National Highway Traffic Safety Administration (NHTSA)
Office of Behavioral Safety Research & Office of Safety Programs
Pedestrian and Bicycle - TRB 2018

PEDESTRIAN AND BICYCLE SAFETY RESEARCH

- NEW RESEARCH AND REPORTS, TOOLS, AND RESOURCES

✓ New Research---Safety in Numbers. Increases in pedestrian and bicyclist crashes as well as an increased emphasis on walking and biking for transportation, health, environmental, and other reasons, compel a look at how increased numbers of pedestrians and bicyclists on and around roadways influence motorist behavior. One way to examine motorist, pedestrian, and bicyclist behavior and interactions is by focusing on the number of crashes that occur between pedestrians and motor vehicles and bicyclists and motor vehicles as more pedestrians and bicyclists are entering the roadway system. The concept known as Safety in Numbers (SIN) has been used to make planning and policy decisions; however, this causal inference has received scrutiny and calls for caution based on a lack of empirical evidence supporting the SIN claim. This project would entail summarizing and evaluating the literature on SIN. (Awarded Sept 2017, 18-month effort.)

✓ New Research-- State of the Knowledge on Pedestrian and Bicycle Safety. The objective of this project is to improve the understanding of pedestrian and bicyclist behaviors and its relationship to traffic safety through a comprehensive review/report of the existing research literature on pedestrians and bicyclists. Topics considered for inclusion include the definition of pedestrian, latest data trends, information on counts, exposure, conspicuity, distraction, helmet use, demographics (including age and sex differences), alcohol and drug impairment, environment (rural vs. urban, road type, time of day), vehicle travel speeds, crash typology, countermeasures [safe systems (e.g., Vision Zero, Road to Zero, Sustainable Safety Approach), engineering (not the focus of this report, but will be addressed), education, enforcement (including automated), laws and policies, and planning, communication, and coordination], data sources, and emerging technologies. (Awarded Sept 2017, 36-month effort.)

✓ New Research--Impact of Speed on Pedestrian and Bicyclist Safety. This project will assess the extent to which vehicle speeds, pedestrian/bicyclist crashes and conflicts and pedestrian/bicyclist injury severity change as a result of implementation of speed related programs to reduce pedestrian and bicyclist incidents and conflicts. Additionally, the impact each speed related countermeasure had on changing behavior outcomes – vehicle speeds, number of pedestrian/bicyclist crashes and conflicts, and pedestrian/bicyclist injury severity will be examined. Based on the effectiveness study of the existing data, a prospective evaluation of the most effective speed-related countermeasures will be conducted. (Awarded Sept 2017, 60-month effort.)

✓ New Report-- Countermeasures that Work: A Highway Safety Countermeasures Guide for State Highway Safety Offices – 9th edition (2018). This reference, assists SHSOS to select effective, science-based traffic safety countermeasures for major highway safety problem areas, including pedestrian and bicycle safety. It describes major strategies and countermeasures relevant to SHSOS, summarizes their use, effectiveness, costs, and implementation time, and references important research summaries and individual studies. Countermeasures that relate to pedestrians (Chapter 8) and bicyclists (Chapter 9). New to this edition is the addition of an Appendix for each chapter for those countermeasures lacking in research to more clearly indicate their use as effective (one and two stars). While still included in the body of the chapter, detailed discussion has been moved to the associated appendix section. Researchers are encouraged to either further evaluate these 1-2 star initiatives or combine countermeasures to enhance effectiveness. Coming Soon: Winter 2018.

✓ New Report – Coming Soon: Pedestrian and Bicyclist Data Analysis. This Research Note presents fatality and injury data for pedestrians and bicyclists, and identifies similarities and differences between these two types of non-motorist road users. The first section examines long-term trends for both pedestrian and bicyclist fatalities over 35 years, from 1980 to 2015. It focuses on fatality numbers and percentages,
gender and age, and considers changes that have taken place over time. The second section examines characteristics of both pedestrian and bicyclist fatalities including urban or rural locations, hours of the day, light conditions, month of the year, day of the week, and non-motorist actions prior to the crashes.

- **Advancing Pedestrian and Bicyclist Safety: A PRIMER for Highway Safety Professionals.** This tool builds upon the pedestrian and bicyclist chapters of *Countermeasures That Work*. It offers a discussion of both behavior and engineering based pedestrian and bicyclist countermeasures, issues, and concepts to further an understanding and importance of a strategic and collaborative “3 E’s” (education, engineering, and enforcement) approach to pedestrian and bicycle safety. A basic grasp of engineering countermeasures by non-engineers, allows decision makers to actualize more opportunities to change pedestrian, bicyclist, and driver behavior and ways behavioral and engineering countermeasures can work together and complement one another to develop comprehensive, multi-faceted programs.

- **2012 National Survey of Bicyclist and Pedestrian Attitudes and Behaviors Database.** This survey randomly selected a national sample of 7,509 people, age 16 and older, to survey the scope and magnitude of bicycle and pedestrian activity and the public's behavior and attitudes regarding bicycling and walking. Report findings update the previous telephone survey of pedestrian and bicyclist attitudes and behavior conducted in 2002.

- **Compendium of Traffic Safety Research Projects (1985-2013).** Brief summaries of research on alcohol-involved driving, drug-involved driving, occupant protection (e.g., seat belts, and child safety seats), speed and other unsafe driving behaviors, motorcyclist safety, pedestrian and bicyclist safety, older driver safety, novice and young driver safety, fatigue and distraction, and emergency medical services. Chapter VI relates to Pedestrian and Bicycle Safety Research.

- **Office of Behavioral Safety Research Electronic Library of Publications.** This electronic library includes research publications from NHTSA’s Office of Behavioral Safety Research.

**Evaluation**

- **Evaluation of the Effectiveness of Cameras as a Deterrent to Reduce School Bus Stop-Arm Violations.** This project investigates if using stop-arm cameras reduces violations and the extent to which drivers do not stop for school buses loading and unloading students before and after a public information program and implementation of a stop-arm bar camera enforcement program. (Final report expected: Fall, 2018.)

- **Evaluation of NHTSA’s Child Pedestrian Safety Curriculum.** This project: (1) evaluated the implementation of NHTSA’s Child Pedestrian Safety curriculum by schools, teachers, and caregivers; and (2) assessed how the curriculum impacted the knowledge and behaviors of young pedestrians. The curriculum teaches and encourages safe pedestrian behaviors for students at the elementary school level (grades K-5) and is designed to aid elementary age school children in developing age appropriate traffic safety knowledge and practical pedestrian safety skills. (Final report expected: Summer 2018.)

**Enforcement**

- **New Report:** The Effect of High Visibility Enforcement on Driver Compliance to Pedestrian Yield Right of Way Laws: Four-Year Follow-Up. This follow-up study in Gainesville, Florida examined the extent to which the observed increases in driver yielding obtained in the previous study, persisted over a follow-up period of nearly four years after the high visibility enforcement intervention program ended. (Click here for the initial study.)

- **Research Project:** Evaluating Enforcement of Bicycle Safety Laws. This research study will assess the extent and typology of bicyclist/motor vehicle crashes, injuries, and fatalities based on bicyclist and motor vehicle driver action; determine which localities are enforcing bicycle safety statutes and how they are enforcing the statutes; determine what methodologies have been developed and are being used to observe and measure bicyclist/motor vehicle interactions; conduct a literature review of studies that have investigated safety laws including passing and yielding laws and detail the role passing distance or yielding versus other actions plays in bicycle/motor vehicle crashes; conduct naturalistic observations to quantify the
targeted behavior; and determine the impact law enforcement combined with increased education about bicycle safety laws has on motorists driving near bicyclists. (48-month effort).

- **Problem Identification**
  - ✓ Report: Effect of Electronic Device Use on Pedestrian Safety. This project explored the use of electronic devices (and other distractors) by pedestrians and drivers when interacting on the roadway, and the extent to which the use of such distractors are involved in pedestrian/motor vehicle crashes and conflicts. This project was divided into three phases.
    - o Literature Review (Phase 1) - a literature review of pedestrian distraction research including electronic device use and the role distraction on the part of pedestrians and/or drivers plays in pedestrian/motor vehicle conflicts. (Complete- Click hyperlink for report)
    - o Naturalistic Observations (Phase 2) - naturalistic observations to quantify distraction including electronic device use by pedestrians and motor vehicle drivers when interacting; and
    - o Crash Report Analysis (Phase 3) - pedestrian/motor vehicle crash data analysis to quantify the extent to which electronic device use by either the pedestrian or driver is involved and to determine crash typology. (Phase 2 and 3 final report expected: Summer 2018.)

- **Pedestrian and Bicycle Safety Program**

- **New Project**
  - ✓ Law Enforcement Training on Bicycle and Pedestrian Safety. The objective of this project is to recommend and complete updates and enhancements to two existing NHTSA law enforcement training courses: one on bicycle safety and one on pedestrian safety for use at police academies and/or for continuing education credit by law enforcement personnel. Awarded as a contract to: Tipping Point Solutions (TPS) out of CO. Base Period of Performance (24 months), awarded Sept 2017.

- **Ongoing Projects---**
  - ✓ Determining Impaired Pedestrians Among DWI Offenders. NHTSA awarded a Task Order contract to Dunlap and Associates to conduct a demographic analysis of alcohol impaired pedestrians killed in motor vehicle crashes in recent years and to identify whether additional analysis of particular groups, such as DWI offenders, is warranted to develop appropriate countermeasures. Alcohol involvement—for the driver and/or the pedestrian—was reported in 48% of all fatal pedestrian crashes in 2014. An estimated 34% of fatal pedestrian crashes had a pedestrian with a BAC of .08 grams per deciliter (g/dL) or higher. An estimated 14% of fatal pedestrian crashes had drivers with BACs of .08 g/dL or higher. (Expected completion by winter 2018)
  
  - ✓ Statewide Pedestrian and Bicyclist Focus Education and Enforcement. These projects continue in AZ, TN, and FL to identify processes and approaches for Highway Safety Offices to provide on-going support to Focus cities and local communities to implement education and enforcement components of their local Pedestrian and Bicycle Safety Action Plan. Projects vary between 2-5 years). For more information, contact Ruth Esteban-Muir at ruth.esteban@dot.gov or (202) 366-2706.
  
  - ✓ Community Based Bicyclist and Pedestrian Behavioral Safety Assessment. NHTSA’s contractor is developing a review process for communities to use to assess their pedestrian and bicyclist safety problems and to better enable them to provide recommendations for safety improvement. This project is in the testing phase. Once complete, communities will have available a systematic process, uniformed guidelines, and technical assistance to address their bicycle and pedestrian behavioral safety problems. (18-month effort, Expected completion by winter 2018)

- **Pedestrian and Bicycle Information Center (PBIC)** (Pedestrian and Bicyclists) NHTSA and FHWA continue with the five-year period of performance of the PBIC. This past year’s focus has been on updating and
reformatting the site to incorporate pedinfo.org + bikeinfo.org + saferoutesinfo.org into one site = pedbikeinfo.org. Year 1 has focused primarily on

- **PRODUCTS— (NO PRODUCTS HAVE BEEN POSTED SINCE TRB 2017)**
  - North Carolina Pedestrian Education and Enforcement Demonstration Project
  - Chicago Pedestrian Education and Enforcement Demonstration Project
  - FL Pedestrian Education and Enforcement Demonstration Project (Posting soon.)
  - NM Pedestrian Education and Enforcement Demonstration Project (Posting soon.)
  - Philadelphia Pedestrian Education and Enforcement Demonstration Project (Posting soon.)
  - Digest of Bicycle and Pedestrian Safety Laws First Edition (Under development, expected completion by summer 2018.)

- **ENFORCEMENT**
  - Pedestrian Safety Enforcement Operations: A How-To Guide. This resource offers law enforcement agencies guidance and programmatic information to assist them in developing and deploying pedestrian safety enforcement programs. It includes promising practices identified through a systematic literature review, from law enforcement agencies, and from a panel of subject matter experts.

- **EDUCATION- YOUTH**
  - Research report: Bicycle Safety Education for Children from a Developmental and Learning Perspective. This research includes a literature review of the developmental capacities of children ages 5 to 16 and associated learning theories, and discusses how this relates to teaching children how to ride bicycles safely.
  - NHTSA’s Child Pedestrian Safety Curriculum teaches and encourages safe pedestrian behaviors for students at the elementary school level (grades K-5) and is designed to aid elementary age school children in developing age appropriate traffic safety knowledge and practical pedestrian safety skills.
  - Research report: Promising Practices to Increase Bicycle Proper Helmet Use Among Middle School Youth. This report summarized findings and lessons learned to increase proper bicycle helmet use among middle school students, based on an 8 week peer-based program. Final internet based products on the program can be used as a national peer-based model consisting of all the resources needed for organizations to replicate this program including video training, guidance, and downloadable materials, see http://cers-safety.com/hsp.htm.
  - Tips for Preteens & Teens: Prevent Pedestrian Crashes (See description below.)
  - Tips for Preteens & Teens: Prevent Bicycle Crashes. These two downloadable handouts about crashes are each divided into two pieces. One piece explains defensive walking (or biking) and how safe walking (or biking) in relation to traffic is a precursor to safe driving. The second piece conveys types of common crashes between pedestrians and cars or between bicycles and cars and explains what happens, shows what it looks like, and offers what pedestrians, bicyclists and motorists can do to prevent the crashes.

- **EDUCATION- ALL AGES**
  - Videos: These videos may be used on closed circuit TV’s or replicated without NHTSA permission.
    - (1) Helmet Fit (Spanish) for parents and adults; (2) Ride Smart. It’s Time to Start (grades 3-7); (3) Bike Safe-Bike Smart (grades 3-7); (4) Bicycle Safety Tips (adults); (5) Stop and Look with Whilly Whistle child pedestrian safety video (grades K-2); (6) Getting There Safely - Youth pedestrian safety video
  - Motion Graphic Videos: These five education tools express the desired safe behaviors using visual cues rather than language to incorporate the needs of non-English speaking or non-literate audiences.
    - (1) Fitting a Bicycle Helmet; (2) Bike Riding Safety; (3) Rules of the Road; (4) Driving Safely around Pedestrians and Bicyclists; and (5) Walking Safely.
• EDUCATION – NON-ENGLISH SPEAKING AUDIENCES

✓ Research Note: Reaching Immigrant Adults on Walking/Biking Safety Through English as a Second Language Course. This research project evaluated the usability of the Walk and Bike Safety curriculum designed to teach adults beginning level English. It shares lessons learned and insight for next steps in reaching Hispanic audiences. Expected Fall, 2018.

✓ Motion Graphics: see prior under education for all ages.

PARTNERSHIP ACTIVITIES AND PRODUCTS:

✓ Model Bicycle Curriculum: Bikeology- On-Bicycle Youth Training Course for Physical Education Teachers and Recreation Professionals. This curriculum was developed under a cooperative agreement with Shape America and is suitable for P.E. Teachers and those in the recreation field to use with middle-high school aged youth. It includes lesson plans and assessments to enable to effective teaching of essential skills to promote skill ability and safety while bicycling. The curriculum and any desired training of teachers is available through Shape America, including twelve supplemental parent tip sheets.

✓ Pedestrian Safety and Injury Prevention- Final Products as a result of a five-year cooperative agreement with Safe States Alliance:

   (1) Pedestrian Injury Prevention Portal
   (2) Supporting Community based pedestrian injury prevention initiative – Lessons and Successes from the Pedestrian Injury Prevention Action Team Program
   (3) Ped Injury Surveillance Recommendations -- 10 recommendations for improving pedestrian injury data collection, analysis, and reporting

QUICK WEB LINKS:
NHTSA’s Bicycle Safety page: https://www.nhtsa.gov/road-safety/bicyclists
For Parents and Caregivers: Parent Central: http://www.safercar.gov/parents/onthemove.htm

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