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

June 24, 2008
MESSAGE FROM THE DIRECTOR OF NDOT

NDOT has made the commitment that landscaping and aesthetics are an important component when designing and constructing projects to ensure our highway system is an integral part of the community. This Landscape and Aesthetics Corridor Plan for US 93, East US 6, and East US 50 helps realize our vision for the future of our highways. The plan will provide the guidance for our design teams, and help Nevada’s citizens participate in formulating context-sensitive solutions for our transportation needs. Together, we will ensure our highways reflect Nevada’s distinctive heritage, landscape, and culture.
The Corridor Plan has been provided for review by the following groups and agencies. Endorsement means agreeing in principle with the identified opportunities and recommendations identified within agency jurisdiction.

Alamo Town Advisory Board
Austin Chamber of Commerce
Austin Development and Community Fund
Authority Esmeralda and Nye Counties (EDEN)
Bureau of Land Management
City of Caliente
City of Ely
City of Wells
City of West Wendover
Clark County
Clark County Public Works Department
Confederate Tribe of Goshute Association
Coyote Springs Development
Da Ka Doiyabe RC&D
Duckwater Indian Reservation
Eastern Nevada Landscape Coalition
Eastern Nevada Lincoln Highway Association
Elko County
Ely Shoshone Indian Reservation
Ely State Museum
Ely Tree Board
Eureka County
Eureka County Economic Development
Federal Highway Administration
Great Basin Heritage Area Partnership
Great Basin National Heritage Route
Great Basin National Park
High Desert Research Conservation and Development Council
Historical Society of Austin
Lander County
Lincoln County
Lincoln County Chamber of Commerce
Lincoln County Public Roads Department
Lincoln County Regional Development Authority
Lincoln County Water Board

Moapa Band of Paiutes
Natural Resources Conservation Service
Nevada Arts Council
Nevada Commission on Tourism
Nevada Department of Transportation
Nevada Division of Forestry
Nevada Division of State Parks (including Eastern Region)
Nevada Division of Wildlife, Eastern and Southern Regions
Nevada Land Conservancy
Nevada State Historic Preservation Office
Nye County
Nye County Natural Resources Office
Pahranagat National Wildlife Refuge
Panaca Town Advisory Board
Pardee Homes
Pioche Town Advisory Board
Sierra Club, Great Basin Chapter
South Fork Band Council
South Fork Band Te-Moak Tribe
Town of Jackpot
Town of Jackpot Advisory Board
Town of McGill
Town of Ruth
U.S. Fish and Wildlife Service
U.S. Forest Service
Wells Band Council
Wendover Air Force Auxiliary Field
White Pine County
White Pine County Chamber of Commerce
White Pine County Economic Diversification Council
White Pine County Tourism and Recreation Board
White Pine Public Museum
Yomba Shoshone Tribe
ACKNOWLEDGEMENTS

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Catherine Cortez Masto
Kim Wallin
Frank Martin
Tom Fransway
Paul Morabito
Governor
Lt. Governor
Attorney General
Controller
Member
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Executive Summary

This plan establishes the vision for the landscape and aesthetics of the US 93, East US 6, and East US 50 corridor. The vision synthesizes historic, current, and future conditions into a comprehensive guide to improve the visual appearance of these highway corridors as they pass through communities, rural landscapes, and scenic environments.

Chapter One provides an introduction to the NDOT Landscape and Aesthetics program. It outlines the mechanism by which corridor design will be managed, a description of programs and elements that influence highway aesthetics, and a summary of background information gathered and analyzed.

Chapter Two describes the process through which sections of the highway were categorized into highway zones and divided into distinct landscape design segments: Hidden Gems, Silver State Passage, Pony Express Passage, and Cowboy Range.

Chapter Three begins by outlining an approach to the design process. This process highlights the necessity of integrating landscape and aesthetics at the beginning of every project. Design guidelines are also included in the third chapter to provide the framework for improving the aesthetics of existing, new, and retrofit highway projects. They are written statements of recommended methods to meet the segment’s design objectives. The guidelines, accompanied by concept diagrams, sketches, or photographs, demonstrate ways in which to achieve the design intent.

Chapter Four summarizes the cost implications associated with the improvements proposed by this Corridor Plan. Cost estimates are included for both preliminary project budgeting as well as ongoing project maintenance. These estimates will inform NDOT during the decision-making process, and help influence budget allocations for the landscape and aesthetics highway improvements.

The appendices provide information that will help readers understand the technical information presented in the document.
Corridor Management and Background Inventory

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SECTION ONE: Introduction

THE VISION

Nevada has a renewed commitment to landscape and aesthetics for the state’s highways. In 2002, the Nevada Department of Transportation (NDOT) adopted the Landscape and Aesthetics Master Plan Pattern and Palette of Place (Master Plan), raising the bar for context-sensitive design.

“We envision a system of state highways that reflect the land and people of Nevada. We believe that Nevada should have highways that are aesthetically pleasing, as well as safe and cost effective. Therefore, no state highway is complete until landscape and aesthetics are considered and addressed.”

Pattern and Palette of Place, 2002, p. 10-11

Today, it is the policy of the State of Nevada to consider landscape and aesthetics in conjunction with other design factors in all transportation projects. Furthermore, NDOT recognizes that successful projects result when local communities, the public, other permitting agencies, and the private sector participate in the planning, design, construction, and maintenance of transportation projects. Partnerships are imperative to ensure Nevada’s highway system expresses the unique heritage, culture, and environment of the state and its communities.

Purpose of the Corridor Plan

Based on the recommendations of the Master Plan, the US 93, East US 6, and East US 50 Landscape and Aesthetics Corridor Plan (Corridor Plan) addresses Nevada’s eastern highways (Figure 2). This plan establishes the vision for landscape and aesthetics for each highway, synthesizing historic, current, and future conditions to improve the visual quality of each corridor. The plan describes the vision, not the promise, for highway landscape and aesthetic treatments and enhancements. Implementation of the vision will be achieved through the combined efforts of local governments, private citizens, civic groups, and the business community.

The study area for this Corridor Plan includes US 93 from the I-15 interchange to the Idaho state line at Jackpot, US 6 from Warm Springs to the Utah state line, US 50 from New Pass Summit to the Utah state line, and ALT 93.

The Corridor Plan is a method for improving the aesthetic qualities of the state’s highways, particularly in relation to adjacent cities, communities, and neighborhoods. The Corridor Plan is intended to affect both existing highways as well as future expansion projects. Landscape and aesthetic treatments identified and prioritized in the Corridor Plan may be funded from a variety of sources. As a general rule, up to 3% of total highway construction costs on all new construction and capacity improvements may be allocated to landscape and aesthetic treatments. Funding for the retrofit of landscape and aesthetic improvements to existing highways is based on community partnerships and the opportunity for communities to match state funds with a share of local money, federal monies, or in-kind contributions. The Corridor Plan is a public-private partnership initiative. This unique approach is guided by the policy outlined in the Master Plan, which states:

“Local communities, the public, other permitting agencies, and the private sector are encouraged to be involved in planning, design, construction, and maintenance of transportation projects to express the unique heritage, culture and environment of the state and its communities.”

Pattern and Palette of Place, 2002, p. 12

Furthermore, NDOT will work with local governments, private citizens, civic groups, and the business community to develop cooperative agreements for funding the design, construction, and maintenance of landscape and aesthetic improvements identified in this Corridor Plan. In locations where recommendations exceed NDOT’s normal financial responsibility and the community desires an elevated level of aesthetic treatment, NDOT will engage the community to create partnerships to find additional funding.
CORRIDOR DESIGN MANAGEMENT

The Corridor Plan is a useful management tool for designing highway projects because it provides specific recommendations, programs, and a description of the intended result.

The first portion of the Corridor Plan establishes a theme, or central design idea, for each highway segment (also called a landscape design segment). Projects within each landscape design segment are guided by the theme, associated design objectives, examples that illustrate interpretation of the theme, and a program of facilities with common definitions.

Design guidelines, estimated costs, and project priorities establish the viability of the Corridor Plan and are provided as part this report. NDOT will use the Corridor Plan as one of the tools to manage the design of highway projects. Prior to designing specific highway projects, NDOT personnel and the design consultant should review the Corridor Plan in order to understand the design idea and level of landscape treatment identified for a particular landscape design segment. Implementation of the designated treatment levels may depend on partnerships and funding opportunities. Overall, the vision and intent of the themes and treatment levels should be considered as the guide throughout the design process. Figure 3 outlines the necessary steps to achieve a desired outcome for this corridor.

Figure 3 – Corridor Design Management

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DIRECT AND REVIEW INDIVIDUAL PROJECTS IN ACCORDANCE WITH THE CORRIDOR PLAN RECOMMENDATION
Public Participation

Early and continuous public involvement was critical to the success of the Corridor Plan. For this reason, NDOT fostered extensive public dialogue at every stage of planning and development, engaging communities to develop local support.

The public participation process provided stakeholders with a forum for sharing knowledge of their communities, identifying opportunities for enhancing the landscape and aesthetics of the corridor, creating design objectives and guidelines for highways in their area, and prioritizing prospective projects.

The public participation process ensured:

- Identification of issues and concerns from each community
- A method, strategy, and action plan to address community concerns
- Opportunities for the public to express their level of support for the Corridor Plan
- Release of full information about the Corridor Plan through public meetings, the corridor planning web site, and fact sheets

Stakeholders for the US 93, East US 6, and East US 50 corridor were divided into three groups: a southern group held meetings in Caliente, a central group held meetings in Ely, and a northern group held meetings in Wells. Holding three sets of meetings shortened driving times to allow for better participation and representation.

Public participation and community involvement were important components of the planning process because they helped ensure that the recommendations outlined in this Corridor Plan reflect the ideas and suggestions of local community members.

The public process involved a multi-layered approach to encourage maximum participation.

- A Technical Review Committee (TRC), composed of a broad range of stakeholders, contributed significant local agency and community knowledge.
- The public was able to identify issues, help establish priorities, ask questions, and provide input at a public open house meeting.
- A fact sheet provided general information about the Corridor Plan.
- The public was able to visit a project web site to learn more about corridor planning activities.

From the inception of the corridor planning process, a Technical Review Committee helped to identify issues and opportunities, shape design objectives and guidelines, and establish priorities based on local knowledge.

Public workshops were held to inform and gather input from stakeholders and community members.
SECTION TWO: Elements of Landscape and Aesthetics

The elements of landscape and aesthetics provide the framework to define the purpose and intent of highway corridor improvements. These elements, described on the following pages, include varying degrees of softscape, structures and hardscape, statewide signage, rest area facilities, native wildflower program, approaches to address outdoor advertising, scenic byways, anti-litter campaign, and a Main Street Approach. Although NDOT currently incorporates some of these elements, the Corridor Plan redefines them and, in some cases, establishes new facility types.

LANDSCAPE TREATMENT TYPES

Landscape treatment types include a combination of applications for both softscape and structures and hardscape. All sections of NDOT rights-of-way have an associated landscape treatment type to help define their design character and anticipated maintenance level. Softscape treatments vary from simple rock mulches to elaborate ornamental plant material. Similarly, structures and hardscape categories range from standard to landmark. Used in combination, these treatment levels establish the design character within the corridor. The matrix of possible combinations of softscape types and structures and hardscape types is shown in Figure 4.
Softscape Types and Treatments

Softscape types and treatments are compositions of plant material including trees, shrubs, perennials, grasses, and ground treatments. The following descriptions and photographic examples define the specific softscape types that may be utilized in sections of the corridor. Although the treatments require varying levels of irrigation, an overall emphasis has been placed on water conservation. NDOT requires cooperative long-term maintenance agreements with local stakeholders for irrigated landscapes.

Ground Treatment

Ground treatments along the roadway provide erosion and dust control. This treatment includes uniform applications of rock mulch or variable sizes of stone, combined with textures that match the existing environment. Soil stabilizer may be used in conjunction with these methods. In rural areas, palettes are derived from natural patterns found in playas, foothills, or ephemeral drainages. In urban environments, various forms of aesthetic rock treatment are used to create patterns and textures. Irrigation is not included in this treatment.

Native Plant Revegetation Landscape

A palette of native southern Mojave or Great Basin plant material should be used to re-establish disturbed areas along the roadway. The primary focus is to cultivate native communities, such as sagebrush or blackbrush, and their associated grasses. Seedings should be interspersed with mature plants, such as creosote bush or sagebrush, to establish a plant community character. Plantings should be sparse to mimic natural patterns and may require temporary irrigation to assure plant establishment. Soil enrichment with mulch, topsoil, and other amendments is required. Preparation techniques include roughening grade for seeding applications.

Note: These photographs are illustrative examples of the softscape types and treatments.
Regionally Adapted Landscape
Combinations of Great Basin or Mojave Desert plants and those from other dry land environments form this landscape palette. Greater densities and varieties of plant material are combined to create a layered effect. Trees provide a distinct overstory, while shrubs and perennials form a thick understory. Plants are selected for color, texture, seasonal interest, and form. For this landscape type to survive, drip irrigation to individual plants is required.

Regional Ornamental Landscape
Regional ornamental landscapes include a diversity of plant species, some of which are imported to this region. Ornamental landscapes introduce taller and denser plant material. The regional ornamental landscape includes shade, varieties of form, and color. It provides a dynamic contrast to the arid landscapes of naturally occurring plant species. In the regional ornamental landscape, vegetation patterns and compositions are designed to reflect aesthetic and cultural qualities. Zoned drip irrigation systems are required.

Note: These photographs are illustrative examples of the softscape types and treatments.
Structures and Hardscape Types and Treatment
The following classifications define a common language for the treatment levels used in highway facility design. Bridges, retaining walls, noise walls, pedestrian crossings, pedestrian fencing, railings, barrier railings, lighting, and transportation art are included in these classifications.

Standard Structures and Hardscape
Standard treatment is simple and functional. Color and proportional adjustments improve aesthetic quality. Standard structure design is economical and satisfies vehicle movement requirements, but does little to establish design character or placemaking. NDOT standards for surface treatment and lighting include painted finishes, vertical rustication formliners, and overhead poles with cobra head illumination or high mast area lighting. Regular trash and graffiti removal maintenance programs are necessary.

Accentuated Structures and Hardscape
Corridor pattern design is defined by a unified system of materials and textures. Adding accents and special finishes to built structures facilitates and enhances placemaking. These elements can include transportation art and the application of high quality finishes and color to highway structures. Drainage details and water harvesting techniques can be enhanced through the use of decorative rock and contour grading.

Note: These photographs are illustrative examples of the structures and hardscape types and treatments.
**Focal Structures and Hardscape**
Focal structures and hardscape treatments facilitate the expression of a specific design character. Structures consist of self-weathering materials, integrated color or textural finishes, and may include detailed formliners on structural surfaces. Patterns consist of a motif-based multi-surface design. Barrier rails utilize custom construction and include designs that are artistically incorporated into the structure, ultimately elevating an engineered form to a work of art. Upgraded lighting elements combine form and function to include lower height standards and decorative elements.

**Landmark Structures and Hardscape**
Landmark treatments call attention to unique elements. Extensive design treatments are used on bridge structures, retaining walls, acoustic walls, barrier rails, and pedestrian crossings. Unique formliner treatments on structural surfaces emphasize the special importance of a place. Subject and composition, combined with placement, denote the importance of transportation art. Elaborate lighting provides special nighttime effects.
The following figure illustrates how varying degrees of softscape treatments and structures and hardscape treatments may be appropriately applied over a section of the corridor.

**Figure 5** APPLICATION OF LANDSCAPE TREATMENT TYPES
STATEWIDE PLACE NAME SIGN PROGRAM

A statewide place name and point of interest sign program better connects people to places.

Benefits of the Program

The State of Nevada is a large geographic area with diverse and oft-hidden features. The sign program will provide clear and consistent direction from the corridors to scenic areas, points of interest, historic sites, and local publicly owned attractions. Signs will welcome visitors and inform residents. In addition to stimulating local economies, signage will draw attention to these important assets and affirm the rich history and physical attributes of the state. The sign program will encourage visitors and residents to better understand the history, culture, and geology of the state.

How the Program Will Work

Utilizing the current Federal Highway Administration (FHWA) Manual on Uniform Traffic Control Devices (MUTCD) as a guide, a family of iconic symbols specific to Nevada will be designed for use on standardized directional and identification signs. To ensure uniformity and consistency, the state will implement a policy manual for the signs, referred to as the Nevada Place Name Sign Manual. Program promotion will occur via informational brochures available at welcome centers, specific identification on state maps, and locally based advertisements. Recognizable icons will demarcate points of interest and directional symbols. FHWA approval for the Statewide Place Name Sign Program is mandatory prior to installation. The program will work in conjunction with Watchable Wildlife, an existing, but separately run, organization that utilizes signage and guide books to promote wildlife viewing areas.

An audio and multimedia interpretive program will be developed with the sign program. This program will provide travelers with audio interpretation of Nevada’s history and natural features.

Eligibility

Under a state-managed and -controlled program, NDOT will establish and approve an initial inventory of categories common to the state, including features specific to each highway corridor. Iconic imagery will be created to represent the general categories. After the initial inventory is confirmed, state and local entities can apply for inclusion based on specific criteria.

Anticipated Categories

Categories for sign icons common to the state of Nevada could include, but are not limited to:

- Nevada historic points and landmarks, including cultural resources approved for public information
- Native American resources approved for public information (check Native American Grave Repatriation Act and other governing organizations)
- Mountains
- Rivers
- Sand dunes
- Mining
- Railroads
- Historic downtowns
- Ghost towns
- Emigrant trails
- Wildlife viewing areas

Associated Cost

The sign program is expected to directly benefit smaller communities and local attractions. Increased tax revenues will give the state a tangible return on its investment. Business partnerships through sponsorships are possible, provided there are partial cost offsets.

Signs Included in the Program

Interstate Level – Exit to Area of Interest or Town

This primary sign type is used only on interstates and is included here for informational purposes only. It will be used as an informational listing, located in advance of interstate exits. It will include symbols and descriptions as well as the interstate exit number.

Highway Level – Directional Sign on State Roads

Used primarily along highway corridors, this secondary sign type provides information for features located on state roads and intersections. It will incorporate symbols and a directional arrow (see illus. 2 on page 1.12).

Signs will be post mounted and use reflective graphics/lettering on a metal panel in accordance with applicable FHWA or MUTCD safety standards. A maximum of four symbols will be used on each sign (one per panel). Concise written descriptions are required to accompany iconic symbols.

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Nevada contains numerous special resources of interest to visitors. Interpretation enhances the traveler's appreciation and understanding of the area.

Iconic signage clearly directs travelers to unique resources and destinations, such as areas of geological or recreational interest.
Highway Level – Scenic Overlook or Viewpoint
This sign type will be located prior to pull-offs and includes symbols and descriptions as well as the distance to the pull-off (see illus. 3).

Signs will be post mounted and use reflective graphics/lettering on a metal panel in accordance with applicable FHWA or MUTCD safety standards. A maximum of two symbols will be used on each sign. Concise written descriptions are required to accompany iconic symbols.

Road services are an important component of any roadway corridor experience. They are even more critical in areas of Nevada where long distances separate developed areas. A complete description of road service facilities and their program components is provided in the Rest Areas, Viewpoints, and Pull-offs guidelines on pages 3.14-3.16. These service areas provide travelers with designated spaces to rest, interpret history and geography, and discover information about nearby activities and communities.

Community rest areas are a special type of road service facility that serves several important functions within the corridor and for the community. These facilities are integrated within the town structure to serve residents and visitors. Community rest areas function like a pocket park or town square. They provide a central location for visitors to learn more about local tourism opportunities, piquing their desire to further explore the community. Central locations or areas connected to community centers provide appropriate sites. Partnerships with towns, counties, or other organizations are required to site the facilities outside of the right-of-way.

The Statewide Place Name Sign Program uses a family of iconic symbols specific to Nevada to identify features such as railroads, historic buildings, and geological points of interest.

Directional signs on State roads use a family of iconic symbols along with a directional arrow. This type of sign uses a maximum of four symbols.

Signs for a scenic overlook or gateway use a maximum of two symbols along with the distance to the pull-off.
NATIVE WILDFLOWER PROGRAM

Inspired by a vision of native plant species along rights-of-way to enhance the beauty of the land, the FHWA has adopted two programs to promote the use of naturally occurring forbs and grasses in a particular region, state, or ecosystem. The Surface Transportation and Uniform Relocation Assistance Act (STURAA) of 1987 requires that at least one-quarter of 1% of funds expended for any federal-aid highway landscape project be utilized for native wildflower plantings. The second is a voluntary program called “Operation Wildflower.” It promotes the use of native wildflowers through a cooperative relationship between the National Council of State Garden Clubs and state highway agencies.

In addition, the FHWA recognizes that native forbs and grasses can also provide:

- Reduced maintenance requirements for established native plants in comparison with non-native species
- Reduced roadside fire hazards
- Reduced use of herbicides when native plants are successfully established
- Improved erosion control through drought-tolerant species
- Improved relationship between the highway corridor and the regional character of the landscape

The University of Nevada’s Mapping Ecosystems along Nevada Highways and the Development of Specifications for Vegetation Remediation (Mapping Ecosystems) supports the use of forbs and grasses in highway rights-of-way. Forbs and grasses that are appropriate to specific regions and ecosystems require “little or no maintenance” and “create defensible space for wildfire along the highway corridors” (Tueler, Post, and Noonan, 2002). As part of the wildflower program, plants should be utilized that do not create a fire hazard or overly attract wildlife.

INVASIVE AND NOXIOUS WEED CONTROL

Invasive species can have devastating effects on a landscape’s economic and environmental quality. Invasive species decrease diversity and can out-compete native species. The Nevada Department of Agriculture maintains a list of noxious weeds that should be contained through a revegetation program along the corridor. The list can be referenced at http://www.agri.nv.gov/nwac/PLANT_NoxWeedList.htm.

Nevada’s Coordinated Invasive Weed Strategy (University of Nevada, 2002) identifies additional species that have the potential to negatively impact Nevada’s environmental quality. NDOT’s continued coordination with the Nevada Weed Action Committee provides an organized effort for invasive and noxious weed control.

Due to the frequency of invasive weeds along the corridor, control measures are necessary for any new landscape design project. Adhering to best management practices for successful revegetation is a suggested control method. Additional suggested procedures include:

- Tailoring revegetation procedures to specific plant community types
- Making recommendations for site and soil preparation
- Including site-appropriate revegetation practices
- Providing for adequate weed maintenance to allow for revegetation establishment

Limitations

In the 40 years since the passage of the HBA, few nonconforming billboards have been removed and many more have been constructed due to exclusions in the law. Enforcement is difficult because Section G of the law requires cities and counties to pay just compensation to owners for billboard...
removal. Although the federal government is required to contribute 75% of the compensation, many communities do not have the funds to pay the 25% requirement, and their ability to use local land use controls to restrict construction was removed. Additionally, the federal government has stopped providing money for billboard removal (Brinton, 2001).

A second limitation within the HBA is the allowance for billboards to be constructed in areas zoned commercial and industrial, as well as in unzoned areas with commercial or industrial uses. The provision also acknowledges that the State has authority over the zoning laws. This entitlement allows the State to implement zoning regulations that effectively increase the difficulty of controlling billboards. Communities may specifically zone an area along the highway as commercial, or the outdoor advertising structure may be built on a parcel that has an obscure commercial use.

A third provision allows designated scenic byways to be segmented and excluded from federal control. An amendment to the HBA, passed by Congress with the 1995 National Highway System Designation Act, allows states to exclude portions of a scenic byway that conflict with the state’s standards for denoting scenic byways and utilize only local restrictions for billboard control. As a result, areas of lower scenic quality become more unattractive and reduce the overall scenic character of the byway.

Nevada Statutes
Removing billboards in Nevada became more difficult in 2001 due to the Nevada Revised Statute (NRS) 278.0215. This regulation prohibits the use of amortization—a method used by many states—for sign removal. Rather than utilizing the traditional cost approach, it defines the methodology for determining “just compensation” to include property uniqueness as well as income generation from the sign. This cost-prohibitive revision renders sign removal almost impossible.

Although control of outdoor advertising seems daunting, there are regulations that provide restrictions to billboard construction. NRS 405.050 allows counties to deny permits for billboards that may “measurably destroy the natural beauty of the scenery or obscure a view of the road ahead.” Additionally, the statutes give the NDOT Director the authority to remove any sign that is a traffic hazard.

The Role of Local Government
Cities and counties have the ability to regulate the location and, to a limited degree, the type of billboard erected within their jurisdiction. Although a state must prove its jurisdictional rights to control outdoor advertising on Indian reservation lands and have a written statement from the State Attorney General, local governments may coordinate with the Bureau of Indian Affairs to determine a course of action to limit the negative visual impacts of billboards. Proactively planning for appropriate placement, size, and design of billboards can address the issue before signs are erected.

Design standards that address height, size, color, spacing/frequency, and context are a valuable method for directing outdoor advertising. For example, signs can be relocated if they block visual resources. Material choices and architectural detail can be improved to reduce the visual distinction between the sign and the surrounding environment. Communities can regulate the location of billboards to reduce the scenic impact of billboards and improve visual quality along the state’s highways. Important viewsheds and scenic corridors may be designated within the county and land use regulations can be developed that discourage or prohibit outdoor advertising.
NEVADA SCENIC BYWAYS DESIGNATION

Nevada’s Scenic Byways program was established in 1983. Since then, 21 scenic byways have been designated. US 93 from the SR 318 intersection north to Ely including US 50/US 6 from the US 93 intersection east to the Utah state line is the only byway located within the corridor area. Several Bureau of Land Management (BLM) Back Country Byways are accessible from the corridor.

According to the FHWA, designating a roadway as scenic has several benefits. These benefits include preservation, promotion, pride, partnership, and, specifically, the protection of scenic and roadside vistas and historic buildings. In addition, the HBA prohibits the erection of new billboards along designated scenic byways that are inter-state, a part of the National Highway System, or federal-aid primary roads. The National Highway Designation Act of 1995 amends the law to allow segmentation of portions of the byway, particularly if sections of the roadway fail to meet the scenic byway criteria. The segments in question are then controlled by local regulations only, allowing new billboards to be erected subject to existing state or local controls. Roadway scenic quality can also be regulated with scenic or conservation easements. These easements preserve landscape character and provide the participating entity with a one-time tax deduction equal to the foregone value of the use of the land.

opportunities for Partnerships

Scenic designation can promote and expand public and private partnership opportunities. For example, America’s Byways Resource Center provides technical assistance and, together with the FHWA, can provide seminars and workshops to further facilitate the partnering process.

Scenic roadway opportunities consist of federal, state, and local programs that provide assistance in achieving scenic designation in Nevada.

- The federal BLM Back Country Byways and US Forest Service (USFS) Scenic Byways plans focus on infrequently traveled paved, unpaved, and four-wheel drive roads that access back country or wilderness areas.
- The Nevada Scenic Byways program focuses on year-round accessible roadways. The program identifies, promotes, and protects the state’s most exceptional roadways. These byways must provide access to recreational areas or historic sites.
- The Local Tourism Routes program allows communities to promote special roadways and other modes of travel (such as boat, balloon, and train rides and bicycling or rafting trips) that are not included under any other programs.

Local groups and agencies nominate and manage scenic byways and local tourism routes. Scenic byway designation is reserved for routes approved by NDOT. The State Scenic Byways Committee, which is comprised of representatives of NDOT, NCOT, the Nevada Division of State Parks (NDSP), and the BLM, reviews and suggests approval. It is the NDOT Director, however, who makes the final designation. NCOT is responsible for the Local Tourism Route program. It reviews and approves all promotional material to ensure that scenic byway designation is not used for local tourist routes.

Levels of Designations Available

Two levels of scenic byway designation are available: basic and advanced. Byways of both classifications are placed on state tourism maps, in visitor information packages, and in other scenic byway promotional materials. The state prepares and distributes a brochure about the byway.

Routes with an advanced designation are eligible for federal and state funds. Advanced designation requires a corridor management plan and a five-year recertification obligation.

Interstate highways have not been included in the state program primarily because encouraging travel on non-interstate routes increases the tourism economic base of rural communities.

Scenic byways should include a simple iconographic image that is related to the place, as part of the Statewide Place Name Sign Program.
Nevada Scenic Designation
The Director of NDOT may establish a scenic designation for any section of highway right-of-way. The Corridor Plan recommends increasing the promotion of the Great Basin Scenic Byway along portions of US 50, US 93, and US 6 and highlighting access to numerous state parks and a national park. Three proposed scenic byways include:
- US 93 from Maynard Lake at the Pahranagat National Wildlife Range to the SR 375/318 intersection north of Alamo
- Rainbow Canyon south of Caliente
- SR 722 south of Austin

These proposed byways are coordinated with current community efforts to designate the highways as scenic.

(*) In addition to increasing tourism opportunities, the use of a scenic byway designation provides mechanisms to preserve areas of high visual quality.
ANTI-LITTERING CAMPAIGN AND SIGNAGE

Fast food containers, bottles, trash bags, and rusty kitchen appliances found alongside the road are distracting and imply general neglect and disregard for the environment. A statewide anti-littering campaign would represent a significant step towards maintaining and improving Nevada’s highways. The campaign should be advertised in such a way as to command the attention of residents and travelers.

Anti-litter messages should be part of a coordinated campaign. Similar to the “Don’t Mess with Texas” anti-littering campaign, this program could become a marketing showpiece for the state of Nevada. The program would be promoted through roadway signage, magazine advertisements, and bumper stickers. The signs shown to the right illustrate potential anti-littering concepts. Final design ideas should follow MUTCD or be used as part of signage and collateral material on billboards or at rest areas.

Distribution of campaign materials would be focused at travel-oriented locations such as welcome centers, rest areas, and truck stops. Coupled with promotional materials, an “Adopt-A-Highway,” or “Sponsor-A-Highway” program would engage residents of Nevada, encouraging active participation in maintaining clean and beautiful highways. This plan recommends implementing an anti-littering campaign using highly visible signage; easily distributed collateral materials such as cups, maps, brochures, and fliers; and an active volunteer clean-up program.

SECTION TWO: Elements of Landscape and Aesthetics

1. Recurring character has changing messages reminding travelers to keep the highway litter free.
2. Recurring character has changing messages reminding travelers to keep the highway litter free.
3. Signage emphasizes the varied beauty and character of the west while providing anti-litter messages.
4. The negative visual impact of litter along the highway significantly impacts the motorist’s experience. Removing and managing litter along the highways is an important topic of the Corridor Plan.
5. The anti-littering campaign’s promotional materials need to grab the attention of motorists and residents. An edgy and provocative campaign will keep the issue of litter very visible to travelers. Highway graphics and signage posted along the highway where trash accumulates is the most significant part of the anti-trash program.

The three examples above illustrate a concept for an anti-littering signage campaign that can be developed around common themes. Design continuity improves driver recognition of the anti-littering message while varying the message also maximizes driver awareness. Motorists are interested to see what the next message will be.
MAIN STREET APPROACH

Vibrant main streets are a critical component of all communities. Rural communities are especially dependant upon vital commercial districts. Bisected and altered by the interstate highway system and suburban sprawl, main streets across America have declined, both economically and physically, to a point where they are no longer viable community centers. Vacant buildings and declining businesses often line the highway. In some areas, revitalized commercial districts indicate continued community growth.

The Main Street Approach, developed by the National Trust for Historic Preservation, assists in revitalizing the older, traditional business districts while simultaneously preserving the history and character of downtowns. The program combines “historic preservation with economic development to restore prosperity and vitality to downtowns and neighborhood business districts.”

The Main Street Approach does not promote a “quick fix.” It is a long-term, comprehensive strategy designed to meet local needs and opportunities. The strategy is based on a four-point approach that includes organization, promotion, design, and economic restructuring. It is a volunteer-based program that relies on community support. Volunteers form the governing board and standing committees, while a paid program manager coordinates and supports the operation.

The National Main Street Center, or the local coordinating agency, provides assistance in the form of technical services, networking, training, and information. The Center can provide direct fee-for-service technical assistance to cities and towns, both independently and in conjunction with state and citywide main street programs. Revitalization programs funded largely by local sources are more likely to succeed than those relying solely on state or federal funds. The Main Street program offers educational sessions related to facilitating local support and generating public and private partnerships. Local involvement in and coordination with the program helps communities find solutions that work best for them.

The accomplishments of Main Street programs are many: improving aesthetics and safety of downtown areas, restoring historic buildings, and revitalizing economic viability. The program identifies potential economic niches; assists with promotional and fund-raising efforts; supports joint marketing efforts among local businesses; encourages and trains new business owners; and finds grants for facade, streetscape, and landscaping improvements. Results include reduced vacancy rates and renovated or restored downtowns.

Physical improvements are quickly evident. Though long-term economic improvements may take up to three years to accomplish, the program’s impact on communities nationwide is indisputably positive and long lasting. Communities have experienced net gains in business development and job creation, with surges in local investment. Most importantly, community pride grows with increased personal involvement in a volunteer-driven program.

As an example of the success of this program, seven communities in rural Iowa participated in the program for ten years. On average, each town renovated 97 downtown buildings, gained 24 businesses, and saw $1.6 million in private sector reinvestment.

Anyone can start a Main Street program in their community. The first step is to contact the statewide coordinating program for support, technical assistance, training, networking, and encouragement. Because Nevada does not currently have a coordinating program, contact should be made with the National Main Street Center in Washington, DC. A self-initiated program may be created without a state program. The National Main Street Center provides contacts to assist in networking with other independent programs and nearby state programs. Communities are welcome to utilize principles and tools from the Main Street Approach regardless of whether they qualify for the program or wish to follow it exactly. The program incorporates historic preservation with community revitalization. Communities designated as a National Historic District qualify for more assistance through the program. Additional information can be obtained by visiting the Main Street web site at www.mainstreet.org.
SECTION THREE: Background Inventory

SOCIAL RESOURCES

Community Settlement Patterns and Growth

Urban Patterns

Eastern Nevada’s historic settlement is tied to travel and mining. Many of the region’s communities are located along early pioneer routes or were established as a result of mining discoveries. Over time, mining camps grew into towns and discovery routes grew into wagon roads and, eventually, the Nevada state highways. The towns within the eastern corridor are located in the least populated region of the State. While some areas are expected to experience significant growth because of spin-off from Las Vegas, other communities will face the continuing challenges of the boom and bust mining cycles that have characterized their region. In the past.

The high percentage of public lands throughout this corridor reduces community growth opportunities by limiting the amount of land available for development. Recent public laws allow the BLM to transfer over 150,000 acres of public lands to state, local, and private entities in Lincoln and White Pine counties (Lincoln County Conservation, Recreation, and Development Act of 2006 and White Pine County Conservation, Recreation, and Development Act of 2006). Transfers of this type would allow private land holdings within Lincoln County to almost double from 148,000 acres to 278,000 acres over the next 10 to 30 years. As of 2007, most of the land available for transfer was located in southeast Lincoln County just north of the town of Mesquite. Along the corridor, land south of Alamo has been sold to develop an industrial park. Within White Pine County, the bill transfers two small parcels of land for the expansion of the industrial park and airport (located north of Ely on US 93) and 3,526 acres located south of Ely on US 93 to the Ely Shoshone Tribe for traditional, ceremonial, commercial, and residential purposes.

Land Ownership

The State of Nevada contains the highest percentage of federal lands among the contiguous 48 states, over 86% (BLM, 2000). In addition, several of Nevada’s eastern counties contain some of the highest percentages of federally-owned land in the state. At least 90% of the land in Lincoln, Ely, and White Pine counties is federally managed. The BLM owns the bulk of the federal lands with small and large in-holdings of other federal and state agencies including the USFS, the US Fish and Wildlife Service (USFWS), and the State of Nevada. Land ownership patterns in the state have not changed much over the last several decades, and this stability in land ownership has provided some level of visual continuity within the state.

Land ownership affects land use and visual character. Public agencies such as BLM and USFS operate under a multiple-use mandate. To the casual observer, a vast majority of the state may appear vacant, wide-open, and wild, but a closer look reveals that much of Nevada is a working landscape. From...
the highway, grazing, mining, power generation, and outdoor recreation are evident throughout the multiple-use federal lands. Although NDOT’s jurisdictional influence over the landscape only extends to the right-of-way, agreements with other public agencies make it possible for NDOT to develop a common vision that will shape visual character and land use decisions for areas adjacent to the roadway as well.

**Implications to the Corridor**

Over the next 20 years, the anticipated changes most likely to influence the corridor include the development of Coyote Springs within both Clark and Lincoln counties and the disposal of BLM lands for public sale. Existing community services in towns such as Alamo, Caliente, and Pioche will face challenges as they adapt to the growth pressures from the southern region. Corridor aesthetics will be faced with maintaining a consistent natural landscape appearance while responding to large developments.

**Travel and Tourism**

**Travel Patterns**

Eastern Nevada offers a rare American West experience with open, untamed landscapes. The Great Basin landscape boasts wide valleys and picturesque mountain ranges interspersed with ranches and historic mining towns. Tourism opportunities include the Great Basin National Park, historic sites, wildlife refuge areas, state parks, archaeological sites, and areas of geological interest. There are also annual celebrations and events in many eastern Nevada towns such as the Silver State Classic Open Road Race and White Pine County Fair. Recreational activities include mountain biking, ATV riding, gaming, geocaching, camping, fishing, and hiking.

US 93, also known as the “Great Basin Highway,” connects to US 50 and US 6 and provides access to many eastern Nevada destinations. The majority of visitors travel via automobile since major airport hubs are located between one to two hours away. Tourist stops typically occur as a side trip for travelers rather than a final destination.

NCOT divided the state into five travel territories based upon major regional destinations and county boundaries. The eastern corridors fall mainly within the Pioneer Territory, the Pony Express Territory, and the Cowboy Territory. The southernmost portion of US 93 continues into the Las Vegas Territory.

The Pioneer Territory includes the portions of US 93 and US 6 in Lincoln and Nye counties, respectively. The name refers to the fascinating boom and bust mining history associated with this region, more than any other in the state. Travel opportunities include the Pahranagat National Wildlife Refuge, the historic mission-style railroad depot in Caliente, and five state parks.


The Cowboy Territory in northeast Nevada contains Wells, West Wendover, and Jackpot. Gaming attractions in Jackpot and West Wendover draw significant weekend crowds from Idaho and Utah and provide lodging facilities for travelers along US 93 and I-80. South of Wells, US 93 passes through scenic valleys with panoramic views of the rugged Ruby Mountains.

**Overview of Existing Travel Facilities**

Highways play an essential role in connecting people to their surroundings. Visitor centers, viewpoints, and signage impact a traveler’s first impression of the state and directly influence their overall experience of key local, state, and national tourist destinations. For example, signs allow travelers to recognize that they are driving through historic mining locations. Signage provides valuable information and is a useful way to notify drivers of upcoming viewpoints and cultural and natural features. Currently Nevada uses the following signs to note tourism opportunities:

- Brown-colored public recreation area and facility signage.
- Brown-colored NCOT signs marking “territory” boundaries.
- White and blue historical marker signs indicating the presence of a blue historical sign off the highway.
- Blue-colored scenic byway signs.

Roadside facilities currently consist of rest areas and welcome centers. This is a strategic way for visitors to orient themselves and gain knowledge of interesting places to visit along their journey. These facilities vary in the type of services and information provided. The majority of the corridor’s 12 NDOT-managed rest areas provide a picnic table with trash cans. Two facilities have chemical toilets, and the welcome center in West Wendover has running water with flush toilets and travel information.

In addition to the 12 NDOT facilities, the BLM manages two rest areas with shaded picnic tables.
and chemical toilet facilities. The presence of several state parks near US 93 also offers opportunities for picnicking and camping with water, restrooms, tables, and grills. Communities also provide places to stop.

Facilities vary in architectural style and site planning. For example, the Jackpot rest area is a good example of a well-sited facility along Salmon Falls Creek. The grade separation from the highway reduces the exposure to traffic movement and reinforces the connection to the natural environment. The more common site planning method currently locates facilities just off the highway with little or no buffer.

Opportunities to Enhance Travel Facilities

Throughout the corridor an opportunity exists to present a better image of the state through the design and placement of highway facilities that connect people to the places they are visiting. Existing travel facilities can be improved by taking full advantage of an area’s unique features and incorporating an enhanced overall design and architectural consistency.

Rest areas should be planned and designed in a consistent and comprehensive manner. Along lengthy stretches of highway, travelers can suffer from driving fatigue. One rest area located every hour is typical for safety measures; however, important historical, cultural, and natural site features should also serve as site planning criteria. Major site features to be considered in the location and design of rest areas include elements such as terrain, views and vistas, vegetation patterns, cultural or historic features, water elements, geological features, and wetlands.

In addition, there is potential for rest areas and/or viewpoints to be located and designed as part of a larger trail or recreation system, such as a gateway to public lands, parks, and other tourist attractions in the region. Partnerships with federal and state agencies, such as BLM and NDSP, offer creative methods for planning and maintaining facilities as part of a comprehensive system. Community rest areas can be developed as part of a partnership with the town. These facilities provide services to travelers and encourage visitors to stop in a town, rather than on its outskirts.

Adequate rest area facilities should include restrooms, picnic areas, pet exercise areas, paved parking, fresh drinking water, interpretive exhibits, and local area information based on traveler needs and frequency of use. Regional architecture, sensitive to the Great Basin environment, should be encouraged for all structures and facilities. In addition, where landscaping is implemented, attention to drought-tolerant landscape treatments is essential to success.

Enhancements to historical marker signs should improve legibility and give motorists advance warning of turn-offs. In addition, marker sites should be reviewed every three to five years to monitor changes in the surrounding development and minimize placement of signs in obscure and unattractive locations.

NATURAL RESOURCES

Water Resources

Natural Systems

Nevada’s Central Hydrographic Region is the primary region underlying the corridor. It also crosses the hydrographic regions of the Ado, Humboldt, and Snake River Basins. Surface water systems readily visible along the corridor include the lakes and reservoirs of Pahranagat Valley, McGill Reservoir (north of Ely), and Salmon Falls Creek (south of Jackpot).

Precipitation averages nine inches per year with a few additional inches at higher elevations. Surface waters are typically channeled through a network of ephemeral streams and washes into playas, where the water gradually percolates downward into the water table or is lost to evaporation. Runoff rates throughout are generally less than 0.2 inches per year except in higher portions of the ranges.

For over the past decade, the western United States has been mined in drought. For southern Nevada, which relies on the Colorado River for nearly 90% of its water supply, the drought has potentially serious consequences. In response to these concerns the Southern Nevada Water Authority has sought out alternative water resources to supply the increasing water demands within the Las Vegas valley. One of the plans that could alter the landscape of eastern Nevada is a proposed pipeline that would siphon rural groundwater from high desert basins. The area affected by the proposed project includes Lincoln and White Pine counties. Although this is one of the least populated regions of the country, opponents cite...
Chapter One — Corridor Management and Background Inventory

SECTION THREE: Background Inventory

Water conservation and use of low-water use plants is mandatory in the arid landscape of Nevada. Highly controversial topics such as exporting water from eastern Nevada to Las Vegas intensifies the need for water conservation.

Water Use Regulations
To address water sustainability issues, a group of rural leaders in central Nevada initiated stakeholder discussions in February, 2005. These discussions resulted in a joint recommendation for the creation of a central Nevada Regional Water Authority that includes all the eastern corridor counties except Lincoln, which is regulated by the Lincoln County Water District.

Due to the limited water availability, highway landscapes should be drought tolerant. NDOT should also coordinate with local jurisdictions and water providers to ensure enough water is available to help establish revegetation efforts. The Corridor Plan recognizes the need to promote water conservation through design that incorporates low-water use vegetation. NDOT requires interlocal maintenance agreements with communities in order for permanent irrigation to be used on projects.

Vegetation
The vegetation community information for this report is based on Mapping Ecosystems (Tueller et al., 2002), a resource completed by the University of Nevada’s “Mapping Ecosystems Along Nevada’s Highways and the Development of Specifications for Vegetation Remediation” is the first step towards preserving the scenic quality of Nevada’s eastern highways.

The environmental decline of Owens Valley in California as an example of what could happen in rural Lincoln and White Pine counties from the diversion of groundwater to the Las Vegas area.

North of the US 93/SR 375 junction the landscape becomes more densely vegetated with plants typical of the Great Basin. Although shrubs dominate basin areas, forests of pinyon and juniper cover the higher slopes of mountain ranges. Salt desert shrub sites occur along valley floors. Here a series of natural springs and lakes create a fertile agricultural oasis, interspersed with pockets of cottonwoods, that extends approximately 40 miles.

Salt desert shrub sites typically require imported topsoil and fertilizers for revegetation due to the low nutrient levels of native soils. Seeding often occurs two years in a row, particularly if temporary irrigation is not used. Mulch is recommended to help maintain soil moisture.

Riparian/agricultural/grass sites generally exhibit good organic matter content and soil moisture, allowing for relatively simple establishment of new plant material. However, noxious weeds, erosion, and periodic flooding can become challenges to successful revegetation.
Wildlife Habitat and Migration

Eastern Nevada is home to a diversity of wildlife. Lack of water, combined with extensive federal government landholdings, renders much of rural Nevada as open and undeveloped, providing excellent wildlife habitat for a number of species. Availability of quality habitat largely determines the abundance and distribution of all wildlife species. Designated regions have been established to protect and preserve the ecological, natural, and cultural resources of specified areas. Almost 1.7 million acres (29%) of Nevada’s most ruggedly scenic areas is designated wilderness, and another 1.59 million acres are recommended as suitable for wilderness designation by the BLM.

Locations along highways where significant collisions occur are prime candidates for wildlife crossing retrofit projects. Signage currently marks the location of wildlife crossings. Future improvement projects should pay particular attention to the location of high quality habitat areas to ensure that wildlife crossings and warning signage are appropriately located.

Antelope, elk, mule deer, and big horn sheep are the large game species most commonly associated with vehicle-wildlife collisions within the corridor. Collisions, as documented for a four-year span by the Nevada Division of Wildlife (NDOW), are shown on the Environmental Considerations maps. Conflict areas include US 93 near the Pahranagat National Wildlife Refuge, US 50/US 6/US 93 in the Steptoe Valley of White Pine County around Ely, and US 50 east of Austin and south of Eureka. Most collisions tend to occur around dusk when animals are looking for food and water or just after a storm. Other species typically involved in incidents are coyotes, raccoons, birds, black- and white-tailed jack rabbits, desert cottontails, rattlesnakes and the desert tortoise.

Deer collisions along US 93 in Lincoln County occur mostly between mile markers 103 to 115. Deer cross from the low hills west of US 93 into the alfalfa fields east of the highway to feed in the evening hours and return to their resting areas in the early morning hours. Wild horse herds also frequent the area and collisions occur typically between mile marker 80 to 125.

Wildlife species noted in this corridor include antelope, elk, big horn sheep, and mule deer. Mule deer and pronghorn antelope are common in the sagebrush and pinyon-juniper upland habitat. Pronghorn antelope are primarily found in the valleys between mountain ranges in northern and central Nevada. Much of the land east of US 93 from Caliente north to Jackpot is designated as mule deer corridors. Large elk corridors are documented south of Ely, and along US 93 south of Wells and east of the Ruby Mountains. Mule deer migrate from higher elevation forest edges to the lower elevation desert floor during the winter. The corridor also hosts several wildlife management and wildlife refuge areas. The Pahranagat National Wildlife Refuge is of importance for its habitat and birding opportunities.

To assess the environmental features, data was gathered from a variety of sources and analyzed according to its relationship to the corridor highways. Data incorporated into the analysis includes wildlife habitats, lakes and playas, and riparian systems. Additional data obtained from the BLM identifies unique features of significant influence, including: wildlife refuges, wilderness areas, and areas of critical environmental concern (ACEC). The BLM designates areas as ACEC to preserve sites with unique biological, geological, historic, or scenic features. The boundaries shown are taken from the BLM database.

Wilderness areas and ACEC are specially designated regions that should be carefully considered with all highway construction projects. Stands of pinyon-juniper and Joshua trees are unique plant communities that should also be preserved as they provide a unique experience along the highway corridor.

ENVIROMENTAL CONSIDERATIONS

Mapping of Environmental Features

The landscape of central Nevada has many special environmental features, including plant communities, rivers, lakes, playas, wildlife, rock outcroppings, cliffs, and mountain ranges. These resources provide opportunities to create viewpoints, preserve natural systems, and enhance wildlife movement corridors.

To assess the environmental features, data was gathered from a variety of sources and analyzed according to its relationship to the corridor highways. Data incorporated into the analysis includes wildlife habitats, lakes and playas, and riparian systems. Additional data obtained from the BLM identifies unique features of significant influence, including: wildlife refuges, wilderness areas, and areas of critical environmental concern (ACEC). The BLM designates areas as ACEC to preserve sites with unique biological, geological, historic, or scenic features. The boundaries shown are taken from the BLM database.

Wilderness areas and ACEC are specially designated regions that should be carefully considered with all highway construction projects. Stands of pinyon-juniper and Joshua trees are unique plant communities that should also be preserved as they provide a unique experience along the highway corridor.
ENVIRONMENTAL CONSIDERATIONS
US 50: NEW PASS SUMMIT TO ELY AND US 93: ELY TO SCHELLBOURNE
ENVIRONMENTAL CONSIDERATIONS
US 93: SCHELLBOURNE TO WELLS AND ALT 93

LEGEND
- US 93, East US 6, and East US 50 Corridor with Mile Markers
- Interstates
- Highways / State Routes
- Local Roads
- Railroads
- Railroads (historic)
- County Line
- Streams / Rivers
- Lakes
- Playas
- Joshua Tree Plant Communities
- Pinyon-Juniper Plant Communities
- Great Basin National Park
- National Recreation Area
- Wilderness Study Area
- National Wildlife Management Area / National Wildlife Refuge
- Wilderness Area
- Humboldt-Toiyabe National Forests
- Area of Critical Environmental Concern (ACEC)
- State of Nevada Lands
- State Park / State Recreation Area

WILDLIFE COLLISIONS
- Elk Collision
- Antelope Collision
- Deer Collision

SCALE: 1 inch equals 10 miles

DESIGN WORKSHOP
LANDSCAPE ARCHITECTURE    LAND PLANNING    URBAN DESIGN    TOURISM PLANNING

UNLV LANDSCAPE ARCHITECTURE & PLANNING RESEARCH

EC4 ENVIRONMENTAL CONSIDERATIONS
US 93: SCHELLBOURNE TO WELLS AND ALT 93

1.27 UNLV
ENVIROMENTAL CONSIDERATIONS
US 93: WELLS TO JACKPOT

WILDLIFE COLLISIONS
- Elk Collision
- Antelope Collision
- Deer Collision

SCALE: 1 inch equals 10 miles

LEGEND
- US 93, East US 5, and East US 50 Corridor with Mile Markers
- Interstates
- Highways / State Routes
- Local Roads
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- National Wildlife Management Area & National Wildlife Refuge
- Humboldt-Toiyabe National Forests
- Wilderness Area
- Area of Critical Environmental Concern
- State of Nevada Lands
- State Park / State Recreation Area

CONTINUE ON MAP EC4

DESIGNWORKSHOP
Landscape Architecture    Land Planning    Urban Design    Tourism Planning
VISUAL RESOURCES

Visual Analysis
A visual analysis was conducted along the corridor as part of a three-day site visit to evaluate the highway system. Scenic resources were identified and highly visible landforms, such as mountain ranges and unique cliffs, were located. Overall, the corridor is highly scenic in quality with notable areas of special visual interest:

- US 93 through Clark County travels through an open valley bounded by the impressive Las Vegas Range and Arrow Canyon Range.
- Mountain ranges along US 93 north of Hiko are heavily clad with trees. This creates a striking appearance that differentiates them from other mountain ranges in the state.
- Wheeler Peak, the second highest peak in Nevada and the highest peak located entirely within the state, can be seen by motorists traveling north along US 93 from Pioche. Its impressive headwall above a large glacial cirque makes it visually distinct.
- Unique rock outcroppings and vegetation create visual interest just outside of Caliente.
- Salmon Falls Creek crosses under US 93 near Jackpot and provides visual interest and changes in the plant community.
- Historic towns like Austin and Eureka contain attractive buildings. Historic buildings and elements enhance the scenic quality of communities.

Scenic Resources
The corridor passes through vast open stretches of the state. Expansive valleys create a distant backdrop for the wild and rugged landscape that characterizes much of Nevada. High mountain passes, agricultural valleys, and vast desert playas combine to create a memorable impression for visitors and creates an indelible sense of identity for those who live in the region.

Areas of Future Development
Significant areas of planned growth include Coyote Springs, the Alamo Industrial District, and the Ely Airport expansion. These developments will be visible from the corridor as new construction occurs within a relatively undeveloped landscape. Aesthetic considerations include setting development back from the highway and using native and enhanced native plant material to blend development into the surrounding environment.

Distance Zones
Landscape features are perceived by drivers with varying levels of detail depending upon the distance between the driver and the feature. Distance zones, including foreground zones, middleground zones, and background zones, define the traveler’s viewing distances. Distance zones are delineated through a process developed by the USFS that relates the detail and importance of distance to the driver on the highway.

Although the distance zones are not delineated on the following maps, the following narrative describes where distance zone boundaries are located in relation to the roadway. Understanding what areas are most clearly seen can guide planning decisions regarding what portions of the landscape are most sensitive to change and what areas are most critical to maintain the highway’s visual character. Management of these areas through multi-jurisdictional cooperation can protect them from billboards and other land uses that obstruct views and detract from the travel experience.

Foreground Zones
Viewers can perceive details such as forms, lines, and colors within a one-quarter mile distance. Changes to the landscape are most significant within the foreground view because they are most immediate to the viewpoint. This zone can be easily manipulated through the Landscape and Aesthetic Program, in part because it includes the highway right-of-way.

Middleground Zones
Viewers can perceive details such as forms, lines, and colors in masses located from one-quarter mile to three miles away.

Background Zones
Background is the area beyond the middleground, extending to the horizon or limit of the area that is seen. Viewers can perceive broad forms, lines, wide valleys, distant hills, and mountains.
LEGEND

- US 93, East US 6, and East US 50
- Corridor with Mile Markers
- Interstates
- Highways / State Routes
- Major Roads
- Existing Scenic Byways
- Existing Back Country Byways
- Railroads
- Railroads (historic)
- County
- County Line
- City Boundary
- Streams / Rivers
- Lakes
- Playas
- Existing Rest Areas

SCALE: 1 inch equals 10 miles

NORTH

VISUAL ANALYSIS

OUTSTANDING VIEWPOINTS
SAMPLE SYMBOLS IN COLORED NORTH

POTENTIAL SCENIC IMPROVEMENTS

HIGHLY VISIBLE LANDFORMS WITH SCENIC VALUE

UNIQUE LANDSCAPE FEATURES

AREAS OF FUTURE DEVELOPMENT

US 50: NEW PASS SUMMIT TO ELY AND US 93: ELY TO SCELBBORNE

UNLV

DESIGN WORKSHOP
**DESIGN WORKSHOP**

Landscape Architecture    Land Planning    Urban Design    Tourism Planning

**VISUAL ANALYSIS**

US 93, East US 6, and East US 50 Corridor with Mile Markers

**LEGEND**

- US 93, East US 6, and East US 50 Corridor with Mile Markers
- Interstates
- Highways / State Routes
- Major Roads
- Railroads
- Railroads (historic)
- Streams / Rivers
- Lakes
- Playas
- Existing Rest Areas
- City Boundary
- County Line
- County
- Existing Scenic Byways
- Existing Back Country Byways
- Outstanding Viewpoints
- Unique Landscape Features
- Areas of Future Development
- Unique Canyon and Riparian Landscape

**SCALE:** 1 inch equals 10 miles
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INTRODUCTION

This chapter establishes the design direction for highway landscape and aesthetics and is organized into five sections. Section One discusses design objectives to address general design goals related to roadway type and surrounding land uses. Sections Two through Five describe the specific design objectives associated with each landscape design segment and its theme. These design objectives clarify how program elements should look.

Figure 7 shows the two categories of highway organization: general and context-sensitive. Information from both categories is used to direct the design of both the functional aspects and physical form of highway facilities.

General Highway Categories consider factors such as the road type, speed and volume of travel, type of access, and the density of adjacent land use.

- Goals represent planning and design ideas that should always be considered for roads with similar functions.

Context-Sensitive Categories consider place-specific features such as environment, culture, and history.

- Goals describe how general design objectives should be interpreted in context.

Design Objectives in Section One: Highway Zones

The Master Plan organizes road systems into different highway types according to the type of road, the speed and volume of travel, and the type of access. They are classified as urban freeways, city streets, or rural highways; each of these may be further divided into highway zones. The program elements and goals established for each zone should always be considered when addressing projects located in areas of similar character. For example, low-speed roads that travel through downtown areas are considered community interface zones. Within these zones, traffic-calming techniques are appropriate and pedestrian needs dominate. As communities develop and adjacent land uses change, the highway zone associated with the new land use and development can be updated. Figures 8 and 9 (on pages 2.3 and 2.5) show where different design objectives are appropriate according to general highway categories and zones.

Design Objectives in Sections Two through Five: Landscape Design Segments

The last four sections of this chapter describe the design objectives, theme, and specific features associated with each landscape design segment. These segments organize the highway into areas of similar character based on elements such as topography, plant communities, and community development.

**Figure 7 - Corridor Organizing Elements**

### GENERAL*

<table>
<thead>
<tr>
<th>HIGHWAY TYPES</th>
<th>DESIGN OBJECTIVES</th>
</tr>
</thead>
<tbody>
<tr>
<td>URBAN FREEWAYS</td>
<td>URBAN CONFLUENCE</td>
</tr>
<tr>
<td>(Not present in this corridor)</td>
<td>URBAN BACKGROUND</td>
</tr>
<tr>
<td>High-speed, high-volume, controlled access roads. Includes elevated highways and some bypasses.</td>
<td>MANAGED LANDSCAPE CHARACTER</td>
</tr>
<tr>
<td>CITY STREETS</td>
<td>COMMUNITY INTERFACE</td>
</tr>
<tr>
<td>Slower-speed, high volume roads that pass through a community with the potential for many different adjacent land uses.</td>
<td>COMMUNITY TRANSITION</td>
</tr>
<tr>
<td>RURAL HIGHWAYS</td>
<td>MANAGED LANDSCAPE CHARACTER</td>
</tr>
<tr>
<td>High-speed, lower volume road with very low-density/residential, agricultural, or open space adjacent land uses.</td>
<td>COMMUNITY INTERFACE</td>
</tr>
<tr>
<td></td>
<td>PRESERVED LANDSCAPE CHARACTER</td>
</tr>
<tr>
<td></td>
<td>SCENIC DESIGNATION</td>
</tr>
</tbody>
</table>

### CONTEXT-SENSITIVE**

<table>
<thead>
<tr>
<th>DESIGN SEGMENT</th>
<th>THEME</th>
<th>SPECIFIC FEATURES</th>
<th>DESIGN INTERPRETATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>LANDSCAPE</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**General**: Includes design goals and objectives that should always be considered during the design of a project as it relates to the types of surrounding land uses, development, and street patterns regardless of the landscape design segment in which they are located.

**Context-sensitive**: Includes themes, design goals and objectives, and projects that relate specifically to the landscape design segment in which they are located. The goals and objectives should be considered in addition to the general goals and objectives.

COMPREHENSIVE DESIGN CONCEPT

The corridor design concept can be articulated for undeveloped and developed rural segments. In rural or predominately undeveloped areas, the highway should blend with the natural landscape. The presence of the road is muted by design interpretations of naturally occurring patterns of geology, vegetation, and soils. The successful emulation of these patterns results in a landscape environment that avoids the distinct separation between road and land that often characterizes rural highways.

In towns, the perception of community character is often shaped by a highway's design and its features. This is especially evident when a highway also serves as a community's main street. Creating a coherent visual environment that unifies a community is key to the success of the highway system. The highway should consist of a range of landscape treatments that focus attention on important places, reveal community character and information, and blend the roadway with surrounding uses.
Design objectives form the parameters for landscape and aesthetics along the roadway. The Master Plan’s general categories of city streets and rural highways are illustrated in Figures 8 and 9. (Because the urban freeways designation is not applicable to this corridor, it is not shown.) Figure 8 provides an overview of the general objectives for city streets; a more detailed description of the zones associated with city streets (community interface, community transition, and managed landscape character) follows on the next page. Figure 9 illustrates the general objectives for the highway zones of rural highways. Specific descriptions of community interface, preserve landscape character, and scenic designation zones along rural highways are found beginning on page 2.6.
SECTION ONE: Highway Zones

GENERAL HIGHWAY CATEGORIES: CITY STREETS – HIGHWAY ZONES

MANAGED LANDSCAPE CHARACTER
Adjacent Land Uses: Vary from residential to industrial. Located in areas of current growth or planned growth at community edges.

COMMUNITY TRANSITION
Adjacent Land Uses: Range from commercial to residential with larger setbacks. Located between a community’s downtown and its undeveloped edges.

COMMUNITY INTERFACE
Adjacent Land Uses: Typically commercial, but may include other uses. Travel speeds are lower with frequent curb cuts and cross streets.

“Transition Zones” in the Master Plan
• Areas of growing or planned development
• Indications of potential community expansion in an otherwise natural setting
• Vehicular needs dominate this zone
• Infrequent pedestrian crossings
• Frontage roads are common
• Low-cost treatments are appropriate

“Urban Zones” in the Master Plan
• Pedestrian needs dominate with frequent intersections and crosswalks
• Slower design speeds
• Shorter block lengths
• Traffic-calming features
• On-street parking
• Buildings, sidewalks and parking in close proximity to travel lanes
• Mid- to high-cost treatments are appropriate

Adjacent Land Uses: Typically commercial, but may include other uses. Travel speeds are lower with frequent curb cuts and cross streets.

Adjacent Land Uses: Range from commercial to residential with larger setbacks. Located between a community’s downtown and its undeveloped edges.

Managed Landscape Character

Community Interface

Community Transition

Community Transition

Community Interface

Managed Landscape Character

Community Interface

Community Transition

Community Transition

Community Interface

Community Transition

Community Interface

Community Transition

Community Interface

Community Transition
CHAPTER TWO — LANDSCAPE DESIGN SEGMENTS

SECTION ONE: Highway Zones

CITY STREETS

Community Interface

Description

In many communities, highways provide the central point of access to all parts of the community. Pedestrian amenities are of primary importance in these areas. The highway must be compatible with pedestrian activities and unify, not divide, the town center.

Community interface zones are characterized by lower travel speeds, frequent curb cuts, cross streets, traffic control devices, and increased pedestrian and other non-vehicular traffic. Adjacent land uses are typically commercial, but may include residential areas, schools, parks, and other civic uses. Block lengths are generally shorter than in community transition zones, with buildings, sidewalks, and parking in close proximity to the travel lanes.

Community Transition

Description

Community transition zones include stretches of highway between the center of a community and its undeveloped edges. These zones provide access to outlying areas of a community and form a buffer between pedestrian-oriented town centers and open stretches of highway on their outskirts. Vehicle needs are balanced with pedestrian needs in these areas. Travel speeds vary, but are generally midway between those in community interface zones and those on the open highway. Pedestrian crossings may be present at intersections, although curb cuts and cross streets are used less frequently than in community interface zones. Adjacent land uses may be commercial, residential, industrial, or agricultural, but setbacks are typically greater than in community interface zones. Where adjacent uses are commercial, building setbacks commonly consist of large parking lots accessible from the highway.

Managed Landscape Character

Description

The managed landscape character zone is distinguished by areas of growing or planned development at community edges. The frequency and density of residential, commercial, or industrial development indicates potential community expansion in an otherwise natural landscape setting. Built elements interrupt the natural environment in a somewhat regular pattern, but without the intensity of urban density.

(1) Areas of managed landscape character indicate locations of planned or expected growth such as Coyote Springs in Clark County and south Lincoln County. Management focuses on transitioning development into the surrounding landscape through the use of native and enhanced native treatment types as depicted.

(2) Outlying industrial areas and areas zoned for development are included in the managed landscape character zone. Emphasis is placed on developing partnerships and proactively working with agencies and towns to preserve viewsheds and prevent disturbance to right-of-way vegetation.
SECTION ONE: Highway Zones

Chapter Two — Landscape Design Segments

RURAL HIGHWAYS – HIGHWAY ZONES

Figure 9 - Rural Highways – Highway Zones

COMMUNITY INTERFACE
Adjacent Land Uses: Commercial and local community development.

PRESERVE LANDSCAPE CHARACTER
Adjacent Land Uses: Typically includes agricultural or low-density residential. Federal or state land ownership dominates.

SCENIC DESIGNATION
Adjacent Land Uses: Varies from conservation and recreation to significant, historical commercial uses. Includes scenic byways and other portions of the highway that travel through areas of high scenic, cultural, or recreational value.

“Rural Communities” in the Master Plan
• Pedestrian needs dominate with frequent intersections and crosswalks
• Slower design speeds
• Shorter block lengths
• Traffic-calming features
• On-street parking
• Buildings, sidewalks, and parking in close proximity to travel lanes
• Mid-cost treatments are appropriate

“Rural Landscape Segments” in the Master Plan
• High speeds
• Maintain integrity of existing landscape – “do no harm”
• Agriculture or low-density residential development
• Native vegetation and landforms dominate views
• Low-cost treatments are appropriate

Adjacent Land Uses: Typically includes agricultural or low-density residential. Federal or state land ownership dominates.

Adjacent Land Uses: Varies from conservation and recreation to significant, historical commercial uses. Includes scenic byways and other portions of the highway that travel through areas of high scenic, cultural, or recreational value.

Adjacent Land Uses: Commercial and local community development.

Community Interface

Preserve Landscape Character

Scenic Designation
Chapter Two — Landscape Design Segments

(1) The primary design objective for community interface zones is to improve the highway’s ability to accommodate a variety of town center activities without reducing its function as a through street. On-street parking buffers pedestrians from travel lanes and helps slow traffic through town.

(2) Pedestrian movement and amenities are of high concern in community interface zones. Highway improvements consider not only the street but the adjacent development and pedestrian needs.

RURAL HIGHWAYS

Community Interface
Description
Community interface zones along rural highways are similar in description to those along city streets. They are primarily located in the developed town centers and the primary design objective focuses on the highway’s ability to accommodate a variety of town center activities without reducing its function as a through street.

In small towns, the highway often becomes the main street, a key component of the community’s economic and social vitality. Limited commercial development reinforces the need to quickly establish a defined community image for motorists as they are welcomed into town and slow their travel speeds significantly. Towns serve as resting points along lengthy highway stretches. Community rest areas with travel information orient the driver while providing economic returns for the town.

Program Elements
Roadway design in these areas must incorporate traffic-calming features that minimize conflicts between pedestrians and vehicles. The following goals establish the approach:

- Manage speed by reducing the appearance of wide roadways. Install raised or planted medians to create pedestrian refuge islands that can double as speed-reduction devices.
- Reduce vehicle-pedestrian conflicts with consolidated curb cuts and planted medians.
- Increase pedestrian safety and reduce crossing distances by combining angled or parallel parking with bulb-outs at crosswalks. Bollards located at bulb-outs, a buffer zone separating travel lanes, and angled

Trees and planting soften the street and help slow traffic
Parallel parking
Wide sidewalks
Minimum lane widths slow traffic
Curb extensions (bulb outs) add sidewalk space, provide place for trees, bike parking, etc. and shorten crossing distance

Pedestrian crossings use a change of paving materials
Appropriately sized sidewalks provide pedestrian space
Trees and planting soften the street and help slow traffic
Bike lane incorporated into road design

(1) Traffic-calming features such as street tree planting, on-street parking, and curb extensions accentuate downtown community areas.

(2) Five-lane highways can be softened through raised, planted medians. Roadway design incorporates bike lanes to promote multi-modal transportation through downtown.
SECTION ONE: Highway Zones

parking offer additional levels of pedestrian safety. Parallel parking is recommended in areas of limited right-of-way.

- Install pedestrian-activated signals for heavily used mid-block crossings or where the distance between crosswalks exceeds one-quarter mile.
- Develop community rest areas that combine travel service facilities with local park and community gathering spaces. Encourage motorists to stop in towns for travel information and use of facilities.
- Encourage slower travel speeds by adding pedestrian-scaled amenities.
- Utilize street trees for shade and visual interest.
- Provide lighting that is appropriate in height, style, and intensity.
- Provide signage that is compatible with preferred architectural styles and is visible to pedestrians and motorists.
- Provide street furnishings that include seating, shelters, trash containers, and wayfinding aids such as sidewalk inlays.

![Diagram](image1)

(1) A 60’ right-of-way provides space for on-street parking and widened sidewalks. Streetscape and pedestrian amenities enliven the downtown area.

(2) Before streetscape improvements.

(3) After streetscape improvements.

(2), (3) The potential for streetscape improvements exists for roadways through commercial and residential areas. Enhancements have the ability to change the character of the roadway and provide a more inviting atmosphere.

![Diagram](image2)

(4) An 80’ right-of-way accommodates dual travel lanes and a planted median. A striped bike lane accommodates cyclists through the community center. Pedestrian amenities may be enhanced with widened sidewalks.
• Incorporate clearly marked bike lanes. Coordinate efforts with local multi-modal transportation plans. Parallel parking is most compatible with bike lanes. Where angled parking exists, parking areas must be deep enough to ensure adequate visibility of cyclists.

Preserve Landscape Character

Description

Landscape character is best preserved in rural highway design. In rural areas, roadside development consists of agricultural or low-density residential uses. The potential for significant future growth appears low. Land ownership is dominated by federal or state entities such as the Department of Defense or Bureau of Land Management. Built elements and human interventions are sparsely distributed throughout the landscape. Native vegetation, geologic features, and landforms dominate the view.

Program Elements

Objectives for project design include the following goals:

• Utilize existing native vegetation to preserve the aesthetic integrity of the roadside.
• Preserve scenic views and viewsheds from the highway.
• Restrict outdoor advertising in scenic locations. Coordinate with local jurisdictions to prevent billboards from obstructing scenic views. Promote outdoor advertising requirements.
• Provide pedestrian and bicycle access to recreation destinations.
• Provide ample space for road bikers on a paved shoulder that is not disrupted by the rumble strip.

• Incorporate the Place Name Sign Program and audio interpretation (radio transmission) at areas with significant historic or natural features.
• Partner with federal and state agencies to coordinate the Corridor Plan with long-term planning.
• Fit the alignment of the highway into existing topography so structures blend into the surrounding landscape.
• Regrade, stain, and revegetate rock cuts to blend with the adjacent hillside.
• Prevent the degradation of surrounding landscapes. Minimize vegetation removal during construction and maintenance activities.
• Prevent the practice of spreading asphalt millings on road shoulders. Use materials that blend with the natural landscape.
• Revegetate disturbed highway areas with native seed mix or salvaged plant materials where possible.
• Identify locations for new wildlife crossings and opportunities for improvements to existing wildlife crossings.
• Screen maintenance facilities from the roadway or visually blend them with their surroundings.
• Improve litter collection along the corridor.

Scenic Designation

Description

Scenic designation includes existing and proposed scenic byways where scenic, cultural, historic, recreational, and/or natural qualities dominate the highway landscape. Facilities in these areas require the highest level of management and should incorporate accentuated treatment levels with a higher level of detail. Designation is indicated where scenic preservation, viewshed management, and access to recreational opportunities are needed.

Program Elements

In addition to the objectives set in preserve landscape character zones, areas of scenic designation include the following goals:

• Protect scenic areas by discouraging structures that obscure views.
• Provide rest areas that serve a diversity of purposes, including access to recreational opportunities, locations for trailheads, and stopping points along shared-use trails.
• Incorporate a separated, shared-use trail within the right-of-way.
• Promote the scenic byway and its statewide importance.
• Create structures that blend with the landscape yet express the special quality of the scenic byway.
• Integrate interpretative elements throughout the corridor.
• Form partnerships with federal and state agencies to maintain scenic intactness of the surrounding landscape.
SECTION TWO – FIVE: Landscape Design Segments

Sections Two through Five describe the design objectives, theme, and specific features associated with each landscape design segment. The major design theme for each segment provides a unifying design concept that is interpreted during individual project design. Figure 10 shows how landscape design segments are used to develop context-sensitive designs.

General program elements, described in the previous section, are further developed through the application of landscape design segment objectives. Because landscape design segments relate to place and community character, design objectives at this level refine program elements to express special features.

**Figure 10 – Landscape Design Segment Themes, Maps, and Sections**

**CONTEXT-SENSITIVE HIGHWAY CATEGORIES**

**Corridor**
A group of highways evaluated to address a topic such as landscape and aesthetics.

**Landscape Design Segments**
Sections of the highway organized according to the surrounding environmental and cultural context. Themes correlate with the segment name and location.

**Using the Landscape Design Segments**
Landscape design segments provide an organizational tool for applying design concepts along the highway. After understanding the project components that may be applied within each highway zone (community interface, managed landscape character, etc.), it is important to understand the theme and design objectives of the segment. The theme and design objectives describe how features should look. Design interpretation images provide physical examples of potential projects. Supporting maps, sections, aerial photos, and imagery illustrate the design objectives, specific features, and their appropriate application throughout the corridor.

The segments designated for this corridor include Hidden Gems, Silver State Passage, Pony Express Passage, and Cowboy Range as shown on the following pages.

**Theme and Design Interpretation**
The segment theme describes the vision for the segment in terms of how the highway should appear. Images that depict how the theme may be interpreted and applied through individual project design are provided.

**Specific Features**
Potential projects and improvements identified within the segment. Projects are grouped into six categories—community, travel and tourism, planting, natural resource and wildlife, views and landmarks, and roadway practices and structures.

**Design Objectives - Plan View**
Design objectives and landscape and aesthetic elements are located within the segment.

**Design Objectives - Section View**
Landscape treatment types and interpretive themes provide additional direction for design objectives and the development of specific landscape and aesthetic elements. The elements shown include improvements to both existing and proposed roadside facilities, major intersections, and statewide gateways.
LANDSCAPE DESIGN SEGMENTS
SOUTHERN NEVADA TO CENTRAL NEVADA

LEGEND
- US 93, East US 6, and East US 50 Corridor
- Hidden Gems Landscape Design Segment
- Silver State Passage Landscape Design Segment
- Pony Express Passage Landscape Design Segment
- Cowboy Range Landscape Design Segment

SCALE: 1 inch equals 22 miles

UNLV LANDSCAPE ARCHITECTURE & PLANNING RESEARCH
US 93, East US 6, and East US 50 corridor

LEGEND

US 93, East US 6, and East US 50 Corridor

HIDDEN GEMS
LANDSCAPE DESIGN SEGMENT

Mojave Desert Vista Sub-Segment

SILVER STATE PASSAGE
LANDSCAPE DESIGN SEGMENT

PONY EXPRESS PASSAGE
LANDSCAPE DESIGN SEGMENT

COWBOY RANGE
LANDSCAPE DESIGN SEGMENT

Ruby Mountains Sub-Segment

SCALE: 1 inch equals 22 miles

NORTH
SECTION TWO: Hidden Gems

THEME

The Hidden Gems Landscape Design Segment includes US 93 from the I-15 interchange to Ely and US 50/US 6 east to the Utah border. Geographic differentiation and shifting plant communities compel the designation of the Mojave Desert Vista Sub-segment from the I-15 interchange to the SR 318 intersection. Here, southern desert and salt desert vegetation along with interspersed Joshua trees dot the landscape. Traveling along the segment, plant communities merge together as Joshua trees and Utah juniper are seen in the same setting. This transition to higher elevation plant communities marks the passage out of the Mojave Desert Vista Sub-segment.

Numerous recreation destinations are easily accessible from the corridor, including eight state parks, one national park, and two national wildlife refuges. Objectives for this segment focus on providing travelers with the necessary signage, information, and facilities to experience the treasures lying just off the highway. This segment also provides scenic opportunities; except for the Mojave Desert Vista Sub-segment, the entire segment has a Nevada scenic byway designation.

Communities along the corridor respond by providing community rest areas that support outdoor recreation and encourage motorists to stop.

The new development of Coyote Springs appropriately transitions into the surrounding landscape with right-of-way landscaping that utilizes enhanced native softscape treatment types. Rather than looking out of place in the desert landscape, intersection and potential interchange improvements blend into the topography with minimal disturbance.

The general highway experience preserves scenic continuity and emphasizes the beauty of the natural resource. Panoramic views are uninterpreted and native revegetation heals any road-side disturbance.

DESIGN SEGMENT OBJECTIVES

Outdoor recreation is diverse and widely available along this segment; design goals emphasize its importance. Design objectives for this segment also include enhancing the interface between communities and the highway and preserving the existing natural landscape. The following objectives are specific to this segment:

Preserve Landscape Character

- Preserve scenic views of distant mountain ranges. Work with other state and federal agencies to maintain visual quality.
- Proactively work with Clark County to influence the roadside features along this segment; design goals emphasize its importance. Design objectives for this segment also include enhancing the interface between communities and the highway and preserving the existing natural landscape. The following objectives are specific to this segment:

Managed Landscape Character

- Recognize the development of the Coyote Springs new community adjacent to US 93. Develop working relationships that support the use of subdued softscape and hardscape materials. Focus design efforts on visually blending the development into the larger natural landscape.
- Utilize signage at the SR 168 intersection to encourage exploration of the recreation opportunities along the corridor. Tie signage into the recreational gateway at the Glendale I-15 interchange.

Scenic Designation

- Preserve the scenic quality of the byway. Prevent any billboard construction and other visual distractions along the highway.
- Connect travelers to the landscape through place name signage. Interpret distinct features such as the merging of plant communities west of Caliente.
- Coordinate roadside facilities to provide ample information on the area’s parks.
- Partner with USFWS to enhance viewpoints around Pahranagat.
- At Pahranagat rest area, partner with USFWS to provide a kiosk with information on the valley and refuge wash.
- Partner with USFWS to provide a pull-off point for migratory birds at the Pahranagat National Wildlife Refuge (NWR). Provide appropriate signage to mark pull-offs. Design shelters and seating areas that are comfortable and visually inviting.
- Utilize signage to interpret geological, cultural, and recreational resources such as the Desert NWR and Sheep Range.
- Promote the use of US 93 as the route to Ely and other northern destinations in order to support tourism growth in communities like Caliente and Pioche.
- Partner with Lincoln County to ensure that planned BLM land disposals do not negatively affect the existing visual continuity.
and informational kiosk at Maynard Lake at the southern boundary of the Pahranagat NWR. Create a “history trail” of information including the valley’s early settlement, rock mustang corrals located near the canyon, Paiute use of the canyon, origin of the Red-tailed Hawk story, and history of the ancient White River that created the valley and canyon.

- Partner with Nevada Division of State Parks (NDSP) to develop a multi-use trail connecting the state parks around Caliente, Panaca, and Pioche. Encourage visitors to stay within a community and bike to various park destinations.
- Consider creating acceleration/deceleration lanes to and from the Pahranagat NWR headquarters and campground entrances.
- Develop community rest areas that promote the many recreation opportunities and describe each town’s history and services.
- Enhance scenic byway signage through the incorporation of iconic imagery that evokes meaningful aspects of the byway.
- Emphasize the connection to the Great Basin National Park.
- Partner with NDSP to develop a multi-use trail connecting the Ward Charcoal Ovens and Cave Lake state parks.
- Partner with Lincoln County to ensure that planned BLM land disposals do not negatively affect the existing visual intactness.
- Designate US 93 as a scenic byway from Maynard Lake to the intersection with SR 375/318.
- Partner with Pahranagat NWR to develop a shared-use path between the refuge and the Town of Alamo.
- Work with NDOW to address vehicle-deer collision issues from Maynard Lake Canyon to Alamo.

### Community Interface

#### Alamo

- Reinforce town entry with gateway signage. Locate signage according to growth boundary that proactively plans for development spurred by Las Vegas and Coyote Springs outgrowth.
- Recognize and interpret the environmental and recreational resources of the Pahranagat NWR as part of community and signage improvements.
- Where water is available or in naturally moist zones, plant native cottonwoods or similar plant material to emphasize sense of place. Highlight the importance of cottonwoods to the Alamo settlement.
- Designate US 93 as a scenic byway from Maynard Lake to the intersection with SR 375/318.
- Partner with Pahranagat NWR to develop a shared-use path between the refuge and the Town of Alamo.
- Work with NDOW to address vehicle-deer collision issues from Maynard Lake Canyon to Alamo.

#### Caliente

- Utilize signage and streetscape design to promote exploration of downtown Caliente. Reinforce the community main street through pedestrian enhancements and downtown gateways.
- Preserve scenic quality and provide signage to Rainbow Canyon, a regional visual resource.

#### Pioche

- Emphasize the town’s history and mining culture.
- Encourage visitation and exploration of the downtown. Develop gateways and signage to the town and downtown areas.
HIDDEN GEMS – DESIGN OBJECTIVES
US 93: I-15 INTERCHANGE TO ALAMO

Note: Interchange enhancements for I-15 are provided in the I-15 Landscape and Aesthetics Corridor Plan. Refer there for related design objectives.

LEGEND

HIDDEN GEMS LANDSCAPE DESIGN SEGMENT
MOJAVE DESERT Vista SUB-segment
Community Interface
Preserve Landscape Character
Managed Landscape Character
Scenic Designation
Landscape and Aesthetics Element
Key Highway Intersection
Historic Trail
US 93, East US 6, and East US 50 Corridor with Mile Markers

SCALE: 1 inch equals 8 miles
NORTH
Preserve Landscape Character
1. Consider place name signage to interpret geological and vegetative areas of interest.
2. Maintain existing vegetation and landforms. Preservation of existing native landscape is the first aesthetic approach for any capacity improvement or maintenance projects.
3. Preserve scenic quality through Pahranagat Valley.

Managed Landscape Character
1. Buffer the highway from new development.
2. Use subdued landscape treatments to blend development into the larger landscape.

Scenic designation
1. Designate US 93 from Maynard Lake to SR 375/318 intersection as scenic byway.
2. Coordinate with other federal and state agencies to promote recreational opportunities along the byway.

Pahranagat National Wildlife Refuge
1. Partner with USFWS to enhance viewpoints and rest area around Pahranagat.
2. At Pahranagat rest area partner with USFWS to provide vault toilets and information on the Pahranagat NWR. Include information on the valley’s pre-refuge establishment and ranching history.
3. Partner with USFWS to provide kiosk with information on the valley and refuge water management for migratory birds at the Pahranagat Middle Marsh access pull-off point.
4. Partner with USFWS to provide pull-off and informational kiosk at Maynard Lake at the southern boundary of the Pahranagat NWR. Create a “history trail” of information including the valley’s early settlement, rock mustang corrals located near the canyon, Paiute use of the canyon, origin of the Red-tailed Hawk story, and history of the ancient White River that created the valley and canyon.
5. Consider creation of acceleration and deceleration lanes into the Pahranagat NWR headquarters and campground entrances.
6. Create a mountain bike/walking path from Alamo to the Pahranagat NWR.
7. Work with NDOw to address vehicle-deer collision issues from Maynard Lake Canyon to Alamo. Consider reducing speed and signing.

Alamo
1. Highlight the historic importance of cottonwoods. Use native cottonwoods in riparian and wet areas as part of plant selections.
Community Interface

Caliente
1. Integrate a modern interpretation of railroad facilities as part of streetscape character. Use Rainbow Canyon and unique vegetation communities as design inspiration.
2. Coordinate travel information and facilities with state parks, Panaca, and Pioche. Provide a consistent message that markets the region as an abundant source of recreation and history.
3. Connect towns to state parks and rest areas by a coordinated multi-use trail loop.
4. Enhance signage at business route intersection to promote town exploration.

Pioche
1. Encourage travelers to drive to historic downtown. Develop a strong gateway and enhance signage at business route intersection to promote town exploration.
2. Use mining history and recreation opportunities as inspiration for design concepts.
3. Coordinate travel information and facilities with state parks, Caliente, and Panaca. Provide a consistent message that markets the region as an abundant source of recreation and history.
4. Connect towns to state parks and rest areas by a coordinated multi-use trail loop.

Scenic Designation
1. Reinvent entry experience into the scenic byway. Enhance signage to visually tell the story of the byway’s resources.
2. Reroute the scenic byway to Hidden Gems to encourage travelling along the highway.

Proposed Great Basin National Park
Southwest Kiosk Rest Area

- Provide interpretation of Lake Valley
- Highlight high quality viewsheds
- Incorporate shade
- Replace existing barriers around tables and seating with aesthetic alternative
- Interpret historic agriculture and ranching and importance of bison
- Highlight connection to Great Basin National Park
- Provide restroom facilities

Charter the NDSIP
- Partner with NDSIP
- Provide shade and restrooms
- Kiosk for Great Basin National Park

HIDDEN GEMS LANDSCAPE DESIGN SEGMENT – US 93

HIDDEN GEMS LANDSCAPE DESIGN SEGMENT – US 93

Native Revegetation
Standard
Enhanced Native
Accentuated

Native Revegetation
Standard
Enhanced Native
Accentuated

Regionally Adapted
Accentuated
- Highlight mining history
- Provide connections to state parks
- Encourage town exploration
- Promote exploration of other state parks and surrounding towns
- Connect to multi-use trail

Regionally Adapted
Accentuated
- Provide interpretation of Lake Valley
- Highlight high quality viewsheds
- Incorporate shade
- Replace existing barriers around tables and seating with aesthetic alternative
- Interpret historic agriculture and ranching and importance of bison
- Highlight connection to Great Basin National Park
- Provide restroom facilities

HIDDEN GEMS – LONGITUDINAL SECTION
Scenic Designation

1. Reinvent entry experience into the scenic byway. Enhance signage to visually tell the story of the byway’s resources.
2. Rename the scenic byway to Hidden Gems to encourage travelling along the highway.


SCENIC DESIGNATION

Native Revegetation
Standard

GREAT BASIN NATIONAL PARK RECREATIONAL GATEWAY
Native Revegetation
Accentuated
- Enhance road signage

US 93/US 6/US 50 INTERSECTION

ELY ELK VIEWING AREA
Native Revegetation
Standard
- Coordinate facilities with Cave Lake and Ward Charcoal Ovens state parks improvements
- BLM removing toilets

CAVE LAKE STATE PARK RECREATIONAL GATEWAY
Native Revegetation
Standard
- Connect to Cave Lake State Park by multi-use trail

WARD CHARCOAL OVENS RECREATIONAL GATEWAY
Native Revegetation
Standard
- Connect to Cave Lake State Park by multi-use trail
- Enhance road signage

SWAMP CEDARS FOREST VIEWPOINT
Native Revegetation
Accentuated
- Highlight Home of Shoshone
- Provide historical information, including massacre history

STATEWIDE GATEWAY
Native Revegetation
Accentuated
- Create highway-level entry
- Use regional materials
- Highlight Native American history
- Interpret mining

Native Revegetation
Standard
• Connect to Cave Lake State Park by multi-use trail

Native Revegetation
Standard
- Enhance road signage

Native Revegetation
Accentuated
- Highlight Home of Shoshone
- Provide historical information, including massacre history

Native Revegetation
Standard
- Create highway-level entry
- Use regional materials
- Highlight Native American history
- Interpret mining

Native Revegetation
Standard
- Connect to Cave Lake State Park by multi-use trail
- Enhance road signage

Structures and Hardscape Type/Treatment

Landscape Type/Treatment

(HORIZONTAL AND VERTICAL SCALES VARY)
**LEGEND**

- **US 93, East US 6, and East US 50**
  - Community with Mile Markers

- **Community Opportunities**
  1. Statewide gateway
  2. Community gateway
  3. Pedestrian linkage and circulation
  4. Bike and multi-use trail linkage
  5. Highway archaeology, cultural, or historic awareness
  6. Highway and community compatibility improvement
  7. Partnerships and resource leveraging

- **Travel and Tourism Opportunities**
  1. Roadside Services
  2. Viewpoints and points of interest
  3. Travel Information Program
  4. Highway art

- **Planting Opportunities**
  1. Ground treatment
  2. Revegetation with native grasses, forbs and herbaceous plants
  3. Enhanced native planting
  4. Mojave Desert regionally adapted planting
  5. Mojave Desert ornamental planting

- **Natural Resource and Wildlife Opportunities**
  1. Environmental resources preservation
  2. Wildlife movement enhancement
  3. Water resources enhancement
  4. Rare, unique, or special natural resource enhancement

- **Views and Landmark Opportunities**
  1. Highway scenic designation
  2. Highway scenic improvement

- **Roadway Practices and Structure Opportunities**
  1. Sound protection or acoustic wall
  2. Bridge and structure aesthetic
  3. Information and directional signage
  4. Highway maintenance practices
  5. Highway facility enhancement
  6. Landform or contour grading enhancement
  7. Geometrics, alignment, and land relationship enhancement
  8. Sustainable corridor practice opportunity

**MAP**

**DESIGN WORKSHOP**

**UNLV**

**HIDDEN GEMS – SPECIFIC FEATURES**

**US93: I-15 INTERCHANGE TO ALAMO**

**Entire Corridor**

- Develop partnerships with state and federal agencies to preserve visual quality, promote national and state parks, and tell the story of the region’s history and culture
- Utilize revegetation methods for disturbed areas
- Maintain scenic continuity through billboard mitigation
- Consider re-use of milled asphalt for paving
- Thin roadside vegetation for safety while maintaining integrity of existing landscape
- Address shoulder safety issues while maintaining visual quality of healthy roadside vegetation
- Utilize sustainable practices and alternative energy sources for lighting and roadside services
- Utilize rainwater harvesting techniques to address drainage and stormwater issues

**Community Opportunities**

- Statewide gateway
- Community gateway
- Pedestrian linkage and circulation
- Bike and multi-use trail linkage
- Highway archaeology, cultural, or historic awareness
- Highway and community compatibility improvement
- Partnerships and resource leveraging

**Travel and Tourism Opportunities**

- Roadside Services
- Viewpoints and points of interest
- Travel Information Program
- Highway art

**Planting Opportunities**

- Ground treatment
- Revegetation with native grasses, forbs and herbaceous plants
- Enhanced native planting
- Mojave Desert regionally adapted planting
- Mojave Desert ornamental planting

**Natural Resource and Wildlife Opportunities**

- Environmental resources preservation
- Wildlife movement enhancement
- Water resources enhancement
- Rare, unique, or special natural resource enhancement

**Views and Landmark Opportunities**

- Highway scenic designation
- Highway scenic improvement

**Roadway Practices and Structure Opportunities**

- Sound protection or acoustic wall
- Bridge and structure aesthetic
- Information and directional signage
- Highway maintenance practices
- Highway facility enhancement
- Landform or contour grading enhancement
- Geometrics, alignment, and land relationship enhancement
- Sustainable corridor practice opportunity

**Scale:** 1 inch equals 8 miles

**Note:** Includes maintenance practices for milled asphalt by-products for entire corridor.
Aerial Landscape and Aesthetic Treatment Simulations

The purpose of the following aerial image is to illustrate landscape and aesthetic treatments at one of the key points along the Hidden Gems Landscape Design Segment.

Gateway to Spring Valley and Echo Canyon State Parks
Accentuated
Regionally Adapted

Gateway to Kershaw-Ryan State Park

Gateway to Cathedral Gorge State Park
Regionally Adapted
Accentuated

LEGEND
Community Interface
Scenic Designation
Landscape and Aesthetics Element

HIDDEN GEMS LANDSCAPE DESIGN SEGMENT

(1) This aerial view looks north towards Meadow Valley along US 93. This stretch of road is located within the Hidden Gems Landscape Design Segment and landscape treatments should highlight gateway connections to the region’s many state parks.

Design Interpretation Summary – Hidden Gems

Interpretation of the segment’s design theme occurs during individual project design. The Corridor Plan establishes the direction for project-level design. Examples illustrate forms and materials that could be used to accomplish the stated design objectives.

(1),(2) Colors and textures should be muted earth tones that echo hues of historic structures. Enhancements use cultural and geological elements as design inspiration.

(3) Nevada’s harsh arid climate mandates shelter from the wind and sun be provided at all rest areas. Structures should provide travelers shelter without detracting from the overall surroundings.

(4) The Hidden Gems segment emphasizes coordinated access to recreation opportunities. Rest areas and state park visitor centers are linked to provide a variety of services and visitor information.

(5) Softscape treatment levels include native revegetation and enhanced native plantings. Plant material relates to the native plant community, whether it be Mojave Desert or Basin and Range.

(6) Structures should be oriented to highlight scenic vistas and constructed with materials that blend with their desert surroundings.
SECTION THREE: Silver State Passage

THEME

The Silver State Passage Landscape Design Segment includes US 6 from Warm Springs to Ely. The segment mainly travels through BLM and USFS lands. Development is limited to ranches and a few small clusters of homes along the corridor.

East US 6 is one of the least traveled highways in the state. The number of road services and the level of landscape treatments reflect this fact. Two annual road races, the Nevada Open Road Challenge and the Silver State Classic Challenge are held just off the highway on SR 318 southward to Las Vegas. These events typify the untamed spirit of the segment.

Lunar Crater Volcanic Field subtly changes the landscape and provides interpretive opportunities. Otherwise, the highway is simple and rural, highlighted only by the use of native revegetation and standard hardscape treatments. Vegetation and landforms are consistent and maintain the integrity of the existing landscape.

DESIGN SEGMENT OBJECTIVES

The Silver State Passage segment beautifully integrates road facilities into the landscape. Design efforts focus on little to no landscape disturbance within the right-of-way and the viewshed beyond. Segment-specific design objectives (in addition to previously described corridor-level objectives) include the following:

Preserve Landscape Character

- Minimize landscape disturbance and revegetate according to appropriate plant community requirements.
- Preserve scenic views of distant mountain ranges and adjacent sagebrush plant communities.
- Enhance travel tourism connection to Lunar Crater and surrounding lava fields.
- Keep rest area facilities simple; provide shade and a consistent, welcoming visual image.
Preserve Landscape Character
1. Highlight areas of geologic or cultural interest.
2. Provide signage for Pancake Range.
3. Manage the Highway for visual consistency without disruption to the surrounding landscape.

Deer Creek Rest Area
1. Enhance aesthetic appeal of facilities. Replace concrete barriers and brightly colored features with elements that meet safety requirements while being visually inviting and attractive.
2. Utilize agrarian landscape and cultural features as cues for design ideas.
3. Incorporate shade.
4. Provide travel information for surrounding towns and nearby Lunar Crater and BLM recreation opportunities. Include vehicular requirements in travel information.

Lunar Crater Viewpoint
1. Provide viewpoint of Lunar Crater, the surrounding lava fields, and Pancake Range.
2. Incorporate travel information for BLM recreation opportunities and the Back Country Byway accessed from the highway.

US 93/US 6/US 50 Intersection
1. Maintain existing scenic integrity of surrounding landscape.
2. Ensure appropriate signage and lighting while minimizing disturbance to vegetation and the night sky.

Native Revegetation
Standard
- Create viewpoint for crater and lava fields
- Provide travel information for BLM Back Country Byway and Lunar Crater site
- Create rest area with restrooms
- Interpret ranching
- Provide travel information for nearby towns and Lunar Crater
- Provide shade for seating and picnic areas
ENTIRE CORRIDOR

1. Develop partnerships with State and Federal agencies to preserve visual quality, promote national and state parks, and tell the story of the region’s history and culture.
2. Utilize revegetation methods for disturbed areas.
3. Maintain scenic continuity through billboard mitigation.
4. Consider re-use of milled asphalt for paving.
5. Thin roadside vegetation for safety while maintaining integrity of existing landscape.
6. Address shoulder safety issues while maintaining visual quality of healthy roadside vegetation.
7. Utilize sustainable practices and alternative energy sources for lighting and roadside services.
8. Utilize rainwater harvesting techniques to address drainage and stormwater issues.

COMMUNITY OPPORTUNITIES

1. Statewide gateway
2. Community gateway
3. Pedestrian linkage and circulation
4. Bike and multiuse trail linkage
5. Highway archaeology, cultural, or historic awareness
6. Highway and community compatibility improvement
7. Partnerships and resource leveraging

TRAVEL AND TOURISM OPPORTUNITIES

1. Roadside Services
2. Viewpoints and points of interest
3. Travel information program
4. Highway art
5. Community Rest Area

PLANTING OPPORTUNITIES

1. Ground treatment
2. Revegetation with native grasses, forbs and herbaceous plants
3. Enhanced native planting
4. Great Basin regionally adapted planting
5. Great Basin ornamental planting

NATURAL RESOURCE AND WILDLIFE OPPORTUNITIES

1. Environmental resources preservation
2. Wildlife movement enhancement
3. Water resources enhancement
4. Rare, unique, or special natural resource enhancement

VIEWS AND LANDMARK OPPORTUNITIES

1. Highway scenic designation
2. Highway scenic improvement

ROADWAY PRACTICES AND STRUCTURE OPPORTUNITIES

1. Sound protection or acoustic wall
2. Bridge and structure aesthetic
3. Information and directional signage
4. Highway maintenance practices
   Note: Includes maintenance practices for milled asphalt by-products for entire corridor
5. Highway facility enhancement
6. Landform or contour grading enhancement
7. Geometric, alignment, and land relationship enhancement
8. Sustainable corridor practice opportunity

SCALE: 1 inch equals 10 miles

SILVER STATE PASSAGE – SPECIFIC FEATURES

US6: WARM SPRINGS TO ELY

LEGEND

- US 93, East US 6, and East US 50 Corridor with Mile Markers
- Community Opportunities
- Travel and Tourism Opportunities
- Planting Opportunities
- Natural Resource and Wildlife Opportunities
- Views and Landmark Opportunities
- Roadway Practices and Structure Opportunities

Legend items include:
- Sustainable corridor practice opportunity
- Highway scenic designation
- Highway scenic improvement
- Sound protection or acoustic wall
- Bridge and structure aesthetic
- Information and directional signage
- Highway maintenance practices
- Highway facility enhancement
- Landform or contour grading enhancement
- Geometric, alignment, and land relationship enhancement
- Environmental resources preservation
- Wildlife movement enhancement
- Water resources enhancement
- Rare, unique, or special natural resource enhancement
- Highway art
- Community Rest Area
- Community gateway
- Pedestrian linkage and circulation
- Bike and multiuse trail linkage
- Highway archaeology, cultural, or historic awareness
- Roadside Services
- Viewpoints and points of interest
- Travel information program
- Highway art

Design Workshop

UNLV Landscape Architecture & Planning Research

TABLE AREA

50 landscape and aesthetics corridor plan
Chapter Two — Landscape Design Segments

Aerial Landscape and Aesthetic Treatment Simulations
The purpose of the following aerial image is to illustrate landscape and aesthetic treatments at one of the key points along the Silver State Passage Landscape Design Segment.

LEGEND

Preserve Landscape

Lunar Crater Viewpoint

Native Revegetation

Standard

SILVER STATE PASSAGE LANDSCAPE DESIGN SEGMENT

1. This aerial view looks west towards Big Sand Springs Valley along US 6. This stretch of road is located within the Silver State Passage Landscape Design Segment and landscape treatments should focus on restoring plant communities and minimizing disturbance.

2. Shade structures provide respite from the intense desert sun while also creating architecturally interesting shadow patterns.

3. The history of abandoned mining towns across the state provides a unique interpretive opportunity.

4. Ancient lava flow and volcanic craters provide travelers with an indication of the natural forces that helped shape the Great Basin landscape.

5. This segment emphasizes the preservation of healthy native roadside plant communities and appropriate revegetation methods. Roadside facilities are minimal due to the low traffic volumes, however, rest areas may include simple path systems that engage the traveler with interpretative signage and native desert plants.

Design Interpretation Summary — Silver State Passage
Interpretation of the segment’s design theme occurs during individual project design. The Corridor Plan establishes the direction for project-level design. Examples illustrate forms and materials that could be used to accomplish the stated design objectives.
SECTION FOUR: Pony Express Passage

THEME

The Pony Express Passage Landscape Design Segment includes US 50 from New Pass Summit east to Ely and continuing north on US 93 to Schellbourne. Parallel to the highway is a series of trails used by Pony Express riders to deliver mail and encourage western settlement. This segment is a continuation of the Pony Express Passage segment described in the Central US 93, West US 6, and Central US 50 Corridor Plan.

The influence of Native Americans on the corridor is prominent. Hickison Summit’s petroglyphs are an important feature. Signage and interpretive opportunities exist for four different tribes that are accessed directly off the corridor:

- Yomba Tribe south of Austin
- Duckwater Tribe southwest of Ely
- Ely Shoshone Tribe in Ely
- Goshute Tribe west of Schellbourne

Native American culture and history are expressed along with mining as part of the corridor’s landscape features and road service facilities. Color and material choices tell the story. Motorists are encouraged to stop at the community rest areas within developed towns. Enhanced landscape treatments and accentuated hardscape treatments increase community visibility and visual interest.

Similar to other segments, design interventions are minimal and the focus is on the surrounding landscape. Roadside disturbance is minimized as the native plant communities thrive and support a beautiful working landscape.

DESIGN SEGMENT OBJECTIVES

The Great Basin landscape is dotted with historic remnants from the Pony Express Trail and early human settlements. The preservation and management of this history is a key component of the design objectives. In addition to applicable corridor-level objectives, these specific design objectives have been established:

Preserve Landscape Character

- Provide signage for important cultural and historic resources, including Pony Express stations, sites of Native American heritage, and mining. Connect travelers with the area’s history.
- Improve facilities at the Schellbourne rest area. Reduce paving and reorganize seating areas. Do not store roadway materials at the rest area.
- Recognize the use of the highway as part of the American Discovery Trail and provide appropriate shoulder width for bike travel that is not disrupted by rumble strips.
- Relocate the Bean Flat roadside pull-off. Improve its connection to the Hickison Petroglyph Recreation Area and highlight Native American culture.
- Create a viewpoint of Austin and the Reese River Valley on the westbound side of Austin. Include community services information encouraging motorists to stop in Austin.
- Provide opportunities to discover the stories and history attached to the region. Interpret the importance of cultural and recreational resources such as the Native American petroglyphs, Illipah Reservoir Recreation Area, and the Pony Express.
- The Pony Express and Native American heritage should be a predominant focus of interpretive efforts along the corridor.

Community Interface

Austin

- Promote historic sites such as Stokes Castle, frontier churches, and cemeteries within the town. Utilize the community rest area to promote town exploration.
- Promote connections to the Toiyabe Mountains and the town’s gateway to mountain biking and recreation opportunities.
- Support the creation of a community rest area.

Eureka

- Emphasize the area’s well-preserved historic buildings and mining history to reinforce community identity.
- Utilize the town’s listing on the National Register of Historic Places to facilitate improvements through the Main Street Program.
- Relocate the Eureka rest area to a community rest area within the town. Design the facility to serve as a town pocket park. Provide travel information to enhance motorists’ enjoyment of the town and region.

Ely

- Enhance signage and information for tourist and historic destinations such as the Nevada Northern Railway Museum and the many murals celebrating Ely’s multicultural heritage.
- Emphasize the town’s role as a gateway community to the Great Basin National Park and its unique environment.

Managed Landscape Character

- Maintain the visual integrity of the natural landscape on the outskirts of Ely.
- Reinforce a clear entry into developed portions of Ely from the north.
- Screen or buffer industrial and storage uses paralleling the highway. Elevate the importance of the natural landscape in creating a desirable scenic presence.
PONY EXPRESS PASSAGE – DESIGN OBJECTIVES
US 50: NEW PASS SUMMIT TO SCHELLBOURNE

SCALE: 1 inch equals 10 miles
Preserve Landscape Character
1. First priority is to maintain and preserve existing landscape. Minimize disturbance and preserve existing vegetation.

Community Interface - Austin
1. Highlight mining and ranching history.
2. Incorporate enhanced native street tree program to define downtown and slow traffic.

Austin Community Rest Area
1. Provide community park that serves as a rest area for travelers. Promote Austin as the gateway to the Toiyabe Mountains.
2. Provide interpretative information enhancing motorists recognition of Native American history and culture in the area. Provide signage to the Yomba Reservation south of Austin. Integrate interpretive features of Native American history and culture.

Austin Viewpoint
1. Provide viewpoint overlooking Austin and the Reese River Valley.
2. Incorporate travel information regarding Austin and the Yomba Reservation.

Bean Flat Rest Area
1. Enhance existing Bean Flat rest area to emphasize Nevada’s Native American history and cultures and highlight Hickison petroglyphs. Provide shade and restrooms.
2. Incorporate aesthetic enhancements through replacement of brightly colored fencing and jersey barriers with context-appropriate alternatives.

Community Interface - Eureka
1. Highlight mining history and historic structures.
2. Provide travel information for historic walking tour.
3. Incorporate enhanced native street tree program to reinforce town character.
4. Emphasize main street improvements that enhance pedestrian facilities and amenities.

Eureka Community Rest Area
1. Relocate existing rest area located just outside of town to downtown Eureka. Rest area should double as a community park.
2. Promote Eureka’s historic district.

Pinto Summit Rest Area
1. Highlight connection to Duckwater Reservation. Incorporate architecture and design materials evocative of Native American culture.
2. Enhance facilities to provide shade.
3. Incorporate aesthetic enhancements through replacement of brightly colored fencing and jersey barriers with context-appropriate alternatives.
Preserve Landscape Character
1. First priority is to maintain and preserve existing landscape. Minimize disturbance and preserve existing vegetation.

Community Interface - Ely
1. Highlight mining and railroad history.
2. Promote community as gateway to the Great Basin National Park and eastern Nevada’s state parks.
3. Incorporate regionally adapted street tree program to define downtown and slow traffic.
4. Emphasize pedestrian movement and enhance streetscape and sidewalk amenities.

Ely Community Rest Area
1. Redefine community park area as a community rest area to encourage travelers to stop and explore the community.
2. Provide interpretative information enhancing motorists’ recognition of the rich mining and railroad history. Utilize local artists and highlight murals located throughout town.
3. Incorporate cultural information for the Duckwater Shoshone and Ely Shoshone tribes. Integrate interpretive features of Native American history and culture.

Pony Express Station Rest Area
1. Highlight Egan Canyon Pony Express Station.
2. Highlight connection to Goshute Reservation. Incorporate architecture and design materials evocative of Native American culture.
3. Enhance facilities to provide shade.
4. Incorporate aesthetic enhancements through replacement of brightly colored fencing and jersey barriers with context-appropriate alternatives.
5. Remove or provide screening of maintenance materials and storage piles.
6. Simplify parking and automobile movement to reduce paving and reintroduce the natural environment into the rest area.
Aerial Landscape and Aesthetic Treatment Simulations
The purpose of the following aerial image is to illustrate landscape and aesthetic treatments at one of the key points along the Pony Express Passage Landscape Design Segment.

Design Interpretation Summary – Pony Express Passage
Interpretation of the segment’s design theme occurs during individual project design. The Corridor Plan establishes the direction for project-level design. Examples illustrate forms and materials that could be used to accomplish the stated design objectives.

(1) Although short lived, remnants of pony express stations stand as reminders to the early period of western settlement and should be incorporated into roadside facilities.

(2) Interpretation of sites and activities that established the towns along US 50 and US 93 allows travelers to better appreciate the historic and scenic qualities of the landscape.

(3), (4) Artistically designed features can be inspired by the forms and patterns of historic structures. Integrated design elements infuses history into daily life.

(5) Nevada contains a rich supply of Native American history and culture. Culturally significant objects and patterns can be reinterpreted to create contemporary facilities that convey the traditional feel of the region.

(6) This segment highlights the preservation and presentation of scenic desert landscapes. Use of architectural windows can make the view more vivid.

(1) This aerial view looks east towards Ely along US 50 and US 93. This stretch of road is located within the Pony Express Passage Landscape Design Segment and landscape treatments should highlight community gateway connections and points of interest within the town of Ely.
SECTION FIVE: Cowboy Range

THEME

The Cowboy Range Landscape Design Segment includes US 93 from Schellbourne north to the Idaho state line at Jackpot and Alt 93 to West Wendover. Scenic vistas of the Ruby Mountains west of US 93 influence the Ruby Mountains Sub-segment designation extending from Schellbourne to Wells.

Defining characteristics of this segment are inspired by the rugged mountains and long-standing working ranches that characterize this portion of the American West. Generations of families have grown up working the land in spite of challenging environmental factors. Today, the highway landscape reflects the legacy of early human settlements and Native American history as well as the dedicated pioneering cowboys and the settling of the West.

Traditions and cultures become more meaningful as they are emphasized through color and material selection. Components of the open range, such as snow fences and wind breaks, are interpreted and expressed as important landscape elements. Rest areas and viewpoints provide information about the local folklore and Great Basin landscape.

Emphasis is placed on the beauty of the landscape and its open grandeur. Improvements and maintenance projects seek opportunities to seamlessly knit the highway into the native setting. Enhanced native vegetation and accentuated hardscape treatments are utilized at roadside facilities, with standard and native revegetation treatments occurring along the majority of the highway.

DESIGN SEGMENT OBJECTIVES

This segment, with its Ruby Mountains Sub-segment, contains several recreational opportunities. Using simple landscape treatments and maintaining the beauty of the working landscape are key to all the design objectives. In addition to applicable corridor-level objectives, the following goals relate specifically to this segment:

Preserve Landscape Character

- Create a viewpoint to emphasize the arrival into Ruby Valley and Clover Valley with the Ruby Mountains and East Humboldt Range flanking the highway to the west.
- Provide travel information for recreation opportunities at the viewpoint.
- Acquaint travelers with the region’s traditions and culture through signage and material choice.
- Use warm, muted colors.
- Blend highway facilities into the contours of the landscape to maintain the corridor’s scenic quality.
- Simplify the truck pull-off and staging area at the US 93/Alt 93 intersection. Revegetate and define parking areas to reduce the visual impact of large paved areas.
- Address trash and dumping issues at locations such as the US 93/Alt 93 intersection. Maintain the high scenic quality of the landscape to stimulate a desire to keep the state beautiful and clean.
- Recognize the importance of wildlife crossings and wildlife movement corridors along and across the highway.

Community Interface

Wells

- Improve visual quality of the town’s entries. Create an enhanced gateway and screen large parking areas. Reinvent the entry experience to reflect the town’s importance as a stopping point along the Humboldt River portion of the California National Historic Trail.
- Provide signage to connect motorists to the historic downtown area.

West Wendover

- As per the I-80 Landscape and Aesthetics Corridor Plan, create a statewide entry at the Utah border.
- Reinforce the importance of the Nevada Welcome Center in greeting and orienting travelers. Provide ample travel information for regional and state destinations. Facilities should reflect state character and traditions.
- Improve visual quality of the town’s entry along Alt 93.
COWBOY RANGE – DESIGN OBJECTIVES
US93: SCHELLBOURNE TO WELLS AND ALT 93

Note: Interchange enhancements for I-80 are provided in the I-80 Landscape and Aesthetics Corridor Plan. Refer to the I-80 Corridor Plan for related design objectives.
**DESIGN WORKSHOP**

Landscape architecture    Land Planning    Urban design    Tourism Planning

**US93, East US6, and East US50 landscape and aesthetics corridor plan**

**UNLV LANDSCAPE ARCHITECTURE & PLANNING RESEARCH**

**SCALE: 1 inch equals 10 miles**

**Ruby Valley Map**

**COWBOY RANGE LANDSCAPE DESIGN SEGMENT**

Preserve Landscape Character

Community Interface

**I-80/US 93 Interchange**

Note: Interchange enhancements for I-80 are provided in the I-80 Landscape and Aesthetics Corridor Plan. Refer there for related design objectives.

**COwBOY rANgE – dESIGN OBJECTIONS**

US93: WELLS TO JACKPOT
Preserve Landscape Character
1. First priority is to maintain and preserve existing landscape. Minimize disturbance and preserve existing vegetation.
2. Highlight ranching and regional character.

US 93/Alt 93 Intersection
1. Reduce appearance of overall paving at intersection.
2. Simplify pull-off areas and incorporate vegetation to reduce appearance of over-paving.
3. Relocate or screen stockpiled road materials.
4. Address litter along intersection. Promote clean-up and adopt-a-highway used along other parts of the corridor.

Viewpoint to the Ruby Mountains
1. Emphasize importance of Ruby Mountains and Humboldt Range.
2. Reflect historical and cultural value of surrounding landscape, including Ruby Valley and Clover Valley.
3. Incorporate travel information regarding recreation opportunities to encourage exploration of the region.

Community Interface – Wells
1. Enhance entry experience into Wells. Simplify curb cuts and buffer large parking lots.
2. Establish compelling community gateways that create a clear town entry and sense of civic pride.
3. Enhance signage to historic downtown area.
4. Interpret Native American history and regional importance.

US 93/Alt 93 Intersection
1. Reduce appearance of overall paving at intersection.
2. Simplify pull-off areas and incorporate vegetation to reduce appearance of over-paving.
3. Relocate or screen stockpiled road materials.
4. Address litter along intersection. Promote clean-up and adopt-a-highway used along other parts of the corridor.

Viewpoint to the Ruby Mountains
1. Emphasize importance of Ruby Mountains and Humboldt Range.
2. Reflect historical and cultural value of surrounding landscape, including Ruby Valley and Clover Valley.
3. Incorporate travel information regarding recreation opportunities to encourage exploration of the region.

Community Interface – Wells
1. Enhance entry experience into Wells. Simplify curb cuts and buffer large parking lots.
2. Establish compelling community gateways that create a clear town entry and sense of civic pride.
3. Enhance signage to historic downtown area.
4. Interpret Native American history and regional importance.

Native Revegetation
- Highlight recreation opportunities and access to Ruby Lake NWR with fishing and birding opportunities
- Interpret historical and cultural value of the Ruby Mountains and Humboldt Range
- Highlight Ruby Valley
- Highlight Clover Valley

Enhanced Native
Accented
Preserve Landscape Character
1. First priority is to maintain and preserve existing landscape. Minimize disturbance and preserve existing vegetation.
2. Highlight ranching and regional character.

Community Interface – West Wendover
1. Incorporate regionally adapted street tree program to define downtown and slow traffic.
2. Emphasize pedestrian movement and enhance streetscape and sidewalk amenities.

Statewide Gateway
1. Statewide gateway established on I-80 route.
2. Emphasize regional and statewide resources and culture. Utilize local materials to create architectural or sculptural element.

Native Revegetation
- Standard
- Regionally Adapted
- Accentuated

I-80/ALT 93 INTERCHANGE
- Refer to I-80 Landscape and Aesthetics Corridor Plan for interchange improvements

VIEWPOINT OF BLUE LAKES
- Native Revegetation
- Standard
- Accentuated
- Regionally Adapted

STATEWIDE GATEWAY
- Refer to I-80 Corridor Plan
- Create viewpoint of Blue Lakes and Bonneville Salt Flats
- Create architectural or sculptural element

LANDSCAPE ARCHITECTURE & PLANNING RESEARCH SECTIONS
- Cowboy Range Landscape Design Segment – ALT 93
- US 93/ALT 93 Intersection
- Landscape Type/Treatment
- Structures and Hardscape Type/Treatment

(HORIZONTAL AND VERTICAL SCALES VARY)
**Preserve Landscape Character**

1. First priority is to maintain and preserve existing landscape. Minimize disturbance and preserve existing vegetation.
2. Highlight ranching and regional character.

**Community Interface – Jackpot**

1. Highlight ranching and gaming history.
2. Incorporate regionally adapted street tree program to define development, reduce the scale of surrounding parking and buildings, and slow traffic.

**Salmon Creek Rest Area**

1. Maintain existing facilities and shade structures.
2. Incorporate walking trail to allow motorists an opportunity to stretch.
3. Connect travelers to the larger landscape through interpretive information regarding geological formations, Salmon Creek, the Great Basin, and surrounding wildlife habitats.
4. Highlight importance of ranching and agriculture in the region. Provide travel information regarding open range and snow fences.

**Statewide Gateway**

1. Develop secondary level statewide entry consistent with traffic associated with US highway.
2. Incorporate regional materials.
3. Connect travelers to culture and history of the region.
4. Place sign so it appears consistent and part of the surrounding landforms rather than being disconnected and arbitrarily placed.

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**Elements**

**Landscape Type/Treatment**

- Native Revegetation
- Standard
- Regionally Adapted
- Accentuated

**Structures and Hardscape Type/Treatment**

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**Cowboy Range Landscape Design Segment – US 93**

**Preserve Landscape Character**

**Community Interface**

**Salmon Creek Rest Area**

**Statewide Gateway**

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**SECTION**

**DESIGNWORKSHOP**

**US93: WELLS TO JACKPOT**

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**D3**

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**COWBOY RANGE – LONGITUDINAL SECTION**

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US93: WELLS TO JACKPOT
LEGEND

US 93, East US 6, and East US 50
Corridor with Mile Markers

COMMUNITY OPPORTUNITIES
1. Statewide gateway
2. Community gateway
3. Pedestrian linkage and circulation
4. Bike and multi-use trail linkage
5. Highway archaeology, cultural, or historic awareness
6. Highway and community compatibility improvement
7. Partnerships and resource leveraging

TRAVEL AND TOURISM OPPORTUNITIES
1. Roadside Services
2. Viewpoints and points of interest
3. Travel information program
4. Highway art
5. Community Rest Area

PLANTING OPPORTUNITIES
1. Ground treatment
2. Revegetation with native grasses, forbs and herbaceous plants
3. Enhanced native planting
4. Great Basin regionally adapted planting
5. Great Basin ornamental planting

NATURAL RESOURCE AND WILDLIFE OPPORTUNITIES
1. Environmental resources preservation
2. Wildlife movement enhancement
3. Water resources enhancement
4. Rare, unique, or special natural resource enhancement

VIEWs AND LANDMARK OPPORTUNITIES
1. Highway scenic designation
2. Highway scenic improvement

ROADWAY PRACTICES AND STRUCTURE OPPORTUNITIES
1. Sound protection or acoustic wall
2. Bridge and structure aesthetic
3. Information and directional signage
4. Highway maintenance practices
   Note: Includes maintenance practices for milled asphalt by-products for entire corridor
5. Highway facility enhancement
6. Landform or contour grading enhancement
7. Geometric, alignment, and land relationship enhancement
8. Sustainable corridor practice opportunity

SCALE: 1 inch equals 10 miles

ENTIRE CORRIDOR

DEVELOP PARTNERSHIPS WITH STATE AND FEDERAL AGENCIES TO PRESERVE VISUAL QUALITY, PROMOTE NATIONAL AND STATE PARKS, AND TELL THE STORY OF THE REGION'S HISTORY AND CULTURE

UTILIZE RE-VEGETATION METHODS FOR DISTURBED AREAS

MAINTAIN SCENIC CONTINUITY THROUGH BILLBOARD MITIGATION

CONSIDER RE-USE OF MILLED ASPHALT FOR PAVING

THIN ROADSIDE VEGETATION FOR SAFETY WHILE MAINTAINING INTEGRITY OF EXISTING LANDSCAPE

ADDRESS SHOULDER SAFETY ISSUES WHILE MAINTAINING VISUAL QUALITY OF HEALTHY ROADSIDE VEGETATION

UTILIZE SUSTAINABLE PRACTICES AND ALTERNATIVE ENERGY SOURCES FOR LIGHTING AND ROADSIDE SERVICES

UTILIZE RAINWATER HARVESTING TECHNIQUES TO ADDRESS DRAINAGE AND STORMWATER ISSUES

COWBOY RANGE – SPECIFIC FEATURES

US 93: WELLS TO JACKPOT
**COWBOY RANGE LANDSCAPE DESIGN SEGMENT**

(1) This aerial view looks south towards Jackpot along US 93. This stretch of road is located within the Cowboy Range Landscape Design Segment and landscape treatments should include aesthetic treatments that reflect the region’s ranching heritage.

**Design Interpretation Summary – Cowboy Range**

Interpretation of the segment’s design theme occurs during individual project design. The Corridor Plan establishes the direction for project-level design. Examples illustrate forms and materials that could be used to accomplish the stated design objectives.

(1) The Cowboy Range continues to celebrate the heritage of the western frontier, including both Native American and Euro-American influences.

(2) Artistic interpretations of the cowboy way of life provide the foundation for meaningful interpretation along the corridor.

(3), (4) Materials and forms found in the rural landscape convey the cultural and natural history of the region.

(5) Appropriately sited rest areas take advantage of views and allow visitors to access and appreciate natural resources.

(6) Forms and styles derived from the surrounding context provide the basis for conveying the segment’s design theme.
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SECTION THREE: Highway Facilities Guidelines ........................................3.12
INTRODUCTION

Purpose of Design Guidelines
Design Guidelines provide the framework for improving the aesthetics of new and retrofit highway projects. They are written statements of recommended methods to meet the segment design objectives. Guidelines should not be mistaken as new standards for highway design. They represent recommendations for design solutions.

Guidelines approach corridor aesthetics as a comprehensive effort, intentionally avoiding a project-to-project approach. Guidelines assist in the development of design. Adherence to the guidelines in planning, design, and operations accomplishes the following goals:

- Interpreting the design themes of each landscape design segment
- Creating visual unity among all highway structures and facilities
- Selecting finishes, color palettes, and surface patterns that are compatible with the surrounding landscape
- Incorporating transportation art motifs and media that represent the landscape design segment themes

The guidelines, accompanied by concept diagrams, sketches, or photographs, demonstrate ways in which to achieve the design intent.

NDOT will review each project design for consistency with these guidelines and the overall Landscape and Aesthetics Corridor Plan. The full design team—NDOT staff, communities, engineers, project managers, landscape architects, consultants, contractors, and maintenance crews—is strongly encouraged to:

1) Become familiar with design guidelines for the design segment in which a project is located. The guidelines direct the design toward creating aesthetic unity within the design segment
2) Understand the site context. The landscape surrounding the proposed project (including predominant materials, colors, and structures, as well as natural and cultural resources and social elements) provides direction for enhancement
3) Seek early review of the project. Changes are much easier to make at the beginning of the project than at the end. Involving others early in the planning/design process helps ensure that the project is both economically and aesthetically feasible

How to Use the Design Guidelines
The Design Guidelines are divided into three sections as described below. The full design team as well as potential partnering entities, such as communities and other organizations, should be familiar with each section.

1) Design Process Guidelines:
Describe the necessity of integrating landscape and aesthetics at the beginning of every project.

2) Community and Urban Context Guidelines:
Describe guidelines for facilities and amenities that are primarily influenced by local communities, depending on right-of-way extents.

3) Highway Facilities Guidelines:
Describe guidelines that are primarily influenced by NDOT’s standards, including structures, grading, roadside services, and construction practices.
SECTION ONE: Design Process Guidelines

These guidelines describe the necessity of integrating landscape and aesthetics at the beginning of every project.

1.0 PROJECT DESIGN PROCESS

1.1 Integrate landscape and aesthetics at the onset of the planning, design, and engineering phases of all highway projects.

Landscape and aesthetics should not be an afterthought to a highway project.

- Landscape and aesthetics are an integral part of the planning, design, and engineering of all highway projects.
- NDOT’s structure inventory report regarding type, size, and location of highway structures should include information on landscape and aesthetics. It should also provide justification for proposed structures that do not meet the design guidelines.
- Engineering design should incorporate landscape and aesthetics to create highway structures and facilities that are effective, safe, and aesthetically appealing.

1.2 Understand the design segment theme and select design concepts that interpret the theme.

- Review the vision and objective for the landscape design segment as described in the Corridor Plan and ensure that the theme guides the project design.
- Understand the site context, including the viewshe analysis and landscape design segment objectives described within the Corridor Plan.
- Ensure project design successfully interprets the landscape design segment theme.

LANDSCAPE AND AESTHETICS IS NOT AN AFTERTHOUGHT TO ENGINEERING, BUT THE STARTING POINT FOR INTEGRATED, CONTEXT-SENSITIVE SOLUTIONS.
1.3 Understand the site context, including the surrounding landscape, and conduct a comprehensive analysis.

- Conduct a comprehensive site analysis for each project. The site inventory for each project should extend beyond project boundaries to analyze the site and surrounding landscape. Ensure the planning and design of the highway project responds to this comprehensive analysis.
- Consider characteristics such as precipitation, topography, ground cover, size and location of plant material, visual conditions, soils, site drainage, rock outcroppings, and other natural features that are located on, and surrounding, the site. Additionally, cultural context such as archaeological and cultural resources and categories, such as historic settlement, are important.

1.4 Use a variety of sketches, three-dimensional modeling, and other tools to visualize and detail the highway.

As the level of design progresses from general to specific, highway layout and facilities should be visualized through a variety of methods to create a high quality system.

1.5 Visualize design concepts in three dimensions.

Plan view design does not accurately represent the experience of the traveler along the highway or illustrate issues of visual design. Therefore, it is important to understand design concepts in their three-dimensional framework.
- Utilize sketches, models, and digital visualization tools. “Roadway Explorer” is an excellent tool to utilize for this purpose.

1.6 Consider landscape and aesthetics costs in conjunction with baseline costs.

Landscape and aesthetics should be considered simultaneously with a project’s capital budget and estimates. In addition to determining a project’s baseline construction cost, allocation of budgets and resources for landscape and aesthetics should be clearly outlined at the start of a project.

1.7 Estimate maintenance costs during design to calculate the total life cycle cost for landscape and aesthetic treatments.

Maintenance is a key component to the success of landscape and aesthetic treatments.
- Design new projects that are low maintenance.
- Consider maintenance routines required for the design program, and identify areas that may need additional attention.
- Create maintenance agreements with local agencies as necessary to establish appropriate practices and levels of maintenance over the life of the project.
SECTION TWO: Community and Urban Context Guidelines

These guidelines include facilities that are primarily influenced by local community desires but may benefit from NDOT’s support. A community’s highway is important and serves as a primary component of the public realm. Even though NDOT is not responsible for facilities outside of the right-of-way, it recognizes the need to work with local jurisdictions to create context-sensitive solutions.

NDOT understands the need for flexibility, and it functions as a facilitator in supporting a community’s vision and goals for the highway. The guidelines found in this section are meant to enhance established traffic engineering and road design practice. No single solution will transform a community’s highway through downtown. Rather, communities should carefully evaluate and consider several options and thoroughly understand the issues at hand in order to create a highway that fulfills the collective goals of the partnership established between the community and NDOT. Neither NDOT nor the community can accomplish the goals on their own.

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2.0 Community-based Street Systems................................................................................................3.6
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4.0 Street Trees and Planting Strips ..................................................................................................... 3.8
5.0 Graphics and Signage ................................................................................................................... 3.11
1.0 COMMUNITY GATEWAYS

1.1 Establish gateways that clearly express community identity.
Gateways are highly visible areas specially designed and maintained to make a positive first impression and convey the identity of neighborhoods, communities, towns, cities, and regions.

- Provide an impressive visual aesthetic.
- Utilize appropriate landscape and/or structural techniques to screen unsightly land uses.

1.2 Integrate the gateway into the highway facilities.
Gateways should be part of a larger design intent, coordinate with community facilities, and use materials that are repeated throughout the town. Refer to Softscape and Hardscape Types and Treatments (pages 1.6-1.9) and Softscape Types and Treatments guidelines (pages 3.33-3.43), for more details about the types of features and plants to consider for community gateways.

- Community gateways need to be integrated with highway structures and landscape (see illus. 1).
- Architectural elements may include transportation art, rock walls, accent lighting, and signage.
- Ensure that community gateways are distinctive, memorable, and functional.

1.3 Ensure community gateways contribute to community identity and clearly define community identity points.

Highlight community entrances with clear and attractive signage, using landscape materials that reflect the community character. Execute the design in a clear, consistent, and bold manner. Design repetition reinforces town identity.

- Signage should be appropriately sized and incorporated into an architectural or sculptural element consistent with the community’s character, the environmental context, and the corridor’s theme (see illus. 3).
- Landscape plantings should include layers of low water-use plant material arranged to enhance the architectural elements and reinforce the transition into the community.

1.4 Locate gateways at likely future growth boundaries.
Community gateways mark the entrances/exits and designate the transition to increased development. Gateways marking downtowns may be used to improve community identity and draw motorists into the heart of town.

- Downtown gateways should complement the community gateway while reflecting the special character of the city center.

1.5 Engage agencies and organizations in the planning and design process.
Engage applicable state and local agencies, as well as local stakeholders and organizations in the planning, design, and implementation of community gateways.

(1) Integrate community gateways with highway facilities and landforms to help strengthen the relationship between the highway and place.

(2) Replace outdated and faded community entry signs with coordinated signage that conveys a positive town image. Consolidate signage for multiple town service groups into an attractive amenity as shown above.

(3) Gateways create a visitor’s first impression of a community and should therefore engage local stakeholders in the planning, design, and implementation of such features to ensure they reflect the community’s vision. Signage reinforces the community’s sense of place and image.
2.0 COMMUNITY-BASED STREET SYSTEMS ISSUES

2.1 Consider improvements to the surrounding street system before widening the highway through communities.

Wide streets discourage pedestrian activity and have a negative economic impact. Secondary streets that are not performing well influence the way in which a highway operates as a community main street. Improvements to other major and minor streets impact the functionality of a main street.

- Traffic improvements should be considered in context with surrounding transportation patterns. Improvements to other streets allow potential lane width reductions along the highway and provide additional space for landscape and aesthetics.
- Improvements to surrounding city streets may include utilizing parallel streets, implementing a truck bypass, improving the local street network, and using parallel, one-way streets.

2.2 Shorter blocks encourage pedestrian activity and provide more corner lots, essential for local businesses.

Short blocks with connecting streets characterize traditional main streets.

- Utilize short blocks of up to 400 feet where possible to encourage pedestrian activity in downtowns.

2.3 Consider routing trucks onto a parallel street and encourage vehicular traffic through main street.

Truck traffic requires more space for turning movements and increases noise levels and fumes within the community. Wide streets discourage pedestrian activity and can harm the town’s economic potential.

- Diverting truck traffic away from the local main street may distribute traffic loads more evenly and improve the function of the main street.
- Vehicular traffic should continue through main street where feasible in order to support community businesses and facilities.
- Parallel streets should have few interruptions and maintain a fairly direct connection that may be improved to accommodate truck traffic.

2.4 Avoid bypasses and only use them in limited applications.

Bypasses are utilized to divert traffic around communities, particularly when heavy traffic conditions obstruct the functionality of main street. However, bypasses reduce the interaction between travelers and communities.

- A bypass may work in certain cases where the highway is designated as part of the freight system or heavy traffic volumes overload a well-designed street system.
- If a bypass is used, maintain connectivity for bicyclists and pedestrians and provide direct connections back to community business districts.

(1)(As highways travel through communities, the function of the road changes as development increases at its edges. Improvements to other streets allow the highway to function more smoothly as it incorporates landscape and aesthetic elements.)

(2)(Truck traffic through communities must be considered as part of street design along rural highways.)

(3)(Parallel, one-way street systems may be used to improve traffic patterns and provide additional space for landscape, pedestrian improvements, or additional commercial development.)
3.0 SIDEWALKS

3.1 Provide a 10 to 15 foot sidewalk width for downtown areas where possible.
A wider sidewalk allows for more pedestrian activities along the street (see illus. 1-4).
- Additional width may be required to accommodate transit shelters, outdoor dining, and retail.
- A sidewalk may be 8 feet wide in constrained circumstances. Minimum sidewalk width is 6 feet.

3.2 Provide continuous sidewalks throughout downtown areas.
The ability of pedestrians to access and move through downtown areas depends on the connectivity of sidewalks and paths, as well as appropriate design and placement of crosswalks.
- Establish connections to other sidewalks or path systems where town centers transition into suburban or rural areas.

3.3 In town centers, provide pedestrian amenities such as benches, drinking fountains, transit shelters, kiosks, trash receptacles, newspaper racks, banners, and decorations.
Streetscapes that appear lively and inviting attract travelers and support local businesses.
- Street furnishings should be consistent with surrounding architectural styles and the overall landscape segment theme.
- Maintain a minimum of 5 feet of clear space around street furniture to accommodate pedestrian movement.
- Provide wide sidewalks and curb extensions as locations for benches.

3.4 Use distinctive paving to highlight sidewalk areas immediately adjacent to the inside face of curb.
Sidewalk areas can be organized into two zones: the amenity zone and the pedestrian zone. The amenity zone is adjacent to the curb and should have a minimum width of 2 feet, but preferably 4 feet or greater, depending on the sidewalk width.
- Distinctive paving treatments may be used in this area to distinguish it from pedestrian movement areas.
- Treatments should be consistent over a block length, but may vary from block to block.
- Street trees, planters, benches, transit shelters, signs, utility poles, and other elements are located in the amenity zone.
- Elements should be grouped together or placed in a way that leaves a minimum open area of 8 feet between them, allowing passage from the sidewalk to the street.

3.5 Provide pleasant seating opportunities along every block in the downtown area.
Seating is essential in a comfortable pedestrian environment.
- Arrange seating to accommodate a variety of views.
- Locate benches and gathering spaces to absorb sun on cold days and provide shade on hot days.
- Ensure that communities commit to maintain and clean street furniture as part of maintenance agreements that are negotiated prior to construction.
3.6 Consider undergrounding utilities to provide additional space for sidewalk enhancements.
Utilities should be consolidated to minimize poles and other sidewalk obstructions.
  • Coordinate signage with utility poles where feasible.
  • Avoid placing signs and utilities in pedestrian areas.

3.7 Incorporate transit shelters to promote pedestrian and non-motorized transportation opportunities.
Coordinate transit stops with local transportation agencies.
  • Locate bus pull-outs on the far-side location of intersections.
  • Minimize conflicts between vehicles, passengers, pedestrians, and cyclists.

3.8 Consider using artistic paving and historical marker insets to accentuate downtown areas.
• Celebrate distinctive areas with accentuated paving materials.
• Consult artists for ideas to improve the community downtown.
• Paving patterns should coordinate with intersection designs and overall community character.

4.0 STREET TREES AND PLANTING STRIPS
4.1 Carefully select plant species.
• Select trees that thrive in the local climate and consider species whose roots, seasonal flowers, or fruit create minimal disruption to sidewalks.
• Evaluate trees based on site-specific characteristics as well as design intent.
• Considerations for physical characteristics include form, height, spread, height to canopy bottom, canopy density, trunk size, root habit, rate of growth, and longevity.
• Consider habitat requirements affecting plant growth, including soil type, compaction tolerance, salt tolerance, irrigation requirements, shade tolerance, heat tolerance, air pollution tolerance, and wind resistance.
• Minimize maintenance costs by avoiding trees with excessive maintenance requirements including flowers, foliage, fruit, and twigs.
• Consider common insect and disease problems that consistently require maintenance or are life threatening.
• Maintain storefront visibility and reduce pedestrian conflicts by selecting trees whose form remains intact when limbed up to 8 feet.
• Consider tree height over traffic lanes. Canopies should appear natural when trimmed to 14 feet.
• Select plants that will provide a variety of ornamental characteristics, such as seasonal color, fruit, texture, bark, and foliage.
• Plant species according to the softscape type and treatment designated by the design objectives.

3.6

3.8

4.1

4.0

SECTION TWO: Community and Urban Context Guidelines

There is an image of a street scene with trees and sidewalks. The image shows a sidewalk with trees, and text discussing the placement of trees.

- Trees should be placed so that they do not block the view of business names and entries.
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3.9 **Chapter Three — Design Guidelines**

- Avoid planting a single species in suburban areas due to the risk of a pest or disease destroying an entire street tree planting.
- Downtown districts may be highlighted through a formalized street tree pattern.

4.2 **Properly place trees in sidewalk conditions.**
Maximize the lifespan of trees to reduce the cost of tree replacement.

- Protect trees from damage by car doors. Where on-street parking is provided, allow adequate room between trees and cars (2 feet at minimum, but ideally 3 to 4 feet). Trees may be placed between parking spaces to minimize damage.
- Allow for root aeration and potential water harvesting through the use of tree wells (4 feet by 4 feet at minimum, but ideally 5 feet by 5 feet). Dry-set pavers may also be used, ensuring adequate root aeration.
- Consider light placement as part of tree spacing and placement (typically 25 to 40 feet).
- Place trees so they do not block vehicular site lines or building access ways. Maintain visibility of traffic signals, directional signage, and access to entry drives.

4.3 **Street tree plantings may be varied to distinguish downtown areas from transition zones and to accentuate wayfinding.**
Small trees in combination with medium and large trees can reinforce wayfinding in towns.

- Distinctive trees may be used within downtown areas to distinguish them from other commercial areas (see illus. 3).
- Key intersections and gateways may be designated by clustering smaller trees or other distinctive groupings.

4.4 **Utilize hanging baskets, containers, and other vertical elements where feasible.**
In areas of limited rights-of-way, hanging baskets, moveable planters, and other vertical elements may be used to provide structure or to accent street tree plantings.

- Hanging baskets may be incorporated into the street design and attached to light fixtures or buildings to provide visual relief and enhance the aesthetics.
- Baskets may be replaced with wreaths or other seasonal accents during dormant seasons.
- Moveable planters add flexibility to the streetscape design.
- Avoid placing containers within clear zones and immediately adjacent to curbs where high levels of heat and vehicle exhaust are more prevalent.
- No container should be used if planter widths exceed 25% of the entire sidewalk width.
- Select container colors that harmonize with brick pavers, concrete sidewalks, most building facades, and the myriad color combinations produced by annual plantings.
- Container design should be simple and understated (see illus. 6).
- Use a consistent planter type within communities and provide groupings where possible. Containers should be sited near street corners (as long as clear visibility is maintained for drivers), to flank entrances to landmark buildings, or to physically and visually define outdoor café spaces.

SECTION TWO: Community and Urban Context Guidelines

- Used consistently, street trees help define the extent of downtown districts and neighborhoods. A change in planting type and spacing can be used to signal transition zones between downtown and outlying areas.
- Place street trees where they are protected from car door damage and allow a smooth flow of pedestrian movement.
- Variety of street types may be used to distinguish key areas and gateways.
- Tree grates protect trees from unwanted root compaction along street environments.
- Container color and form should be simple and understated.
3.10

Chapter Three — Design Guidelines

4.5 Buffer sidewalk from the roadway through the use of planting strips or raised planters where possible.

Planting strips provide opportunities to absorb runoff water and decrease overall drainage requirements. Additionally, they create areas to store snow during removal periods throughout the winter.

- Where space is not required for widened sidewalks or on-street parking, provide planting strips (ideally a minimum of 5 feet in width) or raised planters.
- Planting strip design should consider the placement of benches, signs, bicycle racks, and other street furniture.
- Raised planters should incorporate seat walls to provide additional pedestrian seating.
- Consider providing 3 feet of hard surface between planting strips and parallel on-street parking to accommodate motorists upon exit from their vehicles.

4.6 Ensure that communities commit to maintain and provide irrigation for streetscape plantings.

The success of a streetscape program within communities requires dedication to maintenance and irrigation of planted areas.

- Streetscape plantings should not be provided without community endorsement and support.
- Minimize the use of irrigation. Where required, do not overspray onto walkways and into gutters.

4.7 Use engineered planting soil for street tree plantings.

Trees planted in urban conditions and as part of street tree programs face unique challenges. The soil under adjacent sidewalks and roadways is typically compacted to support the paving. This compaction inhibits root growth and spread, causing shallow root growth and tree stress. Engineered planting soils (see illus. 10) include mixtures of soil, loam, stone, water, and a moisture-retaining polymer or sand that transfers weight-bearing loads from stone to stone in the gravel, leaving the soil between the stones unaffected by compaction. This type of engineered soil creates a larger rooting volume with increased porosity, nutrient-holding capacity, and drainage for a healthier environment for tree root growth.

- Engineered planting soils should be used around root balls of street trees.
- Continuous trenches of engineered planting soil are recommended between street trees.
- Locate trenches parallel to curbs and under non-mortared brick pavers. Trenches provide greater volumes of soil for root growth and permit air and water to reach tree zones.

- Irrigation and maintenance may be funded through community beautification committees and other community organizations.

4.8 Ensure that communities commit to maintain and provide irrigation for streetscape plantings.

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- Irrigation and maintenance may be funded through community beautification committees and other community organizations.
5.0 GRAPHICS AND SIGNAGE

5.1 Create a standard system of signage that aids wayfinding within communities while also providing information about local facilities and organizations.

- Provide a coordinated signage system that reflects the distinctive character of special districts.
- Graphics can take the form of signs, banners, information kiosks, or pavement inscriptions or inlays.
- Materials and designs should be clear and simple, so as to be easily read and quickly understood by pedestrians or motorists, as appropriate.

5.2 Locate and size signage and graphics so that it is easily read and understood by both motorists and pedestrians.

- Pedestrian-scaled signage should be placed at heights that can be easily seen from the sidewalk.
- Signage designed for motorists can be larger and placed at heights and intervals that can be easily seen and understood at higher traveling speeds (see illus. 3).

5.3 Provide community graphics, such as banners, to promote special events and define special districts and neighborhoods.

- Create a coordinated system of signage that describes community events and reinforces community character.
- Banners that span the roadway should be used in distinctive downtown commercial locations. Banners can be installed permanently or as seasonal and temporary forms of signage (see illus. 2).

5.4 Use distinctive signage to direct motorists through the heart of the community.

Truck traffic is often not desired within downtown areas and separate truck routes may be established. Vehicular and tourist traffic, however, is desirable.

- Ensure that signage appropriately directs vehicular traffic to promote tourism and support local businesses.

5.5 Coordinate light fixture design with graphics and signage.

- Banners may be incorporated into light fixtures and should be considered as part of the design. Graphics should be consistently displayed and banners should be placed to avoid conflicts with parked and moving vehicles.
- Customized light fixtures reinforce context-sensitive solutions.

5.6 Utilize a consistent color palette within local communities.

Local jurisdictions may choose a color palette for fixtures and amenities that corresponds with the community’s vision. State Historic Preservation Office coordination and approval may be needed for specialized street light and street furniture amenities if federal funds are used.

- Colors should respond to the natural setting and subtly enhance the community without overpowering the streetscape design.
- Color should complement the NDOT color palette for structures within the right-of-way.
SECTION THREE: Highway Facilities Guidelines

These guidelines pertain to highway facilities that are primarily influenced by NDOT’s standards, including structures, grading, roadside services, and construction practices. The guidelines found in this section are meant to enhance established traffic engineering and road design practice. No single solution will transform the highway. Partnerships may be created with communities and other agencies and organizations to accomplish landscape and aesthetic treatments. In addition, partnerships can support landscape and aesthetic elements that impact areas outside of the right-of-way. Established partnerships and design teams should thoroughly understand and carefully evaluate several options and related issues in order to create a highway that fulfills their collective goals. Neither NDOT nor communities, other agencies, or organizations can accomplish the goals on their own.
1.0 NON-INTERSTATE STATEWIDE GATEWAYS

1.1 Provide statewide gateway features crafted from the land where US 50/US 6 and US 93 enter Nevada from Utah and Idaho, respectively.
Identify state entry points to welcome travelers to Nevada.

- Non-interstate gateways should be understated and relate to the scale of the road (see illus. 1-2).
- Include the Nevada name and state seal.
- Utilize vernacular forms and stone material from local sources.
- Use low-maintenance softscape treatment types, such as native revegetation.
- Recognize major regional features through material selection or design harmony.

(1) The gateway at the Utah-Nevada border along US 50 should be coordinated with signage that identifies Great Basin National Park, as it establishes the traveler’s first impression of the State.

(2) The Idaho-Nevada statewide gateway along US 93 can be sited to take advantage of the surrounding landforms. Grounding the sign into the hillside helps frame the basin view and utilization of local materials and patterns accentuates the connection to place and history.
2.0 REST AREAS, VIEWPOINTS, AND PULL-OFFS

2.1 Provide a comprehensive roadside service program.

Roadside services are key components of the highway corridor, particularly where long distances separate developed areas. The road services matrix on the opposite page describes varying levels of service stops and associated program elements. Refer to the corridor’s Specific Features maps (pages 2.20-2.22, 2.27, 2.33, and 2.41-2.42) for potential road service facility locations.

• Locate rest areas to provide safe stopping points.
• Connect rest areas in highly utilized recreation areas with a shared-use trail.
• Buffer roadside services from the highway, or provide an access road when located off the highway.
• Consider major site resources and features such as topography, views and vistas, unique vegetation, geological features, wetlands, and other qualities native to the site and its surroundings.
• Consider siting activity pull-offs where they provide access to activities located adjacent to the highway.
• Locate truck parking so as to not disrupt views and other features while ensuring safe accessibility to the services provided.

2.2 Ensure rest area design reflects the local setting.

All rest areas, viewpoints, and pull-offs should readily accommodate travel needs and reflect the corridor’s design theme.

2.3 Retrofit existing rest areas.

Analyze existing rest area structures, buildings, amenities, and layout for their visual interest. Renovate to improve the aesthetics and user comfort of existing road service facilities.

2.4 Locate viewpoints and points of interest to take advantage of visual access to the features of interest.

Give special attention to existing or potential views, vistas, and cultural or historic attractions that are unique to the site or have outstanding resource value, such as Native American heritage and emigrant history.

• Design viewpoints to reflect the surrounding setting and features.
<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Landscape Treatment</th>
<th>Program Elements</th>
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</thead>
</table>
| ROADSIDE PULL-OFF                      | Roadside pull-offs provide facilities for drivers to exit the highway for a brief period. Facilities and minimal parking are provided to accommodate the abbreviated stay. (Referred to as “Rest Stop” under former NDOT naming conventions.) | • Native plant revegetation to enhanced native landscape types  
• Standard hardscape type | • Site-specific interpretive signage  
• No toilets or running water  
• Trash containers  
• Limited paved parking for cars and recreational vehicles  
• Scenic overlooks  
• Located according to unique or outstanding features  
• Shade canopy (vegetation or structure) |
| VIEWPOINTS AND POINTS OF INTEREST      | Viewpoints and points of interests present opportunities to view unique vistas, geologic and historic features, or cultural landmarks. Interpretive elements are integrated into the site design, and place name signage and travel information elements are provided to establish the relationship between highway and place. Typically, the length of stay is short and parking is limited. | • Native plant revegetation to enhanced native landscape types  
• Standard to accentuated hardscape types | • Located according to travelers' needs and unique site features  
• Site-specific interpretive signage  
• Toilets/no running water  
• Handicap accessible  
• Picnic tables and shade structures  
• Trash containers  
• Paved car and recreational vehicle parking  
• Telescopes/viewfinders  
• Nature walks or short trails  
• Seating areas  
• Shade canopy (vegetation or structure) |
| BASIC REST AREA AND COMMUNITY REST AREA | Basic rest areas are located throughout the state, offering site-specific interpretive information. They offer limited rest room facilities and may or may not include running water, depending on availability. Typically these rest areas are located adjacent to scenic views or unique historic, cultural, or environmental features. Community rest areas provide facilities within the town’s infrastructure and function as a pocket park or town square. | • Enhanced native landscape type  
• Standard to accentuated hardscape types | • Located according to travelers' needs and unique site features  
• Site-specific interpretive signage  
• Toilets/no running water  
• Handicap accessible  
• Picnic tables and shade structures  
• Trash containers  
• Paved car and recreational vehicle parking  
• Paved truck parking  
• Nature walks or short trails  
• Seating areas  
• Shade canopy (vegetation or structure)  
• Local community information |
| COMPLETE REST AREA                     | Complete rest areas are typically located at 60 mile intervals throughout the state and are usually situated outside of developed areas. They feature fully operable facilities in combination with interpretive information about regionally significant cultural and historic sites. Complete rest areas also provide travelers with picnic facilities and include children’s open play areas and pet areas. | • Regionally adapted landscape type  
• Focal hardscape type | • Regional interpretive signage  
• Running water and flushing toilets  
• Emergency call box and telephones  
• Drinking fountains  
• Vending machine services (at manned sites)  
• Handicap accessible  
• Picnic tables and shade structures  
• Trash containers  
• Bicycle storage units  
• Recreational vehicle dump station  
• Paved car and recreational vehicle parking  
• Paved truck parking  
• Telescopes/viewfinders  
• Interpretive and overlook features  
• Children’s open play area (not play equipment)  
• Pet rest facilities  
• Shade canopy (vegetation or structure)  
• Local community information |
| GATEWAY REST AREA                      | Gateway facilities convey first impressions and identity. Special features may be incorporated to highlight the area through design interpretation of the place. Gateways may be associated with any level of rest stop in the listing. The incorporation of local community information regarding amenities, events, and interpretive elements improves the interface between the highway and the communities it serves. | • Regionally adapted landscape type  
• Landmark hardscape type | | Program elements are consistent with the type of road service area provided.  
Specific elements include:  
• Regional services information  
• Interpretation of regional sites and features  
• Information on regional recreational attractions |
| WELCOME CENTER                         | Welcome centers are located along major entry routes to the state. They offer introductions to the state and help travelers find access to useful travel information. Welcome centers include a staffed information kiosk. | • Regionally adapted landscape type  
• Landmark hardscape type | • Located at major entry routes to state  
• Informational services  
• Staffed visitor center  
• Statewide interpretive signage  
• Running water and flushing toilets  
• Emergency call box and telephones  
• Drinking fountains  
• Vending machine services  
• Handicap accessible  
• Picnic areas and shade structures  
• Trash containers  
• Bicycle storage units  
• Paved car and recreational vehicle parking  
• Paved truck parking  
• Improved trails  
• Children’s play area  
• Pet rest facilities  
• Shade canopy (vegetation or structure)  
• Telescopes/viewfinders |
• Coordinate the preservation and management of scenic vistas and features with the appropriate organizations and groups.
• Evaluate viewpoints periodically to ensure the integrity of the view.
• Consider the use of scenic easements to protect views and vistas.
• Limit the construction of outdoor advertising and other elements and structures that detract from the quality of the landscape.
• Ensure maintenance funding is established prior to viewpoint development.

2.5 Coordinate locations of rest areas with recreational access points.
Coordinate locations of rest areas with regional trail systems (see illus. 7).

2.6 Provide community rest areas within designated towns.
Community rest areas have the dual benefit of serving as town parks and engaging travelers with local businesses.
• Develop community rest areas through cooperative agreements with local municipalities.
• Provide information about local and regional activities, businesses, and points of interest.
• Encourage community development of community rest areas and visitor services.

Walking trails and interpretive elements promote physical activity to energize weary travelers.

A community rest area might include a series of shade structures that entice visitors to stop and take advantage of the town’s services.

Historic elements and cultural influences can be reflected through elegant architectural features. Rest areas provide great opportunities to engage travelers with Nevada’s rich Native American and settlement history.
3.0 TRANSPORTATION ART

3.1 Engage artists early in the design and development stages of highway projects to ensure an integrated and comprehensive art program. Transportation art should not be an afterthought or decoration.

- Incorporate art as part of the design process and as a means of interpreting the corridor’s theme.
- Integrate art as part of functional aspects of highway facilities.
- Artists should coordinate with community members, landscape architects, and architects throughout the design process.
- Scale artwork based on travel speed, slope, and sight distance.

3.2 Create meaningful, regionally appropriate art.

Art enhances the travel experience and can create the first impression of a place. Transportation art should clearly express a meaning and purpose that relates to the surrounding locale, the unique culture and environment of the area, and the travel experience. Patterns and objects used thoughtfully, and even abstractly, can and should evoke a response that connects travelers to the uniqueness of the site and/or the surrounding landscape.

- Patterns imprinted on a highway structure should be designed as an artistic composition of objects, imprints, or patterns.
- Patterns should offer a level of complexity and interest appropriate to the place and highway travel speed.
- Avoid the use of repetitive, overused symbols and patterns.
- Consider artwork that utilizes light and shadow to create pattern and images.

3.3 Ensure artwork expresses excellent craftsmanship, quality, truthfulness, and originality.

Transportation art should complement the overall design of highway facilities. Carefully consider materials and forms to ensure the long-term suitability of the project.

- Select a composition of materials that is durable for the anticipated life span of the project.
- Avoid the use of ready-made, randomly placed, stand-alone objects, or imprints that portray little meaning.
- Use evocative artistic expressions that engage observers and complement highway structures and the surrounding landscape.
- Elements of highway art should not be obvious or forged. Rather, transportation art should convey an excellence of craftsmanship, quality, truthfulness, and originality.

3.4 Consider each art piece as part of a larger whole.

Highway art can be carefully crafted, giving the simplest of all elements a very powerful effect. When planning transportation art, the entire design segment and overall corridor should be considered.

- Consider views and vistas to the surrounding landscape.
- Art should be appropriately scaled to the surrounding landscape and highway speed.
- Avoid distracting art pieces. Consider glance recognition and the intensity of surrounding features in order to prevent safety issues.
3.5 Ensure transportation art supports the landscape design segment themes.
Transportation art is not a typical project, and the choice of appropriate subject matter and media is essential to obtaining the desired expression for each landscape design segment theme. Choose art subjects that support the landscape design segments’ themes.

3.6 Engage local agencies and organizations in the planning process.
Relationships with local agencies as well as the Nevada Arts Council should be developed to assist in the review and implementation of proposed transportation art projects.

- Consider transportation art at the onset of project development.
- For community matching fund and transportation art programs, refer to the guidelines outlined in the current Landscape and Aesthetics Community Match Procedures Manual: Guidelines, Applications, Instructions and Forms for the Community Matching Funds and Transportation Art Program, NDOT.

(a) Murals should thoughtfully celebrate significant historic and cultural events.
(b) Artwork that utilizes environmental components, such as wind, create unique opportunities for interpretation.
(c) Art incorporated into bridges and structures subtly invokes special meaning.
(d) Sculptures set in the landscape should evoke meaning and relate to the overall site context.
(e) Shadow patterns illuminate simple wall features and add interest to night views.
4.0 SIGNAGE
4.1 Provide a standard, cohesive system of service signage.
Utilize the Tourist Oriented Directional Sign (TODS) program as a way to provide signage for services located in communities just off the highway. NDOT manages the TODS program, and it is preferred over numerous private individual business signs and billboards. Lamar Advertising, at www.lamar.com, currently operates the program in Nevada. Work with local community agencies and businesses to develop and locate TODS. Refer to the Outdoor Advertising discussion (pages 1.13-1.14) for more information about billboards along the corridor.

• Utilize General Service signs, such as knife and fork for restaurants, along rural highways. Rural towns located just off US 93, such as Panaca and Pioche, provide services that are not frequently found along the corridor. Therefore, use of General Service signage is supported by the MUTCD.

• Reinforce the message of General Service and TODS signage by incorporating business logos, or business placards, on signage where possible. Use of the Logos program in conjunction with TODS has proven to be more successful than TODS alone.

4.2 Implement a Statewide Place Name Sign Program.
A comprehensive place recognition signage program should be implemented through partnership initiatives with local communities and agencies. The program and sign types are described on pages 1.11-1.12.

• Use a consistent color and material for signs.
• Use signs that are high quality and as durable as other standard highway signs.
• Use the MUTCD for signage requirements within the right-of-way.
• Avoid placing too many signs along the highway. Do not provide signage for sensitive environmental or cultural resources.

4.3 Utilize a family of iconic symbols to represent features.
Encourage the recognition of cultural and environmental features through iconic imagery.

• Signage should depict the general physical shape of the point of interest.
• Establish icons to represent general categories of interest within the Nevada landscape. Illustration 1 shows examples of symbols to represent the categories. Unique icons may be created for areas of national significance. Additional symbols should be developed to represent Nevada landmarks/historic points, emigrant trails, scenic byways, and Native American features. Engage Nevada tribes to develop a universal symbol that is both appropriate and simple to represent the state’s Native American resources.

• Features and points of interest to be recognized in this program will be coordinated with NDOT, Nevada Division of State Parks, Native American tribes, and the State Historic Preservation Office.

• Name and labels included shall be consistent with Nevada State Library and Archives naming conventions. Consider travel speed when descriptions are used. Lettering less than 6 inches in height can be difficult to read at high speeds.

• Final icon and name approval will rest with NDOT.

EXAMPLES CATEGORIES OF ICONIC SYMBOLS FOR PLACE NAME SIGNS

(1) Universal symbols represent Nevada’s cultural and environmental features as part of the Place Name Sign Program. Additional categories such as Nevada landmarks/historic points and Native American features should be developed to provide straightforward icons that symbolize the resources.

(2) General Service signage includes symbols for typical services found along the highway. In rural towns located just off the main highway, use of such signage is important for businesses to attract patrons.

(3) TODS establishes a program of signage for businesses whose visitors do not typically reside within the immediate area. The signage is intended for cultural, recreational, or historic points of interest.
4.4 Implement an audio interpretation program.
Develop and coordinate an audio/multimedia interpretive program with the Statewide Place Name Sign Program. This program could be implemented via broadcast radio, CD or DVD programs, wireless Internet hotspots, satellite transmission, or other media that allow travelers to access additional information from their car.

- Information may include cultural and natural resources, tourist opportunities, and services along the corridor.
- Link the audio interpretation program to the Statewide Place Name Sign Program, state welcome centers, and local chambers of commerce so that travelers can access specific information.
- Utilize synchronous technologies that allow users to control how and when they access this additional information.
- Coordinate with programs, organizations, agencies, and municipalities along the corridor to explore ways to expand the audio interpretation program.

4.5 Coordinate the Statewide Place Name Sign Program with the national Watchable Wildlife program and with other community-driven programs.
Work with other agencies, civic groups, and municipalities to provide interpretive signage where applicable.

4.6 Highlight scenic byway entrances with signage that is coordinated with the Statewide Place Name Sign Program.
Reflect the place and character of the area with iconographic images incorporated into scenic byway signs (see illus. 5).

4.7 Incorporate the anti-littering campaign.
Anti-littering messages located at highway stops that include food and beverage services will provide an immediate reminder to travelers.

- Work with local vendors to place the anti-littering messages on disposable cups, plates, and other items likely to be tossed out the vehicle window.
- Along non-interstate roadways, utilize pole signage for anti-littering messages.
- Develop signage that engages Nevada residents and encourages active participation in maintaining clean and beautiful highways.

4.8 Utilize low-profile interpretive signage at rest areas and pull-offs.

- Incorporate and place signage so that it does not block views of scenic resources. Consider signage with a low-profile base and a reading surface placed at a 45 degree angle.
- Provide durable, long-lasting signage. Interpretive signage should be designed to withstand a large range of climatic elements. Consider using Vitrake porcelain enamel or equivalent. Graphics should be produced on a durable medium that produces high-quality graphics.

(4) Simple kiosk signage can provide additional information on the area’s resources and opportunities. Coordination with the region’s agencies, organizations, and community efforts allows the corridor to better tell the stories of the area in a consistent manner.

(5) Scenic byways should include a specific pictorial graphic that is related to the place.

(6) Low-profile signage can be incorporated into rest areas without blocking views. Providing travel information and interpretive information at rest areas allows travelers to enrich their experience without cluttering highway with signage.

(7) Place-specific interpretive panels highlight important historical, cultural, and environmental information. Panels can be sited along walking paths, allowing travelers to stretch their legs as they become engaged with the state’s history.
5.0 Color Palette Application

5.1 Use a uniform, consistent color palette for all highway structures.

Standard NDOT practice should utilize a uniform and consistent color palette that complements the surrounding landscape for all new and existing highway structures. Base and accent stain or paint colors for all highway structures along the US 93, East US 6, and East US 50 Corridor have been selected. To ensure accurate color reference, the colors are matched to the Dunn Edwards system (see illus. 1).

- Each highway structure should use a selection of one base color and up to two accent colors, chosen from the palette. No more than two different accent colors should be used per site.
- Ensure roadway structures within a single landscape design segment use the same base color and accent color(s).
- When existing structures require refinishing, they should be stained or repainted to be consistent with the selected color palette.
- Specific town logos and transportation art are exempt (refer to Transportation Art guideline, pages 3.17-3.18).

5.2 Ensure accent colors highlight structural aspects.

Accent colors should highlight structural aspects and/or details of highway structures, such as the beam of a bridge or a bridge railing.

- Ensure that accent color application logically responds to and reinforces structural features or change in materials.

5.3 Blend new rock cuts and/or soil with the surrounding landscape.

Match new rock and soil treatments with existing rock and soil color to blend disturbed areas with the surrounding environment.

- Use this process for any corridor project that includes rock cuts.
- Use the University of Nevada’s Mapping Ecosystems (Tueller, et al., 2002) as a guide for soil colors. Soil colors are referenced to the Munsell color guide.
- Blend newly excavated soil and rock with existing weathered rock.
- Where possible, the application of color should occur in a central location and away from sensitive receiving waters.

SECTION THREE: Highway Facilities Guidelines

The landscape inspires the color palette for each landscape design segment. Base colors correspond to the landscape design segment’s environmental features.

The proposed color palette refers to the Dunn Edwards paint system, for reference purposes only.

Any two accent colors may be chosen from the following selections. All landscape design segments use this accent color palette.

<table>
<thead>
<tr>
<th>BASE COLORS</th>
<th>ACCENT COLORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hidden Gems</td>
<td>#6243</td>
</tr>
<tr>
<td>Silver State Passage</td>
<td>#5537</td>
</tr>
<tr>
<td>Pony Express Passage</td>
<td>#5880</td>
</tr>
<tr>
<td>Cowboy Range</td>
<td>#5822</td>
</tr>
<tr>
<td></td>
<td>#5747</td>
</tr>
<tr>
<td></td>
<td>#5697</td>
</tr>
<tr>
<td></td>
<td>#5097</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(1) The proposed color palette refers to the Dunn Edwards paint system, for reference purposes only.

(2) The landscape inspires the color palette for each landscape design segment. Base colors correspond to the landscape design segment’s environmental features.

(3) The color palette was field tested in morning, afternoon, and evening conditions.

(4) The practice of staining rock cuts helps to blend exposed rock surfaces with the color of the surrounding ground plane.
6.0 ROADWAY DESIGN

6.1 Reduce the appearance of a wide right-of-way through communities.

Every effort should be made to keep the roadway as narrow as possible. Wide roads allow for faster vehicular travel speeds and therefore negatively impact the safety of pedestrians.

- Consider reducing the number of lanes.
  Four-lane highways may be retrofitted to two travel lanes or two travel lanes and a turn lane when other street systems are improved and overall traffic patterns move effectively.
- The appearance of a wide roadway may be reduced through the use of vertical elements, curb extensions, and a narrow shy distance (the side clearance from fog line to edge of structure). Utilize a shy distance of 1 to 2 feet from curbs and medians in downtown areas to reduce speed.
- Provide passing lanes outside of rural communities, rather than only within town, to reduce the number of lanes within town and slow travel speeds. Highways that only provide passing lanes within communities encourage higher travel speeds through town because it is the only opportunity to pass slower traffic.

6.2 Consider the use of rumble strips in transition zones to signal a speed reduction.

Changes in paving material and roughened paving provide a visual and audible cue for drivers to slow down.
- Rumble strips may be combined with enhanced roadside treatments such as plantings and gateways to reinforce the entry into pedestrian areas.

6.3 Provide curbs no greater than 6 inches in height in community zones.

Curbs define the edge of the highway and delineate the pedestrian zones within communities. Curbs greater than 6 inches in height may restrict pedestrian movement and create difficult transitions at pedestrian crossings.

6.4 Utilize on-street parking in community interface zones to buffer the sidewalk from traffic.

On-street parking accommodates access to local businesses and slows traffic (see illus. 1-2).
- Use curb extensions to enhance the visibility of pedestrians crossing the street.
- Angled parking should only be used in areas of very low travel speeds.
- Provide a bike lane between parking and travel lanes to create a buffer.
- When bike lanes are not incorporated, consider using a wider outside travel lane or parking area to minimize conflicts between bikes and opening doors.
- For all forms of on-street parking, maintain adequate visibility and buffer zones between travel lanes and parking to prevent conflicts with through traffic.

6.5 Integrate art, softscape, and hardscape as part of a simple landscape treatment for roundabouts.

- Landscape treatments within a roundabout should express the segment theme and community vision.
- Sensitively site transportation art and plantings.
- Treatments should complement and coordinate with the surrounding environment and landscape features and be part of an integrated design approach (see illus. 4).
7.0 MEDIANS

7.1 Revegetate medians along rural highways to integrate the highway with the landscape.
Utilize native plant material to revegetate medians along rural highways to create a more natural and consistent visual experience (see illus. 1).

7.2 Utilize median plantings and treatments to enhance a community’s image.
Landscaped medians beautify wide streets by breaking up large expanses of pavement and making the street feel narrower. Medians can include a combination of rock mulch, signage, plantings, and boulders that help to identify the character of the place (see illus. 2-3).
- Avoid using asphalt paving in medians. Stamped, colored concrete or pavers should be used in narrow medians (those less than 5 feet wide). Paving score patterns and texture should be simple and coordinate with surrounding architecture and pedestrian areas. Colored concrete should use the segment’s base color (see Color Palette guideline page 3.21) or coordinate with adjacent pedestrian walkways.
- The placement of plantings and treatments should direct pedestrians and facilitate the vehicle operator’s view. Selected plant species should also be suitable for the harsh roadway environment.
- Planted medians are generally the width of the center turn lane but can be as narrow as 5 feet. Regardless of width, medians should be designed to allow for safe maintenance as well as for anticipated plant growth.
- Design medians to allow for adequate percolation of water. This practice prevents pavement failure caused by infiltration of irrigation water into the road base/sub-base.

7.3 Utilize medians to reduce potential vehicle-pedestrian conflicts and to enhance pedestrian walkability.
Medians function to improve pedestrian visibility by minimizing turning conflicts and directing and separating traffic. They provide an effective way of reducing conflicts between pedestrians and vehicles because they allow pedestrians to incrementally cross the traffic lanes.
- Medians may be constructed with curbs and combined with pedestrian refuge islands.
- Future development, access management, usage patterns, and changing transportation demands should be examined when determining if raised medians are the appropriate solution for the roadway.

7.4 Direct stormwater to planted medians and landscaped planting strips where feasible.
Utilize drainage swales within medians to handle excess stormwater runoff (see illus. 4-5).
- Carefully design curbs, gutters, catch basins, and drain grates for ease of maintenance.
- Ensure pedestrian movement is not unduly impacted by ponding water.
- In areas where runoff may contain high levels of salt, select salt-tolerant plants.

(1) Native revegetation harmonizes the highway with the surrounding landscape.

(2) Accentuated softscape median treatments combine tree forms with shrub material to give vertical definition to the highway.

(3) Native vegetation and rock-lined medians, alone or in combination with drainage swales, allow for runoff of excess stormwater.

(4) Medians provide the opportunity for planting and design details that help define distinct areas within a community. Breaks in the median provide a safe haven, allowing pedestrians to cross lanes incrementally. These refuge islands provide pedestrians with an additional level of security.

(5) Landscaped medians beautify streets and create context-sensitive solutions.
3.0 PEDESTRIAN CROSSINGS

8.1 Improve pedestrian safety at crossings.
Motorists can see striped crosswalks from a greater distance (see illus. 1).
- Utilize a zebra striping pattern for painted crosswalks.
- Crosswalk striping should correspond to the width and location of sidewalks.

8.2 Use alternative paving type, coloring, or other means to visually highlight pavement in pedestrian crossings.
Crosswalks may be marked with distinctive paving material, colors, and texture.
- Concrete is preferred over brick for its durability. Concrete may be stained, embossed with patterns, or constructed with unit pavers to give crossings a distinctive feel in particular areas.
- Textures and materials should provide a visual contrast with the adjacent road surface, yet they must also provide a smooth travel surface and good traction.

8.3 Reduce curb-to-curb distances at crosswalks.
Incorporate curb extensions as part of the highway system when on-street parking is provided. Provide refuge islands to break up long crosswalks.
Curb extensions reduce the crossing distance for pedestrians, increase visibility for motorists and pedestrians, prevent illegal parking at corners, and provide additional room for people waiting to cross the street.
- Curb extensions should reach into the street no further than the edge of the travel or bike lane.

8.4 Alert motorists to pedestrian crossings through the use of signage and flashers.
Pedestrian signals work in conjunction with traffic signals to assign right-of-way at intersections.
- Active signals are preferred over passive signals.
- Pedestrian signals are appropriate at all intersections with traffic signals where crossing is permitted.

8.5 Balance the need for adequate vehicular turning radii with pedestrian needs.
A tighter turn (or shorter radius) forces drivers to slow down, allowing them to see pedestrians and make quick stops. Additionally, shorter turning radii create more sidewalk space for pedestrian amenities.
- Reduce corner radii where feasible to shorten and align pedestrian crossings while reducing vehicle turning speed.
- Reduce the use of slip lanes (channelization) where possible to minimize vehicle-pedestrian conflicts.

They can be used at mid-block crossings and are beneficial when combined with pedestrian refuges.
- Refuge islands are located at crosswalks in the middle of streets to provide a safe waiting area for pedestrians.
- The waiting area in refuge islands should be in line with the crosswalk and as wide as the crosswalk to allow persons with disabilities to cross without obstruction.
- Refuge islands may include additional pedestrian safety features such as bollards and flashing signage to enhance their visibility.

8.6 Reduce curb-to-curb distances at crosswalks.
Incorporate curb extensions as part of the highway system when on-street parking is provided. Provide refuge islands to break up long crosswalks.
Curb extensions reduce the crossing distance for pedestrians, increase visibility for motorists and pedestrians, prevent illegal parking at corners, and provide additional room for people waiting to cross the street.
- Curb extensions should reach into the street no further than the edge of the travel or bike lane.
9.0 NON-MOTORIZED TRANSPORTATION SYSTEMS

9.1 Consider aesthetics as part of bicycle facility design.

Users of non-motorized transportation (NMT) systems are more likely to use facilities that include aesthetic treatments and that link to critical destinations.

- Minimize underpass length to allow for natural lighting (see illus. 1).
- Utilize transportation art consistent with the segment theme.

9.2 Engage agencies and organizations in the planning and design process.

Proper planning ensures that NMT facilities are convenient while minimizing adverse safety and environmental impacts.

- Engage federal, state, and local agencies as well as local user groups and organizations in the planning, design, and implementation of NMT facilities.
- Ensure the maintenance of connections to regional trails and pedestrian systems.
- Consult the statewide bicycle and pedestrian plans prepared by NDOT.
- Provide signage to trailheads and regional trails to encourage NMT use.

9.3 Integrate NMT into the right-of-way.

Where topography, site conditions, and land use warrant, separate bicycle paths may be built in the right-of-way.

- Ensure that direct connections are made to existing and future trail systems and shared-use pathways (see illus. 3).

9.4 Incorporate designated bike lanes within the roadway to link regional bike trail systems.

Within developed community areas, bike lanes provide access to regional trail systems and local facilities. Along US 50, bike lanes should be incorporated to safely accommodate the heavy use.

- Stripe and sign designated bike lanes to promote driver awareness and enhance user comfort (see illus. 2).
- Enhanced paving or pavement markings may be used in downtown areas.
- Along rural highways, ensure adequate shoulder width is provided. Rumble strips create an unrideable surface for cyclists. Shoulder design should accommodate both rumble strip and bike lane requirements.

9.5 Consider underpass or specifically designed at-grade crossing for NMT crossings along rural highways.

Outside of developed community areas, shared-use paths may need to cross the highway to provide a direct connection to a recreation destination. In such circumstances, safety is of utmost importance. Design considerations include ADT, type of traffic, speed, sight distance, grade, type of roadway, and number of lanes to be crossed.

- An underpass provides the recommended method for crossing the highway in rural areas. Structures should be wide enough to be visually inviting and allow for natural lighting.
- At-grade crossings should be properly signed and striped. Advance warning measures should be incorporated to notify motorists of the need to slow down and look for crossing cyclists.
10.0 BRIDGES

10.1 Accentuate locations where bridges cross major water bodies, drainage courses, or canyons.

Utilize landscape treatments in order to highlight crossings and connect motorists to the landscape (see illus. 3).

- Consider the integration of a grade-separated pedestrian crossing into structure when possible.
- Coordinate with local jurisdictions to determine the need for these features.

10.2 Use a consistent bridge design.

Bridges are prominent features in the landscape and can significantly affect the visual quality of the environment. NDOT standard bridge design incorporates a concrete and steel I-girder, or concrete and steel box girder bridge structure of similar proportion, finish, and barrier rail design. The major structural elements (piers, girders, and abutments) also serve as the major architectural features.

In the event of bridge construction in this corridor, refer to the Central US 95, West US 6, and West US 50 Corridor Plan for additional bridge design guidelines.

- Aesthetic qualities must consider proportion, rhythm, balance, and unity. Refer to the Aesthetic Guidelines for Bridge Design (Minnesota Department of Transportation, 1995) for a complete discussion.
- Bridge form should be simple and uncomplicated (see illus. 2).

- Large amounts of slope paving should be avoided. Grade to a slope of 3H:1V to allow for slope revegetation. Use landscape or rock mulch to stabilize embankments.
- Street names should be embossed on the bridge span, providing place identification for the motorist.
- Where special conditions arise and larger or different bridge spans or types are required, ensure landscape and aesthetic aspects are incorporated into the standard design type.
- Consider fill embankments and approach rails in concert with the abutment, bridge barrier rail, and superstructure. Materials, height, and attachment details should be carefully considered when connecting guardrails to the bridge to avoid joining incompatible materials and creating abrupt vertical changes at connection points.
- Use simple substructure and support features with strong proportional relationships in all standard bridge design.
- Consider open rail design of steel rail or concrete barrier and steel, both to create a more refined bridge with a lighter appearing span, and to maintain scenic views and vistas to the surrounding landscape.

(1) Avoid components and proportions lacking visual appeal.

(2) Preferred landscape and aesthetic treatments improve the appearance of the bridge when applying design guidelines from this section.

(3) Bridge forms should be simple and abutments should visually support the structure.

(4) Bridges should be uncomplicated. Open rails create a more refined appearance and maintain views.
11.0 NOISE REDUCTION AND WALLS

11.1 Minimize the need for noise walls throughout the corridor.

At the planning level, encourage land uses that are compatible with highway noise, such as commercial areas. Noise-sensitive facilities, such as schools and churches, require sound abatement strategies.

- Coordination at the planning stages is critical to avoid conflicts.

11.2 Consider grading to minimize wall height.

Where possible, use an embankment slope with landscape planting to buffer sound (see illus. 1), or use a combination of earth forms and noise walls to achieve structural integrity and buffer sound while limiting actual wall height.

- This guideline does not change or supersede federal noise wall requirements, which specify the location of noise walls according to adjacent land uses and a sound level threshold approaching 67 decibels.
- Noise walls should not be greater than 14 feet in height without a step in the wall plane (see illus. 7).
- Walls used only for visual screening may not be taller than 10 feet.
- Use natural barriers and earth forms when possible.

11.3 Provide landscape planting and setback space between the vehicle recovery zone and the noise wall.

When necessary, work with developers to ensure adequate right-of-way is provided for sound abatement.

- Consider grading to minimize wall height. Landscape plantings in front of walls will soften the appearance of large wall faces (see illus. 1-2).
- Ensure planting and maintenance is provided.

11.4 Select a simple design palette.

Choose a simple design palette of material, pattern, color, and texture that coordinates with the corridor’s landscape design segment theme for retaining walls and noise walls. In the event of noise wall construction in this corridor, refer to the Central US 95, West US 6, and West US 50 Corridor Plan for additional design guidelines.

- Maintain consistent use of the selected material, pattern, color, and texture. The required prototypical surface pattern is shown in illustration 3.
- Avoid using multiple materials, such as steel and concrete or CMU, on continuous spans of wall.
- Post and panel systems are not encouraged for noise wall construction and should be used only for temporary applications. If a post and panel system is used it should be constructed with a single material, preferably pre-cast concrete for all components (see illus. 5).
- Use visual design themes and/or pictorial motifs comprised of simple patterns and surface texture, and carefully design the motif’s composition (height and position) on the wall.
- Noise walls over 12 feet in height require special graphic or pattern treatment (refer to Transportation Art guideline, page 3.17, for more information about appropriate subject matter).
12.0 CONCRETE BARRIERS AND GUARD RAILS

12.1 Stain concrete barriers to blend the roadway into the surrounding environment.

- Concrete barriers should be stained to match the segment’s base color as shown in illustration 1 (refer to Color Palette guideline, page 3.21, for more information on color selection).

12.2 Avoid bright and shiny guard rails.

- Use acid-washed steel guardrails where appropriate (see illus. 2).

13.0 LIGHTING

13.1 Avoid overlighting.

- Excessive high mast lighting can create light pollution along a corridor and impact views to the surrounding landscape.

- Study current lighting level standards to determine levels needed for safety only. Adjust current standards, if necessary, and apply the minimum height, illumination, and number of light masts required.

- Focus attention on illumination versus luminance (i.e. brightness of pavement versus brightness of light).

- Along all sections of the corridor, use lighting fixtures that minimize light pollution and provide even light dispersion.

- Eliminate lighting where possible.

- Use cobra head or shoebox-type pole and fixture instead of high mast lighting where appropriate.

13.2 Use a consistent lighting fixture and pole.

- In central commercial districts and town centers, use light fixtures and lamps that are consistent with surrounding architectural styles.

- Use a durable, powder-coated finish for light poles, matching the color to other structures and the surrounding landscape. Typically use colors that blend with the background and do not visually overwhelm.

- Use poles and fixtures with consistent maintenance requirements and procedures for lighting types used within the same maintenance district.

- Select a sleek and simple pole configuration (see illus. 4).

- Allow for context-sensitive design in fixtures and poles where appropriate, particularly in areas such as historic sites (see illus. 1-2).

- Consider color properties when selecting lamps. Metal halide lamps are preferred in pedestrian areas. Mercury vapor lamps produce favorable lighting for enhanced landscape treatments but should be used sparingly unless energy efficient sources are used. Energy efficient high-pressure sodium lamps are commonly used for large portions of the roadway.

13.3 Lighting height and brightness should be consistent with pedestrian needs in downtown or heavily pedestrian-oriented areas.

- Fixtures should be more closely spaced than conventional cobra head street lights.

- Lighting height and brightness should provide for clear illumination of walking paths.

- Fixtures should be more closely spaced than conventional cobra head street lights.

- Lighting height and brightness should provide for clear illumination of walking paths.
14.0 FENCING
14.1 Ensure right-of-way fencing blends with the landscape.
Fencing can be used in non-urban areas to delineate the highway right-of-way and control access.

- Use wire fencing that blends with the landscape and conforms to current NRS code.
- Ensure right-of-way fencing is well maintained.
- Minimize the use of fencing within rights-of-way where possible.
- In urban areas use colored steel fencing such as powder-coated, acid-washed, or stained-galvanized fencing that visually recedes into the urban background.

15.0 GRADING AND RETAINING WALLS
15.1 Avoid creating steep slopes.
Smooth, moderately inclined slopes will blend more readily with the surrounding landscape, are safer to maintain, and are less vulnerable to erosion.

- Flattened fill slopes can assist in decreasing erosion. Flattened slopes also reduce the need for guardrails and provide better accident recovery in the roadside clear zone.
- Acquire adequate right-of-way to provide enough land to construct the desired slope and grade.
- In some locations, steeper slopes may be unavoidable to protect important natural or cultural resources adjacent to the highway.

15.2 Create smooth landform transitions and revegetate slopes.
- Use finish-grading techniques, such as slope rounding at the top and bottom of cuts, to create smooth landform transitions that blend with the natural terrain (see illus. 1).

15.3 Create artful earthwork.
Create landforms that respond to the uniqueness of the site, the surrounding landscape, and the roadway travel experience.

- Contour grade to create effective planting embankments, shadow patterns, and artful earthwork.
- Where feasible, grade slopes to provide for water harvesting (reclaimed surface runoff).

15.4 Utilize retaining walls that reflect surrounding landform and soil colors to minimize large slope cuts.
Staggering, terracing, and progressive offset of retaining walls can stabilize slopes and reduce erosion while blending more smoothly into surrounding landforms than terraced high wall cuts (see illus. 2-3).

- Select retaining structures or slope stabilization methods that blend with the surrounding landscape and encourage revegetation.
- Provide landscape plantings in front of walls to soften their appearance.
- Provide a minimum of 8 feet between terraces to provide for landscape planting.
• Carefully design gabion walls. Color should be dark and muted to match soil and surrounding landscape. Wire mesh should match stone color. Plant terraces with native vegetation to break up visual impacts.

• Retaining walls should be consistent within a segment and utilize a simple design palette and anchor to the earth (see illus. 5-6).

• Utilize a simple design palette. Avoid using multiple materials such as steel, concrete, keystone block, or CMU on walls. Exterior finish for retaining walls should have the same visual appearance independent of the type of wall.

• For MSE walls, rectangular shaped panels with vertical joints and a consistent pattern are preferred. Patterns should extend across the entire surface of all panels (see illus. 7).

16.0 ROCK CUT AND EXCAVATION

16.1 Analyze rock geology.

Provide a multidisciplinary team of civil engineers, geotechnical engineers, and landscape architects to ensure that the inherent character of a rock’s natural bedding planes, fractures, joints, and overall stability is carefully analyzed and informs the design of all rock cuts.

• Conduct careful analysis of rock geology, site, and costs. Design rock cuts to avoid the need for rock fall protection fencing.

16.2 Design rock cuts to be natural in form, texture, and color in relationship to the surrounding landforms.

• Blend rock cuts to match natural rock forms and use naturalized bedding planes to avoid creating an unnatural rock face (see illus. 2).

• Ensure all designed landforms are natural in appearance and blend with the topography and geology of the surrounding landscape (see illus. 5).

• Match new rock and soil excavations with existing rock and soil using rock staining, soil-coloring treatments, and/or accelerated weathering techniques.

• Where site conditions and cost analysis permit, acquire adequate right-of-way to provide enough land to design and build the desired rock cut slope and grade.
17.0 DRAINAGE
17.1 Use naturalized channel design and infiltration methods.
Avoid paving drainage ditches or check dams with asphalt or concrete. Where possible, secure check dams with rock and use naturalized channel design and infiltration methods to enhance, both functionally and visually, highway drainage systems (see illus. 1).

- In unique situations, utilize geotextiles, impervious mats, or a stone lining to maintain the appearance of a natural channel.
- Excessive flow velocities and erosion potential may demand paved drainage surfaces. Consider the use of open cell concrete block with native grass or rock mulch. Match colors to the surrounding soil.
- Vary the size of rock treatments. Meander naturalized treatments so that they feather into the landscape (see illus. 3).

17.2 Revegetate drainage infrastructure.
Drainage detention and infiltration areas should be shaped with natural undulating edges and bottoms rather than angular embankment slopes (see illus. 2).
- Upper slopes of drainage detention basins should be revegetated or covered with appropriate ground treatment (refer to Ground Treatment Softscape Treatment guideline and Native Revegetation Softscape Treatment guideline, page 3.34).

17.3 Naturalize culvert ends.
- Use rock to naturalize inlets and outlets.
- Culverts should not be exposed except at the end of headwalls and endwalls or with mitered end sections.
- When it is essential to have portions exposed, they should be stained to blend with the surroundings.
- Consider whether trails or wildlife passages can be coordinated with culverts.

18.0 EROSION CONTROL
18.1 Stabilize soils to ensure successful revegetation and to control erosion. Use native materials for stabilization and revegetation to blend with surrounding landscape.
- Use materials such as heavily textured soil and/or gravel mulches to slow water runoff and provide dust control.
- Where water concentrates, riprap material and/or geotextile reinforcement may be used to avoid erosion.
- Permanent revegetation efforts can be improved by providing in situ topsoil, native vegetation fragments, and rocks and by enhancing soil salvage techniques and seed mixes.
- Provide uncompacted topsoil surfaces (approximately 85% compaction) prior to seeding.

18.2 Refer to temporary and permanent erosion control best management practices as prepared and documented by NDOT.

- Design of detention basin uses naturalized, curvilinear shapes instead of “V” channels.
- Rock-lined drainage channels are an attractive alternative to concrete or unlined ditches.
- Feather rock treatments into surrounding landscape so they appear more natural.
- Native rock and vegetation add aesthetic value while stabilizing slopes.
- Application of soil stabilizer aids in dust and erosion control.
19.1 Maintain soil moisture and improve water retention by preserving topsoil, employing effective site surfacing and grading techniques, track walking, applying mulches and tackifiers, sensitively siting features, and using permeable paving or cisterns. The collection of runoff for use in landscape design is especially important in arid climates. Increase the availability of natural water by directing runoff and precipitation into areas such as planting beds prior to moving it off site into drainage structures. Water harvesting methods also reduce the amount of runoff, thereby reducing non-point source pollution, erosion, and flooding while recharging the groundwater. Soil moisture and water retention can be maintained and enhanced in several ways, including:

- Topsoil Preservation:
  Stripping and salvaging the existing topsoil, vegetation seeds, and plant fragments for later reapplication should occur at every site requiring disturbance. This live topsoil contains organisms, seeds, and plant fragments that increase the potential success of revegetation. Incorporation of preserved topsoil increases both the quantity of organic matter and permeability of the soil.

- Site Surfacing:
  Rock surface composition should simulate the original or adjacent surface cover or be integrated as part of the overall design. Create artful water harvesting features that contribute to the aesthetic quality as well as the functionality of landscape treatments. Placing rocks and shaping landforms to create depressions increases water retention and provides moisture to the plants (see illus. 1). Rocks create impervious cover, resulting in water harvesting for the remaining soil and seeds. Rocks also create a rough, uneven surface that slows water runoff, allowing water to collect and increasing infiltration. Rock mulches retain moisture and protect plants by reducing evaporation, providing wind protection, and moderating the soil temperature so that it is cool in the summer and warm in the winter, effectively lengthening the growing period.

- Site Grading:
  Grade surfaces to slow water flow, encouraging absorption. Instead of a continuously angled slope, position breaks or depressed areas around planted areas. Contour slopes so that water slows and infiltrates around vegetation. Prevent erosion by minimizing slope angle and directing water flow.

- Track Walking:
  Where possible, track walk all slope surfaces to stabilize material and minimize potential erosion. Track walking should be performed perpendicular to the contour.

- Mulches and Tackifiers:
  Use mulch and tackifiers to hold seed and topsoil cover and assist with moisture retention during germination. Mulches, such as bark or pinned straw, can be used to stabilize seeded areas and assist in moisture retention during plant germination and growth.

- Siting of Features and Facilities:
  Thoughtful consideration should be given to the siting of features and facilities. Rest areas and other facilities where vegetation is desired should be located where natural surrounding upland topography can provide increased water to the planted areas. Planted areas should be sited where roadway runoff can be directed to provide water to these areas before it enters structured drainage systems. This method enhances plant growth and supplements the irrigation needed for high water use plants, thereby reducing the cost of irrigation. Features used to direct or store water can be part of the aesthetics of the design.

- Permeable Pavements:
  Pavements such as flagstone or permeable asphalt should be used where appropriate to aid in the infiltration of precipitation in urban areas.

- Water Storage in Cisterns or Tanks:
  In some cases it may be desirable to store water in a cistern for later use. Storage provides the most control and flexibility in the use of harvested water. Cisterns collect water throughout the year, storing it until it is needed during the height of summer. Consider the need for mosquito abatement during design. Water should not be stored in open systems for long periods of time. Cisterns can be sculptural and incorporated into an aesthetic design, or they can be large but relatively flat and located under parking areas.

19.2 Use natural and/or artificial products to collect, store, and release water for plant use.

Use products such as:

- Pumice wicks
- Polymer products
- Diatomaceous earth
- Wattles
20.0 IRIGATION
20.1 Select efficient and effective irrigation systems.
Focus on minimizing irrigation needs. Where required, select efficient and easily maintained systems with a central controller.
- Consider the use of reclaimed water, including fully treated effluent and harvested water, as a supplement to irrigation.
- If a non-domestic water source is used, include a filter system to prevent clogging of emitters.
- Consider threaded emitters, as opposed to punch-in types, to minimize vandalism.

20.2 Provide appropriate irrigation for each softscape type.
The early stage of revegetation growth demands the most water use and is most critical to the establishment of young plants in arid climates. As revegetation becomes more established and mature, the demand for water will lessen to the point of complete removal.
- Temporary watering is required for containerized native plants for a period of approximately one to two years, depending on the success rate of revegetation.
- Permanent irrigation to individual plants is required for enhanced native, regionally adapted, and regional ornamental softscape types.
- When a water source is not available, consider water harvesting methods or the use of vertical elements and structures.

20.3 Manage the high concentration of salts.
Nevada’s desert soils often concentrate salts at the outer edge of the wetted soil volume, including near the soil surface, particularly in drip irrigation situations.
- Salt management techniques include flushing the soil periodically with heavy watering and/or planting salt-tolerant materials.

21.0 SOFTSCAPE TYPES AND TREATMENTS
GENERAL GUIDELINES
21.1 Consider aesthetics and maintenance of selected softscape treatment.
In all non-paved areas, select ground treatments that meet both aesthetic and maintenance requirements.

21.2 Select appropriate plant sizes.
The minimum plant size used should consider plant survival and the visual effect of the material.
- Consider sunlight, water requirements, and wind exposure when placing plant material.
- Preserve healthy trees and vegetation.
Mature vegetation is an integral part of community identity and an important public resource that enhances the quality of life.
- Preserve areas that have been previously landscaped with ornamental plant material that is in good condition, form, and health.
- Include a tree inventory listing all protected trees and other landscape materials within the right-of-way.
- Include a listing of species, size, and condition of each tree, an index of trees to remove or preserve, and specifications for tree maintenance during construction.
GROUNDS TREATMENT SOFTSCAPE TREATMENT

21.4 Implement appropriate ground treatment and softscape type.

Use recommended softscape and ground treatment types to assist with erosion and dust control, consistent with NDOT specifications.

- Rock mulch, where used, should complement and/or match the surrounding natural environment.
- For rural areas, ground treatment should be derived from natural patterns found in playas, foothills, or ephemeral drainages.
- For landscaped areas in urban settings, use rock mulches to create patterned and textured ground treatments.
- Implement a ground treatment retrofit program to treat areas of bare soil.

21.5 Coordinate ground treatment with surrounding landscape.

Ground treatment should coordinate in size, texture, color, and aggregate mix with the surrounding landscape.

- Mulches composed of variable-sized rock resemble natural patterns of surrounding soils; their use should be considered as a matching technique.

NATIVE REVEGETATION SOFTSCAPE TREATMENT

21.6 Apply native revegetation softscape along open, rural highways.

Re-establish native conditions using the native revegetation softscape treatment type. The native revegetation softscape type is the background planting for the majority of the corridor and should be implemented as indicated in the landscape design segment sections.

- Roadsides should be revegetated after a fire to reduce erosion and snow drift.
- Plant density and spacing should mimic surrounding conditions, incorporating scattered rock mulch to reduce erosion and improve revegetation success.
- Distribute scattered rock mulch in a pattern similar to that found in the surrounding landscape instead of a thick, even spread of rock mulch.

21.7 Carefully select native plant species.

In addition to plant species identified in Mapping Ecosystems (Tueller, et al., 2002), use the provided native plant species list (see Figure 11) for revegetation efforts. Plant palettes are not restrictive. They provide a starting point for plant selection.

- Select an appropriate native plant palette. Sites should be evaluated for elevation, soil conditions, and ecosystem type (for example, riparian, playa, or salt flat).
- Ensure the plant palette selected for the site complements existing desirable vegetation in the surrounding landscape.
- Use native plant species to create plant communities with variations in plant height, size, and width.
- Additional plants not included in the adjacent list can be included upon review and approval.

(1) Mulches that mimic natural features help to blend disturbed areas with their natural surroundings.

(1) Plant material native to eastern Nevada includes species adapted to the Mojave Desert and the Great Basin.
2.1.8 Utilize revegetation best practices.

- Re-establish native conditions using the native plant revegetation scotsape type. Select perennial grasses, forbs, and shrubs that can be established with little or no maintenance over the long term. Incorporate the Native Wildflower Program in revegetation efforts. Select plants that have been evaluated for drought tolerance, salt and alkali tolerance, seedling vigor, fire retardant characteristics, growth habit, suitable soil groups, seedling rates, Pure Live Seed (PLS), availability, and general costs of native seed sources. Ecosystem categories and suitable plant species have been identified for revegetation specifications along Nevada’s highways in Mapping Ecosystems (Tueller et al., 2002). Tueller’s report offers a complete description of suitable plant species and plant communities, soil classification units, and best management practices for vegetation remediation, and should be used as a guide for revegetation.

- Salvage existing native plants and topsoil prior to construction. Species salvage ability depends on size, location, soils, and analysis of plant value, including the potential survival rate. Salvaged plants can be utilized at revegetation sites to improve roadside aesthetics and to provide mature plants that would otherwise take years to establish. Where existing native plants can not be reused, chip salvaged plants and incorporate into the native plants can not be reused, chip salvaged plants and incorporate into the landscape. Reuse of existing materials should be considered as part of site design.

- Salvage existing native plants and topsoil prior to construction. Species salvage ability depends on size, location, soils, and analysis of plant value, including the potential survival rate. Salvaged plants can be utilized at revegetation sites to improve roadside aesthetics and to provide mature plants that would otherwise take years to establish. Where existing native plants can not be reused, chip salvaged plants and incorporate into the landscape. Reuse of existing materials should be considered as part of site design.

- Apply a prescribed soil treatment such as plowing, disking, harrowing, furrowing, hydroseeding, applying mulches (such as straw), and using tackifiers (such as dark colored netting). Soils should be roughened before and after planting to create favorable seed sites, particularly for grass and forb seeds. In silty conditions a soil stabilizer, such as a hydromulch, or a matting material can reduce potential dust problems. On some sites, deep ripping can loosen hardpan and improve seedling establishment. In conditions of steep cuts and slopes greater than 40%, slope disking can loosen hardpan and improve seeding establishment. Plowing, disking, harrowing, furrowing, hydroseeding, applying mulches (such as straw), and using tackifiers (such as dark colored netting). Soils should be roughened before and after planting to create favorable seed sites, particularly for grass and forb seeds. In silty conditions a soil stabilizer, such as a hydromulch, or a matting material can reduce potential dust problems. On some sites, deep ripping can loosen hardpan and improve seedling establishment. In conditions of steep cuts and slopes greater than 40%, slope disking can loosen hardpan and improve seeding establishment.

- Collect native seed. Initiate a process for native seed collection at the start of each project where revegetation is designated. Native seed should be collected from a site in close proximity to the revegetation area. Because unpredictable weather patterns can affect seed availability, plan ahead to ensure usable seed. Native seed can also be purchased through seed companies or BLM nurseries.
• Monitor revegetation during construction to ensure the specified materials and installation methods have been used. Plan and budget for maintenance of revegetation and weed control areas until the desired species are established. In addition, continue to monitor revegetation plantings for up to five years after construction to ensure successful establishment. Include temporary irrigation if needed. Provide training for NDOT staff who oversee revegetation administration. Failures in revegetation can often be attributed to poor installation and maintenance practices.

• Develop a program to control noxious weeds and invasive plant species. In areas requiring revegetation, quickly establishing native species is the most effective method of controlling invasive species. In much of the corridor, however, re-establishing native plant communities may take many years. Use biotic or organic forms of control, such as temporary mulches, to prevent invasive species from establishing. Provide regular and frequent monitoring of new plantings to identify when additional forms of control may be needed.

Figure 11 - Native Revegetation Plant Palette (cont.)

PLANT PALETTE - GREAT BASIN AREAS (CONT.)

**Lower Elevations**

<table>
<thead>
<tr>
<th>Big Sagebrush Sites</th>
<th>Height x Width</th>
<th>Exposure to Sun</th>
<th>Water Requirement</th>
<th>Seasonal Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shrubs:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Artemisia tridentata - Big Sagebrush</td>
<td>1.5' to 6' x 10'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Aromatic</td>
</tr>
<tr>
<td>Atriplex canescens - Fourwing Saltbush</td>
<td>5' x 5'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Narrow gray leaves</td>
</tr>
<tr>
<td>Eriogonum fasciculatum - Green Rabbitbrush</td>
<td>2' x 3'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Yellow flowers</td>
</tr>
<tr>
<td>Ephedra viridis - Green Ephedra</td>
<td>3' x 3'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Kernanthus lanatus - Winterfat</td>
<td>3' x 3'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Yellowish flower clusters</td>
</tr>
<tr>
<td>Prunus andersonii - Desert Peach</td>
<td>6' x 6'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Pinkish flowers</td>
</tr>
<tr>
<td>Purshia tridentata - Antelope Bitterbrush</td>
<td>6' x 6'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Yellowish spring color</td>
</tr>
<tr>
<td>Rhynchospora trichopoda - Skunkbush Sumac</td>
<td>5' x 15'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Yellow to red fall color</td>
</tr>
<tr>
<td><strong>Grasses:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Achnatherum hymenoides - Indian Ricegrass</td>
<td>24' x 24'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Grass</td>
</tr>
<tr>
<td>Achnatherum hymenoides - Desert Needlegrass</td>
<td>24' x 24'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Grass</td>
</tr>
<tr>
<td>Leymus cinvivos - Basin Wildrye</td>
<td>30' x 24'</td>
<td>Full sun</td>
<td>moderate</td>
<td>Grass</td>
</tr>
<tr>
<td>Leymus triloides - Creeping wildrye</td>
<td>24' x 24'</td>
<td>Full sun</td>
<td>moderate</td>
<td>Grass</td>
</tr>
<tr>
<td>Poa annua - Big Bluegrass</td>
<td>36' x 24'</td>
<td>Sun to light shade</td>
<td>moderate</td>
<td>Grass</td>
</tr>
<tr>
<td>Poa secunda - Sandberg Bluegrass</td>
<td>36' x 24'</td>
<td>Sun to light shade</td>
<td>moderate</td>
<td>Grass</td>
</tr>
<tr>
<td><em>Pseudoroegneria spicata - Bluebunch Wheat Grass</em></td>
<td>36' x 24'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Grass</td>
</tr>
<tr>
<td><strong>Forbs:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ipomopsis aggregata - Scarlet Gilia</td>
<td>3' x 1'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Delicate red flowers</td>
</tr>
<tr>
<td>Linum lewisii - Prairie Flax</td>
<td>12' x 12'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Delicate blue flowers</td>
</tr>
<tr>
<td>Lupinus spp. - Lupine</td>
<td>36' x 36'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Blue flowers</td>
</tr>
<tr>
<td>Lycium scariosum - Alfalfa</td>
<td>36' x 12'</td>
<td>Full sun</td>
<td>moderate</td>
<td>Pinkish flowers</td>
</tr>
<tr>
<td>Melilotus officinalis - Yellow Sweetclover</td>
<td>48' x 24'</td>
<td>Full sun</td>
<td>moderate</td>
<td>Small yellow flowers</td>
</tr>
<tr>
<td>Penstemon eatonii - Firecracker Penstemon</td>
<td>36' x 24'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Red flower spike</td>
</tr>
<tr>
<td>Penstemon palmeri - Palmer Penstemon</td>
<td>36' x 24'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Large fragrant flowers</td>
</tr>
<tr>
<td><em>Cassiope tansyfolia - Tansyleaf evening primrose</em></td>
<td>6' x 12'</td>
<td>Full sun</td>
<td>moderate</td>
<td>Bright yellow flowers</td>
</tr>
<tr>
<td>Sanguinaria minor - Small Burnet</td>
<td>12&quot; x 24&quot;</td>
<td>Sun to light shade</td>
<td>moderate</td>
<td>Unique foliage</td>
</tr>
<tr>
<td>Solidago spectabilis - Nevada Goldenrod</td>
<td>18' x 12'</td>
<td>Sun to light shade</td>
<td>moderate</td>
<td>Orange flowers</td>
</tr>
<tr>
<td><em>Sphaeralcea coccinea - Scarlet Globemallow</em></td>
<td>18' x 18'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Pinkish flowers</td>
</tr>
</tbody>
</table>

**Salt Desert Shrub - Shadscale and Bailey’s Greasewood Sites**

<table>
<thead>
<tr>
<th>Shrubs:</th>
<th>Height x Width</th>
<th>Exposure to Sun</th>
<th>Water Requirement</th>
<th>Seasonal Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atriplex canescens - Fourwing Saltbush</td>
<td>5' x 5'</td>
<td>Sun to light shade</td>
<td>minimal</td>
<td>Yellow flowers</td>
</tr>
<tr>
<td>Atriplex confertifolia - Shadscale</td>
<td>5' x 5'</td>
<td>Sun to light shade</td>
<td>moderate</td>
<td>Flowering spikes</td>
</tr>
<tr>
<td><em>Atriplex gardneri - Gardner Saltbush</em></td>
<td>5' x 5'</td>
<td>Sun to light shade</td>
<td>minimal</td>
<td>Evergreen</td>
</tr>
<tr>
<td><em>Krascheninnikovia lanata</em> - Green Ephedra</td>
<td>3' x 3'</td>
<td>Sun to light shade</td>
<td>minimal</td>
<td>Yellowish flower clusters</td>
</tr>
<tr>
<td>Kochia prostrata - Prostrate Summitcypress</td>
<td>3' x 3'</td>
<td>Sun to light shade</td>
<td>minimal</td>
<td>Gray-green foliage</td>
</tr>
</tbody>
</table>

**Grasses:**

| *Achnatherum hymenoides - Indian Ricegrass* | 12' x 6' | Full sun | minimal | Grass |
| *Agropyron fragile - Siberian Wheatgrass* | 24' x 12' | Full sun | moderate | Grass |
| *Distichlis spicata - Saltgrass* | 6' x 6' | Full sun | minimal | Grass |
| *Elymus elymoides - Squirreltail* | 18' x 12' | Full sun | minimal | Grass |
| *Leptosiphon jamesii* - Winterfat | 24' x 24' | Full sun | moderate | Grass |
| *Sporobolus cryptandrus - Alfalfa Scurf* | 36' x 18' | Full sun | minimal | Grass |

**Forbs:**

| *Oenothera sp. - Evening Primrose* | 48' x 24' | Full sun | moderate | Small yellow flowers |
| *Melilotus officinalis - Yellow Sweetclover* | 48' x 24' | Full sun | moderate | Small yellow flowers |
| *Sphaeralcea coccinea - Scarlet Globemallow* | 12' x 12' | Full sun | minimal | Orange flowers |
Figure 11 - Native Revegetation Plant Palette (cont.)

**PLANT PALETTE - MOJAVE DESERT AREAS**

<table>
<thead>
<tr>
<th>Height x Width</th>
<th>Exposure to Sun</th>
<th>Water Requirement</th>
<th>Seasonal Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TREES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arctostaphylos uva-ursi - Creosote Bush</td>
<td>1.25' x 1.25'</td>
<td>Full sun</td>
<td>Low</td>
</tr>
<tr>
<td>Acacia greggii - Catclaw Acacia</td>
<td>1.5' - 2'</td>
<td>Full sun</td>
<td>Low</td>
</tr>
<tr>
<td>Prosopis glandulosa - Honey Mesquite</td>
<td>2' - 3'</td>
<td>Full sun</td>
<td>Low</td>
</tr>
<tr>
<td>Yucca brevifolia - Yucca Bush</td>
<td>4' - 6'</td>
<td>Full sun</td>
<td>Low</td>
</tr>
<tr>
<td><strong>SHRUBS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chilopsis linearis - Honey Mesquite</td>
<td>2.5' x 3'</td>
<td>Full sun</td>
<td>Low</td>
</tr>
<tr>
<td>Larrea tridentata - Creosote Bush</td>
<td>1.5' x 1.5'</td>
<td>Full sun</td>
<td>Low</td>
</tr>
<tr>
<td>Rhus integrifolia - Desert Willow</td>
<td>2' - 3'</td>
<td>Full sun</td>
<td>Low</td>
</tr>
<tr>
<td><strong>GRASSES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elymus elymoides - Squirreltail</td>
<td>1.5' x 1.5'</td>
<td>Full sun</td>
<td>Low</td>
</tr>
<tr>
<td>Atriplex canescens - Four-wing Saltbush</td>
<td>1.5' x 1.5'</td>
<td>Full sun</td>
<td>Low</td>
</tr>
</tbody>
</table>

For additional plants appropriate to the different plant communities, refer to Mapping Ecosystems (Tueller, et al., 2002).

**Note:** Several of the plants listed above and within Mapping Ecosystems will require establishment from seed since they are not available in containers.
ENHANCED NATIVE SOFTSCAPE TREATMENT

21.9 Apply enhanced native softscape along transition zones and as part of simple gateway treatments.

Enhance the native softscape palette with the enhanced native softscape type. The enhanced native softscape type is the second most commonly used plant palette throughout the corridor and should be utilized as shown in the landscape design segments. The enhanced native softscape type enriches the Great Basin and Mojave Desert plant palettes with a mix of heights and densities.

- Typical applications are specified for community zones as well as simple gateway and rest area treatments.
- A variety of native species are planted in moderately dense patterns to create this landscape.
- Enhanced native softscapes use the plant material of the native revegetation palette as a base and add a limited number of regionally adapted trees, shrubs, and other materials for diversity in form.
- Plants are placed in massings and in closer proximity to one another than in the surrounding native landscape.

21.10 Carefully select enhanced native plant species.

In addition to the plants listed in the native revegetation softscape type, the following list of plants comprises the enhanced native softscape type. Use these species to create plant communities with variations in plant height and width.

- Ensure the plant palette selected for the site complements existing vegetation in the surrounding landscape.
- Use existing vegetation as a cue to selecting appropriate plant species.
- Additional plants not listed in Figures 11 and 12 may be included upon review and approval.

Figure 12 - Enhanced Native Plant Palette

PLANT PALETTE - GREAT BASIN AREAS

<table>
<thead>
<tr>
<th>Height x Width</th>
<th>Exposure to Sun</th>
<th>Water Requirement</th>
<th>Seasonal Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tres:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acer ginnala - Amur Maple</td>
<td>15’ x 15’</td>
<td>Sun to light shade</td>
<td>moderate</td>
</tr>
<tr>
<td>Acer glabrum - Toronto</td>
<td>15’ x 15’</td>
<td>Sun to light shade</td>
<td>moderate</td>
</tr>
<tr>
<td>Pinus monophylla</td>
<td>20’ x 15’</td>
<td>Sun to light shade</td>
<td>moderate</td>
</tr>
<tr>
<td>Pinus aristata - Bristlecone Pine</td>
<td>20’ x 15’</td>
<td>Sun to light shade</td>
<td>minimal</td>
</tr>
<tr>
<td>Pinus edulis - Two-needle Pinyon</td>
<td>20’ x 15’</td>
<td>Sun to light shade</td>
<td>minimal</td>
</tr>
<tr>
<td>Juniperus osteosperma - Utah Juniper</td>
<td>Shrub to 20’x30’</td>
<td>Sun to light shade</td>
<td>minimal</td>
</tr>
<tr>
<td>Cupressus arizonica - Arizona Cypress</td>
<td>20’ x 25’</td>
<td>Sun to light shade</td>
<td>minimal</td>
</tr>
<tr>
<td>Elaeagnus umbellata - Autumn Olive</td>
<td>15’ x 15’</td>
<td>Sun to light shade</td>
<td>minimal</td>
</tr>
<tr>
<td>Populus trichocarpa - Russian Sage</td>
<td>3’ x 5’</td>
<td>Sun to light shade</td>
<td>minimal</td>
</tr>
<tr>
<td>Potentilla crispata - Cinquefoil</td>
<td>15’ x 2’</td>
<td>Sun to light shade</td>
<td>minimal</td>
</tr>
<tr>
<td>Rosa woodsii - Woods’ rose</td>
<td>3’ x 5’</td>
<td>Sun to light shade</td>
<td>minimal</td>
</tr>
<tr>
<td>Rhodiola sp. - Skunkbush and Aromatic Sumac</td>
<td>15’ x 2’</td>
<td>Sun to light shade</td>
<td>minimal</td>
</tr>
<tr>
<td>Shepherdia argentea - Silver Buffaloberry</td>
<td>7’ x 1’</td>
<td>Sun to light shade</td>
<td>minimal</td>
</tr>
<tr>
<td>Shepherdia rotundifolia - Roundleaf Buffaloberry</td>
<td>15’ x 15’</td>
<td>Sun to light shade</td>
<td>low</td>
</tr>
</tbody>
</table>

Forbs and Grasses:

<table>
<thead>
<tr>
<th>Height x Width</th>
<th>Exposure to Sun</th>
<th>Water Requirement</th>
<th>Seasonal Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achillea millefolium - Common Yarrow</td>
<td>3’ x 2’</td>
<td>Sun to light shade</td>
<td>moderate</td>
</tr>
<tr>
<td>Artemisia schmidiana - Silver Mound Artemisia</td>
<td>15’ x 24’</td>
<td>Sun to light shade</td>
<td>moderate</td>
</tr>
<tr>
<td>Aster spp. - Aster</td>
<td>18’ x 24’</td>
<td>Sun to light shade</td>
<td>moderate</td>
</tr>
<tr>
<td>Convolvulus arvensis - Threadleaf Convolvulus</td>
<td>18’ x 24’</td>
<td>Sun to light shade</td>
<td>moderate</td>
</tr>
<tr>
<td>Echinacea purpurea - Eastern Purple Coneflower</td>
<td>18’ x 12’</td>
<td>Sun to light shade</td>
<td>minimal</td>
</tr>
<tr>
<td>Erica cinerea - Heather</td>
<td>12’ x 12’</td>
<td>Sun to light shade</td>
<td>minimal</td>
</tr>
<tr>
<td>Gailardia grandiflora - Blanket Flower</td>
<td>24’ x 12’</td>
<td>Sun to light shade</td>
<td>minimal</td>
</tr>
<tr>
<td>Helianthus annuus - Redflower False Sunflower</td>
<td>3’ x 4’</td>
<td>Sun to light shade</td>
<td>minimal</td>
</tr>
<tr>
<td>Linum lewisii - Prairie Flax</td>
<td>12’ x 12’</td>
<td>Sun to light shade</td>
<td>minimal</td>
</tr>
<tr>
<td>Lupinus spp. - Lupine</td>
<td>12’ x 12’</td>
<td>Sun to light shade</td>
<td>low</td>
</tr>
<tr>
<td>Penstemon strictus - Rocky Mountain Penstemon</td>
<td>2’ x 1’</td>
<td>Sun to light shade</td>
<td>moderate</td>
</tr>
<tr>
<td>Rudbeckia fulgida - Orange Coneflower</td>
<td>18’ x 24’</td>
<td>Sun to light shade</td>
<td>moderate</td>
</tr>
<tr>
<td>Sedum spectabile - Autumn Joy *</td>
<td>18’ x 24’</td>
<td>Sun to light shade</td>
<td>moderate</td>
</tr>
<tr>
<td>Sempervivum tectorum - Houseleek</td>
<td>24’ x 24’</td>
<td>Sun to light shade</td>
<td>moderate</td>
</tr>
</tbody>
</table>

* Note: Pinus aristata to be used only on forested pine or fir sites.

(1) The enhanced native softscape type is used at rest areas and viewpoints.
### Section Three: Highway Facilities Guidelines

#### Chapter Three — Design Guidelines

**Figure 12 - Enhanced Native Plant Palette (cont.)**

**PLANT PALETTE - MOJAVE DESERT AREAS**

<table>
<thead>
<tr>
<th>Tree:</th>
<th>Height x Width</th>
<th>Exposure to Sun</th>
<th>Water Requirement</th>
<th>Seasonal Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acacia farnesiana - Sweet Acacia</td>
<td>10-35’ x 15-25’</td>
<td>Full sun</td>
<td>Low</td>
<td>Spring</td>
</tr>
<tr>
<td>Acacia schaffneri - Twisted Acacia</td>
<td>18’ x 20’</td>
<td>Full sun</td>
<td>Low</td>
<td>Spring</td>
</tr>
<tr>
<td>Cerivium microphyllum - Yellow Palo Verde</td>
<td>20’ x 20’</td>
<td>Full sun</td>
<td>Low</td>
<td>Spring</td>
</tr>
<tr>
<td>Cercis occidentalis - Western redbud</td>
<td>20’ x 15’</td>
<td>Sun-part shade</td>
<td>Low-mod</td>
<td>Spring</td>
</tr>
<tr>
<td>Chitalpa tashkentensis - Chitalpa</td>
<td>30’ x 30’</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Fall</td>
</tr>
<tr>
<td>Cndíia parviflora - Small-Leaf Geiger tree</td>
<td>4’ x 8’</td>
<td>Full sun</td>
<td>Low</td>
<td>Summer</td>
</tr>
<tr>
<td>Parkinsonia aculeata - Mexican Palo Verde</td>
<td>30’ x 30’</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Summer</td>
</tr>
<tr>
<td>Prosopis alba - Argentine Mesquite</td>
<td>30’ x 30’</td>
<td>Full-partial sun</td>
<td>Moderate</td>
<td>Summer</td>
</tr>
<tr>
<td>Prosopis chilensis - Chilean Mesquite</td>
<td>25’ x 40’</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Summer</td>
</tr>
<tr>
<td>Prosopis velutina - Velvet Mesquite</td>
<td>25’ x 30’</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Spring</td>
</tr>
<tr>
<td>Rhus bonus - African Sumac</td>
<td>20’ x 30’</td>
<td>Full sun</td>
<td>Low-mod</td>
<td>Spring</td>
</tr>
<tr>
<td>Vitex agnus-castus - Lilac Chaste Tree</td>
<td>25’ x 25’</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Summer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shrub:</th>
<th>Height x Width</th>
<th>Exposure to Sun</th>
<th>Water Requirement</th>
<th>Seasonal Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acacia cultriformis - Knife Acacia</td>
<td>10-15’ x 10-15’</td>
<td>Full sun</td>
<td>Low</td>
<td>Spring</td>
</tr>
<tr>
<td>Cassio artemisoides - Featherly Cassia</td>
<td>6” x 6”</td>
<td>Full sun</td>
<td>Low</td>
<td>Spring</td>
</tr>
<tr>
<td>Cassio neriophil - Desert Cassia</td>
<td>8” x 8”</td>
<td>Full sun</td>
<td>Low</td>
<td>Spring</td>
</tr>
<tr>
<td>Chrysothamnus nauseosus - Rubber Rabbitbrush</td>
<td>4’ x 4’</td>
<td>Full-partial sun</td>
<td>Low</td>
<td>Fall</td>
</tr>
<tr>
<td>Elyrea vindo - Mormon Tea</td>
<td>5’ x 3’</td>
<td>Full sun</td>
<td>Low</td>
<td>Year Round</td>
</tr>
<tr>
<td>Eremophila spp. - Valentine (TM)</td>
<td>4’ x 4’</td>
<td>Full sun</td>
<td>Low-mod</td>
<td>Winter</td>
</tr>
<tr>
<td>Eriogonum longifolium - Torpentine Bush</td>
<td>2’ x 3’</td>
<td>Full sun</td>
<td>Low</td>
<td>Fall</td>
</tr>
<tr>
<td>Garrya flavescens - Ashy Silktassel bush</td>
<td>12’ x 8’</td>
<td>Sun-part shade</td>
<td>Low</td>
<td>Sp/Soum</td>
</tr>
<tr>
<td>Justicia californica - Chuparosa</td>
<td>5’ x 3’</td>
<td>Full sun</td>
<td>Low</td>
<td>Spring-Fall</td>
</tr>
<tr>
<td>Leucophyllum frutescens - Texas Ranger</td>
<td>5’ x 5’</td>
<td>Full sun</td>
<td>Low</td>
<td>Summer</td>
</tr>
<tr>
<td>Santolina rosmarinifolia - Green Santolina</td>
<td>2’ x 3’</td>
<td>Full sun</td>
<td>Low</td>
<td>Summer</td>
</tr>
<tr>
<td>Simmondsia chinensis - Jojoba</td>
<td>8’ x 6’</td>
<td>Full sun</td>
<td>Low</td>
<td>Spring</td>
</tr>
<tr>
<td>Viscumtoria califomica - Arizona Rosewood</td>
<td>14’ x 10’</td>
<td>Full sun</td>
<td>Low</td>
<td>Spring</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cacti, Accents, Grasses, Groundcovers, and Perennials:</th>
<th>Height x Width</th>
<th>Exposure to Sun</th>
<th>Water Requirement</th>
<th>Seasonal Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berlandiera lyrata - Chocolate Flower</td>
<td>1’ x 1’</td>
<td>Full-partial sun</td>
<td>Moderate</td>
<td>Sp/Soum</td>
</tr>
<tr>
<td>Datura wrightii - Sacred Datura</td>
<td>5’ x 6’</td>
<td>Full-partial sun</td>
<td>Moderate</td>
<td>Summer</td>
</tr>
<tr>
<td>Erigeron angrensis - Spreading Fleabane</td>
<td>1’ x 1’</td>
<td>Full sun</td>
<td>Low</td>
<td>Summer</td>
</tr>
<tr>
<td>Euphorbia rigida - Upright Myrtle Spurge</td>
<td>5’ x 4’</td>
<td>Full-partial sun</td>
<td>Moderate</td>
<td>Win/Sp</td>
</tr>
<tr>
<td>Ferocactus wislizenii - Fishhook Barrel Cactus</td>
<td>5’ x 2’</td>
<td>Full sun</td>
<td>Low</td>
<td>Summer</td>
</tr>
<tr>
<td>Galardia grandiflora - Blanket Flower</td>
<td>1’ x 1’</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Summer</td>
</tr>
<tr>
<td>Mammalianthe turfei - Mojave aster</td>
<td>1’ x 5’</td>
<td>Full sun</td>
<td>Low</td>
<td>Summer/Fall</td>
</tr>
<tr>
<td>Oenothera deltoides - Birdage Evening primrose</td>
<td>1’ x 1’</td>
<td>Full-partial sun</td>
<td>Moderate</td>
<td>Sp/Soum</td>
</tr>
<tr>
<td>Primrose:</td>
<td></td>
<td>Full sun</td>
<td>Low</td>
<td>Sp/Soum</td>
</tr>
<tr>
<td>Datura wrightii - Sacred Datura</td>
<td>3’ x 3’</td>
<td>Full sun</td>
<td>Low</td>
<td>Summer</td>
</tr>
<tr>
<td>Pensteom velutina - Palmer’s penstemon</td>
<td>3’ x 3’</td>
<td>Full sun</td>
<td>Low</td>
<td>Sp/Soum</td>
</tr>
<tr>
<td>Pensteom parryi - Parry’s Beadstring</td>
<td>3’ x 3’</td>
<td>Full sun</td>
<td>Low</td>
<td>Sp/Soum</td>
</tr>
<tr>
<td>Pensteom utahensis - Utah penstemon</td>
<td>2’ x 1’</td>
<td>Full sun</td>
<td>Low</td>
<td>Sp/Soum</td>
</tr>
<tr>
<td>Phillostrophe cooperi - Paper Flower</td>
<td>1’ x 1’</td>
<td>Full-partial sun</td>
<td>Low-mod</td>
<td>Sp/SoumFall</td>
</tr>
<tr>
<td>Santolina rosmarinifolia - Green Santolina</td>
<td>1’ x 1’</td>
<td>Full sun</td>
<td>Low</td>
<td>Spring</td>
</tr>
<tr>
<td>Tetra nitrux acutus - Angelita Daisy</td>
<td>1’ x 1’</td>
<td>Full-partial sun</td>
<td>Moderate</td>
<td>Sp/SoumFall</td>
</tr>
<tr>
<td>Yucca spp. - Yucca</td>
<td>10’ x 8’</td>
<td>Full sun</td>
<td>Low</td>
<td>Summer</td>
</tr>
</tbody>
</table>

The enhanced native softscape type adds verticality and density to create a planting arrangement with varying heights and widths.
21.11 Apply regionally adapted softscape in urban areas and locations of high visibility. Use the regionally adapted softscape type where identified in each landscape design segment (refer to Chapter Two, Sections Two - Five). This softscape type utilizes the Great Basin and Mojave Desert plant palettes along with other low-water use plants that are well adapted to local conditions.

- Typical applications include welcome centers, urban areas, and other high visibility locations.

- Plants are arranged in greater densities, forming overstory and understory layers to create a richness of color, texture, form, and seasonal change, enhancing the desert garden.

21.12 Carefully select regionally adapted plant species. Use regionally adapted plant species. In addition to the plants listed in the native revegetation softscape type and the enhanced native softscape type, the list of plants in Figure 13 should be used to comprise the regionally adapted softscape type.

- Use plant species to create plant communities with variations in plant height and spread.

- Additional plants not listed in Figures 11-13 may be included upon review and approval.

**Figure 13 - Regionally Adapted Plant Palette**

**PLANT PALETTE - GREAT BASIN AREAS**

<table>
<thead>
<tr>
<th>Tree</th>
<th>Height x Width</th>
<th>Exposure to Sun</th>
<th>Water Requirement</th>
<th>Seasonal Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acer fremontii - Autumn Blaze Maple</td>
<td>40' x 30</td>
<td>Sun to part Shade</td>
<td>moderate</td>
<td>Grown for foliage</td>
</tr>
<tr>
<td>Acer grandis - Amur Maple</td>
<td>15' x 12'</td>
<td>Sun to part Shade</td>
<td>moderate</td>
<td>Red fall color</td>
</tr>
<tr>
<td>Cercis canadensis - Blue Atlas Cedar</td>
<td>30' x 30'</td>
<td>Sun to part Shade</td>
<td>minimal</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Ceanothus americanus - Common Huckleberry</td>
<td>20' x 25'</td>
<td>Sun to part Shade</td>
<td>moderate</td>
<td>Yellow foliage</td>
</tr>
<tr>
<td>Crataegus mexicana - Black Chokeberry</td>
<td>4' x 4'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Grown for foliage</td>
</tr>
<tr>
<td>Buddleja davidii - Orange Eye Butterfly Bush</td>
<td>7' x 7'</td>
<td>Full sun</td>
<td>moderate</td>
<td>Purple flowers</td>
</tr>
<tr>
<td>Eriogonum fasciculatum - Blue Mist Spirea</td>
<td>6' x 6'</td>
<td>Full sun</td>
<td>low</td>
<td>White flowers</td>
</tr>
<tr>
<td>Centaurea paradoxa - European Smoke Tree</td>
<td>12' x 18'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Unique foliage</td>
</tr>
<tr>
<td>Cotinus coggygria - Smokebush</td>
<td>6' x 6'</td>
<td>Full sun</td>
<td>moderate</td>
<td>Purple flowers</td>
</tr>
<tr>
<td>Eucalyptus globulus - Red Spreader</td>
<td>10' x 10'</td>
<td>Full sun</td>
<td>minimal</td>
<td>White-pink flowers</td>
</tr>
<tr>
<td>Eucalyptus gunnii - Box</td>
<td>6' x 6'</td>
<td>Sun to part Shade</td>
<td>moderate</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Eriogonum fasciculatum - Blue Mist Spirea</td>
<td>6' x 6'</td>
<td>Sun to part Shade</td>
<td>moderate</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Eryngium planum - Russian Sage</td>
<td>6' x 6'</td>
<td>Sun to part Shade</td>
<td>moderate</td>
<td>Bright Yellow</td>
</tr>
<tr>
<td>Juniperus scopulorum - Juniper</td>
<td>8' x 8'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Mahonia aquifolium - Oregon grape</td>
<td>8' x 8'</td>
<td>Full sun</td>
<td>low</td>
<td>Green foliage</td>
</tr>
<tr>
<td>Mahonia repens - Creeping Barberry</td>
<td>1' x 2'</td>
<td>Full sun to light shade</td>
<td>minimal</td>
<td>Yellow flowers</td>
</tr>
<tr>
<td>Potentilla reptans - Cinquefoil</td>
<td>2' x 2'</td>
<td>Full sun</td>
<td>low</td>
<td>White flowers</td>
</tr>
<tr>
<td>Prunus serotina - Black Cherry</td>
<td>5' x 3'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Green foliage</td>
</tr>
<tr>
<td>Prunus virginiana - Redbud</td>
<td>5' x 3'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Silver foliage</td>
</tr>
<tr>
<td>Rubus spectabilis - Russian Sage</td>
<td>6' x 6'</td>
<td>Full sun</td>
<td>moderate</td>
<td>Red fall foliage</td>
</tr>
<tr>
<td>Shrublandia argentea - Silver Buffaloberry</td>
<td>15' x 12'</td>
<td>Sun to part Shade</td>
<td>moderate</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Rhus aromatica - Sumac</td>
<td>8' x 8'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Red berries</td>
</tr>
<tr>
<td>Fors:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aronia melanocarpa - Black Chokeberry</td>
<td>4' x 4'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Groundcover</td>
</tr>
<tr>
<td>Ceanothus cuneatus - Buckbrush</td>
<td>4' x 4'</td>
<td>Full sun</td>
<td>minimal</td>
<td>White/thin white</td>
</tr>
<tr>
<td>Chamaebatiaria millefolium - Desert Sweetbush</td>
<td>5' x 5'</td>
<td>Full sun</td>
<td>low</td>
<td>Yellow flowers</td>
</tr>
<tr>
<td>Cotinus coggygria - Smokebush</td>
<td>6' x 6'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Various color</td>
</tr>
<tr>
<td>Eriogonum fasciculatum - Blue Mist Spirea</td>
<td>6' x 6'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Pink flowers</td>
</tr>
<tr>
<td>Eucalyptus globulus - Red Spreader</td>
<td>10' x 10'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Various color</td>
</tr>
<tr>
<td>Eriogonum fasciculatum - Blue Mist Spirea</td>
<td>6' x 6'</td>
<td>Sun to part Shade</td>
<td>minimal</td>
<td>Red berries</td>
</tr>
<tr>
<td>Eriogonum fasciculatum - Blue Mist Spirea</td>
<td>6' x 6'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Various color</td>
</tr>
<tr>
<td>Eryngium planum - Russian Sage</td>
<td>6' x 6'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Red berries</td>
</tr>
<tr>
<td>Juniperus scopulorum - Juniper</td>
<td>8' x 8'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Red berries</td>
</tr>
<tr>
<td>Mahonia aquifolium - Oregon grape</td>
<td>8' x 8'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Red berries</td>
</tr>
<tr>
<td>Mahonia repens - Creeping Barberry</td>
<td>1' x 2'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Red berries</td>
</tr>
<tr>
<td>Potentilla reptans - Cinquefoil</td>
<td>2' x 2'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Red berries</td>
</tr>
<tr>
<td>Prunus serotina - Black Cherry</td>
<td>5' x 3'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Red berries</td>
</tr>
<tr>
<td>Prunus virginiana - Redbud</td>
<td>5' x 3'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Red berries</td>
</tr>
<tr>
<td>Rubus spectabilis - Russian Sage</td>
<td>6' x 6'</td>
<td>Full sun</td>
<td>minimal</td>
<td>Red berries</td>
</tr>
</tbody>
</table>

*Regionally adapted softscape types are used along most city streets and rest areas.*
### Chapter Three — Design Guidelines

**SECTION THREE: Highway Facilities Guidelines**

#### Figure 13 - Regionally Adapted Plant Palette (cont.)

**PLANT PALETTE - MOJAVE DESERT AREAS**

<table>
<thead>
<tr>
<th>Trees:</th>
<th>Height x Width</th>
<th>Exposure to Sun</th>
<th>Water Requirement</th>
<th>Seasonal Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acacia confusa - Whitemouth Acacia</td>
<td>10' x 15'</td>
<td>Full sun</td>
<td>Low</td>
<td>Sp/Sum</td>
</tr>
<tr>
<td>Acacia stembryssa - Shoestring Acacia</td>
<td>40' x 20'</td>
<td>Full sun</td>
<td>Low</td>
<td>Spring</td>
</tr>
<tr>
<td>Callera paludosa - Spiny Hackberry</td>
<td>8' x 12'</td>
<td>Full sun</td>
<td>Low</td>
<td>Semi-evergreen</td>
</tr>
<tr>
<td>Cecidium hybridus - Desert Museum Palo Verde</td>
<td>25' x 25'</td>
<td>Full sun</td>
<td>Low</td>
<td>Spring</td>
</tr>
<tr>
<td>Cordia baissleri - Texas Olive</td>
<td>10' x 10'</td>
<td>Full-partial sun</td>
<td>Low</td>
<td>Summer</td>
</tr>
<tr>
<td>Cupressus arizonica - Arizona Cypress</td>
<td>40' x 20'</td>
<td>Full sun</td>
<td>Low</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Eucalyptus microtheca - Coolabah Tree</td>
<td>30' x 30'</td>
<td>Full sun</td>
<td>Low</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Eysenhardtia anthracocarpa - Tahitian Kneebone</td>
<td>18' x 15'</td>
<td>Full sun</td>
<td>Low</td>
<td>Summer</td>
</tr>
<tr>
<td>Fraxinus hybridus - Raywood Ash</td>
<td>35' x 25'</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Spring</td>
</tr>
<tr>
<td>Fraxinus velutina Rio Grande - Fan Tex Ash</td>
<td>50' x 30'</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Spring</td>
</tr>
<tr>
<td>Gladiolus tricolors inermis - Thornless Honey Locust</td>
<td>35' x 25'</td>
<td>Full sun</td>
<td>Moderate</td>
<td>n/a</td>
</tr>
<tr>
<td>Parkinsonia floridum - Blue Palo Verde</td>
<td>20' x 25'</td>
<td>Full sun</td>
<td>Low</td>
<td>Spring</td>
</tr>
<tr>
<td>Flaxia crenata - Chinese Pistache</td>
<td>40' x 20'</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Fall</td>
</tr>
<tr>
<td>Populus spp. - Cottonwood</td>
<td><strong>Note: plant where ground water access is available</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quercus spp. - Oak Tree</td>
<td>40-70' x 20-50'</td>
<td>Full-partial sun</td>
<td>Moderate</td>
<td>Sp/Fall</td>
</tr>
<tr>
<td>Rhus aromatica - Prairie Sumac</td>
<td>12' x 18'</td>
<td>Full sun</td>
<td>Low</td>
<td>Spring</td>
</tr>
<tr>
<td>Robinia spp. - Locust</td>
<td>40-50' x 20-40'</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Sp/Fall</td>
</tr>
<tr>
<td>Ulmus parvifolia - Chinese Elm</td>
<td>80' x 30'</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Fall</td>
</tr>
<tr>
<td>U. parvifolia - Chinese Elm</td>
<td>15' x 15'</td>
<td>Full sun</td>
<td>Low</td>
<td>Spring</td>
</tr>
<tr>
<td>V. californica - Arizona Rosewood</td>
<td>14' x 20'</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Spring</td>
</tr>
</tbody>
</table>

#### Shrubs:

<table>
<thead>
<tr>
<th>Trees:</th>
<th>Height x Width</th>
<th>Exposure to Sun</th>
<th>Water Requirement</th>
<th>Seasonal Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anisacanthus quadrifidus - Mountain Flame</td>
<td>3' x 3'</td>
<td>Full-partial sun</td>
<td>Low</td>
<td>Fall/Sum</td>
</tr>
<tr>
<td>Buddleia davidii - Orange Eye Butterfly Bush</td>
<td>8' x 6'</td>
<td>Full-partial sun</td>
<td>Low</td>
<td>Spring</td>
</tr>
<tr>
<td>Buddleia nanus - White Butterfly Bush</td>
<td>6' x 6'</td>
<td>Full-partial sun</td>
<td>Low</td>
<td>Summer</td>
</tr>
<tr>
<td>Cassia phylloides - Silver-Leaf Senna</td>
<td>6' x 6'</td>
<td>Full sun</td>
<td>Low</td>
<td>Spring</td>
</tr>
<tr>
<td>Chrysothamnus mexicanus - Gom Arrandiana</td>
<td>2' x 2'</td>
<td>Full sun</td>
<td>Low</td>
<td>Summer</td>
</tr>
<tr>
<td>Coreopsis lanceolata - Bush Morning Glory</td>
<td>2' x 3'</td>
<td>Full sun</td>
<td>Low</td>
<td>Fall</td>
</tr>
<tr>
<td>Dalos spp. - Prairie Clover</td>
<td>4' x 5'</td>
<td>Full sun</td>
<td>Low</td>
<td>Fall</td>
</tr>
<tr>
<td>Dasneae viscosa - Texas Hoph bush</td>
<td>10' x 6'</td>
<td>Full sun</td>
<td>Low</td>
<td>Year Round</td>
</tr>
<tr>
<td>Justicia confusa - Arizona Water Willow</td>
<td>3' x 3'</td>
<td>Full-partial sun</td>
<td>Moderate</td>
<td>Summer</td>
</tr>
<tr>
<td>Justicia scabra - Mexican Honeysuckle</td>
<td>3' x 3'</td>
<td>Part-full sun</td>
<td>Moderate</td>
<td>Spring/Fall</td>
</tr>
<tr>
<td>Leucophyllum spp. - Texas Ranger</td>
<td>4' x 4'</td>
<td>Full sun</td>
<td>Low</td>
<td>Summer</td>
</tr>
<tr>
<td>Phlomis fruticosa - Jerusalem Sage</td>
<td>3' x 4'</td>
<td>Full sun</td>
<td>Low</td>
<td>Low-mod Summer</td>
</tr>
<tr>
<td>Rhamnus californica - Coffeebush</td>
<td>8' x 8'</td>
<td>Full-partial sun</td>
<td>Low</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Rhododendron 'Gold Star' - Texas Yellow Bells</td>
<td>10' x 10'</td>
<td>Full-partial sun</td>
<td>Low</td>
<td>Spring</td>
</tr>
<tr>
<td>Salvia leucantha - Mexican Bush Sage</td>
<td>3' x 3'</td>
<td>Full sun</td>
<td>Low</td>
<td>Summer</td>
</tr>
<tr>
<td>Tecoma x Gold Star - Texas Yellow Bells</td>
<td>20' x 8'</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Summer</td>
</tr>
</tbody>
</table>

#### Cacti, Accents, Grasses, Groundcovers, and Perennials:

<table>
<thead>
<tr>
<th>Trees:</th>
<th>Height x Width</th>
<th>Exposure to Sun</th>
<th>Water Requirement</th>
<th>Seasonal Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agave spp. - Agave</td>
<td><strong>Note: plant apart from one another to prevent sisal weevil</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Artemisia frigida - Wormwood</td>
<td>1' x 1'</td>
<td>Full sun</td>
<td>Low</td>
<td>Spring</td>
</tr>
<tr>
<td>Centaury phylloides - Ground Morning Glory</td>
<td>1' x 1'</td>
<td>Full-partial sun</td>
<td>Low</td>
<td>Sp/Sum</td>
</tr>
<tr>
<td>Coreopsis lanceolata - Lanceleaf Tickweed</td>
<td>1.5' x 1'</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Sp/Sum</td>
</tr>
<tr>
<td>Helenium spp. - Daisily</td>
<td>2' x 2'</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Spring</td>
</tr>
<tr>
<td>Lantana spp. - Lantana</td>
<td>4' x 4'</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Summer</td>
</tr>
<tr>
<td>Muhlenbergia rigens - Ochre Grass</td>
<td>3' x 3'</td>
<td>Full sun</td>
<td>Low</td>
<td>Summer</td>
</tr>
<tr>
<td>Nolina evergreen - Foxtail Fern</td>
<td>4' x 6'</td>
<td>Full sun</td>
<td>Low</td>
<td>Spring</td>
</tr>
<tr>
<td>Salvia leucantha - Mexican Bush Sage</td>
<td>3' x 3'</td>
<td>Full-partial sun</td>
<td>Moderate</td>
<td>Sp/Fall/Win</td>
</tr>
<tr>
<td>T. leucantha - Society Garlic</td>
<td>3' x 3'</td>
<td>Full sun</td>
<td>Low</td>
<td>Sp/Sum</td>
</tr>
</tbody>
</table>

**Note:** Regionally adapted softscape types should be used in areas where a highly visible landscape is desired.
REGIONAL ORNAMENTAL SOFTSCAPE
TREATMENT
21.13 Apply regional ornamental softscape type in areas of extremely high importance.
Use the regional ornamental softscape type to create cultural meaning, enhance a landmark feature, or both. The regional ornamental softscape type is the rarest treatment and is not designated for use in the Eastern Corridors.

• It is typically used to denote an area of the utmost importance.
• This softscape type emphasizes the unique cultural elements of a particular urban environment.
• The use of non-native, ornamental plant species in this softscape type accentuates areas through composition possibilities inherent in form and color.
• Dynamic ornamental forms, colors, and textures enhance the native Great Basin or Mojave Desert landscape in complementary patterns.

21.14 Carefully select regional ornamental plant species.
In addition to the plants listed in the native revegetation, enhanced native, and regionally adapted softscape type, the list of plants in Figure 14 comprise the regional ornamental softscape type.

• The species listed represent those plants with significant cultural value.
• Alternative plants that have the same form and characteristics, thereby evoking a similar cultural meaning, may be more desirable if the alternative plant is better suited to the environmental conditions, requires less maintenance, and is more drought-tolerant.
• Additional plants not listed in Figures 11-14 may be included upon review and approval.

Figure 14 - Regional Ornamental Plant Palette

<table>
<thead>
<tr>
<th>Height x Width</th>
<th>Exposure to Sun</th>
<th>Water Requirement</th>
<th>Seasonal Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plants:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aster novi-beli - Michaelmas Daisy</td>
<td>12&quot; x 12&quot;</td>
<td>Full sun</td>
<td>Moderate</td>
</tr>
<tr>
<td>Festuca spp. - Blue Fescue</td>
<td>12&quot; x 12&quot;</td>
<td>Full sun</td>
<td>Moderate</td>
</tr>
<tr>
<td>Hemerocallis spp. - Daylily</td>
<td>24&quot; x 18&quot;</td>
<td>Full sun</td>
<td>Moderate</td>
</tr>
<tr>
<td>Iris spp. - Iris</td>
<td>36&quot; x 18&quot;</td>
<td>Full sun</td>
<td>Moderate</td>
</tr>
<tr>
<td>Leucanthemum x superbum - Shasta Daisy</td>
<td>24&quot; x 12&quot;</td>
<td>Sun to light shade</td>
<td>Moderate</td>
</tr>
<tr>
<td>Sedgegrass - Fescue</td>
<td>10&quot; x 6&quot;</td>
<td>Full sun</td>
<td>Moderate</td>
</tr>
<tr>
<td>Grasses, Forbs, and Perennials:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tilia tomentosa - Silver Linden</td>
<td>45' x 20'</td>
<td>Full sun</td>
<td>Moderate</td>
</tr>
<tr>
<td>European Mountain Ash</td>
<td>30' x 25'</td>
<td>Sun to light shade</td>
<td>Moderate</td>
</tr>
<tr>
<td>Sorbus aucuparia</td>
<td>80' x 35'</td>
<td>Full sun</td>
<td>Moderate</td>
</tr>
<tr>
<td>Syringa spp.</td>
<td>15' x 15'</td>
<td>Sun to light shade</td>
<td>Moderate</td>
</tr>
<tr>
<td>Honeysuckle</td>
<td>6' x 6'</td>
<td>Sun to light shade</td>
<td>Moderate</td>
</tr>
<tr>
<td>Viburnum 8' x 8'</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Viburnum spp. - Viburnum</td>
<td>8' x 8'</td>
<td>Full sun</td>
<td>Moderate</td>
</tr>
<tr>
<td>Forsythia spp.</td>
<td>6' x 4'</td>
<td>Full sun</td>
<td>Moderate</td>
</tr>
<tr>
<td>Hibiscus syriacus - Rose of Sharon</td>
<td>10' x 8'</td>
<td>Sun to light shade</td>
<td>Moderate</td>
</tr>
<tr>
<td>Lonicera spp.</td>
<td>6' x 6'</td>
<td>Sun to light shade</td>
<td>Moderate</td>
</tr>
<tr>
<td>Rosea spp. - Rose (native yellow climbing rose)</td>
<td>Varies</td>
<td>Full sun</td>
<td>Moderate</td>
</tr>
<tr>
<td>Forsythia spp. - Forsythia</td>
<td>6' x 4'</td>
<td>Full sun</td>
<td>Moderate</td>
</tr>
<tr>
<td>Viburnum spp. - Viburnum</td>
<td>8' x 8'</td>
<td>Sun to light shade</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

(1) The regional ornamental softscape type requires permanent irrigation and is used to highlight points of significant interest and landmark quality.

(2) The regional ornamental softscape type adds to the identity and placemaking of areas of high importance.
### Plant Palette - Mojave Desert Areas

<table>
<thead>
<tr>
<th>Plant Type</th>
<th>Species</th>
<th>Height x Width</th>
<th>Exposure to Sun</th>
<th>Water Requirement</th>
<th>Seasonal Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trees:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ebenopsis ebano - Texas Ebony</td>
<td>20' x 20'</td>
<td>Full</td>
<td>Low-mod</td>
<td>Summer Fall</td>
</tr>
<tr>
<td></td>
<td>Gleditsia triacanthos inermis - Thornless Honey Locust</td>
<td>28' x 18'</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Summer</td>
</tr>
<tr>
<td></td>
<td>Koelreuteria paniculata - Goldenrain Tree</td>
<td>35' x 40'</td>
<td>Full partial sun</td>
<td>Moderate</td>
<td>Summer</td>
</tr>
<tr>
<td></td>
<td>Olea europaea 'Swan Hill' - Olive Tree</td>
<td>30' x 30'</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Summer</td>
</tr>
<tr>
<td></td>
<td>Pinus elliottii - Allegheny Pine</td>
<td>40' x 40'</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Fall</td>
</tr>
<tr>
<td></td>
<td>Pinus ponderosa - Ponderosa Pine</td>
<td>80' x 40'</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Fall</td>
</tr>
<tr>
<td></td>
<td>Pitsanouia chinensis - Chinese Pistache</td>
<td>40' x 20'</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Winter/Summer</td>
</tr>
<tr>
<td></td>
<td>Sophora secundiflora - Mesquite Bean</td>
<td>15' x 10'</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Spring</td>
</tr>
<tr>
<td><strong>Shrubs:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acacia redolens - Desert Carpet - Prostrate Acacia</td>
<td>5' x 10'</td>
<td>Full sun</td>
<td>Low</td>
<td>Late Winter</td>
</tr>
<tr>
<td></td>
<td>Aloysia virgata - Sweet Almond Bush</td>
<td>15 x 5</td>
<td>Full sun-part sh</td>
<td>Low</td>
<td>Sp/Sum</td>
</tr>
<tr>
<td></td>
<td>Caesalpinia mexicana - Mexican Bird of Paradise</td>
<td>10' x 6</td>
<td>Full sun</td>
<td>Moderate</td>
<td>Summer</td>
</tr>
<tr>
<td></td>
<td>Caesalpina pulcherrima - Red Bird of Paradise</td>
<td>12' x 12'</td>
<td>Full partial sun</td>
<td>Low-mod</td>
<td>Summer/Fall</td>
</tr>
<tr>
<td></td>
<td>Caryopteris x clandonensis - Dark Knight - Blue Mist</td>
<td>3' x 4</td>
<td>Full sun-part sh</td>
<td>Moderate</td>
<td>Sp/Sum</td>
</tr>
<tr>
<td></td>
<td>Spirea</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Calliandra eriophylla - Fairy Duster</td>
<td>3' x 4</td>
<td>Full partial sun</td>
<td>Low</td>
<td>Winter</td>
</tr>
<tr>
<td></td>
<td>Cotoneaster x lowfast - Lowfast Bearberry</td>
<td>2' x 10'</td>
<td>Full partial sun</td>
<td>Moderate</td>
<td>Spring</td>
</tr>
<tr>
<td></td>
<td>Euphorbia characias - Shrub Spurge</td>
<td>3' x 2'</td>
<td>Full partial sun</td>
<td>Moderate</td>
<td>Win/Sp</td>
</tr>
<tr>
<td></td>
<td>Fouquieria splendens - Ocotillo</td>
<td>18' x 10</td>
<td>Full sun</td>
<td>Low</td>
<td>Spring</td>
</tr>
<tr>
<td></td>
<td>Hesperaloe spp. - False Yucca</td>
<td>3' x 6</td>
<td>Full partial sun</td>
<td>Moderate</td>
<td>Sp/SumFall</td>
</tr>
<tr>
<td></td>
<td>Muhlenbergia capillaris - Regal Mist Grass</td>
<td>2' x 3'</td>
<td>Full sun</td>
<td>Low</td>
<td>Grass</td>
</tr>
<tr>
<td></td>
<td>Opuntia stricta - Desert Rose</td>
<td>2' x 3'</td>
<td>Full sun</td>
<td>Low</td>
<td>Spring</td>
</tr>
<tr>
<td></td>
<td>Phormium tenax - New Zealand Flax</td>
<td>15' x 4</td>
<td>Partial sun</td>
<td>Low-mod</td>
<td>Sp/Sum</td>
</tr>
</tbody>
</table>

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Section Three — Design Guidelines

### Figure 14 - Regional Ornamental Plant Palette (cont.)

(3) Regional ornamental softscape types are used sparingly along the corridor and are designated for areas of highest visual impact.
22.0 WILDLIFE CROSSINGS AND PROTECTION

22.1 Engage appropriate agencies in the planning and design of wildlife crossings.
Engage federal, state, and local agencies and wildlife professionals in the planning and
design of wildlife crossings from the initial
planning stages through implementation.

- Coordinate information on historic mi-
gratory routes and daily wildlife move-
ments to situate crossing structures in
appropriate locations.
- Track locations of wildlife-related auto-
mobile accidents and explore designs to
minimize these collisions.

22.2 Use ecologically-appropriate wildlife cross-
ing structures that meet the needs of spe-
cific wildlife species in order to improve
movement and safety along the corridor.
Analyze wildlife behavioral traits to de-
sign effective crossing structures that
meet the needs of all species that will use a
structure.

- Specific design criteria varies with each
species. Consider larger species, such as
deer, and smaller species, such as coyotes.
- Ensure structures complement the pri-
mary defense strategy for each wildlife
species. For instance, animals such as
deer, elk, pronghorn, and bighorn sheep
depend on good visibility as a key de-
fense mechanism.

- Use open-span bridges and culverts that
are oriented perpendicular to the road
in order to reduce the overall crossing
length and improve visibility. Propor-
tionately increase the size of the under-
pass as the length increases.
- Restore vegetation leading up to wild-
life crossings and provide cover to shield
each crossing entrance from the road
while maintaining clear visibility through
the crossing.
- Within underpasses, incorporate natu-
rally occurring materials that exist in ad-
jacent areas.
- Wildlife underpasses or overpasses com-
bined with fencing have the highest doc-
umented rates of success for large and
small animals. Most successful crossing
structures are open-span bridges with
sloping sidewalks.
- Road underpasses may be constructed of
concrete boxes, elliptical metal culverts,
or open-span bridges. Increased width
and height of structures usually corre-
late with increased use by large mam-
mals. Culvert sizes range from 6.5 feet by
6.5 feet for small animals, to an opening
width of 40 feet by a height of 16 feet
for larger animals. Where possible, use
natural bottoms for underpasses. Deter-
mine the actual size, location, and type
of structure on a site by site basis.
- Placement of underpasses in relation to
an animal’s habitat is crucial. The habi-
tat within the crossing structure should
also be enhanced to encourage use by
wildlife.
- Limit human use of the underpass struc-
tures when possible.

22.3 Use different types of fencing as appropri-
ate for different animals.

- Recommended fencing for deer is an 8
foot high, variable-expanded metal mesh
fence. Metal mesh fencing should be fas-
tened to metal wire. Barbed wire is unac-
ceptable. Fencing should occur on both
sides of the road, and should extend to
the underpass or overpass entrance.
- Incorporate breaks, known as jump-outs,
in areas with continuous fencing to en-
able wildlife trapped within the road
corridor to escape and return to habitat
areas.

22.4 Develop a monitoring system for all major
wildlife crossings to document crossing use
and to collect data for similar projects.
Several studies in other states indicate
that significant movement and migratory
disruptions have occurred due to high-
way construction. Movement and behav-
ior at crossings and other highway loca-
tions should be monitored to help increase
the success of these facilities as part of
ongoing interagency cooperative research.

22.5 The design of crossings may create oppor-
tunities to observe animal movements.
Consideration should only be given when
observation points are designed so as not
to interfere with wildlife movement.

22.6 Design wildlife crossing structures to blend
with surrounding landscape.
Visually screened bridges and culverts re-
cede into the landscape. Combine recre-
ational trails and wildlife crossings as part
of bridge and culvert crossings where
feasible.
23.0 CONSTRUCTION PRACTICES

23.1 Clear the site only within the limits of construction.
Avoid the visual scars and plant disturbance from excessive site disturbance.

23.2 Protect important environmental, landscape, and cultural features.
Identify and protect all areas to be preserved prior to construction. These include trees, shrubs, landscape and cultural features, and environmentally sensitive areas.
- Fence areas where vegetation is to remain. Avoid disturbance and compaction of the ground.
- Maintain and enhance existing groundcover to ensure that the area is left in a condition consistent with the natural surroundings.

23.3 Utilize Best Management Practices (BMPs) and appropriate short term stabilization measures to prevent erosion and sedimentation during construction.
Perform a site risk assessment prior to construction to determine the threat of introducing sediments and pollutants into nearby surface waters and drainage systems.
- Utilize short term BMPs to reduce sedimentation and pollutant runoff during construction.
- Consider site specificity, timing of execution, and application of man-made devices and/or vegetative or organic cover to stabilize banks during construction.
- Research alternatives to hard surface paving.

23.4 Carefully manage and dispose of waste material.
Asphalt millings inhibit slope revegetation, contaminate adjacent soils, and create a cluttered, unfinished appearance.
- Avoid placing disposed milled asphalt on highway shoulders.

23.5 Salvage and store topsoil and native plant materials.
After soil erosion and sediment control measures have been implemented and before grading work begins, remove and store topsoil for project re-use.
- Salvage areas should be designated on plans and staked on the site.
- Salvaged plant materials should be stored and maintained during construction, prior to replanting.
- Stripped topsoil in excess of the quantity required for the project should be stored at specified locations for future use.
- Topsoil of lesser quality can be blended with soil amendments to improve condition for final bedding.

23.6 Carefully consider location/reclamation of construction areas.
Construction staging areas, borrow pits, and other construction areas must be carefully located and returned to a condition that is equal to or better than original, and consistent with the Corridor Plan design guidelines.

(1) Milled asphalt on highway shoulders detracts from the overall visual quality of the landscape.
24.0 MAINTENANCE FACILITIES AND PRACTICES

24.1 Locate and screen maintenance staging areas in visually unobtrusive areas.

Maintenance staging areas should be adequately set back from the highway. Where possible, site facilities so they are screened from the highway by existing landforms.

- Screen maintenance areas, particularly stockpiles, borrow pits, and equipment from the highway and adjacent developed property.
- Consider security fencing, landscape, and architectural solutions.

Grading and drainage is the most important consideration in site planning and design of a maintenance area in order to prevent any environmental damage that could result from leachates in salt and gravel stockpiles. The NDOT Best Management Practices Manual outlines additional points for consideration when planning for maintenance staging areas, including the following:

- Cover salt and sand piles to avoid watercourse and groundwater degradation.
- Provide space for equipment storage, vehicles, and supplies, as well as employee or visitor parking.
- Consider future expansion needs.

24.2 Coordinate with maintenance personnel when planning and designing maintenance areas.

Planning and design of maintenance areas requires close cooperation between designers and the personnel directly responsible for their use.

24.3 Consult BMPs and provide for efficient and effective maintenance of landscape and aesthetic treatments.

With few exceptions, new landscape and aesthetics projects are designed to be low maintenance. Refer to the NDOT Landscape and Aesthetics Maintenance Manual. Provide areas where maintenance equipment can be conveniently located. Consider maintenance routines required for the design program and identify areas that may need additional care or attention initially and/or as the project matures. NDOT maintenance practices include:

- Trash and debris removal.
- Surface finish maintenance (painting, patching, and graffiti removal).
- Grading and earthwork.
- Ground treatment (raking, replacing mulch or decorative rock, and reconfiguring drainage structures).
- Weed control.
- Plantings (interim, temporary, and permanent irrigation; trimming; pruning of shrubs and trees; manual weed control; and fertilizing).
- Disease and pest management (including invasive species control).
- Repair and replacement of structural and electrical components, irrigation, signage, and lighting.

24.4 Create a visual design unity among all existing and new structures based on the design theme.

Ensure a visual design relationship exists among all highway structures. This includes coordinating materials, patterns, and color.

- Ensure structures can be readily patched or painted with matching colors. When paint or stain repair is made, make sure repairs cover the entire surface and extend to joints and logical edges.
- Use anti-graffiti treatment on detailed sculptural elements.
- District level maintenance teams should use the same color palette for all maintenance and repairs (refer to Color Palatte guideline, page 3.21, for more information).
- If no logical edge or joint exists, feather edges of paint.

24.5 Avoid pruning or shearing plant material except as required to remove dead, damaged, or diseased plant part or to provide clear visibility for traffic conditions.
25.0 RECOMMENDATIONS FOR SUSTAINABLE HIGHWAY ENVIRONMENTS

25.1 Use three key principles in highway construction and natural resource management to create sustainable highway environments—avoid, minimize, and mitigate. Concepts central to these principles include:

- Water conservation: efficiency, protection, and reuse.
- Construction materials selection: reduce, reuse, and recycle.
- Air quality protection.
- Energy efficiency: use renewable energy.
- Design innovation.

25.2 Techniques for creating sustainable highway environments.

- Develop systems to encourage sustainable highways. Develop performance standards, monitoring procedures, and promote coordination between environmental and transportation agencies. Promote environmental education for project staff and the public.
- Preserve air quality. Use construction mitigation techniques to minimize dust from construction sites.
- Minimize energy consumption and incorporate alternative energy sources. Where possible, use solar powered electronic signs, low energy use lights (such as LED), and passive solar design.
- Use recycled materials for construction. When applicable, use reclaimed concrete and asphalt, scrap tires, plastics, steel slag, roofing shingles, coal fly ash, and composted municipal organic wastes.
- Reduce waste. Waste reduction concepts include right-of-way management, re-use of organic materials from cleaning and grubbing operations, deconstruction of removed buildings, water conservation, and selection of long-lived materials.

25.3 Utilize sustainable development principles in the design and construction of the highway corridor.

Sustainable design is a holistic philosophy that includes all aspects of function and construction operations including, but not limited to: energy use, air quality, material selection, energy generation, water conservation, heat and solid waste, and habitat enhancement and protection.

- Consider sustainability in both the design and construction of highway systems.
- Prepare whole life costing studies in the planning stages of highway projects. Whole life costing is a process that evaluates every cost incurred in respect of a facility or product from inception to disposal.
- Restore disturbed man-made and natural habitats as an important component in achieving a sustainable highway related landscape.

25.4 Use recycled materials for construction.

Asphalt pavements, concrete, base courses, and embankments increasingly have incorporated ‘waste’ resources instead of raw materials. Reclaimed concrete and asphalt, scrap tires, plastics, steel slag, roofing shingles, coal fly ash, and composted municipal organic wastes are proven, cost effective, and high-efficiency materials with broad applicability in roadway construction. The Recycled Materials Resource Center at the University of New Hampshire was established by Congress to research and encourage recycling in the highway environment.

- Apply recycled materials like reclaimed asphalt paving (RAP), coal fly ash, and blast furnace slag. Use other materials (e.g. foundry sands, steel slags), when available locally, in response to specific market forces.
- Consider several methods of sustainable asphalt pavement construction and reuse. Asphalt may be stripped from a road surface, crushed, and used as granular or hot mix on the same or future road construction projects, reducing the amount of virgin aggregate and oil used. On-site surface recycling involves removing and replacing the top layers of a pavement structure for the purpose of repairing a wide range of pavement distress (surface cracking, raveling, and rutting). Advanced pavement recycling equipment can be used to recycle the bottom lift and place virgin hot mix for the final lift.
- Crushed glass and crushed brick should be used as substitute for aggregates in pavement.
- Where possible, use fly ash in concrete and soil stabilization.
- Consider the use of recycled materials for road base, road surface, sound walls, and ground surfacing/mulch.
- Incorporate recycled materials in guardrails. For example, use cross rails constructed of recycled plastic.
- Identify the state’s recycled products manufacturers and the products’ potential for use in road construction.
- Identify material suppliers capable of producing recyclable materials.
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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.
- Bridgename prediction or 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, and decorative plantings, 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 treatment correlates 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.
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:

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 44-411). The approximate softscape and hardscape costs to develop one mile of corridor right-of-way at each treatment level were estimated.
SECTION ONE: Cost Analysis

**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
SECTION ONE: Cost Analysis

Chapter Four — Cost Analysis and Implementation

FIGURE 20 - FREEWAY OR ELEVATED HIGHWAY INTERCHANGES
Softscape Types - Ground Treatment/Native Revegetation
Structures and Hardscape Type - Standard

Guardrail
Rock mulch
Bridge with standard aesthetic treatment
5' concrete walkway
Revegetation with scattered rock

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

Guardrail
Tree
Pedestrian/bikeway
Bridge with aesthetic treatment
Rock mulch
Groundcover/shrubs
Revegetation with scattered rock

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

Retaining wall
Landscape light
Guardrail
Pedestrian/bikeway
Bridge with aesthetic treatment
Tree
Groundcover/shrubs
Rock mulch
Revegetation with scattered rock

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

Groundcover/shrubs
Retaining wall
Tree
Pedestrian/bikeway
Bridge with aesthetic treatment
Accent tree
Rock mulch
Landscape light

Total Cost: $4,704,000 (infield landscape and bridge deck)
L & A Cost: $2,705,000/acre
SECTION ONE: Cost Analysis

**Figure 24 - Two-Lane Suburban Highway**
Softscape Types - Ground Treatment/Native Revegetation
Structures and Hardscape Type - Standard

- 6' Sidewalk
- Street light
- 2' Curb and gutter
- Bike lane
- Revegetation with scattered rock
- Striped crosswalk

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

- 6' Sidewalk
- Street light
- 2' Curb and gutter
- Street trees
- Shrubs and groundcovers
- Bike lane
- Revegetation with scattered rock
- Bus stop with bench (turn-out lane recommended)
- Striped crosswalk

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

- 6' Sidewalk
- Street light
- 2' Curb and gutter
- Street trees
- Shrubs and groundcovers
- Bike lane
- Revegetation with scattered rock
- Bus stop with bench and shelter (turn-out lane recommended)
- Striped crosswalk

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

- 6' Sidewalk
- Street light
- 2' Curb and gutter
- Street trees
- Shrubs and groundcovers
- Bike lane
- Revegetation with scattered rock
- Bus stop with bench and shelter (turn-out lane recommended)
- Colored crosswalk and intersection paving

Total Cost: $3,188,000 - $4,856,000/mile of ROW
L&A Cost: $1,366,000 - $2,719,000/mile
SECTION ONE: Cost Analysis

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4.7

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

10' Sidewalk
Street light
4' Tighter scoring pattern in the 12' sidewalk
Bike lane
Striped crosswalk

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

10' Sidewalk
Street light
4' Tighter scoring pattern in the 12' sidewalk
Bike lane
Bench and pedestrian amenities
Street tree
Striped crosswalk

Total Cost: $3,830,000 - $4,450,000/mile of ROW
L&A Cost: $1,198,000 - $2,201,000/mile

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

10' Sidewalk with pavers
Street light
Bike lane
Bus shelter, bench, and pedestrian amenities
Street tree
Enhanced crosswalk
Bollard

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

10' Sidewalk with pavers and stone
Street light
Street tree
Bike lane
Bus shelter, bench, and pedestrian amenities
Enhanced crosswalk and intersection paving
Bollard

Total Cost: $6,248,000 - $9,060,000/mile of ROW
L&A Cost: $2,722,000 - $4,979,000/mile
**Chapter Four — Cost Analysis and Implementation**

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**FIGURE 32 - THREE-LANE SUBURBAN HIGHWAY**
Softscape Types - Ground Treatment/Native Revegetation
Structures and Hardscape Type - Standard

- 6' Sidewalk
- Street light
- 2' Curb and gutter
- Bike lane
- Revegetation with scattered rock
- Striped crosswalk

**FIGURE 33 - THREE-LANE SUBURBAN HIGHWAY**
Softscape Types - Enhanced Native
Structures and Hardscape Type - Accentuated

- 6' Sidewalk
- Street light
- 2' Curb and gutter
- 4' Bike lane
- Street trees
- Shrubs and groundcovers
- Bike lane
- Revegetation with scattered rock
- Bus stop with bench
- Striped crosswalk

**FIGURE 34 - THREE-LANE SUBURBAN HIGHWAY**
Softscape Types - Regionally Adapted
Structures and Hardscape Type - Focal

- 6' Sidewalk
- Street light
- 2' Curb and gutter
- 4' Bike lane
- Street trees
- Shrubs and groundcovers
- Bike lane
- Revegetation with scattered rock
- Bus stop with bench and shelter
- Striped crosswalk

**FIGURE 35 - THREE-LANE SUBURBAN HIGHWAY**
Softscape Types - Regional Ornamental
Structures and Hardscape Type - Landmark

- 6' Sidewalk
- Street light
- 2' Curb and gutter
- 4' Bike lane
- Street trees
- Shrubs and groundcovers
- Bike lane
- Revegetation with scattered rock
- Bus stop with bench and shelter
- Colored crosswalk and intersection paving

**TABLE 1: TOTAL COSTS**

<table>
<thead>
<tr>
<th>FIGURE</th>
<th>SOFTSCAPE TYPES</th>
<th>STRUCTURES AND HARDSCAPE TYPES</th>
<th>TOTAL COST (MILE)</th>
<th>L&amp;A COST (MILE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>Ground Treatment/Native Revegetation</td>
<td>Standard</td>
<td>$1,845,000 - $2,166,000/mile</td>
<td>$0.00/mile</td>
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<td>33</td>
<td>Enhanced Native</td>
<td>Accentuated</td>
<td>$1,910,000 - $2,277,000/mile</td>
<td>$65,000 - $111,000/mile</td>
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<tr>
<td>34</td>
<td>Regionally Adapted</td>
<td>Focal</td>
<td>$2,408,000 - $2,839,000/mile</td>
<td>$563,000 - $673,000/mile</td>
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<tr>
<td>35</td>
<td>Regional Ornamental</td>
<td>Landmark</td>
<td>$3,340,000 - $5,096,000/mile</td>
<td>$1,495,000 - $2,930,000/mile</td>
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</table>
SECTION ONE: Cost Analysis

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
SECTION ONE: Cost Analysis

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**FIGURE 40 - FOUR-LANE SUBURBAN HIGHWAY**
Softscape Types - Ground Treatment/Native Revegetation
Structures and Hardscape Type - Standard

- 10' Sidewalk
- Street light
- 2' Curb and gutter
- Bike lane
- Revegetated raised median
- Revegetation with scattered rock
- Striped crosswalk

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

- 10' Sidewalk
- Street light
- 2' Curb and gutter
- Bike lane
- Raised median with enhanced native planting
- Street trees
- Shrubs and groundcovers
- Bike lane
- Revegetation with scattered rock
- Bus stop with bench
- Striped crosswalk

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

- 10' Sidewalk
- Street light
- 2' Curb and gutter
- Bike lane
- Raised median with regionally adapted planting
- Street trees
- Shrubs and groundcovers
- Bike lane
- Revegetation with scattered rock
- Bus stop with bench and shelter
- Striped crosswalk

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

- Street light
- 10' Sidewalk
- 2' Curb and gutter
- Bike lane
- Raised median with regional ornamental planting
- Street trees
- Shrubs and groundcovers
- Bike lane
- Revegetation with scattered rock
- Bus stop with bench and shelter
- Striped crosswalk
- Colored crosswalk and intersection paving

Total Cost: $5,173,000 - $8,025,000/mile of ROW
L&A Cost: $2,397,000 - $4,759,000/mile
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FIGURE 44 - FOUR-LANE DOWNTOWN HIGHWAY
Softscape Types - Ground Treatment/Native Revegetation
Structures and Hardscape Type - Standard

- 12’ Sidewalk
- Street light
- Revegetated raised median
- On-street parallel parking
- Striped crosswalk

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

- 12’ Sidewalk
- Street light
- 4’ Accentuated paving area in the 12’ sidewalk
- Raised median and enhanced native planting
- On-street parallel parking
- Street tree
- Striped crosswalk
- Curb extension

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

- 12’ Sidewalk with pavers
- Street light
- On-street parallel parking
- Raised median with regionally adapted planting
- Bus shelter, bench, and pedestrian amenities
- Street tree
- Enhanced crosswalk
- Bollard
- Curb extension

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

- 12’ Sidewalk with pavers and stone
- Street light
- On-street parallel parking
- Street tree
- Raised median with regional ornamental planting
- Bus shelter, bench, and pedestrian amenities
- Enhanced crosswalk and intersection paving
- Bollard
- Curb extension

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**

- **Native Revegetation**
  - Standard
- **Enhanced Native**
  - Accentuated
- **Regionally Adapted**
  - Focal
- **Native Revegetation**
  - Standard

\[
\begin{align*}
\text{Mile 1:} & \quad 1 \text{ mile} \times \$0 \text{ per mile} \\
\text{Mile 2:} & \quad 1 \text{ interchange} \times \$353,000 \text{ per interchange} \\
\text{Mile 3:} & \quad 2 \text{ miles} \times \$160,000 \text{ per mile} \\
\text{Mile 4:} & \quad 1 \text{ mile} \times \$2,072,000 \text{ per mile} \\
\text{Mile 5:} & \quad 1 \text{ mile} \times \$0 \text{ per mile}
\end{align*}
\]

\[
\text{Total L&A cost:} \quad \$0 \text{ L&A cost} + \$353,000 \text{ L&A cost} + \$320,000 \text{ L&A cost} + \$2,072,000 \text{ L&A cost} + \$0 \text{ L&A cost} = \$2,745,000 \text{ L&A cost}
\]
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.

### SECTION ONE: Cost Analysis

#### Figure 49 - Total Life-cycle Maintenance Costs

\[
\text{Total Life Cycle Maintenance Cost} = \text{NDOT Standard Maintenance Cost (\$/year)} + \text{IA = Additional Landscaping Maintenance Cost (\$/year)} + \text{Annual Replacement & Repairs (\$/year)} + \text{U = Utilities (\$/year)} = \text{AMC = Estimated Annual Maintenance Cost (\$/year)} \\
\text{Number of Years} = X
\]

*Refer to Landscape Treatment Type and Maintenance Cost Matrix

#### Figure 50 - Maintenance Costs for Landscape Treatment Types

<table>
<thead>
<tr>
<th>Treatment Type</th>
<th>Standard</th>
<th>Accentuated</th>
<th>Focal</th>
<th>Landmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Treatment</td>
<td>High: $1,655.11; Median: $888.79; Low: $500.00</td>
<td>High: $2,303.39; Median: $1,524.00</td>
<td>Not Available*</td>
<td></td>
</tr>
<tr>
<td>Native Plant Revegetation</td>
<td>$720.00*</td>
<td>$1,676.40*</td>
<td>$600.00*</td>
<td>Not Available*</td>
</tr>
<tr>
<td>Enhanced Native</td>
<td>$1,201.42 (based on one project only)</td>
<td>$1,099.87 (based on one project only)</td>
<td>Entire Rest Area: High: $8,482,000; Low: $55,374.80</td>
<td>Welcome Center, Memorial Park; Cost not available</td>
</tr>
<tr>
<td>Regionally Adapted</td>
<td>High: $15,504.00; Median: $3,136.00; Low: $673.02</td>
<td>High: $15,242.45; Median: $5,445.00; Low: $1,448.07</td>
<td>$3,054.35 (based on one project only)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Regional Ornamental</td>
<td>High: $11,757.11; Median: $7,200.00; Low: $453.30</td>
<td>High: $8,300.00; Median: $5,425.74; Low: $5,279.50</td>
<td>$3,055.00 (based on one project only)</td>
<td>$9,214.70; Median: $8,391.49; Low: $3,525.82</td>
</tr>
<tr>
<td>Turf</td>
<td>High: $2,125.46; Median: $6,057.00; Low: $1,525.79</td>
<td>$3,178.37 (based on one project only)</td>
<td>Highs: $10,303.33; Low: $3,350.00 (based on two projects, only)</td>
<td></td>
</tr>
</tbody>
</table>

High: Single project with highest cost
Median: Distribution of projects between high and low cost
Low: Single project with lowest cost
* Natural Revegetation costs are assumed to be 10% more than Ground Treatment categories costs.

All entries are per acre annual costs unless otherwise noted.
* Prepared by UNLV Landscape Architecture and Planning Research Office

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

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.

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.

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

#### Table: Potential Funding Opportunities

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<th>Lead Agency</th>
<th>Coordinating Agency</th>
<th>Possible Funding Sources</th>
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<td>Community Gateways</td>
<td>Community</td>
<td>NDOT</td>
<td>Enhancement Fund, Community Match, SAFETEA-LU, SFG</td>
</tr>
<tr>
<td>Upgrade Downtown Streetscape</td>
<td>Community</td>
<td>NDOT</td>
<td>Enhancement Fund, Community Match, Landscape and Aesthetics up to 3% for new construction, SAFETEA-LU, SFG</td>
</tr>
<tr>
<td>Upgrade Suburban Streetscape</td>
<td>Community (with Developer support)</td>
<td>NDOT</td>
<td>Enhancement Fund, Community Match, Landscape and Aesthetics up to 3% for new construction, SAFETEA-LU, SFG</td>
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<tr>
<td>Upgrade Rural Streetscape</td>
<td>Community (with Developer support)</td>
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<td>Pedestrian Crossings</td>
<td>Community</td>
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<tr>
<td>Standard Sidewalk</td>
<td>NDOT</td>
<td>Community</td>
<td>NDOT funding</td>
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<tr>
<td>Enhanced Sidewalk</td>
<td>Community</td>
<td>NDOT</td>
<td>Enhancement Fund, Community Match, Landscape and Aesthetics up to 3% for new construction, Developers building adjacent to the ROW, SAFETEA-LU, SFG</td>
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<td>NDOT</td>
<td>County &amp; Communities</td>
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<td>NDOT</td>
<td>NDSP</td>
<td>NDOT funding sources, SAFETEA-LU, SFG</td>
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<td>Statewide Place Name Sign Program</td>
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<td>NDOT funding sources, NCOT grant, SAFETEA-LU, SFG</td>
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<td>Audio Interpretation Program</td>
<td>NDOT</td>
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<td>NDOT funding sources, NCOT grant, SAFETEA-LU, SFG</td>
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<td>NDOT</td>
<td>Enhancement Fund, SAFETEA-LU, SFG</td>
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<td>Color Palette Retrofit of Existing Facilities</td>
<td>NDOT</td>
<td>Community</td>
<td>Enhancement Fund, Community Match, SAFETEA-LU, SFG</td>
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<td>Non-Motorized Transportation Systems</td>
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<td>NDOT</td>
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<td>Enhancements to Highway Facilities Above What the 3% Would Achieve</td>
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<td>Community</td>
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<td>NDOW</td>
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<td>Anti-littering Campaign</td>
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<td>Communities</td>
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<td></td>
<td>NDOT funding, SAFETEA-LU, SFG</td>
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</tbody>
</table>

**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.
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 reuse 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.

WEST WENDEOVER 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.

ENTIRE CORRIDOR

- Utilize sustainable rainwater harvesting techniques to address drainage and stormwater issues.
- 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 reuse 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.

TRAILS

- Existing Regional Trail.

SCALE: 1 inch equals 10 miles.
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

SCALE: 1 inch equals 10 miles
Conclusion
Conclusion

The US 93, East US 6, and East US 50 Landscape and Aesthetics Corridor Plan represents a significant step in Nevada’s renewed commitment to landscape and aesthetics as integral elements of the state’s highway system. This document guides decisions and policies that affect the aesthetic quality of Nevada’s highways, both on a corridor-wide basis and down to the level of individual projects. It presents extensive research and analysis of Nevada’s existing conditions, its highway corridors, and its scenic natural landscapes. The Corridor Plan describes the composition of elements and programs that will be used to enhance the level of landscape and aesthetics across the state. Perhaps most importantly, the Corridor Plan sets the stage for the following discussions:

- Facilitation of community improvements
- Implementation strategies
- Cost evaluation/strategies
- Priorities and scheduling
- Visual preference evaluation

To accomplish an increased level of landscape and aesthetics for Nevada’s highways, the Corridor Plan has detailed a new NDOT standard level of treatment for capital projects. The new standard significantly enhances the basic level of aesthetics on all future projects.

The Corridor Plan is a public/private partnership initiative. The Plan provides the foundation for this unique initiative to build a comprehensive vision for the landscape and aesthetics of the corridor. The partnership policy, outlined in the NDOT Landscape and Aesthetics Master Plan, states the unique and exciting result of this process.

Many groups, agencies, and individuals reviewed the Corridor Plan in order to provide endorsement. Additionally, the planning process has received high recognition from various organizations. This is evidence that the intent of this document to inspire and encourage context-sensitive solutions will be realized. As a result, the landscape and aesthetics of Nevada’s highway corridors will experience significant benefits in the years to come.

Highways can be perceived as edges or boundaries that separate city or landscape. Interchanges are seen as intersections, nodes, and gateways. These perceptions argue strongly for a design approach that recognizes cultural boundaries and deals with the landscape and aesthetic design of the highway as a corridor segment, rather than on an individual project basis.
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SECTION ONE: Potential Community Funding Sources

STATE AND FEDERAL GRANT PROGRAMS

Funding sources and their structure within NDOT are described in the Program Development Manual. Numerous state and federal funding programs exist for use by communities for highway and community improvements. The following list provides a summary of a few of the funding sources communities may consider as they develop projects. Additional funding opportunities are available when other issues are present, such as a brownfield site located along a highway, tribal land influences, and the presence of historic structures. A list of federal grants is also located at http://www.grants.gov.

Communities should review each grant and determine its applicability for a specific project. Separate projects addressing the same issue may be combined and submitted as a single grant application. Many programs overlap, and proponents may use a combination of the funding and organizational resources listed below, as well as others that might not be shown.

Nevada Grant Programs

Nevada Division of Forestry
Nevada Urban and Community Forestry Southern Region Grant Project and the Northern Nevada Urban and Community Forestry Grant Program
Funds, education, and outreach related to the urban forest, including planning, management, restoration, and sustainability improvements. A tree planting component must be no more than 50% of the project.
http://www.forestry.nv.gov/docs/summary2_012204.pdf
http://www.forestry.nv.gov

Nevada Department of Cultural Affairs
Nevada Arts Council
Provides a quarterly grant program to assist artists, support exemplary art projects, and support a variety of other art related efforts.
http://dmla.clan.lib.nv.us/docs/arts/NACintropgs/grantsfororgs.htm

Nevada Division of Environmental Protection
Nevada Brownfields
Agency provides access to funding for brownfield redevelopment. Administered through the U.S. Environmental Protection Agency (EPA), the program allows communities to establish their own brownfields program by designating an area where redevelopment is to be targeted. Additional funds may be awarded for projects categorized as Demonstration Pilots and have a greenspace component. These monies can be accessed through the Brownfields Assessment Demonstration Pilots and Supplemental Assistance for Demonstration Pilots application processes.
http://www.ndep.nv.gov/bca/brownfld_2.htm

ArtsREACH
Provides modest grants to partnerships of cultural, business, social, government, civic, and religious organizations. ArtsREACH is a National Endowment for the Arts (NEA) pilot program designed to increase the level of direct NEA grant assistance to arts organizations in underserved areas.
http://arts.endow.gov

Clorox Company Foundation (Reno)
The Clorox Company Foundation is dedicated to improving the quality of life in communities where Clorox employees live and work. The Foundation makes grants, mobilizes employee volunteers, and works with community leaders and other funders.
http://www.thecloroxcompany.com/community/index.html

Grantmakers in Nevada
Lists a variety of potential grants within Nevada.
http://www.fundsnetservices.com/nevada.htm
SECTION ONE: Potential Community Funding Sources

Federal Grant Programs
Federal grant program information can be found by accessing the Catalog of Federal Domestic Assistance (CFDA) at www.cfda.gov. The CFDA is a database of all federal programs available to state and local governments; federally-recognized Indian tribal governments; domestic public, quasi-public, and private profit and nonprofit organizations and institutions; specialized groups; and individuals. The grant programs can be found by selecting the “Search for Assistance Program” on the CFDA website and entering the provided “Program Number.”

National Trust for Historic Preservation
Main Street Approach
Community-driven comprehensive methodology to revitalize older, traditional business districts throughout the United States. The underlying premise is to encourage economic development within the context of historic preservation. The strategy includes community-based, grassroots revitalization efforts.
http://www.mainstreet.org/content.aspx?page=3&section=2

National Park Service
Tribal Preservation Program
Assists tribes in preserving historic properties. The grants provide much needed assistance to tribal communities interested in protecting their cultural heritage.
http://www.cr.nps.gov/hps/tribal/index.htm

Historic Preservation Fund
Provides funding support to State Historic Preservation Offices which administer state grants for historic preservation.
http://www.cr.nps.gov/hps/hpf/hpfquest.htm

US Department of Agriculture
Business and Industrial Loans
Assists rural areas in obtaining quality loans for the purpose of improving the economic and environmental climate in rural communities including pollution abatement and control.
Search: Program Number 10.768

Intermediary Re-lending Program Loans
Provides loans for business facilities or community development in rural areas.
Search: Program Number 10.767

Empowerment Zones Program
Provides for the establishment of empowerment zones and enterprise communities in rural areas to stimulate the creation of new jobs, particularly for the disadvantaged and long-term unemployed, and to promote revitalization of economically distressed areas.
Search: Program Number 10.772

Rural Business Enterprise Grants
Facilitates the development of small and emerging private business, industry, and related employment for improving the economy in rural communities.
Search: Program Number 10.769

Rural Development
Provides services to further economic development in rural communities. Grants.gov provides information on more than 1,000 federal grant programs, totaling about $400 billion in funding each year. Rural communities can access funding opportunities at www.grants.gov and then type "rural" in the search section of the website.
http://www.rurdev.usda.gov/nv/offices/offices.htm

Small Business Innovation Research Grants
Provides monies to stimulate technological innovation in the private sector and strengthen the role of small businesses in meeting federal research and development needs.
Search: Program Number 10.212

Fund for Rural America: Research, Education, and Extension Activities Grant Program
Supports unique, innovative, and high-impact research education, and extension projects to aid farmers, ranchers, and rural communities to address changes and challenges facing agriculture and rural communities as a result of fundamental reforms to federal farm programs.
Search: Program Number 10.224

US Department of Commerce
Economic Adjustment Program Grants
Assists state and local interests with the design and implementation of strategies to adjust or bring about change to an economy.
Search: Program Number 11.307

Public Works and Development Facilities Grants
Promotes long-term economic development and assists in the construction of public works and development facilities needed to initiate and support the creation or retention of permanent jobs in the private sector in areas experiencing substantial economic distress.
Search: Program Number 11.300

National Technical Assistance Program
Provides funds to 1) enlist the resources of designated university centers in promoting economic development, 2) support innovative economic development projects, 3) disseminate information and studies of economic development issues of
national significance, and 4) finance feasibility studies and other projects leading to local economic development.
Search: Program Number 11.303

US Department of Defense
Community Economic Adjustment Funding
Alleviates serious economic impacts that result from Department of Defense program changes.
Search: Program Number 12.600

Community Economic Adjustment Planning Assistance
Responds to military base closures and realignments.
Search: Program Number 12.607

US Department of Housing and Urban Development
Community Development
Awards grants to entitlement community grantees to carry out a wide range of community development activities directed toward revitalizing neighborhoods, economic development, and providing improved community facilities and services.
http://www.hud.gov/local/nv/community/cdbg/index.cfm
http://www.hud.gov/grants/index.cfm

Rural Housing and Economic Development
Expands the supply of affordable housing and access to economic opportunities in rural areas.
Search: Program Number 14.250

US Department of Interior
Historic Preservation Fund
1) Provides matching grants to states for the identification, evaluation, and protection of historic properties; 2) provides matching grants to states to expand the National Register of Historic Places and assist in carrying out historic preservation activities; and 3) provides grants to Native American tribes and Alaskan Native Corporations to preserve their culture.
Search: Program Number 15.904.

Rivers, Trails and Conservation Assistance
Provides staff assistance to support partnerships between government and citizens to increase the number of rivers and landscapes protected and trails established nationwide.
Search: Program Number 15.921

Federal Highway Administration (FHWA)
Scenic Byways Discretionary Program
Provides funds to accomplish projects on national scenic byways, all American roads, America’s byways, state scenic byways, and Indian tribe scenic byways. Selected projects recognize state priorities and should benefit the byway traveler’s experience, whether it will help manage the intrinsic qualities that shape the byway’s story, interpret the story for visitors, or improve facilities along the byway used by visitors.
http://www.bywaysonline.org/grants/

Public Lands Highways Discretionary Program
Provides funds to improve access to and within the nation’s federal lands. Monies have been used for adjacent vehicular parking areas; interpretive signage; acquisition of necessary scenic easements and scenic or historic sites; provision for pedestrians and bicycles; construction and reconstruction of roadside rest areas (including sanitary and water facilities), transit facilities, and appropriate public road facilities, such as visitor centers, as determined by the Secretary. The replacement of the federally owned bridge over the Hoover Dam in the Lake Mead National Recreation Area between Nevada and Arizona was funded through the program.

National Recreational Trails Fund
Funds trails and trail-related projects such as urban trails, maintenance, restoration, easement acquisition, and trail-side and trailhead facilities.
http://www.off-road.com/4x4web/land/nrtfaq.html
SECTION TWO: Reference Studies

Other agencies, organizations, and institutions previously completed studies relating to the US 93, East US 6, and East US 50 Corridor Plan. Communities and agencies may reference them to gain additional insight regarding project opportunities and obtain relevant background information. Following is an initial list of documents made known to the planning team during the planning process. Project planners and designers should coordinate with the local town and county and relevant federal and state agencies to determine if additional information is available.

**Urban Forestry Guide**

**Landscape Master Plans**

**Ely**

**Lincoln County**
SECTION THREE:
Mapping Ecosystems
Along Nevada Highways

MAPPING ECOSYSTEMS ALONG NEVADA HIGHWAYS AND THE DEVELOPMENT OF SPECIFICATIONS FOR VEGETATION REMEDIATION

This report has been prepared by Dr. Paul T. Tiller, Professor in the Department of Environmental and Resource Sciences at UNR, Dick Post, Horticulture Specialist with University of Nevada Cooperative Extension (Eminent) and Enne Nacan, a graduate student at UNR (now employed with the National Park Service at Point Reyes, California).

INTRODUCTION

This project was designed to inventory the major plant communities and general soil classification units along the various highways across the state, and to recommend the best procedures and management practices for vegetation remediation based on the appropriate ecosystems and soil types.

SALT DESERT SHRUB—Shadscale and Bailey's Greasewood Sites

Site Analysis

These sites are adjacent to many miles of highways in northern and central Nevada. This vegetation primarily follows the valley bottoms and usually accompanies many miles of relatively straight highways. The soils vary but can be neutral to somewhat strongly saline. They are generally saline to strongly saline over much of this vegetation type. Many of the soils are fairly saline. The surface soils are often restrictive to good water penetration. Some of the soils are quite saline, especially on sites supporting Bailey's greasewood. Many of the soils may have restrictive layers in the form of silts, or calcium carbonate dritpsites.

The floristics of this vegetation is quite simple. Only a few shrubby species are found associated with the shadscale and Bailey's greasewood. Some other common shrubs that might be present include green rabbitsbrush, salt sage, white sage (in some valleys), and spiny hopsage. Forbs are particularly wanting. They often consist of weeds such as mustards and lantana, and annual grasses, such as cheatgrass. One important native forb is globe mallow. Potential grasses include subergass, Indian ricegrass and squirreltail.

Species Selection

<table>
<thead>
<tr>
<th>Shrub</th>
<th>Lbs. seed/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shadscale—Atriplex confertiflora</td>
<td>2.0</td>
</tr>
<tr>
<td>Fourwing saltbush—Atriplex canescens</td>
<td>2.0</td>
</tr>
<tr>
<td>Spiny hopsage—Grypta sparsa</td>
<td>1.0</td>
</tr>
<tr>
<td>Gardner saltbush—Atriplex gardneri</td>
<td>0.5</td>
</tr>
<tr>
<td>Present summer cress—Kochia procerum</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Grasses

<table>
<thead>
<tr>
<th>Grass</th>
<th>Lbs. seed/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saltgrass—Distichlis spicata</td>
<td>2.0</td>
</tr>
<tr>
<td>Squirreltail—Elymus trachycaulus</td>
<td>1.0</td>
</tr>
<tr>
<td>Creeping wildrye—Elymus trachycaulus</td>
<td>1.0</td>
</tr>
<tr>
<td>Galaxa grass—Hilaria jonesii</td>
<td>0.5</td>
</tr>
</tbody>
</table>

09/20/02
### SECTION TWO: Mapping Ecosystems Along Nevada Highways

#### Technical Appendix

<table>
<thead>
<tr>
<th>Species</th>
<th>Seed Rate (lbs/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indian ricegrass – <em>Elymus hymenoides</em></td>
<td>2.0</td>
</tr>
<tr>
<td>Siberian wheatgrass – <em>Agronopron sibiricum</em></td>
<td>1.0</td>
</tr>
<tr>
<td>Alkali sacaton – <em>Sporobolus airoides</em></td>
<td>1.0</td>
</tr>
</tbody>
</table>

**Seeds**

1. Globe mallow – *Sphaeralcea coccinea* | 1.0
2. Yellow sweet clover – *Melilotus officinalis* | 2.0
3. Evening primrose – *Oenothera spp.* | 0.5

Total: 20.0 lbs/acre

In developing appropriate seed mixes, the cost of some of the less common seed may be prohibitive. This must, of course, be taken into consideration as the seed mixture is formulated and the total costs for the seed mixture is determined. In our mixtures we have, in some cases, used lower seeding rates because some of these less available seeds would be much more costly. However, their potential importance on these landscapes suggests that they be included in the mixtures.

### Site/Soil Preparation

Because these sites are often very dry, we recommend the use of some kind of mulch. For establishment supplemental irrigation would be very helpful, but water often is not available. In some cases, where you wish to obtain new vegetation with a high success rate, it might then be feasible to provide water for one or more supplemental irrigations by hauling water to the site. Often when seeding in shadecloth/kitай's greasewood sites, the remediation specialist must be prepared to seed the entire area perhaps two years in a row particularly if no supplemental irrigation is used.

These sites often would be relatively low in many nutrients, particularly nitrogen, and would require a fertilizer of some sort, possibly applied with the supplemental irrigation. Since the seed sources might be devoid of mycorrhizal fungi then an inoculant can be prescribed.

### Revegetation Procedures

These sites may vary from rocky to loamy soils. If the site has few rocks, it might lend itself to seeding with a drill. Also, unless the berms are quite steep the terrain in this type of vegetation is generally flat and could be drilled with a rangeboard drill or some other drill used for tough seeding.

### SALT DESERT SHRUB - BLACK GREASEWOOD SITES

#### Site Analysis

These sites are found in valley bottoms and usually have alkaline and saline soils with heavy clay horizons. Sometimes they are impounded with water. The total number of species is generally low, and for many months the sites are very dry. The dominant species is black greasewood (*Sarcobatus vermiculatus*) with only a few other species. Occasionally you will find marsh rushes (*Distichlis spicata*), salt grass (*Distichlis spicata*), squirreltail grass (*Elymus elymoides*), and globe mallow. These soils hold onto soil moisture tenaciously because of the heavy clay horizons. The salinity or alkalinity may impact the kinds of species that can be seeded there.

#### Species Selection

Even though there are few native adapted species, attempts will be made to select common species found on such sites or species that have similar characteristics and requirements. Woody species (shrubs), grasses and forbs will be included in the specified mixtures. The species listed below are recommended for mixtures to be used on these sites.

#### Shrubs

<table>
<thead>
<tr>
<th>Species</th>
<th>lbs/seed/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quail bush – <em>Artemisia lentiformi</em></td>
<td>1.0</td>
</tr>
<tr>
<td>Rubber rabbitbrush – <em>Chrysothamnus nauseosus</em></td>
<td>2.0</td>
</tr>
<tr>
<td>Greasewood – <em>Sarcobatus vermiculatus</em></td>
<td>2.0</td>
</tr>
<tr>
<td>Kochia – <em>Kochia prostrata</em></td>
<td>2.0</td>
</tr>
<tr>
<td>Fourwing saltbush – <em>Artemisia canescens</em></td>
<td>2.0</td>
</tr>
</tbody>
</table>

#### Grasses

<table>
<thead>
<tr>
<th>Species</th>
<th>lbs/seed/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkali sacaton – <em>Sporobolus airoides</em></td>
<td>1.0</td>
</tr>
<tr>
<td>Tall wheatgrass – <em>Agronopron elongatum</em></td>
<td>2.0</td>
</tr>
<tr>
<td>Great Basin wildrye – <em>Lepturus canescens</em></td>
<td>2.0</td>
</tr>
<tr>
<td>Salt grass – <em>Distichlis spicata</em></td>
<td>1.0</td>
</tr>
<tr>
<td>Squirreltail – <em>Elymus elymoides</em></td>
<td>0.5</td>
</tr>
</tbody>
</table>
SECTION TWO: Mapping Ecosystems Along Nevada Highways

Technical Appendix

SECTION TWO: Mapping Ecosystems Along Nevada Highways

Forbs
1. Desert globe mallow – Sphaeralcea ambigua 1.0
2. Yellow sweet clover – Melilotus officinalis 1.0
3. White evening primrose – Oenothera pallida 1.0
Total 3.2 lbs/acre

Site and Soil Preparation

Importing topsoil may be necessary for initial establishment of these species. Screened soil from nearby material pits or the soil used for the road platform, 1/8 inch or less, would be suitable for topsoil. It is also suggested to apply 250 pounds/acre of horticultural sulfur to reduce the soil pH, making the site more conducive to establishment of the seed mixture. It might be possible to break up these heavy clays with a large chisel or other implement behind a tractor. It might be feasible to provide supplemental irrigation by sprinkling to assist in establishment. This, however, would be somewhat costly unless a water source was near by. It might be possible to bring water in by tanker-truck on a one-time basis. Also a nitrogen fertilizer, such as ammonium sulfate can be applied.

Revegetation Procedures

These areas tend to be relatively flat, and thus a drill might be used to place the mixture into the soil. However, the roadside berm might be too steep for this. In addition to the mixture of seeds, it might be very helpful to acquire some container-grown material of four-wing saltbush and rubber rabbitbrush. Container-grown plants would require hand labor to place them in the relatively small areas to be revegetated. In order to reduce competition among the seeded species, it would be appropriate to place the container-grown plants apart from the seeded areas. In some cases different mixtures might be used to develop a pattern with grasses and forbs apart from areas seeded heavily with shrubs.

SAGEBRUSH SITES—LOWEST ELEVATION SITES WITH BIG SAGEBRUSH
Wyoming big sagebrush (Artemisia tridentata var. wyomingensis), bull big sagebrush (Artemisia tridentata tridentata) and black sagebrush (Artemisia nova).

Site Analysis

The site is dominated by big sagebrush with a number of potential grasses. Big sagebrush soils are often deep and relatively dark although they usually have little organic matter. The precipitation at the site is approximately 12 inches annually in the form of snow in winter and early spring. The goal of revegetation on disturbed sites is to compete with woody weeds, control erosion, and be fire resistant and aesthetically pleasing. In addition, it should not unduly attract wildlife. We have listed a preliminary set of procedures or specifications that could be used on such a site.

Species Selection

Shrubs lbs seed/acre
1. Big sagebrush – Artemisia tridentata 1.0
2. Antelope bitterbrush – Purshia tridentata 1.0
3. Desert peach – Prunus armeniaca 1.0
4. Green ephedra – Ephedra viridis 1.0
5. Green rabbitbrush – Chrysothamnus viscidiflorus 1.0
6. Four-wing saltbush – Atriplex canescens 1.0
7. Skunkbrush sumac – Rhus trilobata 1.0
8. Winterfat – Krascheninnikovia lanata 1.0

Grasses lbs seed/acre
1. Blue bunch wheat grass – Pseudoroegneria spicata 1.0
2. Basin wildrye – Leymus cinereus 1.0
3. Sandberg bluegrass – Poa secunda 0.5
4. Big bluegrass – Poa pratensis 1.0
5. Indian ricegrass – Achimatherum hymenodes 1.0
6. Desert needlegrass – Artemisia filifolia 1.0
7. Creeping wildrye – Leymus tritici 1.0
8. Great Basin wildrye – Leymus cinereus 1.0
Forbs
1. Yellow sweet clover – *Melilotus officinalis* 0.5
2. Small burnet – *Sanguisorba minor* 0.5
3. Prairie flax – *Linum lewisii* 0.5
4. Palmer’s penstemon – *Penstemon palmeri* 0.5
5. Evening primrose – *Oenothera taeopsis* 0.5
6. Scarlet gilia – *Ipomopsis aggregata* 0.5
7. Goldmoss – *Solidago spectabilis* 0.5
8. Globe mallow – *Sphaeralcea coccinea* 0.5
9. Firewaker penstemon – *Penstemon cavanii* 0.5
10. Lupine – *Lupinus spp.* 0.5
11. Vetch – *Vicia sp.* 0.5
12. Alfalfa – *Medicago sativa* 0.5
Total 21.5 lbs. seed/acre

Site/Soil Preparation
Site preparation may require contour development and/or terracing on steep slopes. The appropriate amounts of soil amendments such as fertilizer and mycorrhizal inoculums may be added to the soil. The combination of fertilizer with a drip irrigation system could be used to assure plant establishment. Additional soil preparation such as discing may be required.

Revegetation Procedures
On steeper sites, the slopes should be shaped to no steeper than 3:1. Possibly replace topsoil. The container-grown shrubs should be placed on terraced slopes. Drill at 0.57 pounds/1000 square feet. Broadcast a mixture of forbs/grass/shrub seed. Placement and arrangement of seed and container-grown shrubs should be decided with the landscape architect. Apply a portable, one-acre to one-acre drip system to assure establishment of container-grown shrubs. Determine the appropriate number of entries to irrigate a specific density of shrubs. The site dictates, possibly add an appropriate fertilizer and mycorrhizal inoculums. A mulch applied to support seedling growth should be stabilized with netting or tackifier. Match with 68.9 pounds/1000 square feet of straw material that is tacked to the ground with jute netting.

UPPER ELEVATION
BIG SAGEBRUSH
SITES (Primarily *Artemisia tridentata* var. *vaseyana* and Low sagebrush (*A. tridentata* var. *pinetorum*), also

Site Analysis
These sites have deeper soils, higher in organic matter. However, the growing season is often short. The soils will be variable. Presentation amounts can vary from 10 inches to 20 inches, and the winters can be cold and long. Snow cover in variable but may be deep during some winters. As a general rule of thumb the transition between the low-elevation sagebrush sites and the mountain big sagebrush sites is at about 5000 feet. The vegetation is dominated with mountain big sagebrush (*Artemisia tridentata* var. *vaseyana*) except at one crossing over the ridges or passes. Here if a sagebrush taxa is dominant, it usually will be a low sagebrush such as *Artemisia tridentata* and will have very shallow soils with heavy clay subsoil at about 8 inches to 10 inches. The big sagebrush sites will have a wider variety of perennial grasses and annual and perennial forbs that found in the lower elevation sagebrush sites.

Species Selection
An ideal mix of species should include a combination of a couple species of grass, shrubs, and forbs. It should be emphasized that all of these species do not need to be included in the species selection for vegetation remediation. The number of seeds per pound should be considered in the density of application since their numbers vary widely. For instance, tall fescue has approximately 225,000 seeds per pound, while bentgrass has a density of 9 million seeds per pound.

Grasses
1. Bluebunch wheatgrass or
   *Poa secundiflora* 1.0
2. Velvet bentgrass – *Agropyron smithii* 1.0
3. Big/Sherman bluegrass – *Poa annua* 1.0
4. Smooth or mountain bromes – *Bromus inermis* 1.0
5. Russian wildrye – *Leymus tricoccoides* 1.0
6. Thatches – *Nardus stricta* 1.0
7. Blue fescue – *Festuca arundinacea* 1.0
8. Red fescue – *Festuca rubra* 1.0
9. Tall fescue – *Festuca arundinacea* 1.0
10. Bluebunch wheatgrass – *Agropyron smithii* 1.0
11. velvet bentgrass – *Agropyron smithii* 1.0
12. Smooth or mountain bromes – *Bromus inermis* 1.0
13. Russian wildrye – *Leymus tricoccoides* 1.0
14. Thatches – *Nardus stricta* 1.0
SECTION TWO: Mapping Ecosystems Along Nevada Highways

Technical Appendix

Forbs

1. Palmer’s peastraw/Firecracker peastraw — *Pensetum palmerii/Pennisetum ciliare* 2.0
2. Weeds - yellow-weed — *Lactuca arvensis* 0.5
3. Indian paintbrush — *Castilleja spp.* 0.5
4. Lupine — *Lupinus spp.* 1.0
5. Blue flax — *Linum lewisii* 1.0
6. Prickly poppy — *Argemone mena* 0.5
7. Sunflower — *Helianthus annuus* 0.5

Shrubs

1. Mormon tea (green) — *Ephedra viridis* 1.0
2. Douglas rabbitbrush — *Chrysothamnus viscidifolius* 1.0
3. Mountain big sagebrush — *Artemisia tridentate* 1.0
4. Bitterbrush — *Purshia tridentata* 1.0
5. Purple sage — *Salvia dorrii* 1.0

Total 17.5 lbs/acre

Site and Soil Preparation

These sites may lend themselves well to the storage and replacement of topsoil. These soils, when not too rocky, can lend themselves to machine drilling, possibly preceded by disking, to create a more favorable seedbed for initial establishment. Normally, they would not require fertilization, but this should be determined by soil tests taken at the site. The addition of organic matter would be beneficial for plant establishment. Often it may be necessary to assure establishment with the addition of nitrogen fertilizers, as determined by the soil samples.

Revegetation Procedures

Where feasible, the best procedure would be disking and drilling. In some cases, container-grown species spaced approximately 3-foot apart may be used in conjunction with drilling. Different shrub container species should be alternated at 3-foot spacing for purposes of landscape and aesthetic variety. Planting should occur in either the spring or fall. Planting from containers in the summer would require supplemental irrigation for the first season. Forbs and grasses should be drilled at a density of 20 pounds/acre.

Mulches are important on these sites to ensure establishment of drilled seed. Straw and other light-colored mulches will reduce the soil temperature during the summer months. An application rate of 2000-3000 pounds/acre of mulch is recommended to reduce erosion and cover seed (R-4 revegetation guide, p. 25). Mulches can be applied by hand on 3-to-1 or greater slopes. Steeper slopes will require a mechanical application of mulch.

PINON/JUNIPER

WOODLAND

SITES

Site Analysis

Identify the naturally occurring vegetation on a possible means for assisting with species selection. Examine the vegetation maps and the soil polygons to further determine the natural vegetation. Examine the soils to determine the natural physical and chemical conditions. This will lead to an analysis of the potential seed for certain seed amendments, supplemental irrigation, and mulching to ensure success. Examine the physical characteristics of the site such as precipitation, temperature, slope, aspect, and elevation. In some cases it may be necessary to examine the chemical and physical characteristics of the material to be revegetated.

Species Selection

Species selection for pinon/juniper woodland sites will include species commonly found in the woodland. We will include primarily native species and a mixture of shrubs, grasses, and forbs. Among the forbs, we will include at least one leguminous species for possible nitrogen fixation. The species listed below are recommended for the mixture.

Shrubs lbs/seed/acre

1. Black sagebrush — *Artemisia nova* 1.0
2. Mountain big sagebrush — *Artemisia tridentata var. wyomingensis* 2.0
3. Green rabbitbrush — *Chrysothamnus nauseosus* 2.0
4. Mormon tea — *Ephedra viridis* 1.0
5. Sugar cypress — *Rochia prosata* 2.0
6. Skullbush sumac — *Rhus trilobata* 1.0

Grasses

1. Bluebunch wheatgrass — *Pseudoroegneria spicata* 1.0
2. Sandberg’s bluegrass — *Poa sandbergii* 0.5
3. Smooth brome — *Bromus inermis* 1.0
4. Crested wheatgrass — *Agropyron cristatum* 2.0
5. Siberian wheatgrass — *Agropyron sibiricum* 2.0
6. Giant wild rye — *Elymus glaucus* 1.0

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SECTION TWO: Mapping Ecosystems Along Nevada Highways

FORBS

1. Palmer’s penstemon – Penstemon palmeri
2. Prairie flax – Linium lewisi
3. Small barret – Sanguisorba minor
4. Lupine – Lupinus spp.
5. Indian paintbrush – Castilleja spp.
6. Sticky purple geranium – Geranium viscosissimum

Total 21.5 lbs/acre

SITE AND SOIL PREPARATION

For most pinyon/juniper sites we would not recommend supplemental irrigation. However, we would recommend that a fertilizer be applied. If the topsoil has been removed, the site analysis would likely lead to the appropriate recommendation for a fertilizer. Since many of these soils are deficient in phosphorus and potassium, we would recommend a formulation of 16-20-0 ammonium phosphate applied at 40 pounds/acre. If the material is a homogenous mixture of various materials, a higher nitrogen fertilizer might be recommended. Also in this case a mycorrhizal inoculum would be recommended. Slopes over 3-to-1 would require terracing to help retain soil moisture and provide safe sites for seed. In some cases this would require hand labor.

REVEGETATION PROCEDURES

For small areas, less than an acre, it would be feasible to hand-seed using a cyclone spreader. This would be followed by the application of mulch. We would recommend the spreading of straw by hand or laying of matting over the mulched areas. In some cases we would recommend that a number of container-grown specimens be planted on the site to improve establishment and provide an instant landscape and aesthetics. The container-grown material can be planted in concert with other species of shrubs and the suggested grasses and forbs. To reduce competition between the woody and herbaceous species, we would recommend planting shrubs separate from areas where grasses and forbs are seeded.

MOUNTAIN BRUSH SITES

SITE ANALYSIS

These sites are at higher elevations, mostly above 6,000 feet, as the highways cross mountain passes. The typical mountain brush vegetation supports some of the following mountain brush species: bitterbrush, mountain mahogany, snowberry, serviceberry, mountain big sagebrush, current gooseberry, elderberry, and chokecherry. Soils are often higher in organic matter and may or may not be rocky. The soil chemistry normally would be neutral to slightly acid but not alkaline. Litter accumulation would be high. Often the road cuts are deep and steep. There may be a cut on one side and a fill on the other side. The cuts and fills can remove topsoil and/or cover it up. The organic matter would often be higher than most of the desert sites and similar to forested areas. The higher organic matter generally provides a greater abundance of nutrients.

SPECIES SELECTION

Availability and cost will dictate what seed combination to use. We recommend 19 pounds/acre to 20 pounds/acre of a combination of seed from the species list below.

Not all of these species should be used, but a combination of these is suggested.

<table>
<thead>
<tr>
<th>Shrubs</th>
<th>lbs. seeds/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Serviceberry – Amelanchier alnifolia</td>
<td>1.0</td>
</tr>
<tr>
<td>2. Mountain big sagebrush – Artemisia tridentata</td>
<td>0.5</td>
</tr>
<tr>
<td>3. Chokecherry – Prunus virginiana</td>
<td>1.0</td>
</tr>
<tr>
<td>4. Cliffrose – Gymnandra subulata</td>
<td>1.0</td>
</tr>
<tr>
<td>5. Gambel’s oak – Quercus gambelii (Eastern &amp; S eastern NV)</td>
<td>2.0</td>
</tr>
<tr>
<td>6. Common snowberry – Symphoricarpos albus</td>
<td>1.0</td>
</tr>
<tr>
<td>7. Three leaf senna – Rhus triloba</td>
<td>1.0</td>
</tr>
<tr>
<td>8. Rubber rabbitbrush – Chrysothamnus nauseosus</td>
<td>0.5</td>
</tr>
</tbody>
</table>
SECTION TWO: Mapping Ecosystems Along Nevada Highways

Technical Appendix

Grasses
1. Bluebunch wheatgrass – 
2. Big bluegrass – 
3. Smooth brome – 
4. Mountain brome – 
5. Idaho fescue – 
6. perennial rye grass – 
7. Tall wheatgrass – 
8. Great Basin wildrye – 

Forbs
1. Palmer’s penstemon – 
2. Scarlet gilia – 
3. Indian paintbrush – 
4. Lupine – 
5. Wild geranium - 

Site and Soil Preparation

If slopes are steeper than 3:1, we recommend some terracing – either by hand or with a backhoe. Supplemental irrigation may not be necessary for these sites due to higher elevations correlated with more rainfall. Suggested fertilizers would require a formulation of 16-20-0 (16% nitrogen, 20% phosphorus, and 0% potassium) applied at 40 pounds/acre. If seeding is done in the early fall or spring, we would not recommend supplemental irrigation. If the material is a homogenous mixture of various soils, possibly a higher nitrogen fertilizer would be recommended. However, this could be determined by site-specific soil tests. Microbial inoculums would most likely not be needed at these sites due to the high organic matter in these soils.

Revegetation Procedures

On many of these sites, we would recommend container-grown shrubs of two or three species placed randomly across the disturbed landscapes to provide plant cover in a reasonable amount of time. Furthermore, container-grown species are conducive to successful establishment as many of these species require some sort of seed stratification for germination and are limited by short growing seasons. Seeding of grasses, forbs, and shrubs (not container-grown) along with mulch and tafficer, should precede the placement of the container-grown shrub species. We recommend the spreading of straw on terraces using a tafficer. Container-grown shrub species should be planted in the spring to access more soil moisture.

FORESTED SITES: Forested areas are found primarily in western Nevada, in and around Lake Tahoe, and on a few sites in the spring range in southern Nevada.

Site Analysis

Forest sites and their soils are quite variable. They generally have a neutral to slightly acid reaction and may vary in depth. These sites are usually above 5,000 feet in elevation and are found on every aspect. In the Tahoe area many of the soils are granite and have poor moisture holding capacity. Often the soils are quite stony, which would preclude revegetation practices involving machinery. Roadside areas can be quite steep requiring contouring or other practices. In the Tahoe Basin winter-salting has negatively impacted many of the trees and other vegetation. Some roadside vegetation at higher elevations has been impacted by snowblowing equipment used to clear the highways. The widening, cutting, and filling involved in restaffing the highways has also had a significant impact on roadside vegetation. The growing seasons are short and snowpack will influence revegetation.

Species Selection

Trees and Shrubs. Normally we would not recommend trees close to the highway because of the problems mentioned above and safety concerns they pose by reducing visibility under some circumstances. Therefore our species lists include primarily native shrubs, grasses and forbs.

Shrubs

<table>
<thead>
<tr>
<th>Species Description</th>
<th>lbs. seed/acre</th>
</tr>
</thead>
</table>
| Snowbrush – 
| Huckleberry oak – 
| Serviceberry – 
| Cheesewberry – 
| Whitebough – 
| Moutain mahogany – 
| Manzanita – 
| Saguaro cactus – 
| Moutain big sagebrush – 
| Brittlebush – |

| 1. | 1.0 |
| 2. | 1.0 |
| 3. | 1.0 |
| 4. | 1.0 |
| 5. | 1.0 |
| 6. | 1.0 |
| 7. | 1.0 |
| 8. | 1.0 |
| 9. | 1.0 |
| 10. | 1.0 |
**Site/Soil Preparation**

Steep slopes will require contouring or furrowing. A mulch would be recommended, and straw would probably be the best mulch. It might be possible to obtain some local materials, such as mulch made from pine needles or pine cones. In addition, wood chips and ground-up Christmas trees might be available to use as mulch material. These mulches would have to be tacked with jute netting or some other product. We would not recommend hydroseeding because of mixed reviews of success. A slow release nitrogen fertilizer might be appropriate at about ½ pound thousand square feet. This might not be appropriate along stream environment zones because of potential lake and stream pollution.

**Revegetation Procedures**

Container-grown material would have to be hand planted. Container-grown grasses, such as rye, could be used in conjunction with the broadcasted grass and wildflower seed for initial establishment. A mixture of wildflowers and grasses could be broadcasted in the interspaces between the container-grown shrub species at some spacing determined by the landscape architect. Mulch should be used to initially establish the container-grown species. Mulch may be applied after the broadcast seeding to protect the seed from wind and dehydration.

Several seed companies provide flower seed mixes for different kinds of habitats. For example, Flagstaff Native Plant and Seed (see Appendix 2) has a mixture of flowers adapted to Pinus ponderosa sites that includes eight or ten species and is sold by the ounce. Such mixes may be appropriate for broadcasted and covering with mulch on many of our forested and mountain sites. On these sites, container-grown shrubs would be quite appropriate and so the amount of seed versus seedings would vary. Approximately 10 pounds to 11 pounds/acre is suggested for broadcast seeding of grasses and forbs. This will be supplemented with grasses planted as rye.
SECTION TWO: Mapping Ecosystems Along Nevada Highways

Technical Appendix

STREAM CROSSING SITES WITH GALLERY FORESTS OF POPLARS WITH WILLOW AND OTHER STREAMSIDE WOODY AND HERBACEOUS VEGETATION

Site Analysis

Unlike upland areas, natural and human induced stream meander and channel downcutting result in continuous changes for these vegetation types. This vegetation is often associated with hydric soils. Riparian soils are often the result of streams, seeps, and springs and may not be dependent upon local precipitation. Soils tend to be more organic due to the long history of dense vegetation in these areas. These areas are not elevation dependent but rather dependent upon the presence of streams or riparian areas. Examples include the Humboldt, Truckee, Carson, Walker, Salmon, and the Muddy River drainages. Erosion and periodic flooding are some of the main challenges for the revegetation of these areas. Noxious weeds such as tall white top shown in the lower portion of the photo above often become a problem in these riparian areas.

Species Selection

<table>
<thead>
<tr>
<th>Trees and Shrubs</th>
<th>lbs. seed/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fremont cottonwood – Populus fremontii</td>
<td>0.0</td>
</tr>
<tr>
<td>2. Mountain alder – Alnus tenuifolia</td>
<td>2.0</td>
</tr>
<tr>
<td>3. White alder – Alnus incana</td>
<td>2.0</td>
</tr>
<tr>
<td>4. Dogwood – Cornus sibirica</td>
<td>1.0</td>
</tr>
<tr>
<td>5. Spirea – Spirea densiflora</td>
<td>1.0</td>
</tr>
<tr>
<td>6. Blue elderberry – Sambucus cerulea</td>
<td>1.0</td>
</tr>
<tr>
<td>7. Willow – Salix humulis (5700’ – 9000’)</td>
<td>0.0</td>
</tr>
</tbody>
</table>

8. Pacific willow – Salix lasiolepis (5000’-7800’)
9. Water willow or Seep willow – Baccharis gilula (Mohave stream areas)
10. Virgin’s bower – Clematis ligusticifolia

Grasses

1. Streambank wheatgrass – Agropyron repens
2. Pedi缙草 – Poa palustris
3. Nebraska grass – Carex nebrascensis
4. Baltic rush – Juncus Baltic
5. Meadow brome – Bromus inermis

Forbs

1. Nettleleaf giant hyssop – Agastache arctica
2. California false heliolobite – Veratrum californicum
3. Small bluebells – Mertensia longiflora
4. Sticky purple geranium – Geranium viscosissimum
5. Columbian monkshood – Aconitum columbianum
6. Mule’s ear – Wyethia mollis

Total 19.0 lbs. seed/acre

*Often these species are grown only from cuttings or container-grown plants. Usually seed is not available for poplars and willows.

Site and Soil Preparation

Generally these areas tend to be moist sites, so adding organic matter to the existing soils may not be required. However, if fill soil is being used, the addition of organic matter is necessary. Irrigation for initial establishment may not be necessary for these soil types due to the prevalence of a high water table. The addition of nutrients will encourage faster establishment of plants. Topsoil should be stockpiled and reapplied after grading of these sites. Special care should be taken to minimize disturbing the existing plants in riparian zones. Soil samples should be taken at the site and compared to the undisurbed adjacent sites before amendments are applied.

Re-vegetation Procedures

In some cases, placement of topsoil in disturbed sites prior to seeding would be beneficial for seed germination. The application of amendments and fertilizers should be based on the results of the soil testing. Many of the shrubby plants, such as willow, for
example can be planted as unrooted cuttings to a depth of 6 inches. This is more practical and cost-effective than using container-grown stock. Seeds should be broadcast at the recommended rate for each species, raked lightly and mulched with a light application of composted bark. Evaluating the success of riparian revegetation efforts may be coordinated with other agencies such as the Bureau of Land Management and the Forest Service, who are actively monitoring these areas. Proper functioning condition (PFC) is one quick and qualitative method to assess stream health and vegetation.

Special attention should be given to areas where roads intersect with streams. Bridges and culverts have traditionally been inadequate at handling 150-year flood events. This results in massive sediment transport downstream, incising channels, and flooding of road surfaces. Planning for large culverts and bridge crossings that will not impede the flow of water during these events is essential in maintaining riparian health and road safety. The structural engineer should consult with a hydrologist on this issue.

SPECIFIC EXAMPLE SPECIFICATIONS

In this section we have taken three specific sites and described specifications that might be followed in order to improve the aesthetics, dust control and other problems on these sites.

Example #1. A sagebrush/grass site in Elko County.

REVEGETATION OF A SAGEBRUSH/GRASS SITE NEAR WELLS, NEVADA

Site Analysis

- The predominant vegetation on this site is big sagebrush and a variety of perennial grasses.
- The soils are fairly high in organic matter and the topsoil can be shallow with heavy clay subsoil.
- The precipitation varies from 10 inches to 20 inches, and much of it comes in the form of snow.
- Revegetation is usually successful, even though the growing season is short. Slopes of more than 3-to-1 are common.

Suggested Reclamation Steps

Step 1: Site Preparation
- Shape site to slopes no steeper than 3-to-1.
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Additional soil preparation such as disking may be required.

Step 2: Application of Soil Amendments
- Possibly replace topsoil. Possibly add an appropriate NPK (nitrogen, phosphorus, potassium) fertilizer and mycorrhizal inoculums.

Step 3: Seed Application
- Use a drill and seed apply at a rate of 0.57 lbs/1000 sq. ft.

Step 4: Mulching
- Apply mulch at a rate of 68.9 lbs/1000 sq. ft of straw material that is tacked to the ground with jute netting.

The Proposed Species Mixture
- Bluebunch wheatgrass – Pseudoroegneria spicata
- Basin wildrye – Leymus cinereus
- Sandberg bluegrass – Festuca arundinacea
- Yellow sweet clover – Melilotus officinalis
- Small Burnett – Sanguisorba minor
- Prairie fox – Linum lewisii
- Big sagebrush – Artemisia tridentata
- Rubber rabbitbrush – Chrysothamnus nauseosus

Example #2 Robb Drive Interchange

REVEGETATION PROTOCOL FOR ROBB DRIVE INTERCHANGE ON INTERSTATE 80

Site Analysis
- There are very steep slopes.
- The soils have several layers of chalk or diatomaceous earth.
- Portions of topsoil have been removed.
- Deficient soil development will require tests for additions of mycorrhizal inoculums and fertilizers.
- The site is subject to frequent, high winds.
- It is a relatively arid site.
- The site has considerable weedy volunteer vegetation.
- There is considerable litter along fences.
- There is a narrow steep soil/earth divider between the on and off ramps.
- The cost of placing aesthetic vegetation on this site is likely to be expensive.

Suggested Reclamation Steps

Step 1: Site Preparation
- Contour development and/or terracing on steep slopes.

Step 2: Application of Soil Amendments
- Determine and apply appropriate amounts of fertilizer and mycorrhizal inoculums.
- Combine fertilizers with drip irrigation systems to ensure plant establishment.

Step 3: Supplemental Irrigation
- Apply a portable, 1-to-2 acre drip system to ensure development of containerized shrubs.
- Determine the appropriate number of emitters needed to irrigate a specific density of shrubs.
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ADDENDUM

DUST CONTROL

Soil productivity is affected by wind erosion in various ways. Areas of erosion and deposition on disturbed sites require more costly and less efficient soil management practices. Wind removes the smaller clay particles and organic matter from the soil, while coarser materials are left behind. The continued loss of fine particles reduces soil quality. In shallow soils and soils with a hardpan layer, wind erosion also results in increased root zone depth and water-holding capacity. Such changes may occur slowly and go unnoticed for many years. Bare soil can lead to dust that may be detrimental to safe driving and so must be considered. Many of the procedures discussed above will lead to good dust control. An number of emergency control methods are available to reduce damage from wind-induced soil erosion that already has started or is anticipated:

- Tillage to produce ridges and cloths
- Addition of mulch
- Irrigation to increase soil moisture
- Temporary, artificial wind barriers
- Soil additives or spray-on adhesives

Choice of method, or combination of methods, depends on severity of erosion and the relationship to planned remediation procedures that have been prescribed for a site.

MONITORING

Since remediation efforts are somewhat costly, we would recommend that monitoring be done to assess the success and failure of these efforts. This can be done either on an ad hoc basis or by using a more objective methodology to appraise success and/or failure over time. We would strongly recommend that an objective and scientifically based monitoring protocol be adopted to examine revegetated sites for several years after the treatment to assess the success and/or failure of the efforts. A number of excellent monitoring procedures are available. As a minimum we would suggest a series of belt transects where the seeded and volunteer species are counted one, two and five years after the treatment. Each belt should be about 15 meters or 50 feet in length and 1 meter or 3 feet wide. The number of transects would depend upon the size of the disturbed seeded area. Small areas may require only two or three transects while larger areas may require several more to provide a good statistically valid sample.

Within each belt, a plant density count should be accomplished, counting the number of individual plants per unit area. Density should be determined for both seeded
SECTION TWO: Mapping Ecosystems Along Nevada Highways

and volunteer species. The purpose for looking at the density of the volunteer native species is to have some idea of the level of competition with the seeded species. For some superabundant species, i.e., cheatgrass, it would be necessary to use a subsample to obtain a reliable but feasible density estimate. Plant vigor should also be measured. Vigor can be determined in several ways, e.g., measuring the height of grass culms, leader length in seeded shrubs, and the height and number of leaves of both grasses and forbs. For grasses, a simple count of the number of seed heads signifying reproductive culms would be appropriate. These determinations should be done for all species but especially for seeded species. This can be accomplished in several ways such as by counting the number of seed heads, measuring the height of the plant, and counting the number of new leaves for the perennial grasses. In many cases, a mixture will be used to revegetate and it would be valuable to know which of these species established best and exhibited the greatest vigor on a particular site.

NOXIOUS AND INVASIVE WEEDS

Table 4 is a list of noxious weeds that have been designated by the Nevada State Department of Agriculture. There are a few other species that can be classified as invasive weeds. These might include cheatgrass (Bromus tectorum) and saltbush (Halophila glomerata) in the north and red bristle (Bromus rubens) and Mediterranean grass (Schirianthus barbatus) in the south. In some areas species of mustard (Brassica spp. and Sinapis arvensis spp.) are invasive and can contribute to fire hazard. Our assessment of these weeds along Nevada highways is summarized in Table 5 where we have listed those species that we encountered and the location of populations found along Nevada highways. It would be important for those involved in revegetation to have a working knowledge of these plant species and be able to identify them in the field. We have examined the records of the State Department of Agriculture. They have documented the location of a number of weeds at specific points along the highways. We use these records and they are available in the offices of the State Department of Agriculture, Division of Plant Industry.

WILDFIRE HAZARD

Wildfire is of considerable concern to all Nevadans. Unfortunately many sites along Nevada highways possess vegetation characteristics that have a high potential for wildfire ignition. In this report we are attempting to promote plants that do not constitute high fire hazard. Reference here must be made to the USDA Fire Effects Information System, which has useful information about most of the plants we have listed as possible revegetation species in this report. The FEIS can be accessed at the following Web site (http://www.fs.fed.us/database/feis). Areas of high fire hazard have been identified on the vegetation maps. Those areas with the highest fire hazard are sites with pure stands of cheatgrass (Bromus tectorum), various sagebrush species with understories of cheatgrass, sites with other weeds such as matweed, and other areas where vegetation is not a fire hazard. The most common fire species found along Nevada highways. Those sites can generally be identified by examining the various vegetation polygons on the vegetation maps. Of course, under very dry conditions a wildfire can start anywhere. In the areas of high fire hazard, it may be wise to attempt to establish fire-resistant species along the highways. However, the cost of such endeavors might be prohibitive. It then becomes a situation where the use of the highway system must be informed about fire hazard. While the U.S. Forest Service and Bureau of Land Management are handling this, perhaps the NDOT could somehow add this to the message, or work with them to help get the message out.

Selected References


Appendices

Appendix #1 Species selection

The species listed in the general ecosystem specifications are those that we selected from advertised seed sources. These species are thought to be adapted to the ecosystems in question. Species selection is of paramount importance and requires several steps. The first step is to evaluate the environment where the revegetation effort is to take place. This would require examining the soil and climatic conditions, topography and microtopography, and competing vegetation which may or may not be native species. Then someone familiar with the natural vegetation would begin the selection process. This would require going to various seed companies and determining just what seed is available and what might best fit into a mixture, considering cost and the desirability to include a species in the mixture. Some western seed companies are listed in Appendix #2. Others are available. For each site there would be a number of species that would be appropriate and desirable. For the major ecosystems along Nevada highways we have listed some of the appropriate species. After the selection process is complete, purchase and delivery can be requested. The species finally selected will be a function of availability and cost. In some cases the cost will preclude the inclusion of a species in the mixture even though it may be desirable. Also the cost and availability of container-grown plants must be carefully considered.

Seeding rates will vary from site to site depending upon the soil, the species used, the price and availability of the selected seed. A reasonable rule of thumb would be to seed at a rate of 10 pounds to 20 pounds/acre of pure live seed. In one of the appendices we have included information on how to convert the acre seeding rates to the weight of seed per square foot or per square meter. In addition, it is important to calculate, based on seed germination percentages, the pounds of bulk seed required to yield one pound of pure live seed. This information is also included in Appendix #3.

Appendix #2 Sources of native seeds

We have listed here only a few of numerous seed companies with emphasis on those who provide seed adapted to Nevada conditions. There certainly may be others that could be used.
A.19

Appendix A.19 Bulk pure live seed requirements for seed with specified germination rates.

DEFINITIONS

Category “A”: Weeds not found or limited in distribution throughout the state; actively excluded from the state and actively eradicated wherever found; actively eradicated from nursery stock dealer premises; control required by the state in all infestations

Category “B”: Weeds established in scattered populations in some counties of the state; actively excluded where possible, actively eradicated from nursery stock dealer premises; abatement at the discretion of the state quarantine officer

Category “C”: Weeds currently established and generally widespread in many counties of the state; actively eradicated from nursery stock dealer premises; abatement at the discretion of the state quarantine officer

Nevada Noxious Weed List
from http://agri.nv.gov/nwac/PLANT_NoxWeedList.htm

Appendix #1 Plant Noxious Weed List

DEFINITIONS

Category “A”: Weeds not found or limited in distribution throughout the state; actively excluded from the state and actively eradicated wherever found; actively eradicated from nursery stock dealer premises; control required by the state in all infestations

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Category “C”: Weeds currently established and generally widespread in many counties of the state; actively eradicated from nursery stock dealer premises; abatement at the discretion of the state quarantine officer

Category A Weeds:

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>African Rue</td>
<td>Peganum harmala</td>
</tr>
<tr>
<td>Austrian fieldcress</td>
<td>Rorippa austriaca</td>
</tr>
<tr>
<td>Austrian peaweed</td>
<td>Sphaerophysa salsula</td>
</tr>
<tr>
<td>Camelthorn</td>
<td>Alhagi camelorum</td>
</tr>
<tr>
<td>Common crupina</td>
<td>Crupina vulgaris</td>
</tr>
<tr>
<td>Dalmation Toadflax</td>
<td>Linaria dalmatica</td>
</tr>
<tr>
<td>Dyer’s wood</td>
<td>Alyssum intricaria</td>
</tr>
<tr>
<td>Eurasian water-milfoil</td>
<td>Myriophyllum spicatum</td>
</tr>
<tr>
<td>Giant Reed</td>
<td>Arundo donax</td>
</tr>
<tr>
<td>Giant Salvinia</td>
<td>Salvinia molesta</td>
</tr>
<tr>
<td>Coast’s rue</td>
<td>Galega officinalis</td>
</tr>
<tr>
<td>Houndstongue</td>
<td>Cynoglossum officinale</td>
</tr>
<tr>
<td>Iberian Star thistle</td>
<td>Centaurea iberica</td>
</tr>
<tr>
<td>Klamath weed</td>
<td>Hypericum perforatum</td>
</tr>
<tr>
<td>Leafy spurge</td>
<td>Euphorbia esula</td>
</tr>
<tr>
<td>Malta Star thistle</td>
<td>Centaurea melitensis</td>
</tr>
<tr>
<td>Mayweed chamomile</td>
<td>Anthemis cotula</td>
</tr>
<tr>
<td>Mediterranean sage</td>
<td>Salvia officinalis</td>
</tr>
<tr>
<td>Purple loosestrife</td>
<td>Lythrum salicaria, Livsargatum and their cultivars</td>
</tr>
<tr>
<td>Purple Star thistle</td>
<td>Centaurea calycospha</td>
</tr>
<tr>
<td>Rush skeletonweed</td>
<td>Chondrilla juncea</td>
</tr>
<tr>
<td>Sow Thistle</td>
<td>Sow thistle</td>
</tr>
<tr>
<td>Spotted knapweed</td>
<td>Centaurea maculosa</td>
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<tr>
<td>Squarrose star thistle</td>
<td>Centaurea virgata Lam. Var. squarrose</td>
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<tr>
<td>Sulfur cinquefoil</td>
<td>Potentilla recta</td>
</tr>
<tr>
<td>Syrian Bean Caper</td>
<td>Zygophyllum fabago</td>
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<tr>
<td>Yellow Starthistle</td>
<td>Centaurea solstitialis</td>
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<tr>
<td>Yellow Toadflax</td>
<td>Linaria vulgaris</td>
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Category B Weeds:

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
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<tbody>
<tr>
<td>Carolina Horse-nettle</td>
<td>Solanum carolinense</td>
</tr>
<tr>
<td>Diffuse Knapsack</td>
<td>Centaurea diffusa</td>
</tr>
<tr>
<td>Medusahead</td>
<td>Taeniatherum caput-medusae</td>
</tr>
<tr>
<td>Musk Thistle</td>
<td>Carduus nutans</td>
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<tr>
<td>Russian Knapweed</td>
<td>Acroptilon repens</td>
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<tr>
<td>Sahara Mustard</td>
<td>Brassica tournefortii</td>
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<tr>
<td>Scotch Thistle</td>
<td>Chondrilla acanthum</td>
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Category C Weeds:

<table>
<thead>
<tr>
<th>Common Name</th>
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<tbody>
<tr>
<td>Black henbane</td>
<td>Hyoscyamus niger</td>
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<tr>
<td>Canada Thistle</td>
<td>Cirsium arvense</td>
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<tr>
<td>Green fountain grass</td>
<td>Penstemon setaceum</td>
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<tr>
<td>Hoary cress</td>
<td>Cardaria draba</td>
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<tr>
<td>Johnson grass</td>
<td>Sorghum halepense</td>
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<tr>
<td>Perennial pepperweed</td>
<td>Lepidium latifolium</td>
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<tr>
<td>Poison Hemlock</td>
<td>Conium maculatum</td>
</tr>
<tr>
<td>Puncture vine</td>
<td>Tribulus terrestris</td>
</tr>
<tr>
<td>Salt cedar (tamarisk)</td>
<td>Tamarix spp</td>
</tr>
<tr>
<td>Water Hemlock</td>
<td>Cicuta maculata</td>
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</tbody>
</table>

[Dep't of Agriculture, No. 5511, eff 5-1-68; NAC A by St. Quarantine Officer, 8-9-92; R191-99, 8-7-2000; R097-01, 5-1-2002; R003-03, 9-24-2003]

For further information or comments specific to noxious or invasive plants contact:
Scott S. Marsh, Noxious Weed Regulatory Specialist, Nevada Department of Agriculture
smarsh@agri.state.nv.us
ACEC Area of Critical Environmental Concern

AESTHETIC The visual appearance or look of an object, view, etc.

AMENITIES Aesthetic characteristics or other features of land development that increase its desirability or its marketability. Amenities may include such things as a unified building design, recreational facilities, security systems, views, landscaping, attractive site design, and adjacent open space or water bodies.

BALANCE Balance in design refers to the equilibrium or equality of visual attraction. Symmetrical balance is achieved when one side of the design is a mirror image of the other side. Asymmetrical balance uses different forms, colors and textures to obtain balance of visual attraction (Ingram, 2006).

BERM A raised and elongated area of earth intended to direct the flow of water, visually screen, redirect out-of-control vehicles, or reduce noise levels by shielding a receiver from the highway. (AASHTO, 1991).

BLM Bureau of Land Management

BUFFER A strip of land, compatible land uses, fence, or a border of trees, etc., between one use and another that somewhat mitigates negative impacts between uses. An area which provides a degree of insulation from certain highway or transportation effects on adjacent private property or protected natural resources and vice-versa (AASHTO, 1991).

CARRYING CAPACITY The number of individuals in a population that the resources of a habitat can support (http://www.biology-online.org/dictionary/Carrying_capacity).

COMMUNITY IDENTITY Community identity can be broadly defined as a community of interest or an emotional attachment or sense of belonging to a geographic area. (Province of Nova Scotia, 2006).

COMMUNITY INTERFACE Community interface zones are characterized by lower travel speeds, frequent curb cuts, cross streets, traffic control devices, and increased pedestrian and other non-vehicular traffic. Adjacent land uses are typically commercial, but may include residential areas, schools, parks, and other civic uses.

COMMUNITY TRANSITION Community transition zones include stretches of highway between the center of a community and its undeveloped edges.

CONNECTIVITY In landscape ecology, the measure of the degree to which a matrix, a corridor, or a network is connected. The fewer the gaps or aberrations, the greater the connectivity.

CONSTRAINT A feature or condition of the built or natural environment that poses an obstacle to design, planning, or construction.

CONTEXT-SENSITIVE Consideration for how a proposed project will fit within its physical location and how it preserves the aesthetic, environmental, and historic character of its surroundings.

CONTOUR GRADING Transitioned and rounded grading. Moving the earth to form a shape or obtain a smoothness.

CORRIDOR A stretch of road or highway along with its associated facilities, adjacent land uses, and visual character.

CORRIDOR PLAN A detailed specific plan that considers land use and transportation issues within a carefully organized, collaborative planning process between local governments, regional entities, and NDOT. Refers to this document or similar documents prepared by NDOT for other highway corridors.

CULTURAL RESOURCES Cultural resources include buildings, landscapes, archeological sites, ethnographic resources, objects and documents, structures, and districts. They provide information about people from the past and establish important connections to the present (NPS, 2006).

CURIOSITY GROWTH The number of individuals in a population that the resources of a habitat can support (http://www.biology-online.org/dictionary/Carrying_capacity).

CURB EXTENSIONS A section of sidewalk extending into the roadway at an intersection or midblock crossing that reduces the crossing width for pedestrians and may help reduce traffic speeds (AASHTO, 2004).

DESIGN The process of taking ideas and producing a work of art. The drawings, models, or action of laying out structures, land activities, recreational facilities, vegetation, land cover, erosion protection, watering methods, etc.

DESIGN GUIDELINES A collection of helpful, interpretive, explanatory recommendations that are intended to provide a framework for design.

DESIGN OBJECTIVES Highway types are categorized according to the type of road, the speed and volume of travel, and the type of access. Design objectives establish program elements and goals that should always be considered when addressing projects located along roads with similar characteristics.

DESIGN SPIRIT The intent or vision of the design. What the designer hopes to accomplish.

DESIGN THEME A unifying concept throughout the design. A design theme provides a sense of consistency and harmony because it is created by the repetition of forms and materials throughout the design (Booth, 1999).

DISTANCE ZONES Landscapes are subdivided into three distance zones based on relative visibility from travel routes or observation points. The three zones are: foreground, midground, and background. The foreground zone includes areas where the viewer can perceive details of the landscape and typically extends up to a ¼ mile from the viewer. The midground zone is located between ¼ mile and three miles from the viewer. The background is the area beyond the midground extending to the horizon or limit of the area that is seen.

DROUGHT TOLERANCE A term often used to describe plants with low water requirements, the ability to withstand extended periods without water, or plants of a desert region.

FHWA Federal Highway Administration
FOCAL POINT A noticeable area or spot of attention, activity, or attraction. It may be such a spot because many paths, views, rays, walks, etc. converge or it is of a different color, texture, height, width, brightness, etc.

GABION A wire basket usually filled with stone which is used for erosion control/slope protection (AASHTO, 1991).

GATEWAY An entrance to a city, community, valley, or other large-scale space.

GBNP Great Basin National Park

GROUND TREATMENT Treatment to disturbed ground such as seeded revegetation, pavement, stone mulch, etc.

HARDSCAPE The hard surface elements of a planned (designed) landscape that give it definition and style, including walks, driveways, walls, buildings, fences, and large ornamental or sculptural pieces.

HBA Highway Beautification Act, 1965

INVASIVE A term used to describe plants that vigorously spread, propagate, have rapid unchecked growth, or invade a surrounding landscape area.

LANDMARK A conspicuous object on land that identifies a locality, or a designated preservation site, such as a building, monument, or landscape (AASHTO, 1991).

LANDSCAPE DESIGN SEGMENT Areas of similar character in which the same major design theme is applied.

LANDSCAPE TREATMENT TYPE The combination of varying intensities of softscape, structures, and hardscape.

LIGHT POLLUTION Excess or obtrusive light that obscures the night sky, interferes with astronomical observatories, wastes energy, and disrupts ecosystems.

MAINTENANCE COST The cost of maintaining a landscape. May be calculated annually or over the life of the project.

MANAGED LANDSCAPE CHARACTER Highway zone that comprises areas of current growth or planned growth at community edges along interstates or elevated highways. Can be adjacent to a variety of land uses varying from residential to industrial.

MANAGEMENT PLAN A written report of what the management of a project or property hopes to accomplish and how it intends to do so.

MASSING The grouping of plant materials.

MASTER PLAN In this document, the term refers to the NDOT Landscape and Aesthetics Master Plan. NDOT adopted the University of Nevada’s Pattern and Palette of Place: A Landscape and Aesthetics Master Plan for the Nevada State Highway System.

MUTCD Manual of Uniform Traffic Control Devices

NATIVE PLANTS An original species in a region, as distinguished from an invading, imported, or cultured species (AASHTO, 1991).

NATURAL DRAINAGE The flow of water over undisturbed existing surface topography.

NATURAL FEATURES Conditions produced by nature such as surface land forms, geology, slopes, vegetation, water, drainage patterns, aquifers, recharge areas, climate, microclimate, floodplains, aquatic life, wildlife, views, and landscape ecological patterns of path, corridor, or matrix.

NATURAL SYSTEM Natural systems are any type of system found in nature that is not manmade. A key characteristic of a natural system is that we expect its operating rules (laws) to stay the same forever. Examples include ecosystems, physical, or biological systems.

NCOT Nevada Commission on Tourism

NDOT Nevada Department of Transportation

NDOW Nevada Division of Wildlife

NRS Nevada Revised Statutes

NWR National Wildlife Refuge

OPPORTUNITIES Features or conditions of the built or natural environment that provide an opportunity for design, planning, or construction.

ORIENTATION The direction a person, structure, or any upright feature with a face is directed, or facing.

ORNAMENTAL SOFTSCAPE Plantings used for decorative qualities.

PEDESTRIAN CONNECTIONS A public walkway not adjacent to a street. It may connect between two public streets, or between a public street and a public facility, such as a school or park. The standard pedestrian connection includes a sidewalk and landscaped buffers on each side (http://www.portlandonline.com/transportation/index.cfm?ajbci&c=dggh).

PERENNIAL A plant that persists or resprouts year to year for several or many years.

PLACE-BASED KNOWLEDGE Local knowledge. Knowledge gained from direct experience with a geographic location.

PLACEMAKING Design solutions that use elements unique to the place or new elements to establish a specific style.

PLACE NAME SIGN A sign that provides clear and consistent direction from the corridors to scenic areas, points-of-interest, historical sites, and local attractions.

NDSP Nevada Division of State Parks

NONSTRUCTURAL DRAINAGE DESIGN Drainage features using organic form and natural materials such as earth and rock vs. pipes and concrete.

NOXIOUS WEED Noxious weed means any species of plant which is, or is likely to be, detrimental or destructive and difficult to control or eradicate (NRS 555.005).

NCOT Nevada Commission on Tourism

NMNPD Nevada Division of State Parks

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PLACE NAME SIGN A sign that provides clear and consistent direction from the corridors to scenic areas, points-of-interest, historical sites, and local attractions.
Rhythm is achieved when the elements of a design create a feeling of motion which leads the viewer's eye through or even beyond the designed area. Tools like color, line, and form can be repeated to attain rhythm in landscape design. Rhythm reduces confusion in the design. A pattern cut or scratched into a surface.

**SENSE OF ENTRY** An introduction to a site or place. The impression of having arrived at a site or community.

**SENSE OF PLACE** The unique impressions, perceptions and memories along with physical representations of a site.

**SENSE OF SCALE** The feeling created or perceived when one is placed next to a very large object (such as a 50-story building 500 feet wide) or a small object (a toolshed 6-feet tall and 8-feet wide).

**SEQUENCE OF ARRIVAL** Transition between spaces as a destination is approached.

**SHADOW PATTERNS** Shadow patterns in structures occur due to relief of planes and specific shadow lines and may be part of the ornament of the structure.

**SHARED-USE TRAIL** A trail used by a combination of users, including pedestrians, roller bladers, horseback riders, bicyclists, etc.

**SHRUB** A plant with many stems or much branching near the ground. It is woody and forms new wood from old wood each year.

**SIGNAGE SYSTEM** A coordinated system of visual communications in symbols, pictures, letters, drawing, photographs, or words whose function is to communicate directions, identifications, warnings, advertisements, etc., to passersby.

**SITE ANALYSIS** Observing, considering and evaluating the physical and man-made elements including the environmental, climatic, visual, cultural, historical and other factors relating to a particular location, corridor, or region (AASHTO, 1991).

**SITE CONTEXT** Where the site in question is located in relation to the greater landscape. The surrounding area, whether city, town, wilderness, etc.
**SITE PLAN** A plan of a site showing the positions, size, and types of elements such as roads, drives, parking lots, play areas, land uses, or structures existing or proposed for a site. It may or may not show dimensions, contours, or have a legend.

**SITE RISK ASSESSMENT** The process of evaluating the adverse effects caused by a substance, activity, lifestyle, or natural phenomenon.

**SITE-SPECIFIC** Peculiar to only one particular location (AASHTO, 1991).

**SITE-SENSITIVE MATERIALS** Materials with qualities that blend with the surroundings.

**SOFTWARE** The plantings used in a landscape.

**SOFTWARE TREATMENT TYPE** Software treatments are compositions of plant materials including trees, shrubs, perennials, grasses, and ground treatments.

**SPIRIT OF PLACE** The unique, distinctive, and cherished aspects of a place, including both cultural components and physical aspects such as rivers, architectural style, and views.

**STREET TREE** Trees that are tolerant of city conditions, including pollution, poor soils, low soil moisture, strong winds, and soil compaction. Many communities have a list of accepted trees for their area.

**STRUCTURES AND HARDSCAPES TREATMENT TYPE** Varying levels of treatment for bridges, retaining walls, acoustic walls, pedestrian crossings, railings, barrier railings, lighting, and transportation art.

**SUB-SEGMENT** A portion of a landscape design segment where unique historic, cultural or environmental features may result in a slightly different interpretation of the overall design theme.

**SUSTAINABILITY** The ability to sustain ecological integrity, including human needs throughout generations. The ability to maintain with little deviation, with little wail, with renewable energy, etc.

**SUSTAINABLE DESIGN** Landscape designs that work with nature rather than against it (Booth, 1999).

**TODS** Tourist Oriented Directional Sign

**TRACK WALKING** A method of erosion and sediment control. Track walking with machinery up and down a slope provides grooves that will catch seed, fertilizer, mulch, and rainfall, and reduce runoff.

**TRANSITION** A gradual change. Transition can be obtained by the arrangement of objects with varying textures, forms, or sizes in a logical sequential order (Ingram, 2006).

**TRANSPORTATION ART** Artwork along a transportation route that enhances the travel experience and relates to the surrounding place, the unique culture and environment of the area. Artwork should be of a scale appropriate to highway travel speed.

**TRANSPORTATION CORRIDOR** A strip of land between two termini within which traffic, topography, environment, and other characteristics are evaluated for transportation purposes; also a strip of land for transmission of a utility (AASHTO, 1991).

**TRC** Technical Review Committee

**UNDERSTORY SHRUB** The lower canopy in a layered planting.

**UNITY** The state when independent elements contribute harmoniously to the whole (Williams, 1990).

**URBAN BACKGROUND** Highway zone within urban regions that comprise areas dominated by commercial and residential development.

**URBAN CONFLUENCE** Highway zone within urban regions that serves as an important connector for people and commerce.

**USFS** US Forest Service

**USFWS** US Fish and Wildlife Service

**VERNACULAR FORMS** Forms in indigenous styles constructed from locally available materials following traditional building practice and patterns not architect-designed.

**VERTICAL DESIGN ELEMENT** Site elements such as the facades of buildings, walls, fences, trees and tall shrubs, or steeply sloped ground. Vertical elements may be used as enclosures or for visual interest (Booth, 1999).

**VERTICAL DIVERSITY** Vertical elements that vary in texture, color, transparency, etc. in order to add visual interest to a site (Booth, 1999).

**VIEWPOINT** A “pull-off” area on a highway where travelers can enjoy a scenic vista.

**VIEWSHED** The total area visible from a point or series of points along a linear transportation facility and conversely the area which views upon the facility (AASHTO, 1991).

**VIEWSHED ANALYSIS** Scrutinizing a viewshed to determine the positive and negative aspects.

**VISUAL RELIEF** A unique feature in an otherwise monotinous landscape or structure.

**WATER HARVESTING** Catching and holding rain where it falls for future use. It may be stored in tanks or used to recharge groundwater.

**WATTLES** Poles intertwined with reeds or plants (willows, etc.) to create a fence, barricade, etc.
**WETLAND**  An area that is inundated or saturated by surface or groundwater at a frequency, duration, and depth sufficient to support a predominance of emergent plant species (cattails, etc.) adapted to growth in saturated soil conditions.

**WILDLIFE CROSSING**  Structures built to facilitate wildlife crossing highways and minimize wildlife-related automobile accidents.

**WILDLIFE HABITAT CORRIDORS**  Corridors that connect patches of wildlife habitat. These corridors allow wildlife to move between habitats and allow individual animals to move between groups, helping to restore or maintain genetic diversity that is essential both to the long-term viability of populations and to the restoration of functional ecosystems.
REFERENCES


Eureka County. Eureka County Master Plan. Eureka, Nevada: Author.


Lincoln County. Lincoln County Master Plan (Revisions). Pioche, Nevada: Author.


GLOSSARY REFERENCES

Unless a citation is provided in the glossary entry, definitions were taken from the following book:


ADDITIONAL SOURCES


