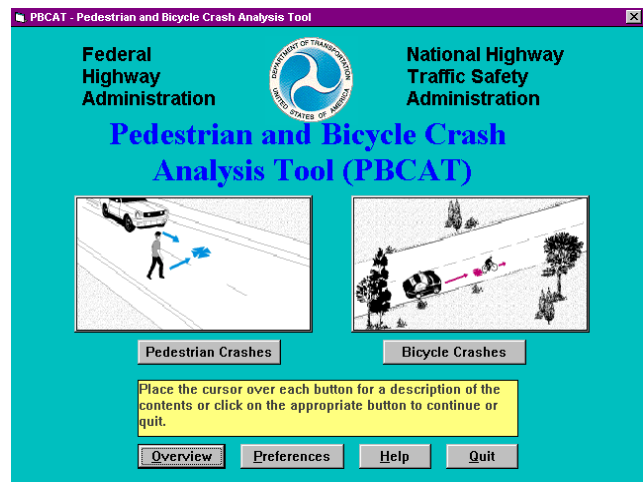# Pedestrian and Bicycle Crash Analysis Tool

Pedestrian & Bicycle Safety

The Pedestrian and Bicycle Safety Research Program focuses on identifying problem areas for pedestrians and bicycles, developing analysis tools that allow planners and engineers to better understand and target these problem areas, and evaluating countermeasures to reduce the number of crashes involving pedestrians and bicycles.

U.S. Department of Transportation
Federal Highway Administration

The Federal Highway Administration (FHWA), in cooperation with the National Highway Traffic Safety Administration (NHTSA), has developed a Pedestrian and Bicycle Crash Analysis Tool (**PBCAT**) through the University of North Carolina Highway Safety Research Center (HSRC).

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 be 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 data base 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 data base developed, the software can then be used to produce reports and select countermeasures to address the problems identified.

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 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 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- and pedestrian-motor vehicle crashes.[1,2] In the 1990's, 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.[3, 4, 5] This method has evolved over time and was refined as part of the development of this software package.

Software Features

PBCAT is designed with 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.
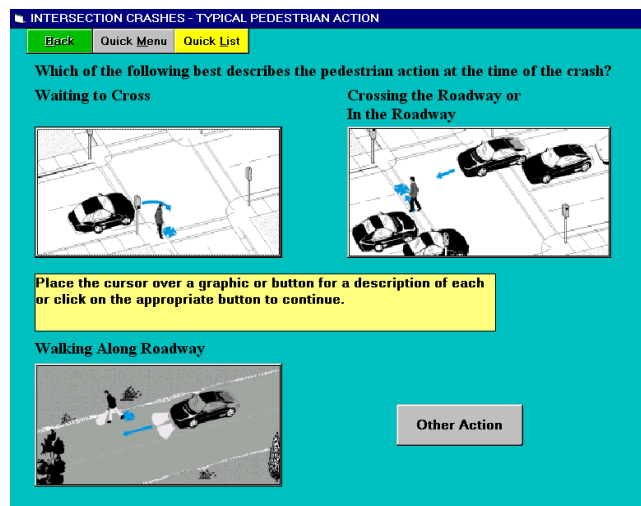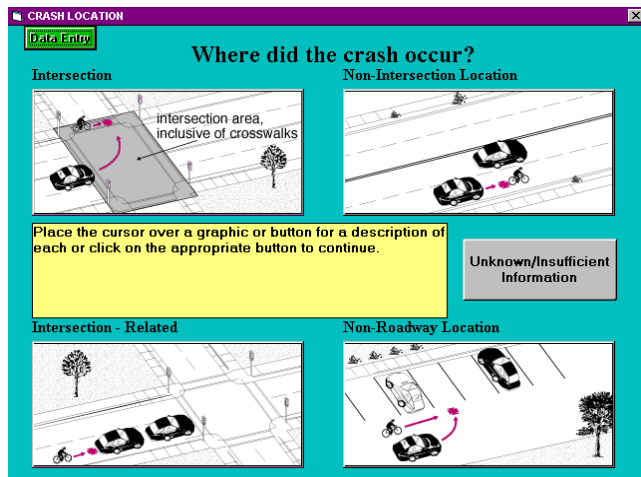
% Ability to customize the data base in terms of units of measurement, variables, and location referencing as well as import/export data from/to other data bases.
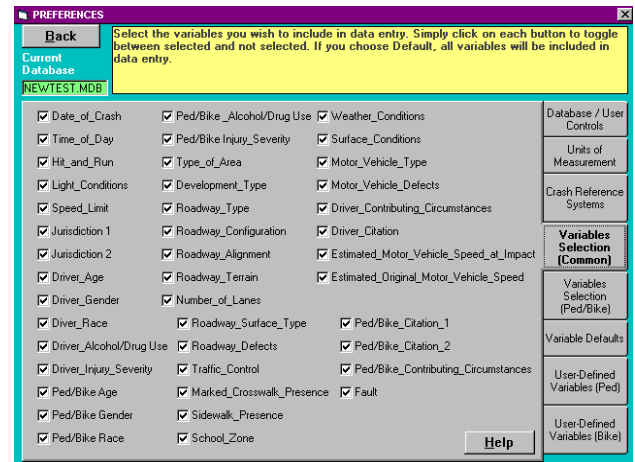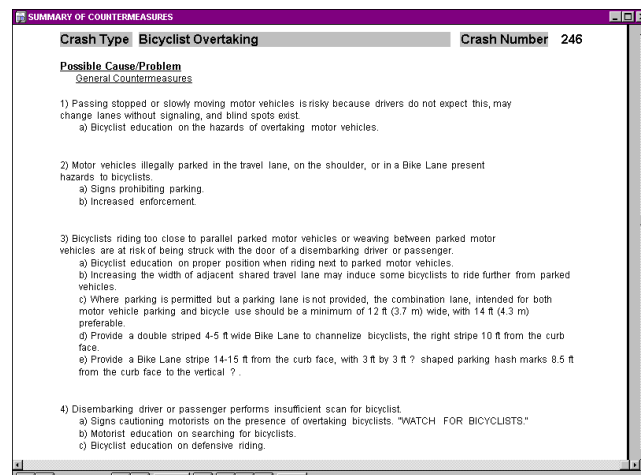

% Ability to produce a series of tables and graphs
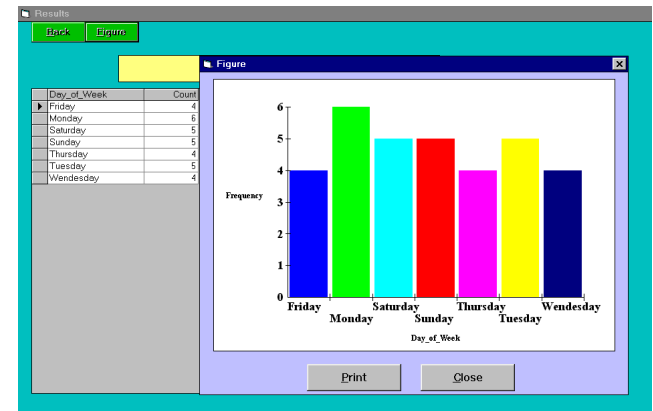
defining the various crash types and other factors associated with the crashes such as age, sex, light conditions, etc.

% Recommended countermeasures 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 a User's Manual (*FHWA-RD-99-192*). To obtain the software, visit the Pedestrian and Bicycle Information Center web site 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 the Lendis Corporation. For more information about this product, please contact either of the individuals below:

David Harkey
University of North Carolina
Highway Safety Research Center
Phone: (919) 962-8705
E-mail: david_harkey@unc.edu

Carol Tan Esse
Federal Highway Administration
Phone: (202) 493-3315
E-mail: carol.tan.esse@fhwa.dot.gov

Essie Wagner
National Highway Traffic Safety Administration
Phone: (202) 366-1361
E-mail: esther.wagner@nhtsa.dot.gov

Leverson S. Boodlal, P.E.
Federal Highway Administration
Phone: (202) 366-8044
E-mail: leverson.boodlal@fhwa.dot.gov

References

1. *Pedestrian Safety: The Identification of Precipitating Factors and Possible Countermeasures* (Publication No. FH-11-7312), M.B. Snyder and R.L. Knoblauch, National Highway Traffic Safety Administration, Washington, DC, 1971.

2. *A Study of Bicycle/Motor Vehicle Accidents: Identification of Problem Types and Countermeasure Approaches, Volume I* (Publication No. DOT HS-803 315), K.D. Cross and G Fisher, National Highway Traffic Safety Administration, Washington, DC, 1977.

3. *Pedestrian and Bicycle Crash Types of the Early 1990's* (Publication No. FHWA-RD-95-163), W.W. Hunter, J.C. Stutts, W.E. Pein, and C.L. Cox, Federal Highway Administration, Washington, DC, June 1996.

4. *Pedestrian Crash Types: A 1990's Informational Guide* (Publication No. FHWA-RD-96-163), W.W. Hunter, J.C. Stutts, and W.E. Pein, Federal Highway Administration, Washington, DC, April, 1997.

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