

APPENDIX M

THE NEED FOR STANDARDIZATION
IN REPORTING COLLISION DAMAGE AND INJURY
IN TRAFFIC ACCIDENTS

J. Robert Cromack

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PRESENTED BY J. ROBERT CROMACK AT THE COLLISION DATA WORKSHOP CONFERENCE,
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THE IMPORTANCE OF COLLECTING ACCURATE AND MEANINGFUL ACCIDENT DATA CAN BE MEASURED ONLY IN TERMS OF THE NEED FOR OR BENEFITS DERIVED FROM WHAT WE LEARN FROM ANALYSES OF THESE DATA. IF THE DATA ARE SELECTED FROM AN ATYPICAL SAMPLE OF THE GENERAL POPULATION, THEN THE CONCLUSIONS WE DRAW FROM STUDYING THEM ARE APPLICABLE ONLY TO THE SAMPLE. SIMILARLY, IF THE DATA ACQUIRED DO NOT ENTIRELY SATISFY THE NEEDS OF THE STUDY, THEN ONCE AGAIN WE MAY BE UNABLE TO DRAW APPROPRIATE CONCLUSIONS. FOR EXAMPLE, QUESTIONS CONCERNING INJURY CAUSATION CANNOT BE ANSWERED WHEN INJURY REPORTS ARE STRATIFIED SIMPLY ACCORDING TO THE CATEGORIES "PROBABLY NOT INJURED," "PROBABLY INJURED," OR "KILLED."

CONCLUSIONS EVOLVED FROM SUCH STUDIES MAY LEAD US TO MAKE INAPPROPRIATE RECOMMENDATIONS OR FORMULATE INVALID REGULATIONS. UNFORTUNATELY, EXCEPT FOR CERTAIN SPECIALIZED STUDIES IN WHICH DATA WERE SPECIFICALLY GATHERED FOR THE PURPOSE, MOST DATA DERIVED FROM STATE AND LOCAL POLICE RECORDS NOW COMPILED IN THE MAJOR ACCIDENT DATA FILES, HAVE MANY OF THESE DEFICIENCIES OF INCOMPLETE-NESS, INACCURACY, AND LACK OF COORDINATION OF ELEMENTS OF INTEREST.

HOW, THEN CAN WE AVOID THESE SNARES AND DELUSIONS. HOW, FOR EXAMPLE, CAN CRASH INDUCED INJURIES IN THE FIELD BE RELIABLY COMPARED WITH LABORATORY SIMULATED INJURIES TO CADAVERS AND ANIMALS IF THE FIELD INJURY DATA ARE EITHER POORLY DOCUMENTED OR ENTIRELY LACKING. I DON'T MEAN TO IMPLY THAT THERE ARE NOT SOME GOOD DATA COLLECTED IN THE FIELD, BUT UNFORTUNATELY, THERE ARE GENERALLY NOT ENOUGH GOOD CURRENT DATA COLLECTED TO BE STATISTICALLY USEFUL. THE ANSWER, OF COURSE, IS TO COLLECT MORE AND BETTER DATA.

ONE MOST IMPORTANT AREA OF INTEREST TO ALL OF US WHO HAVE BEEN WORKING TO REDUCE INJURY SEVERITY IN ACCIDENTS IS THE RELATIONSHIP OF VEHICLE

IMPACT INTENSITY TO RESULTING INJURY TO OCCUPANTS. RIGHT NOW MASS ACCIDENT DATA ARE COLLECTED ALMOST ENTIRELY BY THE POLICEMAN CALLED TO THE SCENE OF THE ACCIDENT. SUMMARIES OF THESE POLICE DATA TELL US THAT THERE WERE "X" NUMBER OF ACCIDENTS, "Y" NUMBER OF INJURIES, "Z" FATALITIES--THEY SAY THAT: SO MANY ACCIDENTS HAPPENED AT NIGHT, ON A RURAL ROAD, THAT WAS UNDER CONSTRUCTION, AND THAT THE VEHICLE WAS TOWED FROM THE SCENE BY ALVARADO'S WRECKER SERVICE -- ALL VERY INTERESTING, BUT WHAT KIND OF A PICTURE DO THESE ELEMENTS OF INTELLIGENCE GIVE US OF THE ACCIDENT SEVERITY. IN FACT, DO THEY PROVIDE ANY MEASURE OR MEASURES OF ACCIDENT SEVERITY.

I BELIEVE THAT TWO VERY IMPORTANT MEASURES OF THE SEVERITY OF AN ACCIDENT ARE: THE EXTENT OF PERSONAL INJURY AND VEHICLE DAMAGE. INJURY AND DAMAGE CAN BE QUANTIFIED AND WHEN THESE QUANTIFICATIONS ARE COMBINED SPECIFICALLY WITH OTHER ROUTINE INFORMATION NORMALLY COLLECTED AT THE POLICE INVESTIGATION LEVEL, A VAST ARRAY OF USEFUL INFORMATION CAN BE EVOLVED.

WHILE VARIOUS SCALES, INDICES AND METHODS HAVE BEEN USED TO QUANTIFY OCCUPANT INJURY AND VEHICLE DAMAGE, THE TWO MOST VERSATILE AND, IN MY OPINION, VALUABLE, ARE THE ABBREVIATED INJURY SCALE ⁽¹⁾ (FOR INJURY QUANTIFICATION) AND THE VEHICLE DEFORMATION INDEX ⁽²⁾ (FOR VEHICLE DAMAGE SPECIFICATION).

THE ABBREVIATED INJURY SCALE, OR AIS AS IT IS OFTEN REFERRED TO, IS A METHOD DEVELOPED BY THE AMERICAN MEDICAL ASSOCIATION TO DESCRIBE PERSONAL INJURY. NUMERICAL INJURY CODES ARE APPLIED TO SPECIFIC TRAUMA IN SPECIFIC ANATOMICAL REGIONS; FOR EXAMPLE, A COMPOUND FRACTURE OF THE LEFT HUMERUS MIGHT RATE AN AIS LEVEL 3. THE INCREASING NUMBERS FROM ZERO TO SIX INDICATE INCREASING SEVERITY OF THE SPECIFIC LESION. THESE CODES WERE DEVELOPED BY PHYSICIANS WHO CONSIDERED SUCH FACTORS AS: ENERGY DISSIPATION AS A CAUSE OF THE TRAUMA, THREAT TO LIFE RESULTING FROM THE TRAUMA, POSSIBILITY OF PERMANENT IMPAIRMENT, THE TREATMENT PERIOD REQUIRED FOR HEALING, AND THE INCIDENCE OF SUCH INJURIES OCCURRING IN THE ROUTINE TREATMENT OF TRAUMA

FROM ROUTINE TRAFFIC ACCIDENTS AS BASED ON THE EXPERIENCE OF THE ATTENDING PHYSICIANS. THE AIS CODES ARE ASSIGNED ONLY BY MEDICAL AND PARA-MEDICAL PERSONNEL.

VEHICLE DAMAGE IS QUANTIFIED USING THE VEHICLE DEFORMATION INDEX, CALLED THE VDI, DEVELOPED BY THE SOCIETY OF AUTOMOTIVE ENGINEERS. THE VDI IS A COMPREHENSIVE DAMAGE DESCRIPTION TECHNIQUE IN WHICH A SIX COMPONENT, SEVEN CHARACTER ALPHANUMERIC CODE IS USED TO DESCRIBE: THE GENERAL DIRECTION OF FORCE, GENERAL AREA OF DEFORMATION, SPECIFIC HORIZONTAL AND VERTICAL AREAS OF DAMAGE, THE TYPE OF DAMAGE DISTRIBUTION, AND THE EXTENT OF DAMAGE. A VDI CODE OF 12FCEN2 INDICATES THAT THE VEHICLE RAN HEAD-ON INTO A NARROW OBJECT, SUCH AS POLE, CAUSING CENTRAL DAMAGE TO THE FRONT OF THE VEHICLE AND THE CONTACT DAMAGE EXTENDED BACK APPROXIMATELY ONE-THIRD THE LENGTH OF THE HOOD.

USE OF THE VEHICLE DEFORMATION INDEX BY A DIVERSE GROUP OF INVESTIGATORS WITH ONLY MINIMAL TRAINING, WAS SHOWN TO BE FEASIBLE IN A STUDY OF 520 ACCIDENT CASES COLLECTED BY 33 TEAMS REPRESENTING NINE EUROPEAN AND NORTH AMERICAN NATIONS IN THE PILOT STUDY ON ROAD SAFETY^(3,4). IN THIS CONTROLLED STUDY, ACCIDENT INVESTIGATORS CORRECTLY APPLIED THE VDI TO DAMAGED VEHICLES IN APPROXIMATELY THREE-FOURTHS OF THE CASES. LESS THAN 5% OF THE CASES CONTAINED INVALID INFORMATION. THE AUTHORS OF THE REPORT CONCLUDED THAT THE VDI COULD BE APPLIED EFFECTIVELY AT THE POLICE LEVEL 90 TO 95% OF THE TIME IN REGULAR USE.⁽⁵⁾

THE DAMAGE AND INJURY SCALES WERE STUDIED FURTHER IN A SPECIAL PROGRAM IN BEXAR COUNTY, TEXAS, DURING THE SIX-MONTH PERIOD ENDING MAY 30, 1973. THE AUTOMATED DATA FILE FROM THIS STUDY CONTAINS INFORMATION ON NEARLY 5500 ACCIDENTS INVOLVING OVER 10,000 VEHICLES AND 15,000 OCCUPANTS. THE CORRELATION BETWEEN INJURY SEVERITY AND VEHICLE DAMAGE WAS STUDIED AND GROSS PATTERNS WERE EVIDENT WHEN THE TWO VARIABLES WERE COMPARED ON SELECTED BASIS.^(6,7)

WITH REASONABLE ASSURANCE, INJURY SEVERITY COULD BE PREDICTED ON THE BASIS OF OBSERVED DAMAGE EXTENT. I HASTEN TO ADD, HOWEVER, THAT THIS STATEMENT MUST BE ACCEPTED IN VIEW OF MANY OTHER QUALIFYING FACTORS. GROSS STATISTICS WERE REPORTED BECAUSE WE SIMPLY DID NOT HAVE A DATA FILE OF SUFFICIENT SIZE TO PRODUCE STATISTICALLY SIGNIFICANT RESULTS IN ANY DEGREE OF REFINEMENT.

A RECOMMENDATION OF THIS STUDY, WHICH I NOW PROPOSE FOR CONSIDERATION OF THIS GROUP IS: USING NOW OBTAINABLE LARGER QUANTITIES OF ACCIDENT DATA, CONDUCT FURTHER STUDIES AIMED AT REFINING THE INJURY SEVERITY PREDICTION POTENTIAL OF THE VDI COLLISION DAMAGE CLASSIFICATION TECHNIQUE USED IN CONJUNCTION WITH THE ABBREVIATED INJURY SCALE; PROMULGATE THE VEHICLE DEFORMATION INDEX AS THE STANDARD COLLISION DAMAGE CLASSIFICATION TOOL FOR USE BY POLICE IN REPORTING VEHICLE DAMAGE IN TRAFFIC ACCIDENTS; INTRODUCE PROGRAMS WHICH WOULD PERMIT UTILIZATION OF THE ABBREVIATED INJURY SCALE (ASSIGNED ONLY BY MEDICAL AND PARA-MEDICAL PERSONNEL) IN CONNECTION WITH POLICE REPORTS IN MAJOR TRAUMA TREATMENT CENTERS.

