EXECUTIVE SUMMARY

This report documents efforts on and findings from Phase 1 of a cooperative agreement between the Federal Highway Administration (FHWA) and the University of Nevada, Las Vegas (UNLV) Transportation Research Center (TRC), titled Pedestrian Safety Engineering and Intelligent Transportation System (ITS) - Based Countermeasures Program for Reducing Pedestrian Fatalities, Injuries Conflicts and other Surrogate Measures Pedestrian Safety Program. Five state and local agencies in Nevada co-sponsored the program: City of Las Vegas, Clark County Department of Public Works, Nevada Department of Transportation, Nevada Office of Traffic Safety, and the Regional Transportation Commission of Southern Nevada. Several other local agencies and private sector organizations were cooperating partners.

The goals of the program are to identify, develop countermeasures (that could be deployed, and evaluated in Phase 2) to help improve pedestrian safety (and minimize risk) and walkability. The intent is for this program to serve as an example that would lead to implementation of successful countermeasures across the nation. The Las Vegas metropolitan area is the region targeted for deploying and identifying countermeasures. This is to be based on identifying high risk pedestrian incident target areas and populations, selecting and implementing safety engineering and ITS based countermeasures, and analyzing the effectiveness of treatments for various target groups and causal factors.

A Geographic Information Systems (GIS) based methodology is used to identify high pedestrian risk zones in the study area and specific pedestrian high crash sites within the zones and throughout the study area. The study area primarily comprises zipcodes in the center of Las Vegas metro area with pedestrian crash rates higher than average pedestrian crash rate for the Las Vegas metro area. Sixteen zones were identified in the Las Vegas metro area as high risk zones. These zones were analyzed in detail using Pedestrian and Bicycle Crash Analysis Tool (PBCAT) and GIS software. These zones were ranked based on computed crash indices. The crash indices were computed by multiplying pedestrian crashes in a zone per mile with a weighted factor and then divided by 100. The weighted factor is a function of fatal crashes and severe injury crashes per mile. Forty-seven pedestrian high crash sites were identified in these 16 high risk zones. Pedestrian crashes in these 47 sites were analyzed to identify pedestrian safety countermeasures based on explanatory factors.

Pedestrian safety countermeasures considered include new technology based and traditional safety engineering design based strategies. Examples of countermeasures considered include countdown timers, enlarged pedestrian signal heads, animated eyes for pedestrian signal heads, animated eyes warning signs that show driver the direction pedestrians are crossing, smart lighting to warn drivers that pedestrians are crossing under dark light conditions, regulatory signs alerting drivers and pedestrians of potential conflict movements, advance stop / yield lines, elimination of permissive left turn movements, flashing beacons activated by speeding vehicles, dynamic signs restricting right-turn-on-red when pedestrians are present, automatic detection of pedestrians, in-pavement lighting, median refuge islands, Danish offsets, and portable speed trailers with
fine information. However, the literature documents limited discussions on the evaluation of such technologies. Phase 1 efforts researched some of these new and emerging treatments, and summarized factors to be considered in selecting such treatments to enhance pedestrian safety at sites with high pedestrian safety risks.

Measures of effectiveness (MOEs) were identified to evaluate pedestrian treatments before and after implementation of the treatments. The MOEs include the number of crashes and conflicts, the degree of severity of the crashes, the number of pedestrians and motorists who comply with the rules, motor vehicle speeds, pedestrian crossing times, proportion of motorists yielding to pedestrians, distance between vehicles stopped for pedestrians and the pedestrian crosswalk, pedestrian crash rates based demographic data and traffic volumes, and users’ perspectives. Cost estimates for deploying and evaluating the proposed countermeasures were also developed.