Introduction

Study Purpose and Objectives

The primary purpose of the Rancho Drive Corridor Study is to identify transportation investment options for one of the most congested non-freeway corridors in the Las Vegas Valley area. This identification of investment options is being undertaken through an extensive analysis and stakeholder outreach process. Specific project objectives include:

- Relieving congestion on US-95 northwest of the Spaghetti Bowl by providing a travel time competitive route for commuters traveling from the growing Northwest to the Resort Corridor.
- Increasing mobility through improved transit service.
- Encouraging corridor redevelopment, especially in the urban core area of the corridor.

Currently, Rancho Drive is one of the region’s most highly congested corridors as identified in Table 1-1. It lacks sufficient capacity to handle existing and projected 2030 travel demand between its US-95 freeway interchanges (pass through trips) and to and from destinations within the corridor itself (internal trips). The situation is aggravated by the lack of continuous parallel arterial routes and available arterial/intersection capacity. In addition, there are no major programs in the Rancho Corridor to implement Transportation System Management (TSM), Transportation Demand Management (TDM), or Intelligent Transportation System (ITS) strategies. Because the nearby US-95 freeway already operates at near capacity levels, there exists no viable route alternative for vehicles using Rancho Drive now or in the future.

With projected population and employment growth trends (see Table 1-2) indicating yet further increases in transportation volumes, this situation is only expected to worsen. Transportation improvements along the corridor are needed to provide a higher level of traffic operational efficiency for both existing and anticipated traffic volumes and to offer enhanced additional travel mode choices have all been identified as objectives for the corridor. A more detailed discussion of specific corridor issues, existing transportation facilities and operations, and future traffic and demographic forecasts are provided in subsequent sections of this report.

Improved transportation services along the corridor will also provide opportunities to enhance traffic operations along the US-95 freeway network and would address future needs as significant commercial and residential development continue along the corridor. Improved transportation facilities along the corridor have been a long-standing goal of the Regional Transportation Commission of Southern Nevada (RTC), Nevada Department of Transportation (NDOT), the City of Las Vegas, the City of North Las Vegas, local residents and business owners.

The identification of transportation improvements for the Rancho Corridor will help address the need to:

- Accommodate future travel demand in the corridor by expanding roadway capacity, reduce congestion at major intersections, and provide a more favorable setting for enhanced transit options.
- Improve mobility along this already congested corridor by providing increased capacity and faster, convenient access to existing employment centers in the Las Vegas downtown and resort concentration (Strip) areas to the southeast.
- Improve mobility options to employment, education, medical, retail and entertainment centers throughout the Las Vegas Valley for residents and tourists.
- Enhance regional connectivity through expanded and improved interchange points with the US-95 freeway.
- Alleviate severe and ever-increasing traffic congestion on the US-95 freeway and the Summerlin Parkway.
- Support local economic and land use plans and goals.

### Table 1-1: Las Vegas Region Worst Roadway Segments

<table>
<thead>
<tr>
<th>Rank</th>
<th>Roadway</th>
<th>Endpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>US-95</td>
<td>Summerlin Parkway</td>
</tr>
<tr>
<td>2</td>
<td>I-15</td>
<td>Charleston Boulevard</td>
</tr>
<tr>
<td>3</td>
<td>I-15</td>
<td>Flamingo Road</td>
</tr>
<tr>
<td>4</td>
<td>Rancho Road</td>
<td>Decatur Boulevard US-95</td>
</tr>
<tr>
<td>5</td>
<td>Tropicana Avenue</td>
<td>Jones Boulevard Kovall Lane</td>
</tr>
<tr>
<td>6</td>
<td>Flamingo Road</td>
<td>Valley View Boulevard Pecos Road</td>
</tr>
<tr>
<td>7</td>
<td>Tropicana Avenue</td>
<td>Swanson Street US-95</td>
</tr>
<tr>
<td>8</td>
<td>Las Vegas Boulevard</td>
<td>Sahana Avenue Tropicana Avenue</td>
</tr>
<tr>
<td>9</td>
<td>I-215</td>
<td>Pecos Road</td>
</tr>
<tr>
<td>10</td>
<td>Lake Mead Drive</td>
<td>Gibson Road Warm Springs Road</td>
</tr>
<tr>
<td>11</td>
<td>Spring Mountain Road</td>
<td>Sands Avenue Decatur Boulevard Paradise Road</td>
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<tr>
<td>12</td>
<td>US-95</td>
<td>Las Vegas Boulevard Sahana Avenue</td>
</tr>
<tr>
<td>15</td>
<td>MLK Boulevard</td>
<td>Cheyenne Boulevard Alta Drive</td>
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</table>


### Table 1-2: 2004 to 2030 Population and Employment Growth

<table>
<thead>
<tr>
<th>Year</th>
<th>Clark County Population</th>
<th>Clark County Employment</th>
<th>Population Forecast</th>
<th>Employment Forecast</th>
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<tr>
<td>2004</td>
<td>1,708,819</td>
<td>927,232</td>
<td>2005</td>
<td>1,775,591</td>
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<td>2006</td>
<td>1,841,063</td>
<td>980,230</td>
<td>2007</td>
<td>1,905,226</td>
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<td>1,967,958</td>
<td>1,027,159</td>
<td>2009</td>
<td>2,029,226</td>
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<tr>
<td>2010</td>
<td>2,089,102</td>
<td>1,069,186</td>
<td>2011</td>
<td>2,147,113</td>
</tr>
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<td>2012</td>
<td>2,203,256</td>
<td>1,100,991</td>
<td>2013</td>
<td>2,257,292</td>
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<td>2014</td>
<td>2,309,117</td>
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<td>2,978,221</td>
<td>1,298,922</td>
<td>2031</td>
<td>3,043,378</td>
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Source: Clark County Comprehensive Planning Housing-Unit-Based Population Estimate July 2003.
Project elements will seek to address these stated needs with the following purposes in mind:

• To improve mobility and reduce congestion along the Rancho Drive Corridor.
• To maximize cost-effectiveness.
• To minimize adverse and maximize beneficial environmental impacts.
• To minimize negative and maximize positive economic impacts.

Study Area

The study area for the Rancho Drive Corridor Study is defined as the approximately ten-mile stretch of Rancho Drive (Business US-95) between the Ann Road/US-95 interchange to the northwest and its intersection with Sahara Avenue to the southeast (south of the Spaghetti Bowl), which is illustrated on Figure 1-1. Rancho Drive from Sahara Avenue to the southerly interchange with US-95 is a City of Las Vegas roadway. North of the southerly interchange with US-95 to the interchange with Ann Road/US-95, Rancho Drive (Business 95) is a State of Nevada roadway with the designation of State Highway 599. The route passes through the northwest portion of Las Vegas and along the southwestern border of North Las Vegas between Cheyenne Avenue and Coran Lane. Rancho Drive is a major arterial roadway and has traffic signalized intersections at the following major cross streets (from north to south):

• US-95 (N)
• Rainbow Boulevard
• Lone Mountain Road
• Craig Road
• Alexander Road/Jones Boulevard
• Jones Boulevard
• Gowan Road
• Cheyenne Avenue
• Decatur Boulevard (N)
• Decatur Boulevard/Perimeter Road (S)
• Airport Drive
• Smoke Ranch Road/Carey Avenue

• Lake Mead Drive
• Vegas Drive
• Washington Avenue
• Earnest May Lane
• Bonanza Road
• US-95 (S)

In addition to serving significant residential and commercial development, Rancho Drive directly serves, or provides convenient access to other transportation facilities such as the North Las Vegas Airport, service providers such as the Valley Hospital and University Medical Centers, and recreational facilities at Painted Desert Country Club, Las Vegas Municipal Golf Course, and Lorenzi Park. The corridor also connects residential land uses with jobs which are concentrated within the Resort Corridor. (Please see Figures 1-2 and 1-3).

Study Goals

The following goals were identified for the study process and desired outcome.

• Provide Stakeholder Involvement Opportunities
  Agency involvement is a key element in RTC transportation planning projects. As the Metropolitan Planning Organization (MPO) for the Las Vegas Urban Area, the RTC is responsible to state and federal governments for maintaining a continuing, cooperative and comprehensive (3-C) transportation planning process. In support of those goals, the RTC established a Rancho Drive Corridor Study Working Group that met throughout the project. This agency input helped to develop consensus among stakeholders, to ensure that the study met the goals and objectives of each agency, and to identify improvements that were acceptable to each agency.

• Develop Improvements Accommodate Many Functions
  Rancho Drive concurrently serves several different functions, including serving as a major arterial street which operates as a regional route for traffic commuting to and from the northwest valley, and also serving as a local street that provides access to commercial and residential land uses along the corridor. As the northwest Las Vegas Valley continues to grow, the need for additional commuter capacity to and from the Resort Corridor will grow. While the US-95 widening program...
being undertaken by NDOT is intended to accommodate a significant portion of this future traffic. The importance of Rancho Drive as a commuter route will continue to increase as residents look to alternate routes as traffic along US-95 increases.

Figure 1-2: 2002 Las Vegas Valley Housing Distribution

- Develop Improvements Reasonably Constructed
  Rancho Drive corridor improvement alternatives have to be identified and evaluated in the context of projects which are constructible. Recommended improvements should be practical and minimize right-of-way and community impacts. The preferred option needs to be able to be constructed in stages, in order to minimize disruptions to existing traffic.

- Develop Improvements Funded
  Potential investment strategies also need to have a realistic opportunity to be included in the RTC’s Long-Range Regional Transportation Plan. Federal regulations require that a financial plan with existing and proposed funding sources accompany the RTP. Total construction and operating costs for all projects with the RTP cannot exceed projected transportation funds. Therefore, the estimated cost of the investment options need to be reasonable and fit with projected available funding levels.

Key Corridor Issues

Influencing the accomplishment of the study’s goals are a number of issues which affect the feasibility of improvement options. These key corridor issues include:

- Traffic Congestion Along Rancho Drive
  Reducing traffic congestion along Rancho Drive was identified as perhaps the greatest corridor need. Several physical features along the corridor decrease overall traffic operations, including inconsistent cross-sections, closely spaced signals, and frequent driveway and cross-street access. Existing intersection geometrics also constrain capacity. Several north-south arterial streets are discontinuous when they intersect at Rancho, thereby double loading short segments of the roadway. Current conditions along Rancho Drive limit the ability of commuter traffic to travel along Rancho Drive without frequent stops, yielding corresponding long travel times.

- Connectivity to the Resort Corridor
  While improvements along Rancho Drive are important, providing connectivity to the Resort Corridor is also an important issue. Connectivity into the Resort Corridor is important because of the high travel time delay experienced south of US-95 as commuters and local residents converge traveling to and from downtown Las Vegas and the Resort Corridor.

- Connectivity to the Adjacent Freeway and Arterial Street Network
  Because Rancho Drive serves both commuters and local residents, connectivity to the adjacent freeway and arterial street network is important. Direct connectivity to US-95 on the north end of the project is important in order to be able to accommodate a higher volume of traffic, and avoid doubleloading key interchanges (e.g., Ann Road).

Figure 1-3: 2002 Las Vegas Valley Employment Distribution
Providing Enhanced Alternative Modes of Travel

Providing enhanced transit and alternative modes of travel opportunities is another key corridor issue. The RTC has embarked on an ambitious program of improving public transportation throughout the entire Las Vegas valley. These projects include the proposed Regional Fixed Guideway, as well as expansion of the already successful Citizens Area Transit (CAT) fixed route and paratransit bus system. In addition, the RTC supports the expansion of both bicycle and pedestrian facilities. The Rancho Drive Corridor Study offers several opportunities to accommodate expanded transit operations, as well as improved bicycle and pedestrian facilities.

Safety

An important element of any transportation enhancement project is safety. The study area has many crash sites, illustrated in Figure 1-4, which may benefit from improved traffic operations along Rancho Drive. Additionally, there are several vehicle high accident rate locations at signalized intersections along Rancho Drive itself. Limited bicycle and pedestrian facilities also hinder safety for residents that chose non-motorized means of transport. As Rancho Drive has, in some instances, developed without the benefit of a master plan, roadway sections and land uses are inconsistent. Wide shoulders are often used as travel lanes and several undeveloped parcels lack off-site improvements such as curb and gutter, sidewalk and street lighting.

Environmental Concerns

Potential environmental impacts are also important elements of the study. Air pollution is always a concern in the Las Vegas Valley and the project must be consistent with overall regional transportation plans to ensure air quality conformance. The project study area is largely urban in nature and thus impacts to the natural (non-man-made) environment are likely to be minimal. However, noise impacts are a concern to adjacent residential areas such as the Alta Drive neighborhood (Figure 1-5), and impacts to historic and cultural resources. Environmental Justice effects or disproportionate effects on low income or ethnic minority neighborhoods also need to be considered. Such effects include displacement of homes and/or businesses, disruption of neighborhood integrity or cohesion, and localized noise, visual or air pollution effects. Increased accessibility to jobs, shopping options and cultural resources should also be identified as positive aspects of potential investments. Visual and aesthetic impacts will need to be considered and these may be of particular concern if any vertical structures are analyzed. While this study is not intended to develop all the information needed to prepare an environmental document, a preliminary environmental evaluation will identify any potential fatal flaws or impacts issues which have potential to significantly affect the cost of the project.

Neighborhood Preservation/Urban Design

The RTC, City of Las Vegas, City of North Las Vegas, and other agencies have recognized the importance of neighborhood preservation and urban redevelopment. The Rancho Drive study area is a diverse area of some of the oldest residential neighborhoods in the Las Vegas Valley. In that context, it is important that potential improvements are designed to serve local residents along Rancho Drive, as well as commuters. Neighborhoods along Rancho Drive include a variety of demographics, and each specific neighborhood may have different interests. It is important to consider each community, both in totality, as well as individually, when proposing improvements. Also, it is important that proposed improvements support the goals of enhancing the streetscape of the corridor. A key challenge is to tie the mixed land uses into a coherent theme for the entire corridor.

Study Process

The work process associated with this study was designed to ensure that all relevant issues and options were identified and addressed and that decisions were carefully considered and documented. A series of stakeholder meetings were conducted which elicited the opinions, needs, and preferences of agency representatives. This input was fully considered by all participating agencies who...
The Rancho Drive Corridor Study encompassed nine major areas of effort as follows:

• **Data Collection** – Information was gathered from a variety of sources and/or collected through direct field observations. Relevant reports associated with projects in the vicinity were obtained and reviewed along with maps, design parameters, traffic data and geologic information. Existing right-of-way and geometric configurations of intersections was collected. Existing traffic counts were recorded and speed and travel time studies were conducted.

• **Traffic Studies** – Existing and future year traffic demand volumes and operating conditions along Rancho Drive and major cross streets were recorded or estimated. Such demand was considered for Existing and Year 2030 Conditions to separately reflect No-Build and Build Scenarios, coupled with alternative land use condition assumptions.

• **Alternatives Analysis** – In addition to the No-Build Scenario, five individual Build Scenarios were considered that included:
  - Enhanced transit opportunities (bus, bus rapid transit, light rail)
  - Alternative travel lane configurations
  - Intersection improvements at major cross streets
  - Grade separations of Rancho Drive at major cross streets
  - An elevated roadway along Rancho Drive

• **Cost Estimates** – A cost/benefit analysis was conducted for the preferred alternative. This analysis addressed cost savings, travel time savings, accident reductions, and improvements to air quality.

• **Geometric Layout** – Conceptual layouts of centerline and curb lines/edge of pavement designs were developed for several of the alternatives listed above. Potential intersections/interchanges and typical sections and conceptual profiles were included in this effort.

• **Engineering Analysis** – A review of utility plans and the extent to which proposed projects affected the placement or location of such utilities was conducted. In conjunction with input from stakeholders and local emergency service providers, local streets were examined with respect to potential realignments and/or closures. Proposed project elements were considered in the context of project staging to ensure operational continuity and to assess project costs.
  - **Urban Design** – In cooperation with stakeholders and local agencies, urban design issues were conceptually addressed based on the following criteria:
    - Urban redevelopment along the corridor
    - Aesthetic design of the corridor
    - Neighborhood impacts
    - Typical cross-sections and roadway features were provided to illustrate the preferred alternative.
  - **Environmental Scan** – Environmental issues were evaluated in order to identify potential problems along the corridor. Issues including sensitive plant and animal species, cultural resources, Section 4(f) properties and air and water quality were evaluated. In addition, Title VI and environmental justice issues were addressed.
  - **Right-of-Way** – Existing right-of-way requirements for all proposed alternative project elements were then developed. A preliminary overlay of project limits with public right-of-way was analyzed to identify potential problem areas and right-of-way acquisition costs.
  - **Cost Estimates** – Unit cost data was assembled based on recent historical data. Conceptual level quantity take-offs with items quantified, as opposed to utilizing an allowance or lump sum approach.

### Participating Agencies

Local agencies have recognized the transportation deficiencies along the Rancho Drive Corridor. In 2002, Clark County voters passed Question 10—The Fair Share Funding Program advisory initiative. The Nevada State Legislature approved Senate Bill 237 in 2003, which allowed the Board of Clark County Commissioners to implement additional revenue sources for transportation improvements. One of the new revenue sources include a new sales tax of one quarter of one percent as of October 1, 2003 to fund additional transportation improvements in Clark County. As part of Question 10 funding, the RTC established a Working Group to identify projects for Question 10 priority funding. Using a series of criteria and prioritization points, the Rancho Drive Super Arterial was ranked the number one project across entities and project types.

The goal of all parties participating in the Rancho Corridor Study was to work cooperatively in the spirit of identifying workable transportation solutions to meet the needs of residents within the Rancho Corridor and throughout the greater Las Vegas Valley area. Because of the Rancho Drive multi-jurisdictional nature and the regional significance of the corridor, the following agencies were specifically involved in the study:

#### Lead Agency
- Regional Transportation Commission

#### Contributing Agencies
- City of Las Vegas
- City of North Las Vegas
- Nevada Department of Transportation
- Clark County Department of Aviation

#### Coordination with other Studies

The RTC has recognized the regional nature of the transportation planning process and the importance of coordination with other agencies and projects. In support of the goal of providing a implementing improvements consistent and complementary of other projects, the Project Team coordinated efforts with studies and design projects being within and adjacent to the project study area. These projects include the following:

- Cheyenne Ave. Corridor Study—Regional Transportation Commission
- Rainbow Boulevard Corridor Study—City of Las Vegas
- US-95 Widening Program—NDOT
- Project Neon (I-15/MLK-Industrial Drive)—NDOT
- US-95 Northwest Environmental Assessment—NDOT
**EXISTING CONDITIONS**

**Introduction**

This section of the report documents the current transportation facilities and operations with the Rancho Drive corridor study area. The limits of the corridor study area extend approximately ten miles through the City of Las Vegas and the City of North Las Vegas from Sahara Avenue on the south to the interchange with Ann Road/US-95 on the north. For traffic modeling and regional impacts, a Las Vegas Valley wide area was considered. In order to evaluate existing conditions along the corridor, the Project Team gathered several items necessary for an evaluation of existing and future transportation facilities and operations. The following data were compiled:

- Corridor land use
- Existing right-of-way width
- Existing roadway and intersection geometrics
- Average annual daily traffic (AADT) volumes
- Intersection turning movement counts
- Intersection Level-of-Service
- Traffic crash history
- Existing CAT bus stop locations
- Transit ridership and headways
- Corridor employment
- Population demographics
- Proposed corridor improvements

**ROADWAY FACILITIES**

**Rancho Drive**

Rancho Drive is a four- to six-lane arterial street which extends through the City of Las Vegas and defines the boundary between the City of Las Vegas and the City of North Las Vegas between Coran Lane and Cheyenne Avenue. Rancho Drive from Sahara Avenue to the southerly interchange with US-95 is a City of Las Vegas roadway. North of the southerly interchange with US-95 to the interchange with Ann Road/US-95, Rancho Drive (Business 95) is a State of Nevada roadway with the designation of State Highway 599. Nevada DOT considers Rancho Drive to be a regionally significant roadway as illustrated on Figure 2-1.

**Land Use**

The southern origin of Rancho Drive Corridor at the intersection with Sahara Avenue is one of the busiest intersections in the City of Las Vegas. Directly east of the intersection with Sahara Avenue intersection is the I-15/Sahara Avenue interchange. The south leg of the Rancho Drive/Sahara Avenue intersection is actually the I-15 southbound on-ramp and a continuation of Rancho Drive to the south. North of Sahara Avenue, the corridor can largely be separated into two basic segments. North of Sahara Avenue to Charleston Boulevard has typical neighborhood characteristics and is predominantly residential. As the corridor extends north of Charleston Boulevard, crossing the southerly interchange with US-95, and extending in a northwest direction to the northerly interchange with US-95, the corridor is mixed use, but is predominantly fronted by businesses and some residences. Residential land uses are common behind the commercial uses along both sides of the roadway.

**Figure 2-1: Regionally Significant Roadways in Las Vegas Urban Area**

Source: Nevada Department of Transportation 2003 Factbook

The Rancho Drive Corridor contains few landmarks or significant travel generators. The route begins in at the Sahara Avenue intersection where the Palace Station Hotel and Casino and a large strip mall where the US Bank Building and several restaurants are located. The Sahara Rancho Corporate Office is located directly north of the intersection on the east side of Rancho Drive. Land use between Sahara Avenue and Charleston Boulevard is residential, including the Rancho Boruto Estates neighborhood. Rancho Drive just north of Charleston Boulevard is predominately small business office strip frontage. North of Alta Drive, Rancho Drive is residential in character including the neighborhoods of Rancho Circle and Rancho Bel Air. North of US-95, the Rancho Drive Corridor is a mixture of residential and commercial land uses.

The Rancho Drive Corridor contains four main hotel-casinos and several smaller neighborhood bar/gaming establishments. At the south end of the corridor, the Palace Station Hotel and Casino is located at the Sahara Avenue intersection. Midway through the corridor, at the Lake Mead intersection, the Texas Station Hotel and Casino is located on the southeast corner and the Fiesta Hotel and Casino is located on the northeast corner. At the north end of the corridor, the Santa Fe Station Hotel and Casino is located south of the point where Rancho Drive merges back into US-95, just north of Lone Mountain Road. Other than these major hotels, the only other significant travel generator is the North Las Vegas Municipal Airport. The Clark County Department of Aviation (DOA) controls land on the east side of the corridor between Cheyenne Road and Lake Mead Drive, but only borders the route for the portion south of Decatur Boulevard. Figure 2-2 illustrates the land use patterns along and adjacent to Rancho Drive.

**Existing Right-of-Way**

Rancho Drive from Sahara Avenue to the southerly interchange with US-95 is a City of Las Vegas roadway. North of the southerly interchange with US-95 to the interchange with Ann Road/US-95, Rancho Drive (Business 95) is a State of Nevada roadway. Existing roadway right-of-way along the corridor is highly variable. Through the residential area north of Sahara Avenue to Charleston Boulevard, the right-of-way width varies between 70- and 80-feet, with widening at the intersection of Sahara Avenue and Charleston Boulevard to accommodate intersection turning lanes. North of Charleston Boulevard to Palomino Lane, the right-of-way width is 100-feet. North of Palomino Lane, the right-of-way widens to 150-feet and continues at a 150-foot width through the south US-95 interchange to Washington Avenue. North of Washington Avenue to Vegas Drive, the right-of-way width is 100-feet. North of Vegas Drive, the right-of-way widens to 125-feet. Right-of-way is consistently 125-feet wide north to Lone Mountain Road, where it widens to 200-feet.
Existing Conditions

Rancho Drive Corridor Study

Existing Roadway and Intersection Geometrics

Rancho Drive is generally fully improved with pavement, raised median islands, curb and gutter, and sidewalk along the corridor. Several sections of Rancho Drive along undeveloped property, especially in the north, do not have curb and gutter and sidewalk, pending future development of the adjacent parcel.

Between Sahara Avenue and Charleston Boulevard, Rancho Drive consists of two lanes in each direction with a center turning lanes, exclusive left turn lanes and a curb-to-curb pavement width of 60-feet. Rancho Drive widens at both Sahara Avenue and Charleston Boulevard to accommodate additional turning lanes (see Figure 2-3).

Between Charleston Boulevard and the southerly interchange with US-95, Rancho Drive consists of three lanes in each direction with raised median islands, although at some major intersections, dual left turn lanes have been constructed. In 2001, the City of Las Vegas, as part of their Alta/Rancho Phase II Improvements Project, rehabilitated the pavement, realigned median islands from Lone Mountain Road to the north terminus of the project at the north interchange with Ann Road/US-95.

**Figure 2-2: Land Use Patterns**

**Figure 2-3: Rancho Drive at Sahara Avenue Looking Southwest**
and turn pockets and restriped Rancho Drive in the vicinity of Alta Drive. As part of the US-95 Widening Program, an interim US-95 improvement project (Contract Number 3167) striped Rancho Drive with two lanes in each direction and dual-left turn lanes to US-95 eastbound, and a single left turn lane to westbound US-95. Ultimate NDOT improvements to the southerly interchange with US-95 (Contract Number 3215) include a Single Point Diamond Interchange (SPDI), with three lanes in each direction along Rancho Drive north to Bonanza Road and dual left turn and free-right turn lanes to both US-95 eastbound and westbound. The project will also add dual right turn lanes from westbound US-95 to southbound Rancho Drive. The Project completion date for these ultimate improvements to the southern US-95 interchange with Rancho Drive is the end of 2006.

North of Bonanza Road to Rainbow Boulevard, a recent NDOT project (Contract Number 3166) slurry sealed and restriped Rancho Drive to three lanes in each direction, with single exclusive left turn lanes (At some major intersections, dual left turn lanes have been constructed). The Curb-to-curb pavement width is generally 85-feet (see Figure 2-4). The northbound right turn lanes from westbound US-95 to southbound Rancho Drive. The northbound outside travel lane at Rainbow Boulevard pavement width is generally 85-feet (see Figure 2-4).

The northbound Rancho Drive outside travel lane at Rainbow Boulevard becomes a forced right turn lane and two northbound thru lanes continue. North of Rainbow Boulevard, Rancho Drive consists of two lanes in each direction, with a curb-to-curb pavement width of 85-feet (see Figure 2-4).

A total of 18 key signalized intersections along Rancho Drive were analyzed. In addition to the 18 intersections under study, there are minor signalized intersections, several unsignalized intersections and numerous median breaks along Rancho Drive. All of the signalized intersections have exclusive left turn lanes and several intersections also have exclusive right turn lanes. Table 2-1 summarizes the 18 key signalized intersections within the study area and the number of lanes for each intersection approach leg.

### Surrounding Roadway Network

Rancho Drive at Sahara Avenue is located just to the west of the I-15/Sahara Avenue interchange, with the south leg of the Rancho Drive/Sahara Avenue intersection serving as the I-15 southbound on-ramp. Rancho Drive also intersects with US-95 at two locations. On the south, the US-95/Rancho Drive interchange is the first interchange west of the I-15/US-95 (Spaghetti Bowl) system interchange. On the north, the Rancho Drive interchange with US-95 occurs just south of the US-95/Ann Road interchange. Rancho Drive actually creates the hypotenuse of a two-legged US-95 triangle as US-95 shifts orientation from east-west to north-south. This connectivity to the freeway network makes Rancho Drive a desirable freeway reliever route for regional travel, particularly when incidents or constructed activity cause bottleneck traffic conditions along US-95.

The surrounding roadway network generally follows a grid system of one-mile spaced section-line major arterial streets. Major east-west arterial streets that intersect Rancho Drive include Sahara Avenue, Charleston Boulevard, Lake Mead Boulevard, Cheyenne Avenue and Craig Road. Major north-south arterials that intersect Rancho Drive include Rainbow Boulevard, Jones Boulevard and Decatur Boulevard. Several of these arterial streets dog-leg with Rancho, funneling their north-south or east-west and traffic flows onto Rancho for short segments of roadway. This condition is particularly acute for the north and south legs of Decatur Boulevard. Minor arterial streets are generally limited to the east-west direction, and spaced between the major arterial streets. These streets include Owens Avenue, Carey Avenue, Gowan Road, Alexander Road, and Lone Mountain Road.

### Table 2-1

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<td>L</td>
</tr>
<tr>
<td>Sahara Avenue</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Charleston Boulevard</td>
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<td>2.5*</td>
<td>0.5*</td>
<td>2</td>
</tr>
<tr>
<td>Alta Drive</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>US-95 Eastbound Ramp</td>
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<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>US-95 Westbound Ramp</td>
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<td>2</td>
<td>0</td>
<td>4</td>
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<td>Washington Avenue</td>
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<td>1</td>
</tr>
<tr>
<td>Vegas Drive/Owens Avenue</td>
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<td>2.5*</td>
<td>0.5*</td>
<td>1</td>
</tr>
<tr>
<td>Lake Mead Boulevard</td>
<td>2</td>
<td>2.5*</td>
<td>0.5*</td>
<td>1</td>
</tr>
<tr>
<td>Carey Avenue / Smoke Ranch Rd.</td>
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<td>2.5*</td>
<td>0.5*</td>
<td>1</td>
</tr>
<tr>
<td>Decatur Boulevard North</td>
<td>1</td>
<td>2.5*</td>
<td>0.5*</td>
<td>1</td>
</tr>
<tr>
<td>Decatur Boulevard South</td>
<td>1</td>
<td>2.5*</td>
<td>0.5*</td>
<td>1</td>
</tr>
<tr>
<td>Cheyenne Avenue</td>
<td>2</td>
<td>2.5*</td>
<td>0.5*</td>
<td>2</td>
</tr>
<tr>
<td>Jones Blvd. S / Alexander Road</td>
<td>1</td>
<td>2.5*</td>
<td>0.5*</td>
<td>1</td>
</tr>
<tr>
<td>Jones Blvd. N / Alexander Road</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Craig Road</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Lone Mountain Road</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Rainbow Boulevard</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

* Indicates shared lane

| Figure 2-4: Rancho Drive South of Lake Mead Drive Looking North |

<table>
<thead>
<tr>
<th>Intersection with Rancho Drive</th>
<th>North Approach</th>
<th>South Approach</th>
<th>East Approach</th>
<th>West Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sahara Avenue</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Charleston Boulevard</td>
<td>1</td>
<td>2.5</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>Alta Drive</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>US-95 Eastbound Ramp</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>US-95 Westbound Ramp</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Bonanza Road</td>
<td>0</td>
<td>2.5</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>Washington Avenue</td>
<td>1</td>
<td>2.5</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>Vegas Drive/Owens Avenue</td>
<td>1</td>
<td>2.5</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>Lake Mead Boulevard</td>
<td>2</td>
<td>2.5</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>Carey Avenue / Smoke Ranch Rd.</td>
<td>2</td>
<td>2.5</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>Decatur Boulevard North</td>
<td>1</td>
<td>2.5</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>Decatur Boulevard South</td>
<td>1</td>
<td>2.5</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>Cheyenne Avenue</td>
<td>2</td>
<td>2.5</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>Jones Blvd. S / Alexander Road</td>
<td>1</td>
<td>2.5</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>Jones Blvd. N / Alexander Road</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Craig Road</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Lone Mountain Road</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Rainbow Boulevard</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
Planned Roadway Improvements

In general, improvements along the Rancho Drive corridor are constructed by individual property owners/developers. As parcels along Rancho Drive are improved, developers widen the street width and construct the curb, gutter and sidewalk to the right-of-way line as part of their development agreements. However, in the fully developed areas of the corridor, public agencies have recently completed or initiated projects to improve the corridor. NDOT work continues on the multi-year US-95 widening program, including widening US-95 from the I-15 Spaghetti Bowl interchange to the Rainbow Boulevard/Summerlin Parkway interchange. NDOT is also sponsoring a project development/environmental document effort to widen US-95 north of Summerlin Parkway to the northwest limits of the Las Vegas Valley at Kyle Canyon Road. The RTC has also undertaken a study to improve Cheyenne Avenue from US-95 on the west to I-15 on the east.

Traffic Data

Average daily traffic volumes (AADT) were obtained from NDOT. NDOT publishes their Annual Traffic Report which contains traffic volumes at several locations along Rancho Drive. These locations include a permanent count station located just north of Cheyenne Avenue and eleven temporary count locations along Rancho Drive. Table 2-2 summarizes average daily traffic (ADT) at these locations. The table indicates that traffic volumes are highest near Rancho Drive’s southerly intersection with US-95, near Bonanza Road. Table 2-3 reports the five year trend of ADT at Cheyenne Avenue, midway through the corridor. Generally, traffic volumes along the Rancho Drive corridor have been slightly decreasing over the past five years. This can likely be explained by increasing volumes of traffic on cross streets which affect signal timing and thus traffic congestion along Rancho Drive.

Table 2-3

<table>
<thead>
<tr>
<th>Year</th>
<th>AADT</th>
<th>% of Previous Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>28,610</td>
<td>—</td>
</tr>
<tr>
<td>2000</td>
<td>27,775</td>
<td>97.1</td>
</tr>
<tr>
<td>2001</td>
<td>27,435</td>
<td>98.8</td>
</tr>
<tr>
<td>2002</td>
<td>27,260</td>
<td>99.4</td>
</tr>
<tr>
<td>2003</td>
<td>26,420</td>
<td>98.9</td>
</tr>
</tbody>
</table>


Table 2-4 summarizes AADT by day of the week. As expected, Friday has the highest AADT day and Sunday has the lowest AADT.

Table 2-4

<table>
<thead>
<tr>
<th>Day</th>
<th>AADT</th>
<th>Percentage of AADT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday</td>
<td>18,769</td>
<td>71.0</td>
</tr>
<tr>
<td>Monday</td>
<td>27,184</td>
<td>102.9</td>
</tr>
<tr>
<td>Tuesday</td>
<td>27,917</td>
<td>105.7</td>
</tr>
<tr>
<td>Wednesday</td>
<td>27,903</td>
<td>105.6</td>
</tr>
<tr>
<td>Thursday</td>
<td>28,046</td>
<td>106.2</td>
</tr>
<tr>
<td>Friday</td>
<td>30,119</td>
<td>114.0</td>
</tr>
<tr>
<td>Saturday</td>
<td>24,985</td>
<td>94.6</td>
</tr>
<tr>
<td>Average Weekday</td>
<td>27,763</td>
<td>105.1</td>
</tr>
<tr>
<td>Average Weekend</td>
<td>21,877</td>
<td>82.8</td>
</tr>
<tr>
<td>Average Day</td>
<td>26,420</td>
<td>100.0</td>
</tr>
</tbody>
</table>


Intersection Turning Movement Counts

Table 2-5 illustrates the comparative role Rancho Drive plays in serving northwest Las Vegas Valley traffic demands. While US-95 clearly shoulders the highest volume of daily traffic, Rancho Drive carries the next highest volume of daily traffic, followed by Martin Luther King Boulevard and Decatur Boulevard.

Figure 2-5: 2002 Daily Traffic Volumes

Table 2-2

<table>
<thead>
<tr>
<th>Location along Rancho (NDOT Count Station)</th>
<th>2003 AADT</th>
</tr>
</thead>
<tbody>
<tr>
<td>North of Carey Avenue (617)</td>
<td>37,000</td>
</tr>
<tr>
<td>North of Cheyenne Avenue (0331909)</td>
<td>26,420**</td>
</tr>
<tr>
<td>North of Mesquite Avenue (402)</td>
<td>40,000*</td>
</tr>
<tr>
<td>North of Bonanza Road (321)</td>
<td>52,600*</td>
</tr>
<tr>
<td>North of Lone Mountain Road (721)</td>
<td>19,050*</td>
</tr>
<tr>
<td>South of Charleston Boulevard (614)</td>
<td>22,400*</td>
</tr>
<tr>
<td>South of Vegas Drive (615)</td>
<td>44,200*</td>
</tr>
<tr>
<td>South of Carey Avenue (616)</td>
<td>40,000</td>
</tr>
<tr>
<td>South of Cheyenne Avenue (618)</td>
<td>29,000</td>
</tr>
<tr>
<td>South of Craig Road (366)</td>
<td>21,700*</td>
</tr>
<tr>
<td>South of Pinto Lane (291)</td>
<td>30,000*</td>
</tr>
</tbody>
</table>


* Traffic Data Adjusted or Estimated

** Permanent Count Station
### Table 2-5
Intersection Traffic Volumes and Levels of Service

<table>
<thead>
<tr>
<th>Intersection Location/Peak Hour Volume (vph)</th>
<th>AM Peak (7:00–8:00 AM)</th>
<th>PM Peak (4:45–5:45 PM)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Through</td>
</tr>
<tr>
<td>Rancho Dr &amp; Sahara</td>
<td>2,663</td>
<td>266</td>
</tr>
<tr>
<td>Rancho Dr &amp; Charleston</td>
<td>1,756</td>
<td>157</td>
</tr>
<tr>
<td>Rancho Dr &amp; Alta</td>
<td>2,600</td>
<td>250</td>
</tr>
<tr>
<td>Rancho Dr &amp; Rainbow Blvd</td>
<td>588</td>
<td>51</td>
</tr>
<tr>
<td>Rancho Dr &amp; Washington</td>
<td>2,117</td>
<td>200</td>
</tr>
<tr>
<td>Rancho Dr &amp; Bonanza</td>
<td>2,185</td>
<td>207</td>
</tr>
<tr>
<td>Rancho Dr &amp; Vegas/Dove</td>
<td>1,880</td>
<td>197</td>
</tr>
<tr>
<td>Rancho Dr &amp; Lake Mead</td>
<td>2,117</td>
<td>202</td>
</tr>
<tr>
<td>Rancho Dr &amp; Carey/Breaker Ranch</td>
<td>1,980</td>
<td>195</td>
</tr>
<tr>
<td>Rancho Dr &amp; Deukar South</td>
<td>2,299</td>
<td>217</td>
</tr>
<tr>
<td>Rancho Dr &amp; Deukar North</td>
<td>1,819</td>
<td>173</td>
</tr>
<tr>
<td>Rancho Dr &amp; Cheyenne</td>
<td>1,637</td>
<td>164</td>
</tr>
<tr>
<td>Rancho Dr &amp; Jones Blvd South</td>
<td>1,870</td>
<td>181</td>
</tr>
<tr>
<td>Rancho Dr &amp; Jones Blvd North</td>
<td>1,260</td>
<td>120</td>
</tr>
<tr>
<td>Rancho Dr &amp; Craig</td>
<td>1,276</td>
<td>126</td>
</tr>
<tr>
<td>Rancho Dr &amp; Low Mountain Road</td>
<td>1,637</td>
<td>164</td>
</tr>
<tr>
<td>Rancho Dr &amp; Rainbow Blvd</td>
<td>1,980</td>
<td>195</td>
</tr>
<tr>
<td>Rancho Dr &amp; Sahara</td>
<td>2,663</td>
<td>266</td>
</tr>
<tr>
<td>Rancho Dr &amp; Alta</td>
<td>2,600</td>
<td>250</td>
</tr>
<tr>
<td>Rancho Dr &amp; Rainbow Blvd</td>
<td>588</td>
<td>51</td>
</tr>
<tr>
<td>Rancho Dr &amp; Washington</td>
<td>2,117</td>
<td>200</td>
</tr>
<tr>
<td>Rancho Dr &amp; Bonanza</td>
<td>2,185</td>
<td>207</td>
</tr>
</tbody>
</table>
The concept of level of service is described in the Transportation Research Board’s (TRB), *Highway Capacity Manual (HCM)* as a qualitative measure that characterizes operational conditions within a traffic stream and their perception by motorist and passengers. Much like a student’s report card, LOS is represented by the letters “A” through “F,” with “A” generally representing the most favorable driving conditions and “F” representing the least favorable.

Level of service for signalized intersections is defined in terms of delay. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. Delay is a complex measure, and is dependent on a number of variables, including the quality of the signal progression, the cycle length, the green time ratio, and the v/c ratio for the lane group or approach in question. Control delay for signalized intersections is the portion of the delay attributable to the control facility (initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay). The LOS for each intersection is calculated by taking the intersection delay and converting it to a letter using the definitions in Table 2-6.

Delay is a complex measure, and is dependent on a number of variables, including the quality of the signal progression, the cycle length, the green time ratio, and the v/c ratio for the lane group or approach in question. Control delay for signalized intersections is the portion of the delay attributable to the control facility (initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay). The LOS for each intersection is calculated by taking the intersection delay and converting it to a letter using the definitions in Table 2-6.

### Table 2-6

<table>
<thead>
<tr>
<th>Level of Service Description</th>
<th>Average Stopped Delay Per Vehicle (Sec.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Uncongested operations; all queues clear in a single signal cycle. Free flow; minimal to no delay.</td>
</tr>
<tr>
<td>B</td>
<td>Very light congestion; an occasional approach phase is fully utilized. Stable flow, but speeds are beginning to be restricted by traffic conditions; slight delays.</td>
</tr>
<tr>
<td>C</td>
<td>Light congestion; occasional backups on critical approaches. Stable flow, but most drivers cannot select their own speeds and feel somewhat restricted; acceptable delays.</td>
</tr>
<tr>
<td>D</td>
<td>Significant congestion on critical approaches, but intersection functional. Cars required to wait through more than one signal cycle during short peaks. No long-standing queues formed. Approaching unstable flow, and drivers have difficulty maneuvering; intolerable delays.</td>
</tr>
<tr>
<td>E</td>
<td>Severe congestion with some long-standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queues may block nearby intersection(s) upstream of critical approach(es). Unstable flow with stop and go; some long delays.</td>
</tr>
<tr>
<td>F</td>
<td>Total breakdown, stop-and-go operation. Congested conditions with excessive delay</td>
</tr>
</tbody>
</table>

Traffic Crash Summary

NDOT provided vehicle, pedestrian and bicycle crash data for key intersections within the study limits. The data covered the time period between July 1, 1993 through July 1, 2003. The information provided by NDOT included the type of crash and contributing factors by severity for the signalized intersections along the Rancho Drive Corridor.

The high crash locations along the Rancho Drive Corridor are generally dispersed along the corridor, with a concentration of accidents at intersections with major arterial streets, over the 10-year period. The intersection of Rancho Drive and Lake Mead Boulevard experienced the most crashes along the corridor, with a total of 781 crashes over the 10-year period, including 231 injury crashes and one fatality. Figure 2-6 illustrates the location and type of traffic crashes throughout the Rancho Corridor study area.
PUBLIC TRANSPORTATION

Fixed Route Service
RTC operates local bus service along Rancho Drive via CAT Route 106. The northwestern terminus of this route is a loop between Lone Mountain Road and Ann Road, and the southeastern terminus is a loop at the Downtown Transportation Center. Service is provided weekdays, weekends and holidays for 24 hours per day with headways typically 30 minutes. During afternoon, evening and early morning hours, headways are 60 minutes. During FY 2004, XXXXX hours of bus service were provided on this route, covering XXXXX miles of revenue service. Speeds averaged XXXX miles per hour, and total ridership was XXXX. The alignment of Route 106 is illustrated on Figure 2-7. The route numbers of connecting or crossing CAT bus lines are also indicated on the illustration.

Relative to other fixed route transit service corridors, Rancho Drive is a mid-level performer due to the relatively low density of adjacent (existing) development north of Smoke Ranch/Carey Road. As the corridor more fully develops over time, prospects for increased ridership and service are promising. These potentials have been evaluated by two recent studies sponsored by RTC. The Las Vegas Valley Transit System Development Plan, completed in 2002, examined eleven (11) high priority corridors for potential transit service improvements. The Rancho Drive corridor was one of the high priority corridors included in this study. A subsequent Las Vegas Valley Long Range Transit Survey was completed in 2004 to build on this plan, and expand the analysis to 81 potential corridors. These two studies suggest that bus rapid transit should be evaluated for future deployment, incorporating enhanced station/stop facilities, limited stops, and increased speeds via exclusive lanes or other means to reduce delays caused by traffic signal delays and mixed traffic congestion.

Demand Responsive/Paratransit Service
Demand responsive, also known as paratransit service, is a shared-ride, door-to-door program available for those who are functionally unable to independently use the CAT fixed route system either all of the time, temporarily or under certain circumstances. The service is reservation-based and is available to customers that have been deemed eligible through an evaluation process. The system operates within the urbanized area of Clark County as required by the Americans with Disabilities Act (ADA).

Eligibility is based on one’s ability to use the fixed route system and is determined through a functional assessment. Disability alone does not determine eligibility. The functional assessment includes a mock trip to and from the bus and evaluates skills such as balance, strength, coordination and range of motion.

The CAT paratransit service operates 24 ours a day, 365 days per year. Because the Rancho Corridor is within the urbanized area of Clark County and is serviced by existing CAT fixed routes, the CAT paratransit system fully operates within the Rancho Drive corridor with a standard rate schedule.

ALTERNATIVE MODES OF TRAVEL

Bicycles and Pedestrians
The Bicycle/Pedestrian Element (BPE) of the Regional Transportation Plan provides guidance for the long term development of bicycle and pedestrian facilities in Clark County. The BPE addresses a broad range of improvements to encourage bicycling and walking as viable alternatives to the automobile, for many trip purposes, improving air quality by reducing vehicle miles traveled tailpipe emissions and traffic congestion.

The goals of the Nevada Bicycle Advisory Board have been integrated, to the extent feasible, in the development of this Bicycle/Pedestrian Element in order to encourage bicycling and walking and promote the expansion of the regional bicycle system.

There are four goals for the bicycle element. All four goals meet the following TEA-21 Planning Factors:

1. Increase the Safety and Security of the Transportation System for Motorized and Non-Motorized Users.
2. Increase the Accessibility and Mobility Options Available To People and Freight.
3. Protect and Enhance the Environment, Promote Energy Conservation, and Improve Quality of Life.
4. Enhance the Integration and Connectivity of the Transportation System, Across and Between Modes, For People and Freight.

To better develop a viable BPE, the RTC initiated the Alternative Mode Master Transportation Plan (AMTP) in 2001. A Working Group was created by the RTC at the onset of the study to ensure that the plan was the consensus of the jurisdictions and users. The recommendations defined within the AMTP were developed through extensive input from all of the Working Group members and in conjunction with several public outreach meetings. The participation by representatives of both public works and planning divisions from the local jurisdictions provided valuable input that was critical to the creation of an implementable plan. The inclusion of bicycle user groups ensured that the plan met the needs of the bicyclists in the Las Vegas Valley and the outlying areas.
The Working Group accomplished the following selection criteria for the selection of bicycle facilities:

1. Identified candidate alignments for on-street bicycle lanes and routes and off-street shared use paths
2. Created improved design standards for proposed facilities
3. Produced cost estimates for each improvement type
4. Identified funding sources
5. Devised an acceptable implementation strategy

The application of the on-street facility selection criteria was discussed with each jurisdiction (Public Works and Planning Departments) to ensure that the street segments recommended for bicycle facilities were appropriately identified. The selection of bicycle facilities assures the following conditions:

- Each implementing entity will ensure a proposed bicycle facility will not create an unsafe condition for the cyclist, pedestrian or motorist. If the unsafe determination is made, the segment will be removed and an alternate route considered.
- Implementation of a bikeway segment will not eliminate any existing travel lanes or reduce the number of travel lanes the roadway was designed to accommodate. If the recommended bicycle facility can not fit within the ROW, an alternate route should be considered.
- The preference is to locate bicycle facilities on roadways with an 80-foot ROW or less.
- Implementing bicycle lanes or routes will be accomplished within the existing ROW.
- The project will not modify any existing median configuration to “fit” the designated bicycle facility.
- Implementation of bicycle facilities requiring reduction in the existing travel lanes to 11-feet to accommodate bicycle lanes will be done only as part of the entities regular scheduled resurfacing program, or as part of a capital project from the Transportation Improvement Project (TIP).
- Installation of bicycle facilities will not be contingent on the removal of on-street parking where it currently exists.
- Entities shall refer to the recommended Bicycle Plan (of the BPE) when considering any roadway overlay or CIP project. When installing adopted bikeways, entities shall apply the most recently approved bicycle facility designation as defined in the Regional Transportation Plan.

The Off-Street Shared Use Path selection focused on alignments that met the evaluation criteria, had space within available right-of-way and provided connectivity with other on- and off-street bicycle facilities. The Shared Use Path network utilizes various on-street facilities for connectivity in situations where space was not available for a continuous (uninterrupted) Shared Use Path facility.

The On-Street Bicycle Network in the vicinity of the Rancho Drive Corridor in the Northwest Las Vegas Valley is shown in Figures 2-2. Rancho Drive from Washington Avenue to Lone Mountain Road is an existing bicycle route. The AMTP identified Rancho Drive from Washington Avenue to south of Sahara Avenue as a proposed bicycle route. The Rancho Drive segment between Charleston Boulevard and Sahara Avenue is programmed for implementation as a bike route in 2006, with no physical improvements required. Between years 2008 and 2016, Rancho Drive between Washington Avenue and Charleston Boulevard is programmed to be developed as a bike route, with improvements required.

Pedestrian travel is an important component of total personal mobility in Clark County. Pedestrian trips are particularly important along the Strip and in the Central Business Districts (CBDs) of the cities. While the volume of pedestrian travel is much lower in the suburban and rural portions of Clark County, it is still asignificant trip making mode, particularly for children going to and from school and recreation facilities. The RTC has adopted a policy on pedestrian facilities for all of its locally funded projects.

The intent of this policy is to ensure that sidewalks or accessible pedestrian facilities are constructed as part of all RTC projects where practical. The need
for sidewalks should be evaluated during the design. During this evaluation, consideration should be given to:

- Providing Continuity of existing sidewalk (fill-in gaps)
- Accessibility to Bus routes
- Providing alternatives to Paratransit service
- Service as a pedestrian route to school, employment or commercial developments
- Demonstrated pedestrian safety benefits
- Extension of existing pedestrian routes and school walking route
- Availability of right-of-way

To provide for sidewalk, Special Improvement Districts (SIDs) are encouraged on all RTC projects where curb and gutter, street lighting, sidewalk, and parking or emergency stopping lanes do not exist. If an SID is formed within an entity, but developed privately owned parcels are determined by a special benefits appraisal or a written opinion from a bonding attorney to be fully or partially non-accessible, reimbursement by the RTC may be made for those offsite improvements, and for offsite improvements adjacent to vacant parcels owned by the federal government or a member entity, or nonaccessible parcels.

Providing that a property can be included in an SID, offsite improvements adjacent to developed privately owned properties on which full or partial offsite improvement requirements have been waived by the entity, or government owned leased to a private for-profit entity are not reimbursable. In areas where sidewalk is necessary and standard curb, gutter and sidewalk improvements are not being constructed with the RTC project, a temporary asphalt sidewalk will be provided as an RTC reimbursable expense.

Pedestrian facilities that currently exist within the corridor include sidewalks, sidewalk ramps and pedestrian signals at all signalized intersections. Sidewalks, which only exist along developed parcels, are generally five-feet in width and located directly at the back of the curb. No additional pedestrian specific facilities exist.
ENVIRONMENTAL SETTING AND ISSUES

The purpose of this report is to identify transportation improvements at a conceptual level of detail which address identified needs. As such, this report will not identify or evaluate impacts to specific properties, but will identify and evaluate environmental issues within the broader context of a fatal flaw analysis. This chapter will also address environmental justice and Title VI requirements.

Physical Constraints

Within the context of this study, environmental constraints are defined as natural or man-made features which may constrain proposed transportation improvements.

• Natural Features

Natural constraints along the Rancho Drive Corridor are minimal. The project corridor traverses the north central and northwest portions of Las Vegas Valley. The terrain is largely flat, with a slight increase in elevation as the corridor extends to the north. The corridor has been largely urbanized by man, with sporadic individual vacant parcels remaining along the corridor that have not been significantly affected by human-caused activity. There are no significant natural waterways that either traverse or parallel the corridor. Both sides of the corridor are largely surrounded by development, altering the natural drainage patterns to accommodate man-made uses.

• Man-Made Features

Man-made constraints along the corridor are significant. These constraints include residential and commercial development along nearly the entire length of the corridor similar to the intersection shown in Figure 3-1. A detailed photographic inventory of the man-made features along the corridor are shown in the appendix.

Many of these residential and commercial developments are located immediately adjacent to the Rancho Drive Corridor right-of-way as illustrated in Figure 3-2. In some instances, developments have constructed parking and other facilities within the right-of-way on a NDOT easement. Other man-made constraints include interchanges and intersections with other regionally significant roadways. The Rancho Drive Corridor has interchanges with U.S. 95 at two locations, and intersections with most of the major east-west arterial streets which traverse the northwest portion of Las Vegas Valley. This includes Cheyenne Avenue, which is under study to be upgraded to a super arterial corridor that would connect U.S. 95 and I-15. In addition, the North Las Vegas Airport is located directly east of Rancho Drive. As the second busiest airport in the State of Nevada, the North Las Vegas Airport has specific access needs, as well as flight path restrictions which directly impact Rancho Drive and other adjacent arterial streets.

Wildlife and Vegetation

The project is within the northeast portion of the Mojave Desert Region and is characterized by moderate to high mountain ranges and adjacent valleys arranged generally in a north-south orientation. Weather patterns generally conform to hot, dry summers and cool, dry winters. Vegetation patterns are primarily desert scrub vegetation, although larger tracts have been altered by anthropogenic activity. Precipitation occurs sporadically from either winter rains or summer thunderstorms.

Field review of vacant parcels which exist along the corridor indicate that these parcels are populated with primarily native vegetation such as creosote bush (Larrea tridentata) and desert saltbush (Atriplex polycarpa), as illustrated in Figure 3-3. The fauna observed along the corridor were common wildlife species adapted to the sparse cover and aridity of desert scrub habitats. Avian species previously observed at vacant lots along the corridor were the greater roadrunner (Geococcyx californianus) (Figure 3-4), american kestrel (Falco sparverius), and mourning dove (Zenaida macroura). Minimal evidence of mammalian wildlife was noted along the corridor. No reptiles were observed, but species common to the desert environment, such as zebra-tailed lizard (Callisaurus draconoides), western whiptail (Cnemidophorus tigris), and side-blotched lizard (Uta stansburiana) could be expected along the corridor.

The Rancho Drive Corridor is located within the general geographic range of some wildlife species that are protected under the Endangered Species Act of 1973, as amended, and Nevada regulations. Literature reviewed for this study included several environmental documents, biological assessments, and reports that were prepared for other projects in the vicinity of the Rancho Drive Corridor. This literature search indicated that 17 species with special federal status potentially occur in the Rancho Drive Corridor as identified in Table 3-1. There is no habitat along the Rancho Drive Corridor suitable to support thirteen of these species. No sites along the corridor are located in an area listed as within a designated preserve.

Cultural Resources

While a detailed cultural resources technical analysis is beyond the scope of this corridor study, and will be addressed during future environmental studies, the historical context of the growth of modern Las Vegas from 1900 to today is presented below.

• Historical Context

The city of Las Vegas, Nevada was founded on May 15, 1905 when the Union
workers that boosted the local economy during the Great Depression, increasing

Construction of Hoover Dam commenced in 1931, bringing construction

law was liberalized, resulting in an influx of visitors seeking a quick divorce.  

population had grown to over 50,000. In 1931, three events occurred that

incorporated on March 16, 1911 and at that time, the city encompassed 19.2

Pacific Railroad auctioned 110 acres for sale, consisting of over 1,200 lots in

jobs, growth, city development, and major federal funds to Las Vegas. Finally

and most significantly, gambling was legalized in the State of Nevada on March 19, 1931.

During the 1960s, led by Howard Hughes, corporations began building,

buying and operating hotel/casino properties in Las Vegas. Throughout the

1970s and into the 1980s, corporate expansion into Las Vegas continued, and

gambling transformed into “gaming” and transitioned into a legitimate business

enterprise. During the 1990s and early 21st century, the gaming industry

continued to attract tourists, and Las Vegas developed into the preeminent

city convention in the world.

• National Register Evaluation Criteria

Federal agencies undertaking actions that may affect cultural resources are
governed by the National Historic Preservation Act of 1966, as amended,
through the implementing regulations set forth by the Advisory Council on
Historic Preservation in 36 CFR Part 60.4(c)(1). The lead federal agency
undertaking a project shall utilize the National Register Criteria (as defined
in 36 CFR Part 60.4) in determining the significance of a cultural resource
for eligibility to the National Register of Historic Places. The criteria are as
follows:

1. The property is at least 50 years old; and
2. The property retains integrity of location, design, setting, materials,
workmanship, feeling, and associations; and
3. The property possesses at least one of the following criteria:
   • Associated with events that have made a significant contribution to the
     broad patterns of our history.
   • Associated with the lives of persons significant in our past; embodies the
     distinctive characteristics of a type, period, or method of construction;
   • Conducted as part of this study.

Several cultural resources studies have been conducted, primarily in conjunction
with NDOT roadway projects, within the Rancho Drive Corridor. As recent
in 2004, a Cultural Resources Technical Report was prepared that
includes the north end of the corridor—the interchange of Rancho Drive and
View Boulevard (see Figure 3-4). A Native American consultation was not
conducted as part of this study.

Figure 3-4: Alta Drive Historic Neighborhood

Section 4(f) Property

Section 4(f) is national policy which help to preserve U.S. natural resources. The
U.S. Department of Transportation Act of 1966 gave a special provision for
this section and stipulates that the Federal Highway Administration (FHWA)
will not approve any program or project that requires the “use” of any publicly
owned public park, recreation area, wildlife refuge or historic site unless:

1. There is “no feasible and prudent alternative to the project,” and
2. The project includes “all possible planning to minimize harm to the
   project.”

The term “use” refers to not only the physical utilization of a property, but also
the indirect effects that would harm the value of protected sites. Section 4(f)
only applies to all publicly owned parks, recreational areas, and wildlife
and waterfowl refuges. If owned by private institutions and individuals, even if
the areas are open to the public, Section 4(f) does not apply. However, the FHWA
does encourage the preservation of privately owned lands. If a governmental
body has a proprietary interest in the land, for instance fee ownership, drainage
 easements or wetland easement, it can be considered “publicly owned” and thus

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Federal Status</th>
<th>State Status</th>
<th>Suitable Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birds</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southwestern willow flycatcher</td>
<td>Empidonax trailli extimus</td>
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<td>P</td>
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<td>Falco peregrinus anatum</td>
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<td>P</td>
<td>Y</td>
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<tr>
<td>Western burrowing owl</td>
<td>Athene cunicularia hypugea</td>
<td>SC</td>
<td>P</td>
<td>Y</td>
</tr>
<tr>
<td>Reptiles</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Desert tortoise</td>
<td>Gopherus agassizii</td>
<td>T</td>
<td>T</td>
<td>Y</td>
</tr>
<tr>
<td>Band-tailed gila monster</td>
<td>Heloderma suspectum cinctum</td>
<td>SC</td>
<td>P&amp;R</td>
<td>N</td>
</tr>
<tr>
<td>Chuckwalla</td>
<td>Sauromalus ater</td>
<td>SC</td>
<td>NS</td>
<td>N</td>
</tr>
<tr>
<td>Mammals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spotted bat</td>
<td>Euodera maculata</td>
<td>SC</td>
<td>T&amp;P</td>
<td>N</td>
</tr>
<tr>
<td>Greater western smooth-bellied bat</td>
<td>Euromis periplus californica</td>
<td>SC</td>
<td>NS</td>
<td>Y</td>
</tr>
<tr>
<td>Allen’s big-eared bat</td>
<td>Idionycteris phyllotis</td>
<td>SC</td>
<td>NS</td>
<td>N</td>
</tr>
<tr>
<td>California leaf-nosed bat</td>
<td>Macrotus californica</td>
<td>SC</td>
<td>NS</td>
<td>N</td>
</tr>
<tr>
<td>Small-footed myotis</td>
<td>Myotis californica</td>
<td>SC</td>
<td>NS</td>
<td>N</td>
</tr>
<tr>
<td>Long-eared myotis</td>
<td>Myotis evotis</td>
<td>SC</td>
<td>NS</td>
<td>N</td>
</tr>
<tr>
<td>Fringed myotis</td>
<td>Myotis yumanensis</td>
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<td>NS</td>
<td>N</td>
</tr>
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<td>Long-legged myotis</td>
<td>Myotis volans</td>
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<td>NS</td>
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</tr>
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<td>Yuma myotis</td>
<td>Myotis yumanensis</td>
<td>SC</td>
<td>NS</td>
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</tr>
<tr>
<td>Big free-tailed bat</td>
<td>Nyctinomops macrotis</td>
<td>SC</td>
<td>NS</td>
<td>N</td>
</tr>
<tr>
<td>Palen Townsend’s big-eared bat</td>
<td>Plecotus townsendi palaeoecus</td>
<td>SC</td>
<td>NS</td>
<td>N</td>
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</tbody>
</table>

Source: U.S. Fish and Wildlife Service and Nevada Heritage office, published in U.S. 95 Final
Environmental Impact Statement

Note: Federal Status=Endangered (E), Threatened (T), Candidate (C), and Species of Concern (SC).
Species of Concern are former category 2 candidate species under the Endangered Species Act which
are afforded no legal protection under that law. State Status=Threatened (T), Rare (R); and Protected
Species of Concern (SC) are afforded no legal protection under that law. State Status=Threatened (T),
Candidate (C), and Species of Concern (SC).

1. There is “no feasible and prudent alternative to the project,” and
2. The project includes “all possible planning to minimize harm to the
   project.”

The term “use” refers to not only the physical utilization of a property, but also
the indirect effects that would harm the value of protected sites. Section 4(f)
only applies to all publicly owned parks, recreational areas, and wildlife
and waterfowl refuges. If owned by private institutions and individuals, even if
the areas are open to the public, Section 4(f) does not apply. However, the FHWA
does encourage the preservation of privately owned lands. If a governmental
body has a proprietary interest in the land, for instance fee ownership, drainage
 easements or wetland easement, it can be considered “publicly owned” and thus

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Environmental Setting and Issues

Rancho Drive Corridor Study

Register of Historic Places, Historic American Buildings Survey/Historic
American Engineering Record identified no culturally significant sites along
the corridor. One area that is potentially significant is the Alta Drive Historic
Neighborhood which was identified by the City of Las Vegas in 2001. This
neighborhood is located along Alta Drive west of Rancho Drive to Valley
View Boulevard (see Figure 3-4). A Native American consultation was not
conducted as part of this study.

Figure 3-4: Alta Drive Historic Neighborhood

Section 4(f) Property

Section 4(f) is national policy which help to preserve U.S. natural resources. The
U.S. Department of Transportation Act of 1966 gave a special provision for
this section and stipulates that the Federal Highway Administration (FHWA)
will not approve any program or project that requires the “use” of any publicly
owned public park, recreation area, wildlife refuge or historic site unless:

1. There is “no feasible and prudent alternative to the project,” and
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the areas are open to the public, Section 4(f) does not apply. However, the FHWA
does encourage the preservation of privately owned lands. If a governmental
body has a proprietary interest in the land, for instance fee ownership, drainage
 easements or wetland easement, it can be considered “publicly owned” and thus
serious non-attainment for carbon monoxide (CO) and inhalable particulate matter of less than 10 microns in diameter (PM10). Consequences of non-attainment include federal sanctions which would prohibit construction of major sources of air pollution as defined in Section 302 of the Clean Air Act and Federal funding sanctions, as well as public health impacts. Any improvements to the Rancho Drive Corridor will need to be evaluated to determine if they conform to local air quality improvement plans.

No publicly owned parks, recreation areas, or wildlife and waterfowl refuges are located within the project corridor. However, the following public facilities are located within the general vicinity of the Rancho Drive Corridor:

- **Lorenzi Park**—Located west of the corridor between U.S. 95 and Washington Avenue (see Figure 3-5). Lorenzi Park is also home to the Nevada State Museum and Nevada Historical Society.
- **Sammy Davis Jr. Festival Plaza**—Located west of the corridor between U.S. 95 and Washington Avenue.
- **Las Vegas Municipal Golf Course**—Located west of the corridor between Washington Avenue and Vegas Drive.
- **Guy Park**—Located east of the corridor between Bonanza Road and Washington Avenue.
- **Hoggar d Park**—Located east of the corridor between Washington Avenue and Owens Avenue.

Several privately owned facilities are located within the general vicinity of Rancho Drive Corridor:

- **The Zoological Botanical Park**—Located west of the corridor between Vegas Drive and Lake Mead Boulevard.
- **Painted Desert Golf Course**—Located north of the project corridor west of the interchange with U.S. 95 and Ann Road.

**Air Quality**

The project corridor is located in Clark County and is under the jurisdiction of the Department of Air Quality and Environmental Management (DAQEM) Clark County Air Pollution Control District. The Las Vegas Valley is designated

**Noise**

Traffic noise impact and abatement analyses need to be conducted in accordance with the procedures as set forth in the FHWA’s “Procedure for Abatement Section 4(f) applies.

Many residential subdivisions are immediately adjacent to the Rancho Drive right-of-way as illustrated in Figure 3-7. These residential homes may be subject to noise levels that exceed acceptable limits. Further environmental studies will evaluate noise impacts and the need for noise mitigation measures such as sound walls.

**Visual Character and Aesthetics**

The FHWA developed guidelines outline in the publication “Visual Impact Assessment for Highway Projects”, published by the FHWA Office of Environmental Policy in March 1981. The report outlines six principal steps required to assess visual impacts:

1. Define the project setting and viewshed.
2. Analyze key views for visual assessment.
3. Analyze existing visual resources and viewer response.
4. Depict the visual appearance of project alternatives.
5. Assess the visual impacts of project alternatives.
6. Propose methods to mitigate adverse visual impacts.

The regional landscape establishes the general visual environment of the project, but the specific visual environment is determined by defining landscape units and the project viewshed. A landscape unit is an element of the regional landscape and can be interpreted to be and “outdoor room” that establishes a distinct visual character. A landscape unit often corresponds to a place that is commonly known among local viewers. A viewshed is a subset of a landscape...
The Sheep Range, to the north. Drive Corridor is the mountains that form distant vistas on the horizon. The illustrated in Figure 3-8. The most important visual element of the Rancho Environmental Setting and Issues 4

Figure 3-8: University of Phoenix Building at U.S. 95

Mount Charleston, part of Toiyabe National Forest, to the west, Figure 3-9.

The Spring Mountain Summit, part of the McCullough Range, to the east.

The Sheep Range, to the north.

Views of these distant natural features are often obscured by man-made uses that block the distant views from the project corridor.

Proposed Rancho Drive Corridor improvements can affect the community from two perspectives:

1. The view from the roadway improvements; and
2. The view of the roadway improvements.

Further environmental studies will evaluate specific visual impacts for corridor improvements, including a more detailed inventory of significant visual resources, impacts, and appropriate mitigation measures.

Title VI and Environmental Justice

In 1964, the U.S. Congress approved and President Lyndon Johnson signed into law the Civil Rights Act of 1964. Title VI of this act ensures that “no person in the United States shall, on the ground of race, color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.” A subsequent Presidential directive issued in 1994, Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, directed every Federal agency to make environmental justice part of its mission by identifying and addressing the effects of all programs, policies, and activities on minority populations and low-income populations. The U.S. Department of Transportation (USDOT) issued its Final Order on environmental justice on April 15, 1997. The Order establishes procedures to use in complying with Executive Order 12898 for USDOT and its operating administrations and components, including the FHWA and Federal Transit Administration (FTA). FHWA’s environmental justice initiatives accomplish environmental justice goals by involving the potentially affected public in developing transportation projects that fit harmoniously within their communities without sacrificing safety or mobility.

There are three fundamental environmental justice principles:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.

To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

The Rancho Drive Corridor is a racially and economically diverse corridor that generally reflects the overall diversity within the Las Vegas Valley as illustrated in 2000 Census block group data graphically presented in Figures 3-10 thru 3-12. Both the north and south ends of the corridor are predominantly white and above the poverty line. Several neighborhoods along the corridor south of U.S. 95 are some of the oldest and most established neighborhoods in the Las Vegas Valley due to their proximity Valley Hospital and University Medical centers and the central business district in downtown Las Vegas. These neighborhoods include Rancho Circle and Rancho Bel Air, both of which are gated and guarded by 24-hour private security. The north end of the corridor is characterized by suburban tract development and has attracted many of the new residents that have emigrated to Las Vegas over the past decade.

The middle of the corridor, in a area extending from U.S. 95 on the south to Lake Mead Boulevard on the north, has a higher concentration of racial minorities and people living below the poverty line. These neighborhoods are older communities with relatively affordable housing and in close proximity to casino properties in downtown Las Vegas. Also, the area east of the Rancho Drive Corridor, with similar limits as above, contains a high concentration of racial minorities and people living below the poverty line. This area is known as the West Las Vegas Neighborhood and has historically been home to the Las Vegas black community. Many West Las Vegas residents are active in the community affairs and it is bonded by a common identity as well as common social and economic concerns.

There is a significant Hispanic population, located east and west of the corridor north of U.S. 95 and south of Lake Mead Boulevard. Numerous day laborers, predominately Hispanic, gather at the intersection of Rancho Drive and Bonanza Road each morning looking for work. In addition, there are several Hispanic oriented businesses within these limits of the corridor.

Any disparate impacts to either minority or low-income populations will need to be considered in future environmental studies of the Rancho Drive Corridor and may have an impact on right-of-way acquisition needs and the development of a preferred alternative.
LONG-RANGE ROADWAY NEEDS

Rancho Drive, in combination with U.S. 95, Summerlin Parkway, the 215 Beltway and a grid network of arterial streets services local and regional travel needs in the northwest quadrant of Las Vegas Valley. This chapter documents the expected growth in traffic forecast to occur by 2030 and the resulting roadway requirements for this transportation corridor.

Travel Forecast Model and Land Use Assumptions

The traffic forecasts contained in this document were produced using the RTC 2004 Regional Travel Demand Model (Update Package 1). A complete description of the model is documented as “RTC 2004 Regional Travel Demand Model, September 2004.”

Regarding land use assumptions, RTC and the member entities embarked on an extensive re-examination of land use during 2004, working with the Southern Nevada Regional Planning Coalition. This work remained underway during the course of this investigation. In the interim, Parsons undertook the preparation of an “interim” planning variable dataset, based on published land plans, announced hotel/casino development plans, and prior estimates of non-hotel employment growth. This information was continuously updated based on RTC and member entity input, and announced development plans. These forecasts were controlled to adopted population and employment forecasts produced by the Center for Business and Economic Research (CBER) in April 2004 and adopted by RTC in May 2004.

Figure 4-1 illustrates the growth in population forecast for Clark County from 2004 to 2030, the planning year horizon for this study. During this 26-year period, population is expected to grow by 72 percent. Figure 4-2 illustrates the assumed distribution of this population growth, expressed by the location of new dwelling units (DUs). The graphic distributes DUs throughout each individual transportation analysis zone (TAZ) as a uniform pattern of density. DUs existing as of June 2002 are not illustrated on the graphic.

One of the principal drivers of economic growth in Las Vegas Valley has traditionally been the hospitality industry. Within Clark County, plans for hotel/casinos are announced well in advance of construction, hence it is possible to estimate this type of employment with reasonable precision. Figure 4-3 illustrates the locations of assumed hotel development throughout the Valley. While the downtown and Strip already provide a significant concentration of hotels, available land permits significant expansion opportunities for both existing and new casino properties.

Regarding the remainder of employment growth, which includes retail, office, industrial, and other non-retail, the forecast distribution of this growth is illustrated in Figure 4-4.

Table 4-1 provides tabulations of land use related data, summarized by transportation corridor planning area. The geographic boundaries of these corridors overlap political jurisdictions, and are illustrated on Figure 4-5.

The Rancho Drive study area extends through the “Northwest” Transportation corridor to the “Resort” Corridor on its southerly end. The Northwest Transportation Corridor planning area is bounded on the east by Martin Luther King Boulevard and on the south by Sahara Avenue and the Las Vegas city limits. The Resort Corridor is comprised of four sub-areas indicated on Figure 4-5. One of these sub-areas, identified as “west of CBD,” includes the southern portion of the Rancho Drive Corridor study area.

Table 4-1 indicates that the total population of the Northwest Transportation Corridor is forecast to increase by 410,765 residents between 2002 and 2030, growing by 93.4 percent. At the same time, job growth will be significant within the Resort Corridor. Nearly 170,000 jobs are forecast to be added within the Resort Corridor between 2002 and 2030.1

Figure 4-1: Clark County Projected County Population (1970-2030)

Figure 4-2: Growth in Dwelling Units

Figure 4-3: Locations of Assumed Hotel Development

Figure 4-4: Distribution of Remaining Employment Growth

Figure 4-5: Geographic Boundaries of Transportation Corridors

1Interim Planning Variable Dataset, Parsons, November 2004.
Travel Forecasts

The addition of dwelling units, population and jobs will significantly increase travel both within the Northwest Corridor and to/from other Las Vegas Valley corridors. Table 4-2 quantifies person trip estimates to/from within the Northwest Transportation Corridor for 2002 and 2030. These flows are also illustrated on Figure 4-5. Trips internal to the Northwest Corridor for work, shopping, school, and personal business comprise the largest percent of daily travel, while trips to/from the Resort Corridor constitute the largest external market. A large portion of these trips to/from the Resort Corridor are work related, and occur during hours of peak travel demand.

Overall, Northwest Corridor person trips are forecast to increase from 1,083,291 in 2002 to 2,150,885 in 2030, a growth of 99 percent. Relative to the overall valley, the Northwest Corridor accounts for 21 to 22 percent of the overall trip market both now and in the future. Trips between the Northwest and both North and West Transportation Corridors constitute strong external trip markets in addition to the Resort Corridor.

Highway Network Assumptions

Highway network assumptions form a critical parameter insofar as the forecast of planning horizon traffic volumes. The planned highway system is defined by the locally approved and adopted Regional Transportation Plan (RTP). The RTP is a long-range transportation plan covering a 20+ year time span. The most recent RTP was adopted in August 2003 and covers the 2004 to 2025 planning horizon. This RTP

- Responds to projected population and employment growth
- Is fiscally constrained by existing and projected revenue sources and amounts
- Ensures that project implementation of identified projects will reach air quality compliance.

The Regional Transportation Plan FY 2004–2025 was developed at a time when Clark County was feeling the full economic effects of terrorist activities of September 2001, and the subsequent economic downturn which was pronounced in the airline and hospitality industry. Table 4-3 indicates the population and employment estimates upon which the RTP was based (2002 data) alongside with the most currently revised forecasts, prepared by CBER and based on 2003 data. Insofar as the 2025 planning horizon addressed by the RTP, current population forecasts are 394,174 higher than what was reflected in the FY 2004–2025 RTP. Insofar as 2030, the design year for federally supported transportation projects, the current population forecasts are 572,986 higher (24 percent) than addressed by the locally identified and fiscally constrained list of projects included in the FY 2004–2025 RTP.

When next updated, the RTP will include transportation projects which respond to these revised and higher population and employment forecasts and the extended planning horizon of 2030. In all likelihood, additional investment in the highway, transit, transportation demand management, and bicycle/pedestrian elements will be identified. In anticipation of this update,
Table 4-1
Las Vegas Valley Demographic Forecasts by Corridor Planning Area

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Total Population</th>
<th>Total Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northwest</td>
<td>439,825</td>
<td>801,572</td>
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<tr>
<td>Resort</td>
<td>116,896</td>
<td>121,863</td>
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<td>West</td>
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<td>151,460</td>
<td>223,480</td>
</tr>
<tr>
<td>Southeast</td>
<td>199,805</td>
<td>317,214</td>
</tr>
<tr>
<td>South</td>
<td>65,450</td>
<td>366,674</td>
</tr>
<tr>
<td>Total</td>
<td>1,498,202</td>
<td>2,624,284</td>
</tr>
</tbody>
</table>

Source: Interim Planning Variable Dataset, Parsons, November 2004.

Table 4-2
Person Trips To/From Northwest Transportation Corridor

<table>
<thead>
<tr>
<th>Corridor</th>
<th>2002 Trips</th>
<th>2030 Trips</th>
<th>2002–2030 % Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northwest</td>
<td>551,290</td>
<td>1,173,187</td>
<td>113%</td>
</tr>
<tr>
<td>Resort</td>
<td>215,586</td>
<td>328,880</td>
<td>53%</td>
</tr>
<tr>
<td>West</td>
<td>121,118</td>
<td>205,765</td>
<td>70%</td>
</tr>
<tr>
<td>Northeast</td>
<td>70,753</td>
<td>191,347</td>
<td>170%</td>
</tr>
<tr>
<td>East</td>
<td>50,436</td>
<td>73,770</td>
<td>46%</td>
</tr>
<tr>
<td>Southeast</td>
<td>24,938</td>
<td>44,554</td>
<td>79%</td>
</tr>
<tr>
<td>South</td>
<td>9,554</td>
<td>71,406</td>
<td>647%</td>
</tr>
<tr>
<td>Total Corridor</td>
<td>1,083,291</td>
<td>2,150,885</td>
<td>99%</td>
</tr>
</tbody>
</table>

Source: RTC 2004 Regional Travel Demand Model (Update Package 1) with Interim Planning Variable Dataset and RTP Plus Network, Parsons.

RTC, NDOT, Clark County, and local entities have been sponsoring studies of regionally significant highway and transit corridors throughout the region assuming 2030 as the planning horizon. Some of these studies include:

- I-515/US-93/US-95
- I-15/Martin Luther King Boulevard–Industrial Boulevard connection
- I-15 North
- US-95 Northwest
- I-15 South
- 215 Beltway (selected segments)
- Cheyenne Avenue
- Rancho Drive
- Boulder Highway
- Henderson to North Las Vegas Regional Fixed Guideway

These corridor studies have identified that regionally significant highway and transit facilities will need to be more robust than defined by the FY 2004–2025 RTP. In response to these identified needs, Parsons in collaboration with NDOT and its corridor consulting engineers, defined a "2030 RTP Plus" network for the purpose of functionally defining design year traffic for the above listed freeway corridors.

Figure 4-6 illustrates the number of traffic lanes assumed for freeway links in the "2030 RTP Plus" network.

Compared with the RTP network, lanes have been added to I-15, US 95, I-515 and the 215 Beltway. These additional lane miles of capacity are partially included in the inventory of freeway lane miles reported in Table 4-4. Lane miles are defined as the distance of the roadway measured along each lane.
Highway miles of travel (VMT) is a measure of the total mileage traveled for all vehicles as estimated by the regional travel demand forecasting model. While the number of lane miles is expected to increase by 53.7 percent between 2000 and 2025, the expected VMT is projected to increase by 110 percent between 2002 and 2030, and by a further 26 percent by 2030. The worsening of traffic congestion, which affects all vehicles, is quantified by measurement of the percent of VMT on congested roadways where traffic volumes equal or exceed roadway capacity (V/C ≥ 1.0). Increases in travel delay will grow faster than daily VMT, because delays grow faster than traffic volumes on congested roads.

As noted in Table 4-5, the VMT and percent congested statistics reported for 2025 are based on the currently adopted RTP for that forecast year. The statistics reported for 2030 assume the “RTP Plus” network wherein additional travel lanes have been added to selected freeways based on NDOT sponsored corridor studies underway as of 2004. Figure 4-7 illustrates the concentration of daily traffic on freeways and major arterial streets within the Northwest Transportation Corridor planning area. The left portion of Figure 4-7 illustrates the modeled assignment of traffic to the Las Vegas Valley highway network as of 2002, whereas the right portion illustrates 2030 forecast conditions. These forecasts assume Rancho Drive with a baseline condition of three lanes in each direction (six lanes total) between signalized intersections.

A comparison of these two graphics clearly illustrates the growth in traffic projected for the Rancho Drive study area as well as virtually all other freeways and arterial streets within the northwest quadrant of the valley.
Rancho Drive Roadway Needs

The preceding discussion of Highway Network Utilization is based on an assumed set of highway improvements which were outlined in the Highway Network Assumptions section of this chapter. For the purpose of this study, Parsons tested a wide range of network scenarios to identify Rancho Drive roadway needs. These scenarios included the following:

2030 RTP Plus Network. This reflects the adopted 2025 regional transportation plan highway network plus the addition of freeway traffic lanes as illustrated on Figure 4-6—tested with 2030 interim land use assumptions. Rancho Drive is assumed to be a six-lane major arterial street with turning lanes at signalized intersections and midblock locations. All other arterial, collector and local streets are assumed to be as defined for the 2025 RTP highway network.

2030 RTP Plus Network with Rancho Drive Expressway. With this network, Rancho Drive was tested as a six-lane arterial street at grade level, with a limited access four-lane freeway constructed above on an elevated structure. Access to the elevated freeway would be limited to U.S. 95 at the north and south end of the corridor, Ann Road, Cheyenne Avenue, Carey Avenue and Lake Mead Boulevard, and the at-grade portion of Rancho Drive south of Washington Street.

2030 RTP Plus Network with Rancho Drive Elevated Freeway. With this network, Rancho Drive was tested as a six-lane arterial street at grade level, with a limited access four-lane freeway constructed above on an elevated structure. Access to the elevated freeway would be limited to U.S. 95 at the north and south end of the corridor, Ann Road, Cheyenne Avenue, Carey Avenue and Lake Mead Boulevard, and the at-grade portion of Rancho Drive south of Washington Street.

2030 RTP Plus Network with Rancho Drive Super Arterial. With this network, Rancho Drive was tested as an eight-lane arterial street with four-lane grade separations at all signalized intersections. All driveway access would be maintained, but all mid-block median crossings would be eliminated. The center two lanes in each direction would operate at higher speeds, while the outside two lanes would provide for local circulation, driveway access, transit vehicle movement, and turning movements at signalized cross street intersections. Through traffic would be grade separated from cross street traffic at all signalized intersections.

Figure 4-8 illustrates the 2030 traffic forecasts for the Northwest Transportation Corridor under each of these four highway network scenarios. This graphic illustrates that depending on the capacity of Rancho Drive, traffic shifts between that facility and the north–south and east–west legs of U.S. 95. To allow for an apple-to-apple comparison, the number of highway lanes assumed for Summerlin Parkway is held constant at its 2025 RTP configuration under all scenarios.

As the capacity of Rancho Drive is increased, traffic shifts from U.S. 95 to Rancho Drive, as the latter presents a more direct route to the Resort Corridor for many Northwest Corridor residents. Traffic declines on U.S. 95, offering the opportunity to increase capacity and throughput on Summerlin Parkway.

Under the four scenarios tested, average daily traffic (ADT) volumes increase dramatically from 2004 levels of ±37,000 ADT south of Lake Mead Boulevard. Year 2030 ADT volumes on Rancho Drive south of Lake Mead Drive are as follows for the four tested scenarios:

- 72,700 with Rancho Drive Arterial
- 132,200 with Rancho Drive Expressway
- 215,700 with Rancho Drive Elevated Freeway
- 188,000 with Rancho Drive Super Arterial.

Corresponding traffic volumes on U.S. 95 south of Lake Mead Boulevard are as follows for the four tested scenarios:

- 283,000 with Rancho Drive Arterial
- 248,100 with Rancho Drive Expressway
- 206,100 with Rancho Drive Elevated Freeway
- 218,000 with Rancho Drive Super Arterial.

Conclusions

The primary purpose of the Rancho Drive Corridor Study is to identify transportation investment options that will relieve congestion on U.S. 95 northwest of the Spaghetti Bowl by providing a travel time competitive route for commuters traveling from the growing northwest to the Resort Corridor.
This study has identified four basic concepts for relieving congestion on U.S. 95 northwest of the Spaghetti Bowl interchange with I-15. These are:

1. A Baseline Option that would optimize traffic operations along a six-lane Rancho Drive arterial.
2. An Expressway Option that would upgrade Rancho Drive to an expressway by providing additional green time for Rancho Drive traffic movements at signalized intersections, consolidate driveway access, and reduce the number of median openings for midblock left-turn movements.
3. A Freeway Option that would construct an elevated four-lane freeway over Rancho Drive, which would continue to operate as a six-lane arterial street at ground level.
4. A Super Arterial Option that would widen Rancho Drive to eight lanes to provide outside lanes for transit and right-turning vehicle use, and construct grade separations at signalized cross streets. This concept would be similar to the Desert Inn Super Arterial, however driveway access would be maintained.

Of these four options, the Freeway Option provides the most traffic relief for U.S. 95 followed by the Super Arterial concept. Considering trade-offs between traffic congestion relief, likely construction cost, neighborhood disruption and visual aesthetics, the public agencies participating in this study concluded that the Super Arterial concept should be pursued further by this study. A Super Arterial would attract approximately 65,000 vehicles per day away from the north–south leg of U.S. 95, obviating or postponing the need for further widening of the east–west leg of U.S. 95 beyond the 10-lane facility which is currently under construction. The Super Arterial would likely maintain neighborhood integrity and minimize visual and noise impacts compared to the Rancho Drive elevated freeway option.
Figure 5-1 illustrates the deployment of the fixed route service as of October 2004. Routes are arranged in a grid network aligned with north–south and east–west arterial streets. This grid pattern of routes is overlaid by a small number of radial routes which run on Las Vegas Boulevard, Boulder Highway and Rancho Drive.

As would be expected, routes serving the largest numbers of residents and jobs attract the highest levels of ridership. In general, routes providing direct service to downtown Las Vegas and the Strip carry more riders than cross-town routes. Table 5-2 lists the monthly ridership levels recorded during October 2004 along with service frequencies and an indication of which routes serve downtown Las Vegas and/or the Strip along Las Vegas Boulevard.

Ridership has since rebounded during FY 2004, exceeding 50 million annual passengers. These ridership levels are reported in Table 5-1 along with other pertinent operational statistics.
Table 5-2
Transit Frequency Table

<table>
<thead>
<tr>
<th>Route</th>
<th>Weekdays</th>
<th>Weekends and Holidays</th>
<th>Service Las Vegas CBD or Strip</th>
<th>October 2004 Monthly Ridership</th>
</tr>
</thead>
<tbody>
<tr>
<td>101 — Rainbow</td>
<td>30</td>
<td>30</td>
<td>No</td>
<td>78,901</td>
</tr>
<tr>
<td>102 — Jones</td>
<td>45</td>
<td>45</td>
<td>No</td>
<td>48,127</td>
</tr>
<tr>
<td>103 — Decatur</td>
<td>30</td>
<td>30</td>
<td>No</td>
<td>137,267</td>
</tr>
<tr>
<td>104 — Valley View/Tommy Pines</td>
<td>45</td>
<td>60</td>
<td>No</td>
<td>36,960</td>
</tr>
<tr>
<td>105* — Martin L. King/Koval</td>
<td>60</td>
<td>60</td>
<td>Yes</td>
<td>52,274</td>
</tr>
<tr>
<td>106 — Rancho</td>
<td>30</td>
<td>30</td>
<td>Yes</td>
<td>78,221</td>
</tr>
<tr>
<td>107 — Boulder Highway</td>
<td>20</td>
<td>20</td>
<td>Yes</td>
<td>222,986</td>
</tr>
<tr>
<td>108 — Paradise/Fremont Street Experience Monorail Connector</td>
<td>20</td>
<td>20</td>
<td>Yes</td>
<td>99,295</td>
</tr>
<tr>
<td>109 — Maryland Parkway</td>
<td>10</td>
<td>15</td>
<td>Yes</td>
<td>321,234</td>
</tr>
<tr>
<td>110 — Eastern Avenue</td>
<td>30</td>
<td>30</td>
<td>No</td>
<td>164,171</td>
</tr>
<tr>
<td>111 — Pecos</td>
<td>30</td>
<td>30</td>
<td>No</td>
<td>113,762</td>
</tr>
<tr>
<td>112 — Desert Inn/Lamb</td>
<td>30</td>
<td>30</td>
<td>Yes</td>
<td>104,256</td>
</tr>
<tr>
<td>113 — Las Vegas Boulevard North</td>
<td>30</td>
<td>30</td>
<td>No</td>
<td>172,463</td>
</tr>
<tr>
<td>114 — Green Valley Circulator</td>
<td>60</td>
<td>60</td>
<td>No</td>
<td>14,803</td>
</tr>
<tr>
<td>115 — Nellis</td>
<td>30</td>
<td>30</td>
<td>No</td>
<td>119,619</td>
</tr>
<tr>
<td>116 — Boulder City</td>
<td>60</td>
<td>60</td>
<td>No</td>
<td>8,559</td>
</tr>
<tr>
<td>117 — Las Vegas Boulevard South</td>
<td>60</td>
<td>60</td>
<td>No</td>
<td>19,365</td>
</tr>
<tr>
<td>201 — Tropicana</td>
<td>20</td>
<td>20</td>
<td>Yes</td>
<td>243,505</td>
</tr>
<tr>
<td>202 — Flamingo</td>
<td>20</td>
<td>20</td>
<td>Yes</td>
<td>254,362</td>
</tr>
<tr>
<td>203 — Spring Mountain/Town Center</td>
<td>30</td>
<td>60</td>
<td>Yes</td>
<td>62,247</td>
</tr>
<tr>
<td>204 — Sahara</td>
<td>20</td>
<td>20</td>
<td>Yes</td>
<td>194,908</td>
</tr>
<tr>
<td>206 — Charleston</td>
<td>15</td>
<td>20</td>
<td>Yes</td>
<td>292,874</td>
</tr>
<tr>
<td>207 — Alta/Summerlin</td>
<td>60</td>
<td>60</td>
<td>Yes</td>
<td>55,070</td>
</tr>
<tr>
<td>208 — Washington</td>
<td>30</td>
<td>30</td>
<td>Yes</td>
<td>100,330</td>
</tr>
<tr>
<td>209 — Vegas/Owen</td>
<td>45</td>
<td>60</td>
<td>No</td>
<td>37,563</td>
</tr>
<tr>
<td>210 — Lake Mead Boulevard</td>
<td>30</td>
<td>30</td>
<td>No</td>
<td>156,311</td>
</tr>
<tr>
<td>211 — Smoke Ranch/Carey</td>
<td>60</td>
<td>60</td>
<td>No</td>
<td>26,498</td>
</tr>
<tr>
<td>212 — Sunset Road</td>
<td>45</td>
<td>60</td>
<td>No</td>
<td>49,363</td>
</tr>
<tr>
<td>213 — Harmon/The Lakes</td>
<td>30</td>
<td>30</td>
<td>Yes</td>
<td>45,345</td>
</tr>
<tr>
<td>214 — Nellis Boulevard</td>
<td>60</td>
<td>60</td>
<td>No</td>
<td>30,107</td>
</tr>
<tr>
<td>215 — Bonanza</td>
<td>30</td>
<td>30</td>
<td>Yes</td>
<td>105,131</td>
</tr>
<tr>
<td>216 — Henderson</td>
<td>60</td>
<td>60</td>
<td>No</td>
<td>10,693</td>
</tr>
<tr>
<td>217 — Warm Springs</td>
<td>60</td>
<td>60</td>
<td>No</td>
<td>25,895</td>
</tr>
<tr>
<td>218 — Cheyenne</td>
<td>60</td>
<td>60</td>
<td>No</td>
<td>38,957</td>
</tr>
<tr>
<td>219 — Craig Road/Centennial</td>
<td>60</td>
<td>60</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>220 — Strip</td>
<td>10</td>
<td>10</td>
<td>Yes</td>
<td>663,353</td>
</tr>
<tr>
<td>222 — Strip Express</td>
<td>15</td>
<td>15</td>
<td>Yes</td>
<td>145,538</td>
</tr>
<tr>
<td>303 — Millennium</td>
<td>60</td>
<td>60</td>
<td>No</td>
<td>16,284</td>
</tr>
<tr>
<td>304 — Cimarron</td>
<td>60</td>
<td>60</td>
<td>Yes</td>
<td>8,185</td>
</tr>
<tr>
<td>305 — RTC/Craig Connector</td>
<td>60</td>
<td>60</td>
<td>Yes</td>
<td>28,076</td>
</tr>
<tr>
<td>MAX—Las Vegas Boulevard</td>
<td>12</td>
<td>12</td>
<td>Yes</td>
<td>118,781</td>
</tr>
<tr>
<td>7066—Silver Star (Seniors)</td>
<td>NA</td>
<td>60</td>
<td>No</td>
<td>941</td>
</tr>
<tr>
<td>804 — Gold Line (Tropicana Express)</td>
<td>30</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>805 — Rose Line (Sahara Express)</td>
<td>20</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>806 — Orange Line (Eastern Express)</td>
<td>20</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>807 — Bronze Line (Flamingo Express)</td>
<td>30</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*Route 209 operates at 45-minute frequencies between 12:30 p.m. and 5:30 p.m.
Route 212 operates at 45-minute frequencies between 9:30 a.m. and 6:00 p.m.
Route 302 begins service at 10:35 a.m. daily.
Routes 710, 711, 712, 714, 715, and 716.

and characteristics has been established.1 As shown in Table 5-3, this research indicates that for the period from December 2001 to March 2002, 46 percent of riders transferred between two or more routes to complete their journey while 54 percent traveled on just one bus. During this survey observation, residents comprised 88 percent of the riders, while visitors made 12 percent of CAT’s passenger trips. Table 5-3 also indicates that CAT service is utilized for a wide variety of trip purposes, more so than other transit systems which attract primarily work trips. Resident “home-based other” trips, visitor trips, resident “non-home-based” and shopping trips are all important components of CAT’s ridership base.

Table 5-3
Observed Transit Trip Characteristics (December 2001—March 2002)

<table>
<thead>
<tr>
<th>Boardings per Trip</th>
<th>Number of Boardings per Trip</th>
<th>Total</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>77,937</td>
<td>54.5</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>58,110</td>
<td>40.6</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>6,568</td>
<td>4.6</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>402</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>Total Boardings</td>
<td>143,017</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Linked trips 109,282
Boardings/linked trip 1.31

Trips by Purpose

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Peak</th>
<th>Off Peak</th>
<th>Total</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resident Home-based work</td>
<td>12,450</td>
<td>26,748</td>
<td>39,198</td>
<td>35.9</td>
</tr>
<tr>
<td>Home-based school</td>
<td>530</td>
<td>1,942</td>
<td>2,472</td>
<td>2.3</td>
</tr>
<tr>
<td>Home-based shop</td>
<td>2,847</td>
<td>6,457</td>
<td>9,303</td>
<td>8.5</td>
</tr>
<tr>
<td>Home-based other</td>
<td>7,442</td>
<td>26,377</td>
<td>33,819</td>
<td>30.9</td>
</tr>
<tr>
<td>Non-home-based</td>
<td>2,906</td>
<td>8,651</td>
<td>11,558</td>
<td>10.6</td>
</tr>
<tr>
<td>Total</td>
<td>26,175</td>
<td>70,175</td>
<td>96,350</td>
<td>88.2</td>
</tr>
<tr>
<td>Visitor Hotel-based</td>
<td>1,242</td>
<td>7,797</td>
<td>8,839</td>
<td>8.1</td>
</tr>
<tr>
<td>Non-hotel-based</td>
<td>891</td>
<td>3,103</td>
<td>3,994</td>
<td>3.7</td>
</tr>
<tr>
<td>Total</td>
<td>2,133</td>
<td>10,900</td>
<td>13,033</td>
<td>11.8</td>
</tr>
</tbody>
</table>

All Trips 28,207
All Trips 81,075
All Trips 109,282

1Mayo & Associates Origin–Destination Study: results expanded to the universe of riders by Parsons for RTC 2004 Regional Travel Demand Model—Mode Split Model development.

RTC Service Deployment Strategy

RTC’s Short Range Transit Plan 2004–2008 (SRTP) states the following as the general strategy for delivering transit service to Las Vegas Valley:

“The future transit system in the Las Vegas Valley will be made up of integrated components that together will offer a high degree of mobility for residents and visitors alike, will support the local economy by providing access to businesses and activity centers, and, by developing an effective alternative to auto travel, will help the RTC in its efforts to reduce traffic congestion and improve air quality.”

The SRTP also details five-year plans for delivering eight elements of the plan comprising:

1. CAT fixed route bus service
2. CAT “Silver Star” service
3. CAT paratransit services

Figure 5-2 illustrates the utilization of CAT’s fixed route transit service, based on the observed origin–destination survey data collected in 2001/2002.
4. The MAX bus rapid transit system
5. The Las Vegas Monorail
6. Transit centers and other passenger facilities
7. Transit operations and maintenance facilities
8. Rail transit

These elements are described in some detail within the SRTP document. Underlying the fixed-route elements of the plan is the following service deployment strategy.

CAT services a large and growing urban area. While residences are dispersed throughout the Valley, jobs are concentrated within the Resort Corridor, centered along Las Vegas Boulevard and downtown Las Vegas. To provide accessibility to its large service coverage area, CAT provides basic fixed-route bus service along major arterial streets which are arranged in a grid pattern. These routes follow linear alignments so that residents and visitors can readily understand the network of fixed routes. As a result of providing a grid route network, a large proportion of bus riders must transfer between routes to complete their journey—from origin to destination. While over 45 percent of CAT riders currently make such transfers, research indicates that non-bus users prefer not to transfer (see inset). To minimize the negative aspects of transferring between routes, and to attract current non-users to public transportation, RTC is developing a number of strategically located transit centers and transit hubs. These facilities provide a location for transit lines to connect with one another and provide air-conditioned space and amenities for both transferring and waiting passengers.

As CAT operates a grid route network, many routes do not directly serve the Valley’s largest concentration of trip attractions which are found within the Resort Corridor. Regional shopping centers, the University of Nevada at Las Vegas (UNLV), hospitals and medical centers are all found within the Resort Corridor in addition to the Valley’s largest hotels and casinos. As many of the bus routes operate with service frequencies of 30 minutes between vehicles, transfers between buses (which are required to access the Resort Corridor) can often add a considerable amount of travel time to a journey involving two CAT bus lines. To reduce the wait time associated with transferring and provide more direct and faster travel to the Resort Corridor, RTC is developing a rapid transit system overlay to complement the grid-based fixed-route bus system. By operating at faster speeds, along more direct (radial) routes, at frequent intervals, these rapid transit lines will compensate for time lost to transfers and address many non-user preferences for improved transit service.

Consumer Preferences for Improved Transit Service
Consumer research has been undertaken in numerous cities regarding the preferences of users and non-users for transit service improvements. Non-bus users in five midwestern cities were asked to rank eight bus system characteristics, using the paired comparison method of indicating preference. The eight characteristics, in order of preference, were as follows:

1. Making a trip without changing buses
2. More frequent bus service
3. Lower fares
4. A shorter walking distance to bus
5. More protection from weather at bus stop
6. Longer hours of available service
7. A shorter time spent traveling in bus
8. Assurance of getting a seat

The figure below illustrates the relative importance of the bus service characteristics as potential mode choice.

<table>
<thead>
<tr>
<th>Relative Preference</th>
<th>A1</th>
<th>A2</th>
<th>B</th>
<th>C</th>
<th>D1</th>
<th>D2</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

A–E Metro areas:
A1: Employed and students
A2: Not employed
D1: Employed and students
D2: Not employed

Source: Las Vegas Valley Transit System Development Plan, Parsons, May 2002

Figure 5-3 illustrates RTC’s overall deployment strategy for its fixed route transit services. Systems-level planning for this strategy was accomplished as part of the Las Vegas Valley Transit System Development Plan, completed in May 2002; with additional candidate corridor investigation being accomplished by the Las Vegas Valley Long-Range Transit Survey, completed in November 2004.

Figure 5-3: Fixed Route Transit Services Overall Deployment Strategy
The status of the individual rapid transit deployment corridors is as follows:

- MAX Northeast—Operational. Runs along Las Vegas Boulevard North
- MAX Boulder Highway—Corridor study complete
- Regional Fixed Guideway—Corridor studies complete. Alternatives Analysis/Environmental Document underway
- MAX Northwest—Corridor study of Rancho Drive underway
- MAX South—Corridor study of Las Vegas Boulevard South underway
- MAX Southwest—Future corridor study
- MAX Flamingo—Future corridor study
- MAX Sahara—Future corridor study

**MAX Northwest Proposal**

Consistent with RTC’s rapid transit deployment strategy, MAX bus rapid transit service would be operated along the Rancho Drive corridor, connecting residential land uses in northwest Las Vegas/North Las Vegas with commercial industrial, retail, business, and hotel/casinos located in the Resort Corridor. The proposed service would serve both corridor land uses and the connecting grid of CAT bus routes running along major east–west arterial streets. As depicted on Figure 5-4, the service would initially operate between the Santa Fe Transit Hub and the Central City Intermodal Transportation Terminal and connect with the proposed Regional Fixed Guideway system. This MAX route could also be extended to the proposed Great Mall shopping center located northwest of the Santa Fe Hub and/or the South Strip Transportation Terminal, to reduce the need for transfers.

Along Rancho Drive, MAX vehicles, such as those illustrated in Figure 5-5, could operate in mixed traffic, or a new fourth lane could be constructed in each direction for MAX, driveway access, and right turning vehicle use. Figure 5-6 illustrates a midblock cross section depicting an 8-lane Rancho Drive with median separation and sidewalks.

BRT stations (boarding platforms), such as those illustrated on Figure 5-7, would be located at major crossing arterial streets having CAT fixed-route bus service (209–Vegas, 210–Lake Mead, 211–Smoke Ranch/Carey, 218–Cheyenne, and 219–Craig), and at other signalized cross streets which provide access to adjacent neighborhoods. Figure 5-4 also depicts a conceptual layout for the proposed BRT station deployment. These BRT station platforms would be located on the far side of signalized cross street intersections. Proposed platform locations are listed in Table 5-4 and illustrated on conceptual roadway drawings provided in Appendix C.
### Table 5-4
Proposed Rancho Drive BRT Station Locations

<table>
<thead>
<tr>
<th>Cross Street</th>
<th>Northbound</th>
<th>Station Spacing (feet)</th>
<th>Southbound</th>
<th>Station Spacing (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central City Transportation Terminal</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Alta Drive and Grand Central Parkway</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Alta Drive and Shadow Lane</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Vegas Drive</td>
<td>165+50</td>
<td>5,550</td>
<td>180+20</td>
<td>6,380</td>
</tr>
<tr>
<td>Lake Mead</td>
<td>242+00</td>
<td>2,750</td>
<td>244+00</td>
<td>1,950</td>
</tr>
<tr>
<td>Smoke Ranch</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Airport Drive</td>
<td>269+50</td>
<td>263+50</td>
<td>263+50</td>
<td>263+50</td>
</tr>
<tr>
<td>Cheyenne Avenue</td>
<td>316+50</td>
<td>309+00</td>
<td>315+00</td>
<td>315+00</td>
</tr>
<tr>
<td>Gowan Road</td>
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<td>340+50</td>
<td>340+50</td>
<td>340+50</td>
</tr>
<tr>
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<tr>
<td>Craig Road</td>
<td>419+50</td>
<td>407+50</td>
<td>407+50</td>
<td>407+50</td>
</tr>
<tr>
<td>Santa Fe Transit Hub*</td>
<td>460+00</td>
<td>460+00</td>
<td>460+00</td>
<td>460+00</td>
</tr>
</tbody>
</table>

*Off-street BRT platform

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**Figure 5-6: Midblock Cross Section for an 8-Lane Roadway**

**Figure 5-7: MAX Northeast Typical Station**
Alternatives Development and Evaluation

Introduction

Rancho Drive is one of the primary non-freeway travel corridors serving the Northwest Las Vegas Valley. At present, operating conditions are generally poor within the core metro area bounded by Sahara Avenue on the south and Lake Mead Boulevard on the north. The poor operating conditions are due to insufficient capacity to accommodate heavy traffic volumes and frequent traffic signals at intersecting arterial cross streets and commercial driveways which impede traffic flow. The poor operating conditions will continue to deteriorate during the next decades as population, employment, and vehicle miles of travel increase. While improvements with the south interchange at U.S. 95 and other roadway projects area will enhance regional mobility, as development increases, long-term travel demand will cause both the freeway and arterial transportation system to become more congested, travel times will increase, speeds will decrease, and air quality will worsen.

The purpose of this study is therefore to define transportation investments that will support existing population and projected growth. Project need is based on the inadequacies of the existing and programmed (funded) freeway and regional roadway system to accommodate forecast traffic growth through year 2030.

This chapter describes the alternatives that were developed and evaluated, which in turn led to a recommended set of investments for the Rancho Drive Corridor. The alternatives development process was an iterative process that included input from project stakeholders through a series of Technical Advisory Committee (TAC) meetings and a Design Workshop. Project alternatives were developed and refined during a design workshop that incorporated input from agency staff and the Parsons’ team. Several alternatives were considered and rejected because they did not meet the purpose and need for the proposed project.

Alternatives Development

As discussed in Chapter 4, this study identified four basic concepts for relieving congestion on U.S. 95 northwest of the Spaghetti Bowl interchange with I-15. These are:

1. A Baseline Option that would optimize traffic operations along a six-lane Rancho Drive arterial.
2. An Expressway Option that would upgrade Rancho Drive to an expressway by providing additional green time for Rancho Drive traffic movements at signalized intersections, consolidate driveway access, and reduce the number of median openings for mid-block left-turn movements.
3. A Freeway Option that would construct an elevated four-lane freeway over Rancho Drive, which would continue to operate as a six-lane arterial street at ground level.
4. A Super Arterial Option that would widen Rancho Drive to eight lanes to provide outside lanes for transit and right-turning vehicle use, and construct grade separations at signalized cross streets. This concept would be similar to the Desert Inn Super Arterial; however driveway access would be maintained.

As discussed in Chapter 1, specific project objectives include:

- Relieving congestion on U.S. 95 northwest of the Spaghetti Bowl by providing a travel time competitive route for commuters traveling from the growing Northwest to the Resort Corridor.
- Increasing mobility through improved transit service.
- Encouraging corridor redevelopment, especially in the urban core area of the corridor.

The Baseline Option that optimizes traffic operations would only incrementally improve traffic operations along the corridor. There is significant arterial cross-street travel demand at locations such as Charleston Boulevard, Cheyenne Avenue, and Craig Road as illustrated in Figure 6-1. These arterial cross streets are anticipated to carry even greater volumes of traffic in the future because of their proximity to the freeway network. Also, several of these streets are under study to be upgraded to higher-order facilities such as super arterials. The Baseline Option does not incorporate additional transit lanes, and other than lower headways on existing bus routes, no transit improvements can be easily implemented. Finally, the Baseline Option would not encourage corridor redevelopment. While aesthetic improvements to the Rancho Corridor can be implemented in any scenario, the Baseline Option does not contemplate a comprehensive corridor redevelopment scheme.

The Expressway Option does provide an increase in traffic capacity for vehicles traversing the corridor. However, this increase in capacity along Rancho Drive would seriously degrade traffic operations along the intersecting east-west arterial streets as more green time is allocated to the Rancho Drive corridor.

Traffic operations along Rancho Drive would be improved at the expense of east-west traffic, resulting in an unacceptable impact on mobility throughout the northwest Las Vegas Valley. Also, by consolidating driveways and limiting left-turns, corridor redevelopment opportunities would be limited because of reduced access.

The Freeway Option would construct an elevated four-lane freeway over Rancho Drive, which would continue to operate as a six-lane arterial street at ground level. This option would provide the highest Rancho Drive corridor capacity by virtue of the elevated freeway section. In addition, access along the corridor would be maintained because the at-grade portion of Rancho Drive would essentially remain unchanged. However, the Freeway Option has several problems. First, an elevated structure along the corridor, starting south of the Ann Road interchange and extending into the Resort Corridor, would have limited access to the east-west arterial cross streets that intersect Rancho Drive. In addition, traffic traveling on the elevated section would bypass all of the development and businesses along the Rancho Drive corridor, including properties such as major neighborhood casinos and numerous local businesses. This would be a concern to the business owners along the corridor and would likely constrain redevelopment opportunities along the corridor because of the limited access from the elevated freeway. A similar freeway viaduct is under construction along State Route 618 in Tampa, Florida and is illustrated in Figure 6-2.
The Freeway Option also has several environmental concerns that would be difficult to mitigate. Neighborhood disruptions would be extensive, especially if the elevated freeway was extended along the residential areas between U.S. 95 and Charleston Boulevard and between Bonanza Road and Vegas Drive. Noise impacts would be difficult to mitigate without constructing soundwalls along the elevated freeway. These sound walls would exacerbate visual impacts for neighborhoods along the corridor.

The Freeway Option construction cost would be very high because of the extensive length of viaduct bridge structures that would be required. It would also be very difficult to phase construction of a elevated freeway option because of the difficulty in tying the elevated freeway section back to the at-grade Rancho Drive. During the interim tie-in locations would suffer severe congestion as elevated and at-grade traffic merged.

The Freeway Option would provide good transit opportunities for express bus service from the far northwest (north of Ann Road) to the Resort Corridor. However, because of the limited access along the Rancho Corridor, transit service south of Ann Road would be limited to traveling along at-grade Rancho Drive. It is unlikely that a travel lane along the at-grade Rancho Drive could be converted to a transit only lane because of the local travel demand along Rancho Drive.

Considering trade-offs between traffic congestion relief, likely construction cost, neighborhood disruption and visual aesthetics, the public agencies participating in this study concluded that the Super Arterial concept would provide many benefits of the freeway option while avoiding the disbenefits and should be pursued further by this study. A Super Arterial would attract approximately 65,000 vehicles per day away from the north–south leg of U.S. 95, obviating or postponing the need for further widening of the east–west leg of U.S. 95 beyond the 10-lane facility which is currently under construction. Starting at Ann Road and extending south to Bonanza Road, the Super Arterial would provide an attractive alternative for commuters. Traffic could flow the entire length of Rancho Drive between Ann Road and Bonanza Road without encountering an intersection because each major arterial east-west cross street would be constructed as a modified single point diamond interchange (Modified SPDI), and minor cross-streets would become right in and out intersections. By providing interchanges at major cross-streets, access to adjacent parcels would be maintained for both local traffic as well as traffic originating north of Ann Road. Conceptual layout of the Rancho Drive Super Arterial is provided in Appendix A with selected locations highlighted in this chapter.
For travel south of Bonanza Road and into the Resort corridor, a phased implementation approach is proposed. The first phase would construct an extension of the elevated Rancho drive Super Arterial south of Washington Avenue, extending over the Rancho Drive and Bonanza Road intersection, tying back into at-grade Bonanza Road. The second phase would construct a viaduct along Bonanza Road, extending south over U.S. 95 and along Martin Luther King Boulevard, and tying into the Martin Luther King/Industrial Road flyover bridge that is proposed as part of Project NEON, illustrated in Figure 6-3. Project NEON is a multi-hundred million dollar project that proposes improvements to I-15 between Sahara Avenue and the I-15/U.S. 95 interchange (the Spaghetti Bowl), reconstruction of the Charleston Boulevard interchange at I-15, and numerous improvements to the local street network in the vicinity of the interchange, including connecting Martin Luther King Boulevard with Industrial Road via a new bridge structure over I-15. Proposed improvements that improve connectivity to the Resort Corridor will be discussed in further detail later in this chapter.

Rancho Drive Super Arterial Project Description

The proposed Super Arterial would begin just south of the Ann Road interchange with U.S. 95. Currently, Rancho Drive traffic to and from U.S. 95 must travel through the Ann Road interchange with U.S. 95. The City of Las Vegas has identified this interchange as operating at a poor level of service, and NDOT is studying the interchange’s traffic operations as part of the U.S. 95 Northwest Environmental Assessment. The Rancho Drive project proposes braided ramps with the U.S. 95 northbound and southbound off-ramps to provide direct access for Rancho Drive traffic to and from U.S. 95. These ramps would be located south of Ann Road and would reduce traffic volumes at the Ann Road ramp terminals because traffic to and from U.S. 95 would not bypass the interchange. To reduce the weave conflict between Ranch Drive and traffic destined to eastbound Ann Road and U.S. 95 traffic existing to Ann Road, Rancho Drive traffic destined for eastbound Ann Road could be encouraged to utilize Rainbow Boulevard though the use of improved geometrics and signing at the Rancho Drive and Rainbow Boulevard intersections. Finally, traffic operations at the U.S. 95 northbound off ramp terminal at Ann Road would be improved by the addition of triple left and a dual right turns at the intersection. The third left-turn lane is intended to accommodate the Rancho Drive traffic destined for westbound Ann Road, thus eliminating the current weaving movement between the U.S. 95 northbound off-ramp traffic destined for eastbound Ann Road and the aforementioned Rancho Drive traffic destined for westbound Ann Road. These intersection improvements and the braided ramp proposals are illustrated in Figure 6-4. The estimated construction cost for these bridge structures and associated improvements is $11.2 million.

South of the proposed improvements at the Ann Road interchange is the first Modified SDPI interchange at Rainbow Boulevard. The interchange includes a bridge structure to accommodate four lanes of the Rancho Super Arterial traffic over the intersection, with off-ramps to an at-grade intersection. This at-grade intersection provides full access to the Santa Fe Station Casino, as well as northbound Rainbow Boulevard.

Because of the proximity to Lone Mountain Road, both the Santa Fe Station/Rainbow Boulevard and the Lone Mountain Road interchange should be constructed concurrently, illustrated in Figure 6-5 and 6-6. The Rancho Drive Super Arterial would remain elevated on fill from just south of the Ann Road interchange to south of Lone Mountain Road. A typical cross section of the Super Arterial on fill is illustrated in Figure 6-7. A two-lane one-way frontage road type roadway would be constructed at-grade on both sides of the Super Arterial and would provide local access as well as access to the interchanges at Santa Fe Station/ Rainbow Boulevard and Lone Mountain Road.

The proposed configuration of Rancho Drive and the interchanges also offers several transit opportunities. Express bus service for trips originating north of Ann Road can utilize the Rancho Drive Super Arterial to avoid the congestion at the two intersections, Santa Fe Station/Rainbow Boulevard and Lone Mountain Road. Local transit service can utilize the outside travel lane along the frontage road. If warranted, this lane can be reserved for transit use and serve as an acceleration/deceleration lane for traffic entering and existing adjacent land uses.

Figure 6-4: Rancho Drive Super Arterial Braided Ramps at U.S. 95-Ann Road Interchange

The estimated construction cost for Santa Fe Station/Rainbow Boulevard and Lone Mountain Road interchanges and associated improvements is $25.2 million.

South of Lone Mountain Road, the Rancho Drive Super Arterial extends south of Craig Road, merging with the one-way frontage roads, combining to form an eight-lane at-grade roadway. A right in and out intersection is proposed for Storm Street, and driveway access would be maintained for adjacent land uses. The outside travel lane is proposed to be reserved for transit use and serve as an acceleration/deceleration lane for traffic entering and existing adjacent land uses. At Craig Road, the four inside express lanes would elevate over the intersection, and travel on a new bridge over the intersection. Two-lane one-way frontage roads to provide local access as well as access to Craig Road are proposed. The estimated construction cost for the Craig Road interchange and associated improvements is $14.2 million.

South of Craig Road, the Rancho Drive Super Arterial extends south of Charleston Boulevard to the I-15 interchange. The proposed Super Arterial would begin just south of the Charleston Boulevard interchange with U.S. 95 and would continue south to the proposed I-15 interchange at I-15, and numerous improvements to the local street network in the vicinity of the interchange, including connecting Martin Luther King Boulevard with Industrial Road via a new bridge structure over I-15. Proposed improvements that improve connectivity to the Resort Corridor will be discussed in further detail later in this chapter.

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one-way frontage roads, combining to form an eight-lane at-grade roadway. A potential roadway cross section is illustrated in Figure 6-8. Driveway access to adjacent land uses would be maintained, with the outside travel lane proposed to be reserved for transit use and as an acceleration/deceleration lane for traffic entering and existing adjacent land uses. North of Jones Boulevard (north) and Alexander Road (north), the four inside express lanes would elevate over the intersection, and travel on a new bridge over the intersection. Because of the proximity to the Jones Boulevard (south) and Alexander Road (south) intersections, the two interchanges should be constructed concurrently.

Figure 6-5: Rancho Drive Super Arterial at Lone Mountain Road

Figure 6-6: Rancho Drive Super Arterial Braided Ramps at Santa Fe Station / Rainbow Boule-

Figure 6-7: Proposed Cross Section for an 8-Lane Rancho Drive Super Arterial Roadway on Fill

Figure 6-8: Proposed Midblock Cross Section for an 8-Lane Rancho Drive Super Arterial
illustrated in Figures 6-9 and 6-10. The Rancho Drive Super Arterial would remain elevated on fill between the two interchanges, and two-lane one-way frontage roads would be constructed at-grade on both sides of the Super Arterial and to provide local access as well as access to the interchanges at both legs of the Jones Boulevard and Alexander Road interchanges. The estimated construction cost for the Jones Boulevard/Alexander Road interchanges and associated improvements is $20.0 million.

South of Jones Boulevard/Alexander Road, the Rancho Drive four inside express lanes merge with the one-way frontage roads, combining to form an eight-lane at-grade roadway. A right in and out intersection is proposed for Duncan Road, and driveway access would be maintained for adjacent land uses. The outside travel lane is proposed to be reserved for transit use and serve as an acceleration/deceleration lane for traffic entering and exiting adjacent land uses. At Gowan Road, the four inside express lanes would elevate over the intersection, and travel on a new bridge over the intersection. Two-lane one-way frontage roads to provide local access as well as access to Gowan Road are proposed. The estimated construction cost for the Gowan Road interchange and associated improvements is $13.6 million.

South of Gowan Road, the Rancho Drive four inside express lanes merge with the one-way frontage roads, combining to form an eight-lane at-grade roadway. A right in and out intersection is proposed for North Michael Way, Jay Road, Ricky Road, and Donnie Avenue, and driveway access would be maintained for adjacent land uses. The outside travel lane is proposed to be reserved for transit use and as an acceleration/deceleration lane for traffic entering and existing adjacent land uses. At Cheyenne Avenue, the four inside express lanes would elevate over the intersection, and travel on a new bridge over the intersection. Two-lane one-way frontage roads to provide local access as well as access to Cheyenne Avenue Road are proposed. Figure 6-11 illustrates renderings of the proposed improvements at Cheyenne Avenue. The estimated construction cost for the Gowan Road interchange and associated improvements is $13.7 million.

South of Cheyenne Avenue, the North Las Vegas Airport is located east of Rancho Drive. Convenient access to the Airport from Rancho Drive is important to the Department of Aviation. The Airport is currently the second largest in Nevada, with over 230,000 operations annually. The Airport has recently upgraded the air traffic control tower equipment, and future plans include a new private hangar and the 77-acre East Side Development Project that includes a new taxi lane, paved access road, aircraft parking apron, lighting, signage, and utility stub outs for future development.

The orientation of the Airport runways impacts the adjacent section of Rancho Drive because of height limitations imposed by the Federal Aviation Administration. These restrictions limit the ability to construct any elevated sections of roadway at the Rancho Drive and Decatur Boulevard North intersection. To accommodate the Airport restrictions, Decatur Boulevard North is proposed to be depressed under at-grade Rancho Drive, illustrated in Figure 6-12. South of Decatur Boulevard North, the four Rancho Drive inside express lanes would elevate over the Decatur Boulevard South intersection, and travel on a new bridge over the intersection. An interchange at Decatur Boulevard South and Perimeter Road is proposed. Two-lane one-way frontage roads to provide local access as well as access to the Airport are proposed. The
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frontage roads would create an interchange with Decatur Boulevard South and Perimeter Road. The depressed Decatur Boulevard north lanes would merge with the frontage road lanes, Decatur Boulevard southbound traffic to access Rancho Drive, Decatur Boulevard South, or Perimeter Drive. The estimated construction cost for the Decatur Boulevard and Airport interchanges and associate improvements is $27.3 million.

South of the Rancho Drive and Decatur Boulevard/Perimeter Drive interchange, Rancho Drive will remain elevated on fill. A bridge structure is proposed at Airport Drive, illustrated in Figure 6-13, creating an interchange in order to maintain full access to the main Airport entrance. Because of the proximity to Smoke Ranch Road/Carey Avenue and Lake Mead Boulevard, Rancho Drive is proposed to remain elevated on fill, with bridge structures at Smoke Ranch Road/Carey Avenue and Lake Mead Boulevard to create interchanges at these locations, illustrated in Figure 6-14. A two-lane one-way frontage road type roadway would be constructed at-grade on both sides of the Super Arterial and would provide local access as well as access to the interchanges at the arterial cross streets. The outside travel lane is proposed to be reserved for transit use and serve as an acceleration/deceleration lane for traffic entering and existing adjacent land uses. The frontage roads would also maintain full access to Texas Station and the Fiesta gaming properties via the arterial cross streets, as well as other right in and out access to Rancho Drive.
Drive adjacent land uses. The estimated construction cost for the Lake Mead Boulevard and Smoke Ranch Road/Carey Avenue interchanges and associated improvements is $24.2 million.

South of Lake Mead Boulevard, the Rancho Drive four inside express lanes would merge with the one-way frontage roads, combining to form an eight-lane at-grade roadway. Right in and out intersections are proposed for Holly Lane, Happy Hollow Street, Primrose Path, Sunset Drive, and other minor intersections and driveways. The outside travel lane is proposed to be reserved for transit use and serve as an acceleration/deceleration lane for traffic entering and existing adjacent land uses. At Vegas Drive, the four inside express lanes would elevate over the intersection, and travel on a new bridge over the intersection. A two-lane one-way frontage road to provide local access as well as access to Vegas Drive is proposed.

South of Vegas Drive, the Rancho Drive right-of-way transitions to 100-feet wide, illustrated in Figure 6-15. Two options were identified to continue the Super Arterial south of Vegas Drive:

1. Begin a viaduct bridge structure just south of Vegas Drive; or
2. South of Vegas Drive, the Rancho Drive four inside express lanes would merge with the one-way frontage roads, combining to form an eight-lane at-grade roadway. The four inside express lanes would elevate over the intersection, and travel on the beginning of a viaduct bridge structure over the Washington Avenue intersection.

Option 1, beginning a viaduct at Vegas Drive has the advantage of eliminating the need for additional right-of-way between Vegas Drive and Washington Avenue. However, the viaduct structure would have significant visual and noise impacts to the existing residential land uses both east and west of Rancho Drive. The estimated construction cost for Option 1 is $55.4 million.

Option 2 would require the acquisition of a row of single family homes along either east or west of Rancho Drive. The extra right-of-way width is required to accommodate the eight-lane at-grade arterial between Vegas Drive and Washington Avenue. Option 2 also maintains access from the adjacent neighborhoods to the Super Arterial, while Option 1 would require residents south of Vegas Drive to travel north of Vegas Drive to access the Super Arterial. The estimated construction cost for Option 1 is $55.4 million and Option 2, including acquisition of the parcels along the west side of Rancho Drive between Vegas Drive and Washington Avenue is $36.7 million.

Several projects that are either in construction or under study have a significant impact on the Super Arterial and the Las Vegas Resort Corridor. Figure 6-16: Project NEON MLK-Industrial Road Bridge over I-15.

Arterial will allow commuters to travel quickly and efficiently from Ann Road to Washington Avenue, merging the increased volumes that can be carried on the Super Arterial with local traffic just north of the U.S. 95 south interchange will unacceptably degrade traffic operations at the U.S. 95 interchange and other adjacent roadways such as Washington Avenue and Bonanza Road.
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Figure 6-17: South of Washington Avenue-Option 1

Figure 6-18: South of Washington Avenue-Option 2

Figure 6-19: South of Washington Avenue-Option 3

impact on the ability of Rancho Drive Super Arterial traffic to access the Resort Corridor and other destinations in the south Las Vegas Valley. First, the on-going NDOT U.S. 95 Widening Program will reconstruct the south interchange of Rancho Drive and U.S. 95. This project has already constructed drainage and other ancillary improvements to Rancho Drive in the vicinity of U.S. 95. This project will also widen U.S. 95 from Rancho Drive to the Spaghetti Bowl as well as U.S. 95 west of Rancho Drive to Rainbow Boulevard and modifications to the U.S. 95 interchange at Martin Luther King Boulevard. NDOT is also studying improvements to I-15 and the I-15 and Charleston Boulevard interchange. This proposed project also includes construction of a major bridge structure over I-15 to connect Martin Luther King Boulevard and Industrial Road, illustrated in Figure 6-16. In addition to Martin Luther King Boulevard, Alta Drive will have convenient access to the new I-15 crossing. Additional significant projects include widening of Martin Luther King Boulevard south of U.S. 95 to six travel lanes and improvements to D and F Streets to enhance access to the City of Las Vegas 61-acre development site.

Participants in the Rancho Drive Corridor Study Design Workshop developed several options to continue access south of the Ranch Drive intersection with Bonanza Road and they are summarized below.

1. Option 1, illustrated in Figure 6-17, proposes construction of a new two-lane viaduct to carry northbound traffic beginning at I-15 south of Sahara Avenue and extending along Rancho Drive over U.S. 95 and connecting into the viaduct at either Washington Avenue or Vegas Drive. Southbound Rancho Drive traffic would travel along a viaduct along Bonaza Road, extending over U.S. 95, running parallel to the relocated Martin Luther King Boulevard and connecting into both the Martin Luther King/Industrial Road Connector and the new southbound I-15 that is proposed in Project NEON.

2. Option 2, illustrated in Figure 6-18, proposes construction of a new two-lane viaduct to carry southbound traffic beginning at either Washington Avenue or Vegas Drive, extending south over U.S. 95 along Rancho Drive, and connecting to I-15 south of Sahara Avenue. Northbound Ranch Drive traffic would utilize the collector-distributor road proposed in Project NEON to access a new, major bridge structure that would be the top level ramp in the Spaghetti Bowl. The viaduct would continue west, running parallel with U.S. 95 and would then connect to the viaduct in the vicinity of Bonanza Road.

3. Option 3, illustrated in Figure 6-19, proposes construction of a new four-lane viaduct to carry northbound traffic beginning at I-15 south of Sahara Avenue and extending along Rancho Drive, over U.S. 95 and connecting into the viaduct at either Washington Avenue or Vegas Drive. Southbound Rancho drive traffic would travel along a viaduct along Bonaza Road, extending over U.S. 95, running parallel to the relocated Martin Luther King Boulevard and connecting into both the Martin Luther King/Industrial Road Connector and the new southbound I-15 that is proposed in Project NEON.

Major reconstruction of the I-15 corridor would be required between Sahara Avenue and along the entire length of Rancho Drive south of either Washington Avenue or Bonanza Road. The viaduct would connect with I-15 south of Sahara Avenue, with left on- and off-ramp proposed for the median of I-15. Major reconstruction of the I-15 corridor would be required between Sahara Avenue...
To carry northbound traffic, Option 2 would utilize one of the ramps proposed in Project NEON, as well as construction of a new, major bridge structure that would travel over the existing Spaghetti Bowl and a viaduct running parallel with U.S. 95. The Rancho Drive northbound traffic would be mixed with the U.S. 95 northbound traffic on the I-15 collector-distributor road, potentially overloading this ramp. In addition, this option is very expensive because of the extensive new bridge structures and viaducts required, as well as right-of-way acquisition costs for parcels between U.S. 95 and Bonanza Road to accommodate the viaduct.

Bonanza Connector Project Description

Considering trade-offs between traffic congestion relief, likely construction cost, neighborhood disruption and visual aesthetics, the public agencies participating in this study concluded that Option 4 should be pursued further by this study. Option 4, the Bonanza Connector, has several benefits versus the other options as follows.

1. Provides direct access to the Martin Luther King/Industrial Road Connector. This allows Rancho Drive traffic direct access to the Resort Corridor.
2. Removes local traffic from I-15 and U.S. 95.
3. Requires minimal right-of-way takes because the Connector utilizes the Bonanza Road and Martin Luther King Road existing right-of-way. The only acquisition required is at the southwest corner of the Bonanza Road and Martin Luther King Boulevard intersection and along Martin Luther King Boulevard to accommodate the median columns for the viaduct.
4. Accommodates the potential extension of Regional Fixed Guideway service or other high-speed transit service to the Northwest Las Vegas Valley. Combined with the Bonanza-MLK Connector, this can be phased with the Rancho Drive Super Arterial as funding becomes available. This will be discussed further in Chapter 8 of this report.
5. Construction of the Bonanza-MLK Connector can be phased with the Rancho Drive Super Arterial as funding becomes available. This will be discussed further in Chapter 8 of this report.

Combined with the Rancho Drive Super Arterial, the Bonanza Connector provides convenient access to the Resort Corridor via Industrial Road. A similar viaduct in Bangkok, Thailand is illustrated in Figure 6-21. In addition to Industrial Road access to the Resort Corridor, the Super Arterial, combined with the existing local and arterial street network, provides access to the following:

1. Downtown Las Vegas via at-grade Bonanza Road, Alta Drive and U.S. 95.
2. Access to southbound I-15 to the South Resort Corridor, McCarran International Airport and other southerly destinations via Alta Drive (through Project NEON which accommodates eastbound Alta Drive to southbound I-15), U.S. 95 (through the U.S. 95 widening project which reconstructs the Rancho Drive and U.S. 95 interchange), Charleston Boulevard (through Project NEON which reconstructs the existing Charleston Boulevard interchange) and Sahara Avenue (through the recently reconstructed interchange with I-15).

As part of this study, the RTC has requested that NDOT consider the addition of an additional travel lane in each direction on the proposed Martin Luther King/Industrial Road bridge over I-15. The bridge is proposed to be a total of eight-lanes (four in each direction), with the center four lanes at the west end of the structure utilized for the Bonanza Connector. These additional lanes can also be utilized to accommodate a future extension of the Regional Fixed Guideway or other high-speed transit service to the Northwest Las Vegas Valley.

The estimated construction cost for the Bonanza Connector and associated improvements is $162.2 million. This cost includes the viaduct, right-of-way acquisition costs at the southwest corner of the Bonanza Road and Martin Luther King intersection and associated items. This estimate does not include additional Project NEON costs associated with adding an additional lane to the Martin Luther King/Industrial Road bridge over I-15 or right-of-way acquisition or roadway improvements along Martin Luther King to accommodate the viaduct columns in the Martin Luther King median.

Figures 6-20: South of Washington Avenue-Option 4

Figures 6-21: Arterial Street Viaduct in Bangkok, Thailand
To illustrate the traffic operations along the Martin Luther King/Industrial Road bridge over I-15, Bonanza Connector and the Rancho Drive Super Arterial, a VISSIM simulation was prepared and is included on the CD-ROM in Appendix B. VISSIM is a microscopic, behavior-based multi-purpose traffic simulation program. The traffic volumes used in the VISSIM simulation reflect 2030 PM peak hour volumes from the RTC 2004 Regional Travel Demand Model (Update Package 1). The first file on the CD-ROM, I-15 Flyover, depicts traffic from the touchdown of the Martin Luther King/Industrial Road bridge at New York Avenue, extending north over I-15 and extending westbound along the Bonanza Connector to Rancho Drive. The second file, Rancho Drive Super Arterial, depicts traffic from Coran Lane to Cheyenne Avenue.

Because of the cost associated with the full Bonanza Connector, an interim scenario was evaluated. In this scheme, the Rancho Drive Super Arterial would continue over the Rancho Drive and Bonanza Road intersection, and would drop back to at-grade Bonanza Road, merging with at-grade traffic. Bonanza Road is proposed to be widened to six-lanes to accommodate the additional Rancho Drive traffic anticipated to utilize Bonanza Road to access Downtown Las Vegas and the Martin Luther King/Industrial Road Connector bridge over I-15.

Summary of Proposed Improvements

Based on current and project Year 2030 travel demand, a Rancho Drive Super Arterial is proposed for Rancho Drive between Washington Avenue and Ann Road. The proposed Super Arterial includes construction of improvement to the Ann Road interchange at U.S. 95 to improve access to and from Rancho Drive and U.S. 95 and interchanges at the following arterial cross street locations:

• Rainbow Boulevard and Lone Mountain Road
• Craig Road
• Jones Boulevard North/Alexander Road North
• Jones Boulevard South/Alexander Road South
• Gowan Road
• Cheyenne Avenue
• Decatur Boulevard North
• Decatur Boulevard South/Perimeter Drive
• Airport Drive (main access to North Las Vegas Airport)
• Smoke Ranch Road/Carey Avenue

• Lake Mead Boulevard
• Vegas Drive
• Washington Avenue

South of Washington Avenue, a viaduct structure is proposed for Rancho Drive, flying over the Rancho Drive and Bonanza Road intersection. A phased implementation approach is proposed, with the first phase constructing an extension of the elevated Rancho Drive Super Arterial south of Washington Avenue, extending over the Rancho Drive and Bonanza Road intersection, and tying back into at-grade Bonanza Road. The second phase would construct a viaduct along Bonanza Road to the east, extending south over U.S. 95 and along Martin Luther King Boulevard, and tying into the Martin Luther King/Industrial Road Connector bridge over I-15 that is proposed in Project NEON.

A detailed implementation plan for the Rancho Drive Super Arterial and the Bonanza Connector is discussed in Chapter 8.
The recommended alternative includes widening Rancho Drive and constructing grade separations at major cross streets to accommodate Year 2030 forecast traffic volumes and relieve traffic congestion on U.S. 95. A detailed description of this alternative is provided in chapter 6, and conceptual design drawings are provided in the appendix of this report. This chapter identifies the costs and estimated benefits associated with implementing the recommended alternative. A potential construction phasing scenario is provided in Chapter 8, Implementation.

Cost Estimates

Cost estimates were developed for each individual element of the recommended alternative. These costs include the capital cost of construction, right-of-way acquisition, and project development/engineering expenses. The process and/or basis used to derive these costs are described below. Total Rancho Drive improvement costs, expressed in 2005 dollars, are reported in Table 7-1 as $348 million.

Construction Costs

Estimates of construction costs have been developed for improving the individual segments of Rancho Drive. Costs reported in Table 7-1 are in present-year 2005 dollars. Unit costs are based on the accepted bid prices for similar Las Vegas Valley area improvements. From these bids, per lane mile or square foot costs for various roadway and structure improvements were calculated. The basis for estimating quantities is the preliminary geometric plan drawings, which are reproduced in the appendix. Cost estimate worksheets are provided in the appendix for each project listed in Table 7-1. The estimated construction costs include an allowance of 25 percent for contingencies.

Right-of-Way Costs

Preliminary right-of-way requirements were determined by comparing Nevada Department of Transportation (NDOT) as-built plans with the footprint of the recommended alternative and tax parcel boundary information collected from the Clark County Tax Assessor’s office. All right-of-way requirements are therefore preliminary and are subject to change.

Right-of-way costs were computed from the preliminary right-of-way requirements based on the appraised value of the land parcel (minus improvements). In the case of partial land takes, a cost to acquire the entire parcel was assumed in lieu of establishing a contingency reserve. Right-of-way cost estimates are preliminary and are subject to change.

An allowance equal to seven percent (7%) of the preliminary right-of-way cost estimate was added for right-of-way appraisals, engineering, and public agency expense.

Engineering Costs

Engineering costs include the cost of professional services for preliminary engineering and environmental documents; final design plans, specifications and estimates; and construction surveys, administration and inspection. An allowance equal to 25 percent of the estimated construction cost was assumed, based on NDOT and industry experience for the recommended type of highway improvements.

Benefits Estimates

Rancho Drive plays an important role in carrying traffic both within the Northwest transportation corridor and to/from the Resort Corridor. Chapter 4 identified that depending on the investment considered for Rancho Drive, traffic volumes could be expected to shift from U.S. 95 and parallel arterial streets to Rancho Drive, thereby relieving congestion on a system wide basis. Because the performance of Ranch Drive has system wide impacts, its benefits were calculated using a system wide analysis tool STEAM 2.0.

The Federal Highway Administration (FHWA) introduced the first version of the Surface Transportation Efficiency Analysis Module (STEAM) in 1997. STEAM was the first FHWA impact analysis product to use input directly from the four-step travel demand modeling process for detailed, system wide analysis of alternative transportation investments. STEAM 2.0 was released in 2000 to expand the scope of the program to address environmental justice measures.

“Like STEAM, STEAM 2.0 is based on the principles of economic analysis, and allows development of monetized impact estimates for a wide range of transportation and investments and policies, including major capital projects, pricing and travel demand management (TDM). Impact measures are monetized to the extent feasible, but quantitative estimates of natural resources usage (i.e., energy consumption) and environmental impacts (i.e., emissions) are also provided. Net monetary benefits (or costs) of alternatives can then be used to evaluate trade-offs against non-monetizable benefits, including sustainability and community livability.”

An important feature of STEAM 2.0 is that the software program post processes the traffic assignment volumes generated from conventional four-step travel forecasting models. The purpose of this feature is to compute benefits based on more accurate highway travel speeds, and to provide FHWA with a more consistent basis of comparison between urban areas.

Table 7-1 Capital Cost for Recommended Alternative (2005 Dollars)

<table>
<thead>
<tr>
<th>Location/Segment</th>
<th>Construction</th>
<th>Engineering/CM</th>
<th>Right-of-Way</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ann Road</td>
<td>18,535,131</td>
<td>4,633,783</td>
<td>2,080,080</td>
<td>$11,167,062</td>
</tr>
<tr>
<td>Rainbow/Lone Mountain</td>
<td>10,077,625</td>
<td>2,516,406</td>
<td>1,617,840</td>
<td>14,214,871</td>
</tr>
<tr>
<td>Craig</td>
<td>10,077,625</td>
<td>2,516,406</td>
<td>1,617,840</td>
<td>14,214,871</td>
</tr>
<tr>
<td>Jones/Alexander</td>
<td>12,327,885</td>
<td>3,062,972</td>
<td>1,964,520</td>
<td>19,254,377</td>
</tr>
<tr>
<td>Gowan Road</td>
<td>9,727,688</td>
<td>2,431,922</td>
<td>1,444,500</td>
<td>13,604,109</td>
</tr>
<tr>
<td>Cheyenne</td>
<td>9,923,344</td>
<td>2,480,836</td>
<td>1,300,050</td>
<td>13,704,230</td>
</tr>
<tr>
<td>Decatur/North Las Vegas</td>
<td>19,500,983</td>
<td>4,887,746</td>
<td>2,836,035</td>
<td>27,224,764</td>
</tr>
<tr>
<td>Lake Mead/Smoke Ranch-Carey</td>
<td>17,876,009</td>
<td>4,469,002</td>
<td>1,877,850</td>
<td>24,222,862</td>
</tr>
<tr>
<td>Vegas/Washington</td>
<td>23,958,849</td>
<td>5,989,712</td>
<td>6,731,370</td>
<td>36,679,931</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$133,011,166</strong></td>
<td><strong>$33,252,792</strong></td>
<td><strong>$19,852,245</strong></td>
<td><strong>$186,116,203</strong></td>
</tr>
</tbody>
</table>
STEAM 2.0 is highly flexible in terms of transportation modes, trip purposes, and time periods analyzed. The software supplies default analysis parameters but allows users to modify these parameters based on local conditions. Assumptions and rates used, specific to Las Vegas Valley, are described following the discussion of test case scenarios.

### Test Case Scenarios

Parsons computed benefits using the STEAM 2.0 software using two scenarios. With Scenario 1, link level free flow travel speeds from the RTC 2004 Regional Travel Demand Model were input STEAM 2.0 along with daily trip tables and highway networks. The STEAM 2.0 software then distributed daily vehicle trips using its own diurnal factors, and assigned trips to the network using its own speed to capacity functions, based on traffic volume and speed data collected nationwide.

The STEAM 2.0 speed models account for delays due to incidents, using data on the frequency, severity, and duration of incidents. Incidents account for a large share of total travel delays due to congestion, especially on freeways. The models also account for peak spreading that occurs when facilities become more congested. The traffic temporal distributions used in developing the models were based on data collected from 579 urban automatic traffic recorders across the nation. Separate temporal distributions were developed for freeways and arterials with low, moderate, and high ratios of average daily traffic to capacity. The models further account for day-to-day variations in traffic. The relationship between delays due to congestion and traffic volumes are highly non-linear in nature, especially when the ratio of demand volume to capacity is close to 1.0. Lastly, the STEAM 2.0 speed models account for the decrease in highway capacity that occurs after demand volumes exceed capacity. The 1994 Highway Capacity Manual notes that observations of freeway queue departure rates range from 1,500 to 2,000 passenger cars per hour per lane. In contrast, freeway capacities for 12-foot lanes with no lateral obstructions are 2,200 to 2,300 passenger cars per hour per lane. Not accounting for the fact that queue departure rates are generally lower than freeway capacities can result in a large understatement of the delays due to queuing.²

As a point of comparison, the STEAM 2.0 software was also used to compute benefits assuming RTC 2004 Travel Demand Model generated link speeds and traffic assignment volumes. Due to limitations of the STEAM 2.0 software, only average daily link speeds could be utilized for this test case which was labeled Scenario 2. Based on a comparison of output results, STEAM 2.0 speed models assign more vehicle trips to arterial streets and less trips to freeways and expressways compared to the RTC 2004 model. For this reason, overall vehicle hours of travel are greater in scenario 1 versus scenario 2, and time related savings resulting from improvements to freeways and expressways are less. Conversely, as more traffic is assigned to arterials and less to freeways, benefits associated with crash (accident) losses are greater.

The sections which follow report monetary benefits associated with implementing the recommended Rancho Drive Corridor improvements for both test case scenarios.

### Travel Time Savings

Vehicle hours of travel were computed for each link in the highway system. Highway link travel speeds and volumes were output directly from the RTC 2004 Regional Travel Demand Model (Update Package 1) TransCAD 4.7 software to STEAM 2.0 using a custom design interface. This program interface is now publicly available for use with any RTC 2004 Model/STEAM 2.0 application.

Consistent with U.S. Department of Transportation guidance for the valuation of travel time in economic analysis, Parsons assumed local personal travel to be valued at 50 percent of the local median wage rate. Business travel by truck and bus drivers was valued at 100 percent of the mean wage for these occupations plus fringe benefits. Clark County’s mean wage for all occupations was reported by the Nevada Department of Employment, Training and Rehabilitation to be $17.10/hour for 2004, hence a value of time equal to $8.55/hour was used for local personal travel. The state reported that transportation and public utility workers residing in Clark County earned $18.55 per hour on average in 2004. A fringe benefit rate of 50 percent of the mean wage was assumed by Parsons for bus and truck drivers, based on an equal mix of employees covered by Teamsters (55.5 percent) and other (44.5 percent) labor agreements. The corresponding value of time for these business travelers was thus estimated to be $27.83/hour.

Computation of benefits also took vehicle occupancy into account for local personnel travel. The following average daily vehicle occupancies were derived from RTC’s 1996 Household Survey: 1.06 for home-based work trips, 1.70 for home-based other trips, 1.23 for home-based school trips, 1.54 for non-home-based trips, 1.43 for home-based shop trips, and 1.54 for visitor trips of all purposes. Taking these vehicle occupancy rates into account, the average daily vehicle occupancy for all trip purposes in the Las Vegas Valley portion of Clark County is estimated to be 1.45 persons per vehicle. While this average occupancy may be lower or higher during peak periods, the average rate was assumed for the benefits calculation for lack of better data.

The estimated benefits associated with travel time savings were calculated by the STEAM 2.0 software assuming two speed scenarios for the 2030 forecast year:

- STEAM 2.0 post processed speeds (test Scenario 1)
- RTC 2004 Model link speeds (test Scenario 2)

Overall, the recommended alternative provides $88 million (Scenario 1) to $105 million (Scenario 2) of travel time savings annually, assuming current year dollars and Year 2030 traffic volumes. Assuming a linear year-to-year increase in traffic volumes and the delivery of capacity enhancements as needed, the recommended alternative would produce $981 million (Scenario 1) to $1.16 billion (Scenario 2) of travel time savings over a 20-year improvement time period.

### Crash Benefits

The frequency of accident occurrence is typically lower on freeways and expressways compared with other types of regional roads and city streets. To compute benefits associated with the recommended alternative versus the baseline alternative, the number of vehicle miles traveled over the highway system was computed for each alternative, using the 2004 RTC Model and STEAM 2.0.

Rates of crash occurrences resulting in fatalities, personal injuries, and property damage only were obtained from NDOT for Year 2002. Statewide rates listed for urban roadways were used in the calculation of benefits. These rates are listed in Table 7–2.

The values of loss associated with accidents were obtained from the National Safety Council and a 1991 Urban Institute/Federal Highway Administration (FHWA) Study. Periodically, the National Safety Council makes estimates of the average cost of fatal and non-fatal injuries due to motor vehicle crashes. These estimates are made using a comprehensive, or willingness to pay method. These costs include economic costs such as wage and productivity losses, medical expenses, motor vehicle damage, etc.; and a value reflecting lost quality of life.

²Ibid.
In 2001, the National Safety Council estimated the following average comprehensive costs on a per injured person basis:

- Death: $3,340,000
- Incapacitating Injury: $165,000
- Non-incapacitating Evident Injury: $42,500
- Possible Injury: $20,200

These per injured person costs were converted to per vehicle crash costs using formulas published in FHWA Technical Advisory T 7570 (June 30, 1988). The resulting costs per vehicle crash were computed to be the following, expressed in Year 2004 dollars:

- Fatal Accident: $4,058,527
- Injury Accident: $91,467

Property Damage Only (PDO) accident costs were computed using a cost value obtained from the California Life-Cycle Benefit/Cost Analysis Model. This model uses a value for PDO accidents estimated by the 1991 Urban Institute/FHWA Study. The Urban Institute/FHWA calculated its estimate taking two primary factors into account:

- Unreported accidents—Automobile accident surveys indicate that roughly 40 percent to 50 percent of all PDO accidents go unreported.
- Combined property value—PDO accidents frequently involve more than one vehicle.

The value of an average non-fatal, non-injury accident was calculated primarily using records of vehicle and property damage payments made by insurance companies. Some additional cost categories, such as travel delay and lost wages, were included to make minor contributions to the final estimate.

Table 7-2

<table>
<thead>
<tr>
<th>Functional Classification</th>
<th>P.O.D. Crash Rate</th>
<th>Injury Crash Rate</th>
<th>Fatal Crash Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interstate urban</td>
<td>220.34</td>
<td>85.51</td>
<td>0.66</td>
</tr>
<tr>
<td>Other Urban Freeways &amp; Expressways</td>
<td>159.61</td>
<td>63.00</td>
<td>0.62</td>
</tr>
<tr>
<td>Urban Principal Arterials</td>
<td>420.15</td>
<td>224.73</td>
<td>2.18</td>
</tr>
<tr>
<td>Urban Minor Arterials</td>
<td>354.48</td>
<td>200.83</td>
<td>2.27</td>
</tr>
<tr>
<td>Urban Collector Streets</td>
<td>228.71</td>
<td>123.64</td>
<td>1.16</td>
</tr>
<tr>
<td>Urban Local Streets</td>
<td>261.85</td>
<td>93.37</td>
<td>0.83</td>
</tr>
</tbody>
</table>

* Crash rates per $100 million vehicle miles. Source: Nevada Department of Transportation

After adjusting the Urban Institute/FHWA estimate to Year 2004 using the gross domestic product deflator, a value of $7,588 per reported PDO accident was derived.

Taking inflation into account, these estimates of accident costs compare favorably with values used in four computerized benefit-cost models, as reported in Table 7-3.

STEAM 2.0 calculates separate internal and external accident costs. Internal accident costs are defined as costs inflicted upon and perceived by transportation facility users. External costs are defined as costs inflicted on users, but not perceived by users. Table 7-4 identifies the breakdown of these accident cost assumptions.

Overall, the recommended alternative provides $27 million (Scenario 2) to $146 million (Scenario 1) of accident cost savings annually, assuming current year dollars and Year 2030 traffic volumes.

Table 7-3

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury</td>
<td>$78,903</td>
<td>$83,848</td>
<td>$59,718</td>
<td>$86,033</td>
<td>$91,467</td>
</tr>
<tr>
<td>Fatal</td>
<td>$3,325,095</td>
<td>$3,521,359</td>
<td>$2,726,350</td>
<td>$3,613,137</td>
<td>$4,058,527</td>
</tr>
<tr>
<td>PDO</td>
<td>$5,651</td>
<td>$5,806</td>
<td>$3,322</td>
<td>$5,957</td>
<td>$7,588</td>
</tr>
</tbody>
</table>

* FHWA, Surface Transportation Efficiency Analysis Model, 1997. Total of internal and external costs.
* Comparison to StratusBENCOST which estimates the reduction in accident costs as the change in highway accidents between the base and alternative (rail) case. StratusBENCOST values inflated by 2.6 percent for all accident types.
* Parsons, based on California Life-Cycle Benefit/Cost Analysis Model, Technical Supplement to User’s Guide.

The health cost of hydrocarbon emissions was taken from a second source that also valued NOx. These values were indexed to the Cal B/C values to estimate the per ton cost of hydrocarbons.

Table 7-4

<table>
<thead>
<tr>
<th>Accident Type</th>
<th>Internal Cost</th>
<th>External Cost</th>
<th>Total Cost (2004)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatal</td>
<td>$3,649,748</td>
<td>$608,779</td>
<td>$4,058,527</td>
</tr>
<tr>
<td>Injury</td>
<td>$377,747</td>
<td>$13,720</td>
<td>$391,467</td>
</tr>
<tr>
<td>PDO</td>
<td>$6,450</td>
<td>$1,138</td>
<td>$7,588</td>
</tr>
</tbody>
</table>

As assumed linear, year-to-year increase in traffic volumes, and the delivery of capacity enhancements when needed to address traffic demands, the recommended alternative would produce $304 million (Scenario 2) to 1.62 billion (Scenario 1) of crash benefits over a 20-year Rancho Drive improvement timeframe.

Motor Vehicle Emissions and Costs

Motor vehicle emissions were calculated for the emissions listed in Table 7-5. Rates of motor vehicle emissions were obtained from the California Life-Cycle Benefit/Cost Analysis Model for CO, NOx, and PM10 assuming a vehicle model year of 2020—the midpoint of the benefit/cost comparison. The source of these emission rates is the California Air Resources Board EMFAC7 model. STEAM 2.0's default values for hydrocarbon (HC) emissions were also used in the analysis. These rates assume a 2010 vehicle model year and are based on EPA's Mobil 5a model results.

Table 7-5

<table>
<thead>
<tr>
<th>Emission</th>
<th>Description</th>
<th>Source</th>
<th>Harmful Effects</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon monoxide (CO)</td>
<td>A toxic gas that under-mines blood’s ability to carry oxygen</td>
<td>Engine</td>
<td>Human health, climate change</td>
<td>Very local</td>
</tr>
<tr>
<td>Fine particulates (PM&lt;sub&gt;2.5&lt;/sub&gt;)</td>
<td>Inhaliable paricles consisting of bits of fuel and carbon</td>
<td>Diesel engines and other sources</td>
<td>Human health, aesthetics</td>
<td>Local and regional</td>
</tr>
<tr>
<td>Nitrogen oxides (NOx)</td>
<td>Various compounds; some are toxic, all contribute to ozone</td>
<td>Engine</td>
<td>Human health, ozone precursor</td>
<td>Regional</td>
</tr>
<tr>
<td>Hydrocarbons (HC)</td>
<td>Unburned fuel; forms carbon</td>
<td>Fuel production and engines</td>
<td>Human health, ozone precursor</td>
<td>Regional</td>
</tr>
</tbody>
</table>

2.0 separates fuel costs into tax and non-tax components, using the tax portion gallon, based on prices prevailing in Southern Nevada in mid-2004. STEAM

The price-per-gallon of regular grade gasoline was assumed to be $2.09 per gallon, based on prices prevailing in Southern Nevada in mid-2004. STEAM 2.0 separates fuel costs into tax and non-tax components, using the tax portion gallon. Truck fuel costs were assumed to be $1.51 per gallon for the non-tax portion and $0.61 for the tax component.

Non-fuel costs for vehicle maintenance and tire expense were assumed to be $0.041 per-mile for automobiles and $0.121 for trucks. The STEAM 2.0 model does not include mileage-based depreciation.

The resulting vehicle operating cost benefits of the Rancho Drive Corridor Improvements, computed for year 2030 traffic volumes, are estimated to be $16 million annually under both test scenarios. Revenue transfers, fuel taxes not collected as a result of these benefits, amount to $4 million annually in Scenario 2 due to higher NOx emissions which decline and then increase as speeds exceed 35 miles per hour.

**Vehicle Operating Costs**

Vehicle operating costs were calculated for the base case and recommended alternatives using estimates of VMT produced by the RTC 2004 Regional Travel Demand Model and STEAM 2.0.

Default values for the fuel consumption rates used in STEAM come from the ITE “Transportation Planning Handbook,” 1992. However, these rates were derived from a study published by Caltrans in 1983. Non-fuel VOC are taken from a USDOT publication, “Characteristics of Urban Transportation Supply,” 1992, and are converted to 1997 dollars. These costs originated in the American Automobile Association (AAA) publication, Your Driving Costs. For the Rancho Drive Corridor Study, fuel consumption was based on estimates of average fuel consumption for the year 2000, obtained from the California Air Resources Board’s Motor Vehicle Emission Inventory models. These rates, used in the California Life-Cycle Benefit/Cost Analysis Model, are reported in Table 7-7.

For the Rancho Drive Corridor Study, fuel consumption was based on estimates of average fuel consumption for the year 2000, obtained from the California Air Resources Board’s Motor Vehicle Emission Inventory models. These rates, used in the California Life-Cycle Benefit/Cost Analysis Model, are reported in Table 7-7.

The resulting vehicle operating cost benefits of the Rancho Drive Corridor Improvements, computed for year 2030 traffic volumes, are estimated to be $16 million annually under both test scenarios. Revenue transfers, fuel taxes not collected as a result of these benefits, amount to $4 million annually in 2030.

**SUMMARY OF BENEFITS**

The recommended alternative will produce net savings in travel time, motor vehicle emissions, crashes, and vehicle operating expense. Collectively, these will amount to $154 million (Scenario 2) to $247 million (Scenario 1), annually based on Year 2030 traffic volumes. These findings are summarized in Table 7-8, sorted by benefit type and test scenario.

### Table 7-6

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon monoxide CO</td>
<td>$127</td>
<td></td>
</tr>
<tr>
<td>Fine particulates PM 2.5</td>
<td>$422,985</td>
<td></td>
</tr>
<tr>
<td>Nitrogen oxides NOX</td>
<td>$51,635</td>
<td></td>
</tr>
<tr>
<td>Hydrocarbons HC</td>
<td>$7,407</td>
<td></td>
</tr>
</tbody>
</table>

### Table 7-7

<table>
<thead>
<tr>
<th>Speed (miles/hour)</th>
<th>Fuel Consumption Rates (gallons/mile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>0.182 (Auto) 0.310 (Truck)</td>
</tr>
<tr>
<td>10</td>
<td>0.123 (Auto) 0.181 (Truck)</td>
</tr>
<tr>
<td>15</td>
<td>0.089 (Auto) 0.135 (Truck)</td>
</tr>
<tr>
<td>20</td>
<td>0.068 (Auto) 0.118 (Truck)</td>
</tr>
<tr>
<td>25</td>
<td>0.054 (Auto) 0.120 (Truck)</td>
</tr>
<tr>
<td>30</td>
<td>0.044 (Auto) 0.133 (Truck)</td>
</tr>
<tr>
<td>35</td>
<td>0.037 (Auto) 0.156 (Truck)</td>
</tr>
<tr>
<td>40</td>
<td>0.034 (Auto) 0.185 (Truck)</td>
</tr>
<tr>
<td>45</td>
<td>0.033 (Auto) 0.223 (Truck)</td>
</tr>
<tr>
<td>50</td>
<td>0.033 (Auto) 0.264 (Truck)</td>
</tr>
<tr>
<td>55</td>
<td>0.034 (Auto) 0.316 (Truck)</td>
</tr>
<tr>
<td>60</td>
<td>0.037 (Auto) 0.374 (Truck)</td>
</tr>
<tr>
<td>65</td>
<td>0.043 (Auto) 0.439 (Truck)</td>
</tr>
<tr>
<td>70</td>
<td>0.052 (Auto) 0.511 (Truck)</td>
</tr>
</tbody>
</table>

Source: Cal-B/C, California Air Resources Board

### Table 7-8

<table>
<thead>
<tr>
<th>Benefit Type</th>
<th>STEAM Speeds (Scenario 1)</th>
<th>RTC Model Speeds (Scenario 2)</th>
</tr>
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<tbody>
<tr>
<td>User Benefits</td>
<td></td>
<td></td>
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<tr>
<td>• In-vehicle travel time</td>
<td>$88,784,400</td>
<td>$105,033,800</td>
</tr>
<tr>
<td>• Fuel costs</td>
<td>$15,892,800</td>
<td>$16,137,400</td>
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<tr>
<td>• Non-fuel operating costs</td>
<td>$789,800</td>
<td>$5,274,000</td>
</tr>
<tr>
<td>• Internal accident Costs</td>
<td>$132,029,700</td>
<td>$25,507,600</td>
</tr>
<tr>
<td>Revenue Transfers</td>
<td>($4,247,300)</td>
<td>($4,525,700)</td>
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<td>Reduction in External Costs</td>
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<tr>
<td>• Emissions</td>
<td>$895,900</td>
<td>($619,900)</td>
</tr>
<tr>
<td>• Global warming</td>
<td>$282,400</td>
<td>$300,900</td>
</tr>
<tr>
<td>• Noise</td>
<td>($38,900)</td>
<td>$78,400</td>
</tr>
<tr>
<td>• Accident</td>
<td>$14,656,600</td>
<td>$2,024,100</td>
</tr>
<tr>
<td>• Other mileage based</td>
<td>($2,370,800)</td>
<td>$4,781,700</td>
</tr>
<tr>
<td>Total Benefits</td>
<td>$246,763,800</td>
<td>$153,992,300</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost Assumptions</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2006–2011</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Viaduct from Washington to MLK/Industrial Connector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Washington Grade Separation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 2012–2017</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade separations at:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Lake Mead/Simode Ranch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Decatur/North Las Vegas Airport</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Cheyenne</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Ann Road/U.S. 95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 2021–2026</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade separations at:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Gowen Road</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Jones/Alexander</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Craig</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Rainbow/Lone Mountain</td>
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</tbody>
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### Analysis Results

<table>
<thead>
<tr>
<th>Life Cycle Benefits/Total costs Ratio (excludes Transit + O&amp;M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1: $2.727M/348M = 7.83</td>
</tr>
<tr>
<td>Scenario 2: $1.702M/348M = 4.89</td>
</tr>
<tr>
<td>Net Present value of benefits/Costs at 6% Discount Rate (excludes Transit + O&amp;M)</td>
</tr>
<tr>
<td>Scenario 1: $969M/$232M = 4.13</td>
</tr>
<tr>
<td>Scenario 2: $659M/$232M = 2.58</td>
</tr>
<tr>
<td>Payback Period at 6% Discount Rate</td>
</tr>
<tr>
<td>Scenario 1: 13 years</td>
</tr>
<tr>
<td>Scenario 2: 15 years</td>
</tr>
</tbody>
</table>

Source: Parsons

### Table 7-9

<table>
<thead>
<tr>
<th>Cost Type</th>
<th>Benefit Type</th>
<th>STEAM Speeds (Scenario 1)</th>
<th>RTC Model Speeds (Scenario 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Benefits</td>
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</tr>
<tr>
<td>• In-vehicle travel time</td>
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<td></td>
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<tr>
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<td>($4,525,700)</td>
<td></td>
</tr>
<tr>
<td>Non-fuel costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>($619,900)</td>
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<tr>
<td>• Global warming</td>
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<td></td>
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<td>• Other mileage based</td>
<td>($2,370,800)</td>
<td>$4,781,700</td>
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<tr>
<td>Total Benefits</td>
<td>$246,763,800</td>
<td>$153,992,300</td>
<td></td>
</tr>
</tbody>
</table>
The recommended improvements are assumed to be implemented over time so that NDOT’s standard for primary arterial operational performance may be maintained at level of service D or better. Benefits will likewise accrue over time as traffic demand volumes increase from present day levels to those forecast for Year 2030. A measurement of life-cycle benefits, assuming a straight-line projection of traffic growth, is reported in Tables 7-9 and 7-10. These tables assume that Rancho Drive Corridor improvements will be implemented in three phases. Components included within each phase are listed in Table 7-8.

**Benefit/Cost Comparisons**

A comparison of life-cycle benefits with costs is reported in Table 7-8. This table lists benefits and costs for the two test scenarios. Total benefits and costs, and the net present values of the overall system improvements assume a discount rate of 7 percent.

These findings indicate the following:

1. Under Test Scenario 1 total benefits ($2,727,389,244) exceed total costs ($348,334,047) by $2,379,055,197 (Year 2005 dollars). This B/C ratio is 7.83. Under Test Scenario 2, total benefits would exceed costs by $1.35 billion, yielding a B/C ratio of 4.89.

2. The net present value of these benefits, assuming a discount rate of 7 percent, is $957,893,593 under test scenario 1. The net present value of implementation costs, excluding maintenance and repair, is $231,786,580. This B/C ratio is 4.13. Under Test Scenario 2, the net present value of benefits is $587,771,639 and the B/C ratio is 2.58.

3. The payback period, at a discount rate of seven percent, is 13 to 15 years.

### Table 7-9

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Benefits</th>
<th>Total Costs</th>
<th>Net Present Value</th>
<th>Net Present Value Benefits</th>
<th>Net Present Value Costs</th>
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</thead>
<tbody>
<tr>
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<tr>
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<tr>
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<td>93,095</td>
<td>8,999,935</td>
<td>8,999,935</td>
<td>93,095</td>
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<tr>
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<td>840</td>
<td>47,294,491</td>
<td>47,294,491</td>
<td>840</td>
</tr>
<tr>
<td>2010</td>
<td>56,328,502</td>
<td>792</td>
<td>44,617,445</td>
<td>44,617,445</td>
<td>792</td>
</tr>
<tr>
<td>2011</td>
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<td>747</td>
<td>42,091,829</td>
<td>42,091,829</td>
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<tr>
<td>2012</td>
<td>12,987,568</td>
<td>705</td>
<td>9,155,722</td>
<td>9,155,722</td>
<td>705</td>
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<tr>
<td>2013</td>
<td>25,975,136</td>
<td>660</td>
<td>17,274,948</td>
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<td>660</td>
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<td>2014</td>
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<td>2015</td>
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<td>592</td>
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<tr>
<td>2016</td>
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<td>558</td>
<td>38,260,952</td>
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<td>558</td>
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<td>2017</td>
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<td>527</td>
<td>41,960,130</td>
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<td>2018</td>
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<td>497</td>
<td>45,180,967</td>
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</tr>
<tr>
<td>2019</td>
<td>103,900,540</td>
<td>469</td>
<td>48,712,625</td>
<td>48,712,625</td>
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</tr>
<tr>
<td>2020</td>
<td>116,888,110</td>
<td>442</td>
<td>51,699,727</td>
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</table>

### Table 7-10

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Benefits</th>
<th>Total Costs</th>
<th>Net Present Value</th>
<th>Net Present Value Benefits</th>
<th>Net Present Value Costs</th>
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<tbody>
<tr>
<td>2006</td>
<td>9,999,035</td>
<td>1,000</td>
<td>9,999,035</td>
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<tr>
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<td>9,999,035</td>
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<td>442</td>
<td>51,699,727</td>
<td>51,699,727</td>
<td>442</td>
</tr>
</tbody>
</table>

Source: Parsons
Rancho Drive Corridor Study

Rancho Drive Super Arterial Implementation Plan

The recommended alternative includes widening Rancho Drive and constructing grade separations at major cross streets to accommodate a year 2030 forecast traffic volumes and relieve traffic congestion on U.S. 95. A detailed description of this alternative is provided in chapter 6, and conceptual design drawings are provided in the appendix of this report. This chapter identifies an implementation plan for the recommended alternative. A potential construction phasing scenario is provided in Chapter 8, Implementation.

Study Findings

Rancho Drive is an important element in the overall transportation plan for the Las Vegas Valley. As an alternative to U.S. 95, Rancho Drive currently provides a relatively high level of service for commuter traffic. However, this high level of mobility and ease of access to adjacent parcels may not be maintained over time as population, and corresponding traffic volumes, increase. This is particularly true as development continues in the rapidly growing Northwest Las Vegas Valley.

Congestion is not the only performance threat facing Rancho Drive. The corridor is also at high risk for traffic signal, intersecting street, and driveway proliferation. At the same time traffic is increasing along Rancho Drive, intersecting arterial and local streets are demanding an increase in green time to accommodate higher east-west traffic volumes. A high number of signals currently exist along corridor. The total number of signalized intersection is anticipated to increase as traffic volumes increase along intersecting east-west streets and corridor development intensifies. Although these signals provide important traffic safety and overall traffic network benefits, they have a serious negative impacts to the mobility of Rancho Drive traffic. Traffic signal, side street and driveway proliferation has already occurred on the southerly end of the corridor, with corresponding degradation of traffic operations experience along Rancho Drive.

Rancho Drive Corridor Vision

The ultimate vision for Rancho Drive is to develop a super arterial which will allow Rancho Drive to function as a high-speed commuter route. Commuters would be able to travel to and from the Resort Corridor and the Northwest Las Vegas Valley without encountering traffic signals along the entire length of Rancho Drive. In addition, access to Rancho Drive itself would be enhanced through construction of improvements to Martin Luther King and Bonanza Road to the south and direct access to U.S. 95 to the north.

The Rancho Drive Super Arterial will also maintain local access to adjacent parcels. As a significant commercial corridor for the cities of Las Vegas and North Las Vegas, access to adjacent parcels is important to maintain and enhance the economic viability of the corridor. In addition, the Rancho Drive Super Arterial provides for enhanced transit opportunities by accommodating the potential expansion of the RTC’s Regional Fixed Guideway system.

The success of the Rancho Drive Corridor Study and other proposed improvements will be evaluated based on the ability of Rancho Drive to serve commuters, to provide local access, to enhance transit, and to generally improve the quality of life of local residents. The measure for this success will be the ability to minimize congestion along the corridor by providing commuters a time competitive route, to provide access to adjacent businesses, and to enhance the urban landscape through enhanced landscaping and urban design.

Achieving these goals and implementing an improvement plan will be an on-going responsibility for all of the Rancho Drive Corridor partners. Implementation of the plan will rely on coordinating agency and private sector activities ranging from local planning efforts to statewide transportation investment priorities.

Short Range Plan Recommendations

Prior to this Study, NDOT and the City of Las Vegas has been implementing improvements to the corridor, including the following:

- Slurry seal and restriping of Rancho Drive to three travel lanes in each direction north of Bonanza Road.
- Reconstruction of the Rancho Drive and southerly U.S. 95 interchange as part of the U.S. 95 Widening Program.
- Improvements to the Rancho Drive and Sahara Avenue intersection.
- Improvements to Ranch Drive between Charleston Boulevard and the southerly U.S. 95 interchange.

The purpose of the Rancho Drive Corridor Study was to identify a comprehensive program to improve the entire Corridor. As such, this Study did not specifically identify short-term improvements. However, the following short range projects should be considered to improve traffic operations at specific locations where marginal safety and traffic operations improvements can be obtained. These changes can be grouped into four categories: traffic operations, geometric improvements, intelligent transportation systems (ITS) solutions, and travel demand measures (TDMs).

- Traffic Operations. These measure focus on reducing the number of turning movement conflicts and increasing traffic flow along Rancho Drive. Specifically, these changes include (1) increasing green time for specific phase; (2) eliminating traffic signals at minor intersections
- Geometric Improvements. This category of short-range improvements includes the construction of new or additional turn lanes at intersections, widening Rancho Drive to accommodate new thru lanes and consolidation of driveways/business access. Some of these improvements may be able to be constructed in right-of-way that is acquired for future construction of the Rancho Drive Super Arterial.
- Intelligent Transportation Systems (ITS). Short-range ITS strategies can be implemented along Rancho Drive to improve safety and reduce congestion. A more extensive ITS infrastructure can be achieved with a fiber optic backbone installed along the entire corridor. While this installation is more applicable to the long-range vision, there are short-term ITS improvements that could be marginally effective in improving safety and traffic flow on Rancho Drive.
- Installation of variable message (VMS) signs to communicate real-time traffic and road conditions. This information would facilitate use of an alternate route during periods of extreme congestion or incidents.
- Roving service patrol to minimize traffic operations disruptions caused by disabled vehicles, traffic collisions and other incidents.
- Transportation Demand Measures (TDMs). The FHWA defines TDMs as “a wide range of actions that are geared toward improving the efficiency of travel demand...and are designed to maximize the people-moving capability of the transportation system by increasing the number of person in a vehicle, or by influencing the time of, or need to, travel.” TDMs developed as a result of the inability of communities to build sufficient roadway capacity to accommodate continuous growth in traffic volumes. Traditional TDM measures include enhancing the transit system operations, developing ridesharing programs, mandating preferential parking for van-and car-pools, encouraging development of pedestrian and bicycle facilities and encouraging a shift in traditional work schedules. These measures should be incorporated into an overall TDM program for the Las Vegas Valley, and as such, will result in benefits to the Rancho Drive, as well as many other...
Long Range Plan Recommendations

The piecemeal approach of a short-term solution to operational problems experienced in the Rancho Drive Corridor will not solve the long-term issues associated with the inevitable increase in travel demand caused by development in the Northwest Las Vegas Valley. The Rancho Drive Super Arterial proposed in this Study is intended to accommodate this growth by increasing the capacity in the Rancho Drive Corridor, thus providing a timely competitive as well as an alternative route to the congested freeway corridors.

Because of the large capital cost associated with the development and construction of the Rancho Drive Super Arterial, improvements were phased to accommodate potential funding sources. As discussed in Chapter 7, Table 8-1 summarizes a proposed implementation plan for the various components of the Rancho Drive Super Arterial.

### Table 8-1 Rancho Drive Super Arterial Implementation Schedule

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Viaduct from Washington to MLK/Industrial Connector</td>
<td>Washington and Vegas Grade Separations</td>
<td>Grade separations at:</td>
</tr>
<tr>
<td>2</td>
<td>Lake Mead/Skokie Ranch</td>
<td>Decatur/North Las Vegas Airport</td>
<td>Gowan Road</td>
</tr>
<tr>
<td>3</td>
<td>Ann Road</td>
<td>U.S. 95</td>
<td>Jones/Alexander</td>
</tr>
</tbody>
</table>

In order to construct the Rancho Drive Super Arterial, right-of-way will need to be acquired at all of the future grade-separated intersection locations, as well as acquisition of residential parcels between Vegas Drive and Washington Avenue. For the majority of the corridor north of Vegas Drive no additional right-of-way is required outside of the limits of the proposed grade separated intersection locations. An early right-of-way acquisition program at the intersections would accommodate construction of an eight-lane at-grade Rancho Drive cross-section with enhanced intersections (dual-left and right-turn lanes). The priority of right-of-way acquisition at intersection locations should mirror the implementation schedule for the Rancho Drive Super Arterial reflected in Table 8-1. As funding becomes available, the grade separation can then be constructed.

The additional travel lane can be used for general purpose traffic, or for a transit only lane to accommodate the expansion of the Regional Fixed Guideway. An additional benefit of the early widening of Rancho Drive is that a widened Rancho Drive will improve the connectivity of the grade separations because the additional travel lanes will better accommodate construction phasing and traffic control measures required during construction of the grade separations.

Several members of the study’s Working Group expressed concern about the costs and impacts associated with the construction of the viaduct from Washington Avenue to the Martin Luther King/Industrial Road Connector Bridge. Therefore, the Project Team was tasked with developing an interim improvement plan that reduced the cost and community impacts, while maintaining the viability of the Rancho Drive Super Arterial and its connectivity to the Resort Corridor and other south Las Vegas Valley destinations.

The Project Team developed an alternative to construction of the full viaduct from Washington Avenue to the Martin Luther King/Industrial Road Connector Bridge. This alternative maintains a viaduct beginning at the intersection of Rancho Drive and Washington Avenue, flying over the intersection of Rancho Drive and Bonanza Road, and then drops to a widened at-grade Bonanza Road. Bonanza Road would be widened to a six-lane arterial street. At the intersection of Bonanza Road and Martin Luther King Boulevard, an additional travel lane along Bonanza Road is proposed to continue through the Martin Luther King intersection. This lane is in addition to the intersection improvements that are being studied by the City of Las Vegas as part of their Martin Luther King Improvement Study.

To the east of the Martin Luther King intersection, Bonanza Road would be widened in the eastbound direction to three travel lanes. The third travel lane would be dropped at the F Street, which is being studied as part of the City Parkway and D Street Connector Study being prepared by the City of Las Vegas. This connection would provide enhanced access to the City of Las Vegas 61-acre redevelopment site.

### Summary of Travel Route Alternatives

Overall, the proposed improvements enhance access to the Resort Corridor, and other destinations south of U.S. 95. The following list, depicted graphically in Figure 8-1, includes the travel route options available to commuters using the Rancho Drive Super Arterial for the following destinations.

- **Downtown Las Vegas**
  - Bonanza Road to F Street and Main Street
  - Bonanza Road to Martin Luther King to Alta Drive
  - Rancho Drive to Alta Drive to Bonneville Avenue
  - Rancho Drive to Oakey Drive to Wyoming Avenue
  - Rancho Drive to Charleston Boulevard
  - U.S. 95

- **Las Vegas Strip and other South Las Vegas Valley Destinations**
  - Bonanza Road to Martin Luther King/Industrial Road Connector to Industrial Road
  - Bonanza Road to Martin Luther King/Industrial Road Connector to I-15 South
  - Rancho Drive to the I-15 interchange at Charleston Boulevard
  - Rancho Drive to the I-15 interchange at Sahara Avenue
  - U.S. 95 to I-15 via the Spaghetti Bowl interchange

This variety of travel route options permit commuter traffic to find the most desirable route to their destination.