CHAPTER 3

PROBLEM IDENTIFICATION

Data collection efforts and identification of pedestrian crash problems are discussed in this chapter.

Pedestrian Crash Data Collection

Accident (crash) reports filed by law enforcement agencies provide the basis for a statewide crash database maintained by NDOT. The accident reports are filed with the Department of Motor Vehicles (DMV), who extracts limited driver data from each report and forwards a paper copy of the report to NDOT. The system is maintained primarily to serve the needs of engineers and planners in determining high crash locations and driver problem areas.

Pedestrian crash detail is severely restricted. The system does not provide details such as how far from the crosswalk the pedestrian was, the direction the pedestrian was traveling, or whether a vehicle was turning left or right at the intersection. The data can be manipulated to extract some additional detail, such as causal factor by age, but most of this must be done manually from the actual reports recorded by the investigating officer. The TRC has worked extensively with data from NDOT, and it has been successful in geo-referencing (in a Geographic Information Systems (GIS) environment) crash data extracted from the NDOT files. Pedestrian crashes over a five-year period (1996 to 2000) were considered for this study. This information was provided in five files, requiring extensive data processing and formatting.

Other sources from which data was collected include the following entities.

1. UMC Trauma (five years of injury data)
2. LVMPD (16 months of pedestrian crash data)

However, to avoid inconsistencies and due to lack of a common field to combine databases, data obtained from UMC Trauma Center and LVMPD were not considered.

The evaluation and identification of high pedestrian crash sites is thus primarily based on crash data maintained by NDOT. Data show that there were 3,710 pedestrian crashes in Clark County between 1996 and 2000. The crash data is geo-coded using the street reference system. The street centerline (SCL) coverage developed and maintained by Clark County GIS Management Office is used to geo-code the crash data. A program is written using Arc Macro Language (AML). Over 95 percent of pedestrian crashes were geo-coded using the AML program.

Pedestrian Crash Problem

Nevada led the nation in pedestrian fatalities per capita during 1999, and has been among the top 10 states for the last 10 years. About 71 percent of the fatalities and 75 percent of the injuries occur in Clark County, the majority of which happen in the city of Las Vegas and the more densely populated portions of Clark County adjacent to the city. As stated
before, figures 6 and 7 (page 1-10) illustrate that during 1997, 1998 and 1999 Clark County, Nevada has experienced the highest rate of fatal pedestrian crashes and pedestrian injury crashes among urban counties with similar populations. Thus, the pedestrian safety problem (as quantified by fatal and injury crashes) in Clark County warrants immediate attention. Myth attributes these rates to the high levels of visitors and the free-flowing alcohol provided to customers at major casinos. Facts, however, dispel this myth. Some of these facts follow next.

Observations have shown that the probability of pedestrian involvement in a crash between 1996 and 2000 was about the same on all days of a week, though it is marginally lower on Sundays. Figure 8 (page 3-4) shows distribution of major hotels / casinos in the study area. Figures 9 (page 3-4) and 10 (page 3-5) show the distribution of pedestrian crashes on Wednesdays and Saturdays. Figure 11 (page 3-5) shows the distribution of pedestrian crashes involving alcohol / drugs consumption by pedestrians. As seen in the figures, pedestrian crashes are distributed throughout the study area thus dispelling the myth that high pedestrian crashes are due to high levels of visitors.

An analysis of pedestrian crashes that occurred from 1996 to 2000 indicates that male pedestrians are involved in twice as many pedestrian crashes as female pedestrians. During the same period, children under 18 years of age were involved in about 30 percent of pedestrian crashes (Figure 12, page 3-6). Likewise, citizens in the age group of 50 to 64 years and 65 years and over were involved in about 11 percent and 8 percent of total pedestrian crashes respectively. Figure 13 (page 3-6) shows that about 75 percent of pedestrian crashes occurred on principal arterial and minor arterial streets (streets with six lanes and four lanes). It has to be noted that the local transit network primarily includes most of the principal arterial and minor arterial streets. About forty percent of pedestrian crashes on principal arterial and minor arterial streets occurred at least 50 feet away from the intersection (or a reference cross street). Figure 14 (page 3-7) shows spatial distribution of crashes occurring away from an intersection. About 65 percent of total pedestrian crashes were in “speed control zones” and five percent of pedestrian crashes were at stop signs. About 60 percent of pedestrian crashes were due to pedestrian failure to yield. About 34 percent of pedestrian crashes were due to motorist failure to yield, driving under the influence of alcohol or inattentive driving. A majority of pedestrian crashes at intersections were due to motorist failure to yield whereas pedestrian failure to yield is the primary cause of crashes at non-intersection locations.

An analysis of the pedestrian action field in all the pedestrian crash records shows the following to be the top five causal factors for the period from January 1996 to December 2000,

1) Crossing not at intersection - no pedestrian crosswalk (33 percent)
2) Crossing at intersection with signal (16 percent)
3) Ran into roadway (9 percent)
4) Not in roadway (9 percent), and
5) Crossing at intersection - no signal, marked crosswalk (6 percent).
About 35 percent of pedestrian crashes were due to crossing not at intersection (Figure 15, page 3-7), of which only a little over 2 percent were at crosswalks. Approximately 40 percent of crashes were under dark conditions, and about the same percentage of crashes are between 12:00 Noon and 6:00 PM.

About 85 percent of the pedestrians in fatal crashes and 80 percent of the drivers involved in pedestrian fatal crashes had Nevada addresses. Residency information was not available for injury data, but it could be expected that the percentages would be similar. Alcohol was a factor in many of the crashes, as is time of day. Approximately 37 percent of the pedestrians who die each year had consumed alcohol or drugs. However, few of the pedestrians killed in the vicinity of the Strip involved pedestrian alcohol consumption.

Overall, pedestrian crashes at signalized intersections, pedestrian crashes at mid-block locations, pedestrian crashes involving children, and pedestrian crashes involving senior citizens are observed as significant pedestrian crash problems of concern, which need immediate attention in the Las Vegas metropolitan area. A pedestrian safety program was initiated to evaluate and research suitable countermeasures to mitigate these growing pedestrian safety problems.
FIGURE 8 Distributions of Hotel / Casinos in the Las Vegas Metropolitan Area

FIGURE 9 Spatial Distributions of Pedestrian Crashes on Wednesdays
FIGURE 10 Spatial Distributions of Pedestrian Crashes on Saturdays

FIGURE 11 Spatial Distributions of Crashes Involving Pedestrians under Influence of Alcohol / Drugs (Red–Fatal; Blue–Injury)
FIGURE 12 Percent of Pedestrian Crashes by Age Group

FIGURE 13 Percent of Pedestrian Crashes by Road Functional Classification
FIGURE 14 Spatial Distributions of Midblock Pedestrian Crashes (Red–Fatal, Blue–Injury)

FIGURE 15 Percent of Pedestrian Crashes by Pedestrian Action