

# TRUCK ROUTE ACCESS EVALUATION

Norfolk Southern Rail Terminal  
Louisville  
Site # 1767

KTC Report No. 99-33

“Freight Movement and Intermodal Access in Kentucky”  
Project No. SPR 98-189

By

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## 1.0 Introduction

This is a study undertaken on behalf of the Kentucky Transportation Cabinet (KYTC). There are two main objectives of the Freight Movement and Intermodal Access in Kentucky Study (SPR 98-189): evaluation of the access for trucks between intermodal or other truck generating sites and the National Highway System (NHS); and furthering the understanding of freight commodity flows throughout the state. This report summarizes the access evaluation for the Norfolk Southern Rail Intermodal Terminal located in Jefferson County in the KIPDA Area Development District (ADD) and KYTC Highway District #5. The location of the site is shown in Figure 1. Work on other specific sites as well as the freight commodity flow task is ongoing and documented elsewhere.

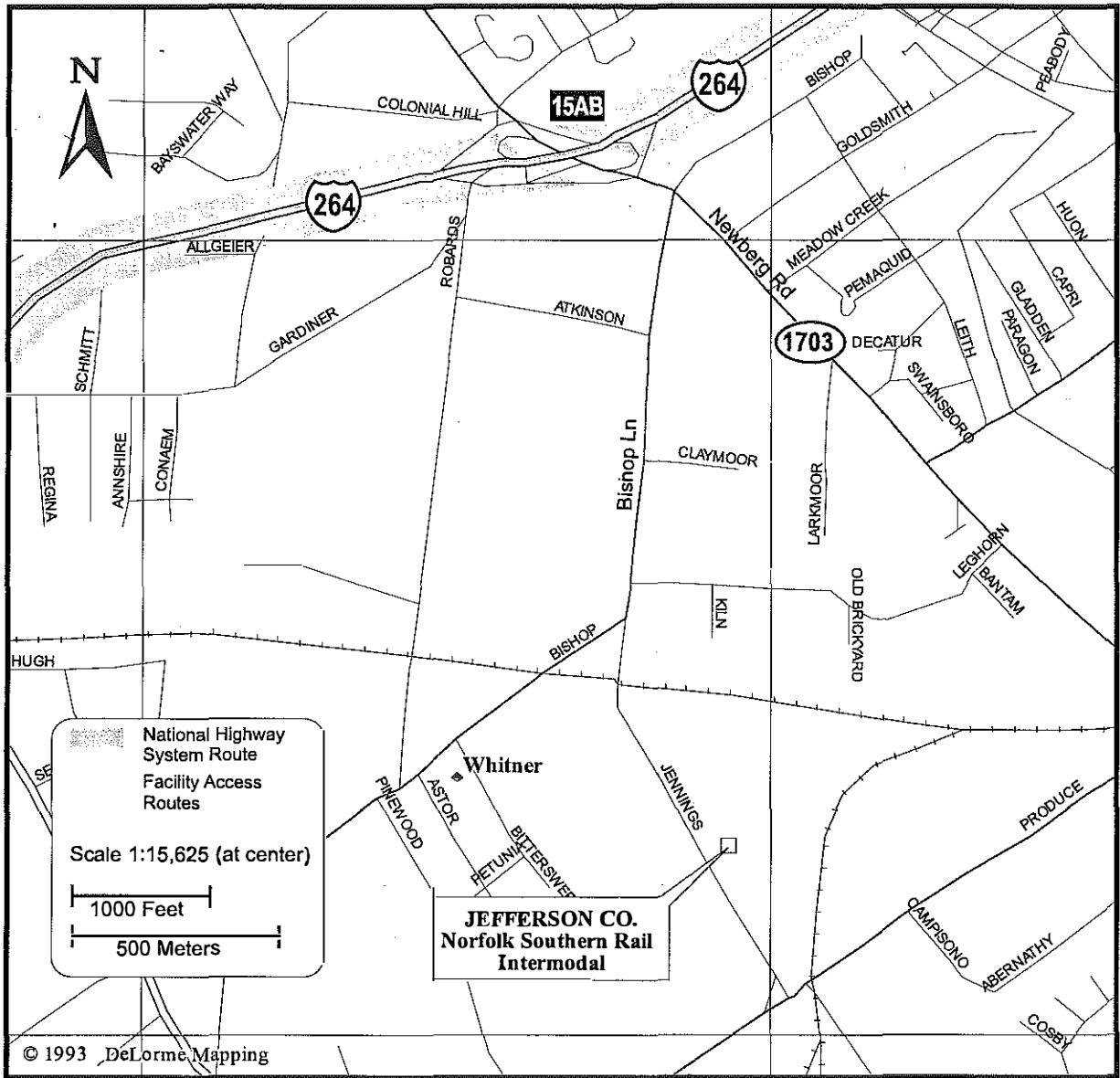
The sites to be evaluated in this study were selected from two existing databases (a truck facility survey from 1994 and the intermodal facility inventory) based on ADD and KYTC Highway District planner recommendations, geographic location, distance to the NHS, and the number of trucks accessing the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

The site was visited for video recording on April 23, 1998 and for data collection on September 29, 1998. The facility is located at 4705 Jennings Lane in Louisville. As shown in Figure 2, the surrounding area is urban and primarily industrial near the site. The Louisville Produce Terminal is another truck trip generator in the immediate vicinity. A phone survey was conducted with the facility manager of the rail terminal early in the study process. The survey found that between 200 and 300 trucks per day normally access the site with significantly higher numbers (up to 400) in the peak season (summer to mid-fall). Truck traffic was reported to peak between 1:00 pm and 6:00 pm. The trucks are generally 40-foot semi trailers; however, 53-foot trailers also access the site. The phone survey indicated general freight was handled at this facility. The only problem mentioned in the survey was a poor state of repair on a section not on the main route to this site. The phone survey information can be found in Appendix A.

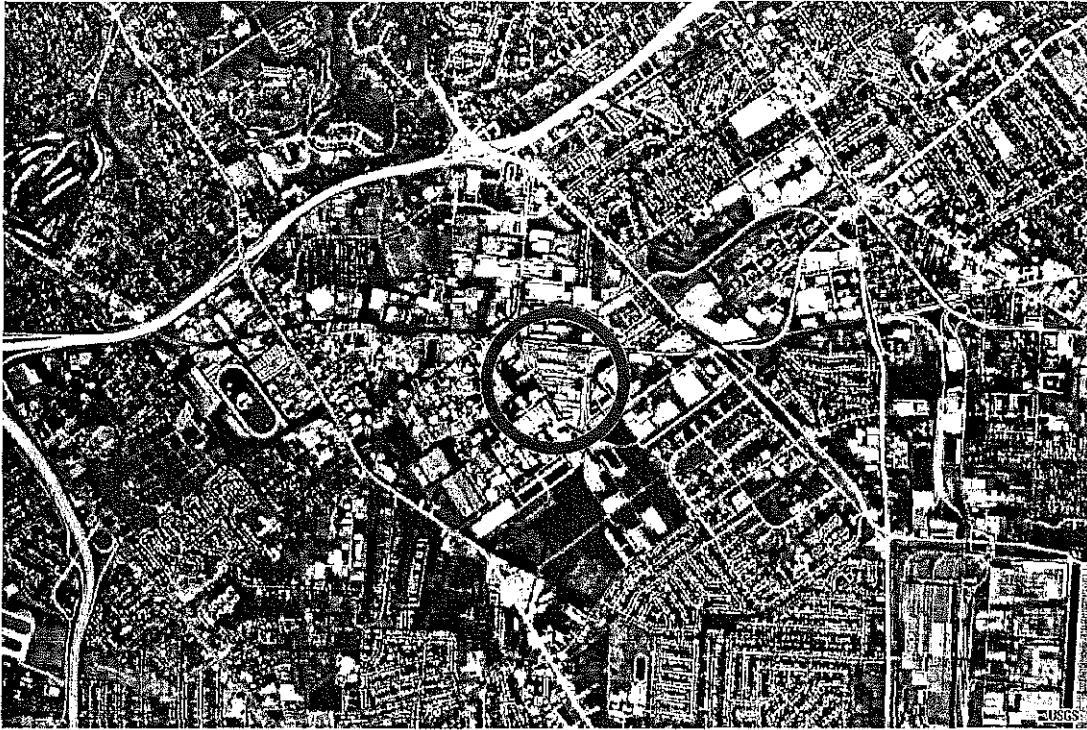
## 2.0 Truck Routes in Use

As shown in Figure 1, trucks exit the National Highway System at Newburg Road (KY 1703) exit 15A and 15B on Interstate 264. Trucks travel approximately 0.2 miles to Bishops Lane which has an ADT of 23,375. Trucks turn at this signal-controlled intersection onto Bishops Lane and travel approximately one mile to the facility entrance. Bishops Lane changes its name to Jennings Lane just north of the railway crossing. The road which forks off to the west is Bishops Lane. Many trucks would not use this section of Bishops Lane due to a humped railway crossing. The route section along Bishops Lane is a four-lane section with curbs and sidewalks as shown in Figure 3. There are two traffic signals along this section. No significant truck traffic generators were noted along this commercial route section. The section of Jennings Lane is a two-lane section with wide shoulder and industrial land use as shown in Figure 4. Only Newburg Road is state-maintained on this route. This section of Newburg Road is pictured in Figure 5.

Figure 1: Location of Truck Generating Site



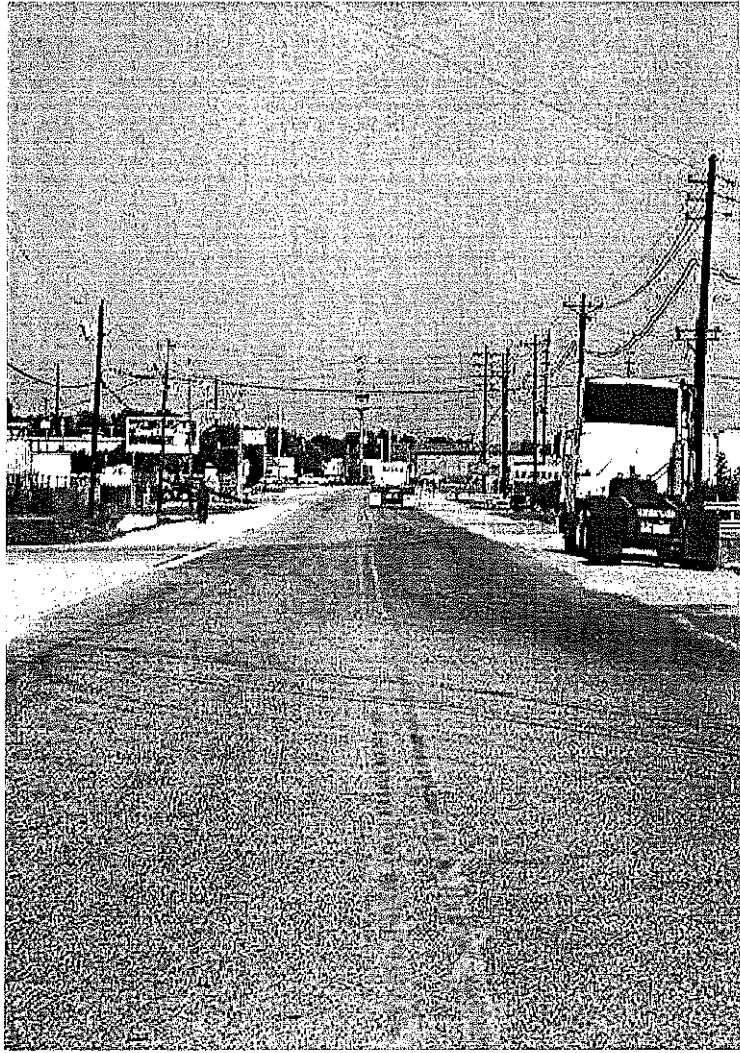
**Figure 2: Aerial Photograph of the General Area**



**Figure 3: Bishops Lane Route Section**



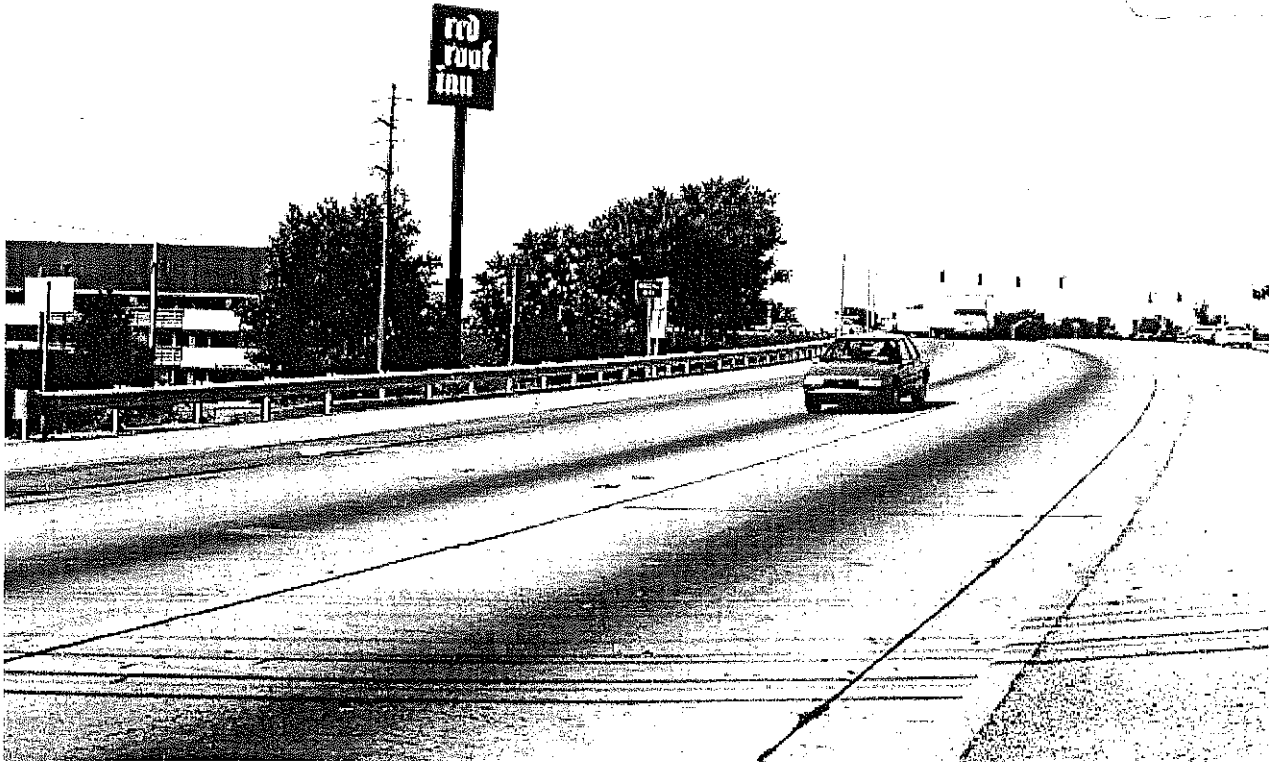
**Figure 4: Jennings Lane Route Section**



### **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 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.

**Figure 5: Newburg Road looking towards I-264 from Bishops Lane**



### **3.1 Traffic Operations and Level of Service**

The phone survey of this site did not reveal any traffic or operational concerns and therefore a traffic level of service evaluation was not conducted. Part of the site visit was undertaken during the noon hour of a weekday. During this time traffic was relatively heavy as one might expect within a commercial area.

### **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). Therefore, only state-maintained routes can be considered for high truck accident sections. The section of Newburg Road along this route is included in the critical truck accident sections for the state. From milepoints 2.161 to 2.347 the critical rate factor is 1.786 indicating the truck accident



**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

rate is higher than is considered critical for this type of roadway based on cross state analysis. Of the 19 accidents listed in the KTC report, 14 occurred at milepost 2.261 which is the interchange with I 264.

Figure 6 shows the locations of accidents on the state-maintained sections of the route during the years 1995, 1996 and 1997. The figure shows that a majority of the accidents were at the intersection of the off ramp of I-264 and Newburg Road. This intersection is signalized and has turning radius problems as described later. These results suggest further study at this intersection is warranted.

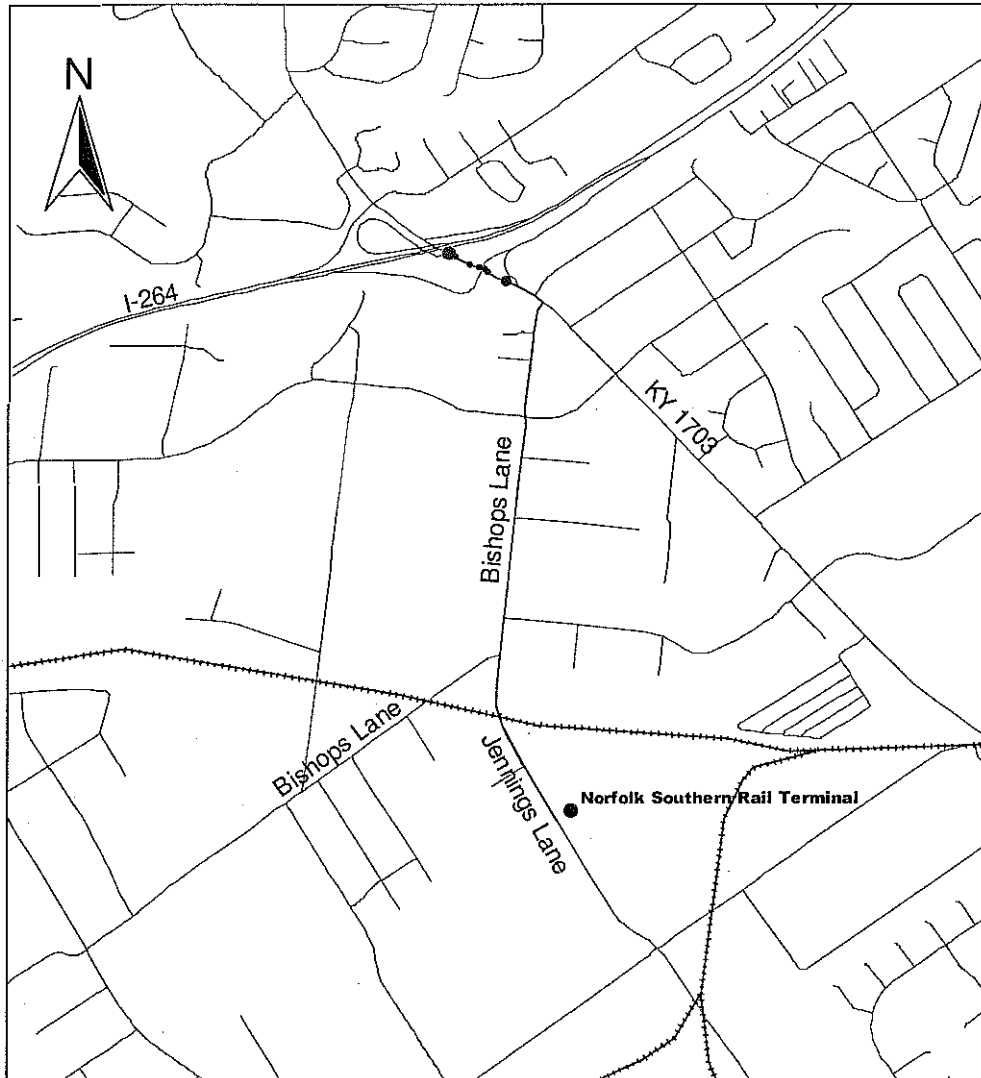
A summary of the accidents along each road section along this truck route is shown in Tables 2 through 4 for the same three-year period. Note that because milepoints were not available for Bishops Lane and Jennings Lane, accidents along the entire length of these roads are indicated in these tables. In both cases, the truck route is along approximately half of the road length. Truck accidents comprise a relatively large portion of the accidents on all three roads. While none of the truck accidents were fatal, they comprised as high as 36% of overall accidents and 60% of intersection accidents.

### **3.3 Cross Section Features**

All portions of this route have “preferred” 12-foot lanes. Figure 7 illustrates the sections of the routes having different widths and types of shoulders. Bishops Lane has no shoulders and is therefore rated “less than adequate”. This route section is curbed which is typical in urban areas. Clear zone issues might arise from the proximity of sidewalks, utility poles and other activities to this route section (see Figure 3). Jennings Lane has “adequate” 10-foot gravel and/or turf shoulders. As evident in Figure 4 there are no clear zone problems on Jennings Lane. Newburg Road has “preferred” paved 10-foot shoulders. Guardrails provide clear zone accommodations along Newburg Road.

Pavement quality is good to fair with edge problems, cracks and rutting at some intersections.

**Figure 6: Accident Locations (1995-1997)**



**LEGEND**

- Facility
- Accidents: 1-6
- Accidents: 7-24
- Accidents: 25-53

Scale - 1:15000

0.1 0 0.1 0.2 0.3 Miles



200 0 200 400 600 Meters



**Table 2: Accident Types along Bishops Lane**

	<i>Non-Truck Accidents</i>	<i>Truck Accidents</i>	<i>Percent Trucks</i>
Total	94	24	20.3
Fatal Accidents	0	0	0.0
Injury	22	3	12.0
Intersection	50	13	20.6

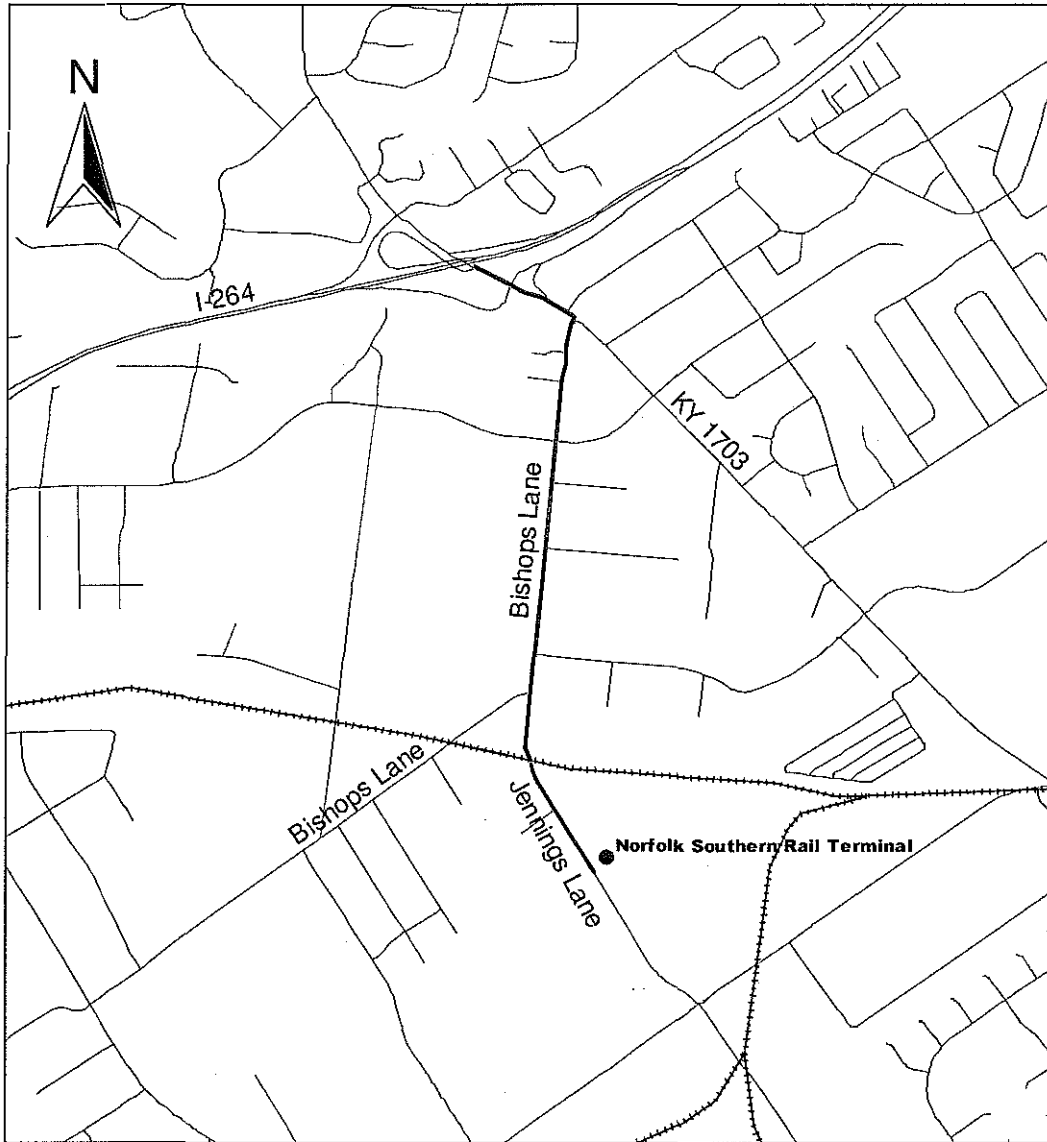
**Table 3: Accident Types along Jennings Lane**

	<i>Non-Truck Accidents</i>	<i>Truck Accidents</i>	<i>Percent Trucks</i>
Total	14	8	36.4
Fatal Accidents	0	0	0.0
Injury	6	1	14.3
Intersection	4	6	60.0

**Table 4: Accident Types along Newburg Road (Ky 1703) Route Section**

	<i>Non-Truck Accidents</i>	<i>Truck Accidents</i>	<i>Percent Trucks</i>
Total	83	15	15.3
Fatal Accidents	0	0	0.0
Injury	12	0	0.0
Intersection	62	11	15.1

**Figure 7: Shoulder Widths**



**LEGEND**

- Facility
- Shoulder Width - 10 Feet Paved
- - - Shoulder Width - 10 Feet Turf/Gravel
- - - Shoulder Width - 10-12 Feet Turf/Gravel
- Shoulder Width - No Shoulder

**Scale - 1:15000**

0.1 0 0.1 0.2 0.3 Miles



200 0 200 400 600 Meters



### **3.4 Curvature Features**

Grades are considered problematic if they cause trucks to slow down excessively. Using the AASHTO speed reduction tables there are no grades on these routes that cause such speed reductions. However, the upgrade towards the I-264 overpass on Newburg Road as trucks are turning from Bishops Lane is large enough to cause labored accelerations (see Figure 5).

Offtracking is considered a problem where a truck cannot stay in its lane through a curve. There are no offtracking problems on horizontal curves on this route. Safe speed on curves is also not a problem for any curve on this route.

The turning radius at the intersection of the eastbound off ramp from I-264 to Newburg Road requires trucks to offtrack into adjacent lanes as shown in Figure 5. Both 53-foot trailers and smaller trucks were observed offtracking. However, because trucks do not offtrack into opposing traffic lanes this radius is rated “adequate” rather than “less than adequate”. The “drop off” beyond the guardrail to the right of the ramp would preclude curve widening at this location.

### **3.5 Railroad Crossings**

There is one at-grade railroad crossing on this route located just before the facility on Jennings Lane (see Figure 1). Figure 8 illustrates the crossing looking toward the Norfolk Southern Rail Terminal. The crossing has warning signs, rough road signs, warning lights and gates. Sight distance is good. The crossing had recently been improved with coarse aggregate and asphalt. The pavement surface was good and the crossing was relatively level. This crossing is rated “preferred”.

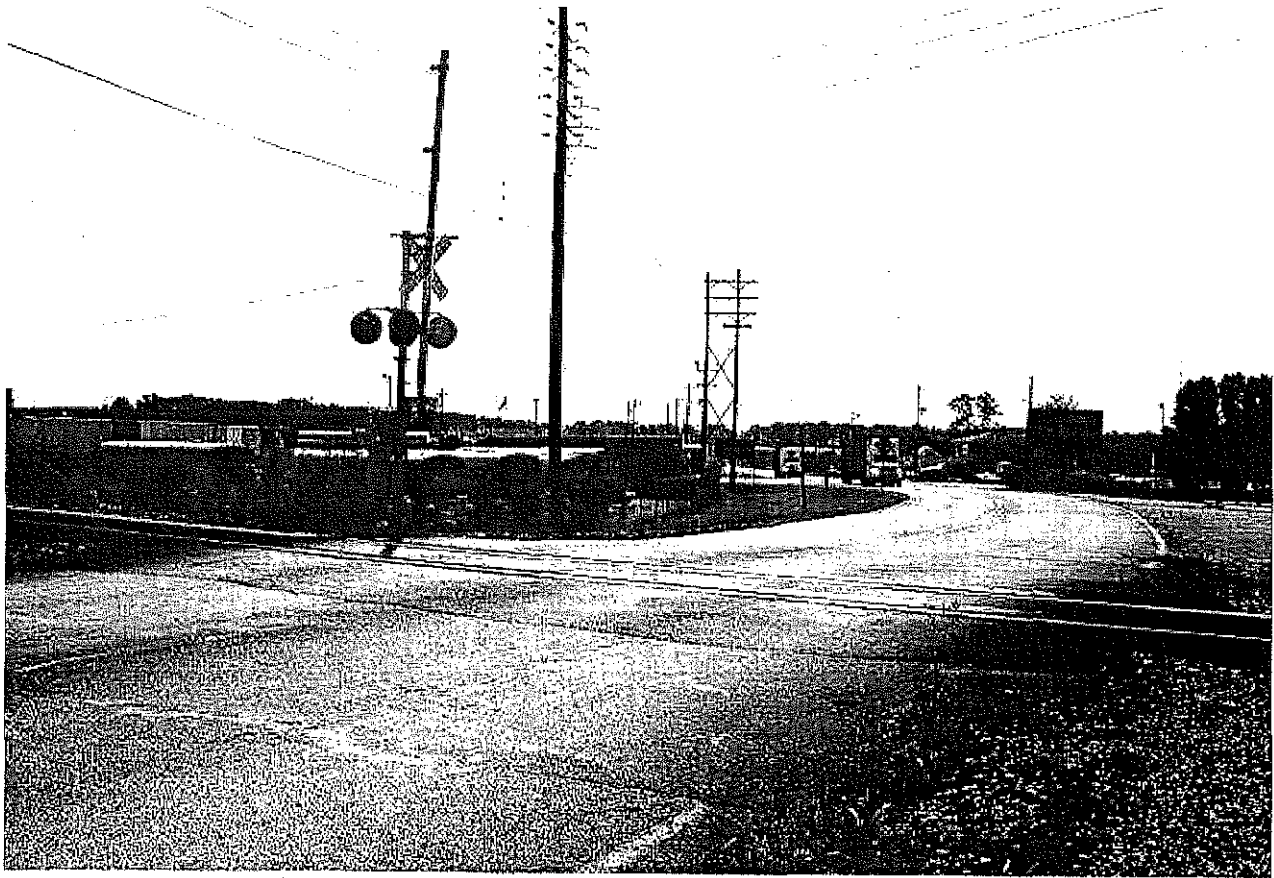
### **3.6 Bridges**

The overpass bridge on Newburg Road over I-264 is the only bridge on this route. The KYTC Division of operations maintains a database of Bridge Sufficiency ratings that is an aggregate measure of the adequacy of a bridge. This bridge has a rating of 92.5 on KYTC scale which translates to a “preferred” rating for the purposes of this study.

### **3.7 Sight Distance**

No sight distance problems were note along this route.

**Figure 8: Railroad Crossing on Jennings Lane**



### **3.8 Other Route Features**

Residential land use along Bishops Lane, particularly a retirement home, make the appropriateness of this route for heavy truck traffic questionable. There are no accommodations for pedestrians at the railway crossing.

The traffic signal at the intersection of Bishops Lane and Newburg Road operates with a protected phase for the Bishops Lane approach but it lacks an arrow light. The solid green is recognized by familiar drivers as being unopposed for the heavy left turn from Bishops Lane into Newburg Road but drivers unfamiliar with the signal's operation would not know this.

## **4.0 Route Evaluation and Recommendations**

### **4.1 Problem Truck Miles and Truck Points**

In order to compare different routes to consider 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 Jefferson County routes, two 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.

Tables 5 contain the total problem truck miles and total problem points for shoulders and turning radius which apply to this route. The rating of these routes relative to others evaluated will be in the final report. The truck count for Newburg Road was obtained by using a 15% truck volume with the ADT available from the KYTC HIS data (18,900). The truck volume on Bishops and Jennings was obtained by increasing the site truck volume as reported in the survey by 30% to account for the truck traffic not generated by the terminal.

### **4.2 Maintenance Improvement Locations**

Pavement repairs might be considered at some intersections where rutting is significant. For the reasons described in section 3.8, a traffic signal head with a green arrow indication should be installed at the intersection of Newburg Road and Bishops Lane.

### **4.3 Overall Route Rating**

In order to account for both the subjectively (including accidents) and objectively evaluated route features along truck routes throughout the state, UK engineers who studied the route and its features either during a site visit or by viewing a video of trucks using the routes have rated the overall access on a scale of 1 through 10. The interpretation for these ratings is shown in Table 6. This route received an overall rating of 8, indicating that minor improvements could improve this route.



**Table 5: Summary of Problem Truck Miles and Points**

Feature	Road	Location	Points*	Length (miles)	Trucks (/day)	Truck-points	Truck-miles
Shoulders	Jennings	Length	1	0.4	400		160
	Bishops	Length	2	0.6	400		480
<b>Total</b>							<b>640</b>
Turning Radius	Newburg	I-264 Ramp	1		400		400
<b>Total</b>							<b>400</b>

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

**Table 6: 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
3-5	Minor improvements are <u>required</u> on this route
6-8	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 route:

- Minor pavement problems,
- Traffic signal needs a left arrow,
- Narrow shoulders,
- Limited turning radius from I-264 ramp on Newburg Road, and
- A critically high truck accident rate on Newburg Road at I-264

Although the first two improvements should be undertaken, urban development limits the ability of the state to correct the third and fourth problems. Further investigation of the accident hazard should be seriously considered.

## Appendices

## Appendix A: PHONE SURVEY RESULTS

<u>Facility ID</u>	<u>Facility Name</u>	<u>Location / City</u>	<u>County</u>	<u>ADD</u>
1767	Norfolk Southern	Louisville	Jefferson	KIPDA

<u>Contact Name</u>	<u>Title</u>	<u>Phone</u>	<u>Fax</u>
John Bohlman		502-968-3187	968-8218

1. Is the location of your facility on the map correct?  
4705 Jennings Lane
2. Our information shows about 200-300 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?  
Seasonal summer - mid fall as many as 400
4. *(If truck traffic is seasonal)* Is the 200 - 300 trucks/day for the peak season?  
No, as many as 400
5. What is the most common size truck operating at your facility?  
40' 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)*  
Freight
8. Does the truck traffic peak at specific times of the day? (e.g., out in the morning and return in the afternoon)  
Afternoon 1-6 p.m.
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)  
All directions, Lexington, Bowling Green, etc.
11. Do you have any other problems or concerns along the route you would like us to consider?  
Indian Trail between Jennings and Poplar level - poor state of repair (southbound lane).
12. Would you like a copy of the final report (roadway/route evaluation ???)  
Yes

NOTES/COMMENTS: