

# Research Bulletin KTC 02-24

## Safety Evaluation of New Roads (Bypasses)

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Information was extracted from Research Report KTC-02-24/U13-02-1F published 06/02. Principal investigators were Ken Agent and Jerry Pigman. Study Advisory Committee Chair was Duane Thomas.

**Objectives:** The research study evaluated the crash history of bypass routes to determine if there were unusual patterns or changes in crash history over the first years of operation and to recommend countermeasures to reduce the probability of crashes, especially at intersections.

**Findings:** A literature review was conducted and crash data was analyzed for nine case study bypasses. It was found that crash rates on bypass routes were generally lower than statewide rates for similar highway types. However, the percentage of crashes occurring at intersections was much higher than on other roads. Most of the crashes were at intersections and all of the fatalities were at intersections. Large numbers of crashes for the period immediately after the opening of a bypass were not generally found. The major change that has occurred at intersections since the opening of the bypasses has been the installation of a traffic signal which has significantly reduced crashes.

**Recommendations:** Recommendations were developed for: Public Information, Enforcement, Traffic Control and Design. The recommendations relate to intersection areas since that is where the predominant number of crashes took place. The following countermeasures are listed in two categories: 1) measures that should be used and 2) measures that may be used.

### Measures that should be used when a road is opened:

#### PUBLIC INFORMATION

- Work with local media to inform motorists of the opening date.
- Work with local media to inform drivers of the characteristics of the high speed rural roadway and safety considerations at intersections.
- Use variable message signs on major side road approaches for at least 3 days prior to opening to inform motorists of the opening date.
- Utilize the public information officer to provide information to the media.

#### ENFORCEMENT

- Work with local and state police and motor vehicle enforcement to provide an enforcement presence during the first 2-3 weeks of operations.

#### TRAFFIC CONTROL

- Use variable message signs for about a month after the opening of new intersections on approaches where there is potential for a driver disregarding a stop sign or signal.
- Place stop bars at proper stopping locations on all stop approaches.
- Place intersection warning signs on the mainline in advance of major intersections.



## TRAFFIC CONTROL (continued)

- Place “cross traffic does not stop” sign where appropriate on stop signs.
- Place temporary rumble strips on stop approaches (use thermoplastic striping to provide both an audible and visual warning).

### Measures that may be used when a road is opened:

#### PUBLIC INFORMATION

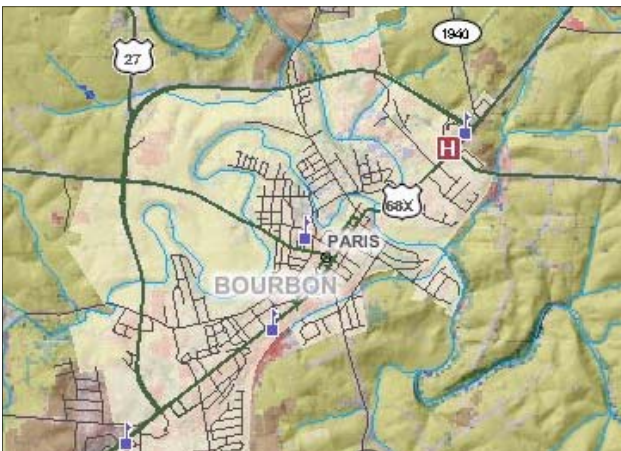
- Place flaggers at major intersections on opening date to inform motorists of changes.

#### TRAFFIC CONTROL

- Dual mount and oversize stop signs.
- Dual mount and oversize stop ahead signs if sight distance is limited.
- Consider use of intersection beacons at major intersections.
- Consider use of beacon on stop ahead or stop sign.
- Consider use of technology that would warn a driver about his approach speed.
- Use “cross traffic does not stop” signs as advance sign on the approach to the stop sign.
- Use projected or actual traffic volume information to determine if a traffic signal is warranted at major intersections.
- Consider exclusive left turn phasing for signals at intersections with 55 mph speed limits.
- Consider partial roadway lighting at major intersections.
- If sight distance is limited, consider placing stop ahead word message on pavement.
- At traffic signals where there are extenuating factors consider the use of an advance warning flasher.
- Consider placement of a permanent active sign displaying the speed of motorists.

### Intersection design considerations (before construction):

- Consider an intersection design that reduces the number of conflict points.
- Add turn lanes with pavement arrow markings on side road approaches..
- Provide a traffic calming device such as painted or mountable islands for channelization of the side road approaches.
- Use a different type of pavement in the immediate approach to the intersection on the side road to provide a warning to drivers approaching the intersection.
- Consider the use of speed bumps on side street approaches.
- If possible do not provide a long tangent with high design speed on the side road approaches.



For more information check our web-site at [www.engr.uky.edu/ktc](http://www.engr.uky.edu/ktc) which has the entire research report or call us at 859 257-4513 and ask for the traffic and safety section or the library.