

# TRUCK ROUTE ACCESS EVALUATION

Cook Family Foods  
Grayson  
Site # 2663

Report No. KTC-98-28

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

By

Joel Weber

with

Ken Agent  
Brian Aldridge  
Lisa Aultman-Hall  
Dave Cain  
Nicole Lefever  
Nick Stamatiadis

KENTUCKY TRANSPORTATION CENTER  
1998



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

September 1998

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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 Cook Family Foods facility located in Carter county in the FIVCO Area Development District (ADD) and KYTC Highway District #9. 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 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.

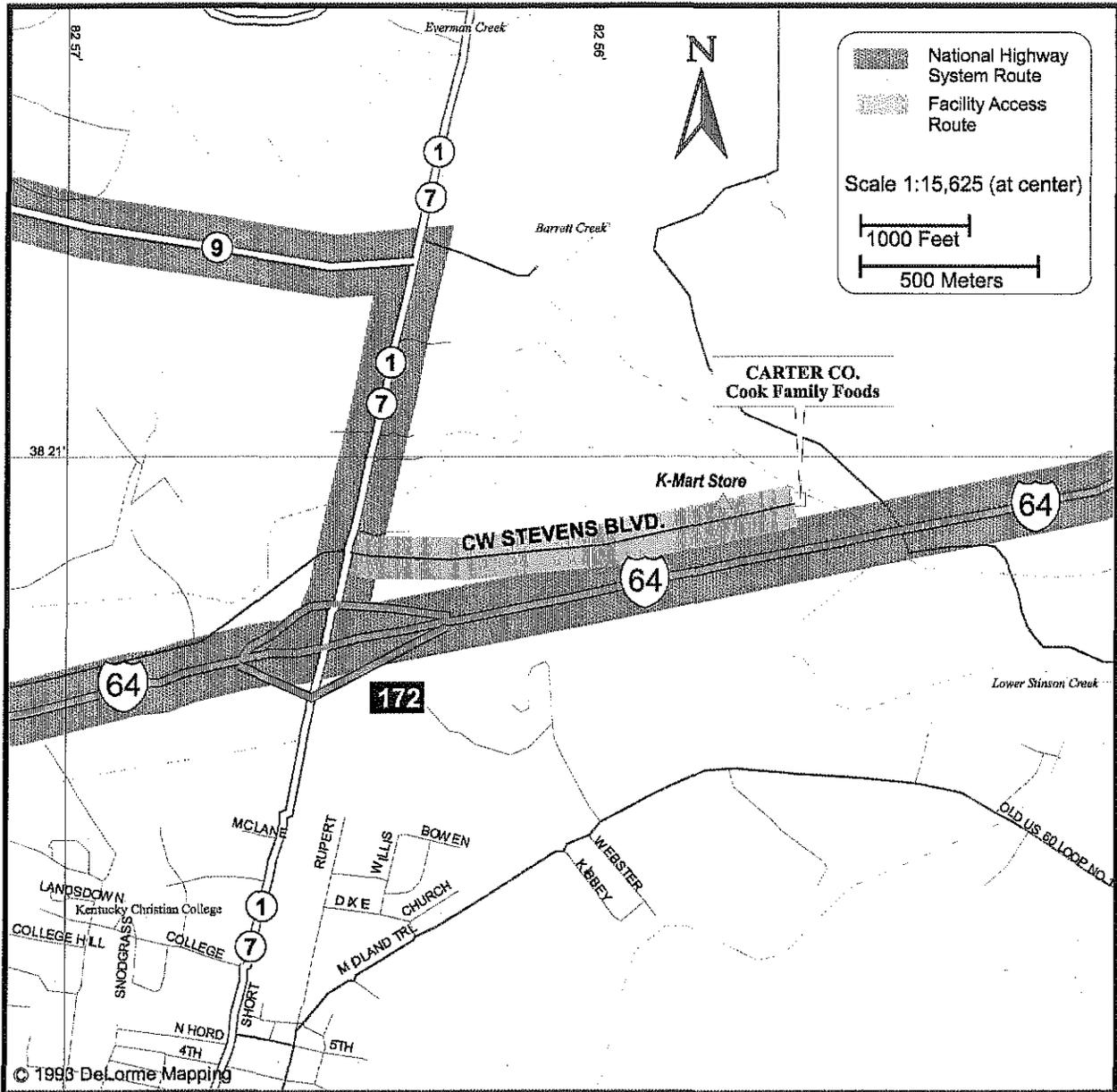
The site was visited for video recording and data collection as listed in Appendix A. The facility is located at the end of CW Stevens Boulevard approximately 0.5 miles east of KY 1/KY 7, which is part of the National Highway System. The surrounding area is currently being developed. A phone survey was conducted with facility managers early in the study process. The phone survey found that approximately 50 trucks per day access the site. The trucks are generally semi tractor trailers with a maximum length of 53 feet. The freight handled at this facility is primarily meat products. The survey indicated that the traffic signal at the intersection of CW Stevens Boulevard and KY 1/KY 7 is slow, and that the exit ramp from I-64 eastbound does not have a traffic signal. The phone survey information can be found in Appendix B.

## **2.0 Truck Route in Use**

There is currently only one route for trucks to reach the National Highway System from this site. \*The trucks accessing the facility are traveling to and from KY 1/KY 7, a distance of less than a mile as shown in Figure 1. CW Stevens Boulevard is a paved street with extremely faded center and edge lines. It is not state maintained. The only traffic signal on the route is at the intersection of CW Stevens Boulevard and KY 1/KY 7.

\*Although the route to the NHS ends at KY1/KY 7, the evaluation of traffic operations and level of service in Section 3.1 was expanded to include the I-64 interchange so that the problems described in the phone survey could be addressed.

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 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 as “preferred” type sections and points do not contribute to an increase in the problem truck points or miles that are summed for the route (see Section 4).

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

The phone survey of this site indicated that there may be a need for a signal at the I-64 ramps and there are delay related problems at the intersection of KY 1/KY 7 and CW Stevens Boulevard. Therefore, the intersection was analyzed using the Level of Service (LOS) approach from the Highway Capacity Software and an overall arterial LOS was utilized using a travel time study. The midday peak period was used for both analysis. Basic assumptions for all intersections are the lack of signal coordination, the absence of pedestrians, and the use of 3 seconds as lost time per phase. The lane use diagrams and volume counts for each intersection are shown in Appendix C.

The results for the intersection using the HCS analysis are shown in Table 2. The LOS for the intersection is at acceptable level A overall, with very low delays and no approach has any significant delays.

For the arterial analysis, a travel time study was conducted where an observer traveled along the path to access I-64 in both directions while maintaining the speed of the traffic. Three passes were made for each direction (field data is shown in Appendix C) and the average time for each direction was computed--131 sec to I-64 and 164 sec from I-64. Given the length of the route, 1.010 miles, the average travel speeds were computed--to I-65 27.8 mph and from I-65 22.2 mph. Using the Highway Capacity Manual and for a type II arterial--urban with medium development and 45 mph speed limit--the LOS is B for the direction toward I-64 and C for the direction from I-64. Therefore, no significant delays or operational problems experienced along this route, since the arterial operates at an acceptable LOS during the peak period.

Finally, the traffic volumes recorded do not indicate that a signal is warranted at the interstate ramps based on required volumes according to the Manual of Uniform Traffic Control Devices.

Given this analysis, the access route operates at an acceptable level. As the area develops further, traffic consideration may be warranted.

**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

Table 2. LOS analysis for intersection (sec/veh / LOS) (May 14, 1998)

Intersection	East-bound		West-bound			North-bound		South-bound		Inters.
	LTR	App	L	T+R	App	LTR	App	LTR	App	
KY 1/KY 7 @ CW Stevens	9.7/B	9.6/B	10.0/B	9.4/B	9.8/B	5.9/A	6.0/A	5.7/B	5.7/B	7.3/B

### 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 (vehicles miles traveled). There were no sections of this route with a truck accident rate as high as the critical rate for that particular highway type.

A summary of the accidents along CW Stevens Boulevard is shown in Table 3 for the years 1994, 1995 and 1996. There were only three accidents along this route, none of them involving trucks. This suggests there are no apparent truck related safety concerns along this route from an accident history point of view.

**Table 3: Accident Types along CW Stevens Boulevard**

	<i>Non-Truck Accidents</i>	<i>Truck Accidents</i>	<i>Percent Trucks</i>
Fatal Accidents	0	0	0
Injury	1	0	0
Intersection	1	0	0
Total	3	0	0

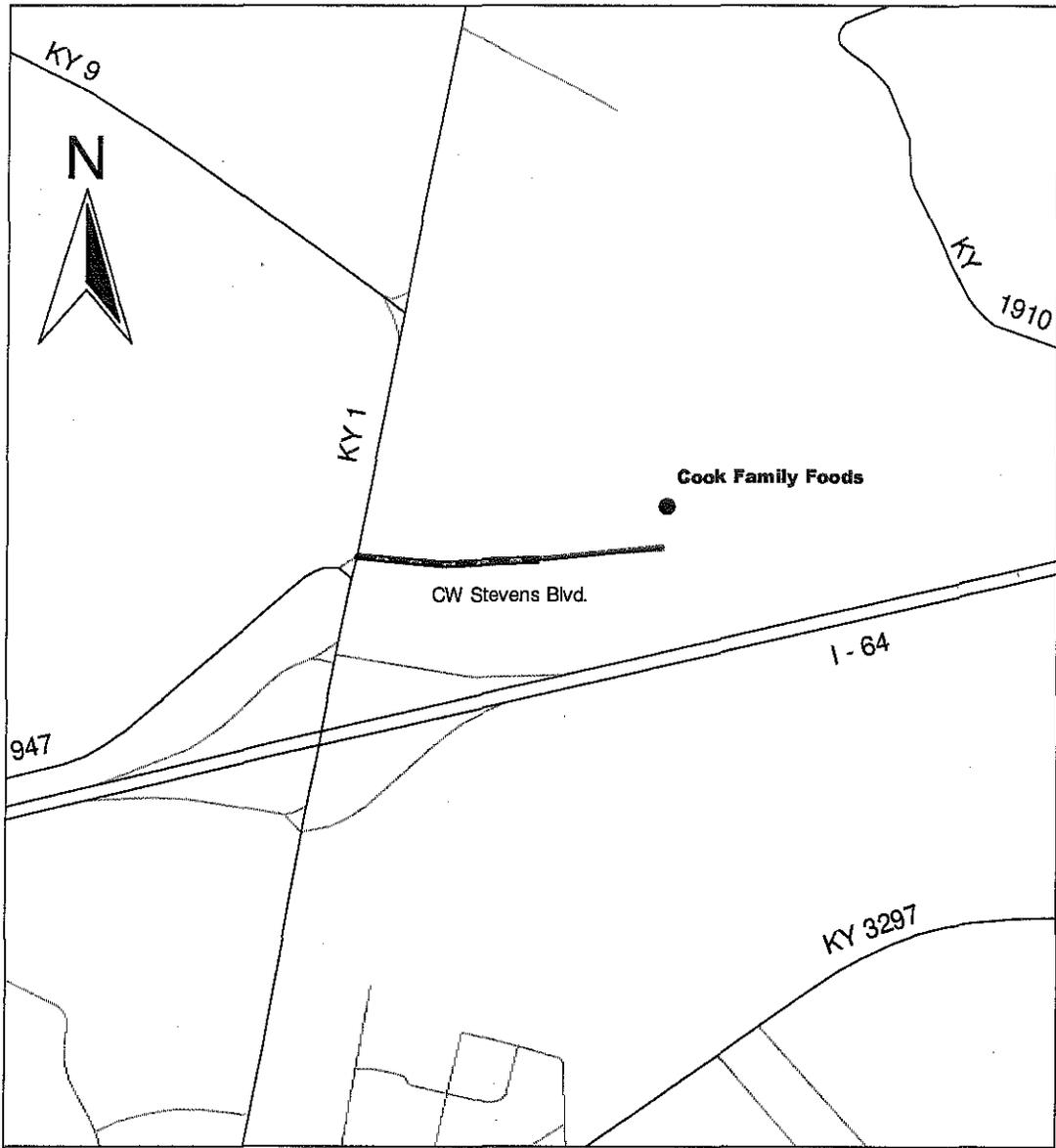
### 3.3 Cross Section Features

Figures 2 and 3 illustrate the sections of the route having different widths of lanes and shoulders. The 11 foot lanes and 10 foot gravel shoulders on the first section (0.24 mi) of CW Stevens Boulevard are considered "adequate" for trucks. The remaining section has "less than adequate" 10.5 foot lanes and does not have a shoulder which is also considered "less than adequate." No significant clear zone problems were found and the pavement was in good condition.

### 3.4 Curvature Features

Grades are considered problematic if they cause trucks to slow down excessively. No such grades were found on CW Stevens Boulevard. There were no segments where safe speed on curves or offtracking would be a problem for trucks along this route.

**Figure 2: Lane Widths**



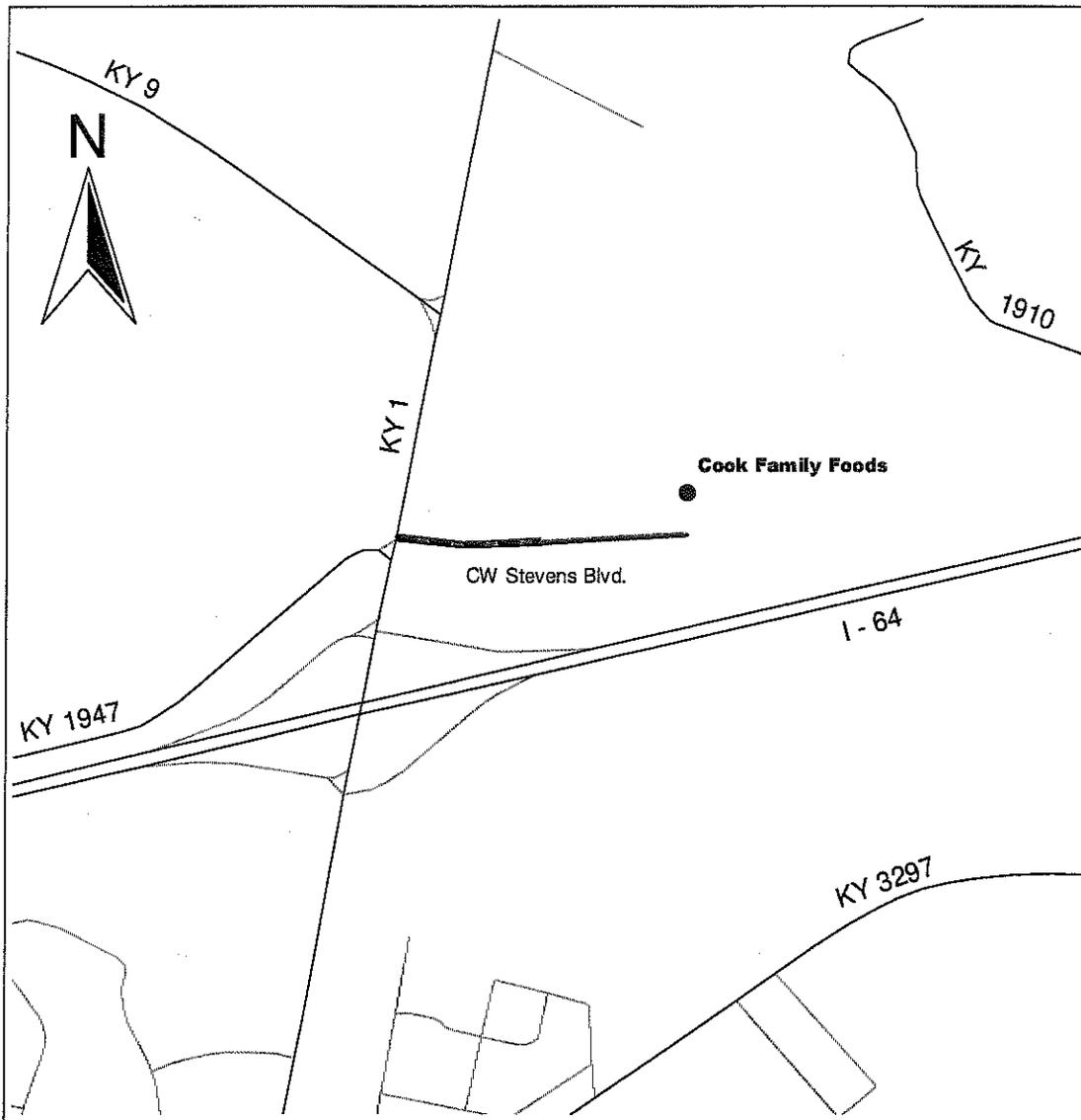
**LEGEND**

- Facility
- Lane Width: 10.5 Feet
- Lane Width: 11 Feet
- State Highway System
- Other Roads

**Scale - 1:12000**



**Figure 3: Shoulder Widths**



**LEGEND**

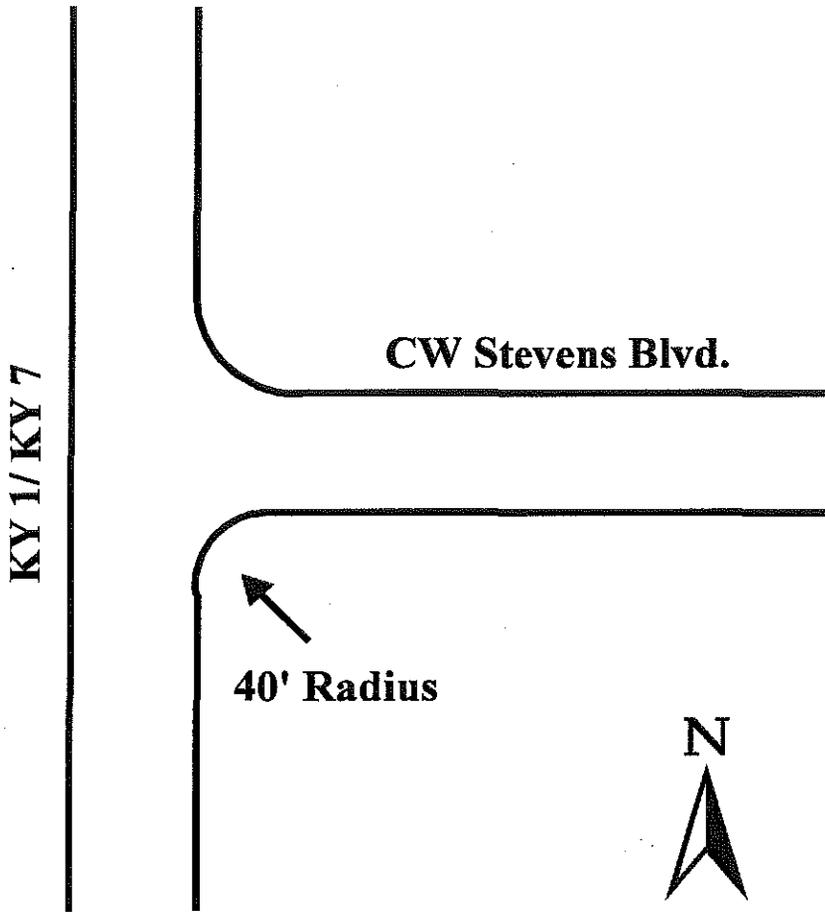
- Facility
- No Shoulder
- Shoulder Width: 10 Feet
- State Highway System
- Other Roads

**Scale - 1:12000**



The turning radius from KY 1/KY 7 onto CW Stevens Boulevard was approximated in the field. The layout of this location is shown in Figure 4. The 40 foot radius was rated “adequate” because the trucks must use the gravel shoulder to complete the turn as shown in Figure 5. The turning radius from CW Stevens Boulevard north onto KY 1/KY 7 was also rated “adequate” because trucks can complete turn by partially encroaching on other lanes in the same direction.

**Figure 4: Approximate Turning Radius at KY 1/KY 7 and CW Stevens Boulevard**



**Figure 5: Truck Turning from KY 1/ KY 7 onto CW Stevens Boulevard**



### **3.5 Railroad Crossings**

There were no at-grade railroad crossings on this route.

### **3.6 Bridges**

There were no bridges on this route.

### **3.7 Sight Distance**

There were no sight distance problems on this route.

### **3.8 Other Route Features**

There is a K-mart on CW Stevens Boulevard near the entrance to Cook Family Foods (see Figure 1). Several trucks were observed using the K-mart parking lot as a turning area and for short term parking. The turning radius onto CW Stevens Boulevard at the K-mart entrance is “less than adequate.”

## 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 are to be normalized for the number of miles, number of points and number of trucks using the route section. In the case of the Cook Family Foods route, three features that were evaluated quantitatively have sections or points that are considered only “adequate” or “less than adequate.” A section or point that is considered “less than adequate” is weighted two times that of an “adequate” point or section. Less than “preferred” sections are weighted by length as well as the number of trucks passing that point. The number of trucks was obtained from a 1998 KYTC Vehicle Classification Count.

Table 4 contains the total problem truck miles and total problem points for lane width, shoulders and turning radii along this route. The rating of this route relative to others evaluated will be reported in the final report.

**Table 4: Summary of Problem Truck Miles and Points for Entire Route**

Feature	Road	Location	Points*	Length (miles)	Trucks (/day)	Truck-points	Truck-miles
Lane Width	CW Stevens	First half	1	0.24	307		73.7
	CW Stevens	Second half	2	0.24	307		147.4
<b>Total</b>							<b>221.1</b>
Shoulders	CW Stevens	First half	1	0.24	307		73.7
	CW Stevens	Second half	2	0.24	307		147.4
<b>Total</b>							<b>221.1</b>
Turning Radii	KY 1/ KY7	CW Stevens	1		261	261	
	CW Stevens	KY 1/KY 7	1		46	46	
<b>Total</b>						<b>307</b>	

\*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 addressed during routine maintenance programs by either the state or county and therefore could improve truck access without requiring major construction or expense. The center and edge lines on CW Stevens Boulevard could be repainted, and pavement widening could reduce the turning radius problems at the intersection of CW Stevens Boulevard and KY 1/KY 7.

## 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 5. The route in Carter County to Cook Family Foods was given an overall rating of 8 indicating that minor improvements could improve the truck access along this route.

**Table 5: Interpretation of the Overall Route Rating**

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

## **Appendices**

**Appendix A: Field Site Visit Dates and Activities**

February 25, 1998 - initial site visit and video taping

May 6, 1998 - field data collection

May 14, 1998 - traffic counts and travel time survey

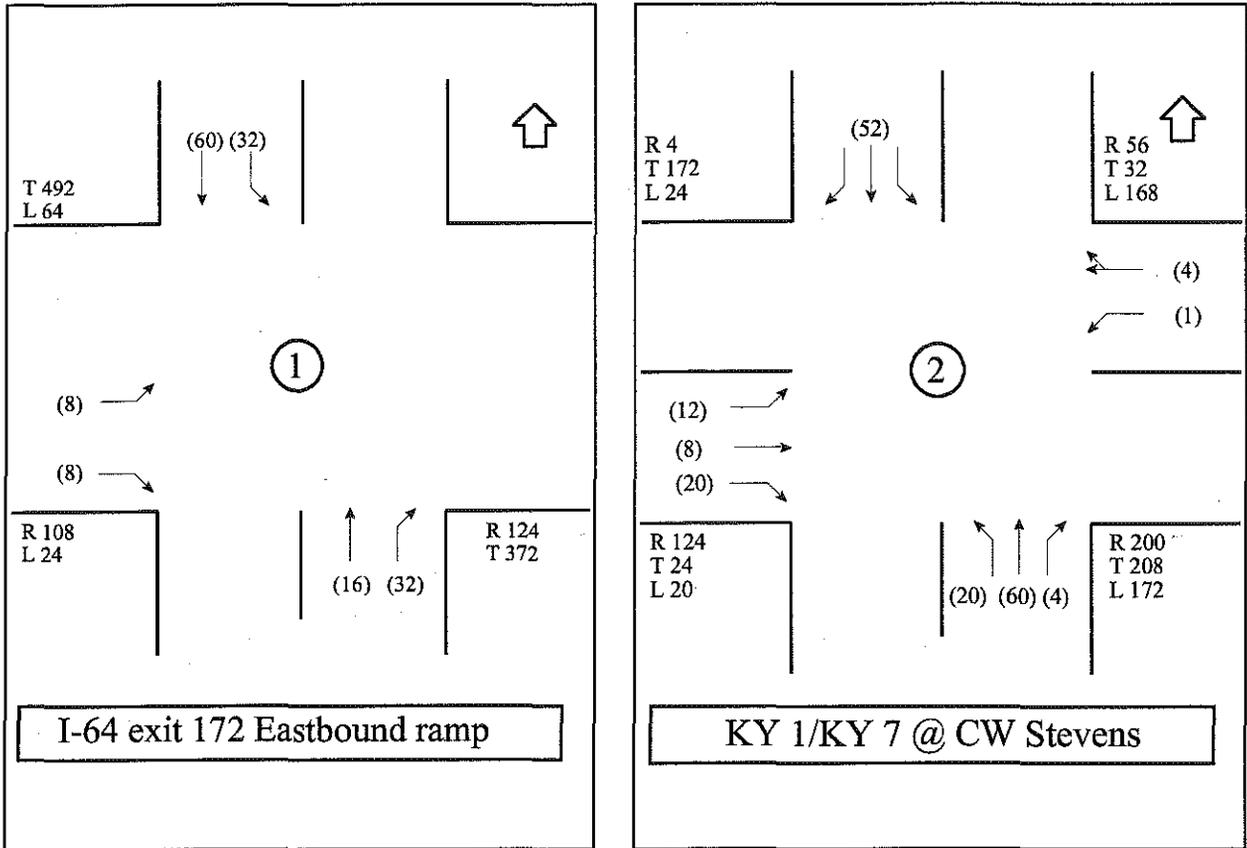
**Appendix B: Phone Survey Conducted with Facility**

<u>Facility ID</u>	<u>Facility Name</u>	<u>Location / City</u>	<u>County</u>	<u>ADD</u>
2663	Cook Family Foods	Grayson	Carter	FIVCO
<u>Contact Name</u>	<u>Title</u>	<u>Phone</u>	<u>Fax</u>	
Don Bond		606-474-3900	606-474-3939	

1. **Is the location of your facility on the map correct?** No, should be at end of CW Stevens
2. **Our information shows about 50 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, September - April peak season
4. **(If truck traffic is seasonal) Is the 50 trucks/day for the peak season?** Yes
5. **What is the most common size truck operating at your facility?** Semitrailer 40' refrigerated
6. **What is the largest truck operating at your facility?** Semitrailer 53'
7. **What type of freight or commodity is shipped, and is incoming and outgoing freight different? (one may be an empty truck)**  
In: Green hams      Out: Processed boxed hams
8. **Does the truck traffic peak at specific times of the day? (e.g., out in the morning and return in the afternoon)** In: 6:00 a.m. - 3:00 p.m.      Out: Noon - 10:00 p.m.
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>
Exit ramp from eastbound I-64 - lack of signal causes backup.	Primarily p.m.
10. **Where do trucks at your facility go to and come from? (This may be an interstate, cities, general direction-N,S,E,W)** Mostly I-64
11. **Do you have any other problems or concerns along the route you would like us to consider?**  
Increasing development is causing high volume on CW Stevens. The 2-lane road is inadequate. Turning radius a corner of CW Stevens and KY 1/KY 7 causes corners to be abused.
12. **Would you like a copy of the final report (roadway/route evaluation ???)** Yes

### Appendix C: Traffic Counts, Intersection Layout and Travel Time Data



### Travel Time Data

To I-64		From I-64	
Pass	Time (min)	Pass	Time (min)
1	1:31	1	2:43
2	3:03	2	2:36
3	1:59	3	2:51
Avg (sec)	131		164