

VIII. ALTERNATIVES REFINEMENT

After the development of the recommended spot improvements described in the previous chapter, a period of time elapsed in which the study lay dormant. In 2007, select components of the existing conditions overview were updated (including the crash analysis) to ensure that recommendations and priorities reflect the current conditions.

A. Identification of Spots and Locations

To build upon the preliminary recommended spot improvements identified, analysts began by conducting an independent crash analysis for vehicle crashes occurring along the route during 2003-2006. This analysis is discussed in **Chapter 2** of this report. Using the same KTC methodology originally employed to identify crash clusters, a list of spots with a CRF greater than 0.90 over the four year period was developed.

Considering only milepoint boundaries of each 0.10-mile spot, analysts compiled a list of all spots occurring in either the 2000-2002 or 2003-2006 data set. Spots which had overlapping milepoints were combined with the overlapping areas noted. Combining the data sets yielded 36 spots in Phase I and 29 spots in Phase II.

To create a more practical approach for project identification, analysts developed the concept of crash “Locations.” A Location is defined as one or more 0.10-mile spots occurring in a concentrated area. It is likely that related factors are causing increased crash rates over a short length of roadway; for example, a series of adjacent urban intersections with high CRF may all be attributable to poor access control applications along the corridor. Consolidating adjacent spots into Locations allowed analysts to look at a larger picture, rather than repeatedly addressing related 0.10-mile problems.

Each Location was named with a number representing the phase, a hyphen, and a sequential letter, with “A” being the southernmost location in each Phase. A total of 21 Locations were identified in Phase I and 15 Locations were identified in Phase II. Crash number, severity, and trend information was assembled for each location. Critical Rate Factors were calculated both for each spot (or spots) composing a Location, and for the Location itself, calculated as a segment if it encompassed more than 0.10 mile. **Exhibits 8.1 to 8.3** show the geospatial placement of all reported crashes in the 2003-2006 data set, coded by severity; any segments identified in the second crash analysis with a CRF greater than 1.00; all spots with a CRF greater than 0.90 in either data set; and the defined Locations.

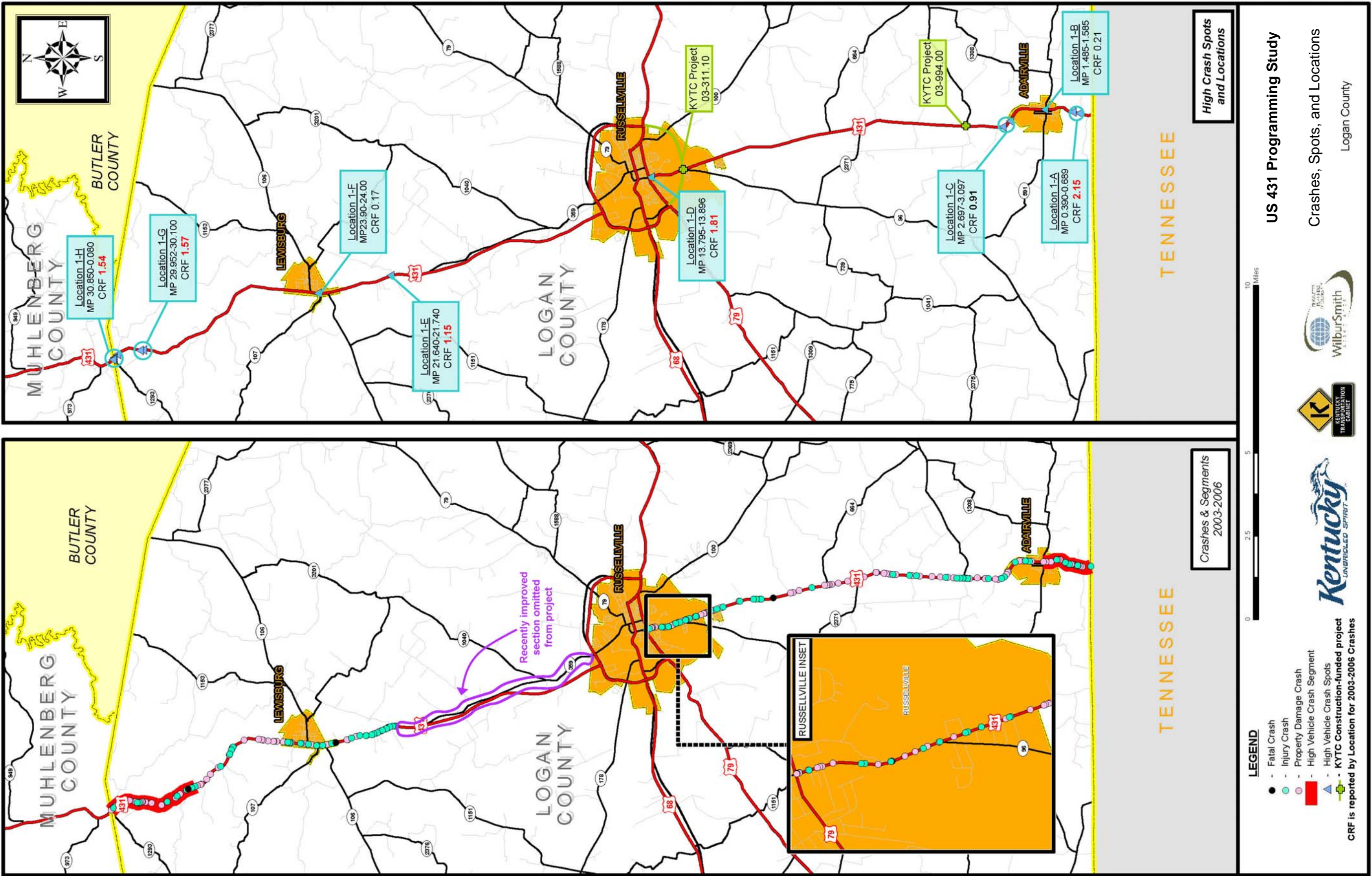
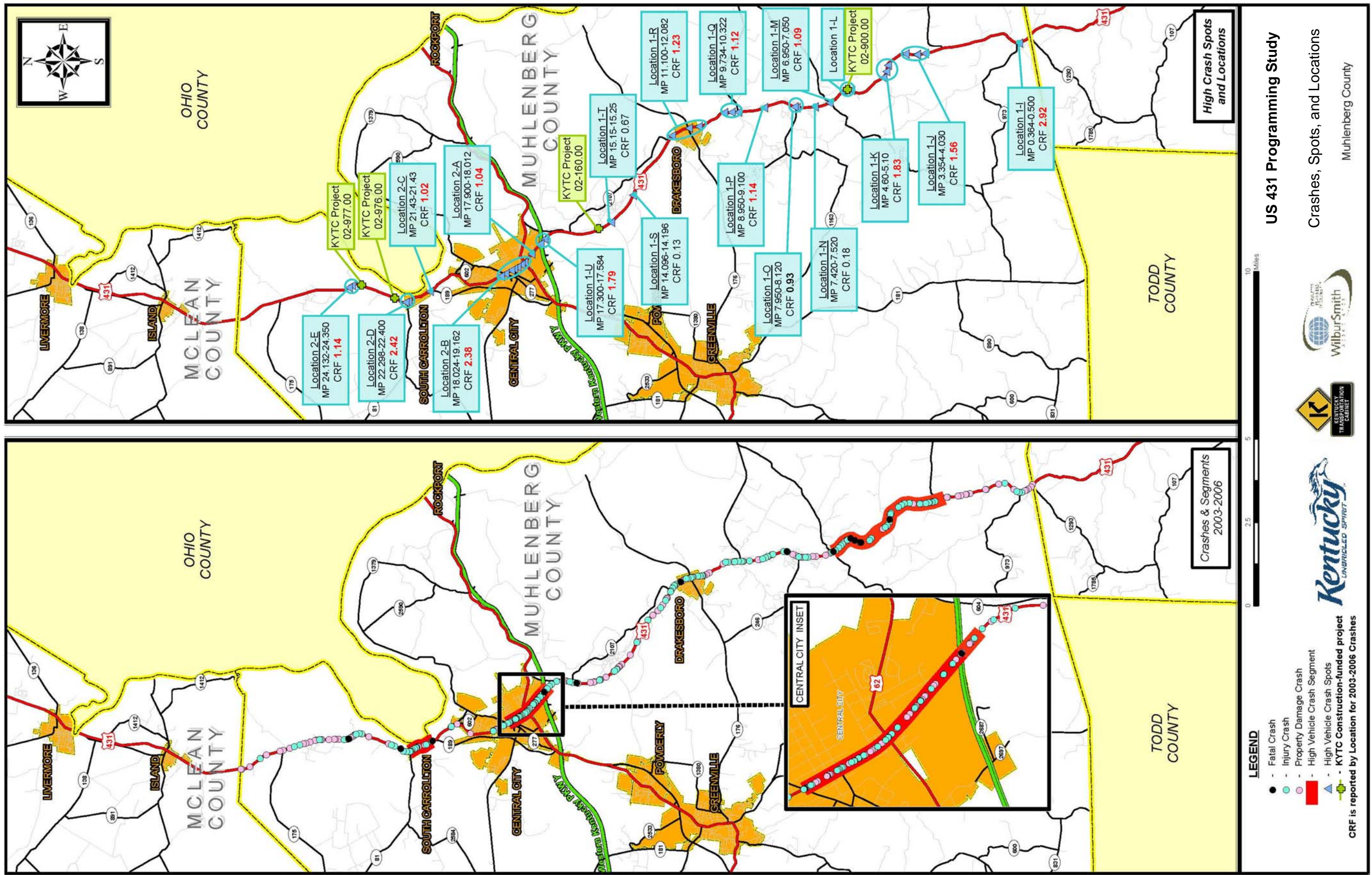


Exhibit 8.1



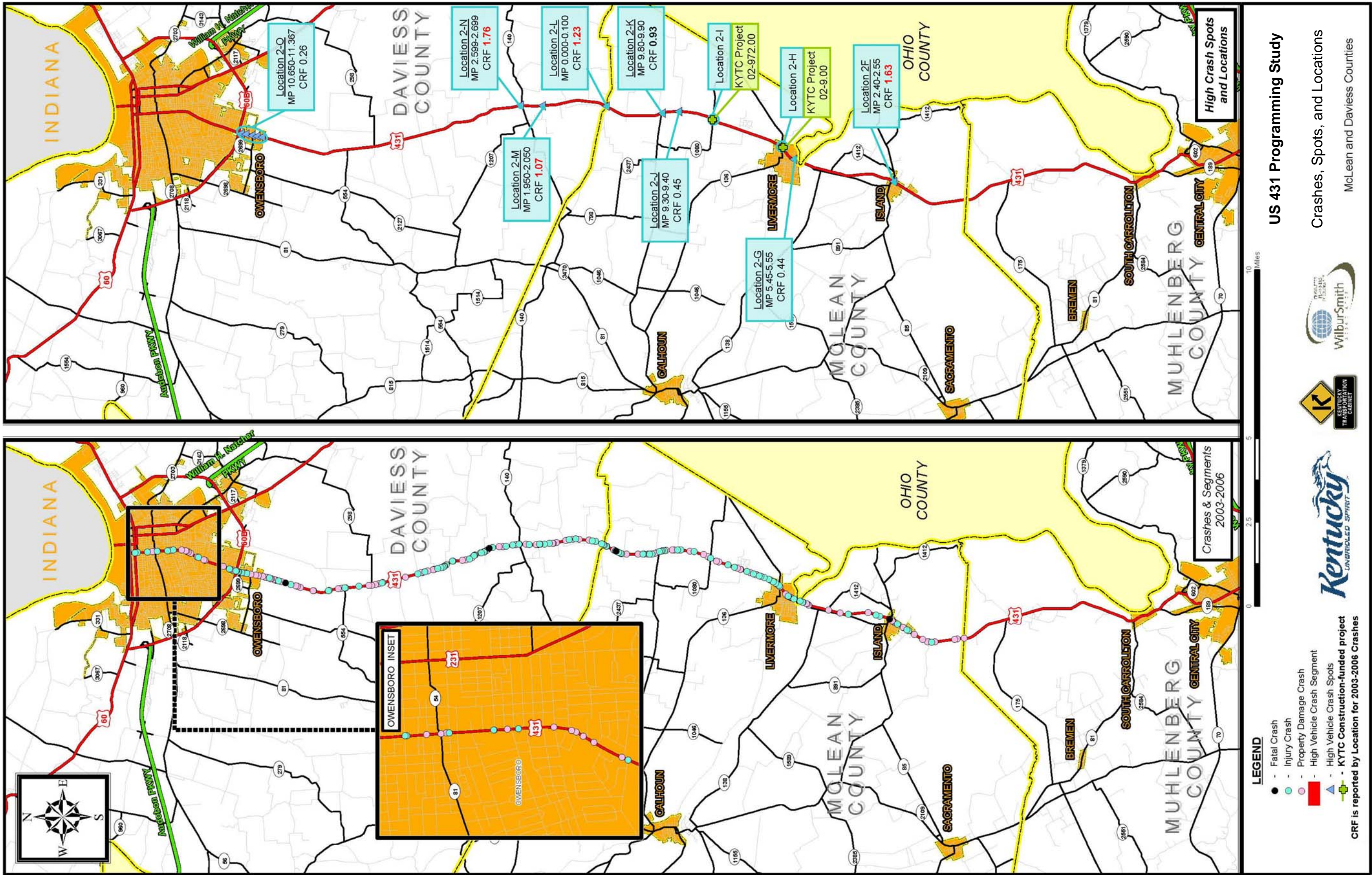


Exhibit 8.3

B. Comparison with Prior Spot Data

Analysts then undertook a comparison of the 2000-2002 and 2003-2006 crash data characteristics at the spot level. Looking at identified high crash spots and CRF data, each Location fell into one of four categories:

- Milepoints which did not appear in either data set were quickly dismissed from consideration for improvements.
- Spots which appeared in the initial data set but were not repeated in later years were investigated to determine if any site conditions may have changed crash propensities.
- Locations appearing in the 2003-2006 crash data set but not the 2000-2002 were given similar consideration to determine if conditions had changed to increase the likelihood of crashes occurring.
- Last, sites with a high CRF in both data sets were assessed to identify effective remedies to repeating crash trends.

<u>Comparing the Data Sets</u>			
Group	High CRF?		Next Steps
	00-02	03-06	
1	N	N	Dismiss Spot
2	Y	N	Examine Existing Conditions
3	N	Y	
4	Y	Y	Seek Mitigation

A table presenting the side-by-side comparison of the 2000-2002 and 2003-2006 data sets is included in **Appendix G**.

A field visit of the project area was completed in July 2007. Potential mitigations were developed for each identified spot within the context of its surroundings.

C. Project Team Meeting IV

The second tier of suggested improvements, based on statistical crash analysis and field observation, was presented to the project team during the fourth and final project team meeting. This meeting was conducted on August 15, 2007, at the KYTC District 4 Office in Elizabethtown. Representatives from KYTC Districts 2, 3, and Central Office and WSA met to review the updated crash data and discuss the final team recommendations. A copy of the meeting minutes is included in **Appendix E**.

The outcome of this discussion was a set of recommendations for each of the identified Locations. Locations were recommended to be dropped from additional consideration or to be pursued for future actions.

Also resulting from this meeting, KYTC District 2 decided to pursue rerouting US 431 around Central City. US 431 will be signed along KY 189 and US 62 west of the city, removing a large portion of long distance trips (including large trucks) from key intersections with high CRF values. As a result, Location 2-B will no longer lie along US 431 and is therefore not considered a part of this study.

1. Locations not recommended for additional consideration

A total of 13 Locations were not recommended for specific safety improvements, typically due to a low CRF. Sites in this grouping include the following Locations.

- *Location 1-A* is just north of the Tennessee state line. A number of crashes coded in this area were inaccurately located and actually occurred on US 431X.
- *Location 1-B* contains the intersection with KY 591 in Adairville. For both the 2000-2002 and 2003-2006 crash data sets, the CRF is less than 1.00.
- *Location 1-C* lies just north of Adairville in a tangent section which terminates in a horizontal curve to the north. Entrances to untenanted commercial properties gain access to US 431 from the east; crash reports do not suggest causal trends although eleven crashes occur within this 0.4-mile long stretch during 2003-2006.
- *Location 1-E* is the intersection of US 431 with Lewisburg-Edwards Road, a few miles south of Lewisburg. A bypass of the city of Lewisburg is in the design phase and is expected to remove a significant portion of traffic at this location.
- *Location 1-F*, between the intersections with KY 106 and KY 107 in Lewisburg, exhibits a significant decline in the number of crashes occurring between the 2000-2002 and 2003-2006 data sets. Only one crash occurred during the second analysis period. Additionally, a bypass of Lewisburg is currently in the design phase and should remove a part of the traffic from this segment.
- *Location 1-N* lies between the US 431 intersections with KY 2270 and KY 246 in southern Muhlenberg County. The CRF decreased to 0.18 during 2003-2006, from a 1.13 CRF during 2000-2002. The reason for this improvement was not determined but recommended projects were identified on either side of this Location.

- *Location 1-S* is just south of Old Sawmill Road in Bevier in Muhlenberg County. The CRF is less than 1.00 for both crash data sets analyzed.
- *Location 2-C* contains the intersection with KY 189 north of Central City. A detailed investigation of police crash reports indicates only one incident actually occurred at this intersection during 2003-2006.
- *Location 2-E* falls within a recently improved section at Power Plant Drive. Construction to realign this segment, widen shoulders, and add guardrail began in 2006.
- *Location 2-H* includes the KY 136 intersection in Livermore. This project was addressed under KYTC Item 2-9.00 with 2005 construction funding. Only one crash has been reported at this Location since that time.
- *Location 2-I* is the KY 1080 intersection at Nuckols. In 2004, construction funding was allotted under Item 2-972.00 to complete improvements at this intersection.
- *Location 2-J* contains the Barrett Hill Road intersection in northeastern McLean County. Despite a number of driveways on US 431, no geometric deficiencies are apparent. The CRF for 2003-2006 is 0.45, a significant reduction from a 1.21 based on 2000-2002 data, although the reason for this improvement in CRF is not evident from statistical analysis or field observation.
- *Location 2-O* is along a recently improved commercial strip in southern Owensboro. In this Location, US 431 has been improved to a divided 4-lane arterial with turn lanes, coordinated signals, and frontage roads. The CRF dropped significantly below 1.00 following these improvements.

2. Locations recommended for future action

The remaining sites were recommended for some type of action as a result of this study. Recommendations include further study, conventional safety improvement projects, and a variety of other build projects. These are discussed in the following chapter.