Baystate Roads Program
Tech Notes

Tech Note #24

Pedestrian and Bicycle Crash Analysis Tool

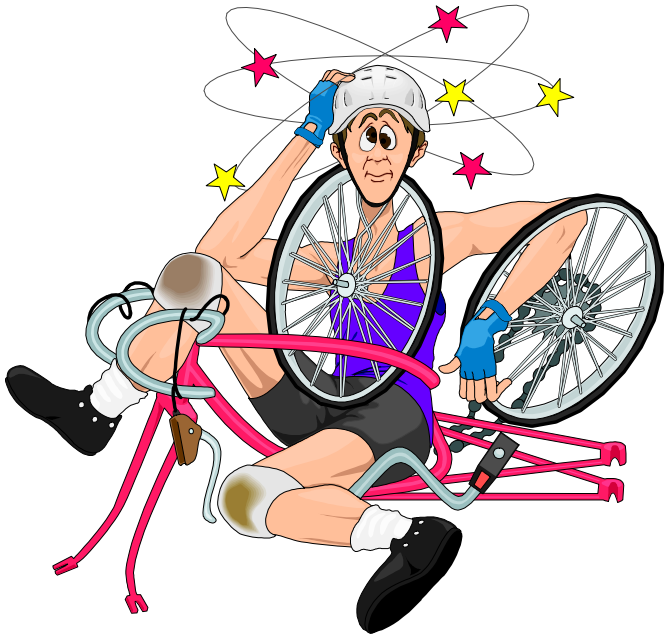
What is PBCAT?

In 1998, 5,220 pedestrians and 761 bicyclists were killed, accounting for 14 percent of all traffic fatalities. An additional 69,000 pedestrians and 53,000 bicyclists were reported to have been injured as a result of collisions with motor vehicles. PBCAT is a software product intended to assist State and local pedestrian and bicycle coordinators, planners, and engineers with this problem.

PBCAT accomplishes this goal through the development and analysis of a database containing details associated with crashes between motor vehicles and pedestrians or bicyclists. One of these details is the *crash type*, which describes the pre-crash actions of the parties involved. With the database developed, the software can then be used to produce reports and select countermeasures to address the problem.

Why Crash Typing?

The development of effective countermeasures to help prevent bicyclist and pedestrian crashes is hindered by insufficient detail on computerized State crash files. Analysis of these data can provide information on where pedestrians and bicyclist crashes occur (city, street, intersection, two-lane road, etc.) when they occur (time of day, day of week, etc.) and characteristics of the victims involved (age, gender, injury severity, etc.). These data cannot provide a sufficient level of detail regarding the sequences of the events leading to the crash.



In the 1970's, methods for *typing* pedestrian and bicycle crashes were developed by NHTSA to better define the sequence of events and precipitating actions leading to bicycle/motor vehicle and pedestrian/motor vehicle crashes. In the 1990's, the methodologies were applied to more than 8,000 pedestrian and bicycle crashes from six states. The results provided a representative summary of the distribution of crash types experienced by pedestrians and bicyclists. This method has evolved over time and was refined as part of the development of this software package system.

Software Features

PBCAT has the following features:

• Ability to quickly determine the crash type through a series of on-screen questions about the crash, crash location, and maneuvers of the parties involved;

• Ability to customize the database in terms of units of measurement, variables, and location referencing, as well as import/export data from/to other databases;

• Ability to produce a series of tables and graphs defining the various crash types and other factors associated with the crashes (such as age, gender, light conditions, etc.);

• Recommended countermeasure linked to specific bicycle and pedestrian crash types and related resource and reference information;

• User-friendly, on-line instructions and help features, including examples, along with a user's manual.

For more information

PBCAT is now available and includes the software itself and the *User's Manual* (FHWA-RD-99-192). To obtain the software, visit the Pedestrian and Bicycle Information Center website at: **www.walkinginfo.org/pbcat**. The software was developed by David L. Harkey of the University of North Carolina Highway Safety Research Center, and Jim Mekemson and Min-Ching Chen of Lendis Corporation. For more information about this product, please contact any of the individuals below:

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5. W.W. Hunter, W.E. Pein, and J.C. Stutts, *Bicycle Crash Types: A 1990's Informational Guide* (Publication No. FHWA-RD-96-104), Federal Highway Administration, Washington, D.C., April 1997.

This article was obtained from TechBrief, FHWA-RD-00-95, May 2000.

observed during the field inspections of the spall repair test sites consisted of cracking of the patches and elimination of the rigid and two-part epoxy repairs from the underlying PCC material. Deterioration of repair edges, aging, and raveling of material, cracking, and loss of material pieces were the predominant distresses observed for the bituminous repairs. In many instances, the distresses developed during the first year after placemement and worsened over time as climate and traffic continued to wear on the repairs.

• Annual cost figures for each site were primarily a factor of the initial material and installation cost.

• In all 28 situations where a repair material was placed using both he saw-and-patch and the chip-and-patch procedures, annual costs for the chip-and-patch repairs were lower than for the saw-and-patch repairs. This was the result of similar performance characteristics observed for all of the repairs placed and the lower installation costs associated with the chip-and-patch procedure.

• Type III PCC performed as well or better than other more expensive rigid repairs at all sites.

• The waterblast-and-patch procedures provided good results when the equipment was operating properly and by personnel familiar with its use. The same level of good performance could not be expected for a maintenance crew first using the device.

Recommendations

• The needed duration of repair survival should be factored into decisions on which material and methods should be used. For situations where only 2 to 3 years of performance are needed because of impending overlay or rehabilitation plans, different repair types will be dictated than in situations where repairs are expected to last 10 to 12 years.

• Based on the cost-effectiveness of the different operations, the chip-and-patch procedures is recommended over the saw-and-patch procedures for the majority of the materials evaluated. The higher productivity and reduced equipment needs make the chip-and-patch procedure more desirable.

• Partial-depth spall repairs placed on both sides of existing pavement joints should have joints formed in the repair to match the underlying pavement. This is true even for flexible pavement repairs.

References

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This study was performed by ERES Consultants, Inc. 505 West University Ave., Champaign, IL 61820-3915 under Contract No. DTFH-93-C-00051 for FHWA. This TechBrief is based on Report no. FHWA-RD-99-153 **LTPP Pavement Maintenance Materials: SHRP PCC Partial-Depth Spall Repair Experiment, Final Report** *and is available from the National Technical Information Service, 5285 Port Royal Road, S*pringfield, VA 22161.