THE ECONOMIC AND INJURY BURDEN OF MOTOR VEHICLE CRASHES IN ARIZONA FOR 2005

July 2007

Reported by the Arizona CODES Project

In 2005, motor vehicle crashes in Arizona resulted in 1,179 fatalities and 70,293 injuries. The Arizona CODES Project estimates that the economic burden of motor vehicle crashes is approximately $5.8 billion for 2005. During the 12-month period nearly 400 thousand individuals were involved in crashes in Arizona. The number of fatalities for pedestrians, bicyclists, and motorcyclists increased during 2005. Arizona's fatality rate per 100 million vehicle miles travelled remained at 2.01, much higher than the national rate of 1.47.

Arizona CODES Partners:

Data Linkage CODES The Crash Outcome Data Evaluation System

Arizona Department of Health Services

Governor's Office Arizona Highway Safety

ADOT

ASU

The Inter Tribal Council of Arizona, Inc

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A REPORT BY THE ARIZONA CRASH OUTCOME DATA EVALUATION SYSTEM PROJECT

THE ARIZONA CODES PROJECT

The Arizona Crash Outcome Data Evaluation System (CODES) Project facilitates the evaluation of crash characteristics, medical and financial outcome of motor vehicle crashes that occurred within the State of Arizona. Arizona is one of several states that participate in this national project. The project is funded by the National Highway Traffic Safety Administration (NHTSA) and is a partnership within the state of Arizona.

The mission of the project is to develop and maintain a comprehensive motor vehicle crash database in order to serve statewide stakeholders for identifying contributing factors in crashes, cost effectiveness of safety measures, and feasibility of policy initiatives in Arizona.

The project links motor vehicle crash reports to injury outcome records such as hospital discharge and emergency department records. In addition, other traffic safety datasets such as roadway data, vehicle registration, and driver licensing and citations are also linked with this data to provide a more comprehensive picture.

Because motor vehicle crash data and medical data usually do not share common personal identifiers that allow for deterministic linkage, CODES applies a statistical methodology to link the two datasets. The probability that two records are a true link is determined by comparing all event characteristics (e.g. date and place) and all person characteristics (e.g. age and sex) that are common to both records. The product of this linkage process is a set of five imputed datasets, reflecting high probability links and representative samples of low probability links. Arizona is fortunate in that it uses driver licensing information to supplement the medical and crash data, resulting in a larger portion of high probability links, thereby improving linkage results significantly.

Once the linked datasets are created, the costs for each individual involved in a crash in Arizona are estimated. These costs fall into three categories:

- *Medical Costs*: Professional, hospital, emergency department, drugs, rehabilitation, long-term care.
- *Other Costs*: Police/ambulance/fire, insurance administration, loss of wages, loss of household work, legal/court costs, property damage.
- *Quality of Life Costs*: based on Quality Adjusted Life Years (approximately $92k/QALY).

The Arizona CODES Project is overseen by a Board of Directors representing data owners and major safety stakeholders in the state: the Arizona Department of Transportation, Arizona Department of Health Services, Governors Office of Highway Safety, the Inter Tribal Council of Arizona, Inc., and the Arizona Injury Prevention Council. The project is managed by Prof. Simon Washington at Arizona State University.

In 2007, the CODES project provided valuable input to the technical evaluation of the fixed speed enforcement camera demonstration project implemented on Arizona State Route 101 in 2006. Preliminary results indicate that the annualized economic benefit of the safety improvement amounted to $10.6 million.

INJURIES AND FATALITIES FROM MOTOR VEHICLE CRASHES IN ARIZONA

Category	2005
Injuries and Fatalities by Severity	
Fatalities	1,179
Disabling Injuries	6,926
Non-Disabling Injuries	25,044
Possible Injuries	38,156
Economic Burden in 2006 dollars	
Medical Costs	$540,752,356
Other Costs	$3,708,522,863
Quality of Life Cost	$1,569,970,818
Total Cost	$5,819,246,037

IMPACT ON DIFFERENT AGE GROUPS for 2005

AGE GROUP	INDIVIDUALS INVOLVED IN CRASHES	MEDICAL COSTS	OTHER COSTS	QUALITY OF LIFE COST	TOTAL COST
Children (0 – 14)	69,701	$53,039,487	$382,502,610	$90,003,312	$525,545,410
Teenagers (15-17)	26,727	$35,801,695	$219,986,309	$75,654,958	$331,442,962
Adults (18-64)	275,835	$411,276,220	$2,767,593,507	$1,210,218,449	$4,389,088,176
Mature Adults (65&+)	23,268	$37,647,473	$313,160,430	$179,745,745	$530,553,647

IMPACT ON DIFFERENT ROAD USERS for 2005

AGE GROUP	INDIVIDUALS INVOLVED IN CRASHES	MEDICAL COSTS	OTHER COSTS	QUALITY OF LIFE COST	TOTAL COST
Drivers*	267,145	$343,001,825	$2,277,508,237	$874,727,842	$3,495,237,904
Passengers*	126,547	$161,955,983	$1,091,947,286	$430,450,623	$1,684,353,892
Passengers ages 0-4	47,982	$41,428,785	$268,651,165	$56,089,021	$366,168,971
Passengers ages 5-9	13,476	$12,229,886	$81,585,153	$20,870,333	$114,685,372
Pedestrians	1,750	$19,954,055	$255,391,975	$219,138,499	$494,484,529
Pedestrians ages 0-14	390	$3,469,714	$23,487,825	$15,652,750	$42,610,289
Pedestrians ages 15-64	1,238	$14,923,264	$197,407,251	$170,875,853	$383,206,368
Mature Adult Pedestrians†	122	$1,561,078	$34,496,898	$32,609,896	$68,667,872
Bicyclists	2,043	$15,766,044	$83,442,724	$45,653,854	$144,862,621
Motorcyclists	3,246	$32,603,344	$267,043,229	$197,224,649	$496,871,222

* Excluding bicycle and motorcycle riders
† Ages 65 plus

SELECTED CRASH TYPES for 2005

CRASH TYPE	NUMBER OF CRASHES	MEDICAL COSTS	OTHER COSTS	QUALITY OF LIFE COST	TOTAL COST
Intersection Crashes‡	60,479	$255,044,837	$1,371,666,765	$352,186,873	$1,978,898,475
Lane Departure Crashes**	18,589	$94,132,756	$869,715,310	$618,283,622	$1,582,131,689
Red-Light Running Crashes	6,439	$46,139,843	$214,805,496	$62,611,000	$323,556,339
Rural Crashes	14,085	$89,512,394	$966,820,260	$717,417,705	$1,773,750,359
Urban Crashes‡‡	124,838	$451,239,962	$2,741,702,604	$852,553,113	$4,045,495,678

‡ Includes intersection related crashes
** Includes run-off-the-road, sideswipe, head-on, and fixed object crashes
‡‡ Crashes occurring within the boundaries of urbanized areas and urban clusters

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