CHAPTER 1

INTRODUCTION

The report is organized into nine chapters. An introduction is presented in Chapter 1. The development of the project team, partners, and stakeholders is summarized in Chapter 2. Chapter 3 addresses the problem identification process and Chapter 4 presents a discussion of the identification of high pedestrian crash sites in high risk zones. A review of the literature is included in Chapter 5. Site specific selection and identification of countermeasures is presented in Chapter 6. The outreach and awareness campaign is summarized in Chapter 7. Chapter 8 discusses comments about Pedestrian and Bicycle Crash Analysis Tool (PBCAT). Chapter 9 summarizes Phase 1. Additionally, a list of references is included. This is followed by appendices.

A discussion on the study area, its development patterns, demographic and transportation system characteristics, law enforcements, and safety problems are discussed in this section.

The Study Area

Several cities lie within the boundaries of Clark County, Nevada, but most of the population resides in the City of Las Vegas or in the unincorporated areas adjacent to the city boundaries. The physical boundaries between the jurisdictions are invisible, creating a unified metropolitan area. The study area includes all of this urban and suburban area. Figure 1 (page 1-7) provides an illustration of the Las Vegas metro area or “valley.” This is the general extent of the study area.

Conditions within the study area are consistent with those to be found in many southwestern states, and in communities with a wide, fast street system. A history of high incidence of pedestrian crashes has generated awareness in the multiple agencies that govern the area. The roadways in the study area are under the jurisdiction of City of Henderson, City of Las Vegas, City of North Las Vegas, Clark County, or the Nevada Department of Transportation (NDOT). The Regional Transportation Commission of Southern Nevada (RTC) and the Nevada Office of Traffic Safety (OTS) are other entities who have administrative responsibilities for the transportation system and transportation safety in the study area.

UNLV TRC is viewed by governing bodies as a politically neutral partner in their efforts to promote traffic safety in the region. The TRC’s Safe Community Partnership has fostered a regional approach to traffic safety, which has essentially laid the groundwork for a multi-jurisdictional effort.

Development Patterns

The original downtown core of Las Vegas has been revitalized and transformed to a large casino pedestrian mall with two cross streets. With the partial exception of government and law, the gaming industry has displaced other civic activities from the center to the margins. Streets entering the downtown area were reconstructed around the year 2000 to
include curb extensions, some wide sidewalks, and landscaping, but the scale favors the motorized vehicle. Near the new mall, the homeless and the unemployed congregate near the day labor office and social services building.

Commerce sprawls out from the center and along Las Vegas Boulevard, known as the Strip. The Strip has evolved into one of the most recognizable and heavily traveled streets in the world. Designed as a Day and Night Scenic Byway, 14 of the 15 largest hotel complexes in the nation are located along this roadway. An estimated 90,000 people stroll along the resort corridor every day of the peak season. The strip consists of a minimum of six lanes of through traffic. The sidewalks are typically crowded with people in a party mood while attractions such as mock facades of famous cities from around the world and an erupting volcano compete for driver attention.

Old and new residential neighborhoods were built as suburbs, disconnected from any city center, commerce, or services. Many peripheral suburbs, such as Summerlin and Green Valley, are exclusive areas connected only by high-speed arterial streets. Some cater to retired citizens, while others attract young white-collar workers. There is evidence of disconnect regarding land use patterns in the Las Vegas valley, but significant changes in current patterns are unlikely in the near future. New development continues to proliferate the wide, fast streets that are the trademark of auto-oriented urbanity and the bane of pedestrian travel.

Neighborhood advisory boards and homeowner associations offer some sense of identity to some residential communities. But there is a less obvious, unique identity of place for residents in the City of Las Vegas and County areas than in other cities in the study area, such as Henderson, or North Las Vegas. These areas have better defined central areas and some geographical distinction at their boundaries.

The assets within the neighborhoods of the study area include the various boards and associations representing the interests of the community. They also include a myriad of organizations such as churches, youth groups, school district, health care providers, law enforcement agencies, emergency responders, and committed businesses that are eager to improve quality of life for those who live, work, and shop within the area. These assets are tapped and cultivated in an effort to combine neighborhood resources with local and regional resources to improve pedestrian accessibility, mobility, and safety.

Population
Clark County, Nevada, which includes Las Vegas, has been the fastest growing metropolitan area in the country, with more than an 85 percent increase in population during the last decade [1]. The County is home to 69.5 percent of Nevada’s 2.1 million residents. About 35 million people from all over the world visit the Las Vegas valley each year, creating a tourism industry and economic base for support businesses that lures an average of 5,000 new residents to the area each month. Entry level hotel/casino employment positions are abundant, but most start at minimum wage.
The Hispanic population in Clark County has grown from 11.2 percent of the total in 1990 to 22 percent of the total in 2000, with an estimated 1,200-1,500 Hispanics immigrating to the area each month. Seventy five percent of the Las Vegas Hispanic population was born outside of the United States, suggesting a language barrier and related limitations on transportation opportunities. The Latin Chamber of Commerce estimates that by the year 2004, Hispanics will be the largest workforce in Clark County. Non-white residents, including African Americans and Asians, represent an additional 17.8 percent of the total population.

About 11 percent of the population is over 65 years of age, and 25 percent of the overall population is under the age of 18 years. The number of children under 18 years of age in Hispanic families is significantly higher, representing 36.6 percent of the Hispanic population. These numbers reflect issues that need to be studied when developing treatment programs, particularly education and outreach campaigns. The culture of the Hispanic community and the needs of senior citizens set them apart from the majority of the population who often has easier access to motorized transportation.

Transportation
Las Vegas is a new urban area by most standards. It was built during the first half of the twentieth century in a vast desert with ample land for urban sprawl. A majority of the growth in population and the economy growth in this area has occurred over the last 20 years. The low-density template used to develop the desert city provided a traditional street grid pattern with major surface arterial streets at every mile, and rights-of-way adequate to provide for six or eight lanes of traffic that generally travels at or above the posted speed limit of 45 miles per hour (mph). Intersections are wider, often with striped dual or triple left turn pockets, and single or double right turn pockets. A few streets have raised medians, but those with adequate width are more likely to have two-way-left-turn lanes in their center. Sidewalks, when present, are generally a maximum of five feet wide and built at the back of curb, with no buffer between the sidewalk and the travel lanes for vehicles. In the 10 years between 1990 and 2000, the number of lane miles in Clark County more than doubled, for a total of 5,849 miles of lanes. Principal arterial streets and minor arterial streets account for 47 percent of urban vehicle miles of travel in the Las Vegas valley. Expansion of the roadway network continues as the area struggles to serve the growing number of vehicles, but the length of time spent commuting gradually creeps up as congestion overtakes the new roads. The Las Vegas valley is a non-attainment area for national clean air standards, which casts a shadow of uncertainly on the area’s ability to continue to increase lane miles indefinitely.

Citizens Area Transit, the local bus system, began serving the citizens of Clark County in December 1992. In just under 10 years, ridership has grown from 15 million riders in 1993 to 51 million riders in 2001 – catapulting CAT to the 27th largest bus system in the nation. Special bus service is available for qualified senior citizens and the disabled. Figure 2 (page 1-8) shows a disabled person boarding a transit bus at one of the busiest bus stops in the Las Vegas valley. The system consists of 52 routes served by 308 buses. Average daily passenger ridership has risen to 150,000 during the last five years, which is a growth rate twice that of the national average. As an example, Figure 3 (page 1-8)
shows high pedestrian activity at a transit stop on Flamingo Road (a 6-lane, 45 mph high speed arterial with link volume greater than 10,000 vehicles per day) in Las Vegas, NV around 12:00 noon. Incidents such as transit system users crossing such “high speed”, “high volume” and “high risk” streets to use the transit system is not uncommon in the study area (Figure 4 and Figure 5, page 1-9).

Bicycling is popular as a mode of transportation. Many shoulders have been converted to travel lanes as traffic has increased. Area guidelines call for curb lanes of at least 14 feet in an effort to provide some space for bicyclists. Each month 35,000 bicycles are transported on the bus system.

The Clark County School District (CCSD) is the sixth largest in the nation - with an enrollment of about 260,000 students. CCSD’s policy is that students who live within two miles of a school are not provided bus transportation by CCSD - i.e., they have to walk, bicycle, get dropped off by a parent / guardian or take a commercial transit bus. (This policy has been changed for the 2002-2003 school year so that high school students who live within three miles of their school will not be provided transportation by CCSD). In spite of this policy, many school children ride buses to school, and it is not uncommon to see buses stop on seven lane, arterial streets to allow children to board and depart. Many of the older suburban schools in the Las Vegas valley are adjacent to multi-lane arterial streets. As in many areas of the United States, schools are frequently placed in locations that require motorized transportation. Elementary aged children who cross major streets at intersections that are not signalized are assisted by a crossing guard during school hours, but middle schools generally do not provide crossing guards. School speed zones are aggressively enforced at speeds of 15 mph for elementary and middle schools, at 25 mph. for high schools, but officer resources limit the number of school zones that can be policed each day.

**Law Enforcement**

The City of Las Vegas and Clark County are served by the Las Vegas Metropolitan Police Department (LVMPD), a consolidated agency funded by both entities. There are approximately 1,800 officers in the department, about 130 of who are dedicated to traffic administration, patrol, and crash investigation. The agency investigates approximately 51 percent of the crashes that occur in Nevada. An inter-local agreement with the Nevada Highway Patrol assigns traffic on and near the freeway system to the state troopers.

LVMPD conducts a variety of specialized enforcement programs, including active efforts to increase motorist compliance at marked crosswalks. They conduct regular Selective Traffic Enforcement Programs (STEPs) under traffic safety grants awarded through the Nevada Office of Traffic Safety (OTS). Pedestrian safety has become an issue for the agency and they are committed to helping with this project. One commanding officer shared his viewpoint that motorists are simply unaware of the dangers a pedestrian confronts in the street environment. One of TRC’s current projects, sponsored by the OTS, is to help officers from LVMPD and other law enforcement agencies in the study area better understand pedestrian safety related issues, conduct pedestrian safety
campaigns using plain clothes officers as pedestrian “decoys”, and cite and educate motorist who violate pedestrian related traffic laws.

**Pedestrian Crash Problem in Las Vegas Metro Area and Safety Program**

Data show that there were a total of 39,730 motor vehicle related crashes in Clark County in 1996. There were 42,844 such crashes in 1997, 43,438 crashes in 1998, 44,118 crashes in 1999, and 43,611 crashes in 2000 in Clark County, Nevada [2, 3]. A summary of crashes in Clark County, Nevada by severity is presented in Table 1 (page 1-10). Figures 6 and 7 (page 1-10) illustrate that over the last three years Clark County, Nevada has experienced the highest rate of fatal pedestrian crashes and pedestrian injury crashes when compared with urban counties having similar populations. Thus, the pedestrian safety problem (as quantified by fatal and injury crashes) in Clark County warrants immediate attention.

**Goals and Objectives**

The goals and objectives of the pedestrian safety program are discussed next.

**Goal**

The goal of the program is to improve pedestrian safety and walkability within the urban boundaries of the Las Vegas Metropolitan area. This is to be achieved by identifying high risk pedestrian incident target areas and populations, by selecting and implementing engineering and Intelligent Transportation System (ITS) based countermeasures, and by analyzing and evaluating the effectiveness of pedestrian safety countermeasures for various target groups and causal factors.

**Objectives**

The objectives of the program (Phase 1) include the following.

1. Build a team of traditional and non-traditional partners committed to enhancing pedestrian safety in the Las Vegas Metropolitan area.
2. Develop measures to quantify risk for pedestrian safety and indicators to be used for the same.
3. Establish a community-based process to identify and prioritize “high risk” locations for pedestrians, and to select and deploy appropriate countermeasures.
4. Identify approximately 12 locations or short corridors that pose the greatest risk for pedestrian safety.
5. Select a set of appropriate countermeasures to be deployed at selected locations.
6. Identify a few locations to serve as control sites.
7. Develop site specific plans for deploying the selected countermeasures and estimates of budgets, funding sources, and schedules for the deployment of the same.
8. Develop a protocol for evaluating the performance of the countermeasures.
9. Develop plans for continued maintenance of the countermeasures and to potentially increase the deployment of such strategies.
10. Develop a methodology for building community awareness and education based on specific target audiences.
11. Disseminate the outcomes, findings, and experiences from the program through topical avenues.
**Project Tasks**
The Pedestrian Safety Project was broken down into several sub-tasks and specifically they consist of the following:

1. Assembly of a team consisting of traditional and non-traditional partners
2. Identify pedestrian crash problem areas, select countermeasures, and conduct outreach & awareness campaign
   a. Problem identification
   b. Countermeasure selection plan
   c. Outreach and awareness campaign
3. Meetings and other presentations / briefings
4. Professional journal paper(s).
FIGURE 1 City and Major Streets in the Las Vegas Metropolitan Area
FIGURE 2 An Example Showing Local Transit System Serving a Disabled Person

FIGURE 3 Pedestrian Activities at a Transit Stop on Flamingo Road at Noon
FIGURE 4 Pedestrian Xing a “High Speed” Major Arterial to Board a Transit Bus

FIGURE 5 Pedestrians Xing a “High Speed” Major Arterial after Alighting Transit Bus
TABLE 1 Summary of crashes by severity in Clark County, NV

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<th>Year</th>
<th>Fatal Crashes</th>
<th>Injury Crashes</th>
<th>Property Damage Only Crashes</th>
<th>Total</th>
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<td>192</td>
<td>11,070</td>
<td>28,467</td>
<td>39,730</td>
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<tr>
<td>1997</td>
<td>188</td>
<td>12,951</td>
<td>29,704</td>
<td>42,844</td>
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<td>1998</td>
<td>183</td>
<td>14,140</td>
<td>29,115</td>
<td>43,438</td>
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<tr>
<td>1999</td>
<td>174</td>
<td>14,797</td>
<td>29,146</td>
<td>44,118</td>
</tr>
<tr>
<td>2000</td>
<td>157</td>
<td>14,575</td>
<td>28,878</td>
<td>43,611</td>
</tr>
</tbody>
</table>

FIGURE 6 Comparisons of Pedestrian Fatal Crash Rates (1997 – 1999)

FIGURE 7 Comparisons of Pedestrian Injury Crash Rates (1997 – 1999)