

Cost Analysis and Implementation

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SECTION ONE: Cost Analysis

To understand the cost implications of the improvements proposed by this Corridor Plan, estimates on a cost per square foot (sf) and per acre (ac) basis have been prepared. At the planning budget level, these estimates can be applied to the landscape design segments to produce an overall maximum cost for the right-of-way sections through undeveloped areas, communities, and individual interchange improvements. These estimates will inform NDOT in the decision-making process, and help influence budget allocations for landscape and aesthetics highway improvements.

APPLICATION OF DESIGN GUIDELINES

The design guidelines included in this report describe the elements that compose typical right-of-way sections and interchanges along elevated highways and bypasses. They also describe a base level of landscape and aesthetic quality that is used to predict costs. The intent of this section is to develop a definition of what is considered a “standard” treatment. Upon adoption of the Corridor Plan, NDOT should initiate internal reviews to determine implementation strategies. These reviews will include cost evaluation, priorities, scheduling, and visual preference evaluations to test each standard proposed in this section.

Funding for the landscape and aesthetics portion of a project should not be used to cover ordinary construction costs. The landscape and aesthetics budget is available for softscape and hardscape treatments that exceed the ordinary construction costs.

The following summary describes components contained within an NDOT standard project that are not generally considered to be landscape and aesthetic costs (L & A costs):

Roadside Service Facilities

- Service area program as defined on pages 3.14-3.16, inclusive of program elements.

Non-motorized Transportation Systems

- Maintain existing sidewalk dimension of intersecting road across bridge overpass.
- Maintain existing bike lane dimension of intersecting road across bridge overpass.
- New bicycle paths and walkways that are part of an approved transportation plan.
- Six-foot concrete sidewalk (community transition zones).
- Ten-foot concrete sidewalk (community interface zones).
- Painted zebra pattern pedestrian crossing with pedestrian crossing sign.

Anti-graffiti Control and Removal

- Application of a long-term, non-sacrificial anti-graffiti treatment to all appropriate structures.

Bridge Structure

- Steel and concrete I-girders or steel and concrete box girder.
- Cast-in-place concrete with variable vertical-ribbed design.
- Two color paint palette (base color with one accent color).
- Concrete barrier rail with acrylic stain base color application or steel rail with painted finish.
- Bridge/road name identification embossment.
- Pedestrian access across and under bridges used at interchanges and over topographic features.

Retaining Walls

- Cast-in-place or pre-cast concrete with vertical rustication or similar pattern.
- Acrylic stain base color application.

Noise Walls

- Cast-in-place or pre-cast concrete with vertical rustication or similar pattern.
- Acrylic stain base color application.
- Variation in sound wall geometry, material, color, texture, and pattern to eliminate monotonous, linear stretches of wall.

Concrete Barrier

- Cast-in-place concrete barrier.
- Acrylic stain base color application.

Guard Rail

- Galvanized steel three-beam guardrail.

Medians

- Revegetated median outside of community zones.
- Revegetated, raised six-inch median with curb within community zones.

Fencing

- Chain link fencing with color application—vinyl clad or painted finish with steel post supports where required (community zones).
- Multi-strand wire fencing with painted steel post supports at right-of-way limits (rural areas).
- Fencing required to control access, grading, and drainage.

How to Read Landscape & Aesthetics (L & A) Costs:

- 1) Determine the cost of the NDOT standard treatment for softscape and hardscape.

Softscape:

Native revegetation – \$1.35 - \$1.60/sf

Hardscape:

Standard – \$130 - \$135/sf

- 2) Determine the cost of the selected treatment type.

Softscape:

Regionally adapted – \$2.70 - \$3.25/sf

Hardscape:

Focal – \$200 - \$218/sf

- 3) Subtract the standard treatment cost for the cost of the selected treatment type.

Softscape:

\$2.70 (Regionally adapted treatment cost)
 - \$1.35 (Native revegetation treatment cost)
 = \$1.35 (L & A cost)

Hardscape:

\$200 (Focal treatment cost)
 - \$130 (Standard treatment cost)
 = \$70 (L & A cost)

The L & A cost is the portion of the cost that is above and beyond the standard cost.



Grading

- Steepest desired slope of 3H:1V.
- Rounded slopes that blend into existing grade.
- See *Project Design Development Manual* (PDDM) Section 2.2.4.2, Side Slopes.

Rock Cuts

- Rock cuts that appear natural in form and blend with existing landforms.
- Staining of rock cut to provide weathered finish.
- Rock fall protection structures, if necessary.

Drainage

- Basic channel conveyance, culverts, and drainage structures.
- Erosion-resistant channels.
- Water quality basins.
- Man-made or constructed wetlands fulfilling mitigation requirements.

Erosion Control

- Provision of temporary erosion control during construction.
- Permanent erosion control.
- Temporary and permanent erosion control best management practices.

Native Revegetation for All Disturbed Portions of Highway Construction

- Salvage and storage of topsoil (six-inch horizon minimum) with native plant fragments.
- Re-spreading of stockpiled topsoil and native plant fragments to minimum six-inch depth (amend topsoil when necessary).
- Application of native plant revegetation seed mix in combination with scattered rock mulch.

- Supplemental irrigation to establish plantings when necessary (two-year minimum by maintenance contract).
- Invasive and noxious weed control (two-year minimum by maintenance contract).

Construction and Maintenance Management Practices

- Dust control practices.
- Construction fencing to preserve sensitive areas.
- Maintenance period to ensure establishment of native revegetation.
- Development of a native revegetation general maintenance program.

Project Components Required for Compliance

- All practices must be in compliance with applicable federal and state regulations.

Roadway Lighting

- Thirty-foot pole with galvanized finish, concrete foundation, and high pressure sodium luminaire (rural areas).
- Thirty-foot pole with powder-coat finish, concrete foundation with acrylic powder-coated base color application, and high pressure sodium luminaire with shoe-box fixture (community zones).

Wildlife Crossing

- Underpass or overpass structures to allow maintenance of natural migration and animal travel patterns.
- Cast-in-place concrete bridges with textured finish and two-color paint palette.
- Wire mesh fencing with painted steel post supports.

PROCESS

Costs (in 2008 dollars) for individual hardscape and softscape treatments were gathered from several sources. NDOT, local engineering and landscape architecture firms, contractors, and product manufacturers provided cost information for treatments such as pedestrian crosswalks, curb extensions, raised planters, concrete formliner imprints, retaining walls, and landscape irrigation. This information was analyzed and compiled into a database that could be applied to several prototypical examples of landscape and aesthetic treatment levels. The softscape and hardscape costs presented here represent the capital costs of construction and do not include extended maintenance costs. The treatments correlate to those presented in the *NDOT Landscape and Aesthetics Master Plan*. A separate report prepared by the University of Nevada, Las Vegas (UNLV), entitled *Maintenance Cost Study for Corridor Planning*, examines long-term maintenance costs such as graffiti removal, pruning, and irrigation.

Prototypical designs for each of the five softscape types and four hardscape treatments were created for sections of highway rights-of-way outside of communities, in developing commercial areas, and in downtown areas. Within communities, designs were created for two-lane, three-lane, and four-lane roadway conditions. The project area was then incorporated into the estimate to create the square foot and acre cost analysis.

Overall cost estimates for each level of treatment were developed from this analysis and compared to the costs from actual projects for verification. A similar process was applied to actual projects to create per-square-foot and per-acre costs for each hardscape and softscape type for comparison.

COST ESTIMATES

Cost information presented here is provided for the purpose of long-range planning and budgeting. It is not intended to substitute for a project-level detailed cost projection.

Softscape Treatments

Using the process described above, planning-level construction cost estimates for the different softscape treatments were determined in 2008 dollars. They are as follows:

Softscape Type Cost Estimate (sf & acre)

Ground Treatment / Native Revegetation:

\$1.35 - \$1.60/sf
 \$58,800 - \$69,700/acre
 L & A Cost \$0.00/sf
 L & A Cost \$0.00/acre

Enhanced Native:

\$1.70 - \$1.90/sf
 \$74,000 - \$82,800/acre
 L & A Cost \$0.30 - \$0.35/sf
 L & A Cost \$13,100 - \$15,200/acre

Regionally Adapted:

\$2.70 - \$3.25/sf
 \$117,600 - \$141,600/acre
 L & A Cost \$1.35 - \$1.65/sf
 L & A Cost \$58,800 - \$71,900/acre

Regional Ornamental:

\$4.15 - \$7.30/sf
 \$180,800 - \$318,000/acre
 L & A Cost \$2.80 - \$5.70/sf
 L & A Cost \$122,000 - \$248,300/acre

The cost for ground treatment/native revegetation is covered under the general construction costs as part of the NDOT standard. The data shown for the different treatment levels represents a total cost. The landscape & aesthetics cost is the portion of the total cost that is above the NDOT standard. For example, a regionally adapted softscape costs about \$1.35 per square foot more than the standard ground treatment / native revegetation level of treatment, for a total cost of \$2.70 per square foot (\$1.35 + \$1.35 = \$2.70). The additional \$1.35 per square foot is funded through the landscape and aesthetics budget (3% for new construction) or community partnerships because it is above and beyond the NDOT standard. The regional ornamental treatment exhibits the widest range of costs due to the highly customized nature of this treatment.

Structures and Hardscape Treatments

Within communities, curbs, sidewalks, and medians compose the majority of hardscape costs. Along elevated highways and bypasses, bridges and sound walls are the main hardscape cost components. For the purposes of cost estimation, the right-of-way conditions established for softscape costs were also used to determine hardscape costs. In addition, a 12,000 square foot (60 feet by 200 feet) bridge was assumed for elevated highways and bypasses. The estimates for the various hardscape levels are:

Hardscape Type Cost Estimate (sf & total)

Standard:
 \$130 - \$135/sf
 \$1,552,000 - \$1,680,000 total
 L & A Cost \$0.00/sf
 L & A Cost \$0.00 total

Accentuated:

\$148 - \$160/sf
 \$1,764,000 - \$1,900,000 total
 L & A Cost \$18 - \$25/sf
 L & A Cost \$212,000 - \$220,000 total

Focal:

\$200 - \$218/sf
 \$2,400,000 - \$2,615,000 total
 L & A Cost \$70 - \$83/sf
 L & A Cost \$848,000 - \$935,000 total

Landmark:

\$252 - \$300/sf
 \$2,964,000 - \$3,528,000 total
 L & A Cost \$122 - \$165/sf
 L & A Cost \$1,412,000 - \$1,848,000 total

The cost for the standard treatment would be covered by the general capital construction budget. The treatment levels are represented as a total cost and the landscape & aesthetics cost represents the portion to be covered by the landscape and aesthetics 3% for new construction or community partnerships. The landmark level shows the widest range

in cost because of the custom nature of many elements that are included in this treatment, such as complex concrete form liners, custom railings, and transportation art.

To place the estimates in the context of a highway corridor, an estimate was calculated for a one-mile section of road. Typical sections of highway right-of-way (ROW) for rural and community applications were developed. Two-lane (50-foot ROW), three-lane (76-foot ROW), and four-lane (102-foot ROW) examples for both suburban and downtown applications were used to determine this value (Figures 16-47, pages 4.4 - 4.11). The approximate softscape and hardscape costs to develop one mile of corridor right-of-way at each treatment level were estimated.

STRUCTURES AND HARDSCAPE TYPES AND TREATMENTS

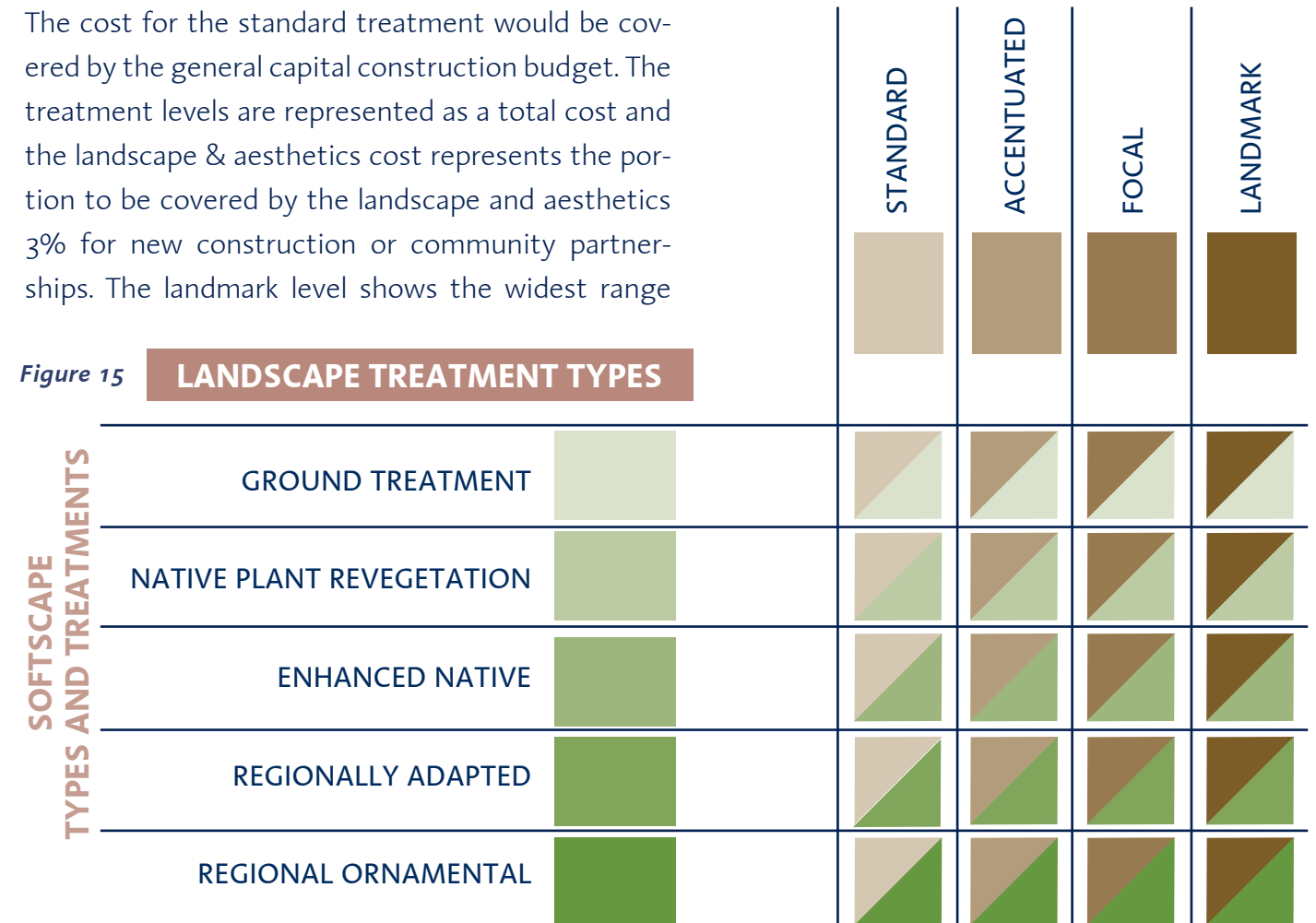
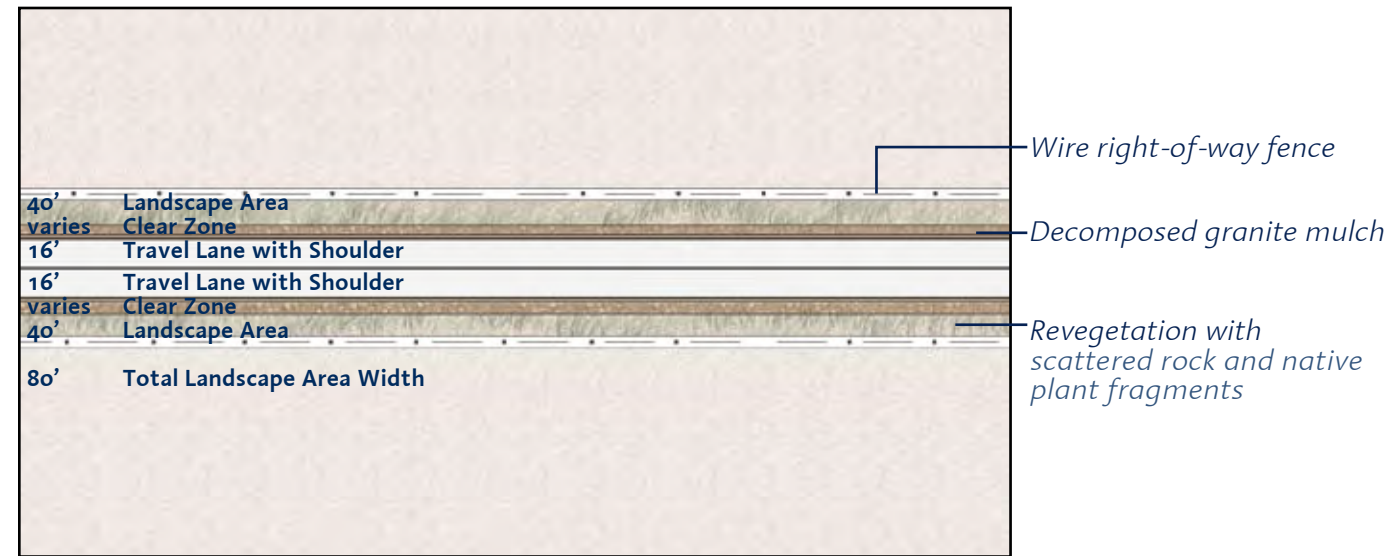


Figure 15 LANDSCAPE TREATMENT TYPES

FIGURE 16 - RURAL HIGHWAY

Softscape Types - **Ground Treatment/Native Revegetation**
Structures and Hardscape Type - **Standard**

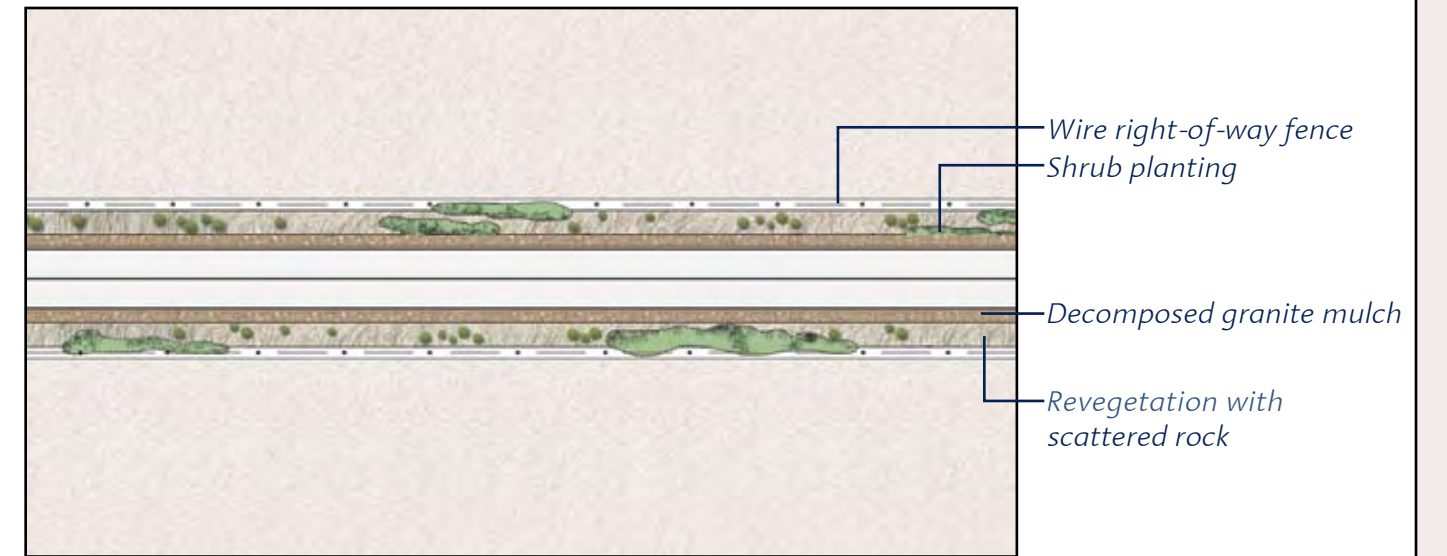


Total Cost: \$39,000 - \$47,000/acre of ROW area

L & A Cost: \$0/acre

FIGURE 17 - RURAL HIGHWAY

Softscape Types - **Enhanced Native**
Structures and Hardscape Type - **Accentuated**

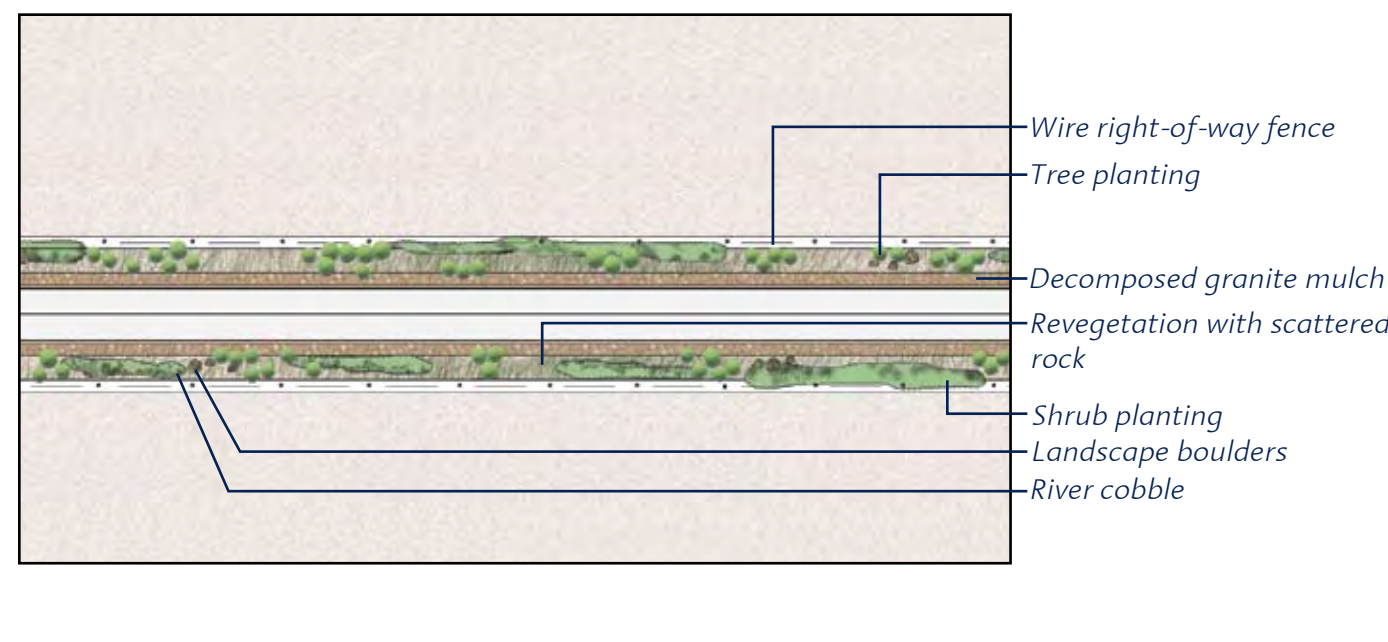


Total Cost: \$48,000 - \$56,500/acre of ROW area

L & A Cost: \$9,000 - \$9,500/acre

FIGURE 18 - RURAL HIGHWAY

Softscape Types - **Regionally Adapted**
Structures and Hardscape Type - **Focal**

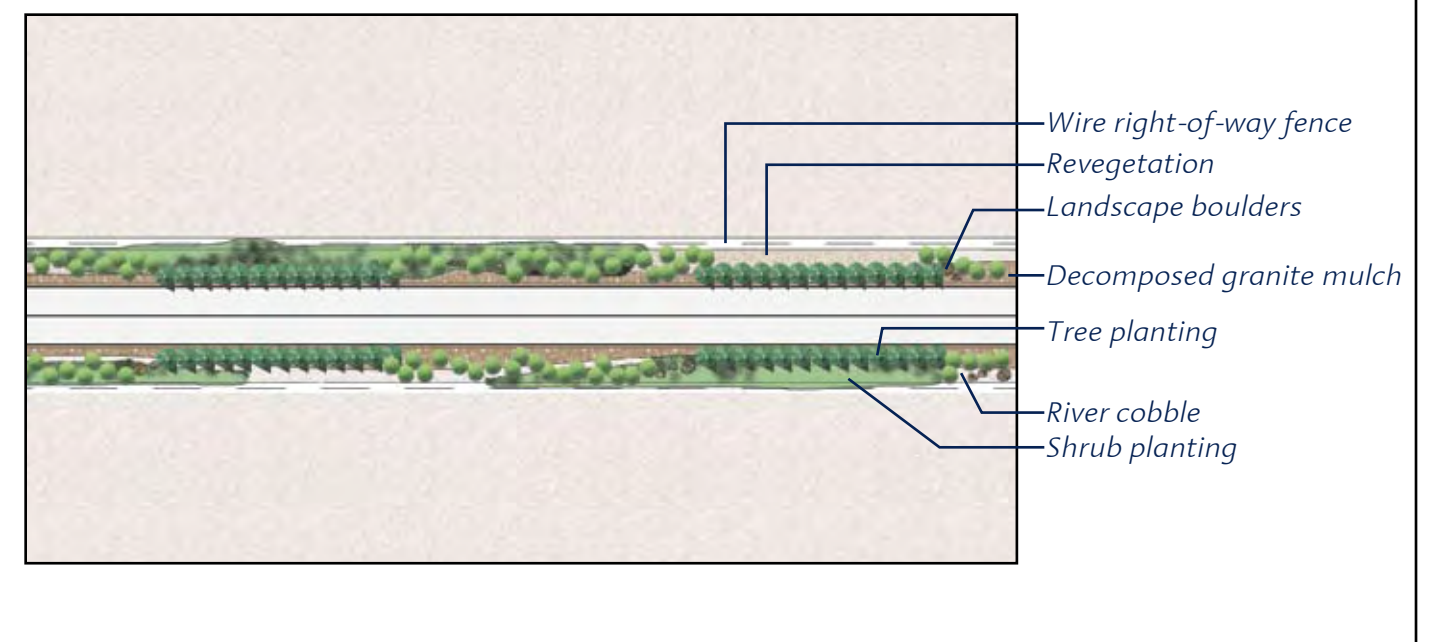


Total Cost: \$77,000 - \$95,000/acre of ROW area

L&A Cost: \$38,000 - \$48,000/acre

FIGURE 19 - RURAL HIGHWAY

Softscape Types - **Regional Ornamental**
Structures and Hardscape Type - **Landmark**

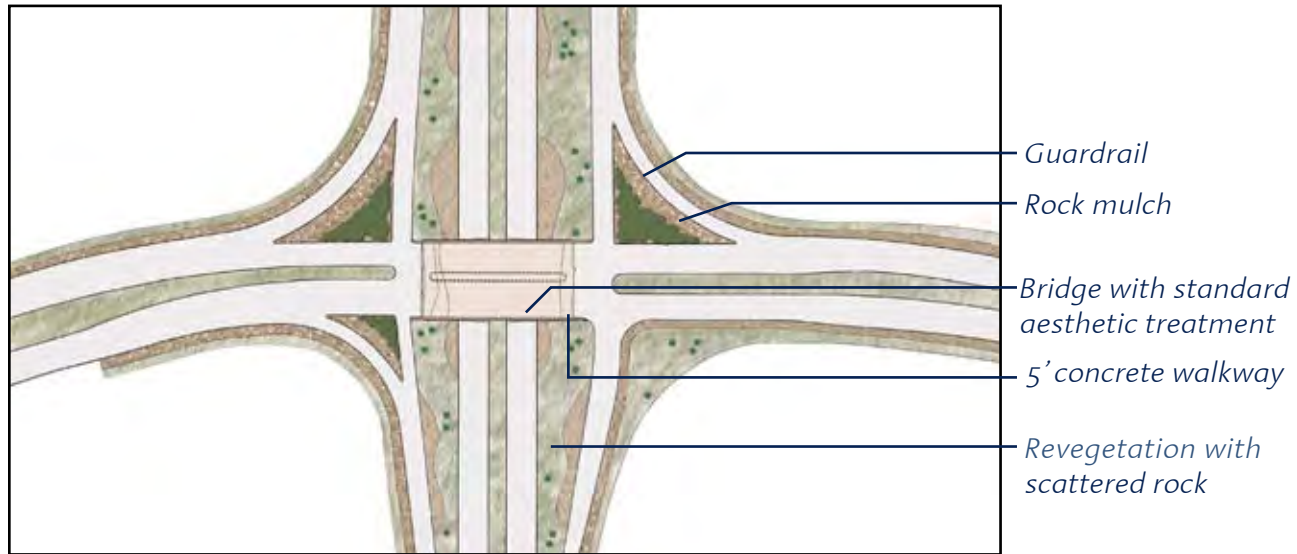


Total Cost: \$120,000 - \$207,000/acre of ROW area

L&A Cost: \$81,000 - \$160,000/acre

FIGURE 20 - FREEWAY OR ELEVATED HIGHWAY INTERCHANGES

Softscape Types - **Ground Treatment/Native Revegetation**
Structures and Hardscape Type - **Standard**

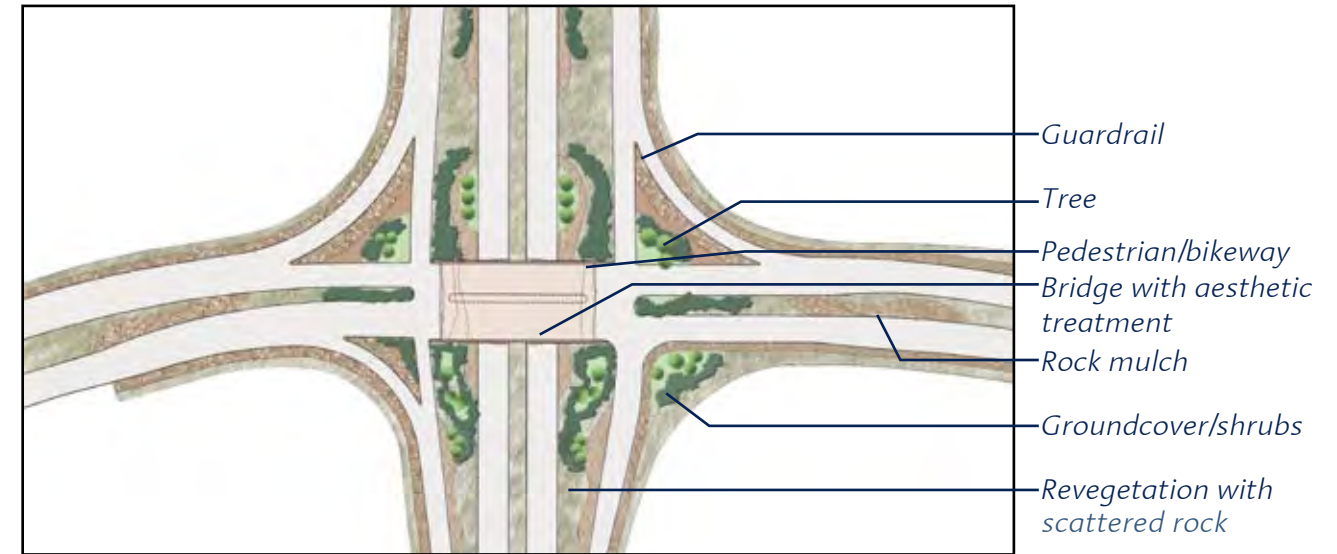


Total Cost: \$1,999,000 (infield landscape and bridge deck)

L & A Cost: \$0.00/acre

FIGURE 21 - FREEWAY OR ELEVATED HIGHWAY INTERCHANGES

Softscape Types - **Enhanced Native**
Structures and Hardscape Type - **Accentuated**

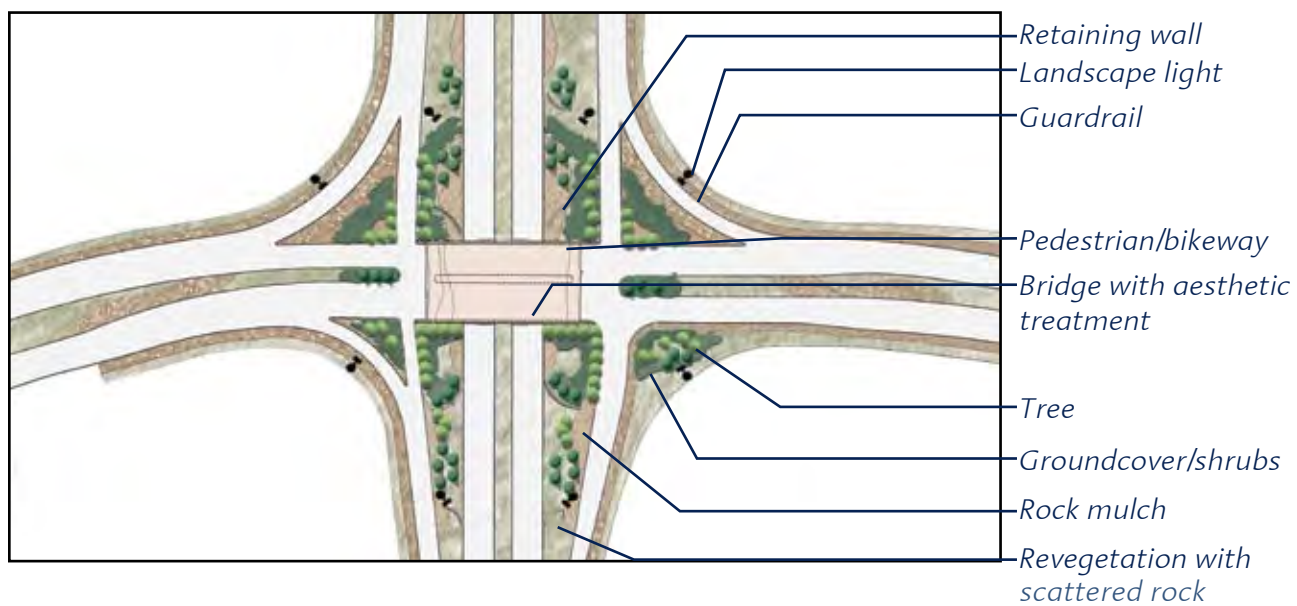


Total Cost: \$2,352,000 (infield landscape and bridge deck)

L & A Cost: \$353,000/acre

FIGURE 22 - FREEWAY OR ELEVATED HIGHWAY INTERCHANGES

Softscape Types - **Regionally Adapted**
Structures and Hardscape Type - **Focal**

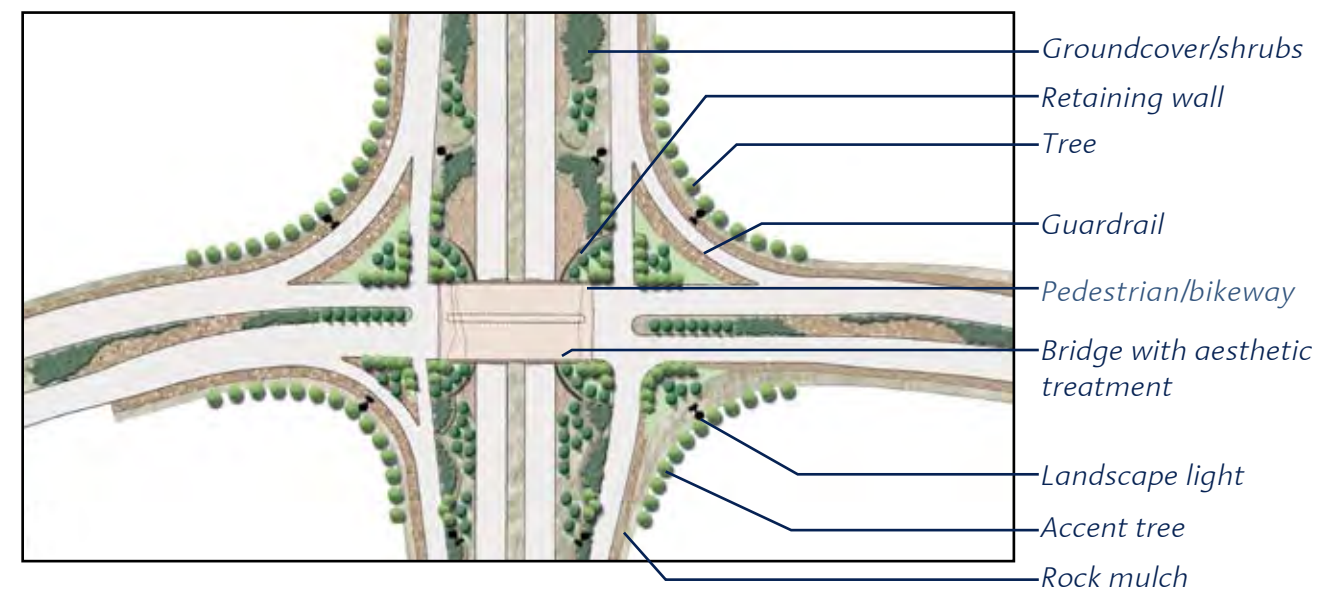


Total Cost: \$3,237,000 (infield landscape and bridge deck)

L & A Cost: \$1,238,000/acre

FIGURE 23 - FREEWAY OR ELEVATED HIGHWAY INTERCHANGES

Softscape Types - **Regional Ornamental**
Structures and Hardscape Type - **Landmark**

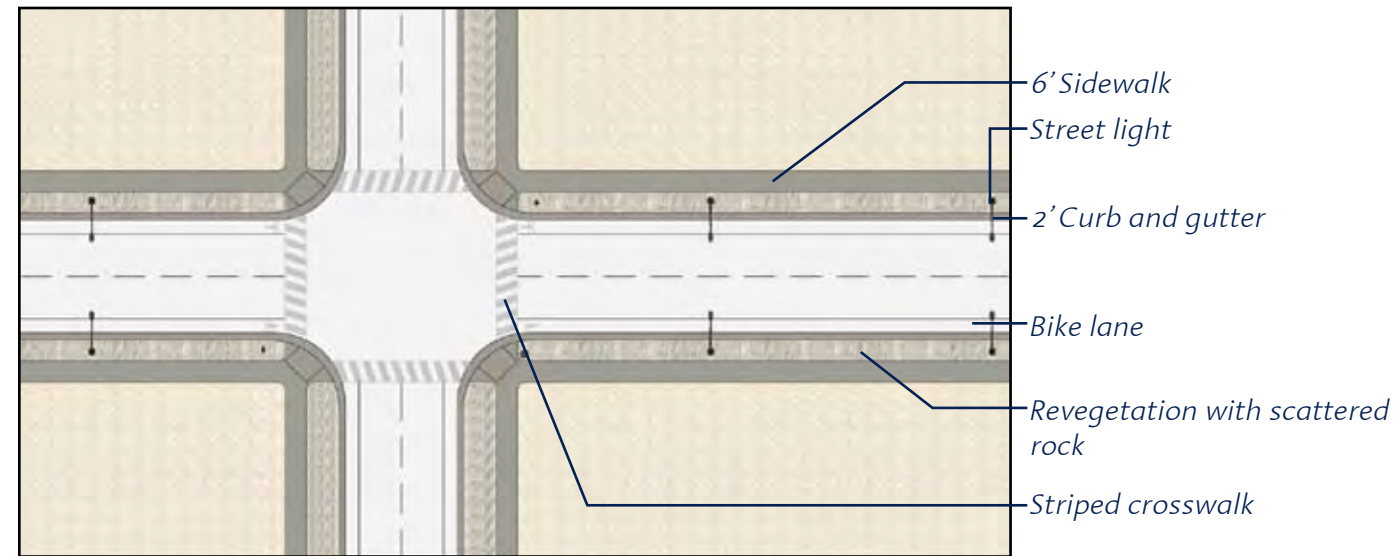


Total Cost: \$4,704,000 (infield landscape and bridge deck)

L & A Cost: \$2,705,000/acre

FIGURE 24 - TWO-LANE SUBURBAN HIGHWAY

Softscape Types - **Ground Treatment/Native Revegetation**
Structures and Hardscape Type - **Standard**

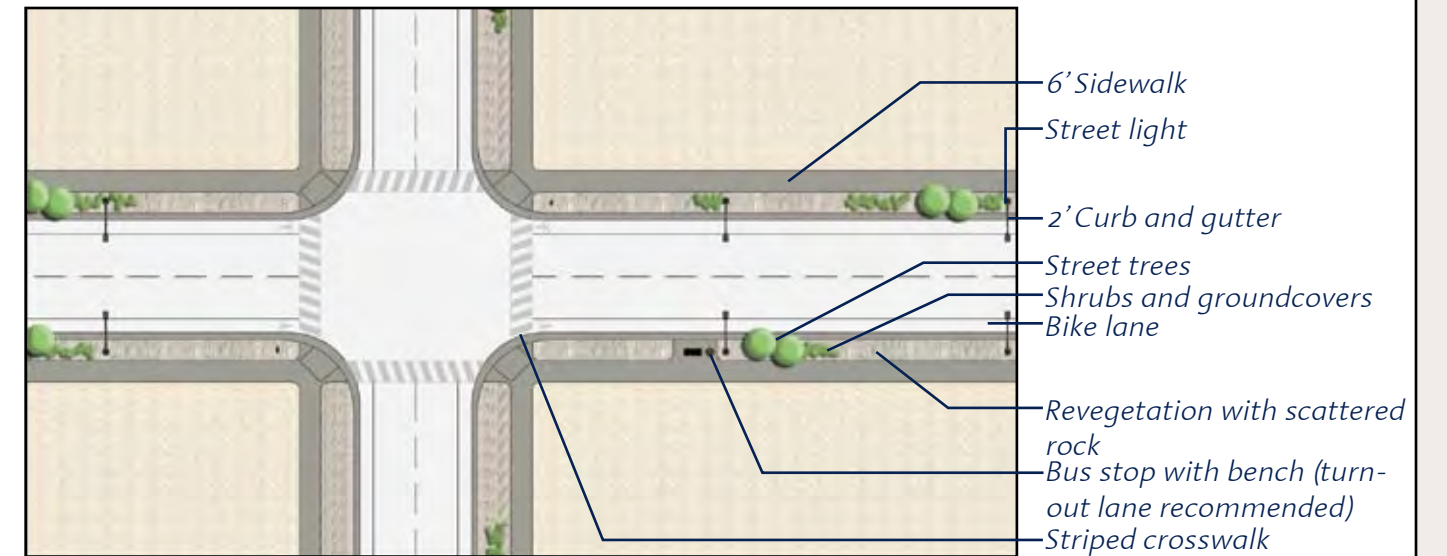


Total Cost: \$1,822,000 - \$2,137,000/mile of ROW

L&A Cost: \$0.00/mile

FIGURE 25 - TWO-LANE SUBURBAN HIGHWAY

Softscape Types - **Enhanced Native**
Structures and Hardscape Type - **Accentuated**

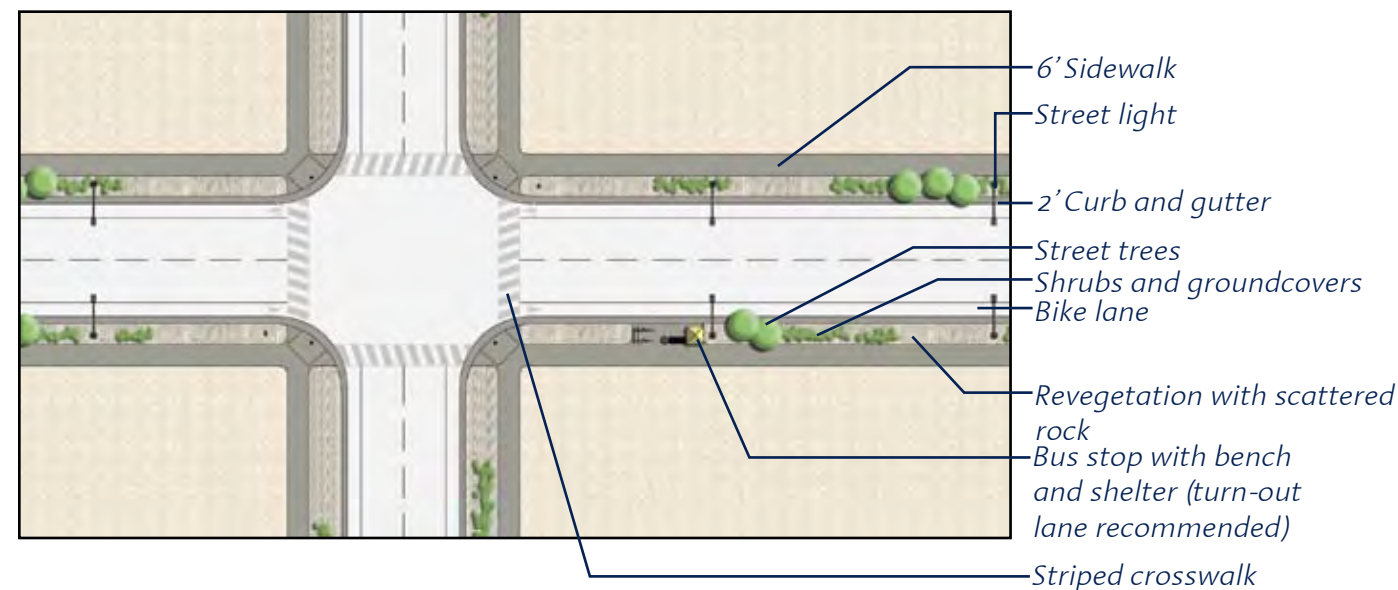


Total Cost: \$1,900,000 - \$2,268,000/mile of ROW

L&A Cost: \$78,000 - \$131,000/mile

FIGURE 26 - TWO-LANE SUBURBAN HIGHWAY

Softscape Types - **Regionally Adapted**
Structures and Hardscape Type - **Focal**

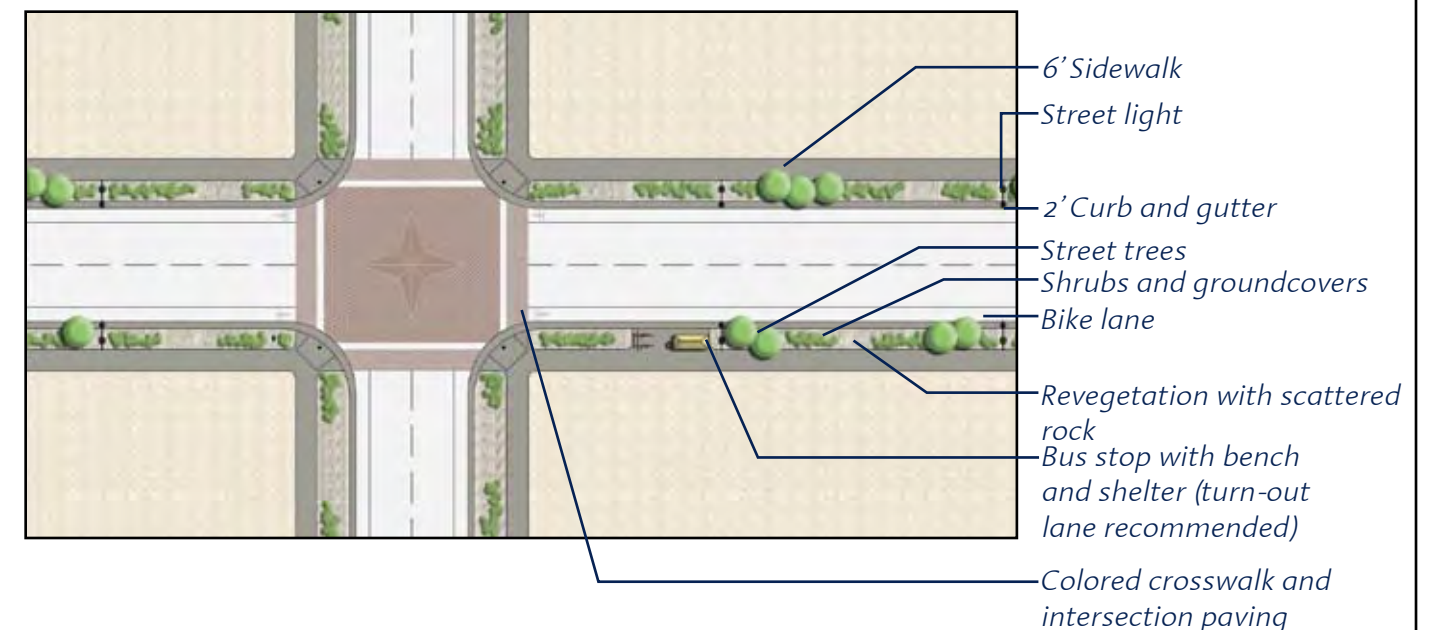


Total Cost: \$2,383,000 - \$2,810,000/mile of ROW

L&A Cost: \$561,000 - \$673,000/mile

FIGURE 27 - TWO-LANE SUBURBAN HIGHWAY

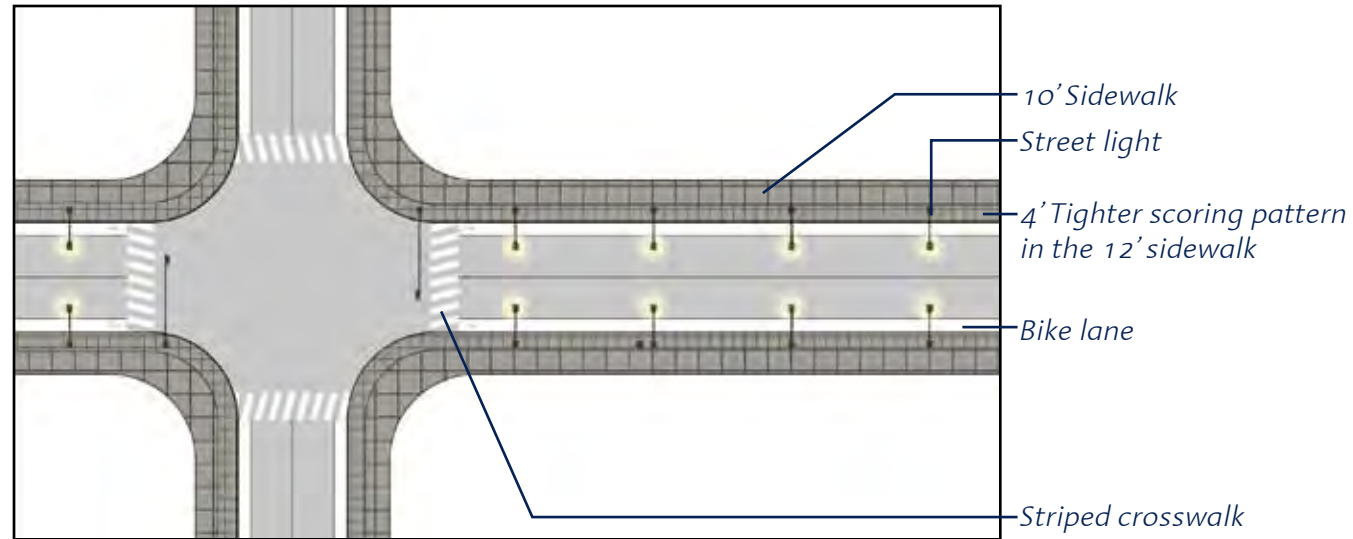
Softscape Types - **Regional Ornamental**
Structures and Hardscape Type - **Landmark**



Total Cost: \$3,188,000 - \$4,856,000/mile of ROW

L&A Cost: \$1,366,000 - \$2,719,000/mile

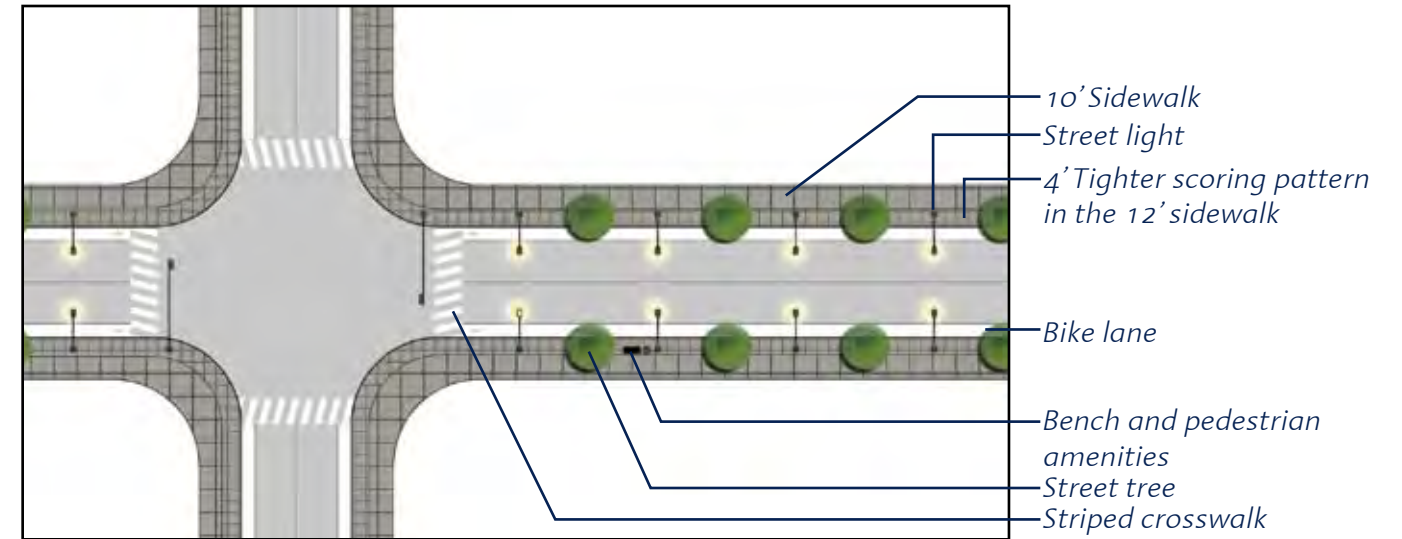
FIGURE 28 - TWO-LANE DOWNTOWN HIGHWAY
 Softscape Types - **Ground Treatment/Native Revegetation**
 Structures and Hardscape Type - **Standard**



Total Cost: \$3,526,000 - \$4,081,000/mile of ROW

L&A Cost: \$0.00/mile

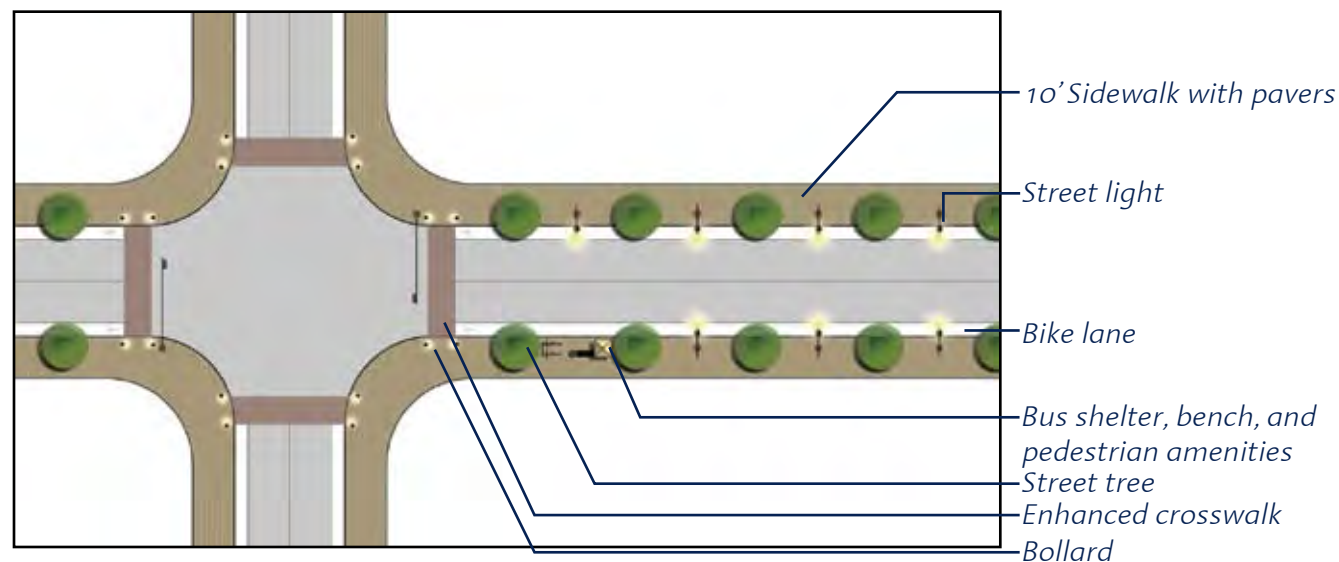
FIGURE 29 - TWO-LANE DOWNTOWN HIGHWAY
 Softscape Types - **Enhanced Native**
 Structures and Hardscape Type - **Accentuated**



Total Cost: \$3,830,000 - \$4,450,000/mile of ROW

L&A Cost: \$304,000 - \$369,000/mile

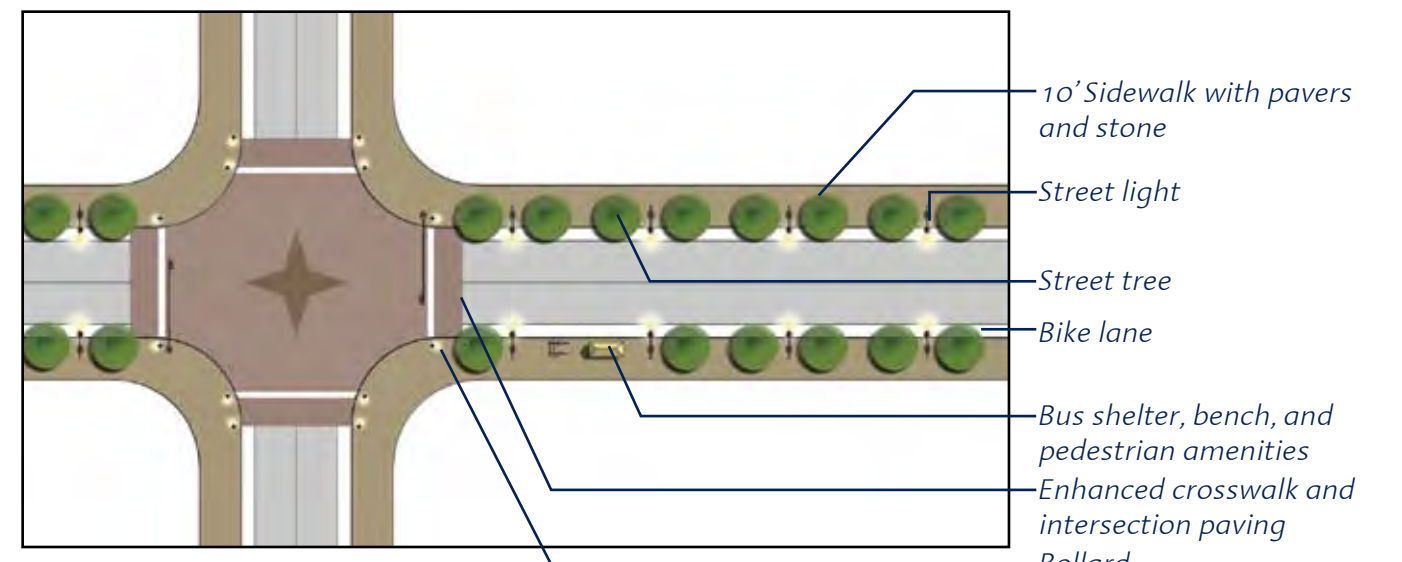
FIGURE 30 - TWO-LANE DOWNTOWN HIGHWAY
 Softscape Types - **Regionally Adapted**
 Structures and Hardscape Type - **Focal**



Total Cost: \$4,724,000 - \$6,282,000/mile of ROW

L&A Cost: \$1,198,000 - \$2,201,000/mile

FIGURE 31 - TWO-LANE DOWNTOWN HIGHWAY
 Softscape Types - **Regional Ornamental**
 Structures and Hardscape Type - **Landmark**

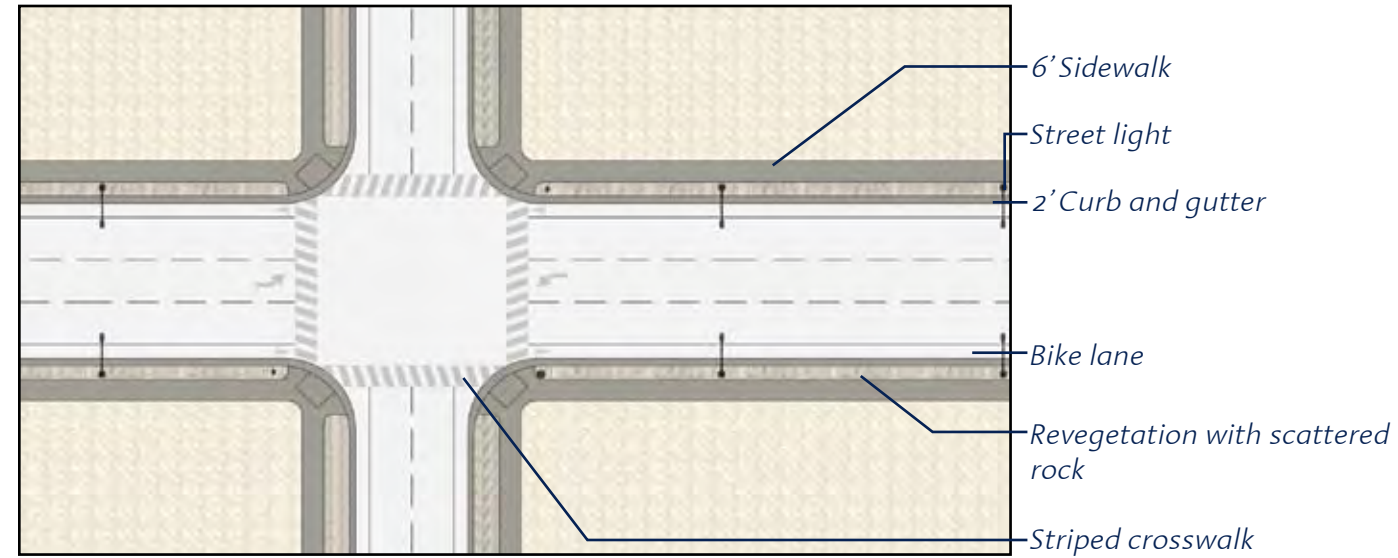


Total Cost: \$6,248,000 - \$9,060,000/mile of ROW

L&A Cost: \$2,722,000 - \$4,979,000/mile

FIGURE 32 - THREE-LANE SUBURBAN HIGHWAY

Softscape Types - **Ground Treatment/Native Revegetation**
Structures and Hardscape Type - **Standard**

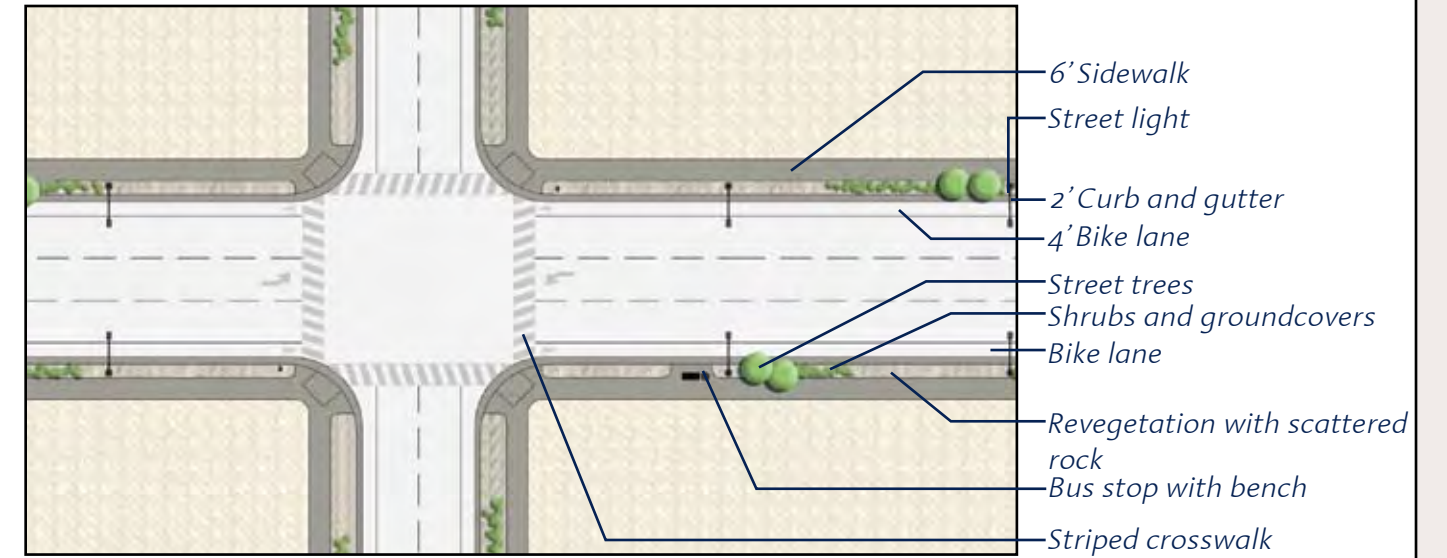


Total Cost: \$1,845,000 - \$2,166,000/mile of ROW

L&A Cost: \$0.00/mile

FIGURE 33 - THREE-LANE SUBURBAN HIGHWAY

Softscape Types - **Enhanced Native**
Structures and Hardscape Type - **Accentuated**

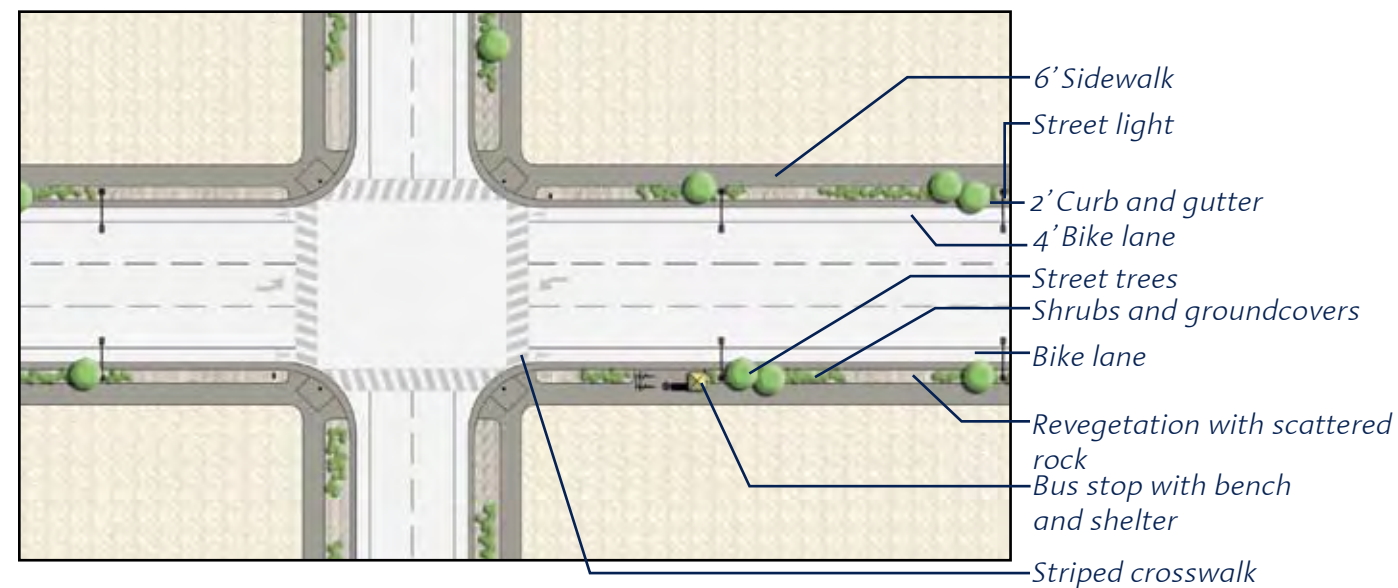


Total Cost: \$1,910,000 - \$2,277,000/mile of ROW

L&A Cost: \$65,000 - \$111,000/mile

FIGURE 34 - THREE-LANE SUBURBAN HIGHWAY

Softscape Types - **Regionally Adapted**
Structures and Hardscape Type - **Focal**

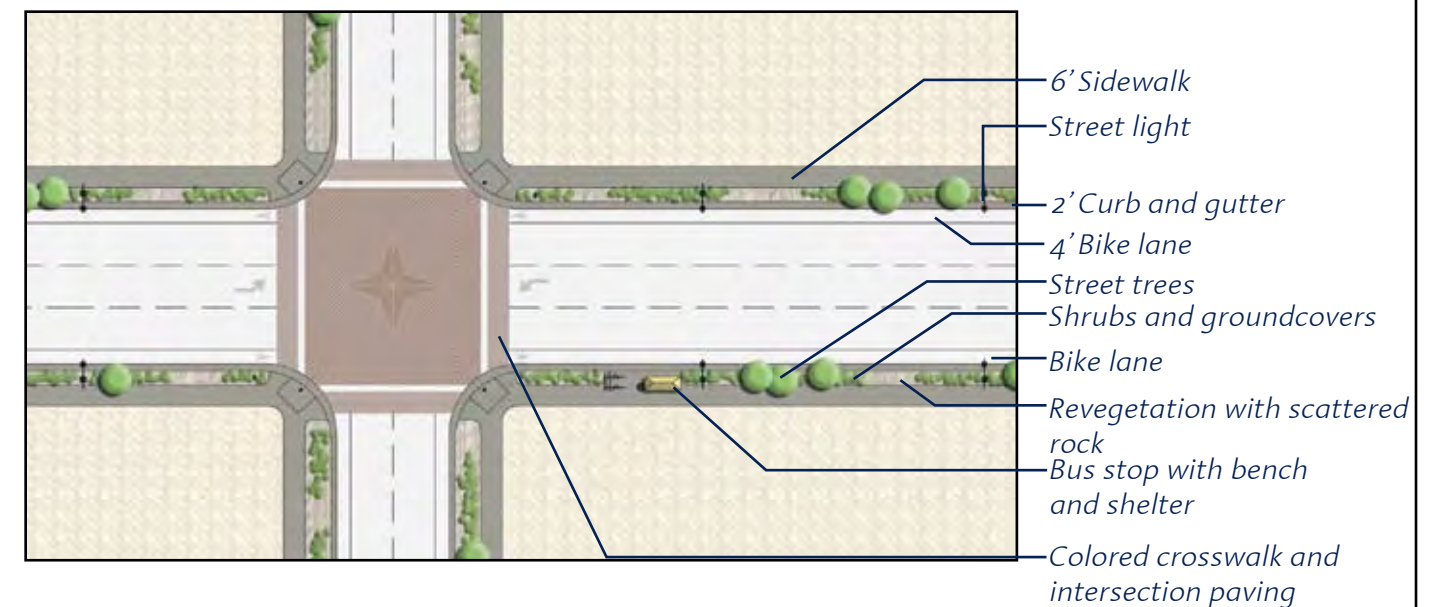


Total Cost: \$2,408,000 - \$2,839,000/mile of ROW

L&A Cost: \$563,000 - \$673,000/mile

FIGURE 35 - THREE-LANE SUBURBAN HIGHWAY

Softscape Types - **Regional Ornamental**
Structures and Hardscape Type - **Landmark**

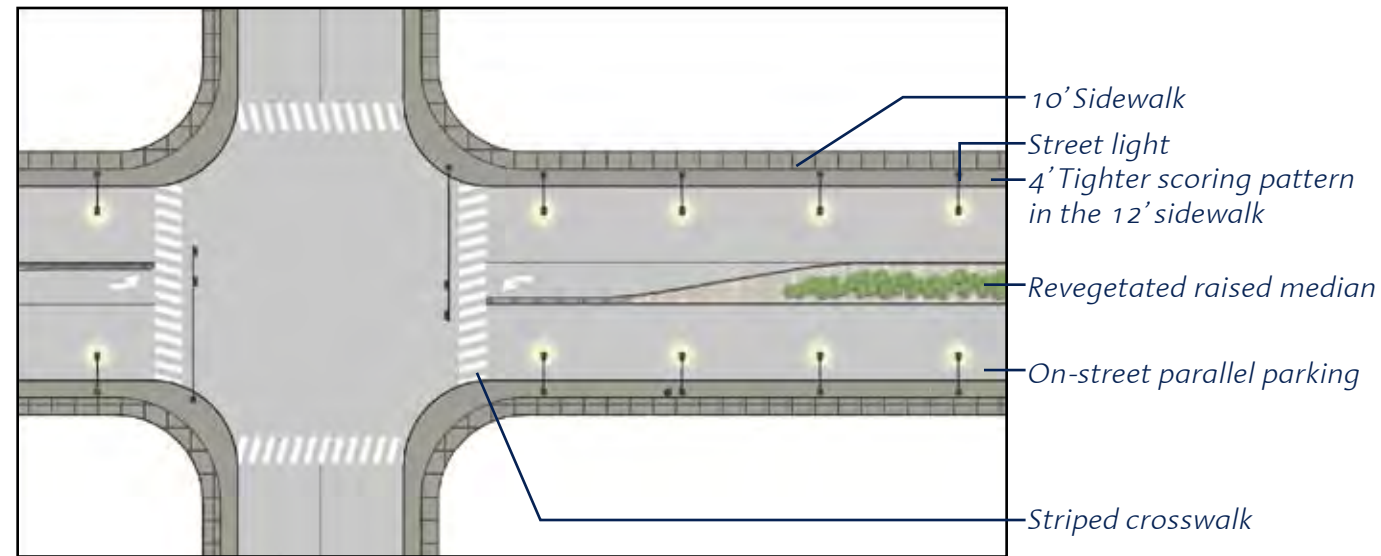


Total Cost: \$3,340,000 - \$5,096,000/mile of ROW

L&A Cost: \$1,495,000 - \$2,930,000/mile

FIGURE 36 - THREE-LANE DOWNTOWN HIGHWAY

Softscape Types - **Ground Treatment/Native Revegetation**
Structures and Hardscape Type - **Standard**

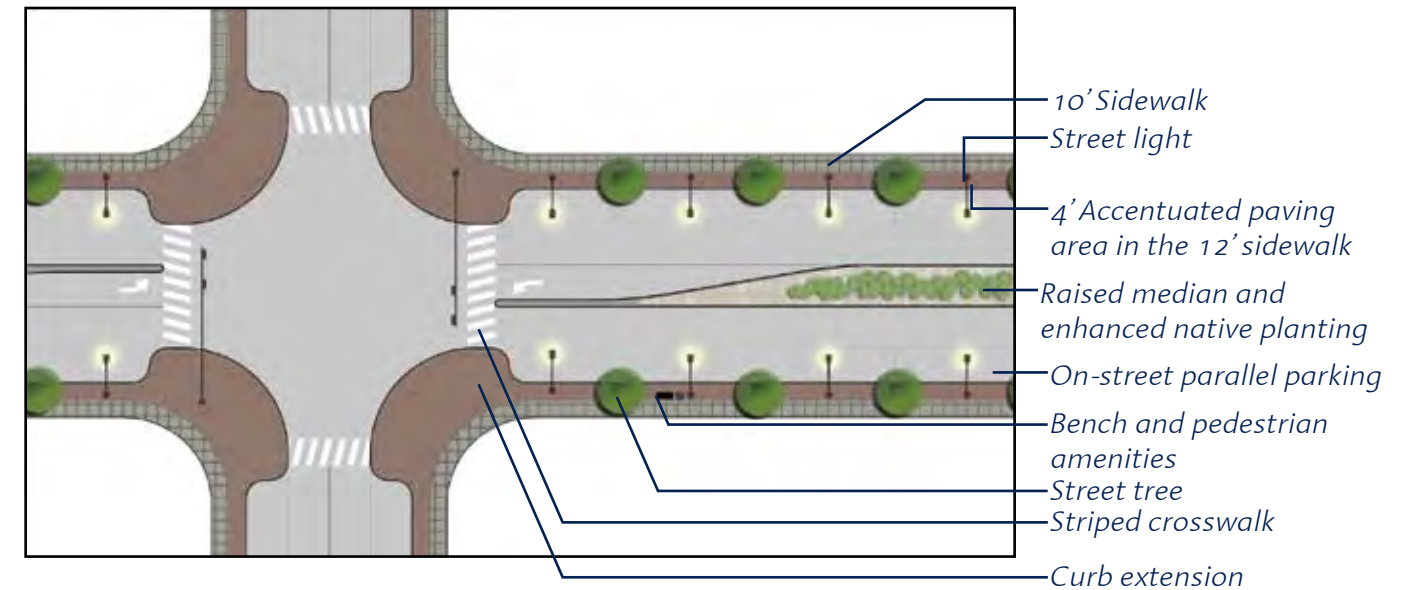


Total Cost: \$3,473,000 - \$4,025,000/mile of ROW

L&A Cost: \$0.00/mile

FIGURE 37 - THREE-LANE DOWNTOWN HIGHWAY

Softscape Types - **Enhanced Native**
Structures and Hardscape Type - **Accentuated**

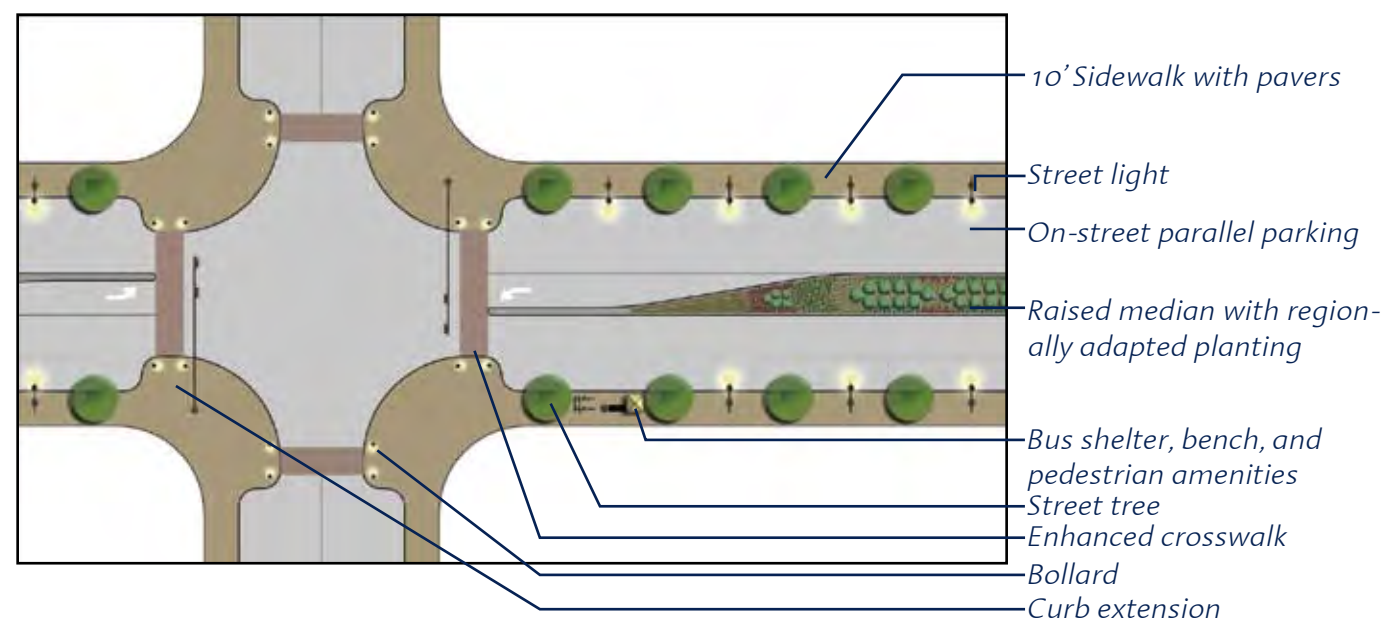


Total Cost: \$4,911,000 - \$5,559,000/mile of ROW

L&A Cost: \$1,438,000 - \$1,534,000/mile

FIGURE 38 - THREE-LANE DOWNTOWN HIGHWAY

Softscape Types - **Regionally Adapted**
Structures and Hardscape Type - **Focal**

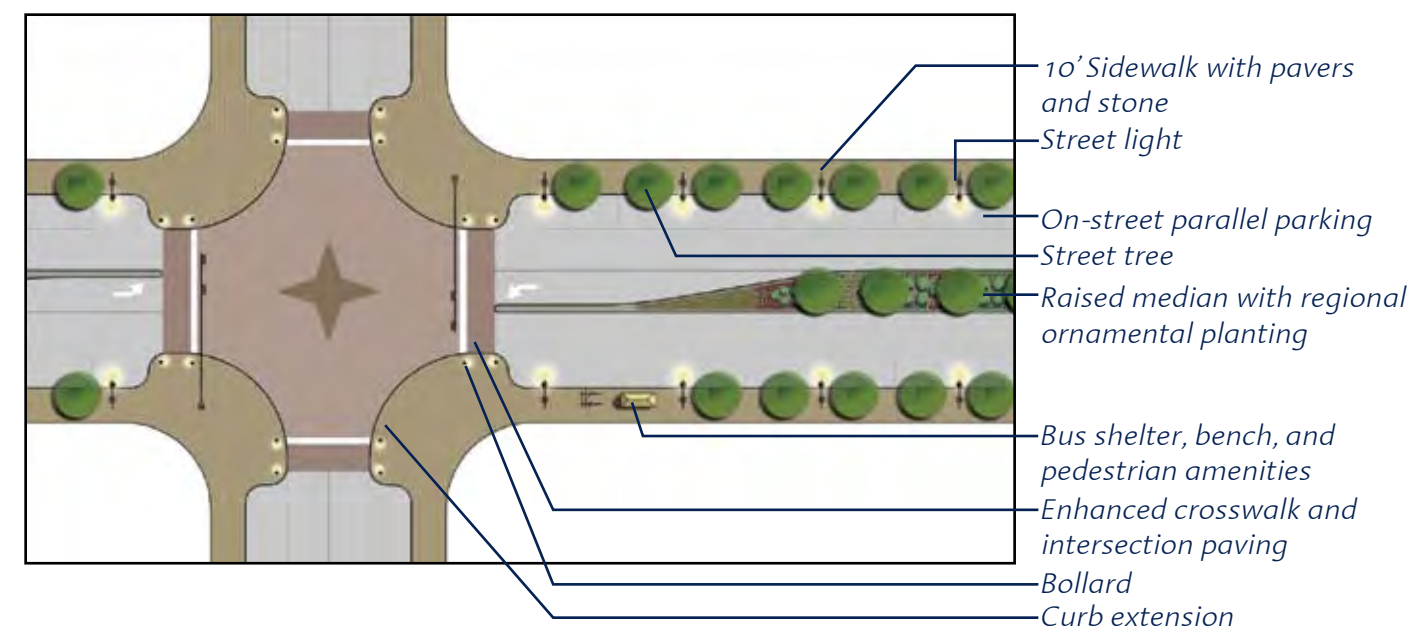


Total Cost: \$5,352,000 - \$7,419,000/mile of ROW

L&A Cost: \$1,879,000 - \$3,394,000/mile

FIGURE 39 - THREE-LANE DOWNTOWN HIGHWAY

Softscape Types - **Regional Ornamental**
Structures and Hardscape Type - **Landmark**

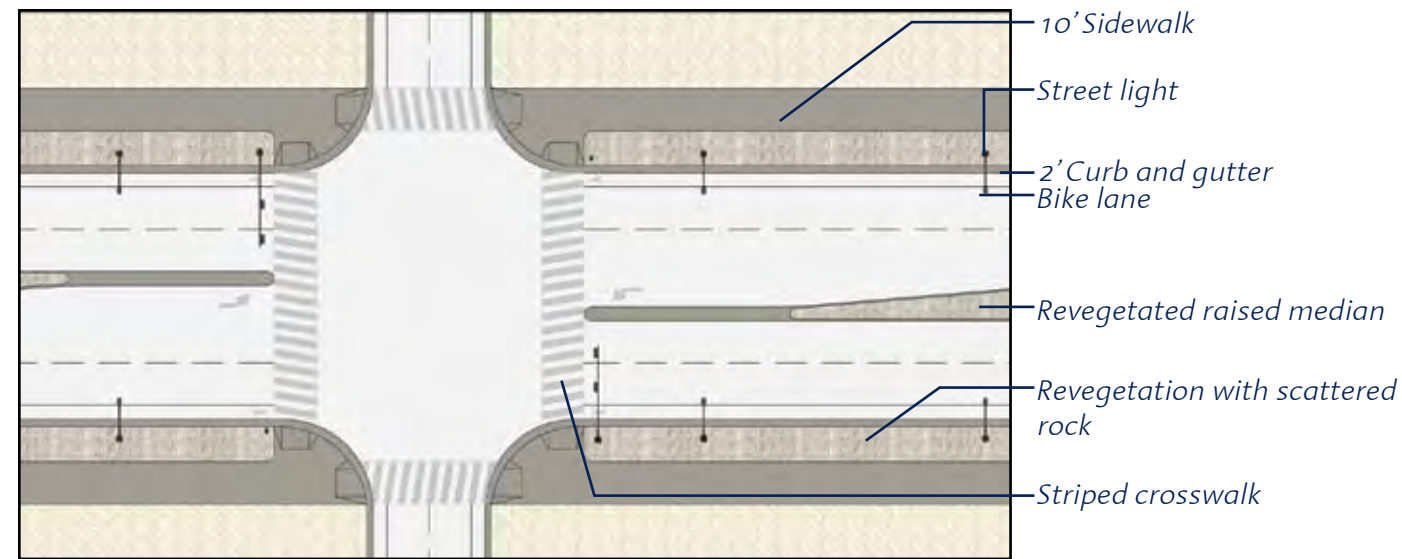


Total Cost: \$6,637,000 - \$8,300,000/mile of ROW

L&A Cost: \$3,164,000 - \$4,275,000/mile

FIGURE 40 - FOUR-LANE SUBURBAN HIGHWAY

Softscape Types - **Ground Treatment/Native Revegetation**
Structures and Hardscape Type - **Standard**

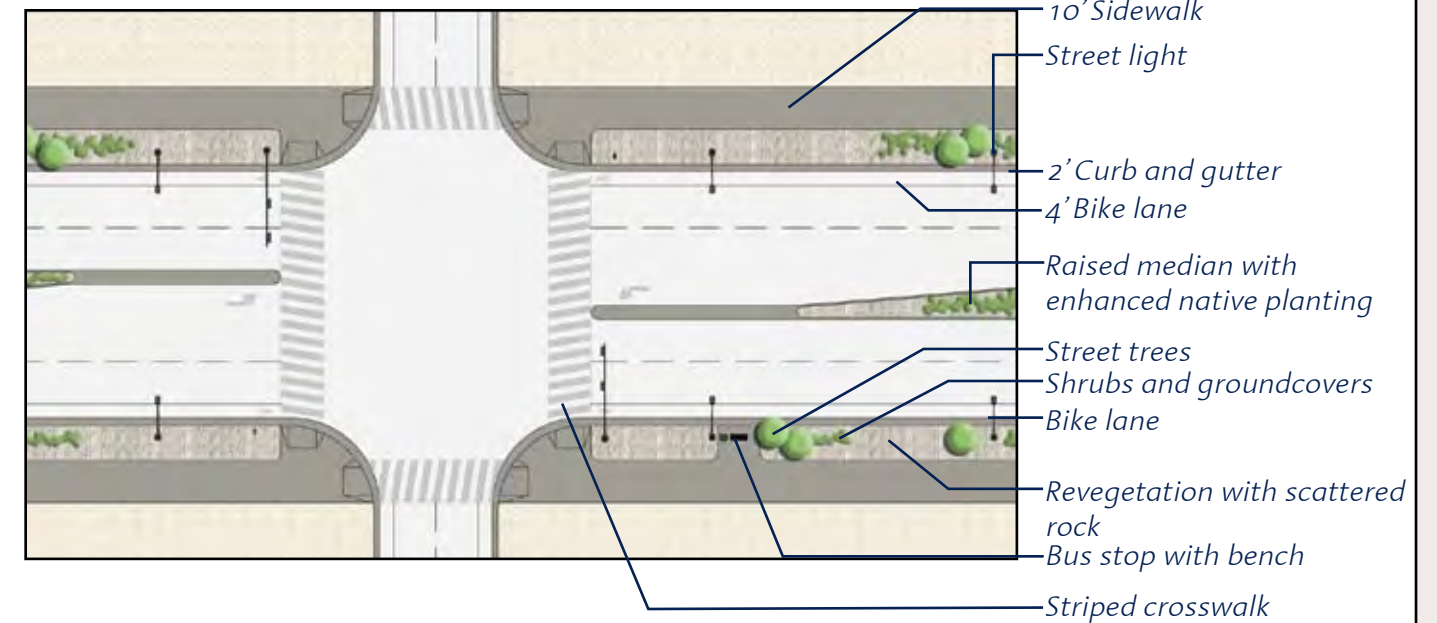


Total Cost: \$2,776,000 - \$3,266,000/mile of ROW

L&A Cost: \$0.00/mile

FIGURE 41 - FOUR-LANE SUBURBAN HIGHWAY

Softscape Types - **Enhanced Native**
Structures and Hardscape Type - **Accentuated**

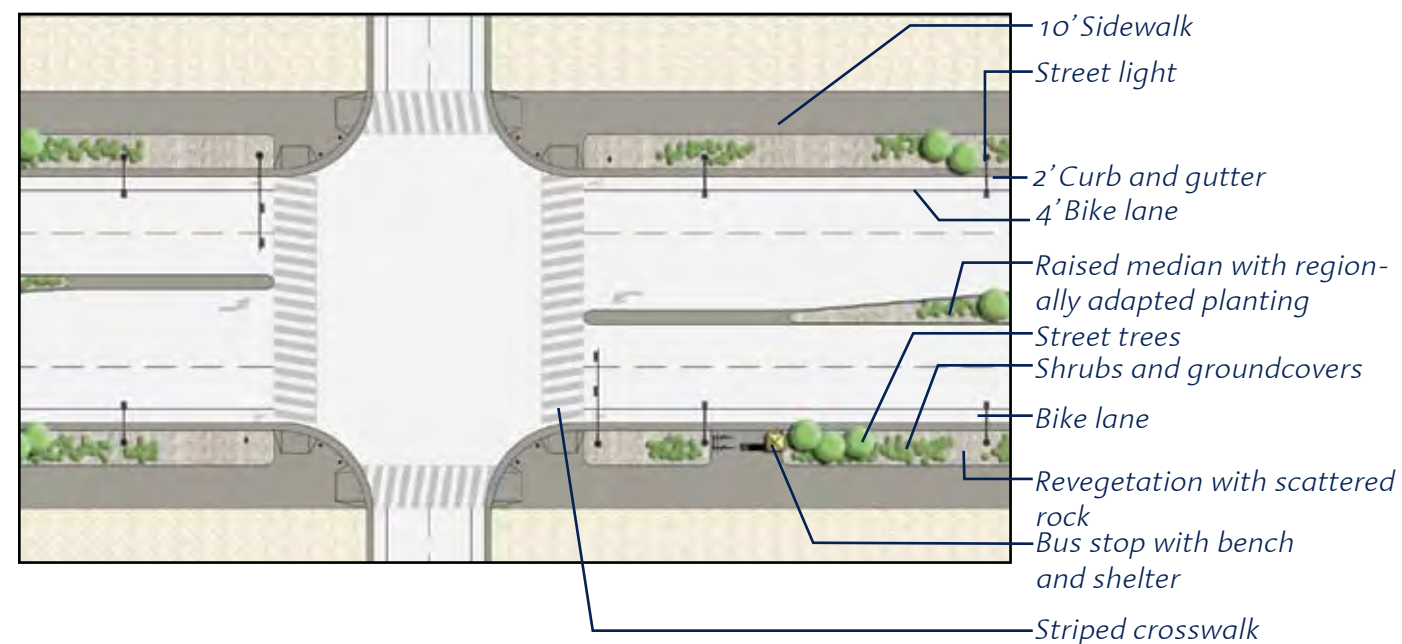


Total Cost: \$2,936,000 - \$3,487,000/mile of ROW

L&A Cost: \$160,000 - \$221,000/mile

FIGURE 42 - FOUR-LANE SUBURBAN HIGHWAY

Softscape Types - **Regionally Adapted**
Structures and Hardscape Type - **Focal**

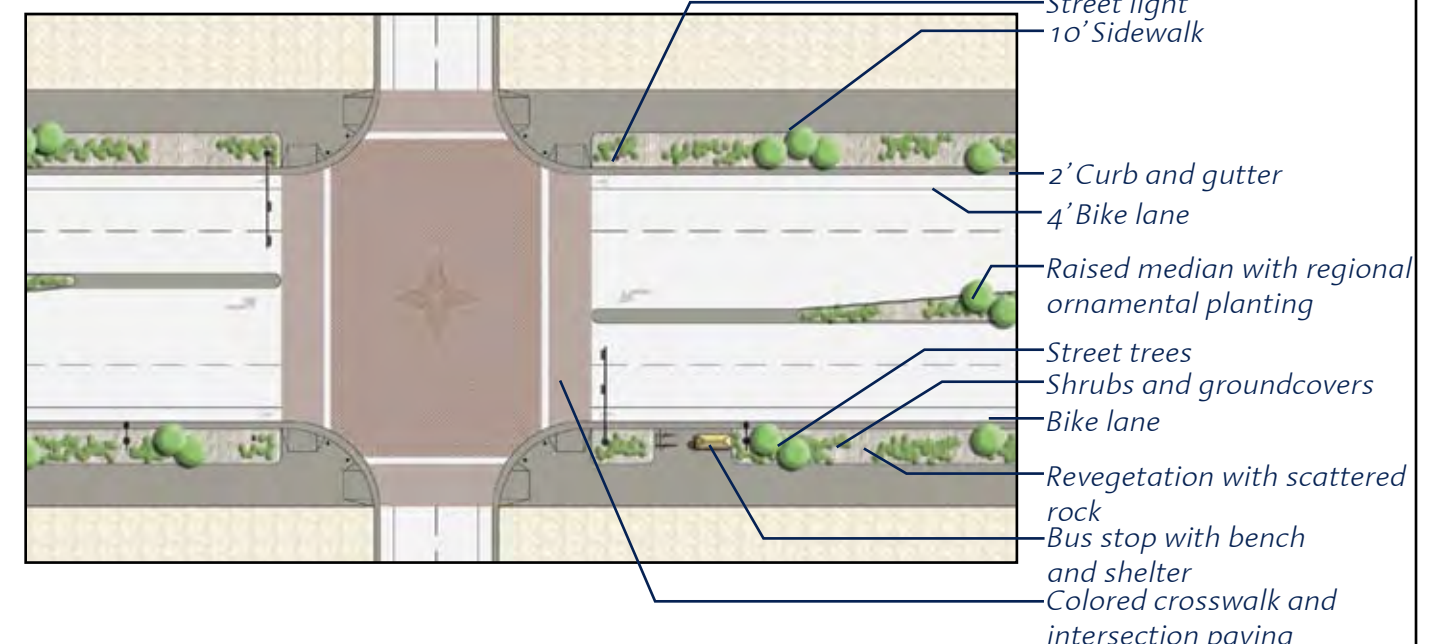


Total Cost: \$3,880,000 - \$4,523,000/mile of ROW

L&A Cost: \$1,104,000 - \$1,257,000/mile

FIGURE 43 - FOUR-LANE SUBURBAN HIGHWAY

Softscape Types - **Regional Ornamental**
Structures and Hardscape Type - **Landmark**

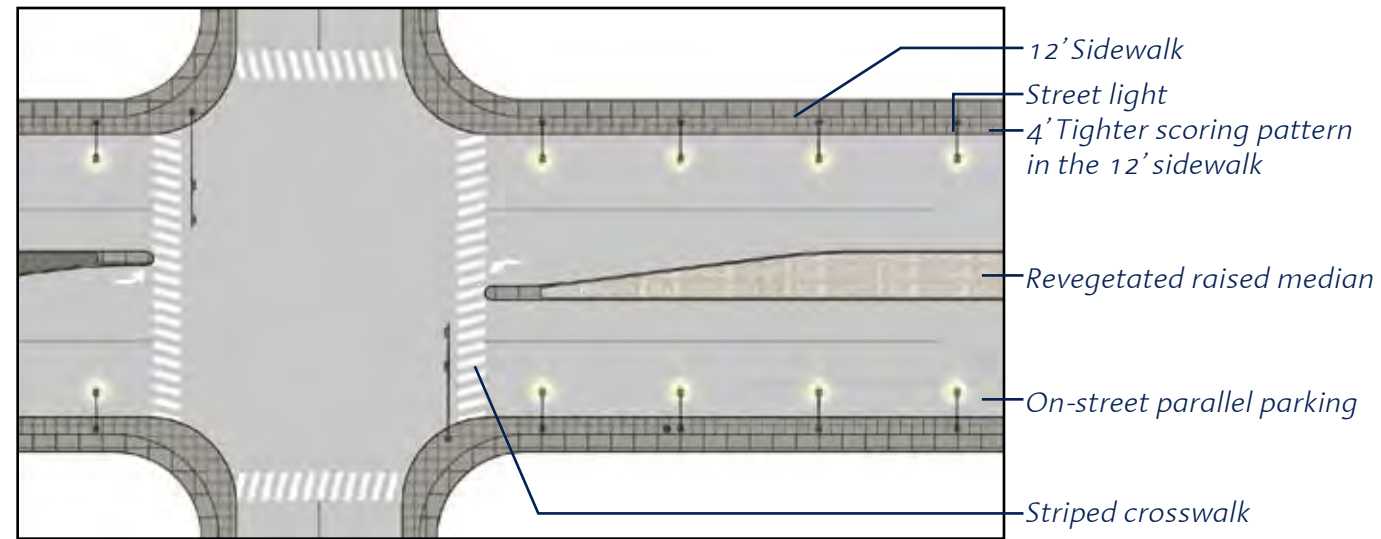


Total Cost: \$5,173,000 - \$8,025,000/mile of ROW

L&A Cost: \$2,397,000 - \$4,759,000/mile

FIGURE 44 - FOUR-LANE DOWNTOWN HIGHWAY

Softscape Types - **Ground Treatment/Native Revegetation**
Structures and Hardscape Type - **Standard**

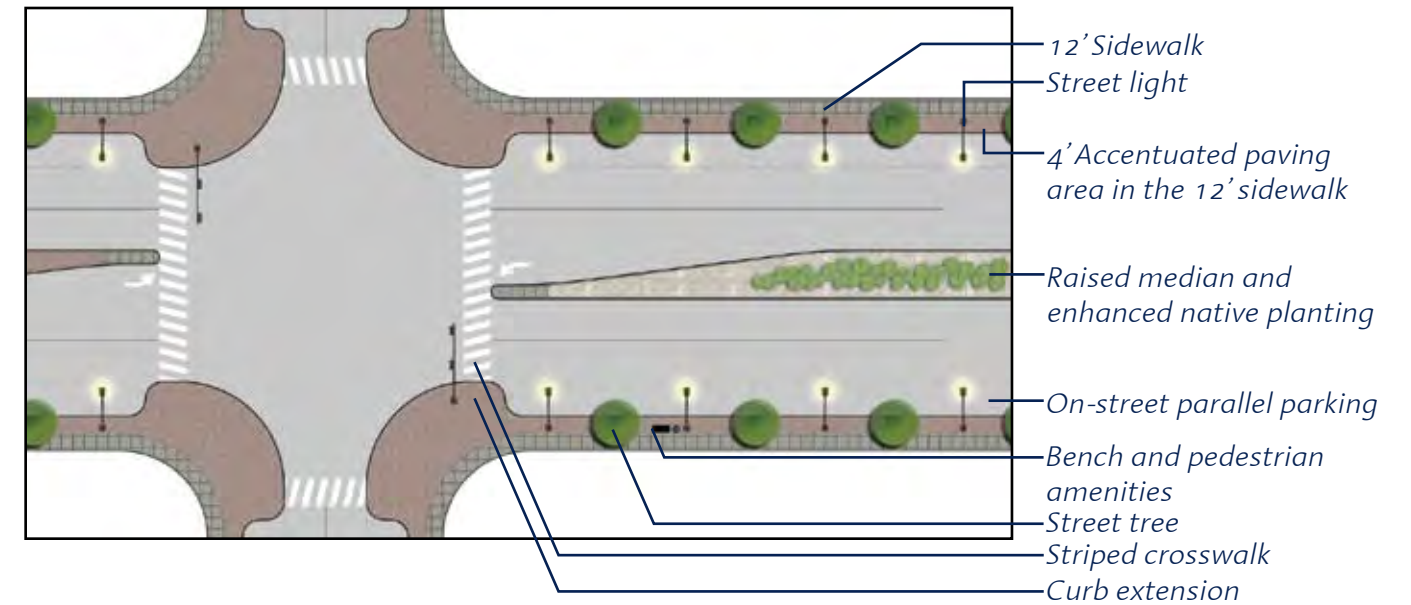


Total Cost: \$3,553,000 - \$4,123,000/mile of ROW

L&A Cost: \$0.00/mile

FIGURE 45 - FOUR-LANE DOWNTOWN HIGHWAY

Softscape Types - **Enhanced Native**
Structures and Hardscape Type - **Accentuated**

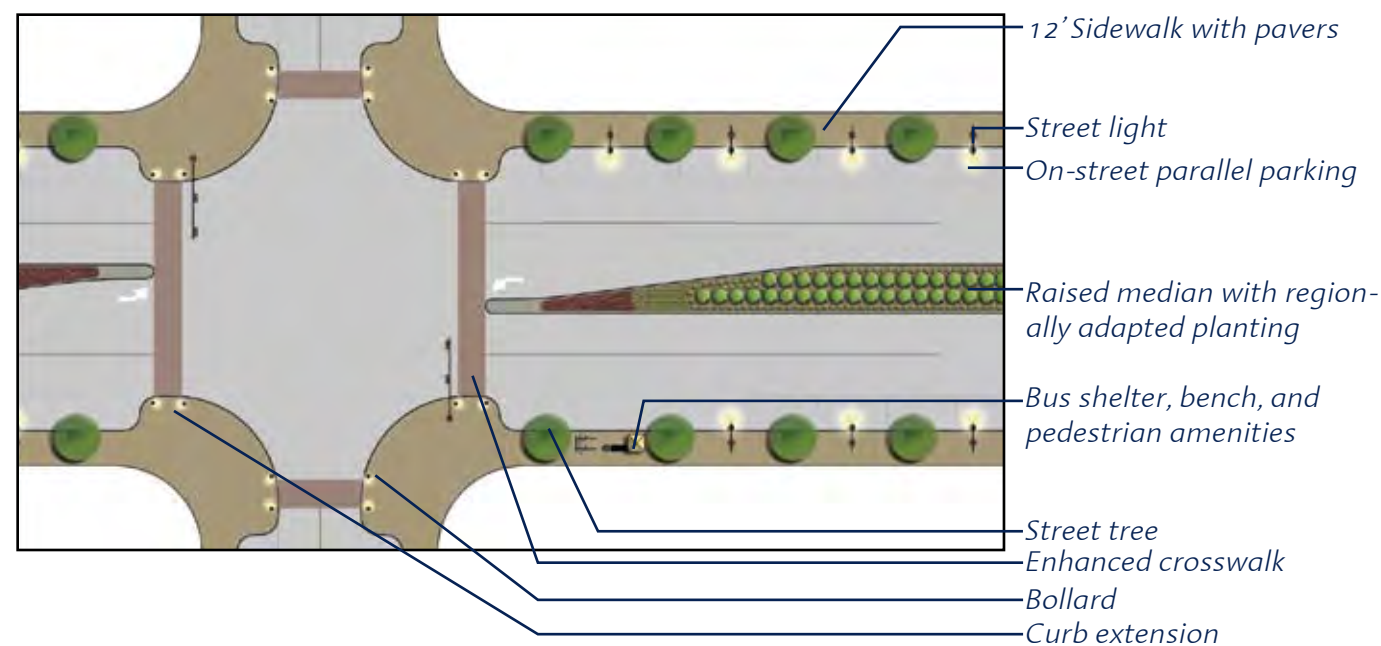


Total Cost: \$5,034,000 - \$5,739,000/mile of ROW

L&A Cost: \$1,481,000 - \$1,616,000/mile

FIGURE 46 - FOUR-LANE DOWNTOWN HIGHWAY

Softscape Types - **Regionally Adapted**
Structures and Hardscape Type - **Focal**

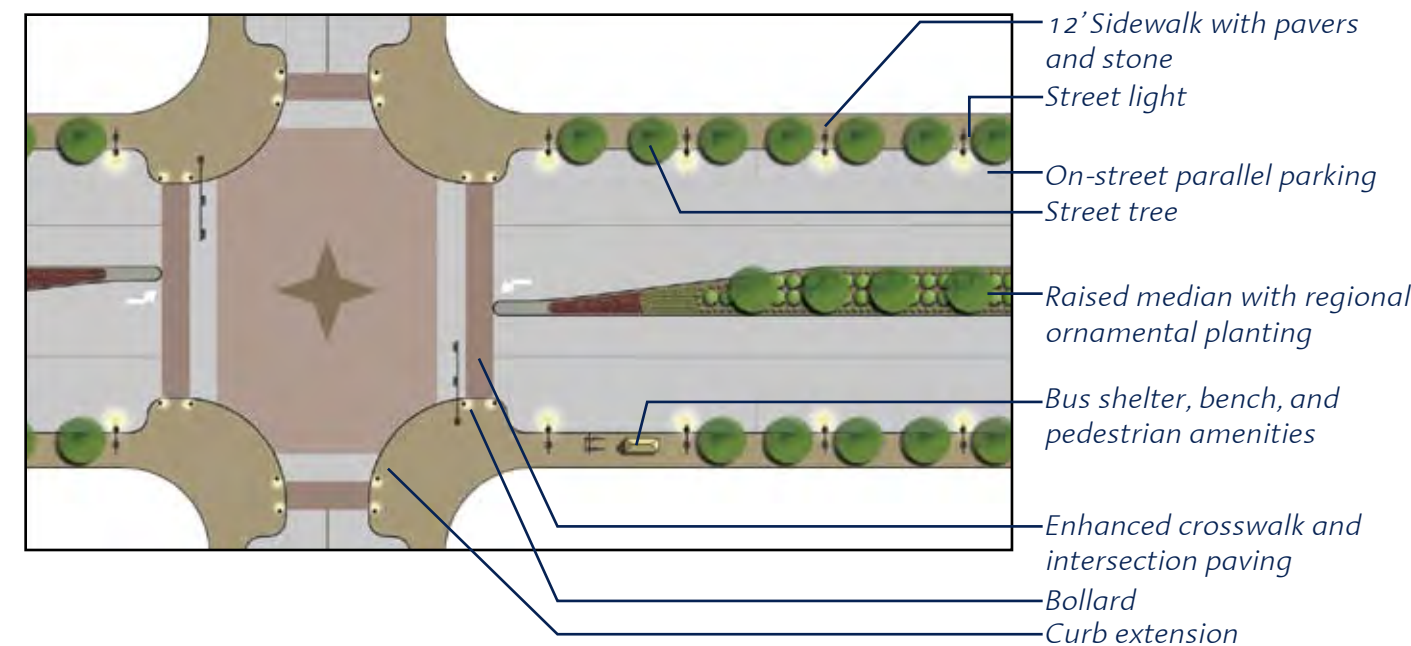


Total Cost: \$5,625,000 - \$7,698,000/mile of ROW

L&A Cost: \$2,072,000 - \$3,575,000/mile

FIGURE 47 - FOUR-LANE DOWNTOWN HIGHWAY

Softscape Types - **Regional Ornamental**
Structures and Hardscape Type - **Landmark**

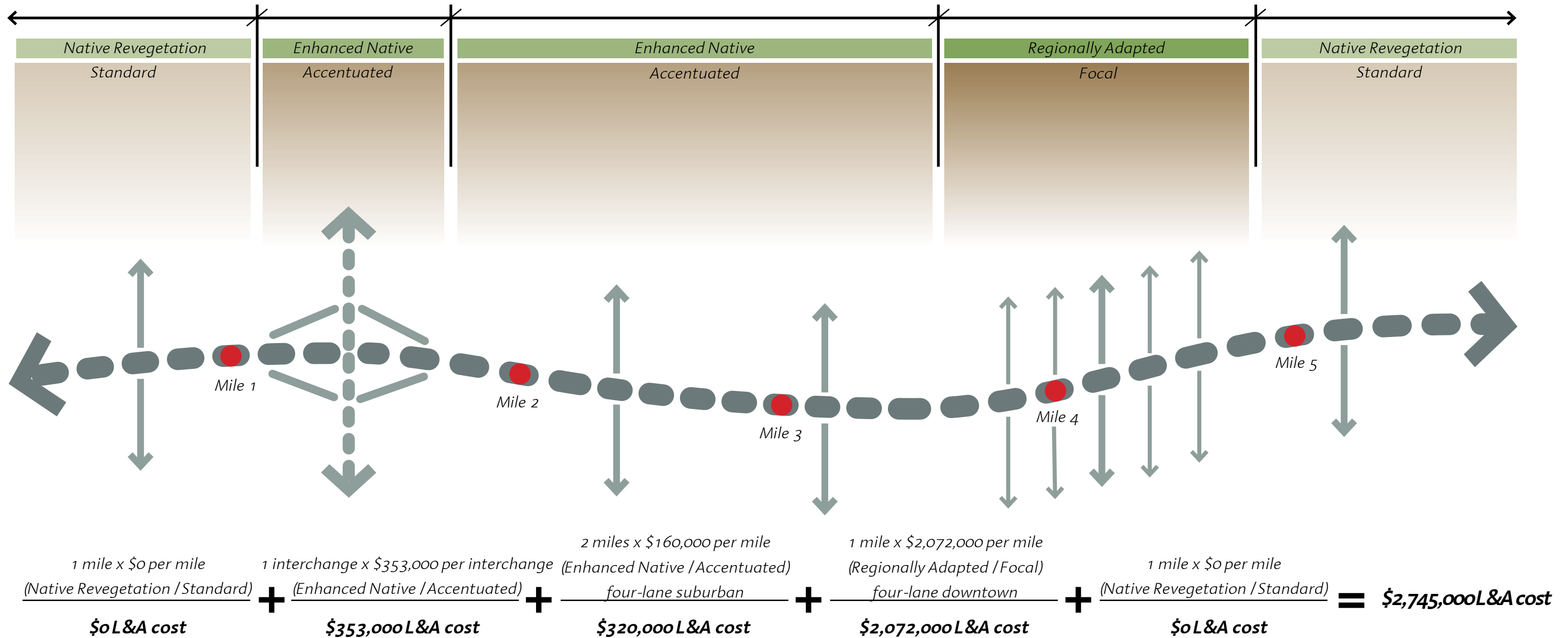


Total Cost: \$7,077,000 - \$10,569,000/mile of ROW

L&A Cost: \$3,524,000 - \$6,446,000/mile

The diagram below shows how the cost estimate information can be used to determine a planning-level estimate of the landscape and aesthetics costs for this hypothetical seven-mile section of highway corridor. The costs shown are for landscape and aesthetic enhancements that are above the defined NDOT standard.

Figure 48 - Planning Level Cost Estimate



MAINTENANCE COSTS

The Corridor Plan identifies the level of landscape and aesthetic treatment as well as the maintenance investment. Therefore, it is important that maintenance cost data be incorporated into the Corridor Plan. Furthermore, local public agencies and others will be interested in maintenance expenses to help navigate the long-term maintenance implications of retrofit projects.

In collaboration with the Corridor Plan, long-term maintenance costs have been researched by UNLV and compiled as the *Maintenance Cost Study for Corridor Planning*. Figure 49 diagrams how total life-cycle maintenance costs were developed for the different landscape and aesthetic treatments. Figure 50 shows the maintenance costs that were determined for the various combinations of softscape and hardscape types. Current estimates exhibit relatively wide variations in cost due to the limited amount of data available. Further research and tracking of projects, however, will result in more clearly defined maintenance cost estimates.

Figure 49 - Total Life-cycle Maintenance Costs

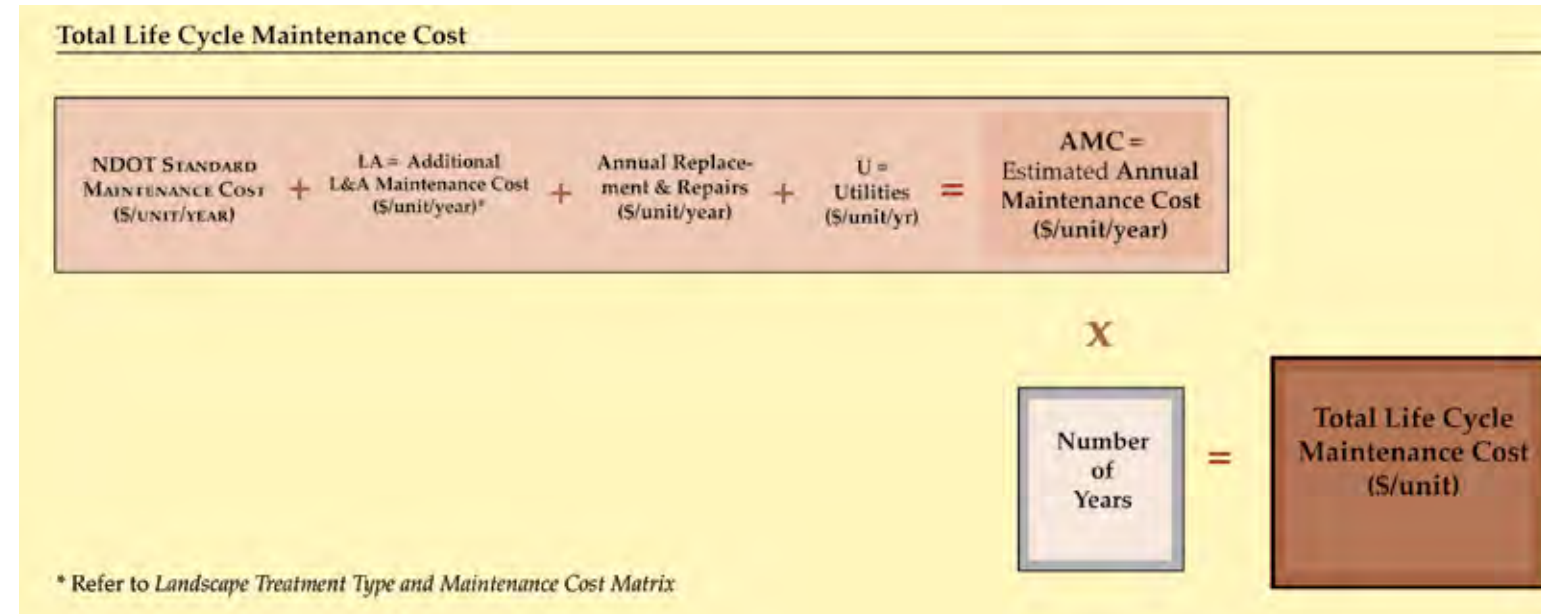


Figure 50 - Maintenance Costs for Landscape Treatment Types

Treatment Type	Hardscape				
	Standard	Accentuated	Focal	Landmark	
Softscape	Ground Treatment	High: \$4,655.11 Median: \$655.70 Low: \$520.00	High: \$2,383.19 Low: \$1,524.00	\$588.00 (based on one project, Cedar City)	Not Available
	Native Plant Revegetation	\$720.00*	\$1,676.40*	\$650.00*	Not Available*
	Enhanced Native	\$1,201.12 (based on one project only)	\$1,089.87 (based on one project only)	Entire Rest Area: High: \$549,200.00 Low: \$29,374.00	Welcome Center Memorial Pt. Cost not available
	Regionally Adapted	High: \$15,840.00 Median: \$3,116.88 Low: \$673.02	High: \$15,242.45 Median: \$5,445.00 Low: \$1,448.67	\$3,054.55 (based on one project only)	Not Available
	Regional Ornamental	High: \$11,775.11 Median: \$7,200.00 Low: \$433.33	High: \$8,500.00 Median: \$3,425.74 Low: \$2,279.59	\$3,005.00 (based on one project only)	\$197,846.36 (based on one project only)
	Turf	High: \$12,325.46 Median: \$6,057.00 Low: \$1,529.79	\$13,178.57 (based on one project only)	High: \$10,363.13 Low: \$3,135.00 (based on two projects, only)	High: \$9,214.70 Median: \$8,391.49 Low: \$3,325.82

High: Single project with highest cost
 Median: Distribution of projects between high and low cost.
 Low: Single project with lowest cost.

All entries are per acre annual costs unless otherwise noted.
 * Natural Revegetation costs are assumed to be 10% more than Ground Treatment categories costs.

All entries are planning level estimates based on limited available data.

NOTE: Utilities and Repair & Replacement are not included in number

* Prepared by UNLV Landscape Architecture and Planning Research Office





(1) Partnerships with agencies such as the BLM and USFS, as well as local communities and governing agencies, enhance the ability to manage the corridor's scenic quality and maintain the open character along a highway.

SECTION TWO: Implementation

POTENTIAL FUNDING OPPORTUNITIES

Many opportunities exist to provide funding for the implementation of corridor projects. Features described as standard will be undertaken by NDOT as new construction, capacity improvements, and facility replacement occur. Upgrades to the standard landscape and aesthetic features will be considered as new highway construction occurs. Funding for new landscape and aesthetic projects associated with the state's highway program will be provided by state and federal sources. Up to 3% of the total project construction cost may be allocated for landscape and aesthetic improvements associated with all new construction and capacity improvements.

When a landscape and aesthetics project can significantly influence an adjacent community or area, the community may choose to participate in the process. The matching funds program provides matching funds up to 50% of the cost for specific community projects. In-kind services, state funds, and federal monies may be used for the community match.

Additionally, communities may request enhanced levels of landscape and aesthetic treatments. Capital cost and maintenance cost-sharing agreements with NDOT are required. Communities may also require that developers with properties located directly adjacent to the NDOT right-of-way follow the Corridor Plan recommendations to improve their areas.

Banking of landscape and aesthetic project funds is encouraged. In so doing, NDOT can shift landscape and aesthetics money to priority areas needing landscape and aesthetic treatment. The capacity to re-allocate funds allows NDOT to broadly manage landscape and aesthetics on a corridor-wide basis.

Facilities such as rest areas and viewpoints will require NDOT funding. Funding partnerships with other agencies and organizations, however, are encouraged. Other partnership opportunities include the development of the Statewide Place Name Sign Program and an audio interpretation program. With these two programs promoting statewide tourism, a partnership between NDOT and Nevada Commission on Tourism could succeed. Private sector partners, including the Nevada Mining Association and the Nevada Ranchers Association, could also be enlisted.

A Main Street Program (refer to page 1.18) could assist numerous Nevada communities in downtown beautification and economic development efforts. This program could be anchored at the state level, with an organization such as the Nevada Commission on Economic Development. Funding could be provided by community chambers of commerce or other direct sources.

Projects and programs described in the Corridor Plan are outlined in Figure 51 along with opportunities for potential partnerships, the suggested lead agency, and potential funding sources. Counties, cities, agencies, and other organizations should be familiar with the Corridor Plan and coordinate community plans, master plans, and other governing documents in order to provide an integrated approach towards achieving the vision and goals set forth. Active participation and review of the Corridor Plan, coordinated with a review of other community documents, will increase the potential for action and success.

Figure 51 - Potential Funding Opportunities

Projects and Programs	Lead Agency	Coordinating Agency	Possible Funding Sources
Community Gateways	Community	NDOT	Enhancement Fund, Community Match, SFG
Upgrade Downtown Streetscape	Community	NDOT	Enhancement Fund, Community Match, Landscape and Aesthetics up to 3% for new construction, SAFETEA-LU, SFG
Upgrade Suburban Streetscape	Community (with Developer support)	NDOT	Enhancement Fund, Community Match, Landscape and Aesthetics up to 3% for new construction, SAFETEA-LU, SFG
Upgrade Rural Streetscape	Community (with Developer support)	NDOT	Enhancement Fund, Community Match, Landscape and Aesthetics up to 3% for new construction, SAFETEA-LU, SFG
Pedestrian Crossings	NDOT	Community	Enhancement Fund, Community Match, Landscape and Aesthetics up to 3% for new construction, Developers building adjacent to the ROW, SAFETEA-LU, SFG
Standard Sidewalk	NDOT	Community	NDOT funding
Enhanced Sidewalk	Community	NDOT	Enhancement Fund, Community Match, Landscape and Aesthetics up to 3% for new construction, Developers building adjacent to the ROW, SAFETEA-LU, SFG
Street Trees and Planting Strips	Community	NDOT, NDF	Enhancement Fund, Community Match, Developers building adjacent to the ROW, NDF plant supply, SAFETEA-LU, SFG
Community Lighting	Community	NDOT	Enhancement Fund, Community Match, Developers building adjacent to the ROW, SAFETEA-LU, SFG
Community Rest Areas	Community	NDOT	Enhancement Fund, Community Match, SAFETEA-LU, SFG
Community Environmental Graphics	Community	NCOT	Enhancement Fund, Community Match, SAFETEA-LU, SFG
Statewide Gateways	NDOT	County & Communities	Enhancement Fund, NDOT funding sources, SFG
Roadside Services	NDOT	NDSP	NDOT funding sources, SFG, FHWA
Statewide Place Name Sign Program	NDOT	NCOT	NDOT funding sources, NCOT grant, SFG
Audio Interpretation Program	NDOT	NCOT	NDOT funding sources, NCOT grant, SFG
Transportation Art	Community	NDOT	Enhancement Fund, SFG
Color Palette Retrofit of Existing Facilities	NDOT	Community	Enhancement Fund, Community Match, SFG
Non-Motorized Transportation Systems	Community	NDOT	Landscape and Aesthetics up to 3% for new construction, SAFETEA-LU, SFG
Standard Highway Facilities	NDOT		Landscape and Aesthetics up to 3% for new construction
Enhancements to Highway Facilities Above What the 3% Would Achieve	NDOT	Community	Enhancement Fund, Community Match, Developers building adjacent to the ROW, SFG
Wildlife Crossings and Protection	NDOT	NDOW	Landscape and Aesthetics up to 3% for new construction, NDOW grant, SFG
Main Street Approach	Community	NDOT, Nevada Commission on Economic Development	Consortium of Communities, Nevada Commission on Economic Development grant, SFG
Native Wildflower Program	NDOT		Surface Transportation and Uniform Relocation Assistance Act, Landscape and Aesthetics up to 3% for new construction
Anti-littering Campaign	NDOT	Communities	NDOT funding, SFG
Scenic Highway Designation	NDOT		NDOT funding, FHWA

List of Acronyms

NDF – Nevada Division of Forestry
 NDSP – Nevada Division of State Parks
 NCOT – Nevada Commission on Tourism
 NDOW – Nevada Division of Wildlife
 USFS – United States Forest Service

SAFETEA-LU – Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
 ROW – Right-of-way
 SFG – Additional state and federal funding sources such as those listed in Appendix A
 FHWA – Federal Highway Administration

SECTION THREE: Priorities

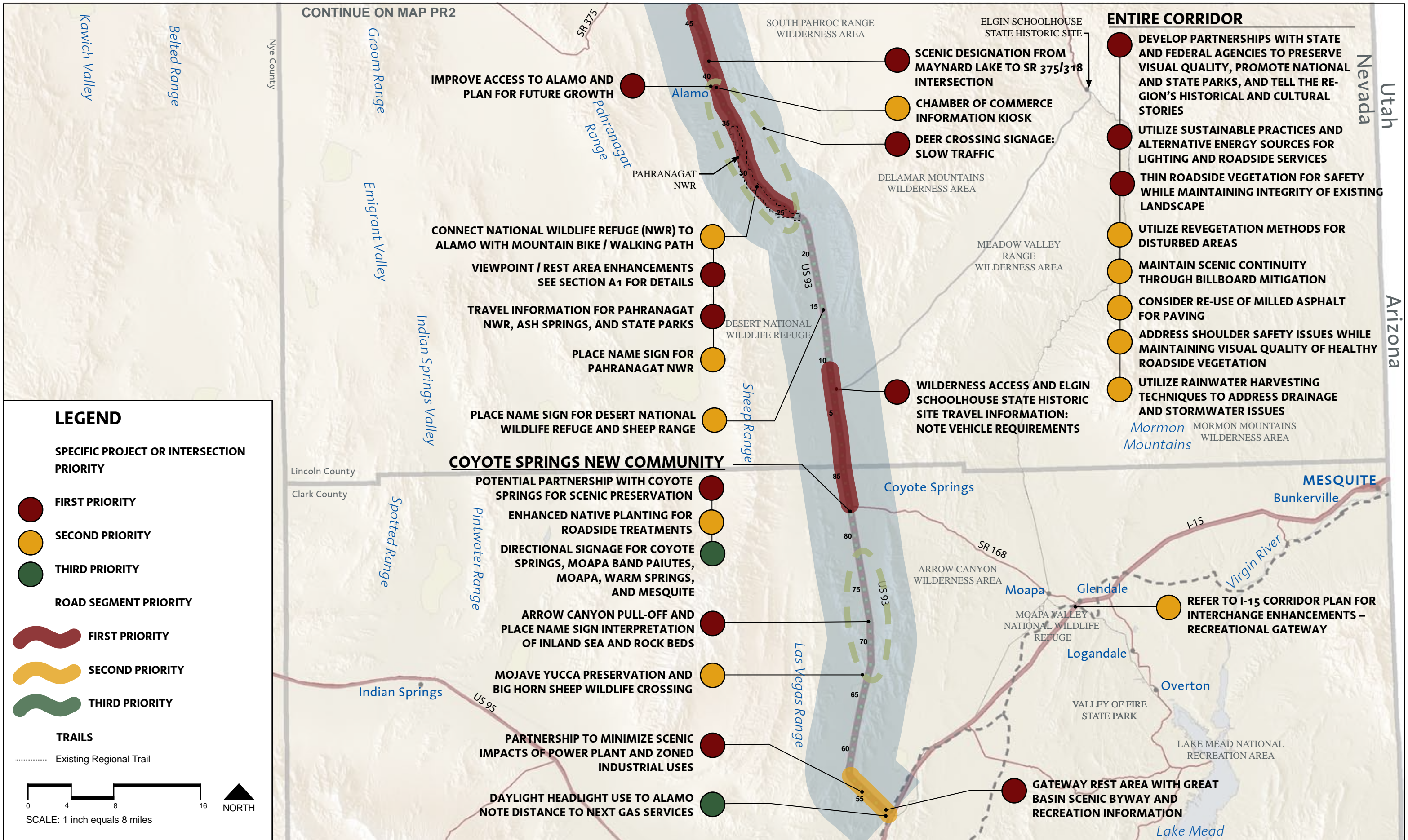
This section describes priority levels for projects within the landscape design segments. The priority levels are based on current capital improvements, as well as landscape and aesthetics planning. They are intended to act as a guide and represent those projects the corridor planning team recommends as having the greatest potential impact on the aesthetics of the entire corridor. The priorities identified in this chapter are subject to change according to the availability of funds for individual project improvements. Capital projects are significantly influenced by the availability of funding.

First priority is given to highly visible and identifiable projects and sections of road, areas of significant and immediate quality, and projects that are currently in progress. Second priority applies to projects that will provide additional benefits and aesthetics as part of the long-range plan. Third priority goes to areas that currently display a reasonable level of aesthetic quality and, upon enhancement, will complete the landscape and aesthetics program for their particular landscape design segment. General comments received from the public and Technical Review Committee members influenced the designation of priorities.

The following activities have been selected as high priorities because of the immediate and significant impact they will have on the overall aesthetics and sense of place for the entire corridor.

- Retrofitting existing rest areas (including aesthetic and programmatic improvements) and designating the development of new rest areas.
- Establishing gateways and improved signage to improve the highway/community compatibility.
- Travel information and signage to state and national parks and recreation areas are of prime importance to the Hidden Gems segment because of its direct support of the segment's design objectives.
- Partnering for visual preservation and management of Nevada's open lands.

Second priority features include viewpoint and pull-offs as well as place name signage components. Wildlife movement corridors are an important component of the corridor environment. Recommendations to analyze wildlife corridor movement and provide improved crossing facilities are listed as medium priority due to the large capital cost. As funding and partnerships occur, these elements can advance in priority.



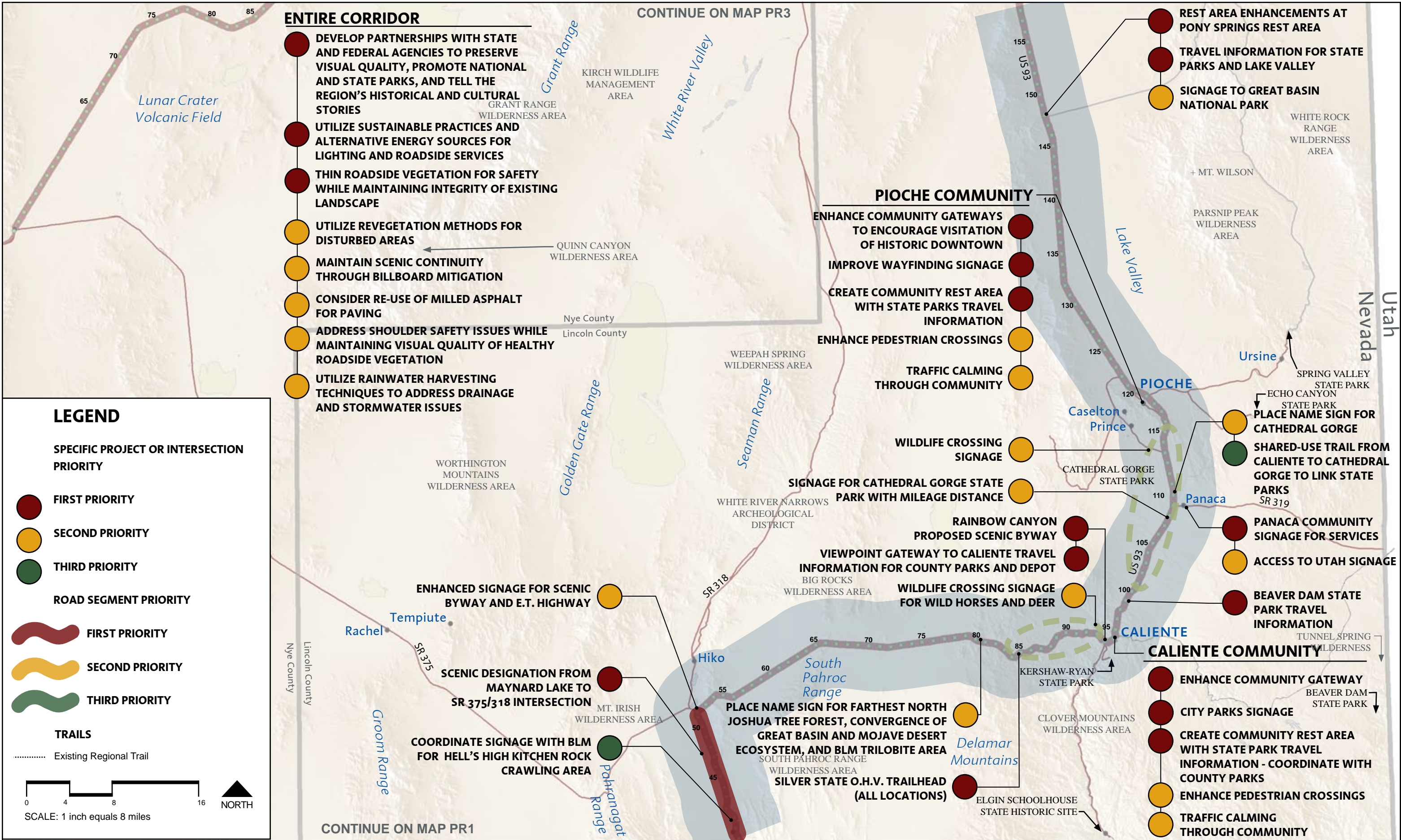
US 93, East US 6, and East US 50 landscape and aesthetics corridor plan

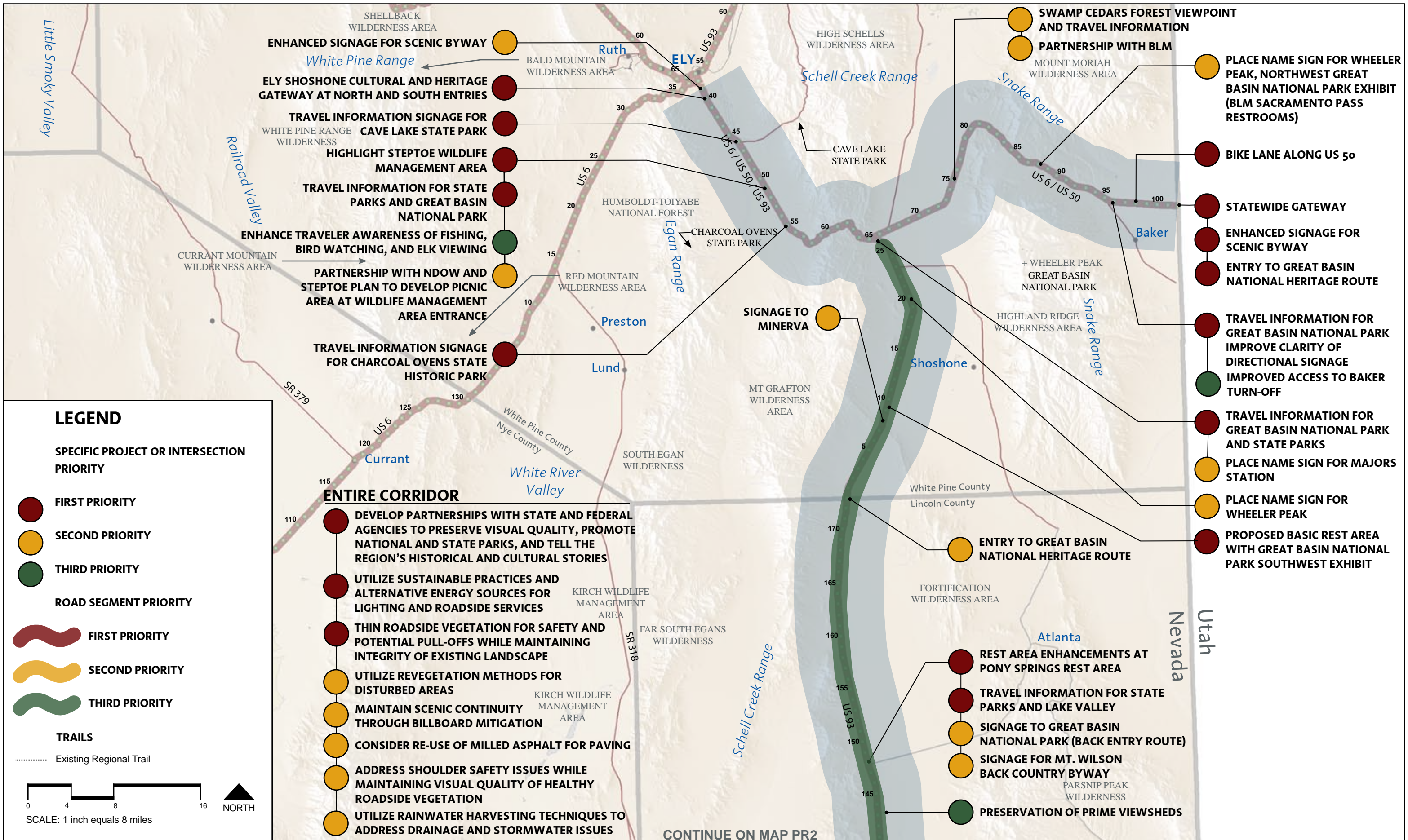


HIDDEN GEMS – PRIORITIES
US93: I-15 INTERCHANGE TO ALAMO

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Landscape Architecture Land Planning Urban Design Tourism Planning

MAP PR1
4.17





LEGEND

SPECIFIC PROJECT OR INTERSECTION PRIORITY

- FIRST PRIORITY
- SECOND PRIORITY
- THIRD PRIORITY

ROAD SEGMENT PRIORITY

- ~ FIRST PRIORITY
- ~ SECOND PRIORITY
- ~ THIRD PRIORITY

TRAILS

- Existing Regional Trail
- 0 4 8 16
SCALE: 1 inch equals 8 miles
- ▲ NORTH

ENTIRE CORRIDOR

- DEVELOP PARTNERSHIPS WITH STATE AND FEDERAL AGENCIES TO PRESERVE VISUAL QUALITY, PROMOTE NATIONAL AND STATE PARKS, AND TELL THE REGION'S HISTORICAL AND CULTURAL STORIES
- UTILIZE SUSTAINABLE PRACTICES AND ALTERNATIVE ENERGY SOURCES FOR LIGHTING AND ROADSIDE SERVICES
- THIN ROADSIDE VEGETATION FOR SAFETY AND POTENTIAL PULL-OFFS WHILE MAINTAINING INTEGRITY OF EXISTING LANDSCAPE
- UTILIZE REVEGETATION METHODS FOR DISTURBED AREAS
- MAINTAIN SCENIC CONTINUITY THROUGH BILLBOARD MITIGATION
- CONSIDER RE-USE OF MILLED ASPHALT FOR PAVING
- ADDRESS SHOULDER SAFETY ISSUES WHILE MAINTAINING VISUAL QUALITY OF HEALTHY ROADSIDE VEGETATION
- UTILIZE RAINWATER HARVESTING TECHNIQUES TO ADDRESS DRAINAGE AND STORMWATER ISSUES

- SWAMP CEDARS FOREST VIEWPOINT AND TRAVEL INFORMATION
- PARTNERSHIP WITH BLM
- PLACE NAME SIGN FOR WHEELER PEAK, NORTHWEST GREAT BASIN NATIONAL PARK EXHIBIT (BLM SACRAMENTO PASS RESTROOMS)
- BIKE LANE ALONG US 50
- STATEWIDE GATEWAY
- ENHANCED SIGNAGE FOR SCENIC BYWAY
- ENTRY TO GREAT BASIN NATIONAL HERITAGE ROUTE
- TRAVEL INFORMATION FOR GREAT BASIN NATIONAL PARK IMPROVE CLARITY OF DIRECTIONAL SIGNAGE
- IMPROVED ACCESS TO BAKER TURN-OFF
- TRAVEL INFORMATION FOR GREAT BASIN NATIONAL PARK AND STATE PARKS
- PLACE NAME SIGN FOR MAJORS STATION
- PLACE NAME SIGN FOR WHEELER PEAK
- PROPOSED BASIC REST AREA WITH GREAT BASIN NATIONAL PARK SOUTHWEST EXHIBIT

- ENTRY TO GREAT BASIN NATIONAL HERITAGE ROUTE
- REST AREA ENHANCEMENTS AT PONY SPRINGS REST AREA
- TRAVEL INFORMATION FOR STATE PARKS AND LAKE VALLEY
- SIGNAGE TO GREAT BASIN NATIONAL PARK (BACK ENTRY ROUTE)
- SIGNAGE FOR MT. WILSON BACK COUNTRY BYWAY
- PRESERVATION OF PRIME VIEWSHEDS

CONTINUE ON MAP PR2

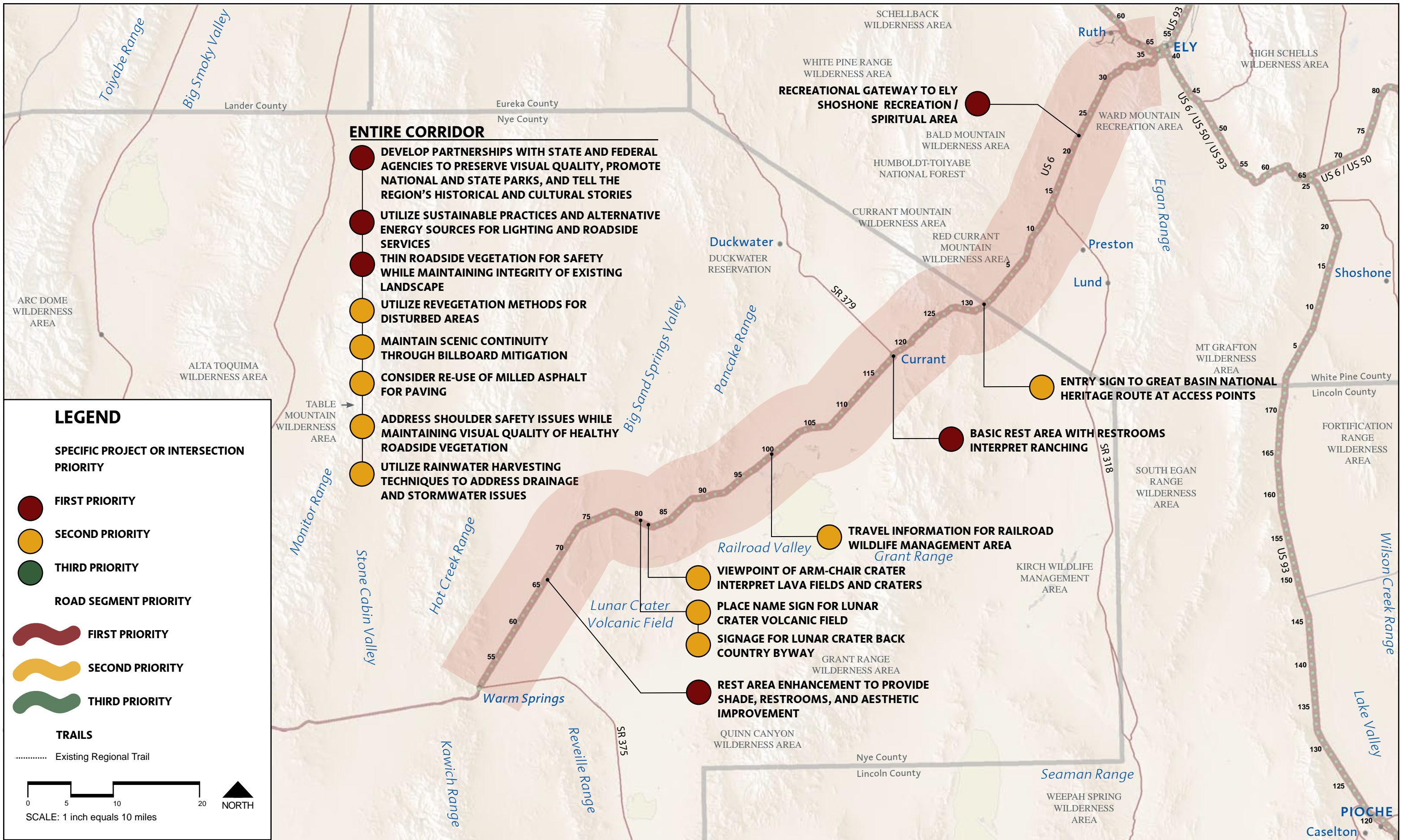
US 93, East US 6, and East US 50 landscape and aesthetics corridor plan



HIDDEN GEMS – PRIORITIES
US 93: MM 155 TO ELY AND THE UTAH STATE LINE

DESIGNWORKSHOP
Landscape Architecture Land Planning Urban Design Tourism Planning

MAP PR3
4.19



ENTIRE CORRIDOR

- DEVELOP PARTNERSHIPS WITH STATE AND FEDERAL AGENCIES TO PRESERVE VISUAL QUALITY, PROMOTE NATIONAL AND STATE PARKS, AND TELL THE REGION'S HISTORICAL AND CULTURAL STORIES
- UTILIZE SUSTAINABLE PRACTICES AND ALTERNATIVE ENERGY SOURCES FOR LIGHTING AND ROADSIDE SERVICES
- THIN ROADSIDE VEGETATION FOR SAFETY WHILE MAINTAINING INTEGRITY OF EXISTING LANDSCAPE
- UTILIZE REVEGETATION METHODS FOR DISTURBED AREAS
- MAINTAIN SCENIC CONTINUITY THROUGH BILLBOARD MITIGATION
- CONSIDER RE-USE OF MILLED ASPHALT FOR PAVING
- ADDRESS SHOULDER SAFETY ISSUES WHILE MAINTAINING VISUAL QUALITY OF HEALTHY ROADSIDE VEGETATION
- UTILIZE RAINWATER HARVESTING TECHNIQUES TO ADDRESS DRAINAGE AND STORMWATER ISSUES

LEGEND

SPECIFIC PROJECT OR INTERSECTION PRIORITY

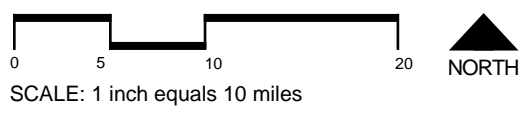
- FIRST PRIORITY
- SECOND PRIORITY
- THIRD PRIORITY

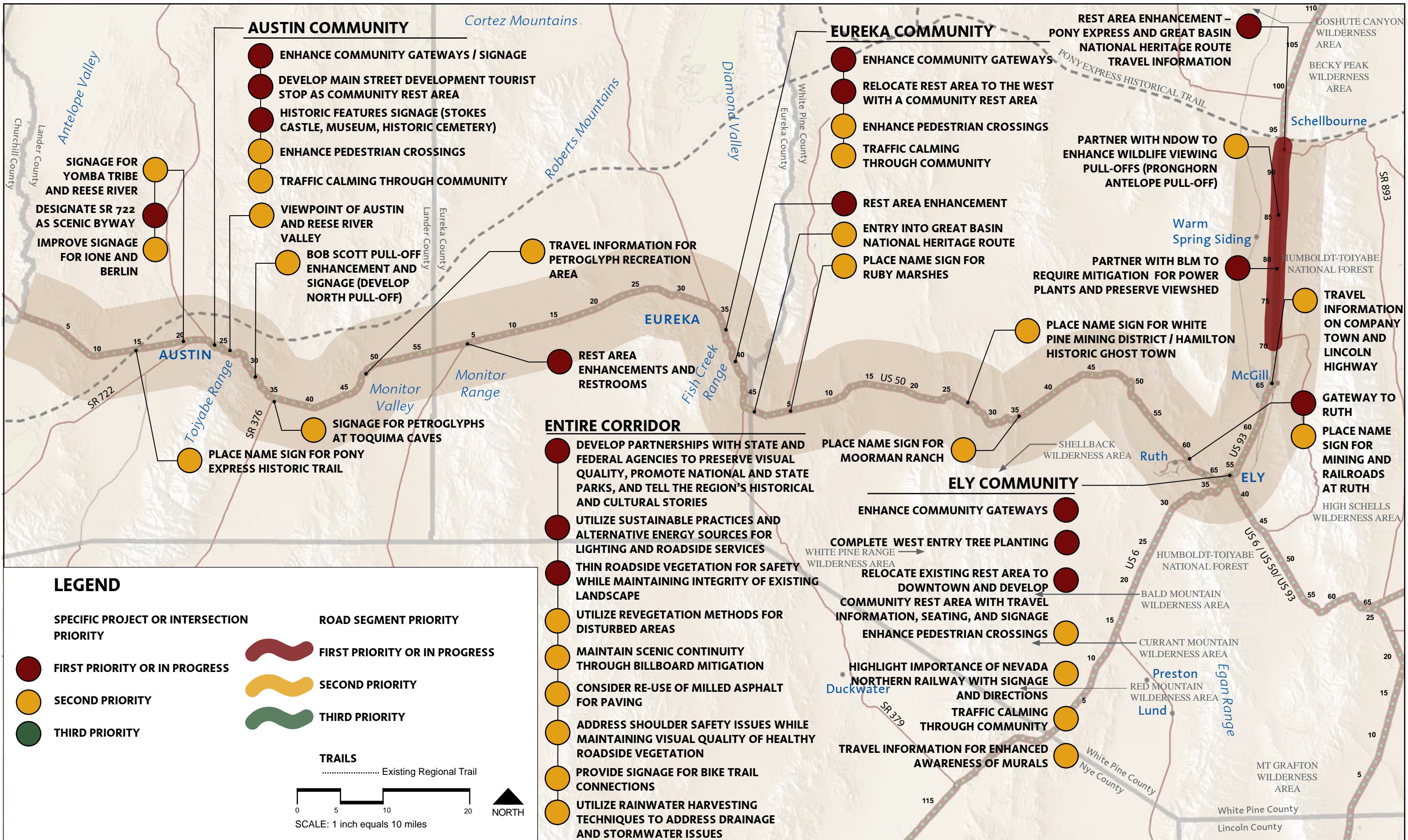
ROAD SEGMENT PRIORITY

- FIRST PRIORITY
- SECOND PRIORITY
- THIRD PRIORITY

TRAILS

..... Existing Regional Trail





AUSTIN COMMUNITY

- ENHANCE COMMUNITY GATEWAYS / SIGNAGE
- DEVELOP MAIN STREET DEVELOPMENT TOURIST STOP AS COMMUNITY REST AREA
- HISTORIC FEATURES SIGNAGE (STOKES CASTLE, MUSEUM, HISTORIC CEMETERY)
- ENHANCE PEDESTRIAN CROSSINGS
- TRAFFIC CALMING THROUGH COMMUNITY
- VIEWPOINT OF AUSTIN AND REESE RIVER VALLEY
- BOB SCOTT PULL-OFF ENHANCEMENT AND SIGNAGE (DEVELOP NORTH PULL-OFF)
- TRAVEL INFORMATION FOR PETROGLYPH RECREATION AREA
- REST AREA ENHANCEMENTS AND RESTROOMS
- SIGNAGE FOR PETROGLYPHS AT TOQUIMA CAVES
- PLACE NAME SIGN FOR PONY EXPRESS HISTORIC TRAIL

EUREKA COMMUNITY

- ENHANCE COMMUNITY GATEWAYS
- RELOCATE REST AREA TO THE WEST WITH A COMMUNITY REST AREA
- ENHANCE PEDESTRIAN CROSSINGS
- TRAFFIC CALMING THROUGH COMMUNITY
- REST AREA ENHANCEMENT
- ENTRY INTO GREAT BASIN NATIONAL HERITAGE ROUTE
- PLACE NAME SIGN FOR RUBY MARSHES

REST AREA ENHANCEMENT – PONY EXPRESS AND GREAT BASIN NATIONAL HERITAGE ROUTE TRAVEL INFORMATION

PARTNER WITH NDOW TO ENHANCE WILDLIFE VIEWING PULL-OFFS (PRONGHORN ANTELOPE PULL-OFF)

PARTNER WITH BLM TO REQUIRE MITIGATION FOR POWER PLANTS AND PRESERVE VIEWSHED

PLACE NAME SIGN FOR WHITE PINE MINING DISTRICT / HAMILTON HISTORIC GHOST TOWN

TRAVEL INFORMATION ON COMPANY TOWN AND LINCOLN HIGHWAY

GATEWAY TO RUTH
PLACE NAME SIGN FOR MINING AND RAILROADS AT RUTH

ENTIRE CORRIDOR

- DEVELOP PARTNERSHIPS WITH STATE AND FEDERAL AGENCIES TO PRESERVE VISUAL QUALITY, PROMOTE NATIONAL AND STATE PARKS, AND TELL THE REGION'S HISTORICAL AND CULTURAL STORIES
- UTILIZE SUSTAINABLE PRACTICES AND ALTERNATIVE ENERGY SOURCES FOR LIGHTING AND ROADSIDE SERVICES
- THIN ROADSIDE VEGETATION FOR SAFETY WHILE MAINTAINING INTEGRITY OF EXISTING LANDSCAPE
- UTILIZE REVEGETATION METHODS FOR DISTURBED AREAS
- MAINTAIN SCENIC CONTINUITY THROUGH BILLBOARD MITIGATION
- CONSIDER RE-USE OF MILLED ASPHALT FOR PAVING
- ADDRESS SHOULDER SAFETY ISSUES WHILE MAINTAINING VISUAL QUALITY OF HEALTHY ROADSIDE VEGETATION
- PROVIDE SIGNAGE FOR BIKE TRAIL CONNECTIONS
- UTILIZE RAINWATER HARVESTING TECHNIQUES TO ADDRESS DRAINAGE AND STORMWATER ISSUES

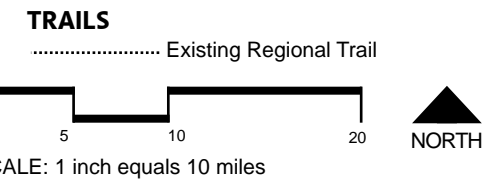
ELY COMMUNITY

- ENHANCE COMMUNITY GATEWAYS
- COMPLETE WEST ENTRY TREE PLANTING
- RELOCATE EXISTING REST AREA TO DOWNTOWN AND DEVELOP COMMUNITY REST AREA WITH TRAVEL INFORMATION, SEATING, AND SIGNAGE
- ENHANCE PEDESTRIAN CROSSINGS
- HIGHLIGHT IMPORTANCE OF NEVADA NORTHERN RAILWAY WITH SIGNAGE AND DIRECTIONS
- TRAFFIC CALMING THROUGH COMMUNITY
- TRAVEL INFORMATION FOR ENHANCED AWARENESS OF MURALS

LEGEND

- SPECIFIC PROJECT OR INTERSECTION PRIORITY**
- FIRST PRIORITY OR IN PROGRESS
 - SECOND PRIORITY
 - THIRD PRIORITY

- ROAD SEGMENT PRIORITY**
- FIRST PRIORITY OR IN PROGRESS
 - SECOND PRIORITY
 - THIRD PRIORITY



US 93, East US 6, and East US 50 landscape and aesthetics corridor plan



PONY EXPRESS PASSAGE – PRIORITIES
US 50: NEW PASS SUMMIT TO SCHELLBOURNE

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Landscape Architecture Land Planning Urban Design Tourism Planning

MAP PR5
4.21

ENTIRE CORRIDOR

- DEVELOP PARTNERSHIPS WITH STATE AND FEDERAL AGENCIES TO PRESERVE VISUAL QUALITY, PROMOTE NATIONAL AND STATE PARKS, AND TELL THE REGION'S HISTORICAL AND CULTURAL STORIES
- UTILIZE SUSTAINABLE PRACTICES AND ALTERNATIVE ENERGY SOURCES FOR LIGHTING AND ROADSIDE SERVICES
- THIN ROADSIDE VEGETATION FOR SAFETY WHILE MAINTAINING INTEGRITY OF EXISTING LANDSCAPE
- UTILIZE REVEGETATION METHODS FOR DISTURBED AREAS
- MAINTAIN SCENIC CONTINUITY THROUGH BILLBOARD MITIGATION
- CONSIDER RE-USE OF MILLED ASPHALT FOR PAVING
- ADDRESS SHOULDER SAFETY ISSUES WHILE MAINTAINING VISUAL QUALITY OF HEALTHY ROADSIDE VEGETATION
- UTILIZE RAINWATER HARVESTING TECHNIQUES TO ADDRESS DRAINAGE AND STORMWATER ISSUES

LEGEND

SPECIFIC PROJECT OR INTERSECTION PRIORITY

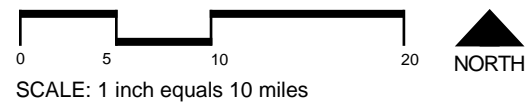
- FIRST PRIORITY
- SECOND PRIORITY
- THIRD PRIORITY

ROAD SEGMENT PRIORITY

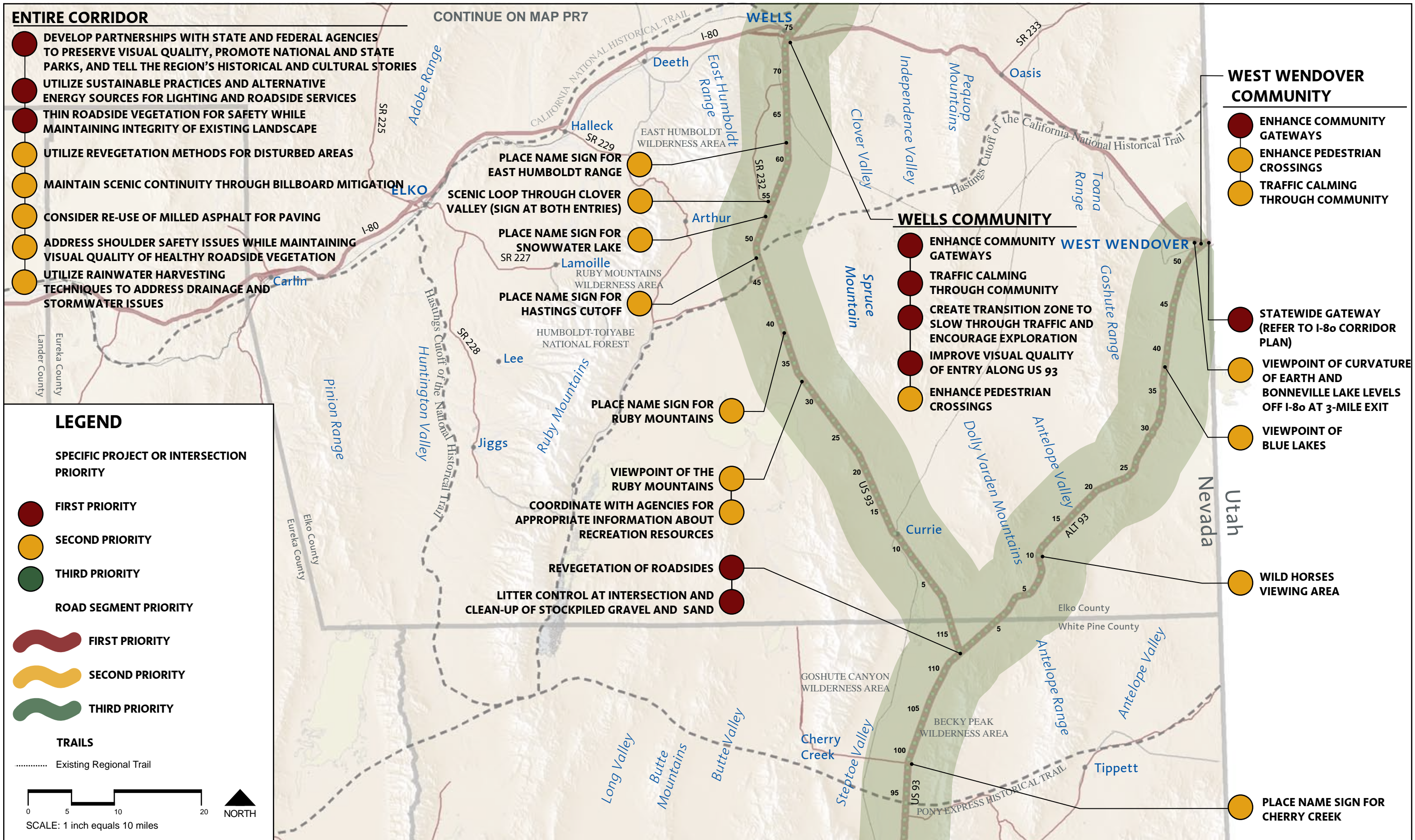
- ~ FIRST PRIORITY
- ~ SECOND PRIORITY
- ~ THIRD PRIORITY

TRAILS

- Existing Regional Trail



CONTINUE ON MAP PR7



WEST WENDOVER COMMUNITY

- ENHANCE COMMUNITY GATEWAYS
- ENHANCE PEDESTRIAN CROSSINGS
- TRAFFIC CALMING THROUGH COMMUNITY

WELLS COMMUNITY

- ENHANCE COMMUNITY GATEWAYS
- TRAFFIC CALMING THROUGH COMMUNITY
- CREATE TRANSITION ZONE TO SLOW THROUGH TRAFFIC AND ENCOURAGE EXPLORATION
- IMPROVE VISUAL QUALITY OF ENTRY ALONG US 93
- ENHANCE PEDESTRIAN CROSSINGS

PLACE NAME SIGN FOR EAST HUMBOLDT RANGE

SCENIC LOOP THROUGH CLOVER VALLEY (SIGN AT BOTH ENTRIES)

PLACE NAME SIGN FOR SNOWWATER LAKE

PLACE NAME SIGN FOR HASTINGS CUTOFF

PLACE NAME SIGN FOR RUBY MOUNTAINS

VIEWPOINT OF THE RUBY MOUNTAINS

COORDINATE WITH AGENCIES FOR APPROPRIATE INFORMATION ABOUT RECREATION RESOURCES

REVEGETATION OF ROADSIDES

LITTER CONTROL AT INTERSECTION AND CLEAN-UP OF STOCKPILED GRAVEL AND SAND

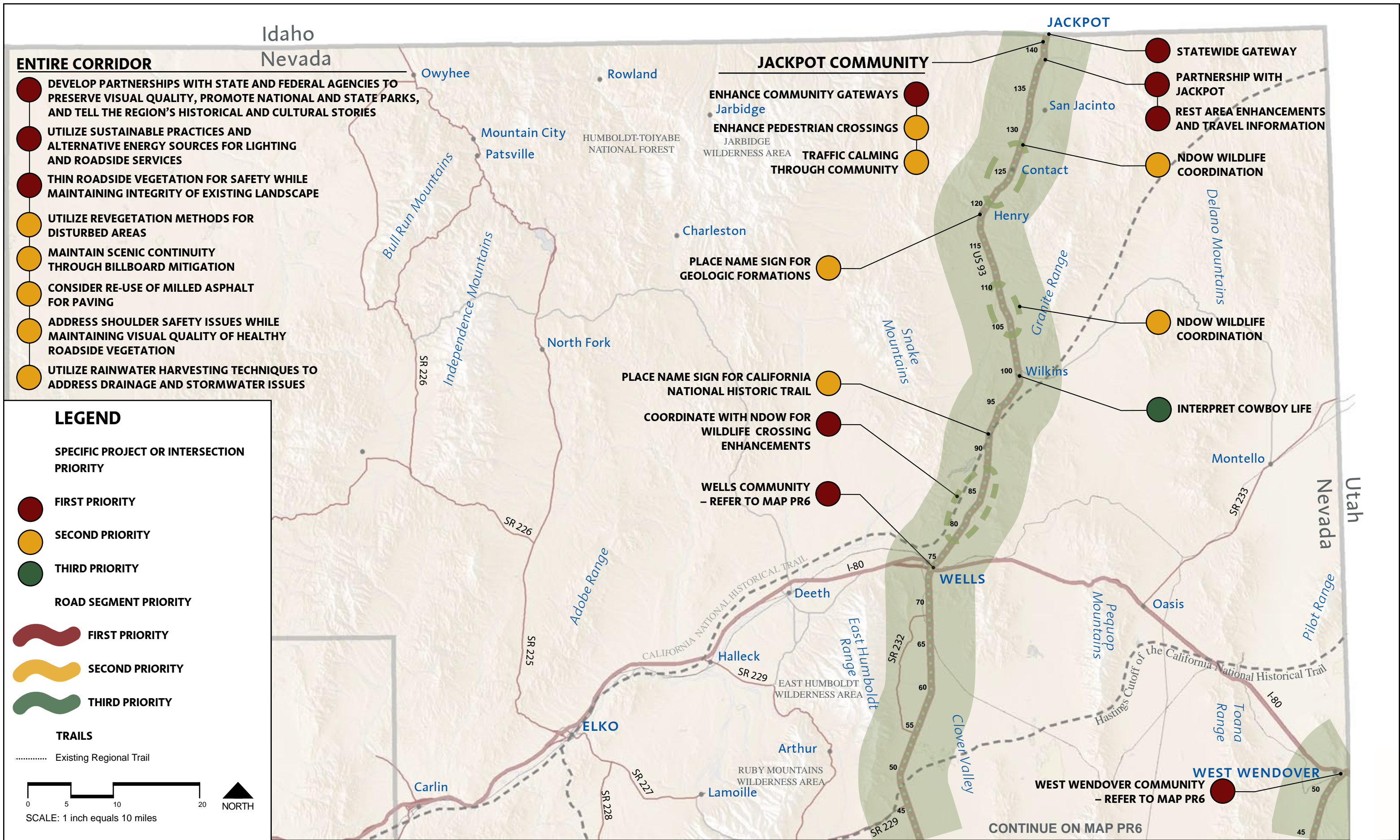
STATEWIDE GATEWAY (REFER TO I-80 CORRIDOR PLAN)

VIEWPOINT OF CURVATURE OF EARTH AND BONNEVILLE LAKE LEVELS OFF I-80 AT 3-MILE EXIT

VIEWPOINT OF BLUE LAKES

WILD HORSES VIEWING AREA

PLACE NAME SIGN FOR CHERRY CREEK



US 93, East US 6, and East US 50 landscape and aesthetics corridor plan



COWBOY RANGE – PRIORITIES
US 93: WELLS TO JACKPOT

DESIGNWORKSHOP
Landscape Architecture Land Planning Urban Design Tourism Planning

MAP PR7
4.23