

TRUCK ROUTE ACCESS EVALUATION

Topy Corporation
Franklin County
Site #53

Report Number KTC-99-9

“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 Franklin County in the Bluegrass Area Development District (ADD) and Kentucky Transportation Cabinet (KYTC) Highway District #5. The location of the site outside of Frankfort 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.

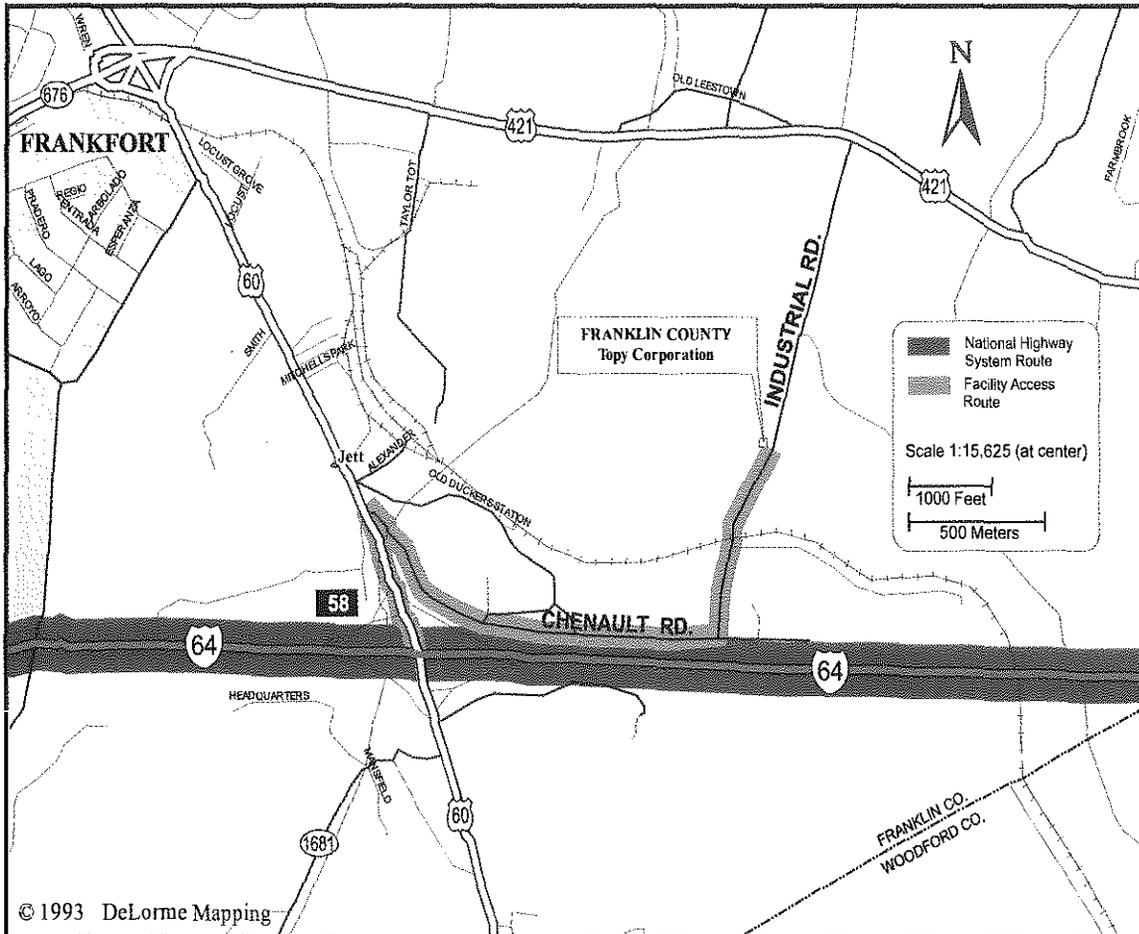
The sites to be evaluated were selected from two existing databases (a truck facility survey from 1994 and the intermodal facility inventory) based on ADD and KYTC planner recommendations, geographic location, distance to the NHS, and the number of trucks accessing the site. Consideration was also made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

This particular site was visited for data collection on September 20 and November 25, 1998 and video recording on January 15, 1998. The facility for study was the Topy Corporation located in Frankfort on Industrial Drive. Originally, Frankfort Plastics was to be added to Topy to create a cluster, but the survey for Frankfort Plastics indicated that it would cease operations in late September 1998. The last site visit confirmed that it had closed. The only other truck-traffic generator in the vicinity is Allied Signal, but the site visit revealed that it did not produce a large volume of trucks. In addition, Allied Signal has direct access onto US 421 and would not use the same route as the Topy Corporation. Thus, Allied Signal was not surveyed or included in this report. Early into the study process, phone surveys were conducted so that facility managers could indicate the routes and provide insight into potential access-limiting issues. The phone survey completed on the facility, which is located in Appendix A, found that approximately 70 trucks per day (140 one-way trips) are accessing the facility.

2.0 Truck Routes in Use

There is one route that trucks use to get to the National Highway System, I-64 or US 60 in this case (Figure 1). Trucks exit the facility at Topy's southernmost entrance and proceed south on Industrial Road to the intersection of Chenault Road. Industrial Road, which begins at US 421 and ends at Chenault Road, is characterized as low-density industrial development. At the intersection with Chenault Road, trucks turn right and proceed west to US 60. Chenault Road has several industrial facilities along its length, but none produce a significant flow of trucks. This section of US 60 is not part of the NHS, although US 60 south of I-64 is. Thus, whether trucks continue south on US 60 or enter onto I-64, the route under study here ends at the interchange of US 60 and I-64. Total route length is approximately 1.2 miles. The average daily traffic (ADT) on the

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



route portion of US 60 is 23,543 vehicles (from 1996 KYTC traffic counts). The ADT on Industrial and Chenault Roads is 1,613 vehicles per day (from a 1998 classification count conducted by Presnell Associates for the KYTC Division of Planning).

3.0 Route Data Collection and Evaluation

The route features that are to be evaluated in this study are shown in Table 1 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.

3.1 Traffic Operations and Level of Service

The phone survey with the manager of this site indicated that there were no operational problems or concerns for this site. The only problem indicated dealt with temporary construction-related congestion that does not permanently affect the level of service of operations. Traffic counts and level of service calculations were only conducted in this study when phone surveys indicated possible traffic/operational concerns. Thus, the route is assumed to operate at an acceptable level of service.

3.2 Accidents

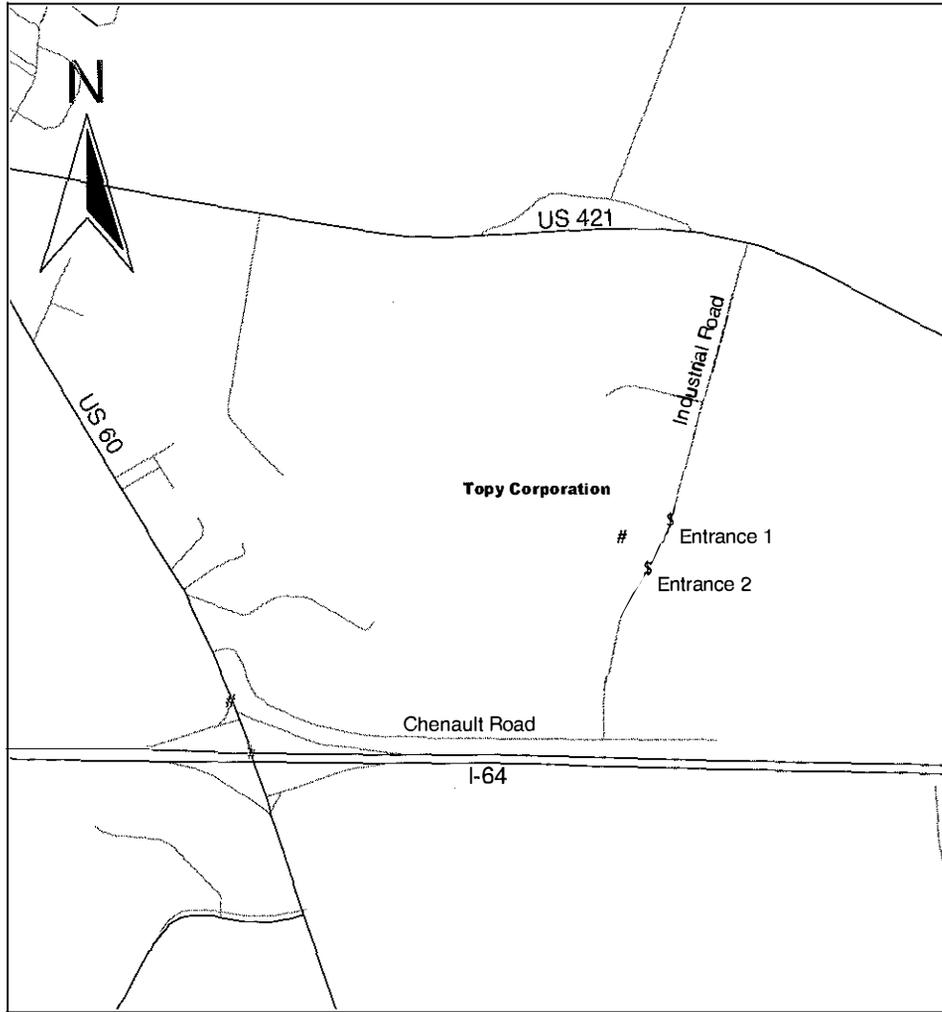
In 1997 the Kentucky Transportation Center studied all the state-maintained roads throughout Kentucky and determined average truck accident rates for different types of road sections. A critical accident rate was then calculated using the average accident rate for a specific highway type along with an assumed level of statistical significance and exposure (vehicle miles traveled). There are no sections of this route with a critical rate greater than one indicating that none of these sections have accident rates greater than the critical rate for the particular highway type.

Figure 2 shows the locations of accidents during the years 1995, 1996, and 1997. A summary of the accidents along both truck routes (for all roads, not just state-maintained roads) is shown in Table 2 for the same three-year period. The percentage of truck traffic on the route portion of US 60 (4.6%) is somewhat lower than the total percentage of truck accidents along the entire route (7.3%). Both Chenault and Industrial Roads had higher percentages of truck traffic (12.8% and 9.6%, respectively) than the 7.3% of accidents involving trucks. Thus, there appears to be no serious problem with the route from an accident history perspective.

Table 1: 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

Figure 2: Accident Locations (1995 – 1997)



LEGEND

- # Facility
- # Accidents: 1-3
- # Accidents: 4-11
- # Accidents: 12-15

Scale - 1:15000



Table 2: Accident Types along Franklin County Truck Route

	<i>Non-Truck Accidents</i>	<i>Truck Accidents</i>	<i>Percent Trucks</i>
Total	51	4	7.3
Fatal Accidents	0	0	0.0
Injury	14	2	12.5
Intersection	14	2	12.5

3.3 Cross Section Features

Figures 3 and 4 illustrate the sections of the route with different lane widths and shoulder types, respectively. Chenault Road has only 10-foot lanes that are considered “less than adequate”. Industrial Road has 10.5-foot lanes that are also “less than adequate”. Both roads have 2- to 4-foot turf shoulders that are “less than adequate”. The route portion of US 60 has “preferred” 12-foot lanes and 10-foot paved shoulders.

3.4 Curvature Features

Offtracking is considered a problem where a truck cannot stay in its lane through a curve. One curve along this route was evaluated as it was suspected of causing trucks to offtrack into opposing lanes of travel. Figure 5 depicts the curvature in question on Chenault Road, immediately east of US 60. The travel lanes have been widened through the curve to 22 feet, and trucks are not forced to offtrack into the opposing lane. Thus, the curvature is not problematic.

One intersection was evaluated for possible turning radius problems. Right turning trucks were observed offtracking at the intersection of Chenault and Industrial Roads, which is illustrated in Figure 6. Thus, this intersection is considered “less than adequate”.

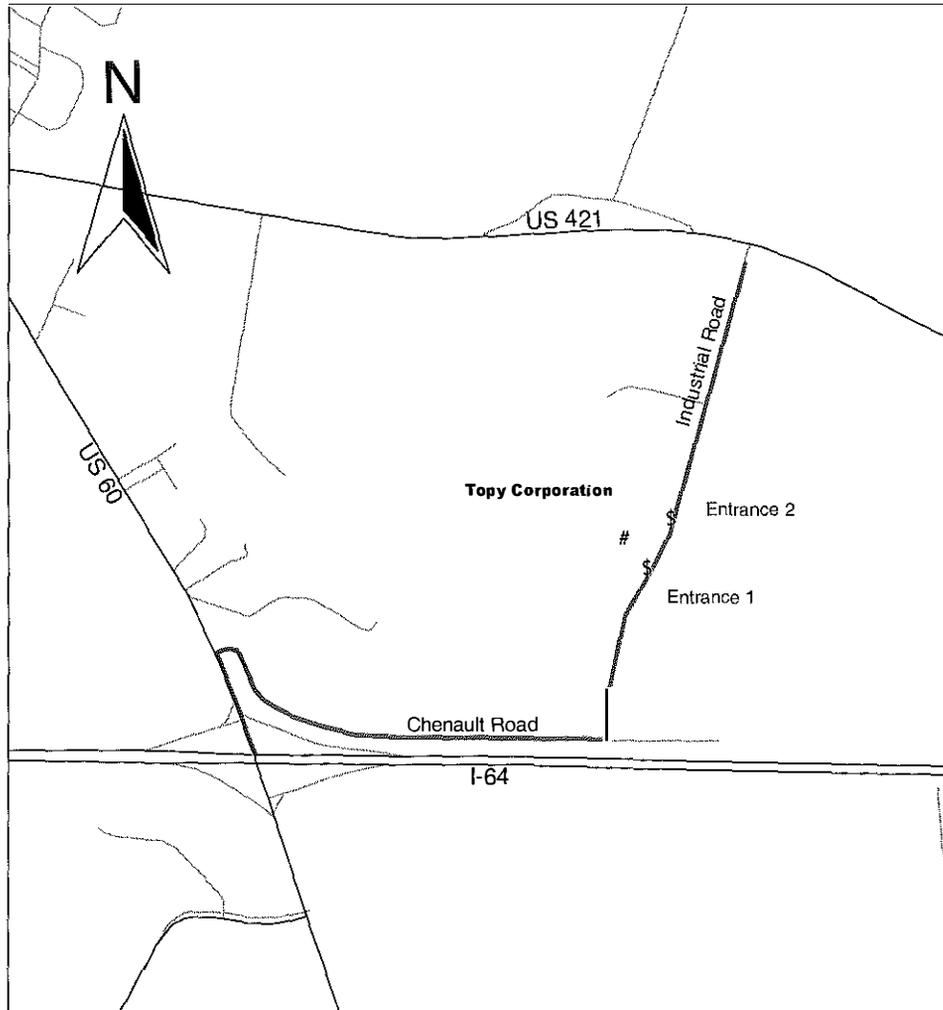
Horizontal curvature along the route was also tested for safe speed problems by using the ball-bank indicator at the posted speed limits or advisory speeds through curves. No curves failed the ball bank test.

A grade is considered problematic if it significantly reduces the speed of trucks. There are no grades that cause problems for trucks along this route.

3.5 Railroad Crossings

There are no at-grade railroad crossings along this route.

Figure 3: Lane Widths



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#	Facility
	Lane Width: 10 Feet
	Lane Width: 10.5 Feet
	Lane Width: 12 Feet
	Lane Width: 22 Feet

Scale - 1:15000

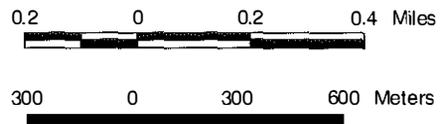


Figure 4: Shoulder Widths

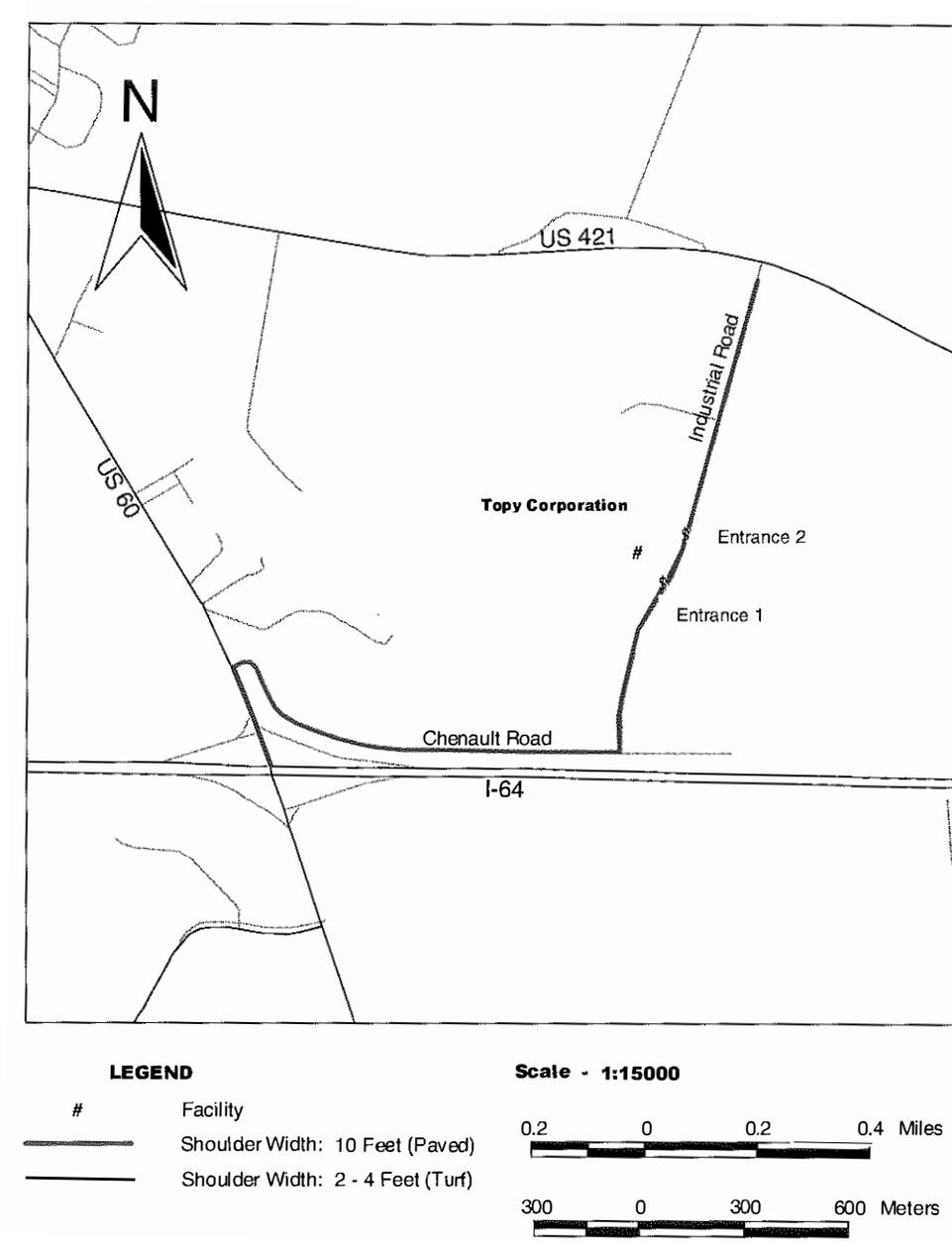
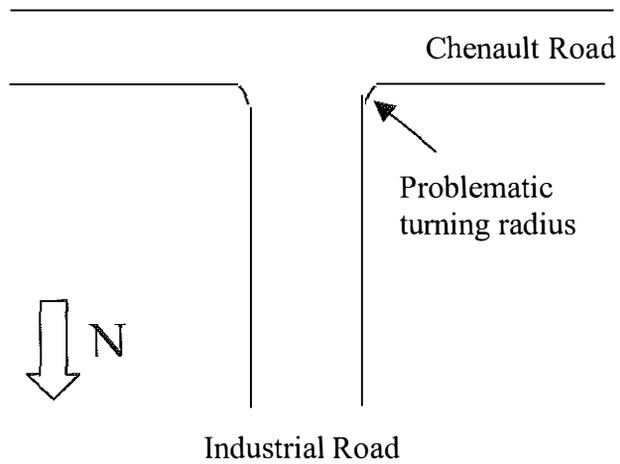


Figure 5: Westbound View of Curvature on Chenault Road (near US 60)



Figure 6: Intersection of Chenault Road and Industrial Road



3.6 Bridges

There is one bridge along this route, at the location shown in Figure 7. 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. The bridge, on Industrial Road just north of the intersection with Chenault Road, has a sufficiency rating of 77.7 out of a possible 100 points, which is considered "adequate".

3.7 Sight Distance

There are no problems with sight distance along this route.

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 have been normalized for the number of miles, number of points, and number of trucks using the section. In the case of this Franklin County truck route, four features (lane widths, shoulder widths, turning radius, and bridge ratings) 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 weighed by length as well as the number of trucks passing that point.

Table 3 contains the total problem truck miles and total problem points for lane width, shoulders, turning radii, and bridges along both routes. Truck counts were conducted by Presnell Associates, Inc. for the KYTC Division of Planning on August 8 – 12, 1998. The rating of these routes relative to others evaluated will be reported in the final report.

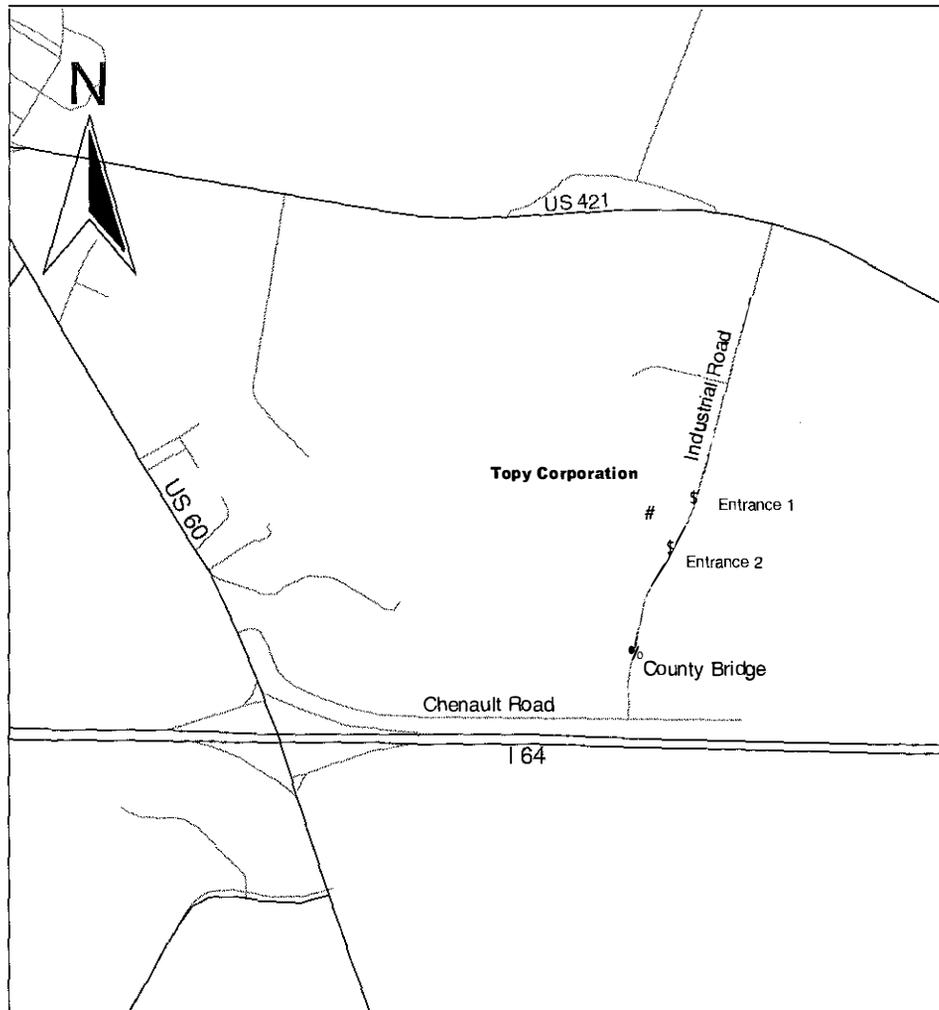
4.2 Maintenance Improvement Locations

There are no maintenance problems along this route.

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 4. Based upon the findings from the various site visits and information obtained from the HIS database, this route merits a rating of 8 indicating that minor improvements could improve the route.

Figure 7: Bridge Location



LEGEND

- # Facility
- Bridges

Scale - 1:15000

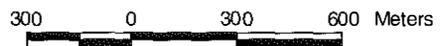
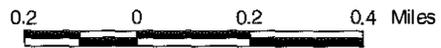


Table 3: Summary of Problem Truck Miles and Truck Points for Entire Route

Feature	Road	Location	Points*	Length (Miles)	Trucks (/day)	Truck- points	Truck- miles
Lane width	Industrial	Length	2	0.2	363		145.2
	Chenault	Length	2	0.9	363		653.4
Total							798.6
Shoulders	Industrial	Length	2	0.2	363		145.2
	Chenault	Length	2	0.90	363		653.4
Total							798.6
Turning radius	Chenault	Industrial	2		363	726	
Total						726	
Bridge Ratings	Industrial	County bridge	1		363	363	
Total						363	

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

4.4 Conclusions and Recommendations

In conclusion, the following problems were identified along the truck access route to the Topy Corporation in Frankfort:

- Significant lengths of route with less than "preferred" lane widths and shoulders;
- One intersection (Industrial Road with Chenault Road) with problems for right turning trucks; and
- One less than “preferred” bridge sufficiency rating.

Lane widening near the intersection of Chenault and Industrial Roads might alleviate the turning radius problem for right turning trucks. The problems associated with lane and shoulder widths could only be corrected through reconstruction of both Chenault and Industrial Roads, which is currently unnecessary. However, should traffic volumes increase, such reconstruction might be reconsidered.

Table 4: 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

Appendices

Appendix A: Phone Survey Conducted with Facility Manager

PHONE SURVEY RESULTS

<u>Facility ID</u>	<u>Facility Name</u>	<u>Location / City</u>	<u>County</u>	<u>ADD</u>
53	TOPY	FRANKFORT	FRANKLIN	BLUEGRASS

<u>Contact Name</u>	<u>Title</u>	<u>Phone</u>	<u>Fax</u>
JOHN PERKINS		502-695-6163 X530	502-875-5429

1. Is the location of your facility on the map correct? YES
2. Our information shows about 70 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)*
AUTOMOBILE WHEELS, IN - RAW STEEL COILS
8. Does the truck traffic peak at specific times of the day? *(e.g., out in the morning and return in the afternoon)* PEAK TRAFFIC PERIOD IS BETWEEN 8:00 AM AND 10:30 AM FOR SHIPMENTS. RECEIPTS (IN COMING MATERIAL) ARE CONSTANT.
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
I-75 NEAR CLAYS FERRY EVERYDAY CONSTRUCTION
I-75N NEAR CINCINATTI EVERYDAY DUE TO CONGESTION
10. Where do trucks at your facility go to and come from? *(This may be an interstate, cities, general direction-N,S,E,W)* TO/FROM: SMYRNA, TN; NASHVILLE, TN; MARYSVILLE, OH; CANADA; LEXINGTON, KY; LAFAYETTE, IN; SPRING HILL, TN; FLAT ROCK, MI.
11. Do you have any other problems or concerns along the route you would like us to consider? NO
12. Would you like a copy of the final report (roadway/route evaluation ???) NO

NOTES/COMMENTS: