figure 2. The surrounding area is generally residential. The phone survey found approximately 100 trucks per day accessing this site (in and out), while the KYTC's Division of Planning data indicates 496 trucks per day travel along KY 3499 at Dollar General Drive. The site trucks generally have 48-foot trailers. The phone survey information can be found in Appendix A.

Figure 1: Location of Truck Generating Site

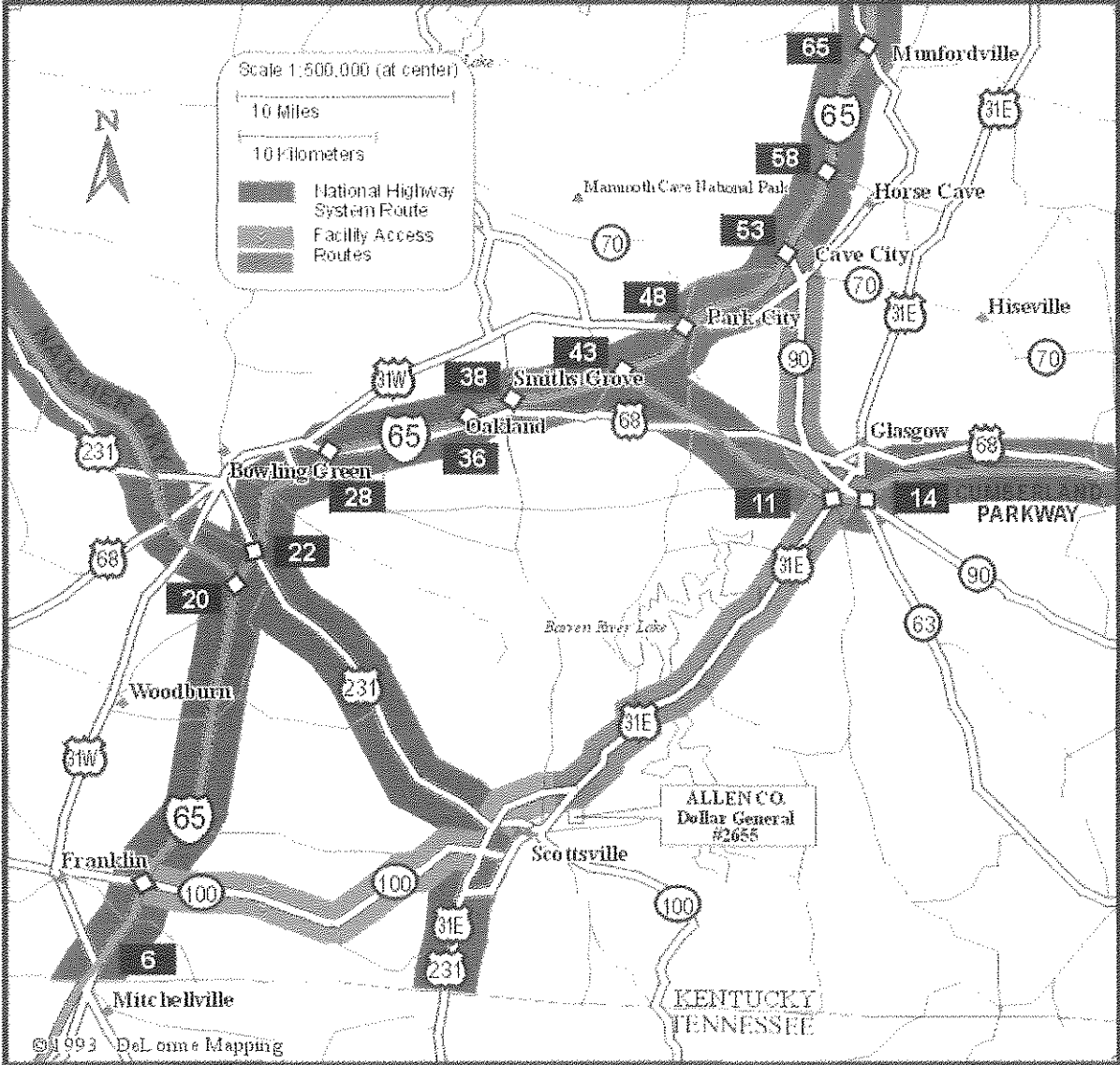
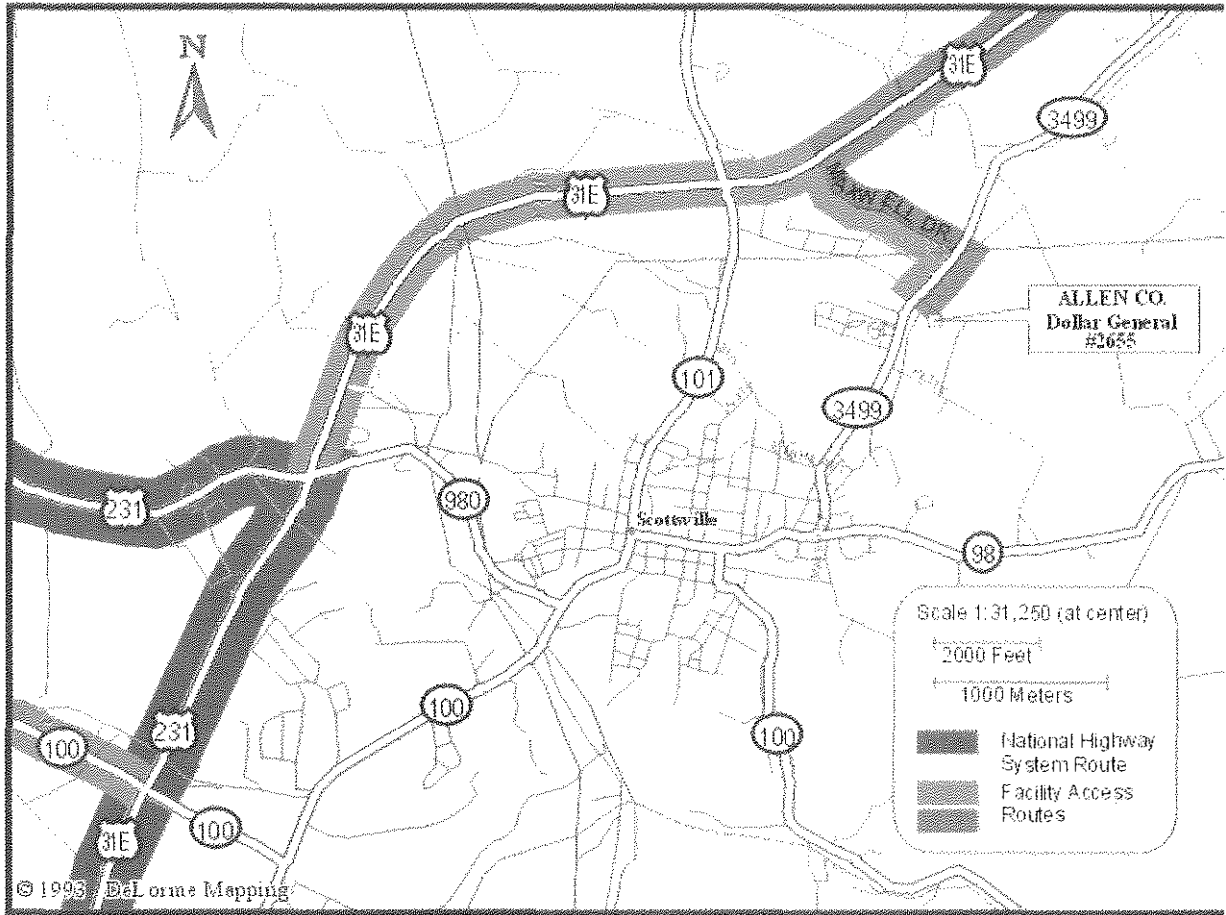


Figure 2: Location of Dollar General Facility in Scottsville



2.0 Truck Routes in Use

Two routes were indicated as access routes to the National Highway System from this site in Allen County as shown in Figure 1. Both routes intersect I-65 which is a National Highway System route. There are indications that truck traffic may also use two National Highway System routes in the area, US 231 north from Scottsville and US 31E south from Scottsville. The two truck access routes which were evaluated in this report follow KY 3499 from the site to Maxwell Drive then to US 31E. At this point, trucks with a southern destination follow US 31E South to KY 100 (Route One) then to I-65 near Franklin. Traffic with a northern destination follows US 31E North from Maxwell Drive to I-65 near Cave City via KY 90 and KY 70. A route designation summary is shown in Table 1.

Table 1: Route Designation Summary

Route	County	Milepoint	Functional System	Weight Class	ADT
KY 100	Simpson	Length	Rural Major Collector	AAA	2,180 - 3,030
KY 100	Allen	Length	Rural Major Collector	AAA	1,560 - 3,450
KY 3499	Allen	Length	Rural Local	A	3,100
Maxwell Dr.	Allen	Length	Local Non-State-Maintained	-	1,318
US 31E	Allen	Length	Rural Minor Arterial	AAA	2,850 - 4,520
US 31E	Barren	0.000 - 10.404	Rural Minor Arterial	AAA	2,850 - 4,890
		10.404 - 14.258	Urban Principal Arterial	AAA	10,000 - 24,000
KY 90	Barren	0.000 - 8.347	Rural Minor Arterial	AAA	8,400
		8.347 - 9.923	Urban Principal Arterial	AAA	13,450
KY 70	Barren	5.178 - 5.359	Rural Minor Arterial	AAA	4,990

Route One, following KY 100 west of Scottsville, is approximately 22 miles in length and intersects I-65 at Exit 6 east of Franklin. This route travels 3.6 miles along US 31E, of which 1.2 miles between US 231 and KY 100 is part of the NHS. After intersecting and turning onto KY 100, the route travels through Allen and Simpson Counties. The terrain is generally rolling and is primarily agricultural. Traffic signals with left turn phases are located on US 31E at the intersections with KY 101, US 231, and KY 100. Only the 2.4 mile section of US 31E between KY 100 and Maxwell Drive along this western route is on the National Truck Network. Therefore, if a 102 inch wide truck were to use this route it would be an STAA violation.

Route Two follows US 31E north from Maxwell Drive and is approximately 34 miles in length. The route passes through Allen and Barren Counties and follows KY 90 near Glasgow and KY 70 near Cave City. The entire route is designated as a National Truck Network route. The terrain between Scottsville and Glasgow is generally rolling and used for agriculture while the Glasgow area is commercialized.

Maxwell Drive, a local non-state-maintained road approximately 0.5 miles in length, connects US 31E and KY 3499. Dollar General Drive is approximately 0.2 miles south on KY 3499 from the Maxwell Drive intersection. The Dollar General truck facility is located on this road.

3.0 Route Data Collection and Evaluation

The route features that were evaluated in this study are shown in Table 2 along with a brief description of the evaluation method. While some of these features require only subjective evaluation by the engineer during site inspection, others required quantitative measurement in order to label the particular point or section as “preferred”, “adequate”, or “less than adequate” for truck access. The guidelines for labeling a point or section into one of these three descriptive categories are provided in both the interim and final report for this project. In several cases measurements were only taken where subjective evaluation indicated a problem might exist.

Table 2: Route Features and Method of Evaluation

Feature	Methodology	Team Consensus based on Committee Meeting and Draft Report Feedback	Feature Type
Offtracking	Lane Width with formula based on wheel and axle spacing	Evaluate where observation of trucks indicates possible offtracking - use HIS data and collect in field	Point
Max. Safe Speed on a Curve	Ball Bank Indicator Reading	Evaluate complete route due to ease of data collection	Point
Grade	Speed Reduction Tables with Percent Grade and Direct Observation	Evaluate where observation of trucks indicates speed reduction occurs using HIS data and collect in field as needed	Continuous
Lane Width	HIS data and field measurement	Review complete route due to ease of data collection	Continuous
Clear Zone	Observation	Subjective evaluation	Subjective
Shoulders	HIS data and field measurement	Evaluate where HIS data is available and estimate based on observation elsewhere	Continuous
Pavement Condition	Observation	Subjective evaluation	Subjective
Truck Stopping Sight Distance	Field measurements	Measure only when observation indicates possible problem	Point
Turning Radii	Field measurements and observations of trucks	Measure only when observation indicates possible problem	Point
Accident History	Accident data files and KTC High Truck Accident Report	Do for entire route	Subjective
Intersection LOS	Traffic counts	Only where problems are indicated by facility managers	Point
Route LOS	Traffic counts and travel time studies	Only where problems are indicated by managers	Continuous
RR Crossings	Field Observation	Evaluate all level crossings	Point
Bridges	KYTC Sufficiency Rating	Evaluate all bridges	Point

3.1 Traffic Operations and Level of Service

The survey of this site indicated that there were no traffic-related problems or concerns for this site. The only problems identified deal with geometric problems that are discussed in another section of the report. Thus, the route is assumed to operate at an acceptable level of service.

3.2 Accident History

In 1997 the Kentucky Transportation Center studied all state-maintained roads throughout Kentucky and determined average truck accident rates for different types of road sections. A critical accident rate was then calculated using the average accident rate for a specific highway type along with an assumed level of statistical significance and exposure (vehicle miles traveled).

A section of KY 100 in Simpson County between MP 14.792 and 16.271 has a critical rate factor of 1.1, indicating that the truck accident rate is 10 % higher than the critical rate for that type of highway. No section of truck access roadway in Allen County has an accident rate higher than the critical rate for trucks. A section of US 31E in Barren County between MP 0.0 and 7.7 has a critical rate factor of 2.9. Several of these accidents occurred at intersections with US 31E. The section of KY 90 also in Barren County between MP 9.325 and 9.923 has a critical rate factor of 1.4. Nine of the ten accidents occurred at the KY 90 intersection with US 31E. These critical rate factors indicate that there are some safety concerns along these routes from a truck accident history point of view.

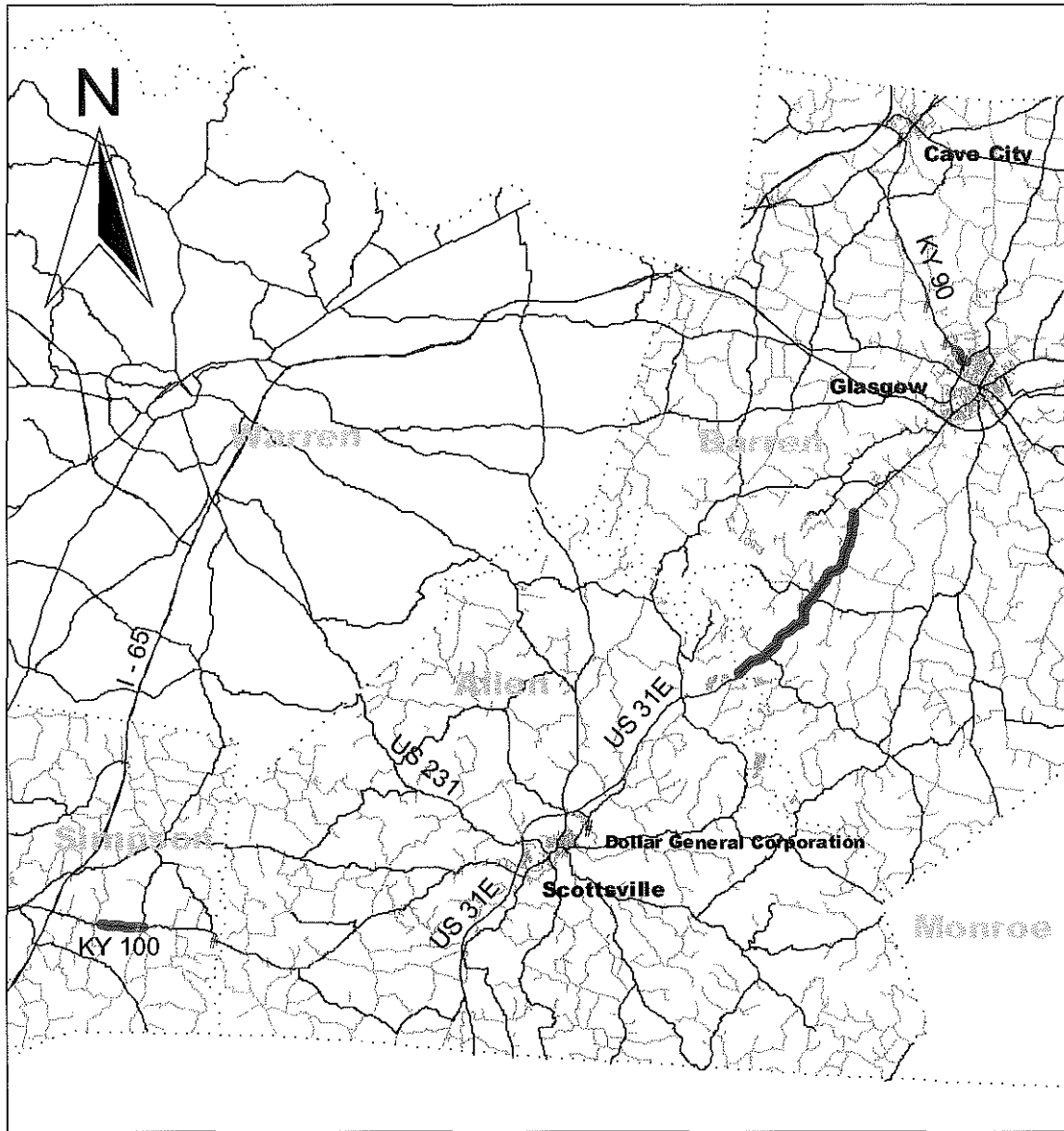
Figure 3 shows the locations of all accidents during the years 1995, 1996 and 1997. The figure illustrates that many accidents are occurring at intersections. A summary of the accidents along each truck route is shown in Tables 3 and 4 for the same three-year period. Truck accidents represent a significant portion of the overall accidents along this route.

The 9.3% of accidents along Route One involving trucks is much lower than the percent trucks along KY 3499 (14.5%), Maxwell Drive (30.1%), US 31E (17.6%) and KY 100 (15.6%).

The 12.7% of accidents involving trucks along Route Two is lower than the 19.6% percent trucks traveling along US 31E in Allen County and a section of US 31E in Barren County (MP 0.0-4.2). However, the 12.7% of truck accidents is higher than the percent of trucks traveling along a section of US 31E in Barren County (MP 4.2-14.8 - 9.0%), KY 90 (10.2%) and KY 70 (11.8%).

Figure 4 shows that accidents in the vicinity of the truck facility are occurring mostly near intersections.

Figure 3: Accident Locations (1995-1997)



LEGEND

- # Facility
- . Accidents: 1-2
- Accidents: 3-6
- ## Accidents: 7-10
- ### Accidents: 11-42
- Critical Accident Rate Section

Scale - 1:350000

3 0 3 6 9 Miles



4 0 4 8 12 Kilometers



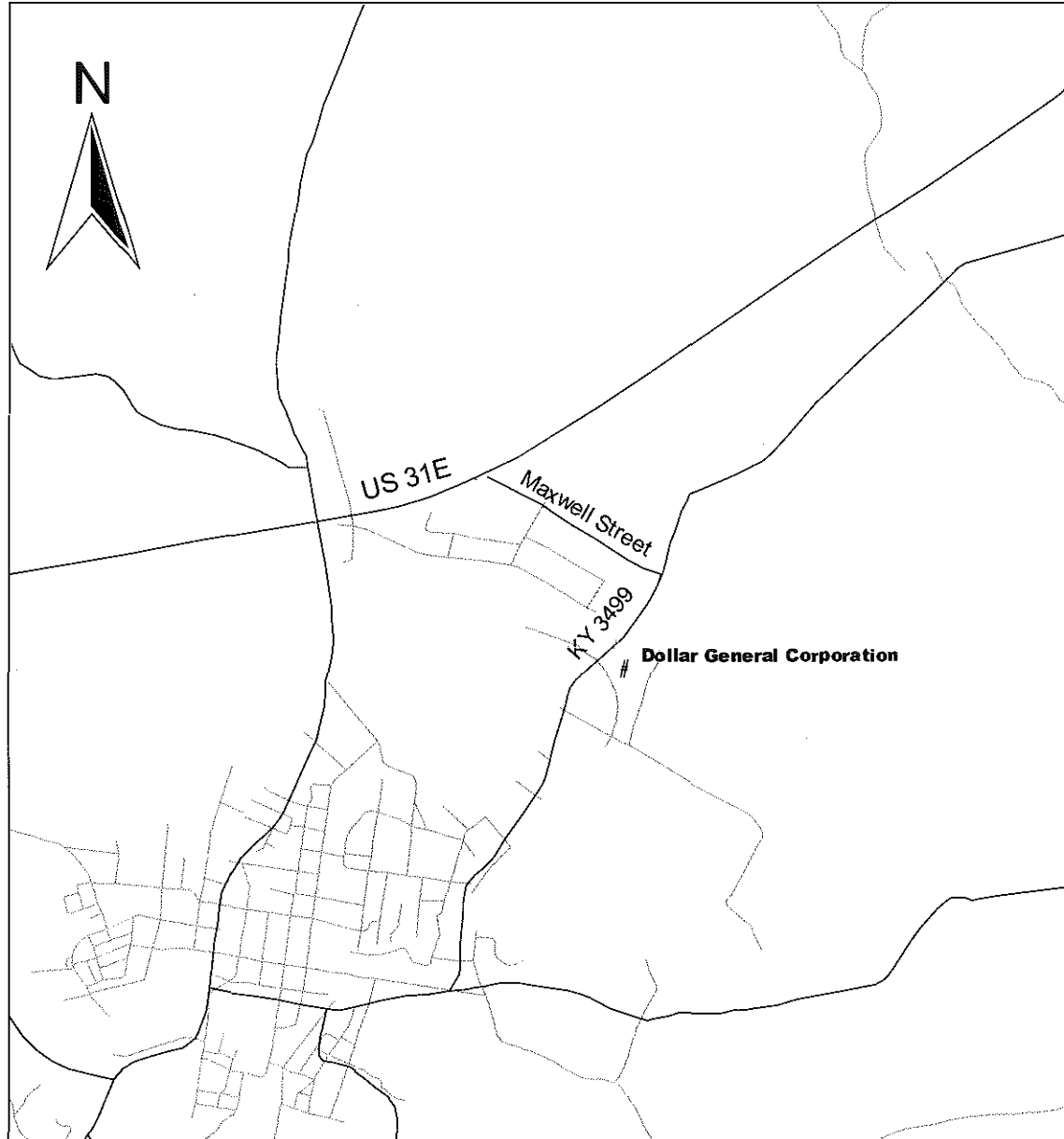
Table 3: Accident Types along Route One (US 31E, KY 100)

	<i>Non-Truck Accidents</i>	<i>Truck Accidents</i>	<i>Percent Trucks</i>
Total	98	10	9.3
Fatal Accidents	4	3	42.9
Injury	39	4	9.3
Intersection	22	3	12.0

Table 4: Accident Types along Route Two (US 31E, KY 90, KY 70)

	<i>Non-Truck Accidents</i>	<i>Truck Accidents</i>	<i>Percent Trucks</i>
Total	144	21	12.7
Fatal Accidents	2	1	33.3
Injury	55	10	15.4
Intersection	71	12	14.5

Figure 4: Accident Locations Near the Dollar General Site (1995-1997)



LEGEND

- # Facility
- . Accidents: 1-2
- Accidents: 3-6

Scale - 1:25000

0.2 0 0.2 0.4 0.6 Miles



300 0 300 600 900 Meters



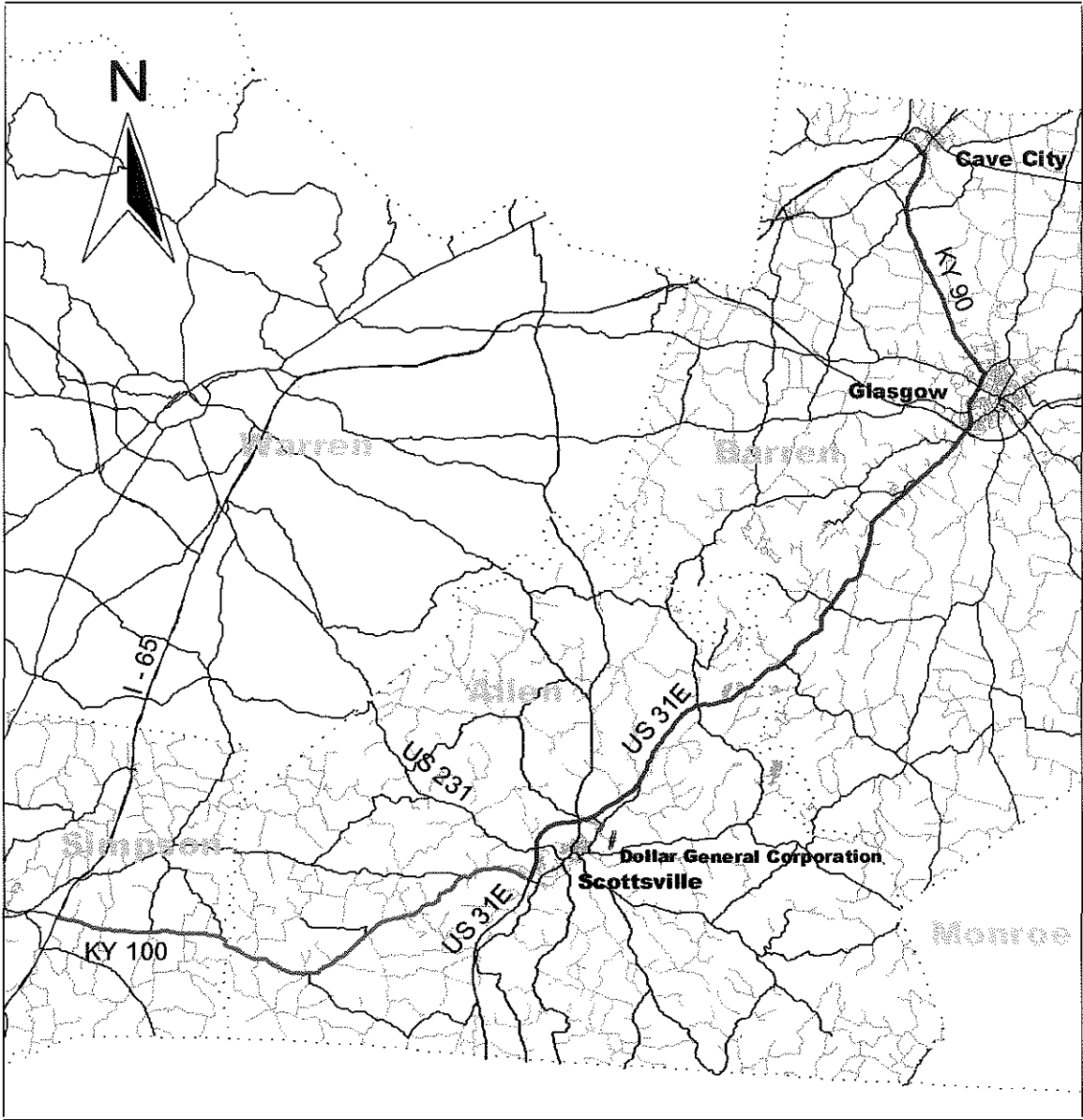
3.3 Cross Section Features

Figures 5 through 8 illustrate the sections of the routes having different width of lanes and shoulders. All access routes in the vicinity of the site have two lanes. KY 100, on Route One, has two 10-foot “less than adequate” lanes, while US 31E had “preferred” 12-foot lanes. Maxwell Drive has 12-foot “preferred” lanes and KY 3499 has “less than adequate” 9-foot lanes. Shoulder widths vary from two-four feet (“less than adequate”) along KY 100 to 10 feet (“preferred”) along US 31E. Maxwell Drive and KY 3499 have “less than adequate” turf shoulders. The pavement surface on KY 100 in Simpson County is new while the surfaces along the other sections of KY 100 and US 31E are in good condition. The pavement surfaces along Maxwell Drive and KY 3499 are in fair condition. Dollar General Drive intersects KY 3499 as shown in Figures 9 and 10.




US 31E to the north of Scottsville has mostly “preferred” 12-foot lanes with about eight miles of “adequate” 11-foot lanes in the vicinity of Barren River Lake. US 31E in Glasgow has four, 12-foot “preferred” lanes. KY 90 and KY 70 have “preferred” 12-foot lanes. The shoulder widths along US 31E vary from a “less than adequate” width of two feet to a “preferred” width of 10 feet. Approximately two miles of US 31E in Glasgow has curbed shoulders resulting in a “less than adequate” rating for this section. KY 90 has a short section in Glasgow of curbed, two-foot shoulder, which is also rated “less than adequate”. Most of KY 90 has 10-foot “adequate” shoulders that are graveled. KY 70 has 10-foot “preferred” paved shoulders. The pavement surfaces on US 31E, KY 90, and KY 70 are in good condition.

A few sections along KY 100 on Route One had clear zone problems such as trees, drainage ditches, mailboxes, fence posts, and highway signs. The section of US 31E in Glasgow, which has curbs, generally has sufficient clear zone space beyond the curb. The section of KY 90 with curbs, also in Glasgow, does not consistently have sufficient clear zone space.

Figure 5: Lane Widths



LEGEND

#	Facility
	Lane Width: 9 Feet
	Lane Width: 10 Feet
	Lane Width: 12 Feet

Scale - 1:350000

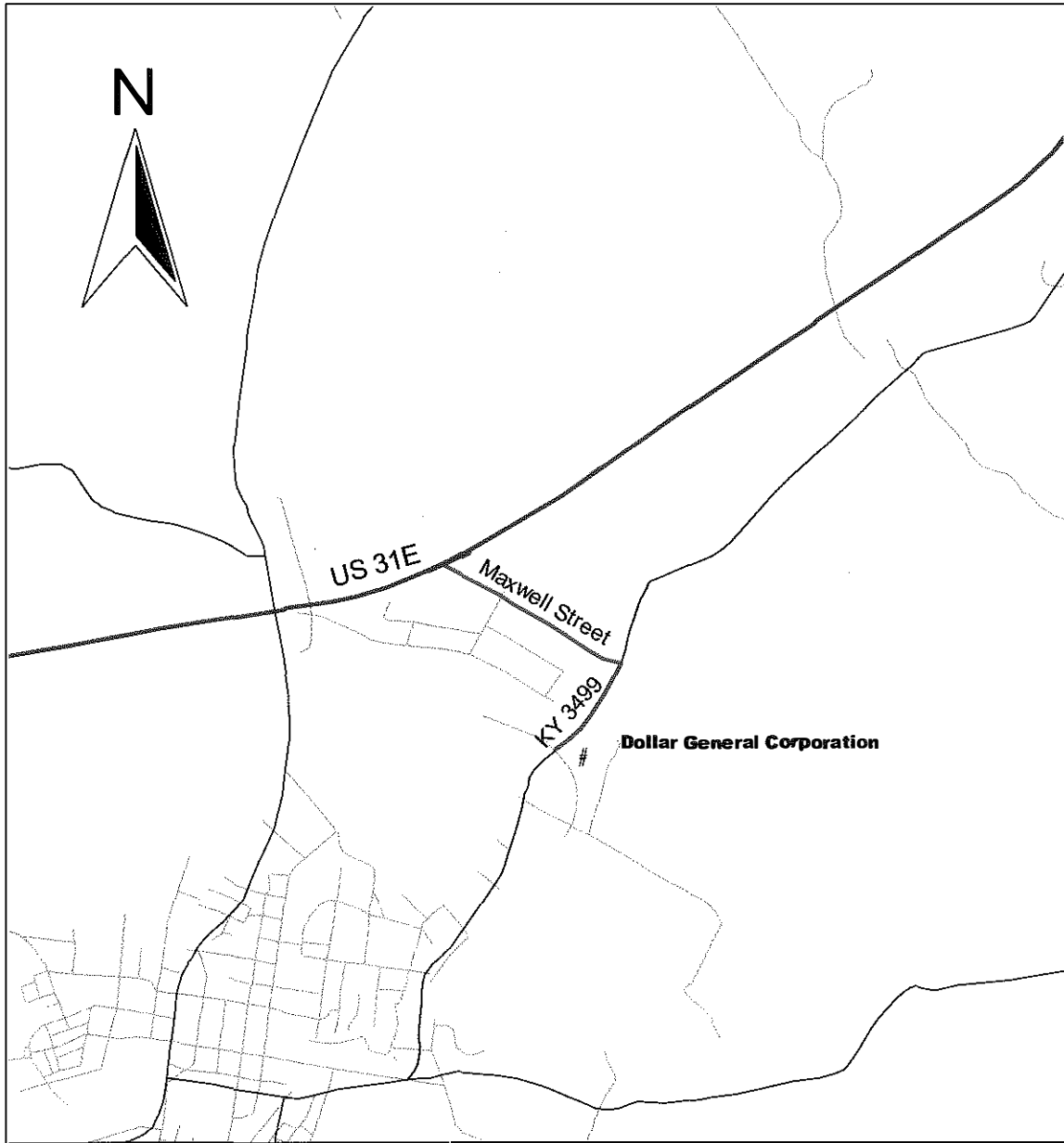
3 0 3 6 9 Miles



4 0 4 8 12 16 Kilometers



Figure 6: Lane Widths Near the Dollar General Site



LEGEND

#	Facility
—————	Lane Width: 9 Feet
- - - - -	Lane Width: 10 Feet
—————	Lane Width: 12 Feet

Scale - 1:25000

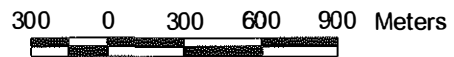
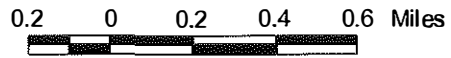
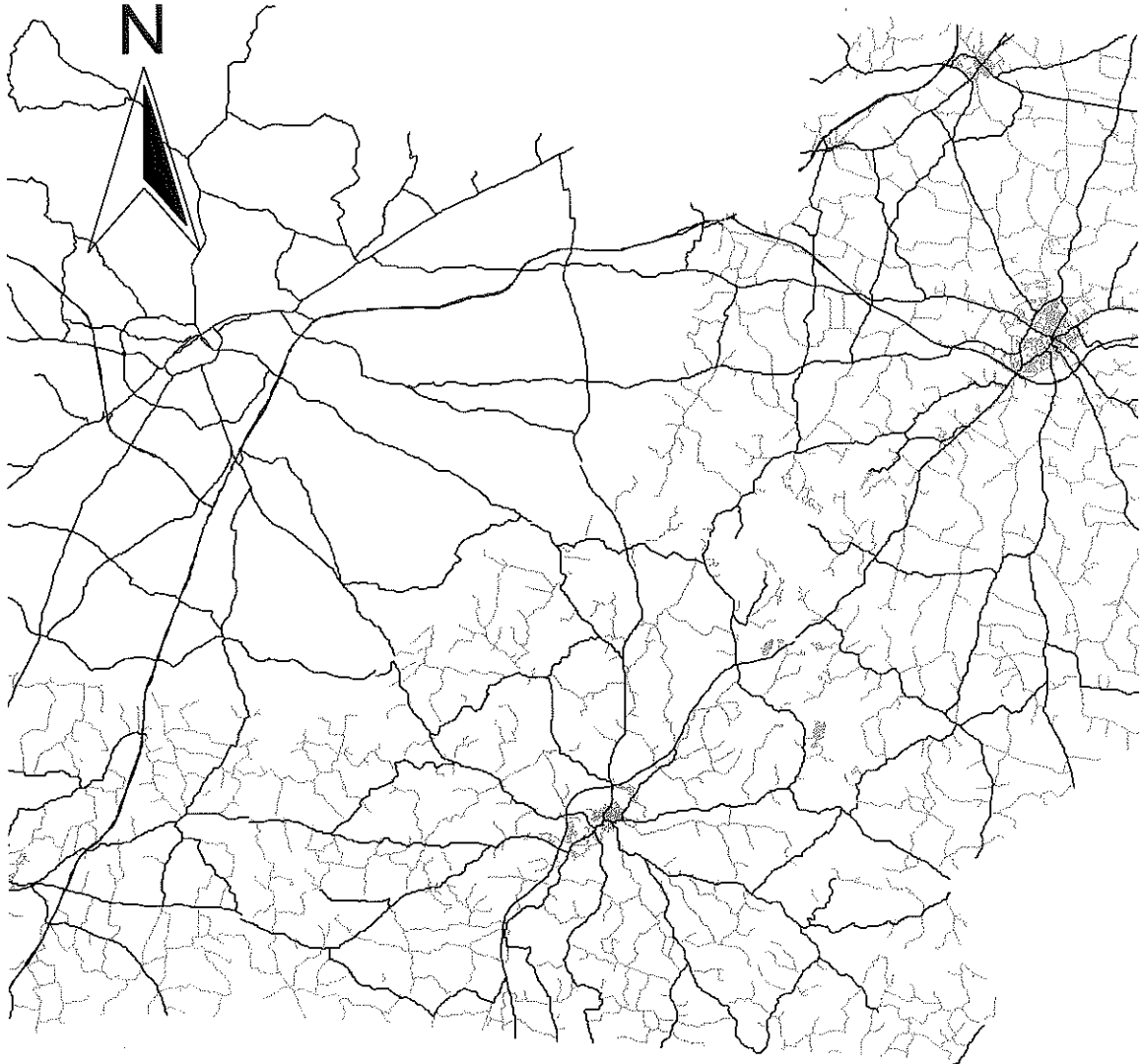


Figure 7: Shoulder Widths



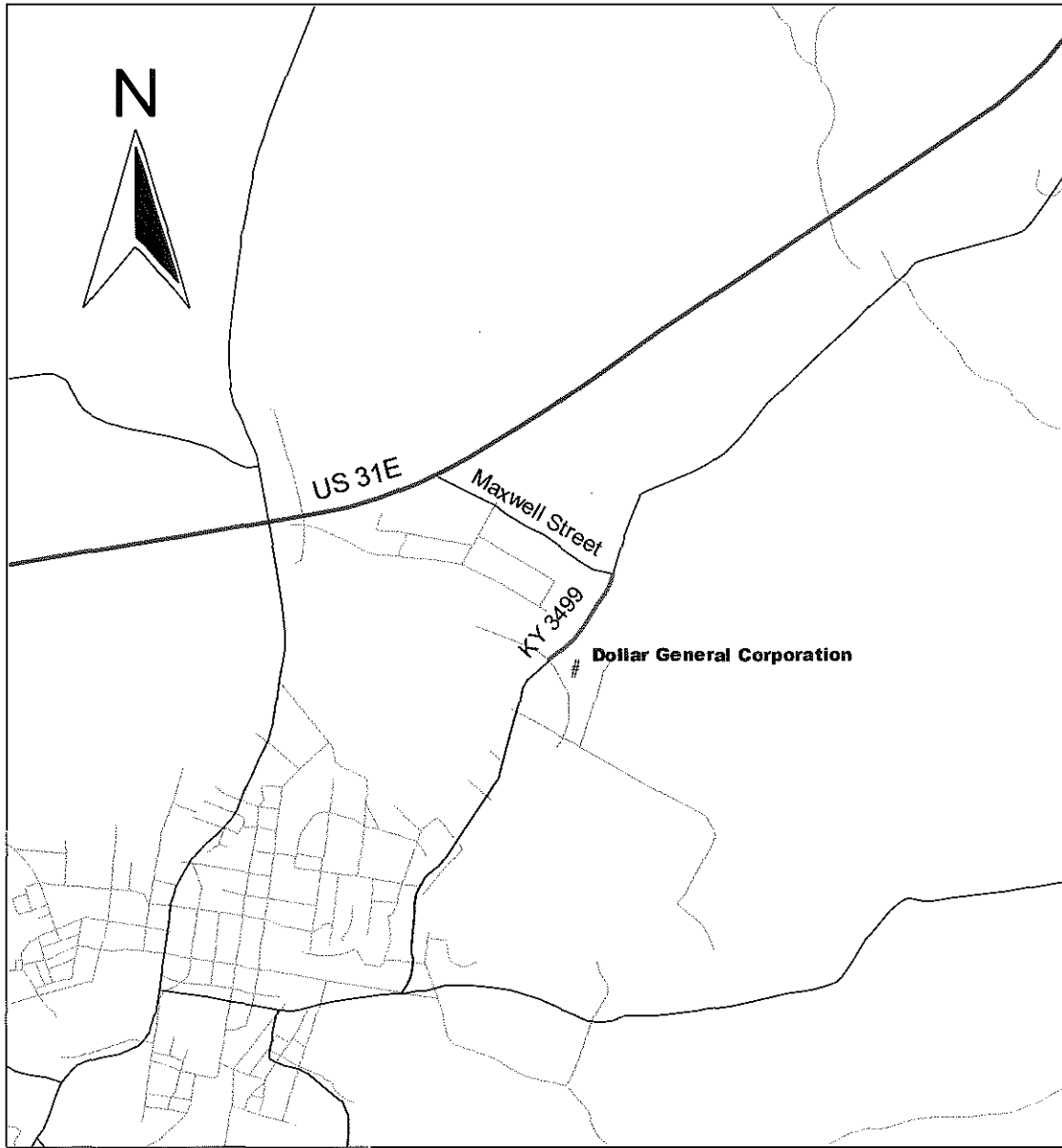
LEGEND

#	Facility
—	Shoulder Width: 0 Feet
— — —	Shoulder Width: 2-3 Feet
— — — —	Shoulder Width: 4-6 Feet
— — — — —	Shoulder Width: 10 Feet

Scale - 1:350000

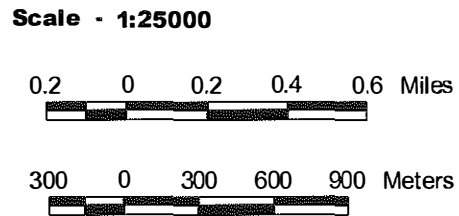


Figure 8: Shoulder Widths Near the Near Dollar General Site



LEGEND

#	Facility
—————	Shoulder Width: 0 Feet
- - - - -	Shoulder Width: 2-3 Feet
====	Shoulder Width: 4-6 Feet
—————	Shoulder Width: 10 Feet



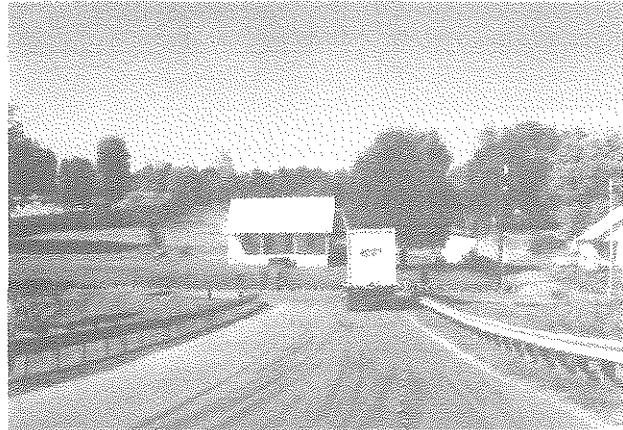


Figure 9: KY 3499 at Dollar General Drive

Figure 10: Dollar General Drive at KY 3499

3.4 Curvature Features

Grades are considered problematic if they cause trucks to slow excessively. Four such grades are located along US 31E between Scottsville and Glasgow but are not considered a hindrance because truck lanes are provided. No critical grade problems were observed on Route One along KY 100. The up-grades on Maxwell Drive inhibit acceleration, while the down grades apparently are problematic for trucks as shown by the tire skid marks in Figures 11 and 12.



Figure 11: Maxwell Drive approaching US 31E

Figure 12: Maxwell Drive at KY 3499

Maxwell Drive intersects US 31E approximately midway on a downhill grade northbound on US 31E at MP 11.040. Based on the range of the Degree of Grade (4.5 -6.4) and the length (0.51 miles) of this section, it is rated “preferred”. Trucks traveling along Route One to the west must make a left turn onto US 31E South from Maxwell Drive and travel up this grade as shown in Figures 13 and 14. However, there did not appear to be any significant traffic problems associated with this section. Sight distance is not problematic and ADT is fairly low (4,830 vehicles per day) at this location.

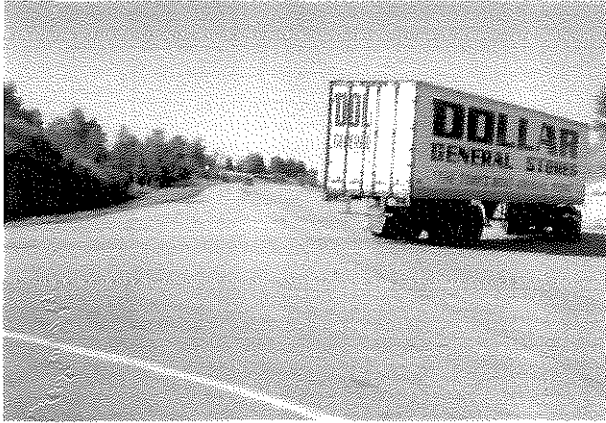


Figure 13: US 31E SB at Maxwell Drive

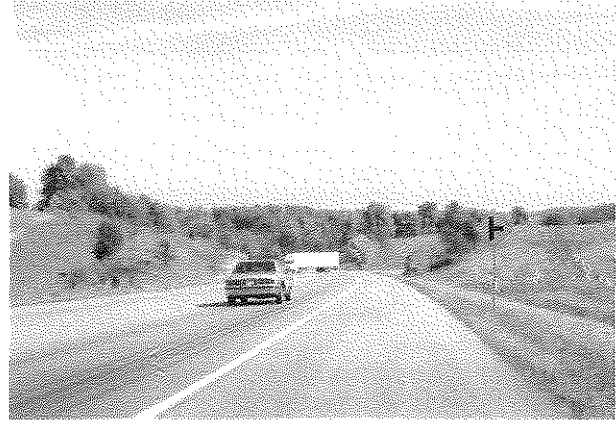


Figure 14: US 31E NB at Maxwell Drive

Offtracking is considered a problem where a truck cannot stay in its lane through a curve. No curvature data was available for KY 100, along Route One, in Simpson and Allen Counties. Therefore, visual observations were made and potential offtracking locations were listed. The approximate milepoints of the curves which are less than “preferred” are listed in Appendix B. The number of curves on each route rated “adequate” or “less than adequate” is shown in Table 5. Potential offtracking locations for US 31E were calculated from the degree of curvature and lane widths which were obtained from HIS data.

Table 5: Summary of Curvature Data

Route	Number of Curves with less than “preferred” Offtracking Ratings	
	“adequate”	“less than adequate”
US 31E to I-65 (Exit 6) - Western access	0	23
US 31E to I-65 (Exit 53) - Eastern access	3	14

Maxwell Drive is located at MP 11.040 on US 31E. This local roadway is the connector between US 31E and KY 3499. The length is approximately 0.5 mile and has a down grade approach to both intersections. The turning radii at the US 31E intersection are sufficiently wide enough to accommodate trucks turning in and out of Maxwell Drive. However, the turning radius (“adequate”) at the intersection of Maxwell Drive with KY 3499 appears to be restricted from evidence of offtracking in the corners as shown in Figure 15.

Turning radii did not appear to be a severe problem at the intersection of Dollar General Drive and KY 3499. Dollar General Drive is 22 feet wide and inclines up a hill from KY 3499.



Figure 15: KY 3499 at Maxwell Drive

3.5 Railroad Crossings

There are no at-grade railroad crossings along Route One on KY 100 in Allen and Simpson Counties. The only at-grade railroad crossing along Route Two in on US 31E in Glasgow approximately 0.7 miles from the intersection with KY 90. The single-track crossing is located at MP 14.2 and crosses the four-lane section of US 31E. The crossing has warning lights but no gates. The crossing surface is smooth and level and is rated “preferred”.

3.6 Bridges

The information regarding bridges on the truck access routes for this site is summarized in Tables 6 and 7 and the locations are shown in Figure 16. The sufficiency rating (provided by the KYTC’s Division of Operations) was used as follows: “preferred”: 80.0-100, “adequate”: 50.0-79.9, and “less than adequate”: 0.0-49.9. Of the five bridges on KY 100 in Simpson and Allen Counties, four were rated “adequate” and one was rated “preferred”. There are eight bridges on Route Two along US 31E in Allen County and US 31E, KY 90 and KY 70 in Barren County. Two were rated “preferred”, five were rated “adequate” and one was rated “less than adequate”. There are three bridges on US 31E in the vicinity of Barren River Lake that were being repaired at the time of the site visit and videotaping of the route. One of these bridges, B0007 at MP 19.112, had a very low sufficiency rating of 25.9.

Table 6: Bridge Sufficiency Ratings for Route One: US 31E to KY 100 to I-65

Route	County	Milepoint	Bridge No.	Sufficiency	Evaluation Rating
KY 100	Simpson	18.937	B0004	63.8	“adequate”
	Allen	3.968	B0016	74.0	“adequate”
		4.149	B0015	74.0	“adequate”
		9.181	B0014	70.5	“adequate”
US 31E	Allen	9.946	B0043	95.2	“preferred”

Table 7: Bridge Sufficiency Ratings for Route Two: US 31E to KY 90 to KY 70 to I-65

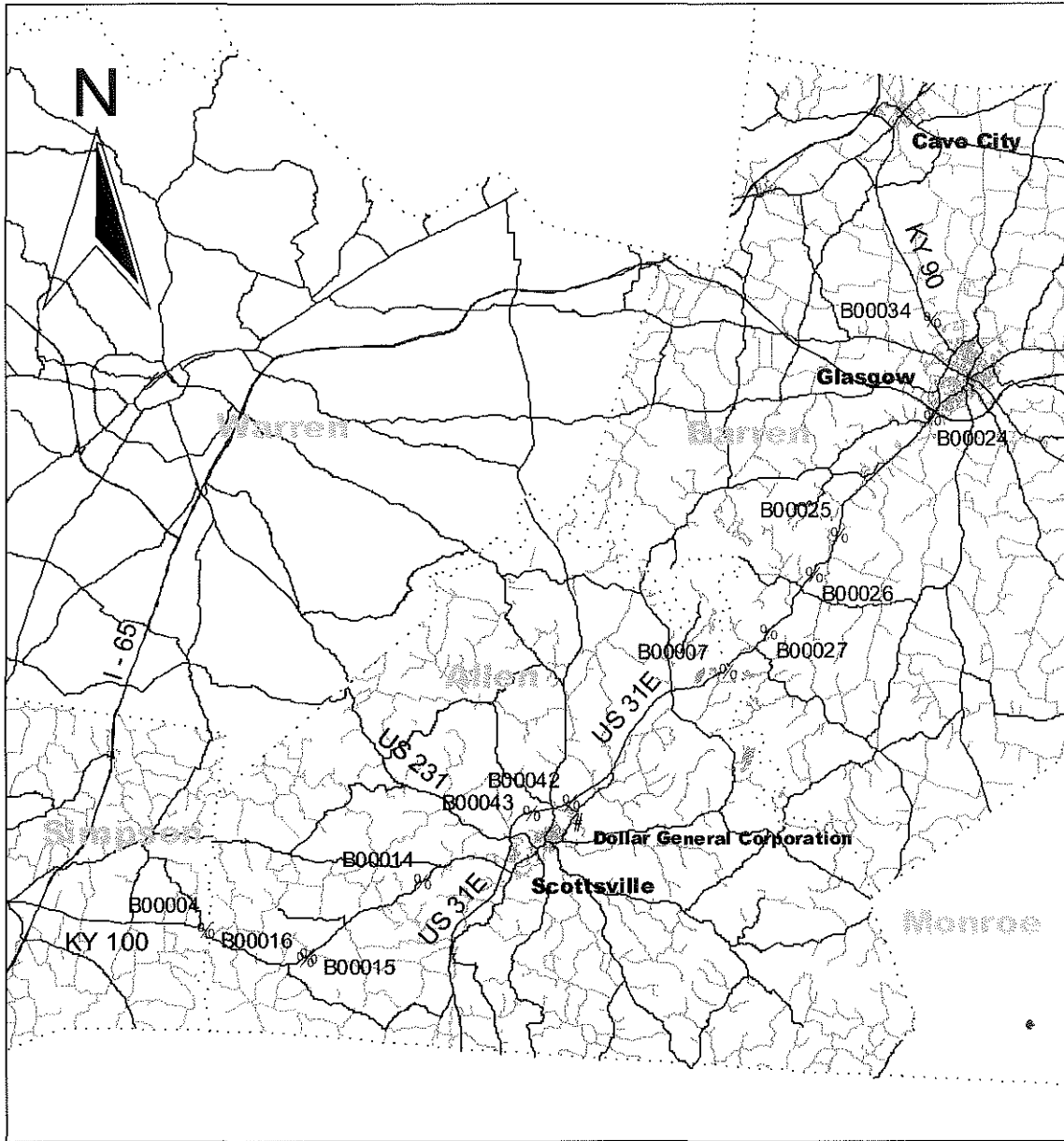
Route	County	Milepoint	Bridge	Sufficiency	Evaluation Rating
US 31E	Allen	11.311	B0042	94.2	“preferred”
		19.112	B0007*	25.9	“less than adequate”
	Barren	2.080	B0027*	62.7	“adequate”
		6.667	B0025*	57.8	“adequate”
		12.337	B0026	71.7	“adequate”
KY 90	Barren	12.338	B0024	77.0	“adequate”
		0.381	B0033	75.6	“adequate”
		8.347	B0034	92.7	“preferred”

*Repair in Progress

3.7 Sight Distance

No sight distance problems were noted on these routes.

Figure 16: Bridge Locations



LEGEND

Facility
 % B00000 Bridges

Scale - 1:350000

3 0 3 6 9 Miles

4 0 4 8 12 Kilometers

3.8 Other Route Features

The survey included mention of daily Amish horse-drawn carriage traffic along KY 100. Signs are present along the roadway to warn drivers of this possibility. A carriage was observed traveling along the shoulder on US 31E near KY 100 as shown in Figure 17. The video also revealed one traveling just after dusk with appropriate highway vehicle lighting.

Several signs are also present along KY 100 in Simpson County indicating that high water is possible.

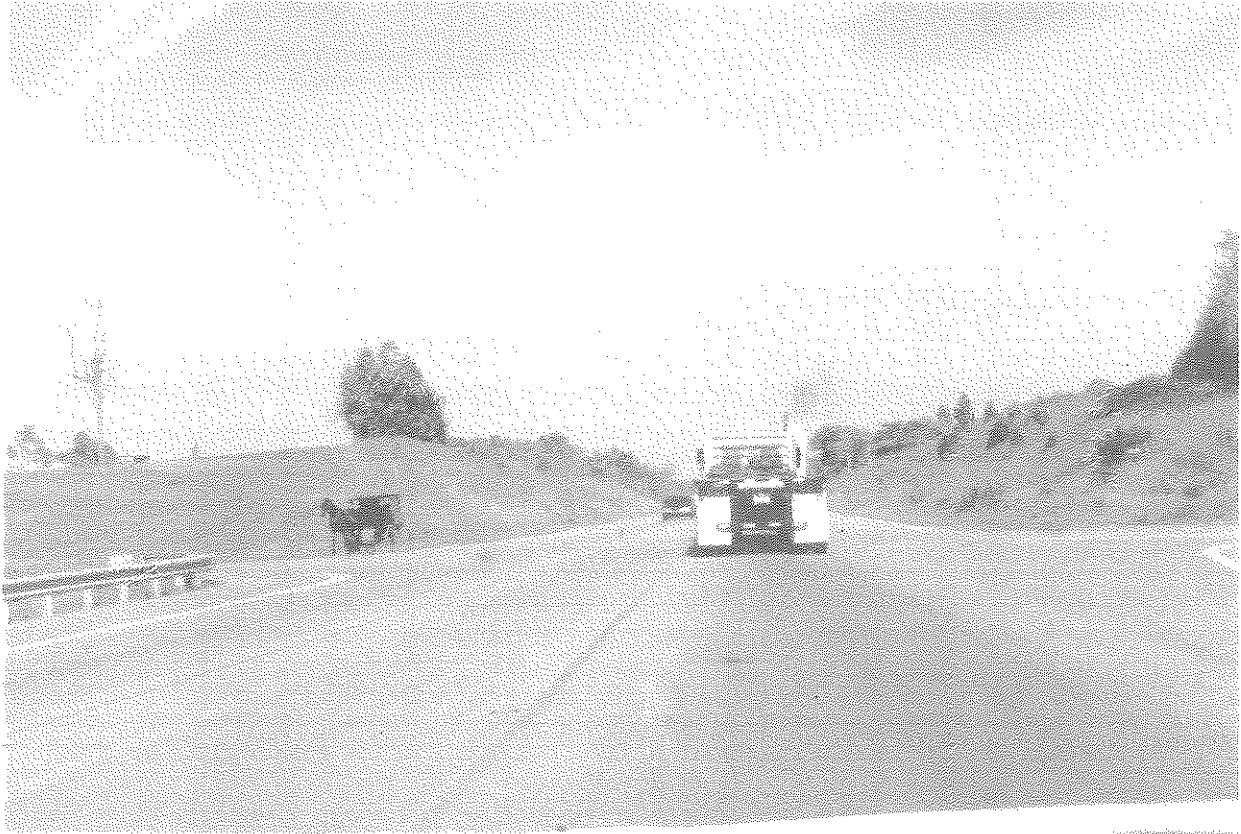


Figure 17: Horse-Drawn Carriage Traveling Along US 31E

4.0 Composite Route Evaluation and Recommendations

4.1 Problem Truck Miles and Truck Points

In order to compare different routes to consider the relative urgency of needed route improvements the features rated “preferred,” “adequate” and “less than adequate” along a route have been normalized for the number of miles, number of points and number of trucks using the route section. In the case of these Allen, Simpson, and Barren County routes, four features that were evaluated quantitatively have sections or points that are considered only “adequate” or “less than adequate”. A section or point that is considered “less than adequate” is weighted two times that of an “adequate” point or section. Less than “preferred” sections are weighted by length as well as the number of trucks passing that point. The number of trucks was obtained from 1998 KYTC Vehicle Classification Counts.

Tables 8 and 9 contain the total problem truck miles and total problem points for lane and shoulder widths, offtracking, and bridges which apply to these routes. The rating of these routes relative to others evaluated will be reported in the final report.

Table 8: Summary of Problem Truck Miles and Problem Truck Points for Route One (US 31 to KY 100 to I-65)

Feature	Road	County	Location	Points*	Length (miles)	Trucks (/day)	Truck- points	Truck- miles
Lane Width	KY 3499	Allen	MP 0.8-1.0	2	0.2	495		198
	KY 100	Allen	MP 0.0-12.7	2	12.7	300		7,620
	KY 100	Simpson	MP 12.9-19.0	2	6.1	405		4,941
Total								12,759
Shoulder Width	KY 3499	Allen	MP 0.8-1.0	2	0.2	495		198
	Maxwell Dr.	Allen	Length	2	0.5	395		395
	KY 100	Allen	MP 0.0-12.7	2	12.7	300		7,620
	KY 100	Simpson	MP 12.9-19.0	2	6.1	405		4,941
Total								13,154
Offtracking		See Table B 1						8,843
Bridge Ratings	KY 100	Allen	MP 3.968	1		370	370	
	KY 100	Allen	MP 4.149	1		370	370	
	KY 100	Allen	MP 9.181	1		305	305	
	KY 100	Simpson	MP 18.937	1		340	340	
Total								1,385

*1 point for “adequate” features and 2 points for “less than adequate” features (0 points for “preferred” features not shown)

Table 9: Summary of Problem Truck Miles and Problem Truck Points for Route Two (US 31E to KY 90 to KY 70 to I-65)

Feature	Road	County	Location	Points*	Length (miles)	Trucks (/day)	Truck-points	Truck-miles
Lane Width	KY 3499	Allen	MP 0.8-1.0	2	0.2	495		198
Total								198
Shoulder Width	KY 3499	Allen	MP 0.8-1.0	2	0.2	495		198
	US 31E	Barren	MP 0.0-1.2	2	1.2	335		804
	US 31E	Barren	MP 1.2-4.2	2	2.0	365		1,460
	US 31E	Barren	MP 4.2-10.0	2	5.8	260		3,016
	US 31E	Barren	MP 10.0-11.2	2	1.2	530		1,272
	US 31E	Barren	MP 11.2-11.9	2	0.7	615		861
	US 31E	Barren	MP 11.9-12.2	2	0.3	640		384
(Curbed)	US 31E	Barren	MP 13.0-14.8	2	1.8	1,130		4,068
(Curbed)	KY 90	Barren	MP 9.4-9.9	2	0.5	860		860
Total								12,923
Offtracking		See Table B2						10,059
Bridge Ratings	US 31E	Allen	MP 19.112	2		335	670	
	US 31E	Barren	MP 2.080	1		365	365	
	US 31E	Barren	MP 6.667	1		260	260	
	US 31E	Barren	MP 12.337	1		640	640	
	US 31E	Barren	MP 12.338	1		640	640	
	KY 90	Barren	MP 0.381	1		75	75	
Total								2,650

1 point for "adequate" features and 2 points for "less than adequate" features (0 points for "preferred" features not shown)

4.2 Maintenance Improvement Locations

No additional routine maintenance is indicated along the routes.

4.3 Overall Route Rating

In order to account for both the subjectively and objectively evaluated route features along truck routes throughout the state, a panel of UK engineers who studied the route and its features (either during a site visit or by viewing a video of trucks using the routes) scored the overall access on a scale of 1 through 10. The interpretation for these ratings is shown in Table 10.

Route One on US 31E in Allen County and KY 100 in Allen and Simpson Counties connecting the facility and I-65 near Franklin was given an overall rating of 6 indicating that minor improvements could improve this route. The 10-foot lane widths, lack of adequate shoulders, and the curvy and hilly roadway on KY 100 in Simpson and Allen counties contributed to the reduced rating.

Route Two follows US 31E in Allen and Barren Counties and KY 90 and KY 70 in Barren County to I-65 at Cave City. This route was given an overall rating of 8 indicating that minor improvements could improve this route. US 31E has a stretch of “less than adequate” shoulders in Barren County, which could suffice in an emergency but do not provide the necessary surface for normal use without creating a hazard. The presence of bridge rehabilitation on three consecutive bridges near on US 31E will continue to affect traffic flow during the construction period. Traffic is reduced to a signal controlled one lane. However, this is obviously temporary and does not affect the overall route rating.

Table 10: Interpretation of the Overall Route Rating

Overall Route Rating	Qualitative Interpretation of Rating
1	Trucks should not be using this route
2	Major construction is required to improve this route
3 to 5	Minor improvements are <u>required</u> on this route
6 to 8	Minor improvements could <u>improve</u> this route
9	Minor problems exist that do not seriously impede truck access
10	Trucks are served with reasonable access

4.4 Conclusions and Recommendations

In conclusion, the following problems were identified along the truck access routes to the Dollar General Corporation Site.

- 10-foot lane widths on KY 100 in Allen County;
- 9-foot lane widths on KY 3499;
- Narrow shoulder widths on KY 100 and KY 3499 in Allen County;
- Narrow shoulder widths on US 31E in Barren County;
- Curbed shoulders on US 31E near Glasgow;
- Less than “preferred” bridge sufficiency ratings on all routes; and
- Accident histories along sections of KY 100, US 31E and KY 90.

In order to correct the surface width problems along these routes, complete reconstruction would be necessary. However, the problems associated with lane and shoulder widths are not believed to be severe enough at this time to warrant such action. If truck volumes were to increase, the need to correct the less than “preferred” features present on some route would become more of a priority. Curbed shoulders are located in an urban area along a section of US 31E with four lanes and 45 mph speed limits. Any corrective action would not be warranted other than to insure a two to three meter clear zone is maintained from the edge of the traveled roadway.

Appendix A: Phone Surveys Conducted with Facilities

PHONE SURVEY RESULTS

<u>Facility ID</u>	<u>Facility Name</u>	<u>Location / City</u>	<u>County</u>	<u>ADD</u>
2655	DOLLAR GENERAL	SCOTTSDALE	ALLEN	BARREN RIVER

<u>Contact Name</u>	<u>Title</u>	<u>Phone</u>	<u>Fax</u>
MARK SPENCER	TRAFFIC SUPERVISOR	502-237-5444	502-237-5642

1. Is the location of your facility on the map correct? YES
2. Our information shows about 100 trucks per day access your facility. Is that correct?
If not, fill in correct volume. YES
3. Is the truck traffic to and from your facility seasonal or mostly constant?
CONSTANT
4. *(If truck traffic is seasonal)* Is the trucks/day for the peak season?
5. What is the most common size truck operating at your facility? SEMI TRAILER
6. What is the largest truck operating at your facility? SEMI TRAILER
7. What type of freight or commodity is shipped, and is incoming and outgoing freight different?
(one may be an empty truck)
RETAIL COMMODITY
8. Does the truck traffic peak at specific times of the day? (e.g., out in the morning and return in the afternoon) DEDICATED FLEET HEAVIER AFTERNOON OTHER CARRIERS 4 - 9
9. What traffic congestion and delay problems along the routes are you aware of, or feel need improvement?
Location (route segment, intersection, etc.) Time and Day of Week
NONE
10. Where do trucks at your facility go to and come from? (This may be an interstate, cities, general direction-N,S,E,W) 6 STATES , ½ HWY 100 TO I-65 AND ½ N US 31E TO KY 90 TO I-65
11. Do you have any other problems or concerns along the route you would like us to consider?
KY 101 NARROW AND LOW SHOULDERS
KY100 HORSE/ BUGGY TRAFFIC DAILY
12. Would you like a copy of the final report (roadway/route evaluation ???)
YES

NOTES/COMMENTS:

TURNING RADIUS TOO TIGHT AT INTERSECTION OF MAXWELL AND US 31E BYPASS

Appendix B: Curvature Data

Table B1. Potential Offtracking Locations for Route One (US 31E to KY 100 to I-65)

County	Route	Location	Points	Trucks/Day	Truck-Points
Simpson	KY 100	MP 13.7	1	505	505
Simpson	KY 100	MP 14.2	2	505	1010
Simpson	KY 100	MP 15.9	1	505	505
Simpson	KY 100	MP 16.7	1	340	340
Simpson	KY 100	MP 17.3	2	340	680
Simpson	KY 100	MP 18.2	1	340	340
Allen	KY 100	MP 0.2	2	160	320
Allen	KY 100	MP 0.3	1	160	160
Allen	KY 100	MP 1.2	2	160	320
Allen	KY 100	MP 1.6	2	160	320
Allen	KY 100	MP 2.3	2	160	320
Allen	KY 100	MP 2.5	1	160	160
Allen	KY 100	MP 2.9	2	160	320
Allen	KY 100	MP 3.3	2	175	350
Allen	KY 100	MP 4.5	2	175	350
Allen	KY 100	MP 7.1	2	145	290
Allen	KY 100	MP 7.7	1	145	145
Allen	KY 100	MP 8.4	2	145	290
Allen	KY 100	MP 9.0	2	145	290
Allen	KY 100	MP 9.5	2	145	290
Allen	KY 100	MP 9.7	2	145	290
Allen	KY 100	MP 10.2	2	145	290
Allen	KY 100	MP 10.4	2	250	500
Allen	KY 100	MP 10.8	2	250	500
Total					8,885

Table B2. Offtracking Locations for Route Two (US 31E to KY 90 to KY 70 to I-65)

County	Route	Location	Points	Trucks/Day	Truck-Points
Allen	US 31E	MP 18.3	1	335	335
Barren	US 31E	MP 0.6	2	335	670
Barren	US 31E	MP 0.9	2	335	670
Barren	US 31E	MP 1.4	2	365	730
Barren	US 31E	MP 1.6	2	365	730
Barren	US 31E	MP 1.9	2	365	730
Barren	US 31E	MP 2.7	2	365	730
Barren	US 31E	MP 2.9	2	365	730
Barren	US 31E	MP 3.5	2	365	730
Barren	US 31E	MP 4.7	2	260	520
Barren	US 31E	MP 5.0	2	260	520
Barren	US 31E	MP 5.4	2	260	520
Barren	US 31E	MP 6.2	2	260	520
Barren	US 31E	MP 6.4	2	260	520
Barren	US 31E	MP 7.5	2	260	520
Barren	US 31E	MP 8.7	1	260	260
Barren	US 31E	MP 11.3	1	615	615
Total					10,050