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INTRODUCTION

Purpose
Consistent with the development of an overall urban design vision for the corridor, the purpose of this technical memorandum is to investigate all modes of active transportation and opportunities for Complete Street treatment options along the corridor within the project study limits. This will include opportunities for “road diets”, completion of bicycle and pedestrian facilities, and other related multi-modal improvements. The analysis evaluates the feasibility of Complete Streets implementation, either through new development, or as part of the transit improvement project and will incorporate all of the guiding principles in the RTC’s Bicycle and Pedestrian Plan, and the RTC’s Complete Streets Design Guidelines for Livable Communities as well as the National Association of City Transportation Officials’ Urban Street Design Guide and Urban Bikeway Design Guide.

RTC defines a Complete Street as a road designed to be safe for all users, including design features that aim to make streets pleasant places for all users. Users include car drivers, transit riders, pedestrians of all ages and abilities, and bicyclists. The RTC has also identified significant Complete Streets benefits, such as:

- Make walking, biking, and transit riding more attractive.
- Improve travel options for groups that have limited access to cars.
- Improve safety of various modes.
- Increase the likelihood of physical activity.
- Reduce vehicle emissions to improve air quality.
- Improve the economic situation for communities.

Complete Streets are comprised of a variety of roadway design components. Typical features may include improvements such as traffic calming, dedicated transit lanes, protected bicycle lanes, pedestrian crossings, landscaping beautification, enhanced sidewalks and safety enhancements. However, not all components or category of components will be applicable and beneficial to all streets. It is important that the components incorporated are in harmony with certain planning goals and criteria specific to that corridor and that its transportation context and function are taken into consideration.

Corridor Description
The study corridor limits generally range from Russell Road and the McCarran Airport vicinity at the south end continuing north to Charleston Boulevard with various alternative routes through Downtown Las Vegas to the BTC being evaluated. Maryland Parkway from Russell Road to Sahara Avenue is within Clark County limits and from Sahara Avenue to Bonanza Road is the City of Las Vegas. Maryland Parkway is classified as a Minor Arterial with a posted speed limit of 30 mph for the majority of the corridor. South of Hacienda Avenue to Russell, the posted speed limit is 35 mph. Maryland Parkway has three through lanes in each direction for the majority of the corridor and is generally built out to the full extent of the existing right-of-way. Maryland Parkway becomes a one-way couplet in the southbound direction from Mesquite Avenue to Clark Avenue. In the northbound direction, it becomes a one-way couplet named 13th Street. Maryland
Parkway has two through lanes in each direction from Tropicana Avenue to Russell Road. The study limits of Maryland Parkway include curb and gutter. There are also paved sidewalks and streetlights throughout most of this portion of Maryland Parkway. However, much of the sidewalks have only minimum width, are often narrowed with utility poles or other obstructions, and have numerous curb cuts for access. The center of the roadway varies between raised medians with channelized left turn lanes and continuous left turn lanes. On-street parking exists from Stewart Avenue to Clark Avenue on both portions of the one-way couplet, however the remaining parts of the corridor do not have any on-street parking.

The 2014 RTC Maryland Parkway Alternatives Analysis characterizes the corridor in the following manner:

“The Maryland Parkway Corridor serves a key purpose within the Las Vegas area’s regional transit system as the backbone of north-south transit service outside of the Resort Corridor. The existing transit service in the corridor (Route 109) passes through highly developed residential and commercial areas. 55,000 residents and 81,000 jobs are within ½ mile of the Route 109 alignment. On average, there are 8.1 people per acre in the corridor, 80 percent higher than the 4.5 people per acre for the Las Vegas region as a whole. The average employment density in the corridor is 11.9 jobs per acre, 495 percent higher than the 2.0 for the Las Vegas region as a whole. The Maryland Parkway Corridor provides access to many of the Las Vegas region’s significant regional activity centers, including Downtown Las Vegas, Sunrise Hospital and Medical Center, The Boulevard Mall, the University of Nevada Las Vegas and McCarran International Airport (see Figure 1). Together, these activity centers provide 35,000 jobs for Las Vegas area residents. The primary university in the Las Vegas region is the University of Nevada – Las Vegas (UNLV), which has nearly 28,000 students and 3,000 staff. UNLV is primarily a commuter campus with its main entrance on Maryland Parkway (over 90 percent of UNLV students do not live on campus). Thus, the corridor is the primary access route for the students and staff of UNLV.”

A map of the corridor within the general study limits is shown in the following figure.
Figure 1: The Maryland Parkway Corridor Study Limits
EVALUATION OVERVIEW

The evaluation performed in this task follows the guidelines described in RTC’s Complete Streets Evaluation Process, developed for the City of Henderson, but is easily applied to any corridor or other jurisdiction. In summary, the process involves 3 steps:

The process is summarized below and an illustration of its components is shown on the next page.

1. Process Initiation
   a. “Support and Opportunity”
   b. “Candidate Approach”
2. Evaluation and Development
   a. “Component 1 - Evaluation and Benefits”
   b. “Component 2 - Concept Development and Costs”
3. Recommendations and Conclusions

Figure 2: Complete Streets Evaluation Process (adopted from City of Henderson, developed by Parsons, 2014)
PROCESS INITIATION

Support
The decision to evaluate Complete Streets opportunities along the Maryland Parkway Corridor comes from a consensus from Southern Nevada Strong and the stakeholders involved with this group and corridor. This support includes organizations such as the RTC, City of Las Vegas, Clark County, UNLV and the Maryland Parkway Coalition.

Opportunity
The opportunity for initiating this evaluation was created as a result of the Fuel Revenue Index (FRI), which is the primary funding source for the RTC Maryland Parkway Environmental Document. Implementation of recommendations from this technical memorandum will depend on what future funding resources become available. The funding opportunity could come from an extension of FRI which will go to public vote in November 2016. It could also come from Small Starts/New Starts FTA grants or possibly from some other innovative funding opportunities. A financial plan will be prepared as part of RTC Maryland Parkway Environmental Document.

Candidate Approach
As this evaluation process was developed, there were three primary approaches identified:

1) Evaluation of a Single Corridor
2) Evaluation of a Multiple Corridors
3) City-Wide Evaluation

Since the process in this report does not involve a competitive comparison against other corridors or a City-Wide evaluation, the candidate approach will be option 1 - Evaluation of a Single Corridor. Therefore, no comparative ranking will be developed in Component 1) Evaluation and Benefits, however this component will still be completed as it lays the foundation for identifying and focusing the benefits of any recommendations developed.

COMPONENT 1 - EVALUATION AND BENEFITS
Under Component 1, candidates are evaluated using the main factors typically utilized by other successful programs for evaluating Complete Streets. These factors were then grouped into three principal categories:

1) Demand for Complete Streets implementation
2) Need for Complete Streets implementation
3) Compatibility for Complete Streets implementation
Potential Demand
The potential demand for Complete Streets improvements along a corridor is determined by the sources of possible users and the density of travel destinations attracting those users. This is referred to as Land Use Intensity in this memo. It demonstrates how much activity is surrounding a certain corridor and the attractors that generate trips. The more activity and attractors, the more people of the community are traveling between locations and are interested in having different options to reach their destinations. Areas with higher industrial or undeveloped land use will have lower demand for Complete Streets in comparison.

The following factors are included for determining Land Use Intensity for a specified corridor.

- **Commercial and Residential Density and Growth** – based on employment and population quantification and forecasts.
- **Other Attractors** - involves identifying attractors such as schools, parks, churches, recreational centers, golf courses and trails within close proximity of the corridor.
- **Multimodal Traffic** - involves evaluating transit ridership and auto, bicycle and pedestrian counts that are available or that can be obtained to determine existing traffic for each mode along specified corridors. The counts help to determine the level of corridor users that will most likely benefit from multi-modal connections. Transit ridership involves identifying ridership numbers for routes with stops located on specified corridors.

This study utilized existing maps or developed new maps with existing data to demonstrate the evaluation factors and the process. When available, projected data for future years is utilized as well.

Commercial and Residential Density and Growth
Employment and Population density and growth maps were prepared along the corridor. The maps displayed areas where there may be the greatest demand for Complete Streets improvements:

**Employment**
The areas showing the highest existing employment clusters:

1. South of Russell Road, including the McCarran Airport
2. Between Tropicana Avenue and Vegas Valley Drive, which includes UNLV, the Boulevard Mall and Sunrise Hospital
3. Northwest of Charleston Boulevard and Maryland Parkway, including Downtown Las Vegas

Areas showing the greatest projected growth, increasing by more than 1000 employees by 2035, also fall within these areas:

1. McCarran Airport
2. UNLV and the commercial area north of Flamingo Road, including Boulevard Mall
3. Combined area northwest of Charleston Boulevard and Maryland Parkway, including Downtown Las Vegas
Figure 3: Employment – 2014 Total and Growth to 2035

Population
The areas showing the highest existing population clusters:

1. North of Russell Road to Desert Inn Road, generally on both west and east sides, except for the UNLV facility area and the Boulevard Mall area.
2. Between Desert Inn Road and Charleston Boulevard, primarily on the east side.
3. North of Charleston Boulevard around Maryland Parkway

Areas showing the greatest projected growth, increasing by more than 100 residents by 2035, also fall within these areas:

1. Between Reno Avenue and Tropicana Avenue, east side only
2. Between Flamingo and Vegas Valley Drive, west side only
3. North of Charleston Boulevard
Other Attractors

Schools, Parks, Trails, Churches and Other Destinations
- Siegfried and Roy Park along northwest side of Russell Road and Maryland Parkway
- UNLV, Thomas and Mack, Sports Fields, Artemus Concert Hall
- University United Methodist Church, north of University Avenue
- Las Vegas Country Club, between Desert Inn Road and Karen Avenue
- John C Fremont Middle School, southwest of St. Louis Avenue
- St. Anne’s Catholic School, northeast of St. Louis Avenue
- Huntridge Circle Park
Multimodal Traffic

Vehicle Traffic

Current traffic information is being collected and analyzed as part of development of this project. This information will be included in the next version of this technical memorandum. At the time of this draft, the traffic volumes were gathered from the NDOT Maryland Parkway Road Safety Audit, 2013.

Vehicle volume on Maryland Parkway ranges from 17,000 per day near Russell Road to 36,000 per day just north of Flamingo Road. Vehicle volumes on Maryland Parkway are particularly high (greater than 30,000 vehicles per day) between Tropicana Avenue and Sahara Avenue.

Generally, the traffic flow on Maryland Parkway is free flowing with congestion occurring during the AM, midday, and PM peak periods at the signalized intersections of Tropicana Avenue, Flamingo Road, Desert Inn Road, Sahara Avenue, and Charleston Boulevard. There are several NDOT count stations on this portion of Maryland Parkway and 13th Street. All of the count stations show a decrease in Average Annual Daily Traffic (AADT) from 2002 to 2011. The AADT data for 2002 and 2011 and the NDOT count stations locations are shown in the following table.

Table 1: Traffic Volumes (AADT) at NDOT Count Stations

<table>
<thead>
<tr>
<th>St. Number</th>
<th>Location</th>
<th>2002 AADT</th>
<th>2011 AADT</th>
</tr>
</thead>
<tbody>
<tr>
<td>630629</td>
<td>200 feet north of Hacienda Avenue</td>
<td>21,000</td>
<td>17,000</td>
</tr>
<tr>
<td>630630</td>
<td>500 feet south of Flamingo Road</td>
<td>39,000</td>
<td>32,000</td>
</tr>
<tr>
<td>630631</td>
<td>900 feet north of Flamingo Road</td>
<td>44,000</td>
<td>36,000</td>
</tr>
<tr>
<td>630633</td>
<td>0.1 mile north of Desert Inn Road</td>
<td>41,000</td>
<td>35,000</td>
</tr>
<tr>
<td>630635</td>
<td>0.1 mile north of Sahara Avenue</td>
<td>30,000</td>
<td>24,000</td>
</tr>
<tr>
<td>630636</td>
<td>0.1 mile north of Charleston Boulevard</td>
<td>18,400</td>
<td>12,000</td>
</tr>
<tr>
<td>630637</td>
<td>0.1 mile south of Bonanza Road</td>
<td>12,500</td>
<td>9,500</td>
</tr>
<tr>
<td>630638</td>
<td>300 feet north of Bonanza Road</td>
<td>8,300</td>
<td>6,600</td>
</tr>
<tr>
<td>031000</td>
<td>13th St., between Clark Ave. and Lewis Ave.</td>
<td>8,050</td>
<td>6,200</td>
</tr>
<tr>
<td>031002</td>
<td>50 feet south of Bridger Street</td>
<td>8,450</td>
<td>6,200</td>
</tr>
</tbody>
</table>

Source: NDOT Maryland Parkway Road Safety Audit, 2013
Transit Service

Transit service along Maryland Parkway is currently provided by Route 109, a traditional local bus service operating in mixed-flow traffic with approximately 15 minute headways peak hours. Bus stops are located at the curbs and spaced approximately every 1/4 mile apart. The Maryland Parkway Corridor has been one of the top ridership routes within the RTC system, although it has dropped significantly over the last few years. It serves the highest ridership for north-south routes, with the exception of those on the Strip.

Maryland Parkway receives a large number of riders through the west-east connecting transit routes and, likewise, many transit users on Route 109 ride it with the intention of connection to one of the several west-east connections available. Connections between Russell Road and Downtown include: 201 at Tropicana, CX and 202 at Flamingo, 203 at Twain and Desert Inn, SX the Sahara Express, 206 at Charleston, 208 where Maryland Parkway continues north and finally the Bonneville Transit Center.

The figure to the right shows the alignment and connections of Route 109.

Figure 5: RTC Transit Route 109 - Weekdays
Bike and Pedestrian Traffic
Bicycle and pedestrian counts were obtained during the 2012 RTC Alternatives Analysis. Data was collected at the major and minor intersections, and certain segments, along the corridor. For this memo, the data was summarized and sections were provided a demand rating based on total counts for both modes, as shown in the table below. The highest demand for the corridor is apparent between Tropicana Avenue and Desert Inn Road, with the greatest intensity at Flamingo Road. Within this range, the highest intensity is in the southern area near the University. Sahara and Charleston intersection indicated some medium levels of intensity. The counts did not include Downtown Las Vegas, however, non-vehicular traffic is expected to be high in this area.

Table 2: Bike and Pedestrian Counts along Maryland Parkway (Summarized from 2012 RTC Alternatives Analysis data counts)

<table>
<thead>
<tr>
<th>Maryland Parkway Intersection</th>
<th>Demand Rating</th>
<th>Bike and Ped Counts</th>
<th>Ped Counts</th>
<th>Bike Counts</th>
</tr>
</thead>
<tbody>
<tr>
<td>At Charleston</td>
<td>2</td>
<td>322</td>
<td>296</td>
<td>26</td>
</tr>
<tr>
<td>At Franklin</td>
<td>1</td>
<td>66</td>
<td>40</td>
<td>26</td>
</tr>
<tr>
<td>At Oakey</td>
<td>1</td>
<td>57</td>
<td>35</td>
<td>22</td>
</tr>
<tr>
<td>At St. Louis</td>
<td>1</td>
<td>85</td>
<td>66</td>
<td>19</td>
</tr>
<tr>
<td>At Sahara</td>
<td>3</td>
<td>553</td>
<td>525</td>
<td>28</td>
</tr>
<tr>
<td>At Karen</td>
<td>1</td>
<td>187</td>
<td>162</td>
<td>25</td>
</tr>
<tr>
<td>At Vegas Valley</td>
<td>1</td>
<td>117</td>
<td>113</td>
<td>4</td>
</tr>
<tr>
<td>At Sunrise Hospital</td>
<td>1</td>
<td>94</td>
<td>72</td>
<td>22</td>
</tr>
<tr>
<td>At Desert Inn</td>
<td>2</td>
<td>256</td>
<td>223</td>
<td>33</td>
</tr>
<tr>
<td>At Sierra Vista</td>
<td>2</td>
<td>208</td>
<td>188</td>
<td>20</td>
</tr>
<tr>
<td>At Twain</td>
<td>2</td>
<td>276</td>
<td>243</td>
<td>33</td>
</tr>
<tr>
<td>At Katie</td>
<td>2</td>
<td>373</td>
<td>351</td>
<td>22</td>
</tr>
<tr>
<td>At Flamingo</td>
<td>5</td>
<td>896</td>
<td>847</td>
<td>49</td>
</tr>
<tr>
<td>At Harmon</td>
<td>3</td>
<td>432</td>
<td>398</td>
<td>34</td>
</tr>
<tr>
<td>At University</td>
<td>2</td>
<td>214</td>
<td>199</td>
<td>15</td>
</tr>
<tr>
<td>At Tropicana</td>
<td>3</td>
<td>415</td>
<td>378</td>
<td>37</td>
</tr>
<tr>
<td>At Hacienda</td>
<td>1</td>
<td>99</td>
<td>92</td>
<td>7</td>
</tr>
<tr>
<td>At Russell</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>At Paradise</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maryland Parkway Segment</th>
<th>Demand Rating</th>
<th>Bike and Ped Counts</th>
<th>Ped Counts</th>
<th>Bike Counts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Charleston and Franklin</td>
<td>1</td>
<td>6</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Between Sierra Vista and Twain</td>
<td>1</td>
<td>125</td>
<td>123</td>
<td>2</td>
</tr>
<tr>
<td>Between Harmon and Flamingo</td>
<td>2</td>
<td>207</td>
<td>202</td>
<td>5</td>
</tr>
<tr>
<td>Between Harmon and University</td>
<td>3</td>
<td>429</td>
<td>415</td>
<td>14</td>
</tr>
</tbody>
</table>

LEGEND

- **Low Demand**: 0-199
- **Medium-Low Demand**: 200-399
- **Medium Demand**: 400-599
- **Medium-High Demand**: 600-799
- **High Demand**: 800-999
Maryland Parkway Environments Assessment
Technical Memorandum
COMPLETE STREETS ANALYSIS & CONSIDERATIONS

Potential Need
While the demand for Complete Streets improvements is based on land use intensity, there may also be areas where there is an opportunity for improvements due to the desire for increasing safety or for increasing mobility and closing gaps between various facilities. This section includes evaluation criteria that determine the “Potential Need” or opportunities for enhancements.

Safety
Maryland Parkway Road Safety Assessment
NDOT completed a Road Safety Assessment (RSA) in 2013 in cooperation with the RTC, City of Las Vegas, Clark County and other relevant stakeholders. The report analyzes crash data along the corridor, identifies high incident locations and makes recommendations for improvements that can be implemented to have the greatest positive impact in increasing safety, or decreasing the quantity and severity of crashes. For purposes of this memo, the following Complete Streets recommendations were extracted and summarized in the table below.

Table 3: Summary of Multimodal Safety Recommendations (compiled from the 2013 NDOT Maryland Parkway RSA)

<table>
<thead>
<tr>
<th>Segment</th>
<th>Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
</tr>
<tr>
<td>Priority 1A</td>
<td>Look at moving existing bus stop locations closer to marked and unmarked crosswalks.</td>
</tr>
<tr>
<td>Entire Corridor (EC)</td>
<td>Repurpose the right-of-way to utilize the underutilized pavement to widen the pedestrian realm.</td>
</tr>
<tr>
<td>Tropicana</td>
<td>Russell</td>
</tr>
<tr>
<td>At Stewart Avenue</td>
<td>Install pedestrian walk time should be reviewed and updated, if needed, to the current standard.</td>
</tr>
<tr>
<td>At Ogden Avenue</td>
<td>Pedestrian walk time should be reviewed and updated, if needed, to the current standard at the intersection of Maryland Parkway and Bonnieville Avenue to account for the distance from the pedestrian push button to the crosswalk ramp.</td>
</tr>
<tr>
<td>At Franklin Avenue</td>
<td>Install signal ahead signs in advance of the pedestrian signals before the curves in both directions on Maryland Parkway to the north of Franklin Avenue.</td>
</tr>
<tr>
<td>Oakey</td>
<td>St. Louis</td>
</tr>
<tr>
<td>At St. Louis Avenue</td>
<td>The pedestrian walk time should be reviewed and updated, if needed, to the current standard at the intersection to account for the distance from the pedestrian push button to the cross walk ramp.</td>
</tr>
<tr>
<td>At Pedestrian Refuge Islands</td>
<td>Consider installing yellow flexible bollards and “Look Before Crossing” signs.</td>
</tr>
<tr>
<td>At Pedestrian Activated Crosswalks</td>
<td>Consider installing a flasher head directed at the crosswalk ramp.</td>
</tr>
<tr>
<td>At 13th Street and Ogden</td>
<td>The pedestrian walk time should be reviewed and updated, if needed, to the current standard at the intersection to account for the distance from the pedestrian push button to the cross walk ramp.</td>
</tr>
<tr>
<td>At 13th Street and Ogden</td>
<td>School crosswalk sign should be relocated on the northeast corner to make it visible for motorists.</td>
</tr>
<tr>
<td>Priority 1C</td>
<td>Coordinate with RTC FAST to review the signal timing parameters, splits and offsets at the signalized intersections along the portion of Maryland Parkway in Clark County.</td>
</tr>
<tr>
<td>EC</td>
<td>Tactile strip replacement on ramps where they are missing.</td>
</tr>
<tr>
<td>EC</td>
<td>Pedestrian clearance intervals for signals along the parkway should be reviewed and updated, if needed, to the current standard.</td>
</tr>
<tr>
<td>At Desert Inn Road</td>
<td>Repair the sidewalk upheaval on the west side of Maryland Parkway, south of Desert Inn.</td>
</tr>
<tr>
<td>At Dumont Avenue</td>
<td>Evaluate installing “Yield Ahead” or “Watch for Pedestrian When Turning” signs on the exit from Boulevard Mall.</td>
</tr>
<tr>
<td>EC</td>
<td>Consider installing yellow flexible bollards and “Look Before Crossing” signs at all pedestrian refuge islands.</td>
</tr>
<tr>
<td>At Reno Avenue</td>
<td>Upgrade the streetlight over the pedestrian crosswalk.</td>
</tr>
<tr>
<td>At Reno Avenue</td>
<td>Relocate the school pedestrian crossing sign so that it is visible to motorists.</td>
</tr>
<tr>
<td>At Rawhide Street</td>
<td>Install a crosswalk ramp on the west side of Maryland Parkway on either the north or south approach to the intersection.</td>
</tr>
</tbody>
</table>
## COMPLETE STREETS ANALYSIS & CONSIDERATIONS

<table>
<thead>
<tr>
<th>Segment</th>
<th>Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throughout Priorities 2A, 2B, and 2C</td>
<td>Consider making portions of the corridor &quot;Pedestrian Safety Zones&quot; by adding signage. The portions that should be considered include the areas near Sunrise Hospital, the Boulevard Mall, and UNLV.</td>
</tr>
<tr>
<td>Portions of Maryland Parkway</td>
<td>Enhancement of the pedestrian realm must consider buffer zones, the separation of vehicular and pedestrian traffic, safer inter-modal vehicular and community connectivity with transit, the minimization of driveway-pedestrian conflict points and the assurance of compliance with ADAAG.</td>
</tr>
<tr>
<td>EC</td>
<td>Reduction of traffic lane widths to provide more width for the pedestrian realm facilities and buffer zones.</td>
</tr>
<tr>
<td>EC</td>
<td>Reducing of six traffic lanes with center two-way left turn lane to four traffic lanes and two transit lanes with center two-way left turn lane.</td>
</tr>
<tr>
<td>EC</td>
<td>Installation of raised median with left turn lanes at access points and reduced median width between access points and openings to provide more width for the pedestrian realm and the control of left turn movements at local intersections and driveways.</td>
</tr>
<tr>
<td>EC</td>
<td>The raised median should include design elements to discourage pedestrians from crossing outside of crosswalks and to direct the pedestrians to the crosswalks. The design elements could include mounding the top of the median or installing a soft barrier.</td>
</tr>
<tr>
<td>EC</td>
<td>Relocate utilities to below ground to free up sidewalks for pedestrians.</td>
</tr>
<tr>
<td>EC</td>
<td>Crosswalk ramps should be upgraded to comply with current ADAAG and PROWAG standards, tactile strips that are missing should be installed on ramps, cracked rutted and shoved pavement should be repaired.</td>
</tr>
<tr>
<td>EC</td>
<td>Pedestrian push buttons should be relocated to meet current PROWAG standards for height (48&quot;) and reach (24&quot;). Pedestrian push buttons should also be upgraded to meet current ADAAG standards for size.</td>
</tr>
<tr>
<td>EC</td>
<td>Lips between ramps and lip of gutter should be ground down or reconstructed to provide smooth transition from the sidewalk to the roadway at crosswalk ramps.</td>
</tr>
<tr>
<td>EC</td>
<td>Commercial driveways should be reconstructed to meet current ADAAG and/or RTC standards to reduce cross slopes and change the curb radii and sidewalk transition at the edges of the driveway.</td>
</tr>
<tr>
<td>EC</td>
<td>Four (4) feet of sidewalk clearance should be provided around sidewalk furniture and controller cabinets along the corridor to enhance pedestrian walkability above the current three (3) foot CLV and CC standard. Four (4) feet of clearance would be the desirable clearance minimum. Consider relocating the sign or pole or extending the sidewalk in front of or behind the obstacle.</td>
</tr>
<tr>
<td>EC</td>
<td>Feasibility study should be conducted to determine if bus turn-outs should be constructed.</td>
</tr>
<tr>
<td>EC</td>
<td>RTC should consider updating and relocating bus stop shelters to at least six feet behind back of curb.</td>
</tr>
<tr>
<td>At Sunrise Hospital</td>
<td>Review and evaluate the pedestrian bridge on Maryland Parkway at Sunrise Hospital to determine if it can be upgraded to provide ADA access and if the median pier can be retrofitted with impact extenuators.</td>
</tr>
<tr>
<td>At Sunrise Hospital</td>
<td>Consider installing a marked crosswalk with pedestrian activated flashers at the emergency entrance to Sunrise Hospital if the pedestrian bridge to the north cannot be retrofitted with ADA access and impact extenuators.</td>
</tr>
<tr>
<td>At Sunrise Hospital</td>
<td>Review and evaluate the pedestrian bridge on Maryland Parkway at Sunrise Hospital to determine if it can be upgraded to provide ADA access and if the median pier can be retrofitted with impact extenuators.</td>
</tr>
<tr>
<td>At Cottage Grove</td>
<td>Consider installing a marked pedestrian crosswalk with pedestrian activation and a refuge island such as a Danish Offset near the intersection of Maryland Parkway and Cottage Grove Avenue. The UNLV Master Plan should be considered when determining the location of this marked pedestrian crosswalk in case there are future plans to align Cottage Grove Avenue with Rochelle Avenue.</td>
</tr>
<tr>
<td>At Reno Avenue</td>
<td>Consider adding a Danish Offset and a pedestrian activated signal or flashers to the intersection of Maryland Parkway and Reno Avenue.</td>
</tr>
<tr>
<td>At Las Vegas Wash</td>
<td>Evaluate the need and consider installing a marked crosswalk near the Las Vegas Wash with pedestrian activated flashers on Maryland Parkway.</td>
</tr>
<tr>
<td>EC</td>
<td>Consider pedestrian activated signals or flashers at all marked crosswalks at unsignalized intersections. The pedestrian activated signals could include HAWKS, Puffins, Pelicans, Toucans, or traditional traffic signals.</td>
</tr>
<tr>
<td>EC</td>
<td>Consider enhancements to the bicycle facilities along the Maryland Corridor. This corridor connects low cost housing to employment centers, the downtown area and UNLV. The Transit Center at UNLV will have the facilities needed to store over 100 bikes when completed.</td>
</tr>
<tr>
<td>EC</td>
<td>Reduction of traffic lane widths to provide more width for the pedestrian realm facilities and buffer zones.</td>
</tr>
<tr>
<td>Priority 2D</td>
<td><strong>Improvements that should be considered for inclusion in a future NDOT project when funding becomes available.</strong></td>
</tr>
<tr>
<td>EC</td>
<td>The crosswalk ramps should be upgraded to comply with current PROWAG standards along this segment of Maryland Parkway for the corners that are under the jurisdiction of NDOT.</td>
</tr>
</tbody>
</table>
Mobility
There are potential benefits from recommendations that improve mobility of corridor users. This can be evaluated by making recommendations that integrate well with existing Master Plans (or other related plans), and with improvements that complete Mode Gaps or meet ADA Compliance.

Master Plans and Other Plans
RTC Complete Streets Design Guidelines for Livable Communities
“Many 100-foot ROW streets have a speed limit of 45mph. When recommending complete street enhancements to these streets, it is important to consider the target speed, which is the highest speed vehicles should operate to support a safe and efficient multimodal travel environment including non-motorized modes such as bicycles and pedestrians. On typical 100-foot ROW streets, with six travel lanes and five-foot sidewalks (with two-foot curb and gutters), it may be appropriate to consider reducing the maximum speed in addition to other design enhancements.”
– RTC Complete Streets Design Guidelines for Livable Communities, 2013

Recommendations for Alternative Roadway Standards for 100-Foot Wide Roadways with Transit

Figure 6: 4 lanes with median and curbside transit-bike lanes
(RTC Complete Streets Design Guidelines for Livable Communities)

Figure 7: 4 lanes with center-running transit-only lanes
(RTC Complete Streets Design Guidelines for Livable Communities)
RTC Southern Nevada Bike Map

Below are maps showing designated bike options along Maryland Parkway and its potential downtown routes. The Maryland Parkway Corridor, from Russell Road north to Charleston and continuing into the downtown area, currently does not have marked bike facilities available. There are wide outside shoulders on the roadway south of Tropicana Avenue. The portion of Maryland Parkway from Tropicana Avenue to Russell Road is designated as a bike compatible road or street.

However, if bike options were implemented on this corridor, there are some opportunities for connectivity to other bike options. West-east bike options that currently exist include:

- Bicycle Lanes - Hacienda, Harmon, Katie Avenue, Sahara and St. Louis
- Bicycle Route – Karen Avenue
Figure 8: RTC Southern Nevada Bike Map along Project
RTC Spencer Greenway Transportation Trail and UNLV Campus Bike Plan

The Southern Nevada Strong Regional Plan strongly supports improving multi-modal access between Downtown Las Vegas and the University of Nevada Las Vegas (UNLV) campus. The RTC has completed a Preliminary Corridor Assessment for a project called the Spencer Greenway and Trail. The RTC plans to further this development by completing a Spencer Greenway Transportation Trail and UNLV Campus Bike Plan.

Spencer Street is a roadway running parallel to Maryland Parkway, about ½ mile to the east from Russell Road to just south of Desert Inn Road. There is currently a bike lane striped along this section of the roadway. This project will review the existing Spencer utility corridor and associated routes for impediments and barriers to a multiuse trail between Downtown Las Vegas and UNLV. Some of the connections to UNLV being considered include Twain Road or possibly a Flamingo Wash Trail within the existing Regional Flood Control District easement. Alternatives connecting the Spencer trail section to UNLV will cross Maryland Parkway at some point. Complete Streets improvements recommended for Maryland Parkway should be evaluated in coordination with the Spencer Greenway/UNLV Bike Plan Project so the full benefits of access and connectivity are achieved.

The UNLV Campus Bike Plan will involve delineating potential bicycle pathways and facilities. The project may be the impetus for a secondary Bike Share Program. The first bike share program is intended to commence by Fall 2016.

RTC Regional Bicycle and Pedestrian Plan

With funding support from the Southern Nevada Health District (SNHD), the Regional Transportation Commission of Southern Nevada (RTC) has initiated efforts to update and revise the Regional Bicycle and Pedestrian Plan. This regional plan was last completed in 2008. A consultant has been contracted to work with RTC staff to develop the plan over the next year in coordination with advisory groups consisting of local jurisdictions and other key stakeholders. In addition to serving as a stand-alone document, this plan will be included as a component of the next update to the Regional Transportation Plan (RTP). This plan will also support the implementation of a major theme of the Southern Nevada Strong (SNS) Regional Plan to increase transportation choices for residents and visitors.

The Regional Bicycle and Pedestrian Plan will help the RTC identify and prioritize bicycle, pedestrian, and paved trail (shared use path) facilities for the regional transportation system and could influence roadway design and construction to accommodate such facilities in the future. The study area will include the entire geographical area of Clark County, including all of the cities. The updated plan will address how Southern Nevada measures performance for bicycling and walking in accordance with federal mandates. The updated plan will also support the inclusion of elements that meet the RTC Complete Streets Initiative and may help determine project prioritization for RTC funding programs.

**Mode Gap Analysis and ADA Compliance**

After reviewing the corridor for possible mode gaps, the following table was developed. In summary, the primary mode that was not currently well supported is bicycles, generally having no facilities within the core section of the corridor. With the demand shown in previous sections, adding this improvement may be demonstrate the greatest benefit to the corridor in terms of completing a mode gap. Sidewalks exist along the entire study corridor, however, they are generally just meeting minimum standards and often have obstructions narrowing the path and are of need of some repairs. ADA ramps are updated whenever improvements are made that impact pedestrian ramps. The same applies with any intersections not yet having ADA compliant pedestrian-activated crossings. As discussed previously, transit already exists with Route 109 and covers the full corridor, however, the purpose of the Environmental Document will be to evaluate options to enhance this service. Finally, the landscaping varies along the corridor. The entire corridor could be improved with landscaping along the medians, but a lower costing method may be to focus on the areas that are ranked low in the table below and also show high multimodal demand.

**Table 4: Identifying Mode and ADA Compliance Gaps**

<table>
<thead>
<tr>
<th>Segment</th>
<th>Complete Sidewalk</th>
<th>Bike Option</th>
<th>Transit</th>
<th>Landscape</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russell to Hacienda</td>
<td>Yes</td>
<td>Low - Unstriped, wide outer lane</td>
<td>Yes</td>
<td>Low</td>
<td>No landscape on medians</td>
</tr>
<tr>
<td>Hacienda to Tropicana</td>
<td>Yes</td>
<td>Low - Unstriped, wide outer lane</td>
<td>Yes</td>
<td>Low</td>
<td>Concentration of landscape significantly lower on eastern sidewalk</td>
</tr>
<tr>
<td>Tropicana to Flamingo</td>
<td>Yes</td>
<td>None</td>
<td>Yes</td>
<td>Medium to Low</td>
<td>No landscape on medians, significantly less landscape on eastern sidewalk</td>
</tr>
<tr>
<td>Flamingo to Twain Ave</td>
<td>Yes</td>
<td>None</td>
<td>Yes</td>
<td>Low</td>
<td>No landscape on medians</td>
</tr>
<tr>
<td>Twain Ave to Desert Inn</td>
<td>Yes</td>
<td>None</td>
<td>Yes</td>
<td>Low</td>
<td>No landscape on medians, there is almost no landscape on eastern sidewalk along Boulevard Mall parking lot</td>
</tr>
<tr>
<td>Desert Inn to Katie Ave</td>
<td>Yes</td>
<td>None</td>
<td>Yes</td>
<td>Medium to High</td>
<td>No landscape on medians</td>
</tr>
<tr>
<td>Katie to Oakey Blvd</td>
<td>Yes</td>
<td>None</td>
<td>Yes</td>
<td>Low</td>
<td>Low amounts of landscape on medians, there are some sections of this segment with no landscape at all</td>
</tr>
<tr>
<td>Oakey Blvd to Charleston</td>
<td>Yes</td>
<td>None</td>
<td>Yes</td>
<td>Medium to High</td>
<td>Medium amounts of landscape on outer sidewalks, high concentration of landscape in the middle due to park.</td>
</tr>
</tbody>
</table>
COMPONENT 2 - CONCEPT DEVELOPMENT

The second component of the process requires identifying the different design features under consideration. These features may include pedestrian enhancements, bicycle lanes, dedicated transit lanes, roadway landscaping, enhanced street crossing features, and reduced street width (road diet). By analyzing the specific street, its function, location and transportation context; the design features best for the specific street corridor can be determined. The National Complete Streets Coalition of Smart Growth America discusses this point:

“Instead of trying to make each street perfect for every traveler, communities can create an interwoven array of streets that emphasize different modes and provide quality accessibility for everyone. Some streets may emphasize vehicles or trucks, while others emphasize pedestrians or public transportation. In more industrial areas, some streets will emphasize access for freight vehicles.”

Five steps are proposed for this development process:

1. Define transportation context.
2. Identify appropriate modes (existing and potential new modes).
3. Identify constraints and number of lanes.
4. Select appropriate zones, elements, and sample cross-sections. Identify various levels of enhancement for costs and phasing.
5. Revisit priorities and objectives. Test the results, evaluate trade-offs, and categorize into transportation funding levels and planning timeframes.
Step 1: Define transportation context.
To be consistent with context zones and characteristics established at the regional level in Southern Nevada, Maryland Parkway is compared with those identified in the RTC Regional Complete Streets Study (June 2012). The RTC study explains in detail how land use development affects transportation systems. The six Context Zones and their distinguishing characteristics are shown below. The project is likely best described by Context Zone C-4 along the Maryland Parkway Corridor, and potentially C-5 as the project alignment falls within the Downtown area.

<table>
<thead>
<tr>
<th>Context Zone</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-1 Natural</td>
<td>Natural landscape</td>
</tr>
<tr>
<td>C-2 Rural</td>
<td>Agricultural with minimal development</td>
</tr>
<tr>
<td>C-3 Suburban</td>
<td>Primarily single family residential with curvilinear internal roadway configurations and limited connections to landscape character. Includes separated public and commercial uses that support the residential uses, including schools and shopping centers.</td>
</tr>
<tr>
<td>C-4 General Urban</td>
<td>Mix of housing types, including attached units, with a range of commercial and civic activity at the neighborhood and community scale.</td>
</tr>
<tr>
<td>C-5 Urban Center</td>
<td>Mix of housing types, including attached housing such as townhouses and apartments. Includes workplace and civic activities at the community or sub-regional scale. May include large-scale hotel and tourist attraction areas.</td>
</tr>
<tr>
<td>C-6 Urban Core</td>
<td>Highest intensity areas in sub-region or region, with high-density residential and workplace uses, entertainment, civic, and cultural uses</td>
</tr>
</tbody>
</table>

Source: RTC Regional Complete Streets Study, June 2012
Step 2: Identify appropriate modes
The modes that are currently found within the project limits and should be considered with the design development of the project include:

- Pedestrian
- Bicycle
- Transit
- Automobile
- Some trucks, limited to nonfreight/regional large trucks

Steps 3, 4 and 5:
As the design further develops, the project will identify constraints, appropriate zones, elements, and sample cross-sections. Various levels and locations of enhancement for costs and phasing will be developed. The recommendations will involve an evaluation of trade-offs, and categorize into transportation funding levels and planning timeframes.

An outline of some possible Complete Streets toolbox items and their possible applicability with this project are shown in Table 6. Some examples of Complete Streets elements integrated with other transit corridors are shown in Figure 9.

A drawing of a possible cross-section configuration is included in Figure 10 with a photo perspective rendering included in Figure 11. Although both side-running and center-running configurations are being considered for this project, the side-running is shown in this memo as an example. Planning level costs have been developed for the overall project based on the preliminary design. Costs have not been developed for specific complete streets elements for this project at this stage.
### Table 6: Complete Streets Toolbox and Possible Applicability with Transit on Maryland Parkway

<table>
<thead>
<tr>
<th>General Method</th>
<th>Applications</th>
<th>Application on Corridor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Traffic Calming</strong></td>
<td>Narrower travel lanes. 11-foot or 10-foot are just as safe as 12-foot for posted speeds of 45 MPH.</td>
<td>Russell to Charleston: Yes; Bonneville Transit Center: Yes</td>
</tr>
<tr>
<td></td>
<td>Road diets work for ADT volumes as high as 20,000.</td>
<td>No; No</td>
</tr>
<tr>
<td></td>
<td>Tightening corner curb radii to the minimum needed for the appropriate design vehicle will slow down turning vehicle speed.</td>
<td>No; No</td>
</tr>
<tr>
<td></td>
<td>Eliminate free-flow right turn lanes. This includes freeway entry and exit ramp connections. This is dangerous for both pedestrians and bicyclists.</td>
<td>No; No</td>
</tr>
<tr>
<td></td>
<td>Raised medians. Raised medians visually narrow the roadway and provide median refuge for mid-block crossings.</td>
<td>Yes; Yes</td>
</tr>
<tr>
<td></td>
<td>Median landscaping. Low maintenance landscape further visually narrows the roadway and provides a calming effect.</td>
<td>No; Yes</td>
</tr>
<tr>
<td></td>
<td>Curb parking. Curb parking provides for community access while creating a significant traffic calming effect.</td>
<td>No; Yes</td>
</tr>
<tr>
<td></td>
<td>Curb bulb-outs. Bulb outs where onstreet parking exists, shorten pedestrian crossing distances, improve sight lines and help control parking.</td>
<td>No; Yes</td>
</tr>
<tr>
<td><strong>Traffic Calming for Road Diets</strong></td>
<td>Pavement texturing/coloring pavement to emphasize a street, intersection, or pedestrian crossing.</td>
<td>No; Yes</td>
</tr>
<tr>
<td></td>
<td>Curb extensions.</td>
<td>No; Yes</td>
</tr>
<tr>
<td></td>
<td>Medians.</td>
<td>Yes; Yes</td>
</tr>
<tr>
<td></td>
<td>Chicanes (curb extensions or on-street parking that alternate from one side of the street to the other, forming S-shape curves)</td>
<td>No; No</td>
</tr>
<tr>
<td></td>
<td>Chokers (curb extensions directly across from each other at midblock locations that narrow the curb to curb width of the roadway with landscaping and/or widens sidewalks.</td>
<td>No; No</td>
</tr>
<tr>
<td></td>
<td>Raised crosswalks.</td>
<td>No; No</td>
</tr>
<tr>
<td></td>
<td>Raised intersections (flat raised areas covering an entire intersection, with ramps on all approaches and often with textured materials on the flat section)</td>
<td>No; No</td>
</tr>
<tr>
<td></td>
<td>Diagonal diverters (barriers placed diagonally across an intersection, blocking through movements and creating two separate, L-shaped streets)</td>
<td>No; No</td>
</tr>
<tr>
<td></td>
<td>Selective enforcement.</td>
<td>Yes; Yes</td>
</tr>
<tr>
<td><strong>Pedestrian Crossing Measures</strong></td>
<td>Narrower travel lanes.</td>
<td>Yes; Yes</td>
</tr>
<tr>
<td></td>
<td>Road Diets: Reduce the number of lanes to be crossed.</td>
<td>Yes; Yes</td>
</tr>
<tr>
<td></td>
<td>Tighten corner radii. Shorten pedestrian crossing distances and provide space for perpendicular curb ramps.</td>
<td>No; No</td>
</tr>
<tr>
<td></td>
<td>Adding corner “pork chop” islands where design vehicle turning radii do not permit a smaller radius. Also shortens pedestrian crossing distances.</td>
<td>Yes; No</td>
</tr>
<tr>
<td></td>
<td>Raised medians: Provide pedestrian refuge and allow pedestrians to cross half the street at a time.</td>
<td>Yes; Yes</td>
</tr>
<tr>
<td></td>
<td>Curb bulb-outs. Shorten pedestrian crossing distances, improve sight lines and provide space for curb ramps.</td>
<td>No; No</td>
</tr>
<tr>
<td></td>
<td>Continental-style crosswalks and pedestrian crossing warning signs: Effective for lightly traveled arterials posted for urban speed limits.</td>
<td>Yes; Yes</td>
</tr>
<tr>
<td></td>
<td>Pedestrian actuated crosswalk warning signs: For heavier traffic flows.</td>
<td>Yes; Yes</td>
</tr>
<tr>
<td></td>
<td>HAWK-style, pedestrian actuated signals: Will be in the new MUTC.</td>
<td>Yes; Yes</td>
</tr>
<tr>
<td></td>
<td>Full signalization: All pedestrian signal should now be timed using the new MUTC pedestrian walking speed of 3.5 fps to set the Flashing Don’t Walk pedestrian clearance time and 3.0 fps to determine the total Walk/Flashing Don’t Walk time.</td>
<td>Yes; Yes</td>
</tr>
<tr>
<td></td>
<td>Countdown clocks: The new MUTC will not only require countdown clocks at all new pedestrian signal installations, but there will be a 10-year compliance date for retrofitting all existing pedestrian signal locations, finally correcting the longstanding confusion surrounding the traditional but counter-intuitive Flashing Don’t Walk.</td>
<td>Yes; Yes</td>
</tr>
<tr>
<td><strong>Bikeway Design</strong></td>
<td>Implement shared roadways via the following:</td>
<td>Russell to Charleston: Yes; Bonneville Transit Center: Yes</td>
</tr>
<tr>
<td></td>
<td>Wide curb lanes.</td>
<td>Yes; Yes</td>
</tr>
<tr>
<td></td>
<td>Sharrow (shared lane marking stencils) remind bicyclists to ride further from parked cars, make motorists aware of bicycles potentially in the travel lane and they show bicyclists the correct direction of travel.</td>
<td>Yes; Yes</td>
</tr>
<tr>
<td></td>
<td>Centerline removal (in low traffic volume areas) facilitates passing by of bicyclists by motor vehicles.</td>
<td>No; No</td>
</tr>
<tr>
<td></td>
<td>Bicycle boulevards is an enhanced shared roadway; a local street is modified to function as a prioritized through street for bicyclists while maintaining local access for bicycles.</td>
<td>Yes; No</td>
</tr>
<tr>
<td></td>
<td>Shoulder bikeways provide a place for bicyclists to ride at their own pace on rural highways.</td>
<td>No; No</td>
</tr>
<tr>
<td></td>
<td>Designated bike lanes.</td>
<td>Yes; Yes</td>
</tr>
<tr>
<td></td>
<td>Cycletrack</td>
<td>No; No</td>
</tr>
</tbody>
</table>
Figure 9: Examples of Complete Streets Elements Integrated with Transit Corridors
Figure 10: Complete Streets Configuration Option

Figure 11 - Rendering - Side-Running Transitway with Bike Lanes and Landscaping
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