

TRUCK ROUTE ACCESS EVALUATION

Willamette Industries
Hancock County
Site #2659

Report No. KTC-99-13

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

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1.0 Introduction

The Freight Movement and Intermodal Access in Kentucky Study (SPR 98-189), undertaken by the Kentucky Transportation Center (KTC) on behalf of the Kentucky Transportation Cabinet (KYTC), has two main objectives. These objectives include 1) the evaluation of 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 one facility located in Hancock County in the Green River Area Development District (ADD) and KYTC (Kentucky Transportation Cabinet) Highway District #2. 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.

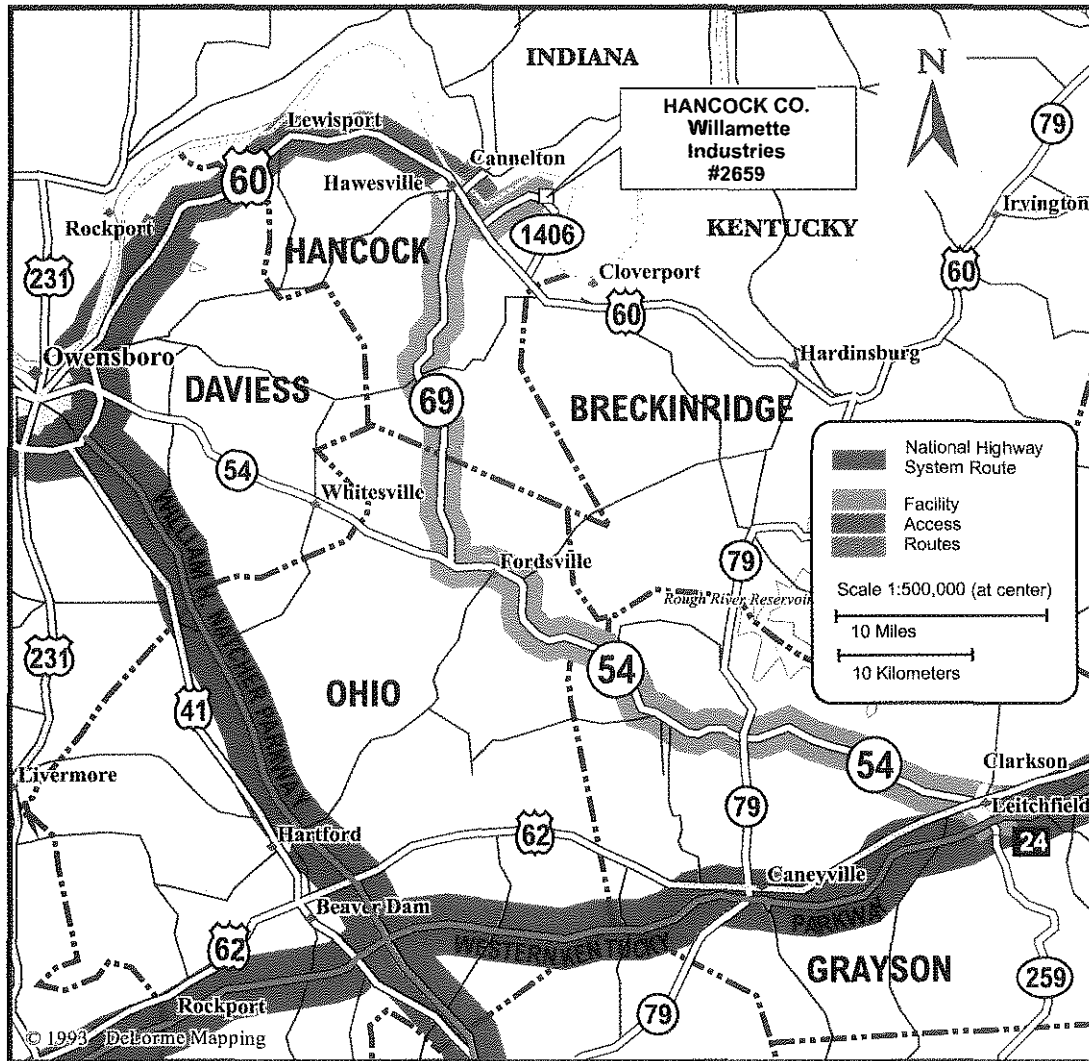
The sites to be evaluated were selected from two existing databases (a truck facility survey from 1994 and the intermodal facility inventory) based on ADD and KYTC planner recommendations, geographic location, distance to the NHS, and the number of trucks accessing the site. Consideration was also made for the freight type handled and transportation modes used.

The facility for study is Willamette Industries east of Hawesville, and the initial trip to the site revealed that there were no other significant sources of truck traffic in the vicinity. The site was visited for videotaping on July 6, 1998 and the site visit for data collection was on August 14, 1998. Early into the study process, phone surveys were conducted so that the facility manager could identify the truck routes and access problems. The phone survey completed for the facility, which is located in Appendix A, found that approximately 200 trucks per day (400 one-way trips) are accessing the facility. The most common size truck is a 48-foot semi-trailer.

2.0 Truck Routes in Use

There are three routes used for access to the NHS. The first route (south route) takes trucks from the facility on Skillman Road south on KY 1406 to US 60. From there, trucks proceed west on US 60 to the intersection with KY 69 just south of Hawesville. KY 69, a rural, two-lane road is traveled to the intersection of KY 54 (in Ohio County), another rural, two-lane roadway. Trucks then proceed east on KY 54 through the small town of Fordsville and into Grayson County until they reach KY 259 in Leitchfield. Trucks then turn south onto KY 259 and proceed to the Western Kentucky Parkway which is the NHS. With the exception of KY 54 from milepost 0 – 16.65 in Grayson County, all sections of this route are in the AAA weight class and can carry 80,000 pound loads (Grayson County's KY 54 to milepost 16.65 is in the A weight class with 44,000 pound gross weight loads). Traffic signals control the intersections of KY 259 and US 62 and KY 259 and East Shain Drive (both in Leitchfield). Caution lights are found at the intersections of KY 54 and KY 79 (in Grayson County west of Leitchfield) and KY 54 and KY 69 (in Ohio County). The south route is approximately 54.4 miles in length. This route would be in STAA violation for 53-foot long, 102-inch wide trucks.

Figure 1: Location of Truck Generating Site (Hawesville, KY)



The second route (west route) has trucks leaving the facility on Skillman Road via KY 1406 south and proceeding west on US 60. The route extends through Hancock County on US 60 and becomes the NHS at milepost 22.82 in Daviess County, northeast of Owensboro at the new Maceo bridge (over the Ohio River) connector. The west route is approximately 21.1 miles in length. US 60 from KY 69 in Hancock County west is part of the NTN.

The third route (north route) takes trucks from the facility via Skillman Road and US 60 west to its intersection with KY 69, just south of Hawesville. The route then turns north and continues on KY 69 to the Ohio River bridge (Bob Cummings Lincoln Trail Bridge) in Hawesville to Indiana. Although this route does not terminate at the NHS, the

evaluation only included Kentucky routes and therefore ends at the Indiana border. Traffic control occurs at the intersections of US 60 and KY 69 and at KY 69 and KY 334. Total route length is 6.2 miles.

The average daily traffic (ADT) volumes were extracted from the HIS database for all route segments. Table 1 contains the range of ADT's (as well as the year each KYTC traffic count was conducted) for each route segment. In cases where the route segment had only one ADT listed, the value was included in the "highest" column.

Table 1: Average Daily Traffic (ADT) along Each Route

County	Road	Milepoints	Average Daily Traffic (ADT)			
			Lowest	Year	Highest	Year
West Route						
Hancock	KY 1406	0 - 1.575			3,045	1998
	US 60	0 - 14.06	5,127	1998	10,520	1997
Daviess	US 60	22.82 - 28.288	8,752	1998	10,222	1999
North Route						
Hancock	KY 1406	0 - 1.575			3,045	1998
	US 60	10.24 - 14.06	5,127	1998	10,520	1997
	KY 69	13.08 - 13.92	6,679	1993	9,037	1996
South Route						
Hancock	KY 1406	0 - 1.575			3,045	1998
	US 60	11.78 - 14.06	5,127	1998	10,520	1997
	KY 69	0 - 13.08	806	1993	2,230	1995
Ohio	KY 69	31.623 - 37.339	996	1995	2,961	1995
	KY 54	6.018 - 18.244	615	1996	5,424	1993
Grayson	KY 54	0 - 18.466	615	1996	6,908	1996
	KY 259	12.116 - 12.954	4,770	1996	18,500	1996
	US 62	20.787 - 20.973			20,234	1996

3.0 Route Data Collection and Evaluation

The route features that are to be evaluated in this study are shown in Table 2 along with a brief description of the evaluation method. While some of these features required 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 the site indicated some possible congestion problems may exist along US 60 near Hawesville. However, the site visit did not reveal any traffic-related problems. The site visit was during the AM peak period of travel and there was only minimal traffic along the route. Traffic counts were not required for this evaluation as no specific intersection was discussed in the phone survey. Thus the route is assumed to operate at an acceptable level of service.

3.2 Accidents

In 1997 the Kentucky Transportation Center studied all the 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). There are two sections of the south truck route with an accident rate higher than the critical rate for the highway type. KY 69 between milepoints 1.9 and 2.1 in Hancock County (just north of the Ohio County line) had a critical rate factor (CRF) of 1.15 and KY 54 between milepoints 8.6 and 8.9 in Ohio County had a CRF of 1.51, where the CRF is the ratio of the actual accident rate to the critical accident rate. These values indicate that the number of accidents involving trucks on both sections is a problem.

Figure 2 shows the locations of accidents during the years 1995, 1996, and 1997. A summary of the accidents along all three truck routes (for all roads, not just state-maintained roads) is shown in Tables 3 through 5 for the same three-year period. The 12.4 percent of accidents involving trucks on the south route is slightly higher than the percentage of trucks found on KY 69 in Ohio County (11.7%). However, it is much higher than the 7.8, 6.1, and 7.1 percentage of trucks on KY 54 in Ohio and Grayson Counties and KY 259 in Grayson County, respectively. The west route had 13.7 percent of the total accidents involving trucks while US 60's traffic composition was made up of only 10.5 percent trucks. The north route had only 3.4 percent of its accidents involving trucks. Thus, there are accident-related concerns for both the south and west routes.

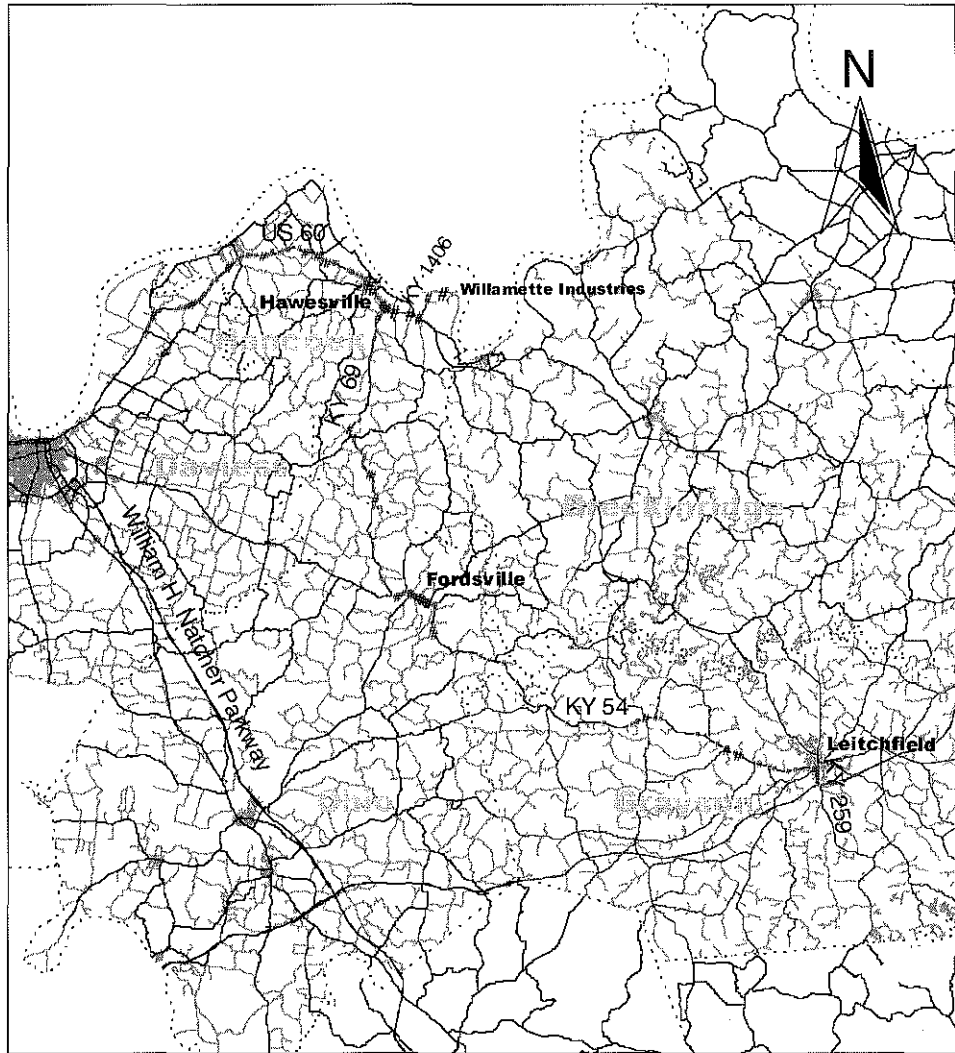
Table 3: Accident Types along South Truck Route

	<i>Non-Truck Accidents</i>	<i>Truck Accidents</i>	<i>Percent Trucks</i>
Total	205	29	12.4
Fatal Accidents	3	1	25.0
Injury	92	8	8.0
Intersection	40	2	4.8

Table 4: Accident Types along West Truck Route

	<i>Non-Truck Accidents</i>	<i>Truck Accidents</i>	<i>Percent Trucks</i>
Total	157	25	13.7
Fatal Accidents	0	1	100.0
Injury	69	11	13.8
Intersection	44	4	8.3

Figure 2: Accident Locations (1995 - 1997)



LEGEND

- # Facility
- # Accidents: 1-2
- # Accidents: 3-5
- # Accidents: 6-9

Scale - 1:500000

5 0 5 10 15 Miles

10 0 10 20 Kilometers

Table 5: Accident Types along North Truck Route

	<i>Non-Truck Accidents</i>	<i>Truck Accidents</i>	<i>Percent Trucks</i>
Total	27	1	3.6
Fatal Accidents	0	0	0.0
Injury	8	0	0.0
Intersection	9	1	10.0

3.3 Cross Section Features

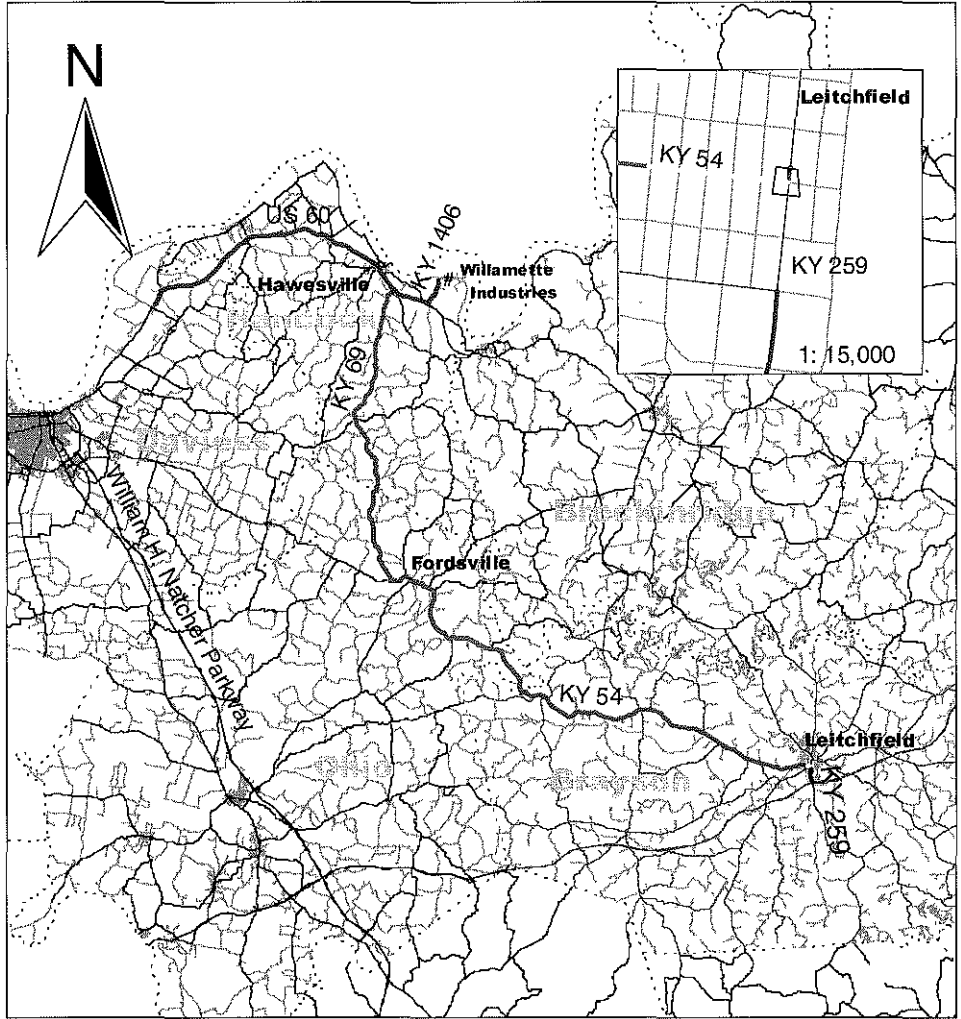
Figures 3 and 4 illustrate the sections of the route with different lane widths and shoulder types, respectively. Tables B1 and B2 of Appendix B include all route sections with only “adequate” or “less than adequate” lane and shoulder widths (respectively) separated into the south, west, and north routes. Portions of the south route (north and south of Fordsville) have only nine-foot lanes. The remainder of the south route has 10-foot lanes, with the exception of the Leitchfield area which has mostly 12-foot lanes. The north and west routes are composed of no less than “adequate” 11-foot lanes. Shoulders are varied along the routes. The majority of the south route has “less than adequate” two- to four-foot turf shoulders while the north and south routes have a combination of “preferred” 10-foot paved shoulders, “adequate” 10-foot turf and/or gravel shoulders, or “less than adequate” turf shoulders.

One notable feature of the west route is the lane narrowing on westbound US 60 occurring near milepoint 8.7 in Hancock County. When US 60 was redesigned for four lanes (with median separation), the existing US 60 was utilized for two travel lanes by replacing the yellow center stripe with a white centerline. This resulted in two nine-foot lanes with only two- to four-feet of turf shoulder along a short (approximately 0.5 miles) section of the route.

3.4 Curvature Features

Curve safe speed along this route was tested by the use of the ball-bank indicator. By maintaining the posted speed limits and advisory speeds through curves, the ball-bank indicator allows for the determination of whether or not the curve should be driven at indicated speeds. Only two curves on the south route resulted in “less than adequate” results from the ball-bank test. Both curves lie on KY 69 in Hancock County. The first begins at milepoint 7.4 and the second at milepoint 11.0 (both approximated). Both curves had no advisory speeds posted and thus were driven at 55 miles-per-hour with ball bank readings of greater than 10°, which is “less than adequate”.

Figure 3: Lane Widths



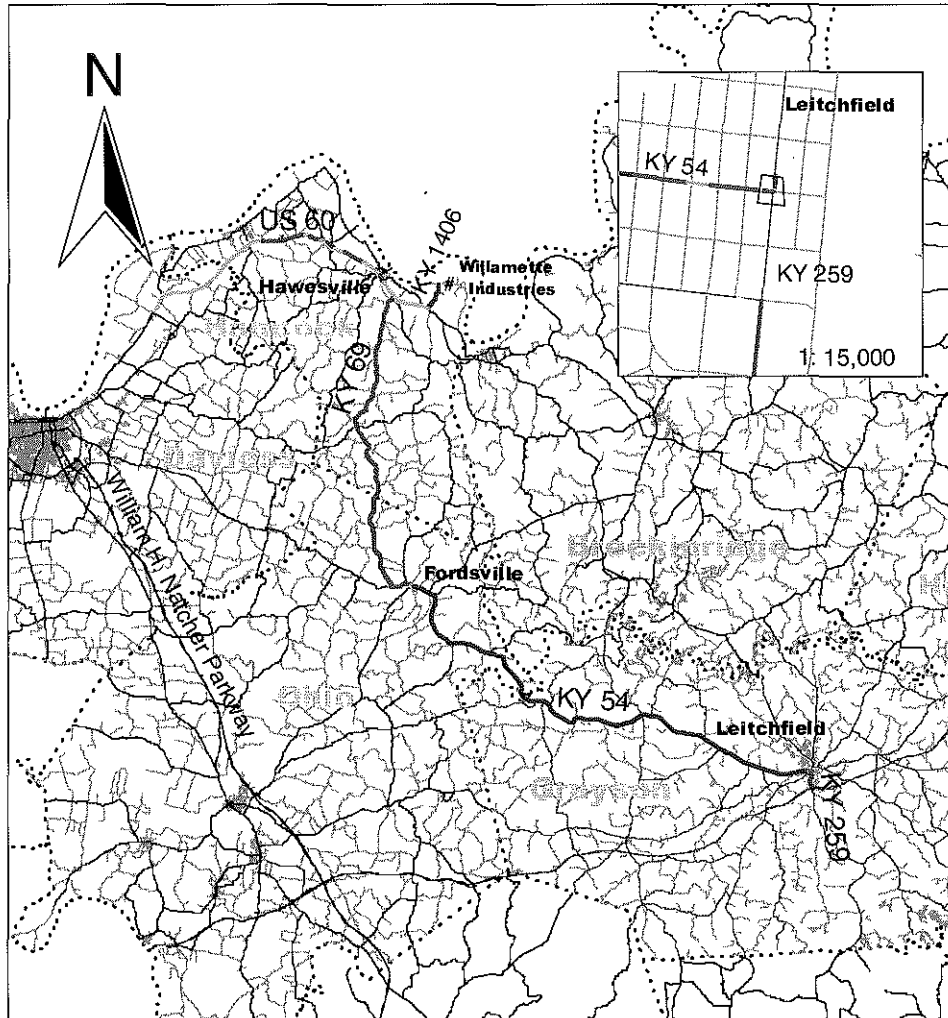
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#	Facility
—	Lane Width: 9 Feet
==	Lane Width: 10 Feet
===	Lane Width: 11 Feet
====	Lane Width: 12 Feet
=====	Lane Width: 14 Feet

Scale - 1:500000



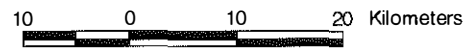
Figure 4: Shoulders



LEGEND

#	Facility
—	Shoulder Width: 0-1 Foot
—	Shoulder Width: 2 Feet
—	Shoulder Width: 3 Feet
—	Shoulder Width: 4 Feet
—	Shoulder Width: 6-12 Feet

Scale - 1:500000

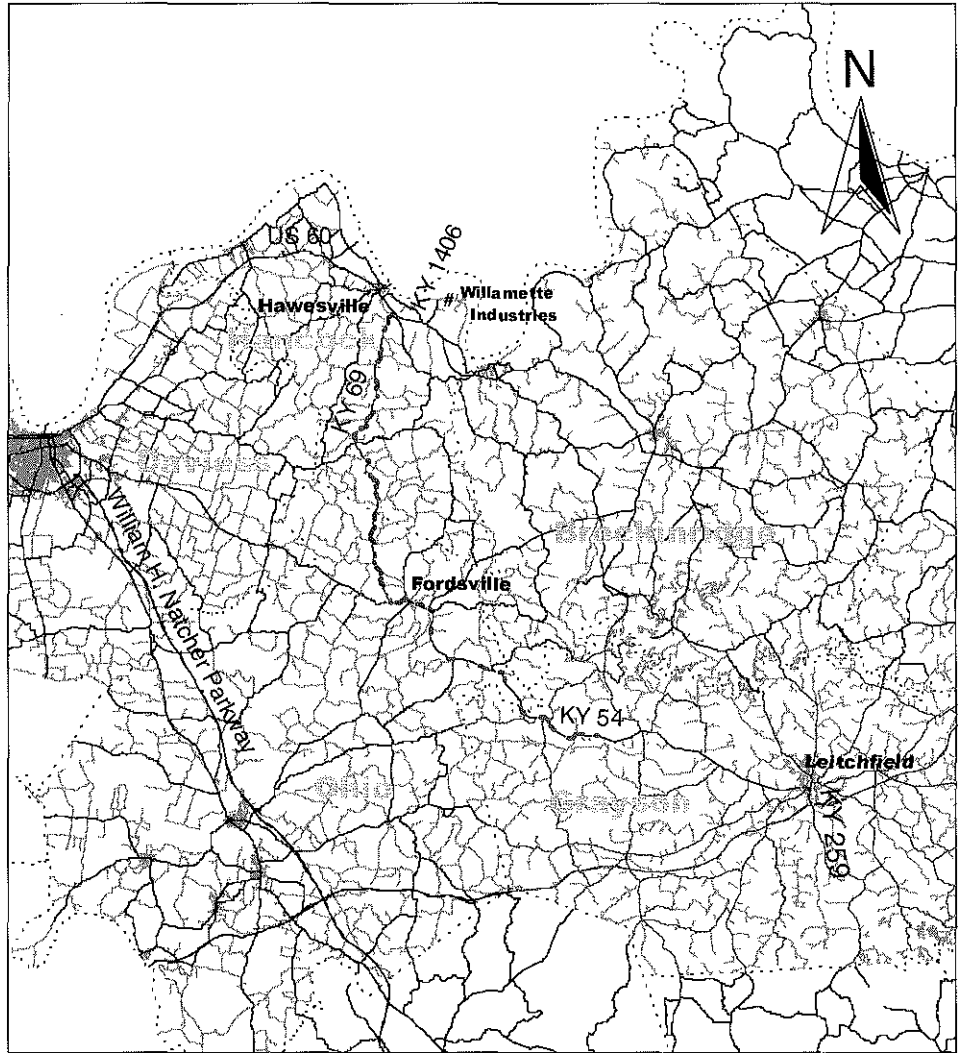


Offtracking is considered a problem where a truck cannot stay in its lane through a curve. Figure 5 shows the locations of all less than “preferred” curves. Table B3 in Appendix B contains curves where offtracking is problematic for trucks. Horizontal curvature found to be less than “preferred” is included for all three routes.



A grade is considered problematic if it causes trucks to slow excessively. Route sections found to have less than “preferred” grades are shown in Figure 6. These are also included in Table B4 of Appendix 5 for the three routes. The majority of these grades are found along the south route as the west route is relatively flat and the north route has only one serious grade.

Two turning radii were suspected of being less than “preferred” for truck use and therefore required field measurements. The first is on the south route at the intersection of KY 69 and KY 54 in Ohio County, as illustrated in Figure 7. Trucks turning right onto northbound KY 69 from KY 54 have only a 45-foot turning radius available. While no semi-trailers were present during the site visit, single unit trucks were witnessed encroaching into the opposing traffic lanes while making the turn. Thus, this radius is considered “less than adequate”. The second radius is on the north route at the signalized intersection of KY 69 and KY 334 in Hawesville, shown in Figure 8. Due to improperly parked vehicles in the vicinity of the intersection during the data collection site visit, this radius could not be properly measured. However, especially with automobiles parked in proximity to the intersection, trucks were observed waiting for the southbound left turning lane from KY 69 onto KY 69 south to clear so that they could safely make the turning maneuver. Thus, this radius was considered “less than adequate”.

Figure 5: Curves where Offtracking Could Occur



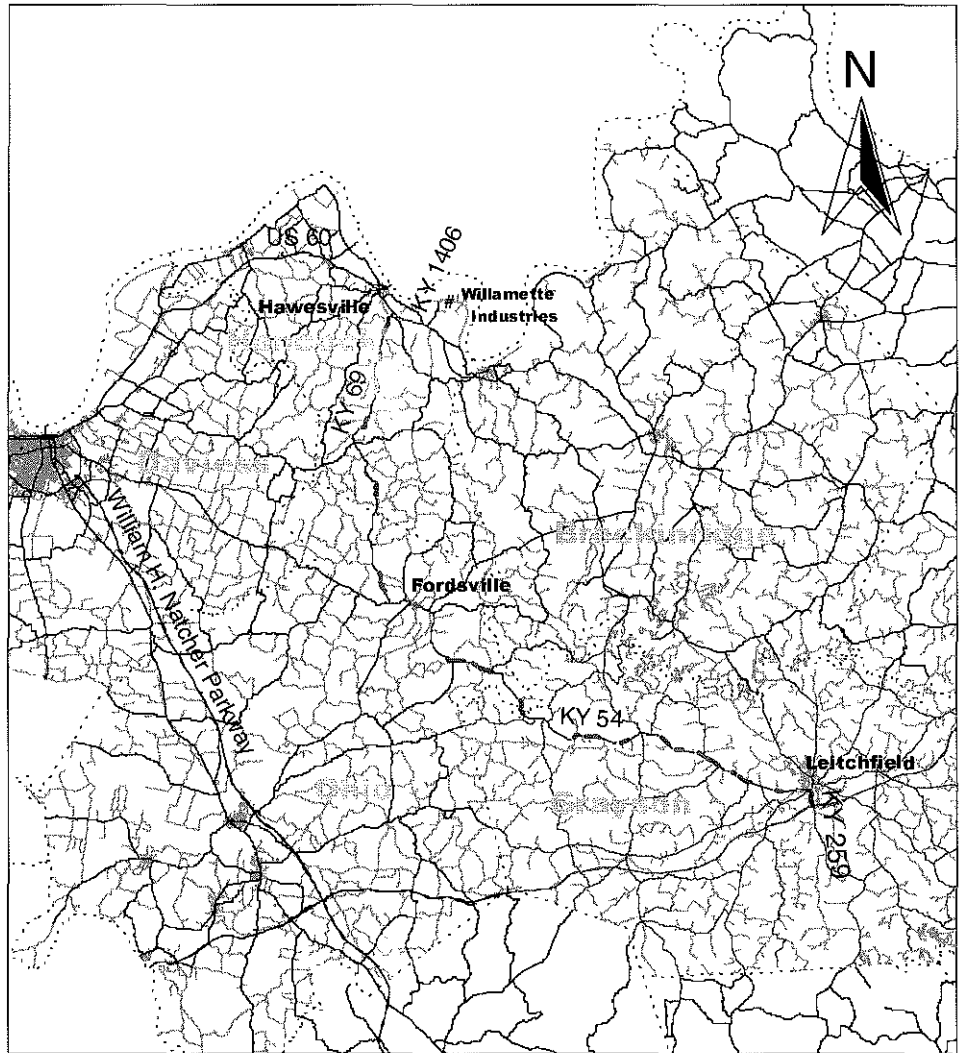
LEGEND

#	Facility
	Offtracking: Adequate
	Offtracking: Less than Adequate

Scale - 1:500000



Figure 6: Grades



LEGEND

#	Facility
—	Grade: Adequate
—	Grade: Less than Adequate
—	Freight Access Route

Scale - 1:500000

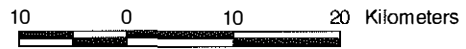


Figure 7: Intersection of KY 54 and KY 69 in Ohio County

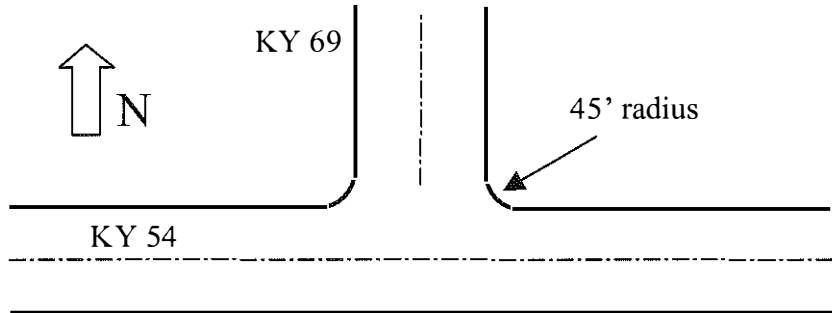
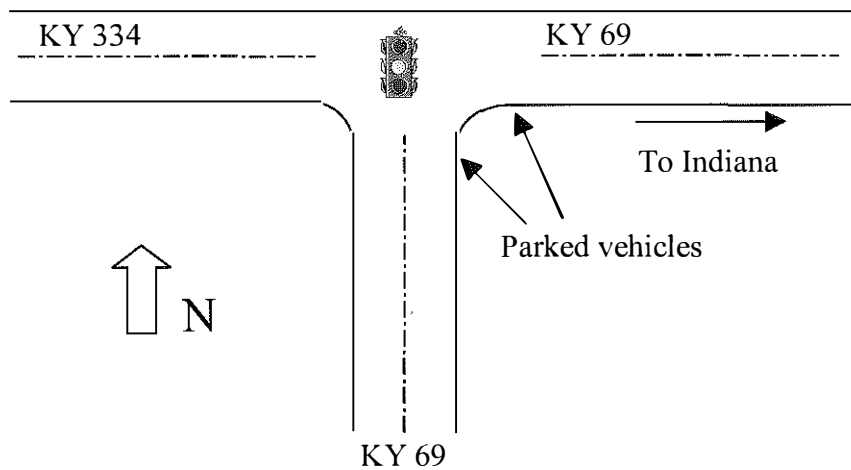


Figure 8: Intersection of KY 69 and KY 334 in Hawesville



3.5 Railroad Crossings

There is one at-grade railroad crossing along the south route. This crossing is located at milepost 18.06 on KY 54, approximately 0.25 miles west of the town square in Leitchfield. This crossing has signs indicating rough pavement conditions (from both the east and west approaches), as illustrated in Figure 9. Warning lights are present, but there are no gates to prevent vehicles from attempting to cross the tracks while trains are in the vicinity. There is ample sight distance available. With the rough pavement conditions being the only problem present, this crossing is rated as “preferred” for the purposes of this study.

Figure 9: Rough Crossing on KY 54 West of Leitchfield



3.6 Bridges

There are numerous bridges along each route, as illustrated in Figures 10 (north and west routes) and 11 (south route). The Kentucky Transportation Cabinet's Division of Operations maintains a database of bridge sufficiency ratings that are based on the serviceability (as well as other factors) of the structure. Bridges were evaluated as "preferred", "adequate", or "less than adequate" using the sufficiency rating. Table B5 in Appendix B contains the ratings for all bridges found along the routes that are considered to be less than "preferred". The south route has twelve bridges that are considered "adequate". The north and west routes each have one "less than adequate" bridge.

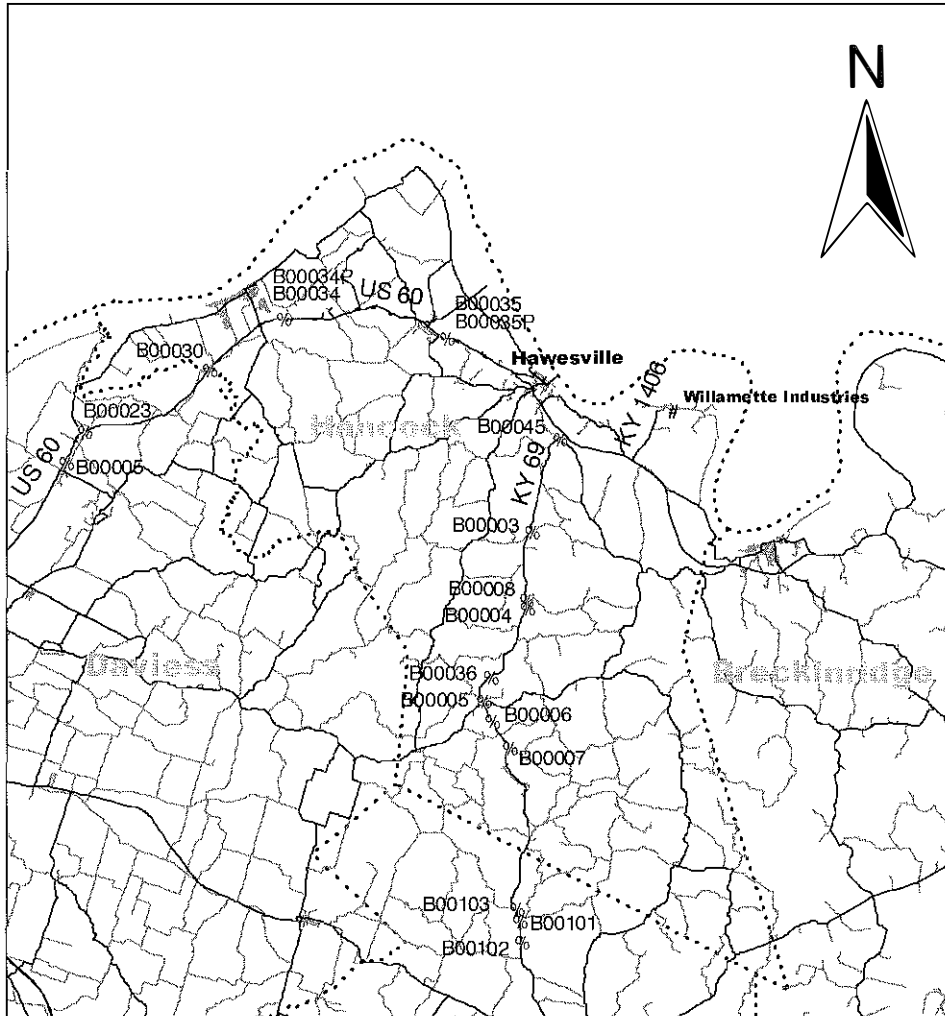
3.7 Sight Distance

No sight distance problems were noted along the routes.

3.8 Other Route Features

The Western Kentucky Parkway interchange in Leitchfield poses some problems for trucks. The deceleration lanes on the Western Kentucky Parkway are relatively short, which is problematic for all vehicles. However, the problem is especially evident for trucks. In addition, trucks turning from the exit ramps were observed offtracking into opposing lanes of KY 259 as seen in Figure 12. While the trucks were capable of making the turn without offtracking (thus, no problem truck-points were given to the turning radii), the majority did encroach into opposing lanes.

Figure 10: Bridges along North and West Routes



LEGEND

#	Facility
% B00000	Bridges

Scale - 1:240000

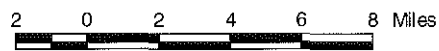
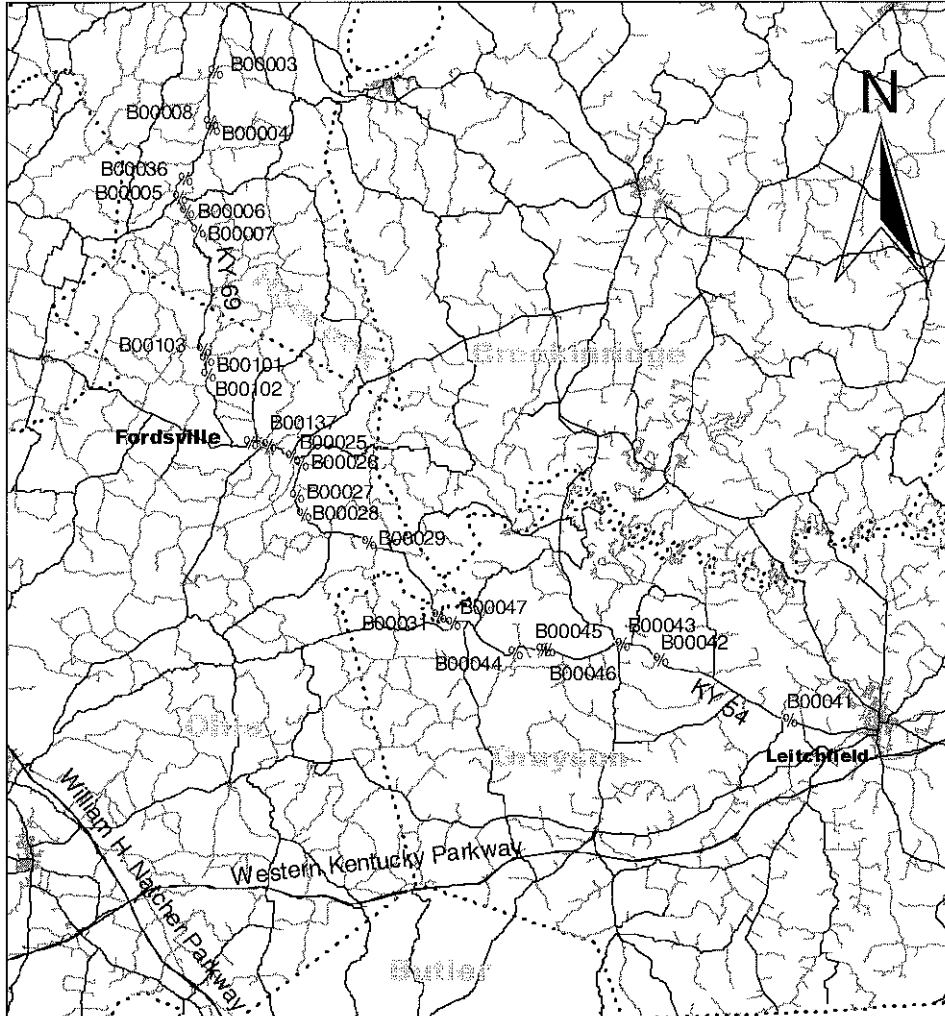


Figure 11: Bridges along South Route



LEGEND

#	Facility
% B00000	Bridges

Scale - 1:325000

4 0 4 8 Miles



4 0 4 8 12 Kilometers



Figure 12: Truck Turning from Western KY Parkway onto KY 259 Northbound



Another problematic feature of the south route is the town square in Leitchfield, as shown in Figures 13 and 14. Since there is no traffic signal control from any of the four approaches which meet at the square, there is some confusion for trucks trying to enter onto KY 54 westbound. Trucks must first turn right from US 62, circle around the square, and then turn right onto KY 54. The entire square has automobile parking available for retail establishments along the outside which also causes problems for trucks trying to travel around the square.

Figure 13: Town Square in Leitchfield (KY 54 approach eastbound)



Figure 14: Town Square in Leitchfield (looking towards KY 54 approach from north)



4.0 Complete 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 are to be normalized for the number of miles, number of points, and number of trucks using the section. In the case of these Hancock County truck routes, a total of 7 features (lane widths, shoulder widths, curvature – both horizontal and vertical, safe curve speeds, bridges, and turning radii) were found to be less than “preferred” on portions of the 3 routes. 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 weighed by length as well as the number of trucks passing that point.

Table 6 contains the compiled total problem truck miles and total problem points (from Tables B1 through B5 in Appendix B) for all less than “preferred” features along the south, west, and north routes, respectively. Truck counts were conducted for the KYTC Division of Planning in the summer of 1998 for the majority of the roads. The rating of these routes relative to others evaluated will be reported in the final report.

Table 6: Summary of Problem Truck Miles and Truck Points for Each Route

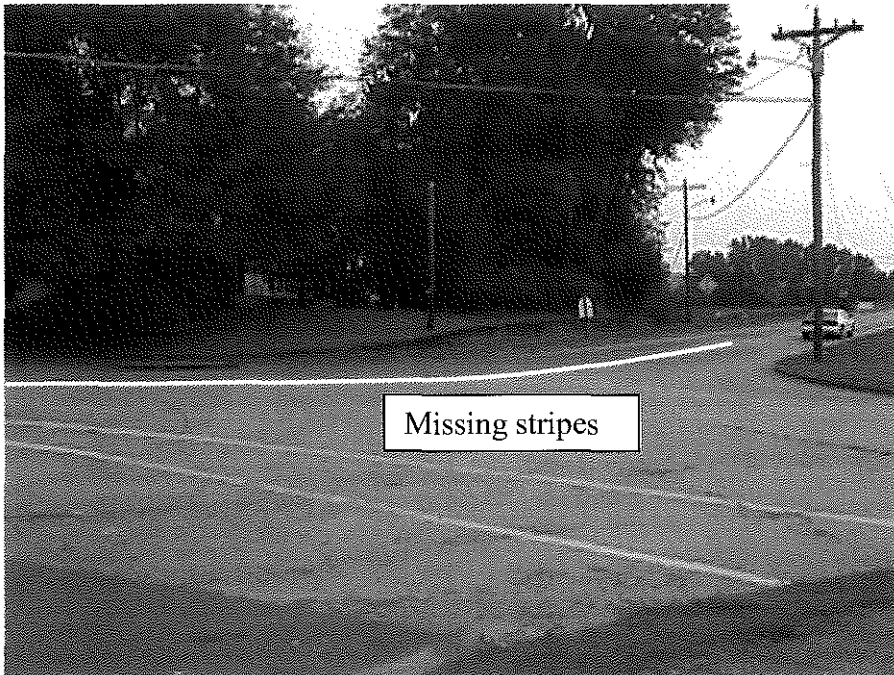
Feature	ROUTE		
	North	South	West
Lane width Truck-miles	1,110.4	44,464.1	1,426.4
Shoulders Truck-miles	3,207.0	62,181.9	21,634.5
Grade Truck-miles	686.2	10,094.4	0
Curve safe speed Truck-points	0	1,460.0	0
Offtracking Truck-points	0	46,900.0	0
Turning Radii Truck-points	1,438.0	816.0	0
Bridge Ratings Truck-points	1,438.0	4,283.0	1,264.0

4.2 Maintenance Improvement Locations

Placement of advisory speed signs on the curves discussed in Section 3.4 (south route) should be considered so that the relative amount of curvature is evident to drivers and appropriate action can be taken. In addition, the pavement condition on the KY 54 railroad crossing west of Leitchfield could benefit from maintenance.

The north route could benefit from the addition of “no parking” signs near the intersection of KY 334 and KY 69 in Hawesville so that parked vehicles would not interfere with the turning maneuvers of trucks. In addition, pavement markings along the curve immediately south of the Ohio River Bridge are in need of repainting (see Figure 15).

Figure 15: KY 69 Just South of the Ohio River Bridge



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 Kentucky Transportation Center engineers who are responsible for studying the routes associated with this project devised a scale for quantitatively scoring the route from 1 to 10. The interpretation for this scale can be seen in Table 7. Table 8 shows the ratings for each route based upon the findings from the various site visits and information obtained from the HIS database.

Table 7: 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 required on this route
6 to 8	Minor improvements could improve this route
9	Minor problems exist that do not seriously impede truck access
10	Trucks are served with reasonable access

Table 8: Route Ratings

Route	Length	Rating
North	6.2 miles	6
West	21.1 miles	8
South	54.4 miles	3

4.4 Conclusions and Recommendations

In conclusion, the following problems were identified along the truck access routes to Willamette Industries in Hawesville:

- Accident-related concerns along the west and south routes;
- Significant lengths of each route with less than "preferred" lane widths and shoulders;
- Numerous less than "preferred" bridge sufficiency ratings;
- Numerous less than "preferred" grades (predominately along south route);
- Numerous curves where offtracking may occur (predominately along south route);
- Two curves with safe speed problems (south route); and
- Two problematic intersections (KY 69 and KY 334 on the north route, KY 54 and KY 69 on the south route) with problems for right turning trucks.

The intersection of KY 54 and KY 69 could be improved by widening the lanes on both roads in the vicinity of the intersection so that trucks have more space available to turn into. Preventing vehicles from parking near the intersection of KY 69 and KY 334 in Hawesville might alleviate that turning radius problem. In order to correct the lane width, shoulder, and curve deficiencies along these routes, complete reconstruction would be necessary. If growth in the respective areas were to increase truck volumes, such action may be considered.

Appendices

Appendix A: Phone Survey Conducted with Facility Manager

PHONE SURVEY RESULTS

<u>Facility ID</u> 2659	<u>Facility Name</u> WILLAMETTE IND.	<u>Location / City</u> HAWESVILLE	<u>County</u> HANCOCK	<u>ADD</u> GREEN RIVER
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<u>Contact Name</u> RON SEATON	<u>Title</u>	<u>Phone</u> 502-927-6961	<u>Fax</u> 502-927-9929
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1. Is the location of your facility on the map correct? YES
2. Our information shows about 200 trucks per day access your facility. Is that correct? *If not, fill in correct volume.*
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? 45 - 48' SEMITRAILER
6. What is the largest truck operating at your facility? 53' SEMITRAILER
7. What type of freight or commodity is shipped, and is incoming and outgoing freight different? (one may be an empty truck) IN - WOOD CHIPS, SCRAP PAPER, SUNDRY CHEMICALS OUT - PAPER OR PAPER PRODUCTS
8. Does the truck traffic peak at specific times of the day? (e.g., out in the morning and return in the afternoon) NO, CONSTANT 24 HRS.

9. What traffic congestion and delay problems along the routes are you aware of, or feel need improvement?

<u>Location (route segment, intersection, etc.)</u>	<u>Time and Day of Week</u>
US 60 EAST OF STILLMAN	
KY 69 ACCESS TO OWENSBORO - NEED TO COMPLETE FOUR LANE TO HAWESVILLE, BRIDGE COMPLETION AT OWENSBORO	

10. Where do trucks at your facility go to and come from? (This may be an interstate, cities, general direction-N,S,E,W) IN - S. INDIANA EASTER KY CORBIN OUT - 48 STATES

11. Do you have any other problems or concerns along the route you would like us to consider?

KY 86 BRECKINRIDGE CO. 1ST US 60
KY 69S 1ST KY 69

12. Would you like a copy of the final report (roadway/route evaluation ???) YES

NOTES/COMMENTS:

Appendix B: Less Than “Preferred” Features along All Routes

Table B1: Problem Truck Miles for Lane Widths

Route	County	Road	Begin_MP	End_MP	Points	Trucks / day	Truck- miles	
South	Hancock	KY 1406	0.0	1.6	1	705	1110.4	
	Hancock	KY 69	0.0	13.1	2	719	18809.0	
	Grayson	KY 259	12.0	12.2	2	986	493.0	
	Grayson	KY 54	0.0	18.2	2	154	5609.0	
	Grayson	US 62	20.8	21.0	2	649	220.7	
	Ohio	KY 54	6.0	18.2	2	408	9955.2	
	Ohio	KY 69	15.4	37.3	2	189	8266.9	
						TOTAL	44464.1	
West	Hancock	KY 1406	0.0	1.6	1	705	1110.4	
	Hancock	US 60*	8.7	9.2	2	316	316.0	
							TOTAL	1426.4
* Westbound lanes only (1/2 of total trucks/day)								
North	Hancock	KY 1406	0.0	1.6	1	705	1110.4	
						TOTAL	1110.4	

Table B2: Problem Truck Miles for Shoulders

Route	County	Road	Begin MP	End MP	Rating	Trucks / day	Truck- miles	
South	Hancock	KY 1406	0.00	1.58	2	705	2220.8	
	Grayson	KY 259	12.20	12.95	2	986	1486.9	
	Grayson	KY 54	0.00	18.07	2	154	5564.0	
	Grayson	KY 54	18.07	18.21	2	154	45.0	
	Grayson	KY 54	18.21	18.31	2	154	30.5	
	Grayson	KY 54	18.31	18.35	2	154	12.3	
	Grayson	KY 54	18.35	18.47	2	154	35.7	
	Grayson	US 62	20.79	20.97	2	649	241.4	
	Hancock	KY 69	0.00	6.41	2	189	2423.4	
	Hancock	KY 69	6.41	12.19	2	189	2183.3	
	Hancock	KY 69	12.19	12.73	2	189	206.4	
	Hancock	KY 69	12.73	13.08	2	189	131.2	
	Hancock	US 60	0.00	1.93	1	632	1221.7	
	Hancock	US 60	2.31	10.38	1	632	5099.6	
	Hancock	US 60	2.66	5.24	2	632	3267.4	
	Hancock	US 60	5.24	5.56	1	632	202.2	
	Hancock	US 60	5.56	6.30	2	632	932.8	
	Hancock	US 60	6.30	6.74	1	632	279.3	
	Hancock	US 60	6.74	7.26	2	632	653.5	
	Hancock	US 60	7.26	7.85	1	632	374.8	
	Hancock	US 60	7.85	9.11	2	632	1586.3	
	Hancock	US 60	9.11	9.40	1	632	183.3	
	Hancock	US 60	9.40	10.38	1	632	620.0	
	Hancock	US 60	10.38	10.78	2	632	513.2	
	Ohio	KY 54	0.00	7.10	2	408	5793.6	
	Ohio	KY 54	7.10	7.40	2	408	244.8	
	Ohio	KY 54	7.55	18.24	2	408	8726.3	
	Ohio	KY 69	15.40	37.34	2	408	17902.2	
							TOTAL	62181.9
	West	Hancock	KY 1406	0.00	1.58	2	705	2220.8
Hancock		US 60	0.00	1.93	1	632	1221.7	
Hancock		US 60	2.31	9.40	1	632	4479.6	
Hancock		US 60	2.31	10.38	1	632	5099.6	
Hancock		US 60	2.66	5.24	2	632	3267.4	
Hancock		US 60	5.24	5.56	1	632	202.2	
Hancock		US 60	5.56	6.30	2	632	932.8	
Hancock		US 60	6.30	6.74	1	632	279.3	
Hancock		US 60	6.74	7.26	2	632	653.5	
Hancock		US 60	7.26	7.85	1	632	374.8	
Hancock		US 60	7.85	9.11	2	632	1586.3	
Hancock		US 60	9.11	9.40	1	632	183.3	
Hancock		US 60	9.40	10.38	1	632	620.0	
Hancock		US 60	10.38	10.78	2	632	513.2	
						TOTAL	21634.5	
North	Hancock	KY 1406	0.00	1.58	2	705	2220.8	
	Hancock	KY 69	13.08	13.41	2	719	473.1	
	Hancock	US 60	10.38	10.78	2	632	513.2	
						TOTAL	3207.0	

Table B3: Problem Truck Points for Offtracking

Route	County	Road	Begin MP	End MP	Rating	Trucks / day	Truck- miles
South	Grayson	KY 54	0.9	1.5	1	154	154.0
	Grayson	KY 54	1.7	2.0	1	154	154.0
	Grayson	KY 54	3.0	3.4	1	154	154.0
	Grayson	KY 54	3.4	3.9	1	154	154.0
	Grayson	KY 54	4.7	4.9	1	154	154.0
	Grayson	KY 54	18.0	18.1	1	154	154.0
	Hancock	KY 69	0.9	1.0	1	719	719.0
	Hancock	KY 69	1.1	1.2	1	719	719.0
	Hancock	KY 69	1.5	1.6	1	719	719.0
	Hancock	KY 69	1.6	1.8	1	719	719.0
	Hancock	KY 69	1.8	2.1	2	719	1438.0
	Hancock	KY 69	2.1	2.2	1	719	719.0
	Hancock	KY 69	2.2	2.3	1	719	719.0
	Hancock	KY 69	2.4	2.5	1	719	719.0
	Hancock	KY 69	3.3	3.4	2	719	1438.0
	Hancock	KY 69	4.8	5.0	1	719	719.0
	Hancock	KY 69	5.1	5.2	1	719	719.0
	Hancock	KY 69	5.6	5.8	1	719	719.0
	Hancock	KY 69	5.9	6.1	2	719	1438.0
	Hancock	KY 69	6.3	6.5	1	719	719.0
	Hancock	KY 69	6.7	6.8	1	719	719.0
	Hancock	KY 69	6.9	7.0	2	719	1438.0
	Hancock	KY 69	7.9	8.0	1	719	719.0
	Hancock	KY 69	8.4	8.5	1	719	719.0
	Hancock	KY 69	8.6	8.7	2	719	1438.0
	Hancock	KY 69	8.7	8.9	1	719	719.0
	Hancock	KY 69	9.7	9.7	1	719	719.0
	Hancock	KY 69	9.9	10.0	1	719	719.0
	Hancock	KY 69	10.1	10.3	2	719	1438.0
	Hancock	KY 69	10.3	10.5	2	719	1438.0
	Hancock	KY 69	10.5	10.5	1	719	719.0
	Hancock	KY 69	10.5	10.7	1	719	719.0
	Hancock	KY 69	11.8	11.9	1	719	719.0
	Hancock	KY 69	12.2	12.3	1	719	719.0
Hancock	KY 69	12.3	12.5	2	719	1438.0	
Hancock	KY 69	12.5	12.7	2	719	1438.0	
Hancock	KY 69	12.9	13.0	2	719	1438.0	

Table B3 (continued): Problem Truck Points for Offtracking

Route	County	Road	Begin MP	End MP	Rating	Trucks / day	Truck- points
South	Ohio	KY 54	5.9	6.1	1	408	408.0
	Ohio	KY 54	6.4	6.7	2	408	816.0
	Ohio	KY 54	6.8	6.9	2	408	816.0
	Ohio	KY 54	7.0	7.1	1	408	408.0
	Ohio	KY 54	7.3	7.3	1	408	408.0
	Ohio	KY 54	7.7	7.7	2	408	816.0
	Ohio	KY 54	7.7	7.7	2	408	816.0
	Ohio	KY 54	7.9	8.0	1	408	408.0
	Ohio	KY 54	8.1	8.2	2	408	816.0
	Ohio	KY 54	8.2	8.3	2	408	816.0
	Ohio	KY 54	8.8	9.0	2	408	816.0
	Ohio	KY 54	9.9	10.2	1	408	408.0
	Ohio	KY 54	12.0	12.3	1	408	408.0
	Ohio	KY 54	14.0	14.1	2	408	816.0
	Ohio	KY 54	14.3	14.5	1	408	408.0
	Ohio	KY 54	15.3	15.5	2	408	816.0
	Ohio	KY 54	15.8	16.0	1	408	408.0
	Ohio	KY 54	17.8	18.2	1	408	408.0
	Ohio	KY 69	29.0	29.2	2	189	378.0
	Ohio	KY 69	29.6	29.8	2	189	378.0
	Ohio	KY 69	31.7	31.8	1	189	189.0
	Ohio	KY 69	32.8	32.9	2	189	378.0
	Ohio	KY 69	32.9	33.1	2	189	378.0
	Ohio	KY 69	33.2	33.3	1	189	189.0
	Ohio	KY 69	33.6	33.7	2	189	378.0
	Ohio	KY 69	33.9	34.1	2	189	378.0
	Ohio	KY 69	34.3	34.4	1	189	189.0
	Ohio	KY 69	34.7	34.9	2	189	378.0
	Ohio	KY 69	35.5	35.7	2	189	378.0
	Ohio	KY 69	35.7	35.9	2	189	378.0
	Ohio	KY 69	36.0	36.2	2	189	378.0
	Ohio	KY 69	36.3	36.4	2	189	378.0
	Ohio	KY 69	36.5	36.6	2	189	378.0
	Ohio	KY 69	37.0	37.3	2	189	378.0
						TOTAL	46900.0

Table B4: Problem Truck Miles for Grades

Route	County	Road	Begin MP	End MP	Points	Trucks / day	Truck- miles
North	Hancock	KY 69	13.13	13.43	2	719	431.4
						TOTAL	431.4
South	Grayson	KY 259	12.05	12.57	2	986	1021.5
	Grayson	KY 259	12.57	12.73	1	986	151.8
	Grayson	KY 259	12.73	12.95	2	986	451.6
	Grayson	KY 54	3.33	3.63	2	154	92.4
	Grayson	KY 54	4.13	4.46	2	154	101.6
	Grayson	KY 54	4.65	4.98	1	154	50.8
	Grayson	KY 54	6.26	6.68	2	154	130.6
	Grayson	KY 54	8.85	9.36	2	154	157.1
	Grayson	KY 54	9.94	10.34	1	154	61.6
	Grayson	KY 54	11.27	11.65	1	154	58.5
	Grayson	KY 54	11.82	12.17	1	154	54.7
	Grayson	KY 54	12.17	12.60	2	154	132.4
	Grayson	KY 54	13.52	13.73	2	154	64.7
	Grayson	KY 54	14.00	14.20	2	154	61.6
	Grayson	KY 54	14.33	14.50	1	154	27.0
	Grayson	KY 54	14.50	14.73	2	154	70.8
	Grayson	KY 54	16.35	16.63	2	154	86.2
	Hancock	KY 69	1.10	1.75	2	719	934.7
	Hancock	KY 69	5.85	6.35	2	719	719.0
	Hancock	KY 69	6.35	6.60	2	719	359.5
	Hancock	KY 69	8.25	8.55	2	719	431.4
	Hancock	KY 69	8.70	8.98	1	719	201.3
	Hancock	KY 69	10.10	10.55	2	719	647.1
	Hancock	KY 69	11.70	12.10	1	719	287.6
	Hancock	KY 69	12.10	12.55	2	719	647.1
	Ohio	KY 54	7.65	7.99	1	408	138.7
	Ohio	KY 54	11.80	12.50	2	408	571.2
	Ohio	KY 54	12.50	12.95	2	408	367.2
	Ohio	KY 54	13.60	14.00	1	408	163.2
	Ohio	KY 54	14.00	14.90	2	408	734.4
	Ohio	KY 54	17.30	18.15	2	408	693.6
	Ohio	KY 69	18.40	18.80	1	189	75.6
	Ohio	KY 69	18.80	19.10	1	189	56.7
	Ohio	KY 69	19.25	19.60	1	189	66.2
	Ohio	KY 69	21.45	21.80	1	189	66.2
	Ohio	KY 69	32.55	32.99	1	189	83.2
	Ohio	KY 69	33.30	33.70	1	189	75.6
						TOTAL	10094.4

Table B5: Problem Truck Points for Bridges

Route	County	Road	Milepoint	Bridge Number	Rating	Trucks / day	Truck- points
South	Grayson	KY 54	3.35	B00046	1	154	154
	Grayson	KY 54	4.68	B00044	1	154	154
	Grayson	KY 54	7.76	B00043	1	154	154
	Grayson	KY 54	14.81	B00041	1	154	154
	Hancock	KY 69	7.98	B00004	1	719	719
	Hancock	KY 69	10.09	B00003	1	719	719
	Ohio	KY 54	6.82	B00024	1	408	408
	Ohio	KY 54	8.75	B00025	1	408	408
	Ohio	KY 54	9.18	B00026	1	408	408
	Ohio	KY 54	10.30	B00027	1	408	408
	Ohio	KY 54	18.21	B00031	1	408	408
	Ohio	KY 69	35.66	B00103	1	189	189
							TOTAL
West	Daviess	US 60	23.75	B00023	2	632	1264
						TOTAL	1264
North	Hancock	KY 69	13.62	B00043	2	719	1438
						TOTAL	1438