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A Compendium of NHTSA Pedestrian and Bicyclist Traffic Safety Research Projects, 1969-2007

This compendium provides an overview of the National Highway Traffic Safety Administration pedestrian and bicycle safety research program. It covers the research produced by the Office of Behavioral Safety Research and its predecessor organizations from the inception of the program in 1969 through 2007. Some work done by the Federal Highway Administration (FHWA) is also included when it was coordinated with or based on the NHTSA program.

In the late 1960s, a research decision by NHTSA fundamentally altered the way in which pedestrian and bicycle crashes were analyzed and addressed by countermeasures. The decision involved trying to disaggregate all pedestrian crashes into specific crash types with similar behavioral causes. The resulting study by Snyder and Knoblauch (1971)¹ has been the cornerstone of NHTSA's pedestrian research program ever since.

Since the publication of the Snyder and Knoblauch report, numerous studies have been conducted using crash types as a focus. Many efforts were directed at the development of specific interventions for the identified types. Other studies dealt with uncovering a better understanding of the crash types themselves, including any differences as a function of locale (urban, suburban, rural) or any changes over time. Emulating the successful approach of the work on pedestrian-related crashes, NHTSA then repeated the crash type identification process for bicycle/motor vehicle crashes in a landmark study by Cross and Fisher (1977)².

The generation of crash taxonomies was a productive first step for the NHTSA pedestrian and bicycle research program. In addition, the decision to base the taxonomies on the behaviors of the crash participants—pedestrians, bicyclists, and drivers—proved critical in making the resulting crash types particularly useful as a basis for development of countermeasures. Simply, by focusing on the defined types, countermeasures were in essence dealing directly with the underlying behavioral errors that caused them. This is true regardless of whether the countermeasure itself consisted of engineering, education, or enforcement components or a combination thereof.

Once crash types were defined, the NHTSA research program turned to the development and evaluation of countermeasures based on education and enforcement, the two areas for which NHTSA has primary responsibility. Simultaneously, FHWA focused on engineering approaches to crash prevention. Together, these initial forays into prevention efforts produced both useful products and a better understanding of the basic behaviors needed to avoid crashes. Perhaps the most fundamental of the principles identified was the preeminent importance of the search function for crash avoidance. The benefit of a left-right-left search pattern for everyone in the traffic environment was identified as a critical basic behavior.

The compendium begins with a description of the structure and philosophy of the NHTSA pedestrian and bicycle research programs. It is followed by a section that describes the research on the development of taxonomies of crash types since the results of that research formed the foundation for most of the subsequent NHTSA pedestrian and bicycle research studies. The document then provides a chronological listing of major activities that occurred in the decades spanned by NHTSA's research programs and discusses lessons learned for future pedestrian and bicycle research.

An appendix contains abstracts of relevant research in a standardized format. Synopses of research studies are presented under the following topical categories:

- Problem identification
- Technology/tools
- Program reviews and syntheses
- Public awareness
- Conspicuity/visibility
- Countermeasures
- Alcohol
- Speed
- Children
- Older adults

Also included in an appendix are lists of pedestrian and bicyclist crash types as they have evolved over the years. A reference section provides documents identified in the compendium. Finally, an index of authors and principal subject matter is provided to assist the user in identifying research of interest.

The compendium represents a revision, consolidation, and update of two draft reports originally prepared for NHTSA by Safety Consulting Services.

¹ Snyder, M.B., & Knoblauch, R.L. *Pedestrian Safety: The Identification of Precipitating Factors and Possible Countermeasures, Volume I*. Final Report, DOT HS-800 403, January 1971. Washington, DC: National Highway Traffic Safety Administration.

² Cross, K.D., & Fisher, G. *A Study of Bicycle/Motor-Vehicle Accidents: Identification of Problem Types and Countermeasure Approaches. Volume 1*. Final Report, DOT-HS-803 315, September 1977. Washington, DC: National Highway Traffic Safety Administration.

How to Order

For a copy of *A Compendium of NHTSA Pedestrian and Bicyclist Traffic Safety Research Projects, 1969-2006* (36 pages plus appendices) write to the Office of Behavioral Safety Research, NHTSA, NTI-130, 1200 New Jersey Avenue SE., Washington DC 20590, send a fax to 202-366-7096, or download from <http://www.nhtsa.dot.gov>. Marvin Levy, Ph.D., was the project officer.



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