CHAPTER 1. PRODUCT OVERVIEW

In 2004, 4,641 pedestrians and 725 bicyclists were killed, accounting for 13 percent of all traffic fatalities in the United States. An additional 68,000 pedestrians and 41,000 bicyclists were reported to be injured as a result of collisions with motor vehicles.[1, 2] The Pedestrian & Bicycle Crash Analysis Tool (PBCAT) is a software product intended to assist state and local pedestrian and bicycle coordinators, planners, and engineers in addressing pedestrian and bicyclist crash problems.

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 problems identified.

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 pedestrian 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 sequence of events leading to the crash.

In the 1970s, methods for typing pedestrian and bicycle crashes were developed by the National Highway Traffic Safety Administration to better define the sequence of events and precipitating actions leading to bicycle- and pedestrian-motor vehicle crashes.[3,4] In the 1990s, the methodologies were applied to over 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.[5,6,7] This method has evolved over time and was refined during development version 1.0 of PBCAT.[8]

VERSION 2.0 FEATURES

This version of the software has resulted in significant improvements in the functionality of the product and an improved design that makes the product easier to use. Some of the features of Version 2.0 include:

- User-friendly environment and improved navigation—A Microsoft® Windows® operation environment has been adopted and includes pull-down menus and toolbars.
- Form Designer—Users can customize their data entry form for inputting crash data. The form can be designed to match the police crash report used in their community.
- Group Crash Typing—An alternative version of crash typing is available for those users who do not wish to have the level of crash type detail offered in the traditional version.

- Location Data—Users have the option of recording the specific location information (e.g., approach leg and travel direction) for pedestrian crashes occurring at intersections.
- Crash Reports—Single variable and multivariable tables can be produced within the application, and the results can be exported to Excel for further customization and graphic production.
- Countermeasures—Users have access to detailed descriptions of engineering, education, and enforcement countermeasures that are provided to address specific types of crashes.
- Expert System Tools—Links are provided to online expert systems tools for additional help with countermeasure selection.
- Import/Export Capabilities—A conversion utility is included for importing PBCAT 1.0 data sets, and data may be exported in several formats for users who wish to conduct more sophisticated analyses with other applications (e.g., SAS® or Excel®).

APPLICATIONS

As previously noted, the principal objective of the PBCAT application is to allow agencies to type their pedestrian and bicyclist crashes, and by doing so, be able to better assess the problem and select the most appropriate countermeasures. Crash typing requires the user to have access to the police crash reports. The narrative and diagram of the crash, along with information pertaining to the location, operator characteristics, and contributing factors, are all used to answer questions within the crash typing logic of the program and determine the appropriate crash type. While the crash reports are required for typing purposes, it is not a requirement that all of the information on the crash report be entered in the PBCAT database.

The software is designed to allow users to customize the database and the data entry forms to meet their needs. Some agencies will have hardcopy police crash reports, but will not have an easily accessible database with this information. For these agencies, the PBCAT software can be used to create this database. Forms can be designed to match the police crash report and include the crash typing information desired. The database can also be exported to other applications (e.g., Excel) for more sophisticated analyses.

Other agencies will already have robust databases that include most or all of the information recorded on police-reported crash forms. In these cases, there is no need to enter this information a second time. Instead, the user can develop a customized form to capture the crash typing information produced by PBCAT and any missing variables that may not be included in the primary database. The PBCAT database can be exported to Excel or as a delimited text file and merged with the primary database, using the crash report number as the linking field.

The latter approach has been used for several years in North Carolina. The Department of Transportation (NCDOT) has an extensive crash database that includes all of the variables present on the police crash report. The agency also maintains a database of scanned police crash reports. Each year, the reports involving pedestrians and bicyclists are downloaded, printed, and used to type all crashes. The crash typing database is then exported and merged with the NCDOT crash database. The database is used to analyze pedestrian and bicyclist crashes and produce annual reports on the state of pedestrian and bicyclist safety. The database is also maintained on

a Web site (www.pedbikeinfo.org/pbcat), which allows State and local agencies, as well as the general public, to access a series of standard analysis reports and produce customized queries. This Web site provides one example of how PBCAT may be utilized in assessing pedestrian and bicyclist safety, and at the same, providing an online tool for practitioners to conduct further analyses.

TECHNICAL SUPPORT

Technical support for PBCAT is provided online at www.walkinginfo.org/pbcat. Users with questions or software problems can contact technical support via e-mail.