CHAPTER 2
EXISTING ROADWAY CONDITIONS

A key element of this transportation plan is the acquisition and analysis of information on the conditions of existing roadways. This existing information provided a means by which conditions on each roadway could be evaluated and provided a basis for the prioritization of roads described later in Chapter 3. During this part of the planning process, information was collected on county, state and federally maintained roadways. Methodologies for gathering data on these roadways varied based on the availability of existing information and the data needs for each type of roadway. County road data needs required extensive on-site field work, while most data required for state and federal roads was available through the KYTC, Highway Information System (HIS). The HIS is a statewide inventory of data that is made available through KYTC for use in transportation planning. Data available from this source includes geometric information, traffic volumes, accident data, level of service, and others. Furthermore, data for state and federal roadways maintained in the HIS is compiled based on milepoints, which readily accommodates analysis based on smaller segments of the roadway. The state does maintain limited information on county roads. Information available for this study included data on all bridges over twenty (20) feet in length and accident data. Accident data is reported on a statewide basis by police departments and maintained in the state's HIS.

STATE AND FEDERAL ROAD INVENTORY

Not all state and federally maintained roads within Campbell County were inventoried as part of this study. Roadways selected were those that 1) provided connectivity between the county road system and major state and federal roads 2) served the largest population and employment areas 3) generated the highest traffic volumes and 4) served the urban growth area as designated in the Campbell County Comprehensive Plan. For most purposes these state and federal roads function as an extension of the road system in Campbell County and carry traffic primarily generated within Campbell County versus traffic passing through Campbell County for other destinations. The designated routes included in the analysis are as follows:

<table>
<thead>
<tr>
<th>Designated State and Federal Roadways</th>
</tr>
</thead>
<tbody>
<tr>
<td>KY 8</td>
</tr>
<tr>
<td>KY 9</td>
</tr>
<tr>
<td>KY 10</td>
</tr>
<tr>
<td>KY 547</td>
</tr>
<tr>
<td>KY 824</td>
</tr>
<tr>
<td>KY 915</td>
</tr>
</tbody>
</table>

In the decision making process, these designated state roadways are, at times, overshadowed by the larger state and federal roadways serving Campbell County which
include Interstates 275 and 471, US 27 and the portion of KY 9, known as the AA Highway, which extends from I-275 to the Campbell/Pendleton County line.

Characteristics of these designated routes in Campbell County are identified in the following sections. Included are transportation systems, geometric data, traffic conditions, and crash history. Features of the highways within Campbell County are summarized from the KYTC Highway Information System (HIS) database. Table summaries of this information are located in Appendix B.

**Highway Systems**

The various highway systems represented for the Campbell County designated routes are provided for additional information and are summarized in Appendix B. These include the State System, the National Truck Network (NN), the National Highway System (NHS), functional classification and truck weight class. The highway systems information is defined as follows:

State-maintained roads in Kentucky are classified into one (1) of six (6) categories under the State System, ranging from Supplemental Road to State Primary.

The National Truck Network includes roads that have been specifically designated for use by commercial trucks with increased dimensions (102 inches wide: 13 feet, six (6) inches high; semi-trailers up to 53 feet long; trailers up to 28 feet long – not to exceed two (2) trailers per truck).

The National Highway System (NHS) was established by the Intermodal Surface Transportation Efficiency Act (ISTEA). It includes the Interstate Highway System and other significant principal arterial roads important to the nation’s economy, defense, and mobility. NHS routes in Campbell County include parts of KY 8 and US 27, and all of I-471 and I-275.

One (1) of 12 functional classification categories is assigned to each state-maintained road in Kentucky. These include rural and urban interstate, rural and urban principal arterial, urban freeway and expressways, rural and urban minor arterial, rural major collector, rural minor collector, urban collector, and rural and urban local.

A truck weight class is designated for the Kentucky state-maintained highway system as required by Kentucky Revised Statutes. With the exception of permits for over-dimensional or over-gross-vehicle-weight-classification-limit vehicles issued by the KYTC, Division of Motor Carriers, there are three (3) weight classification limits: 1) AAA – 80,000 lbs. gross vehicle weight; 2) AA- 62,000 lbs. gross vehicle weight; and 3) A – 44,000 lbs. gross vehicle weight.
Geometric Characteristics

Geometric characteristics for designated routes in Campbell County, presented in Appendix B, include items such as the number of lanes, lane widths, shoulder widths, roadway type, and route speed limits. The geometric characteristics are used in the existing level of service and crash analysis and provided for additional reference. For additional information, selective geometric characteristics information is defined as follows:

Shoulder width is either a measure of the shoulder width in feet or designated as a curb and gutter section (i.e. Curbed) with no shoulder.

Roadway type can be one of three designations: couplet, divided highway, or undivided highway. A couplet refers to a pair of one-way streets.

Existing Traffic and Level of Service

Campbell County’s existing traffic and operational conditions, for the above designated routes, are listed in Appendix B. For this project, both existing (Year 2002) traffic volumes and level of service (LOS) have been identified and are discussed further in this section.

Existing traffic volumes (Year 2002) for select segments were summarized based on information provided in the HIS database. Existing truck percentages were determined for the study area routes using the HIS data and KYTC default values based on the functional classification of the segment. For the designated routes, traffic volumes range from a low of less than 200 vehicles per day (vpd) along KY 1121 up to 28,300 vpd along KY 8. Note that traffic volumes along the Interstate system and US 27 equal and in several cases far exceed the volumes along KY 8.

Level of Service (LOS) is a qualitative measure defined in the 2000 Highway Capacity Manual, published by the Transportation Research Board (TRB), and used to describe traffic conditions. Individual levels of service characterize these conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Six (6) levels of service are defined and are given letter designations from A to F. Each level of service represents a range of operating conditions and is described in general terms in Table 1.

Typically, a minimum of LOS D is acceptable in urban areas and LOS C in rural areas. The 2000 Highway Capacity Manual provide guidelines on the analytical procedures for estimating LOS for streets and highways. For the Year 2002, LOS along the designated routes is acceptable except along KY 8 in the urban areas of Newport and Bellevue. LOS along the designated routes is shown on Map 1.
TABLE 1
LEVEL OF SERVICE DESCRIPTIONS

<table>
<thead>
<tr>
<th>LOS</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Represents the best operating conditions. Traffic is free flowing and drivers are able to drive at their desired speed. Delays are minimal.</td>
</tr>
<tr>
<td>B</td>
<td>Traffic flow is stable, but the presence of other vehicles in the traffic stream becomes noticeable. Freedom to select a desired speed is not affected, but freedom to maneuver slightly declines. Delays remain minimal.</td>
</tr>
<tr>
<td>C</td>
<td>Traffic flow is stable, but interactions with other vehicles in the traffic stream begin to affect operations. Speed selection and maneuvering are affected by the presence of other vehicles. Delays become noticeable and general levels of comfort and convenience decline noticeably as well.</td>
</tr>
<tr>
<td>D</td>
<td>This represents high density, but stable, flow. Speed and freedom to maneuver are severely restricted, but traffic flow remains high. Delays are more substantial and intersection queues form frequently. Though driver comfort and convenience generally are poor, the utility or productivity of the facility is high. This is often considered to be the limit of acceptability for planning purposes in urban areas.</td>
</tr>
<tr>
<td>E</td>
<td>Operating conditions are at or near capacity. All speeds are reduced to a low, but relatively uniform value. Freedom to maneuver is extremely difficult and driver comfort and convenience levels are extremely poor. Delays approach an unacceptable level and operations are usually unstable.</td>
</tr>
<tr>
<td>F</td>
<td>Oversaturated conditions exist when demand exceeds capacity, resulting in forced or breakdown flow. Operations are characterized by stop-and-go conditions and are extremely unstable. Delays generally exceed limits of driver acceptability. Though undesirable, LOS F conditions are commonplace during peak traffic periods in major urban areas.</td>
</tr>
</tbody>
</table>


Crash Summary

Crash data for the designated routes in Campbell County were considered for a three-year period from January 1, 1999, to December 31, 2001. The location of crashes with valid milestone designations, recorded in the HIS database, are shown by corridor segment and by spot (0.1 miles in length) in Appendix B to determine possible high crash locations. A spot location or segment of roadway is considered to have a high crash rate when the total crash rate is higher than the critical crash rate for similar roads in the area.

When a spot location or segment has a critical rate factor greater than one (1.00), it indicates that crashes at this location may not be occurring randomly. The critical rate factors are calculated on the methodology presented in the Kentucky Transportation Center’s *Analysis of Traffic Accident Data in Kentucky (1995-1999)*. Accident Rate, Critical Rate and Critical Rate Factor (CRF) is defined as follows:
Accident Rate – The accident rate is expressed in terms of annual accidents per 100 million vehicle miles traveled. The rate allows for comparison of accident history among roadways having different traffic levels.

Critical Accident Rate - A statistically derived accident rate developed for similar types of facilities throughout the state. A high accident location has an accident rate greater than the critical rate for that type of facility.

Critical Rate Factor (CRF) - A comparison of the accident rate to the critical accident rate:

\[
\text{Critical Rate Factor (CRF)} = \frac{\text{Accident}}{\text{Critical}}
\]

As part of this process, each crash was classified into one (1) of three (3) categories based on the degree of severity: fatal, injury, or property-damage-only. During the period studied, there were six (6) fatal, 273 injury, and 735 property-damage-only crashes along the designated Campbell County routes. These are depicted on Map 2.

High accident segments were identified along KY 8, KY 10, KY 547, KY 915, KY 1121, and KY 2238. Smaller spot locations were located throughout Campbell County along the designated routes. These spot locations are identified with triangles on Map 2.

LOCALLY MAINTAINED FUNCTIONALLY CLASSIFIED INVENTORY

In addition, to the county, state and federal roadways reviewed, this study inventoried the Local Maintained Functionally Classified Roads (LMFC) within Campbell County. A LMFC Route is defined to perform to at a higher level than a local road and connect residential areas to commercial centers. By being designated as LMFC roadways and functionally classified as Urban Collector and Minor Arterial Streets, they are eligible for federal funding. The KYTC can assist with maintenance of a locally maintained functionally classified route.

As with the state and federal roadways, characteristics of the LMFC routes within Campbell County are identified in Appendix B. Included are transportation systems, geometric data, traffic conditions, and crash history. Features of the highways within Campbell County are summarized from the KYTC Highway Information System (HIS) database.

As seen in Appendix B for LMFC roadways, data from the HIS database is incomplete in some areas. Because of this fact, the calculation of LOS has been estimated and should be considered a preliminary planning level calculation. Future consideration of specific projects should be analyzed on a more detail level as needed.

Similar to the state and federal roadways, crash data were considered for a three-year period from January 1, 1999, to December 31, 2001. During the period studied, there were no fatal, 61 injury, and 530 property-damage-only crashes along the designated
CAMPBELL COUNTY TRANSPORTATION PLAN

CRASH DATA ON DESIGNATED STATE ROADS*

LEGEND

FATALITY •
HIGH VEHICLE CRASH SPOT ▲
INJURY ♦
PROPERTY DAMAGE ONLY ♣

*Designated routes are those identified for inclusion in this study. See Page 2-1 for further detail.

MAP 2
LMFC Campbell County routes. Because crash data for LMFC routes are not identified by milepoint, a detailed crash analysis could not be conducted.

COUNTY ROADWAY INVENTORY

The distinguishing feature of this plan over many that have been done up to this time within the OKI region is the emphasis on county maintained roadways. County roads in Campbell County were for the most part built to handle low volume "farm to market" type traffic. A shift toward more urbanized land use patterns has increased traffic on the county road system. Urbanization is characterized by lot and parcel sizes that are smaller than typical farms. Persons residing in these areas do not typically rely on agriculture as the primary source of income, but commute to work at other employment centers. Traffic demands and increased roadway usage resulting from this activity is placing increased maintenance and capacity burdens on the county which will result in financial impacts. Existing and future growth anticipated within Campbell County, the interest by city and county officials to effectively plan for future budgetary issues and decisions related to road maintenance and improvements is the focus of the plan.

The inventory and analysis of existing county roadway conditions provides the basis for the county road portion of this plan. The inventory/analysis of county roads and the development of a database, suitable for on-going update by the Campbell County Road Department is one of the important final products of this planning process.

Inventory Process

The inventory process included three (3) components. The county road field survey comprised the cornerstone of this effort. Traffic volumes and accident data comprised two (2) of the other components and the final component of the inventory was the development of the database and accompanying mapping of existing conditions.

County Road Field Survey

The county road field survey involved a process whereby a trained technician traveled each county road and observed its physical condition, measured bridge and pavement width, and recorded the components noted above. Digital photographs were taken to supplement field data.

Prior to embarking to the field for the survey, the consultant team, in conjunction with OKI and County Staff prepared the survey form. The first step in this process was the determination and verification of the data needed for this study, which is described above. Second, was the development of the form itself and field testing of the form to determine weaknesses in the form and/or data collection techniques. The field tests also assisted to determine how long the surveying process might take and the staffing needs.
Survey Form: A copy of the survey form and the County Scoring Guide for the field survey is included in Appendix C. The survey form was prepared using a database program. The program readily provided a format for paper copies of the form for field use. Data input is made simple because the same format as the printed version used in the field is viewable on the computer screen when data is transferred from field work to the computerized database. Finally, data is readily transported and adaptable from the database program to a GIS system, which has been used to prepare the mapping for this project.

Field Tests: The consultant team conducted field tests on approximately five (5) of the county roads. These tests were done to test the form, determine manpower needs for the survey, and to insure that survey staff was consistent when inventory items, primarily regarding roadway condition, required the use of subjective judgments. These tests were conducted by teams of two and three persons, including engineers familiar with roadway conditions and design standards.

Field tests indicated that one person could adequately conduct the survey. Consultant staff was then trained on the process. The survey of Campbell County Roads was conducted over a two week period in May 2002.

Field Survey: Campbell County maintains 183 total roads comprising approximately 184 miles of roadway length. To accommodate data analysis and future data maintenance, each county road was divided into segments. Segments were established along each road, as appropriate, using the following criteria:

- At intersections with other roads,
- When road conditions changed significantly (e.g. paved to gravel, significant changes in width and/or pavement condition)

A total of 265 roadway segments comprise the final database developed for this plan.

Components of County Road Field Survey

The inventory of county roads entailed a survey of each county road and included the tabulation of information provided by KYTC and the Campbell County Road Department. During the field survey information was gathered on the following roadway components or characteristics:

- Bridge width (Bridge length and other information, such as weight limits and structure type, was provided from KYTC and Campbell County Road Department records.)
- Road width
- Road surface (asphalt, concrete, gravel, etc.)
- Road condition (excellent, good, fair, poor)
- Pavement markings and conditions
- Median information
CAMPBELL COUNTY TRANSPORTATION PLAN

- Number of lanes
- On-street parking
- Shoulders
- Sight distance
- Vertical and horizontal alignment
- Lateral clearance
- Traffic control devices (stop signs, stop lights)
- Lighting
- Drainage

The county road pavement condition component, unlike all the other components, presented a challenge due to the fact that it involved a subjective judgment based on observation versus a measurement or observation. This component required each person conducting the field work to be consistent in the judgment of roadway conditions. The following characteristics were used to generally guide the field classifications of road conditions:

Excellent - the entire roadway was free of visible problems and no repair was anticipated within the next several years.

Good – the majority of the roadway surface was in good condition, but was not required to be free of minor problems, such as some patching or edge of pavement damage. Major repairs to these roads were not required, nor likely to be required in the near future.

Fair – the roadway had problems that likely could be repaired without major resurfacing, but resurfacing would be an option.

Poor – the roadway clearly had problems that required major repairs and resurfacing.

It should be noted that the above criteria is for road surface conditions only and the measurement did not take into account other deficiencies such as roadway width, which was evaluated separately.

In addition, to these listed items, traffic count and accident information was collected from the previously described KYTC HIS database. Traffic count data from the HIS database was further supplemented by traffic counts conducted specifically for this inventory at selected key locations.

The following maps have been prepared from the data obtained during the county road inventory. All other components of the county road field survey are shown in Appendix C.
Map 3 – County Roadway Pavement Condition

This map presents the roadway conditions (excellent, good, fair, and poor). On this map color is used to identify pavement conditions ranging from poor to excellent. In this manner the roads most in need of attention are identified.

Map 4 – County Roadway and Bridge Width

This map uses color to indicate roadway and bridge width deficiencies. Roads that have bridges with less width than the adjoining roadways are also identified.

Traffic Volume and Accident Data

Traffic volume and accidents were other measures used to determine existing conditions. These measures are not direct components of the physical condition of the roadways. However, they provide a useful means for comparison so that roads with problematic physical conditions and higher traffic volume or accidents could be identified. Roads sharing these attributes would be indicative that attention should be given during the prioritization process, which is described in subsequent sections of this plan.

Traffic counts were conducted for over thirty (30) locations, where no reliable count data was available or was out of date. Most of these locations were on the county maintained road network. Additional traffic volume information was obtained from information available from the KYTC HIS. Table 2 shows the locations and traffic counts that were made especially for this study. Using the information on actual counts, both from the HIS and those taken for this study, volumes for all the county roads were estimated where counts were not available. This process entailed estimating what volumes should exists on those roads where traffic counts were not available based on counts from nearby and adjoining roads (see Map 5).

Inventory Database and Mapping

Completion of the county road field survey and the recording of all data into the database completed the inventory phase of the Campbell County Transportation Plan. In order to readily connect the database to a GIS system, as previously described, each road segment needed a unique and common field with the GIS database. For this purpose the official county road numbers established by the Campbell County Road Department was used. This database was then submitted to the NKAPC for development of mapping of inventory data. The NKAPC already maintains GIS data for Campbell County. This allowed the survey data to be easily integrated with the existing GIS base data to create mapping of inventory information.
<table>
<thead>
<tr>
<th>COUNTY RD. NUMBER</th>
<th>COUNT LOCATION</th>
<th>24 HOUR COUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR1103</td>
<td>California Crossroad, N. of KY 10</td>
<td>826</td>
</tr>
<tr>
<td>CR1103</td>
<td>California Crossroad, E. of Wash. Trace</td>
<td>364</td>
</tr>
<tr>
<td>CR1208</td>
<td>Siry Road /Smith Hiteman</td>
<td>1551</td>
</tr>
<tr>
<td>CR1205</td>
<td>Craft Rd., East of US 27</td>
<td>334</td>
</tr>
<tr>
<td>CR1207A</td>
<td>Parkside Drive, E. of US 27</td>
<td>502</td>
</tr>
<tr>
<td>CR1224</td>
<td>Pleasant Ridge, W. of KY 915</td>
<td>1580</td>
</tr>
<tr>
<td>CR1202</td>
<td>Lickert Rd., E. of US 27</td>
<td>1307</td>
</tr>
<tr>
<td>CR1206</td>
<td>Woeste Rd., S. of Lickert</td>
<td>246</td>
</tr>
<tr>
<td>CR1102</td>
<td>Dead Timber Rd., E. of AA Highway</td>
<td>117</td>
</tr>
<tr>
<td>CR1003</td>
<td>Grandview Rd., W. of KY 9</td>
<td>275</td>
</tr>
<tr>
<td>CR1003</td>
<td>Grandview Rd., E. of KY 10</td>
<td>723</td>
</tr>
<tr>
<td>CR1027</td>
<td>Poplar Ridge, N. of KY 9</td>
<td>1109</td>
</tr>
<tr>
<td>CR1027</td>
<td>Poplar Ridge, E. of US 27</td>
<td>5272</td>
</tr>
<tr>
<td>CR1375</td>
<td>Enzweiler Rd., E. of US 27</td>
<td>302</td>
</tr>
<tr>
<td>CR1304</td>
<td>E. Alexandria Pk., N. of US 27</td>
<td>6357</td>
</tr>
<tr>
<td>CR1024</td>
<td>Upper Tug Fork, E. of E. Alexandria Pk.</td>
<td>673</td>
</tr>
<tr>
<td>CR1022</td>
<td>Lower Tug Fork, W. of KY 547</td>
<td>416</td>
</tr>
<tr>
<td>CR1033</td>
<td>Eight Mile Rd., E. of KY 547</td>
<td>773</td>
</tr>
<tr>
<td>CR1033</td>
<td>Eight Mile Rd., W. of KY 8</td>
<td>849</td>
</tr>
<tr>
<td>CR1011</td>
<td>Fender Rd., W. of KY 8</td>
<td>396</td>
</tr>
<tr>
<td>NA</td>
<td>Poole's Creek #1, E. of KY 9</td>
<td>3971</td>
</tr>
<tr>
<td>CR1349</td>
<td>Dry Creek Rd., E. of KY 9</td>
<td>456</td>
</tr>
<tr>
<td>CR1350</td>
<td>Murnan Rd., N of KY 9</td>
<td>404</td>
</tr>
<tr>
<td>CR1350</td>
<td>Murnan Rd., W. of US 27</td>
<td>1025</td>
</tr>
<tr>
<td>NA</td>
<td>Dodsworth Ln., N. of E. Alex. Pk.</td>
<td>4036</td>
</tr>
<tr>
<td>CR1316</td>
<td>Dodsworth Ln., S. of KY 8</td>
<td>1068</td>
</tr>
<tr>
<td>CR1312</td>
<td>Uhl Rd., S. of Dodsworth Ln.</td>
<td>1002</td>
</tr>
<tr>
<td>CR1312</td>
<td>Uhl Rd., W. of KY 547</td>
<td>638</td>
</tr>
<tr>
<td>NA</td>
<td>N. Ft. Thomas Ave., S. of Clover Ridge</td>
<td>3344</td>
</tr>
<tr>
<td>CR1330</td>
<td>Covert Run Pk., W. of N. Ft. Thomas Ave.</td>
<td>1552</td>
</tr>
<tr>
<td>CR1207A</td>
<td>Golf Course Entrance, E. of US 27</td>
<td>479</td>
</tr>
<tr>
<td>NA</td>
<td>US 27, 200' N. of Golf Course Entrance</td>
<td>13411</td>
</tr>
<tr>
<td>NA</td>
<td>US 27, 200' S. of Golf Course Entrance</td>
<td>13030</td>
</tr>
</tbody>
</table>

Accident data for county maintained roads, as previously mentioned, is maintained by the KYTC HIS. This data, however, is not tabulated by milepoint like those that occur on state and federal roads. This results in the inability to identify accident locations within a particular road segment for county maintained roads.

Map 5 – Estimated Traffic Volume

This map presents information from traffic counts obtained from specific counts conducted for this study, the KYTC HIS, and traffic count estimates made for roads where no counts were available from either source.

Map 6 – County Roadway Accident Information

This map uses color to identify roads with the highest number of accidents.
ESTIMATED DAILY TRAFFIC VOLUME*

LEGEND

- Greater than 75000
- 50000-74999
- 20000-49999
- 10000-19999
- 5000-9999
- 2500-4999
- 1000-2499
- Less than 1000

*Traffic volume estimates based on KYTC 2002 traffic count data and actual counts per Table 2.