

TRUCK ROUTE ACCESS EVALUATION

Millard Processing

Nelse

Site # 1677

Report No. 99-30

KENTUCKY TRANSPORTATION CENTER
LIBRARY

“Freight Movement and Intermodal Access in Kentucky”

Project No. SPR 98-189

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1.0 Introduction

This is a study undertaken by the Kentucky Transportation Center 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 Millard Processing located in Pike County in the Big Sandy Area Development District (ADD) and KYTC Highway District #12. 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. A second facility using part of the same route is located on KY 1441 east of KY 1789.

The site was visited for video recording on March 5, 1998, and the field data were collected on August 25, 1998. The facility is located on Nelse Hill Road west of US 460/KY 80, which is part of the NHS. The surrounding area is generally rural. A phone survey was conducted with facility managers early in the study process. The survey with Millard Processing found that approximately 200 trucks per day normally access the site. The trucks are generally triaxles or 36-foot semitrailers. The primary freight handled at this facility is coal. The survey respondent did not indicate any problems along the route. The survey can be found in Appendix A.

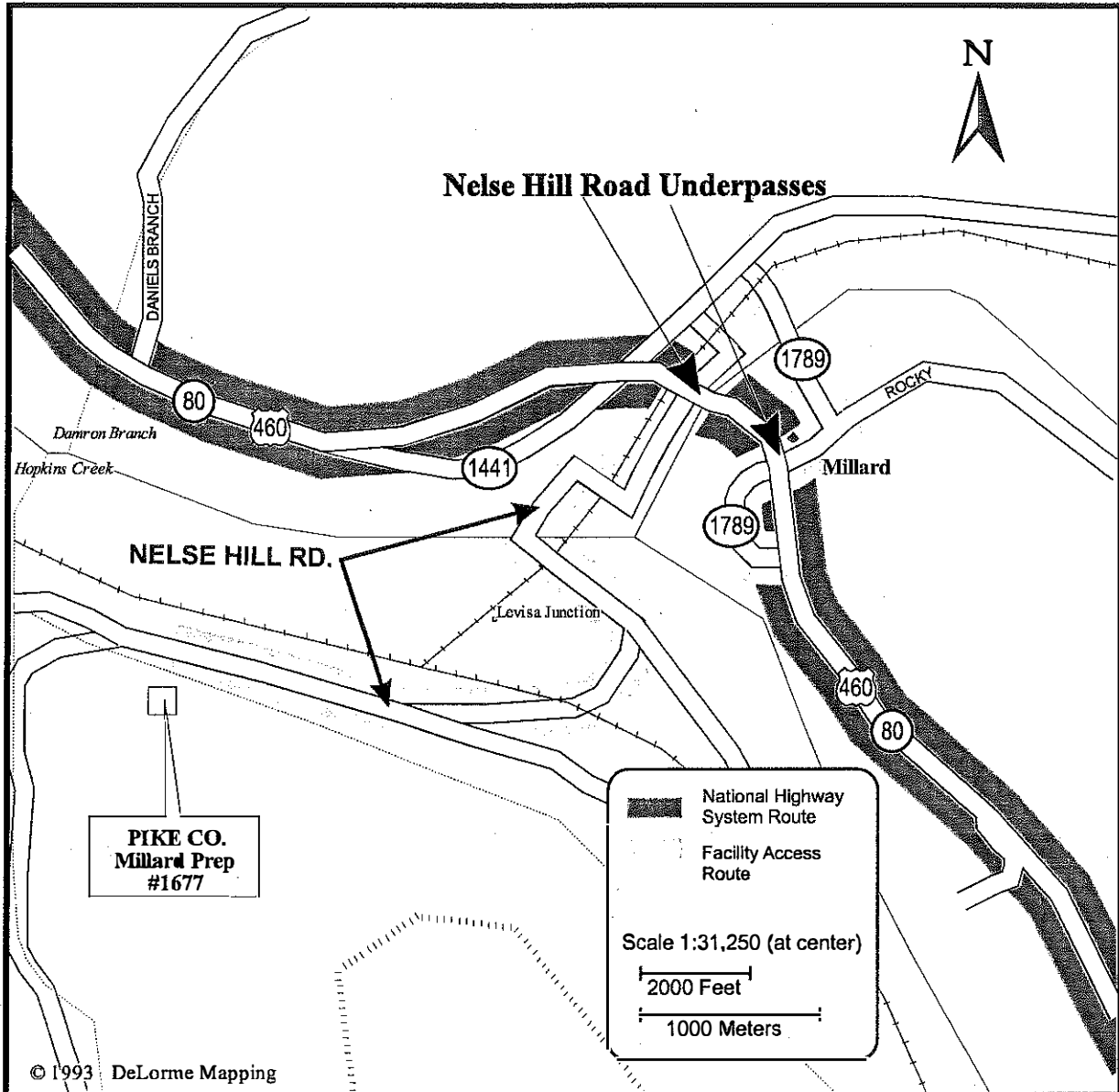
2.0 Truck Route in Use

As shown in Figure 1, trucks accessing the National Highway System from this site take Nelse Hill Road to KY 1441, then KY 1789 to US 460, a distance of approximately 1.1 miles. Nelse Hill Road has a gravel surface and no lane markings. Nelse Hill Road has two underpasses under US 460 as indicated on the map. It has only one lane and the curves are the only places wide enough to allow vehicles to meet. KY 1441 and KY 1789 are two-lane roads with minimal shoulders. There are stop signs where those roads intersect and where KY 1789 intersects US 460. KY 1441 and KY 1789 are state-maintained. The ADT on these sections is between 2395 and 2518.

An alternate route is to use KY 1441 to reach US 460. This route is part of the extended weight coal haul system which allows weights of up to 120,000 pounds. KY 1789 has a weight limit of 62,000 pounds. Although both routes are approximately the same length, nearly all of the trucks from this facility were observed using KY 1789 rather than KY 1441.

There were no signs in the field showing the name of Nelse Hill Road. The road name was obtained from a local map. The road is also known as Hopkins Creek Road and Nelse Bottom Road. Nelse Hill Road is used for the remainder of this report for simplicity.

Figure 1: Location of Truck Generating Site



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.

3.1 Traffic Operations and Level of Service

The survey of this site indicated that there were no operational problems or concerns for this site. Thus, no traffic evaluations were performed.

3.2 Accident History

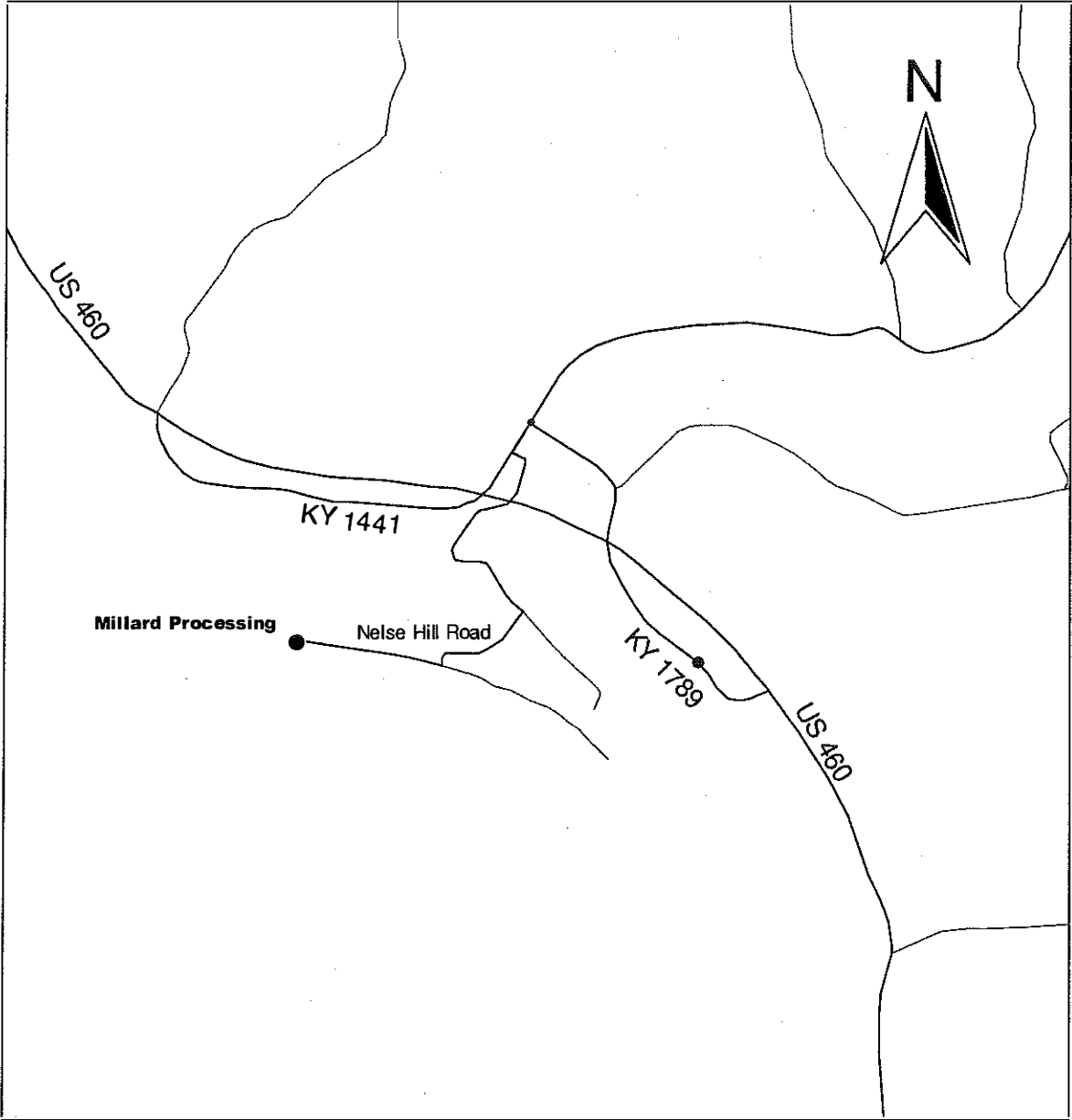
In 1997, the Kentucky Transportation Center studied all state-maintained roads throughout Kentucky and determined average truck accident rates for different types of road sections. A critical accident rate was then calculated using the average accident rate for a specific highway type along with an assumed level of statistical significance and exposure (vehicle miles traveled). There were no sections along this route where the accident rate was as high as the critical rate for that type of highway.

Figure 2 shows the locations of accidents during the years 1995, 1996 and 1997. Accident data were not available for Nelse Hill Road. The figure does not indicate any problem areas along the route.

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

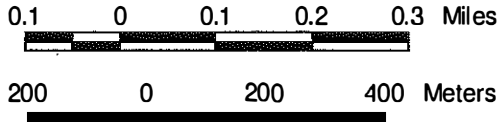
Figure 2: Accident Locations (1995-1997)



LEGEND

- Facility
- Accidents: 1
- Accidents: 2

Scale - 1:11000



A summary of the accidents along the truck route is shown in Table 2 for the same three-year period. The single truck accident represents 33.3% of the total accidents along the route. The percentage of trucks on this route was not available. The low number of accidents suggests that there are no apparent safety concerns from an accident history point of view along the route.

Table 2: Accident Types along Truck Route

	<i>Non-Truck Accidents</i>	<i>Truck Accidents</i>	<i>Percent Trucks</i>
Total	2	1	33.3
Injury	2	0	0.0
Intersection	0	0	0.0
Fatal Accidents	0	0	0.0

3.3 Cross Section Features

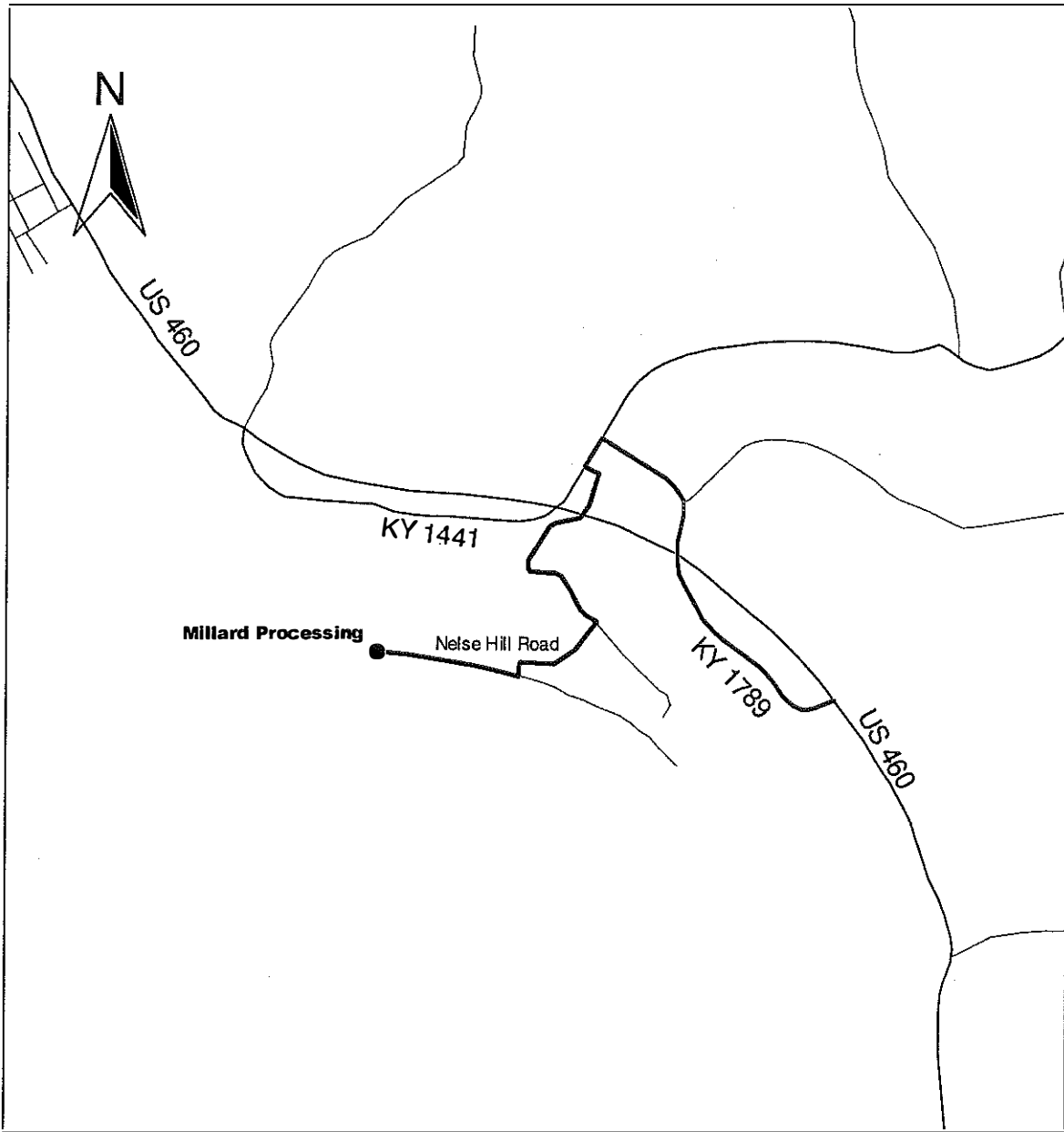
Figures 3 and 4 illustrate the sections of the route having different widths of lanes and shoulders. Nelse Hill Road is a two-way road that is only 12 feet wide. It is considered a one-lane road with a lane width of 12 feet. This is clearly “less than adequate” for trucks. KY 1441 and KY 1789 have “adequate” 11-foot lanes. Nelse Hill Road had no shoulder, while KY 1441 and KY 1789 had a shoulder width of one foot. The entire route was rated “less than adequate” for shoulder width. The clear zone was generally good along the route with rock formations causing some problems. The pavement was in good condition along the route.

3.4 Curvature Features

Grades are considered problematic if they cause trucks to slow down excessively. There were no problematic grades along this route.

Offtracking is considered a problem where a truck cannot stay in its lane through a curve. Figure 5 shows the location of three curves on KY 1789 where offtracking could be a problem as calculated from the lane width and degree of curvature. Two of the curves were rated “adequate” and the other was rated “less than adequate.” Two of those curves (see Figure 6) received a “less than adequate” rating for safe speed on a curve as measured using a ball bank indicator.

Figure 3: Lane Widths



LEGEND

- Facility
- Lane Width: 11 Feet
- == Lane Width: 12 Feet

Scale - 1:11000

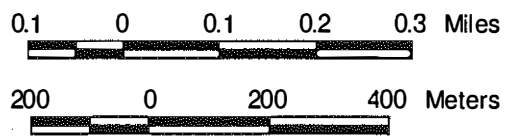
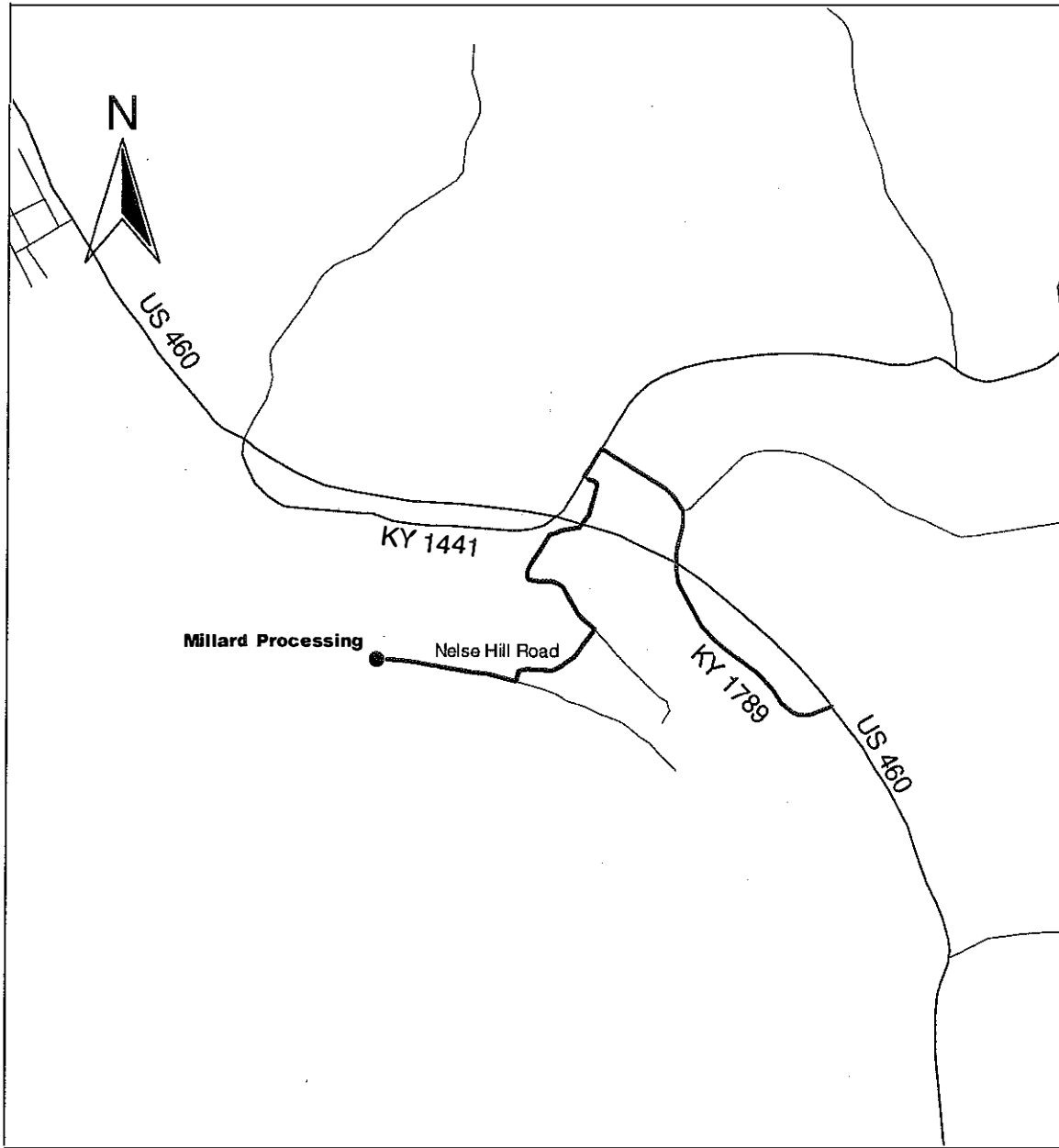


Figure 4: Shoulder Widths



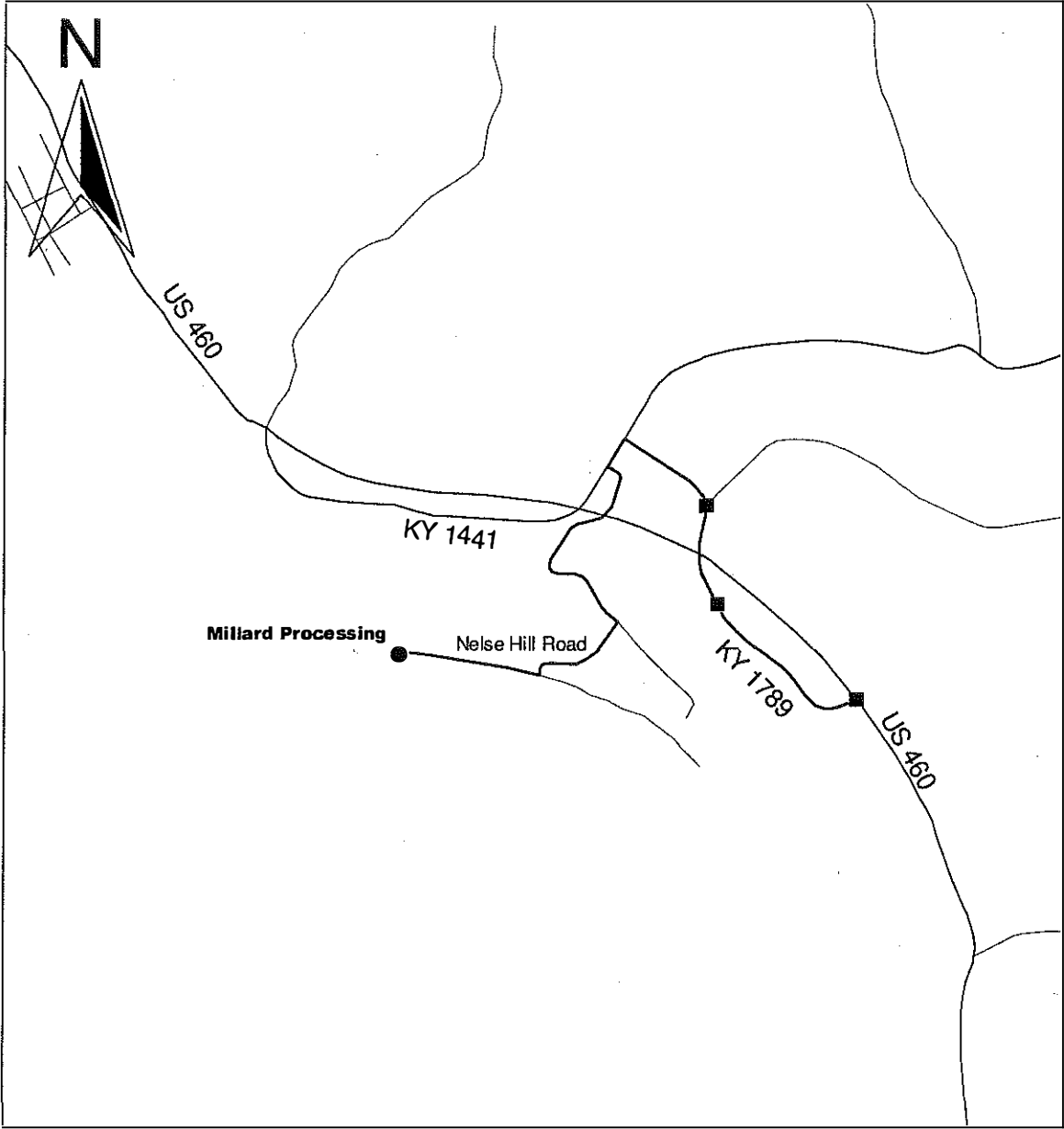
LEGEND

- Facility
- Shoulder Width - 1 Foot
- - - - No Shoulder

Scale - 1:11000



Figure 5: Curves Where Offtracking Could Occur



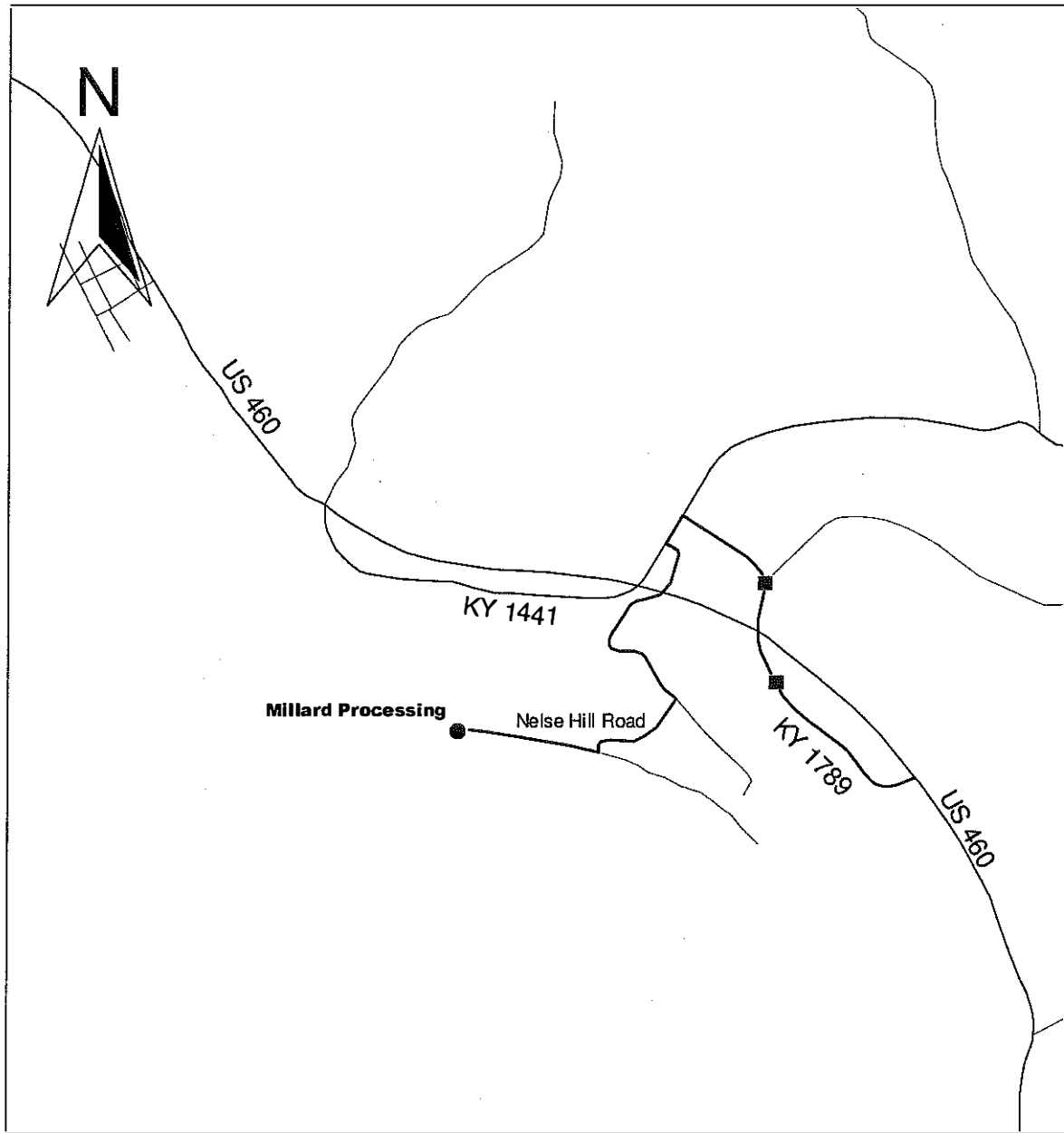
LEGEND

- Facility
- Offtracking - Adequate
- Offtracking - Less Than Adequate

Scale - 1:11000



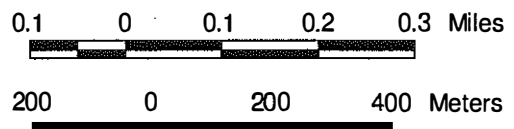
Figure 6: Curves Where Safe Speed May be a Problem



LEGEND

- Facility
- Curve Speed - Less Than Adequate

Scale - 1:11000

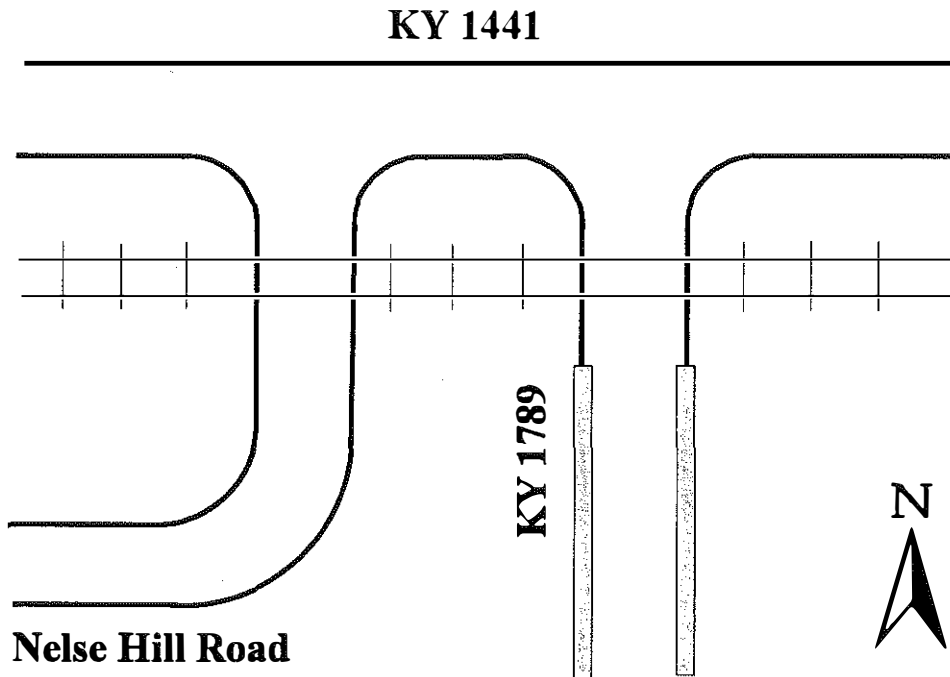


The turning radius from Nelse Hill Road onto KY 1789 was approximated in the field. A view of this intersection is shown in Figure 7, and the approximate layout of intersections is shown in Figure 8. In Figure 7, the pick-up truck is on KY 1441, Nelse Hill Road crossing the railrail track is in the foreground, and the bridge on KY 1789 can be seen beyond Nelse Road on the right hand side of the picture. Trucks perform a U-turn maneuver and do not make separate turns on and off of KY 1441. The 50-foot radius of this turn was rated “less than adequate” because trucks were observed turning into opposing traffic lanes on both KY 1441 and KY 1789.

Figure 7: Turning Radius from Nelse Hill Road onto KY 1789 via KY 1441



Figure 8: Layout of Intersection



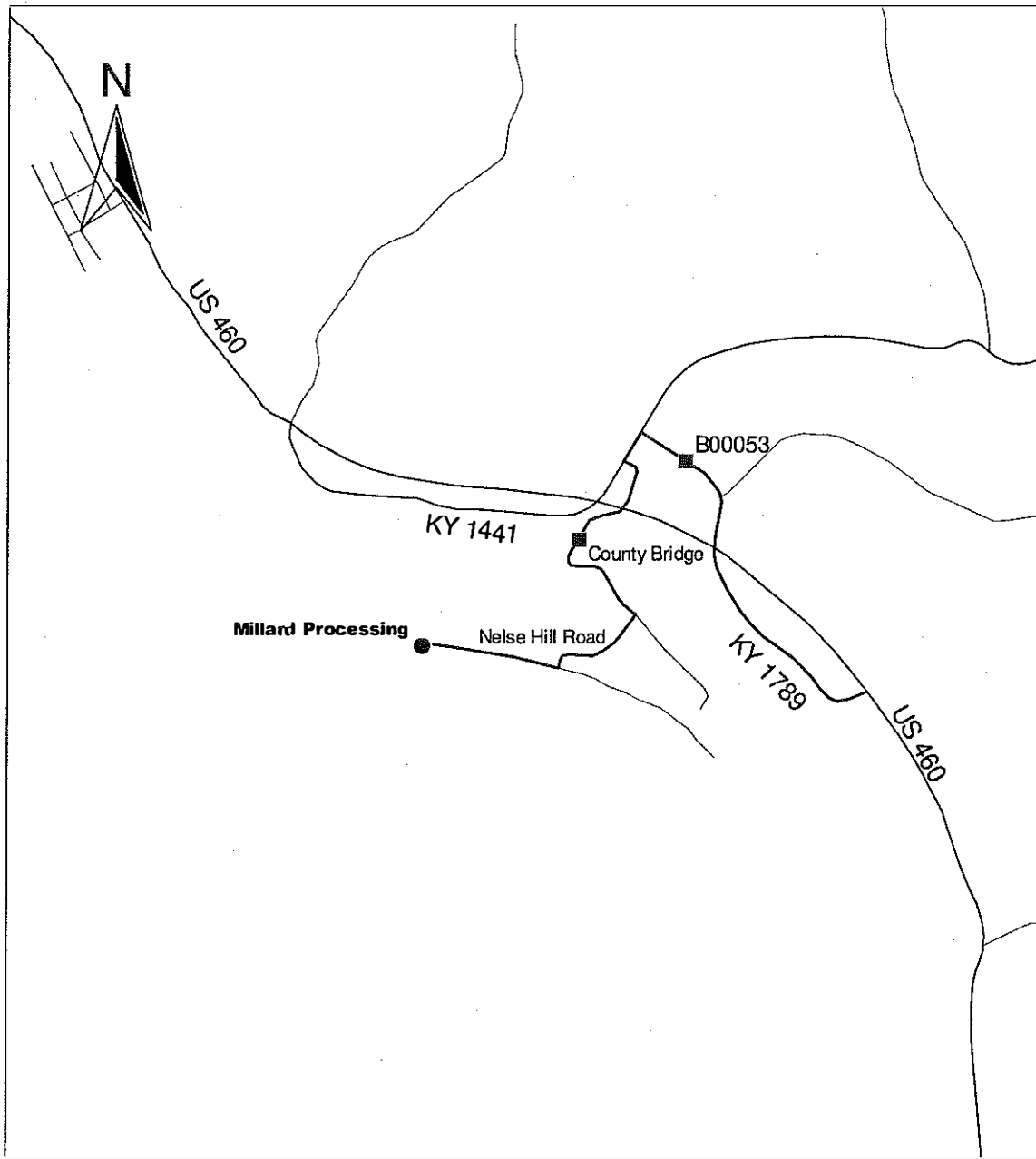
3.5 Railroad Crossings

The railroad crossings on KY 1789 and Nelse Hill Road near KY 1441 (see Figure 7) were rated “adequate” due to rough crossing surfaces. A crossing on Nelse Hill road approximately 0.4 mile from KY 1441 received a “preferred” rating. The locations of the railroad crossings are shown in Figure 1.

3.6 Bridges

As shown in Figure 9, the route includes bridges on KY 1789 and Nelse Hill Road. The bridge on KY 1789 has a sufficiency rating (provided by the Division of Operations at the KYTC) of 91.4 (out of a possible 100) which gives it a “preferred” rating. The bridge on Nelse Hill Road does not have a sufficiency rating because it is not maintained by the state or county. This bridge is only 14 feet wide and carries two-way traffic.

Figure 9: Bridge Locations



LEGEND

- Facility
- B00053 Bridges - Bridge Number

Scale - 1:11000

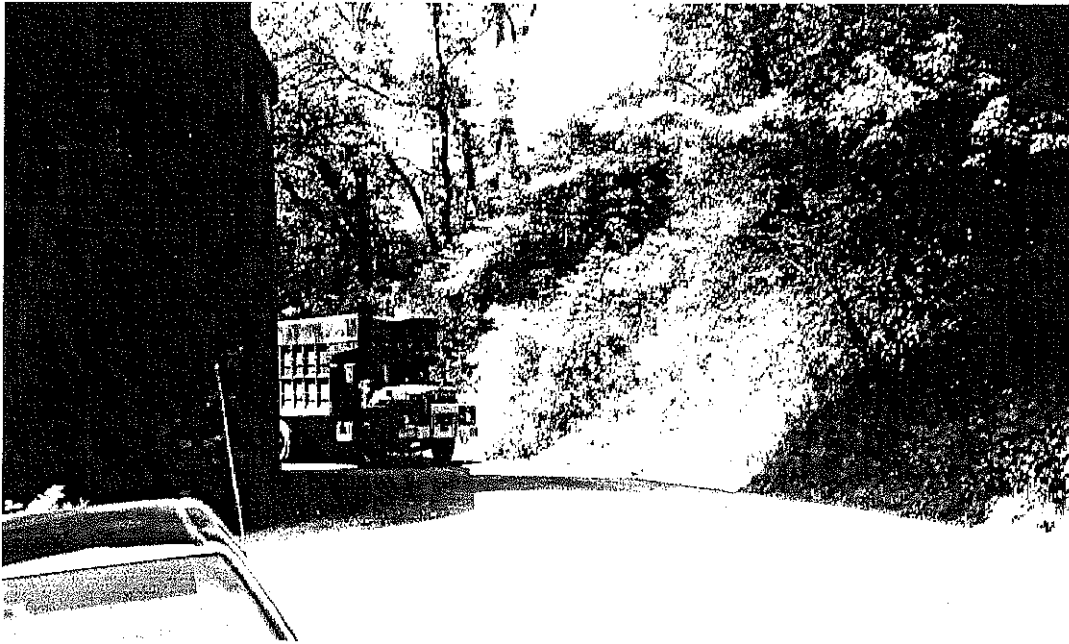
0.1 0 0.1 0.2 0.3 Miles

200 0 200 400 Meters

3.7 Sight Distance

There were no sight distance problems observed at intersections on this route. As shown in Figure 10, a pier of the railroad bridge blocks sight distance around a curve on Nelse Hill Road. It is assumed that the low travel speeds on this road due to width and curvature will eliminate any safety problems associated with this sight distance.

Figure 10: Sight Distance on Nelse Hill Road



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 were normalized for the number of miles, number of points and number of trucks using the route section. In the case of this Pike County route, six 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 estimated from the phone survey information and field observations because the data were not available from other sources. Approximately half of the trucks using KY 1789 were traveling to the facility on KY 1441.

Table 3 contains the total problem truck miles and total problem points for lane width, shoulders, offtracking, curve speed, turning radius and railroads along this route. The rating of this route relative to others evaluated will be reported in the final report.

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

Feature	Road	Location	Points*	Length (miles)	Trucks (/day)	Truck-points	Truck-miles
Lane Width	Nelse Hill	Length	2	0.7	400		560
	KY 1789	Length	1	0.4	800		320
Total							880
Shoulders	Nelse Hill	Length	2	0.7	400		560
	KY 1789	Length	2	0.4	800		640
Total							1,200
Offtracking	KY 1789	MP 0.0	1		800	800	
	KY 1789	MP 0.2	2		800	1600	
	KY 1789	MP 0.3	1		800	800	
Total						3,200	
Curve Speed	KY 1789	MP 0.2	2		800	1600	
	KY 1789	MP 0.3	2		800	1600	
Total						3,200	
Turning Radius	Nelse Hill	KY 1789	2		200	400	
Railroads	Nelse Hill	Near KY 1441	1		400	400	
	KY 1789	MP 0.4	1		800	800	
Total						1,200	

*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

Some features noted during the site work could be changed to improve truck access without requiring major construction or expense. The rough railroad crossings on the route could be improved. A sign could be added on KY 1441 to mark Nelse Hill Road.

4.3 Overall Route Rating

In order to account for both the subjectively 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 4. This route received an overall rating of 2 indicating that major construction is needed to improve the route.

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
3-5	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:

- Two-way traffic on a one-lane road (Nelse Hill Road),
- Lack of usable shoulders,
- Problematic horizontal curves on KY 1789,
- Inadequate turning radius from Nelse Hill Road onto KY 1789,
- Rough railroad crossings,
- Sight distance around bridge pier, and
- Narrow bridge on Nelse Hill Road.

The low traffic volumes on Nelse Hill Road may not justify major improvements along that road. The intersection of Nelse Hill Road, KY 1441 and KY 1789 could be improved to eliminate the problems with turning radius and rough railroad crossings. These problems could also be

addressed through enforcement of existing weight limits on KY 1789. Enforcing the weight limit would encourage trucks to use KY 1441 (on the extended-weight coal haul system) rather than KY 1789.

Appendices

Appendix A: Phone Survey Conducted with Facility

<u>Facility ID</u> 1677	<u>Facility Name</u> Millard Processing	<u>Location / City</u> Nelse	<u>County</u> Pike	<u>ADD</u> Big Sandy
<u>Contact Name</u> Kermeal Hylton	<u>Title</u>	<u>Phone</u> 606-432-5217	<u>Fax</u> 606-432-5547	

1. Is the location of your facility on the map correct? Yes
2. Our information shows about 80 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?
Seasonal, higher in summer
4. *(If truck traffic is seasonal)* Is the 80 trucks/day for the peak season? No
5. What is the most common size truck operating at your facility? 48' Semitrailer
6. What is the largest truck operating at your facility? 48' Semitrailer
7. What type of freight or commodity is shipped, and is incoming and outgoing freight different? *(one may be an empty truck)*
Lime, coal, etc.
8. Does the truck traffic peak at specific times of the day? (e.g., out in the morning and return in the afternoon) 6:00 a.m. to noon
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) Cincinnati area, Indiana, Louisville
11. Do you have any other problems or concerns along the route you would like us to consider?
None
12. Would you like a copy of the final report (roadway/route evaluation ???) Yes