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## Appendices

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StanCOG | State Route 99 Corridor Enhancement Plan 1
1. Introduction

1.1 Purpose of the Study

"Beautify State Route 99 in Stanislaus County to Promote Economic Vitality and Improve Overall Livability and Quality of Life in the Region."

The mission statement above, envisioned by the Stanislaus Council of Governments (StanCOG) and the Beautify 99 Campaign Steering Committee, is the source and inspiration for the development of this State Route 99 Corridor Enhancement Plan. The document provides design concepts, guidance documents and resources for planning highway structures and landscapes, controlling soil erosion, improving water quality and providing resources for transportation project funding. It is not the intention of this document to provide design documentation for specific locations within the corridor, but rather to provide a design approach for the entire corridor.

StanCOG serves the communities and governments of Stanislaus County as a Metropolitan Planning Organization and a Regional Transportation Planning Agency. It was established in 1971 by a Joint Powers Agreement to address regional issues. One such issue is the unsightliness of the twenty-five mile segment of SR99 within Stanislaus County. The State Route 99 Corridor Enhancement Plan actively responds to this issue by providing the guidance needed to transform the corridor into a welcoming and attractive commuter and trade route to stimulate sustainable economic development, tourism and livable communities.

Also known as the Golden State Highway and the Main Street of the Central Valley, the entire length of State Route 99 extends from east of Red Bluff where SR99 intersects SR39 to south of the town of Mettler where SR99 merges with I-5, a total length of 416 miles. Other corridor enhancement plans that have been prepared include the “SR 99 Corridor Enhancement Master Plan” (Dec. 2004), prepared by the California Department of Transportation for the 274 mile long segment between Kern and Sacramento counties and the “Highway 99 Beautification Masterplan” (July 2000) prepared by the Fresno Council of Governments for the 31.59 mile long segment of SR99 in Fresno County.

This publication represents the culmination of a year-long planning effort on the part of representatives of the Stanislaus Council of Governments (StanCOG), cities of Modesto, Ceres and Turlock, Beautify 99 Campaign Steering Committee, California Department of Transportation-District 10 and the design-engineering team of Haygood & Associates Landscape Architects of Albany, CA, Rajappan & Meyer Consulting Engineers, Inc. of San Jose, CA and WRECO Consulting Engineers of Walnut Creek, CA. See Section 1.4 for a complete list of the organizations and their members.

1.2 Assessment of Existing Environment

State Route 99 serves as a regional north-south highway within Stanislaus County and connector to the county’s nine incorporated cities and thirty-six unincorporated communities.

Between the north and south county lines, extending from the Stanislaus River to south of Turlock, the 24.74 mile long segment of highway is located within flat terrain bordered on the east and west by the Sierra Nevada and Diablo Ranges respectively. The urban centers of the cities of Modesto, Ceres and Turlock are clustered along the highway. Beyond these nodes of urbanization, vast stretches of land are in agricultural production extending to the foothills of the adjacent mountain ranges. Orchards are next to the highway, limiting long range vistas. Cultivated fields are farther to the east and west and it is from these vantage points that long range views are afforded across open land where one can appreciate the vastness of the Central Valley and a connection with the natural environment. Rivers are important natural features in the landscape. The Stanislaus and Tuolumne rivers meander through the valley floor carrying water from Sierra Nevada Range. From a distance, the course of the rivers can be traced across the land by virtue of the tall trees and shrubs that grow along their banks. The water and vegetation provide rich environments for wildlife.

Stanislaus County lies in the fertile Central Valley of California. The warm climate, rich alluvial soils and natural water-ways attracted farmers to the region in the early 1800’s. Today it is the single most productive agricultural region in the world, generating annual revenues in excess of $4.4 billion from its top ten commodities alone including almonds, milk, cattle, walnuts, chickens, silage, turkeys, fruit and nut nursery and almond pollination. As agriculture grew, so did the need for housing, services and industry. Today’s population exceeds half a million inhabitants. Today that diversity is visible from State Route 99.

1.3 Design Concept for Overall Corridor

The Route 99 Corridor Enhancement Plan showcases the scenic and unique ecological characteristics found in Stanislaus County through the landscape and structural aesthetics design concepts that are presented in this document. Beauty, pride, agriculture, industry and community have long been experiences vital to Stanislaus County. State Route 99 provides the setting and opportunity to express these experiences that make the County a special place to live, to cultivate and care for the land, to be industrious and participate in maximizing the quality of life of its citizens. The designs reflect a strength of character and offer of welcome as each interchange serves as a gateway to urban, industrial/commercial, agricultural and riparian communities and environments. Each of the design themes in this document highlights unique characteristics of the land uses along the corridor and together they provide a unified and attractive corridor representative of the high quality of life within Stanislaus County.
1.4 Acknowledgements

StanCOG wishes to thank the tireless efforts of its staff, the members of the 99 Beautification Steering Committee, the Project Development Team and the Design Team without whom the State Route 99 Corridor Enhancement Plan would not have come to fruition. They are:

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2. Identification of Corridor Themes

Land uses that we see from Route 99 are agricultural, light industrial/commercial, riparian and urban. Identified as themes, design concepts for each land use and guidance documents are provided to serve as a basis for development of highway improvement projects on Route 99 in Stanislaus County. The unique characteristics of each land use described below are the sources of inspiration for the landscape, structures and paving concepts.

2.1 Agricultural

Agriculture connects us to a unique form of the natural environment, one that is arranged and organized by human hand and ingenuity. It is something we experience as we drive along a country road passing row upon row of trees and leafy stalks. If we are fortunate to be a passenger, we watch the angles in the spaces between rows change from one direction to another, the soundless rhythm of the cultivated land. Within this green network so firmly rooted to the earth, buds, flowers, fleshy fruits and nuts form, burst and fall in their own time. While most are gathered and taken to market, others are pecked, scooped and carried on the wing. Rows, leaves, angles and fruit are the sources of inspiration for the patterns and motif used in the aesthetic treatment of the overcrossing, walls and paving for the Agricultural Theme.

2.2 Light Industrial-Commercial

Industry and commerce are important and visible companions to agriculture in Stanislaus County. Industrial structures are practical, emerging from the necessities of function and purpose to protect, contain and transport fragile and perishable goods. Commercial architecture is an outgrowth of the marketplace where the language of form is dynamic, inviting and encouraging people to buy and sell, sit and walk, enter and leave. The Modesto arch welcomes those who arrive and reminds others of home. Storefronts support bright colors, distinctive shapes and strong messages announcing what to buy and how much it will cost. The elements of welcome, commerce, transport and purpose are the sources of inspiration for the columns, arched shapes, horizontal bands and colorful accents used in the landscape and architectural features of the Light Industrial-Commercial Theme.
2.3 Riparian

Riparian is a place where water and land meet, a co-existence of the natural environment and what is engineered by humankind. Abundant trees and grasses thrive along the banks of the Stanislaus and Tuolumne rivers that meander through the valley of Stanislaus County, providing rich habitats for wildlife and sources of recreation and respite for weary workers. Crossing the threshold from land to stream brings us closer to what is simple and peaceful in life. We see the wind blowing grasses and rippling surfaces of water, a flush of birds bursting from trees and reeds, the sky reflected in a quiet pond. Flowing water, grasses and waterfowl are the sources of inspiration for the Riparian Theme.

2.4 Urban

Urban refers to cities and cultures, places where people live and work side by side, interact and cooperate, express creatively and purposefully in densely populated areas. More than in any other land use, it is in the urban environment where individual preferences are expressed in architecture and landscapes. Personal environments are created to reflect perceptions of home and the natural world. People go to town for goods and services, gather at cafes to enjoy the company of others, attend sports and cultural events to be entertained and informed and enjoy the out-of-doors in community parks. City buildings, lighted environments, marquees and tree-shaded parks are among the features that are the sources of inspiration for the Urban Theme.
2.5 Locations of Each Theme Along Route 99 Corridor

Legend

The legend below provides the color-code for each of the four themes whose location and extent along State Route 99 in Stanislaus County is illustrated on the strip maps that follow the legend.

Visual characteristics observed that differ from local land use plans are noted on the strip maps. With each project that emerges, local planning documents will need to be reviewed and a visual inspection conducted of the project area to determine if the existing visual characteristics are still consistent with the design themes presented in this document or whether they have changed over time and are better represented by one of the other design themes provided. The photos below are representative of land use characteristics in each of the design theme areas. See the Section D of the Appendices for additional photos.

Agricultural

Light Industrial Commercial
Riparian

Urban
3. **Landscape and Aesthetic Treatment for Structures, Pavement & Lighting**

The following pages illustrate concept designs for use within each of the four themed areas: Agricultural, Industrial-Commercial, Riparian, and Urban. The concepts include landscape and hardscape features within interchanges and the highway corridor. Illustrated are the arrangement and species of plants, groundcover materials, rock gabions, walls and gore paving. Photos of the materials are included. Design concepts for structural features and slope paving are provided in elevation drawings including overcrossings, abutments, slope paving, soundwalls and retaining walls. The lighting selection for each of the themed areas is provided in Section 3.6. See Section 7 for Recommendations for Implementation. The following sections describe the features in each theme.

### 3.1 Agricultural

The landscape design for the interchange draws upon features that we see within the agricultural areas of Stanislaus County: Rows of trees and shrubs, irrigation canals and almond orchards. Similar to a cultivated field, the landscape concept extends to the limits of the available space, from right-of-way line to edge of highway. See Section 3.9. Within this space, we see representations of field crops and orchard trees arranged row upon row. Oriented on an angle, the rows set up the familiar rhythm that we see when we travel along a country road looking across the land. Also familiar are the necessary features of agriculture such as the irrigation ditch and the access road that strike paths of least resistance through the fields. These features are represented in the landscape concept by highway ramps and a long rectangular shape representing an irrigation canal. Paved with natural cobbles and edged with a 30” wide concrete band, the canal cuts through the center of the design. Plants selected for the concept have growth patterns that are reminiscent of the agricultural environment.

The design patterns and motifs on structures such as walls, abutments, columns, railings and slope paving draw upon the theme of the linear cultivated row. The motif shown on the concrete structures is a leafy branch with clusters of mature almonds. The retaining walls have window panels with almond branches appearing in different positions in each window, simulating the experience of the motorist viewing a landscape while driving.

The railings and lights are finished in the standard Caltrans green, RAL 6005, including all fabricated and standard steel pieces, chain link fabric, light bases, poles and fixtures and all hardware and conduits that are attached, or adjacent to green-finished metal surfaces.

### 3.2 Light Industrial-Commercial

The wheels of industry and commerce are the inspiration for the design of the landscape and structures aesthetics of the Light Industrial-Commercial themed areas. See Section 3.10. The landscape concept includes concentric circular shapes created by plants, rock filled gabions and gravel mulch, reflective of the life, steel and grit that make industry and commerce work with determination and purpose. The natural landscape that surrounds the circles provides a soft backdrop against which the circular focal points are highlighted in the design. Together, there is a harmonious balance between the natural and constructed elements in the environment. The Italian Poplar trees in the design are tall and vertical. Chinese Pistache and Purple Leaf Plum trees are rounded and colorful.

The design elements on the structures for this themed area include linear and rounded shapes. Monumental concrete sentinels stand at the east and west entrances to the overcrossing. Mounted on top of the sentinels are silver colored perforated stainless steel domes that are illuminated from within, emitting pinpoint rays of light during the night. The metalwork is finished in black including posts, rails, hardware, lights and fixtures. The barrier has a smooth horizontal band that is finished by hand with a brick red concrete sacking. The red horizontal stripe is a theme color that is repeated throughout the entire length of Route 99 in California. Rectangular window-like panels on the soundwalls and retaining walls include views of the themes’ linear and rounded shapes as if viewing them through a moving vehicle.

### 3.3 Riparian

Flowing lines swirl around the contours of the Riparian themed landscape, simulating the streams and shallows that course through the valley floor of Stanislaus County. Seasonal forces of flowing water push and scour the earth and rock into valleys, levees, and riverbanks. The riparian theme reflects the use of running water, riparian vegetation, gravel and boulders and mound areas planted with trees, shrubs and groundcovers. See Section 3.11. The natural-appearing landscape is created by random and unstructured placement of trees and shrubs. Meadows of poppies blanket the interchange and extend along the highway. A design feature of the Plan is a California poppy-lined highway, funded and reseeded on a yearly basis by members of the community through the Adopt-a-Highway, or similar program.

Images of reeds and waterfowl are highlighted in the structural aesthetics for the bridges, walls and paving. The undulating pattern on the bridge railing, representing flowing water, complements the reeds and waterfowl that are featured on the bridge structures and walls along the highway.

The metal work on the bridge, lights, hardware and conduits attached to them will be finished in the standard Caltrans green color, RAL 6005 (Standard Dark Green).

### 3.4 Urban

“Elegant and sophisticated” appropriately describe the Urban theme design concepts. The landscape for the interchange is tastefully simple, evoking images of a beautiful city park with well-defined paths, bordered by colorful shrubs and shaded by generous canopies of leafy trees. See Section 3.12.

The design elements on the overcrossing reflect images of the center of town with bright lights, decorative railings, stepped building facades and marquees. The metal elements and conduits in contact with metal are finished in black. The horizontal band on the barrier of the overcrossing has a red stripe applied by hand using a brick red concrete sacking over a fractured concrete formliner finish. The rectangular window shapes on the retaining and soundwalls have snaps of cityscapes within them as if viewed from the window of a moving vehicle.

### 3.5 Consistent Design Features Throughout Corridor

Four land use themes are showcased in the document with individual design concepts. Equally important is the appearance of cohesiveness throughout the Route 99 corridor in Stanislaus County, achieved through the use of selected common features. For example, rectangular window patterns appear on the vertical surfaces of soundwalls and retaining walls throughout the corridor. Frames and motifs are created with custom formliners. The motifs in each window change in succession as if viewing the landscape through the window of a moving vehicle. The soundwalls and retaining walls have the same color, block design and basic configuration.

**Soundwalls** are constructed of 8”x8”x16” concrete masonry units in a stack-bond pattern. The caps are 16”-long concrete masonry units. The field color and caps are light tan, ground face blocks with specks of black-colored aggregate. Below the cap is a 16” high light gray horizontal stripe, from 8”x8”x16” precision surface blocks with specs of black-colored aggregate. The patterns on the soundwalls walls are created with StanCOG |State Route 99 Corridor Enhancement Plan
split face blocks of the same light tan block color used for the field.

Retaining walls match the light tan color of the soundwalls, achieved by mixing pigment into the concrete. The surfaces of the walls are sacked completely and evenly using matching light tan sacking concrete. No mica is added to the surface. Color-staining concrete is avoided due to uneven results. No sandblasting is to be used to texture or clean wall surfaces. Light-textured grit is added to the sacking mix to mimic a light sandblast finish. Where retaining walls abut overcrossing wing walls and abutments, retaining walls are the same light tan color described in this paragraph. Abutments and wing walls are plain gray concrete.

Slope paving field resembles the soundwall field color and texture. To mimic the dark speckled surface of the concrete block, the surface is seeded with black mica in an even distribution so that the light tan concrete is dominant and the black mica serves as the accent color. The concrete surface on the slope paving is scored in an 8"x16" stack-bond pattern to match the soundwall block design.

Decorative formliner panels for soundwalls, retaining walls and slope paving are created from custom formliners with the designated patterns. The integral concrete color matches the field color in the retaining walls. No mica is added to the surface. Finishes are smooth.

Control joints are designed to work with the graphic elements of the design. At retaining walls, control joints are centered vertically, outside of and between concrete window panels. No control joints are to go through decorative concrete panels with themed design features. On slope paving, control joints will be required within the decorative panels due to their length. For the Agricultural theme, align the joints with the two valley "V" hinge points in the angular pattern; avoid the almond cluster. On the Industrial-Commercial theme avoid the round shape. Avoid scoring through the birds on the Riparian theme and for the Urban theme, score only along exterior frames and in 8"x16" score joint pattern.

Gore paving will be integral-colored concrete matching the light tan color of the retaining walls. The score joint pattern is shown on the design concepts in the following pages. The surface texture will be a medium broom finish drawn ninety-degrees to direction of travel.

Bridges, barriers, abutments and wing walls are plain gray concrete. Mix formula is to be identical for all gray concrete produced for individual projects and throughout corridor to make sure all gray color is the same. Custom formliners are used to create architectural features. All concrete structures at and above overcrossing road will be sacked with gray concrete sacking to match formula used for cast in place concrete features. Sacking will produce an even and consistent texture similar to a very light sandblast finish.

Pedestrian sidewalks are plain gray concrete. The field is finished with a medium broom finish drawn at a ninety-degree angle to the direction of traffic. Edges are tooled and defined by walls, curbs and control joints.

The full length of the corridor, organized with landscape designs and similar treatments of walls and paving, will appear cohesive and attractive.

Metal Birds are stainless steel, 24 gauge, powdered-coated with matte finish Brick Red #38/30028 by Tiger Drylac, or equal. Mounting height is six feet clear of pavement and no more than 1" protuberance from surface of wall. Such specifications are based on Caltrans standards and must be verified with their current regulations.

Green Finish on Metals where specified is RAL 6005 (Standard Dark Green).
Black Finish on Metals where specified is RAL 9005 (Black Satin Finish).
Plant Materials: See Section 4 for Plant Selections and Resource List for Nurseries and Materials.
3.6 Lighting

Lighting for the highway and overcrossings will be consistent throughout the corridor. The lights are RoadStar Series by Phillips Lumec or equal providing LED illumination. The poles are round with an arched mast-arm.

Highway mainline fixtures and poles will be standard Caltrans gray and maintained by Caltrans. At overcrossings, on- and off-ramps and transition zones between overcrossings and local streets, lights will be finished in standard Caltrans semi-gloss dark green at the Agricultural and Riparian themed areas and in semi-gloss black at the Industrial-Commercial and Urban themed areas. RAL number for green is 6005 (Standard Dark Green). RAL number for black is 9005 (Black Satin Finish).

The lights on overcrossings are positioned directly across the travel way from one another and not in a staggered formation. Lights at on- and off-ramps are in a staggered formation. Corbel lights within the perforated stainless steel domes at the Light Industrial-Commercial theme concept are high-intensity LED lights, designed to cast rays of light through the perforations.

3.7 Areas Requiring Specialized Treatment

It is the goal of this plan to provide views from SR99 that are attractive, neat, clean and well-organized.

Landscaped Freeway Status and Outdoor Advertising:

Enhancement and preservation of the beauty of a transportation corridor over the long term is integrally tied to the prevention of billboards and sign pylons from being erected and removal of those that are existing. Outdoor advertising is regulated by the State of California and its presence limits the ability to plant trees and tall shrubs within the corridor, therefore diminishing the visual quality and appearance of a highway substantially. Refer to California Code of Regulations, Division 6, Chapter 1, Outdoor Advertising-General.

The State will not issue a permit for erection of a billboard if it is adjacent to a section of Landscaped Freeway. Refer to http://www.dot.ca.gov/hq/LandArch, Landscaped Freeway for the criteria for classification as a Landscaped Freeway. In brief, a Landscaped Freeway is classified by the State of California. The landscaping is continuous for 1,000 feet in length on one side of the freeway or 1,000 feet combined length on both sides of the freeway. If there is a gap of 200 feet or less in the landscaping and the gap adjoins a landscaped segment of freeway, then the adjoining landscaped segment must be at least 500 feet in length.

Screening Unsightly Views:

- To beautify the corridor immediately, City and County Planners are encouraged to work with individual land owners who have debris, debris bins, demolished automobiles, stockpiled materials, unkempt buildings and materials and graffiti-painted surfaces that are visible from the highway, to install 8 foot tall chain link fencing on their property lines facing the highway, using fuse-bonded PVC finished chain link fabric, black in color, with steel posts and top rail to match black color, and to plant vines at a minimum of 6 feet on center on the private property side of the fence, irrigated with an automatically controlled irrigation system. In addition, local agencies are encouraged to require landowners to plant a single row of tall screening shrubs 12 feet in front of the fence on their property at a spacing not greater than 6 feet on center, also irrigated by an automatically controlled irrigation system. The plant materials should be selected from the master plant list in this plan to maintain design consistency throughout the corridor.

- Local and County community services agencies are encouraged to work with law enforcement to find shelter and food for those who make use of highway right-of-way lands for personal needs.

Debris Pick-up Within Highway: Debris pickup is one of the contributions that can be made by local organizations and businesses with acknowledgment provided by the California Department of Transportation Adopt-a-Highway signage program.

Landscaped Buffers: City Planners and County Agencies are encouraged to require with commercial, industrial and research and development building permits, a 40-foot landscaped buffer along the full length of their property measured 90 degrees from the Caltrans right-of-way line. The landscaped buffer would serve a two-fold purpose. First, it would provide a beautiful community tree-lined highway for the future as the highway is widened toward the right-of-way line over time. Secondly, it would insure that private land uses are screened from view of the highway. Landscape shrubs planted within the buffer should be selected from the master plant list in this plan. Trees should match the theme tree selection designated for the highway adjacent to individual properties and be spaced between 20 to 40 feet on center.

3.8 Railroads

UPRR and Amtrak have rail lines in a north-south corridor that are adjacent to State Route 99 in Keyes, Ceres and northern parts of Modesto. Railroad companies have specific requirements concerning landscape planting adjacent to their property. In addition, any encroachment in, or over railroad rights-of-way, will require written agreement with the individual railroad company. Refer to Title 23, Code of Federal Regulations, Chapter I, Subchapter G, Part 646, Subpart B [23 CFR 646(B)], and Part 625.4, Paragraph (b) [23 CFR 625.4(b)] for information on design and horizontal and vertical clearances from railroad facilities. Also, see U.S. Department of Transportation, Federal Highway Administration website.

Legend

- Drainage Swale

3.9 AGRICULTURAL
15 gal Trees 25’-100’ Mature Height

- Cupressus aritonsis ‘Gabra’ Smooth Arizona Cypress
- Prunus car ‘Kwuter Vesuvius’ Kwuter Purple Leaf Plum
- Populus nigra ‘Tuscar’ Lombardy Poplar
- Olea europea ‘Swan Hill’ Olive
- Pistacia chinenis ‘Keith Devey’ Keith Dwarf Chinese Plache

Shrubs 2’-6’ Tall

- Rhamnus ‘Clara’ Indian Hawthorn
- Rhus ovata Sugar Bush
- Photinia fraseri ‘Compacta’ Compact Red Robin

Accent Planting 1’-5’ Tall

- Helianthus annuus ‘Tunis’ Zinnia
- Lavatera montevidensis Purple Tailing Lavatera
- Plumbago auriculata Plumbago

Gravel Mulch

- Grass Hydroseed & Groundcover

- Rock Filled Cage (Gabion) 6’x2’x3’

Legend

- Drainage Swale
- Bottom of Slope
- Storm Basin Location
- Landscape Adoption Sign
- Gore Paving

Scars Joints on Broom Finish Concrete Surface

3.10 LIGHT INDUSTRIAL COMMERCIAL

[Diagram showing various plants and materials for landscaping]
Legend

Shrubs 2’-6’ Tall
- Raphiolepis ‘Clara’ Indian Hawthorn
- Rhus ovata Sugar Bush
- Photinia fraseri ‘Compacta’ Compact Red Robin

Grass Hydrosed & Groundcover
- Cotoneaster dammeri ‘Royal Beauty’ Bearberry Cotoneaster
- Acacia redolens ‘Low Boy’

15 gal Trees 30’-100’ Mature Height
- Populus nigra ‘Italica’ Lombardy Poplar
- Prunus cer ‘Krauter Vesuvius’ Krauter Purple Leaf Plum
- Pistacia chinensis ‘Keith Davey’ Keith Davey Chinese Pistache

3.10 LIGHT INDUSTRIAL COMMERCIAL
Overcrossing

Retaining Wall

Sound Wall

Slope Paving

3.10 LIGHT INDUSTRIAL COMMERCIAL
StanCOG State Route 99 Corridor Enhancement Plan

Legend
- Drainage Swale
- Landscape Adoption Sign
- Gore Paving
- Score Joints on Broom Finish Concrete Surface

Accent Planting 2'-4' Tall
- Rosa 'Meidiland'/ 'Marpjohn'/ 'Meidiland Rose'
- Rhipsalis sp. 'Jack Evans'
- Indian Hawthorn
- California Fuchsia
- Eriogonum spp.
- Buckwheat

Shrubs 2'-6' Tall
- Elaeagnus pungens 'Silverberry'
- Forsythia X intermedia 'E.

15 gal Trees 10'-100' Mature Height
- Pappus nigra 'Tall Poplar'
- Lombardy Poplar
- Quercus lobata 'Valley Oak'
- Populus nigra

Grass Hydroseed & Groundcover

Wildflower Hydroseed

Grading 1' Contours

Cobbles and Boulders (4'-6')

Gravel Mulch

3.11 RIPARIAN

StanCOG State Route 99 Corridor Enhancement Plan
Shrubs 2’-6’ Tall
- Rosmarinus officinalis 'Tuscan Blue'
- 'Tuscan Blue'
- Blau Rosemary
- Narum osisan 'Sierra Agave'
- Olearia
- Leucophyllum 'Green Cloud'

Grass Hydroseed & Groundcover
- Acacia redolens 'Low Boy'
- Anthophyta
- Shrub Macaranta

Wildflower Hydroseed
- Chilopsis linearis 'Burgundy'
- 'Burgundy Dessert Willow'
- Rhus ovata 'Sugar Bush'

15 gal Trees 25’-70’ Mature Height
- Platanus × acerifolia 'Columbia'
- Columbia London Plane
- Quercus ilex 'Holly Oak'

3.12 URBAN
Overcrossing

Retaining Wall

Sound Wall

Slope Paving

3.12 URBAN
4. Plants

4.1. Introduction

The following pages provide lists and photos of plants that are suitable for use in highway environments and the local climate around State Route 99 within Stanislaus County. They have been reviewed and approved by the Landscape Architecture Department of the California Department of Transportation, District 10 (Caltrans).

Locations for trees, shrubs and groundcover must conform to Caltrans standards. Refer to current document of, "Landscape Architecture PS&E Guide, Section 4, Highway Planting Design, Plans, Plant List and Specifications Sheet,” which is available for viewing on-line at the following website address:

www.dot.ca.gov/hq/LandArch/16_la_design/guidance/lap_guide/Sec4.pdf

Also refer to the following Caltrans websites to find current documents and standards:

http://www.dot.ca.gov/hq/LandArch/index_intro_to_la.htm
http://www.dot.ca.gov/hq/LandArch/16_la_design/guidance/index.htm

Construction documents developed for projects within Caltrans right-of-way must not deviate from current Caltrans standards. Since the standards apply to all levels of the work from design features to CAD line weights and layers as well as specifications, the designer is encouraged to become thoroughly familiar with the standards prior to beginning work.

The plants listed below are drought tolerant, requiring moderate to very low amounts of potable-quality irrigation water. Next to the plant name on the lists is a letter corresponding to water use requirement. The letters are M=Moderate, L=Low, VL=Very Low. The source for determining the amount of water use a plant requires is the University of California Extension's document, "Water Use Classification of Landscape Species", otherwise known as WUCOLS, available at,


If non-potable water is the water source for irrigation, existing landscapes must continue to be irrigated with potable water to protect their health. If new landscapes are to be irrigated with non-potable water, a chemical analysis from the purveyor and the following plant lists must be submitted to a soil and plant laboratory for assessment and preparation of a report identifying which of the plants in the list would survive using the proposed non-potable water source. The soil laboratory should also provide recommendations for the type of soil to use with the water chemistry to prevent damage to the soil structure from salts.

Due to the large number of trees and shrubs used in the highway landscape, it is recommended that the plants be contract-grown in order to insure that all of the plants, correct species and cultivars are available on schedule. Wholesale nurseries are best suited to manage and care for the thousands of plants required for the highway landscape project. It is recommended that the designer include a registered certified and consulting arborist on the design team to visit the growing grounds after a contract grow agreement is in place to inspect and tag trees to be included in the contract grow contract. A follow-up inspection is made one month before delivery to make sure that the tagged trees are in optimum condition and if they are not, to select replacement trees. See Section 4.4, Resource List for Nurseries and Materials.
Arbutus unedo ‘Marina’  
Strawberry Tree - (L)

Callistemon viminalis  
Weeping Bottle Brush - (L)

Calocedrus decurrens  
Incense Cedar - (M)

Cedrus deodara  
Deodar Cedar - (L)

Celtis occidentalis  
Common Hackberry - (L)

Cercis canadensis  
Western Redbud - (M)

Cercis occidentalis  
Eastern Redbud - (L)

Cercis x ‘Oklahama’  
Oklahoma Redbud - (L)

Cupressus arizonica ‘Glastra’  
Smooth Arizona Cypress - (L)

Eucalyptus microtheca  
Coolabah - (L)

Ginkgo biloba  
Maiden Hair Tree ‘Autumn Gold’ - (M)

Lagerstroemia indica ‘Natchez’  
White Crepe Myrtle - (L)

Lagerstroemia indica ‘Tuscany’ - (L)

Lagerstroemia indica ‘Muskogee’  
Lavender Crepe Myrtle - (L)

Laurea  
Laurel - (L)

Liquidambar styraciflua  
Sweetgum - (M)

Nyssa sylvatica  
Tupelo - (M)

Olea europaea ‘Swan Hill’  
Swan Hill Olive - (M)

Pinus canariensis  
Canary Island Pine - (L)
### 4.3 Median Planting

The following information is provided to assist the designer with assessing and implementing median planting.

<table>
<thead>
<tr>
<th>Median Width</th>
<th>Landscape Treatment</th>
<th>Guardrail Around Landscape Area</th>
<th>Aesthetic Treatment Above Concrete Barrier</th>
<th>Aesthetic Treatment on Concrete Barrier</th>
</tr>
</thead>
<tbody>
<tr>
<td>0'-12'</td>
<td>Asphalt/Concrete/Stamped Concrete/color</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>12'-30'</td>
<td>Hydroseed</td>
<td>No</td>
<td>Yes/No</td>
<td>Yes/No</td>
</tr>
<tr>
<td>30'-60'</td>
<td>Shrubs</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>60'-90'</td>
<td>Trees and Shrubs</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

The median widths indicated in the table above are found in the existing highway conditions within SR99. Individual project median designs are subject to Caltrans District 10 approval.

The designer is to use plants selected from the SR99 Corridor Enhancement Plan, plant list. Final plant selection is subject to Caltrans District 10 approval.

Landscape planting is subject to Caltrans design standards including:


Plants (from plant list) suitable for use in medians:

#### Shrubs
- Arctostaphylos cultivars, Manzanita Cultivars
- Celtis occidentalis, Common Hackberry
- Heteromeles arbutifolia, Toyon
- Laurus ‘Saratoga’, Saratoga Bay Laurel
- Nerium oleander ‘Mrs Roeding’, Mrs. Roeding Oleander
- Nerium oleander ‘Sister Agnes’, Sister Agnes Oleander
- Photinia x fraseri, Red Robin
- Rhamnus californica, ‘Leatherleaf’, Leatherleaf Coffee Berry
- Rhaphiolepis indica ‘Jack Evans’, Jack Evans India Hawthorn
- Rhaphiolepis ‘Majestic Beauty’, Majestic Beauty India Hawthorn
- Rhaphiolepis ‘Clara’, Clara India Hawthorn
- Rhus ovata, Sugar Bush
- Xylosma congestum, Xylosma

#### Trees
- Calocedrus decurrens, Incense Cedar
- Cedrus deodara, Deodar Cedar
- Ceratonia sil fica, Carob
- Cupressus arizonica ‘Glabra’, Smooth Arizona Cypress
- Eucalyptus microtheca, Coolibah
- Liquidambar styraciflua, Sweetgum
- Nyssa silvatica, Tupelo
- Olea europaea, Olive
- Pinus canariensis, Canary Island Pine
- Pistacia chinensis ‘Keith Davey’, Keith Davey Chinese Pistache
- Platanus x acerifolia ‘Columbia’, Columbia London Plane
- Platanus racemosa, California Sycamore
- Populus nigra ‘Italica’, Lombardy Poplar
- Prunus cerasifera ‘Krauter Vesuvius’, Krauter Purple Leaf Plum
- Quercus agrifolia, Coast Live Oak
- Quercus ilex, Holly Oak
- Quercus lobata, Valley Oak
- Quercus suber, Cork Oak
- Quercus wislizenii, Live Oak
- Schinus molle, California Pepper Tree
- Ulmus parvifolia, Chinese Elm
4.4 Resource List for Nurseries and Materials

The following website lists over a hundred wholesale growers complete with contact information.
http://www.plantsearchonline.com/CA.htm

The nurseries below are among several that supply materials for highway projects.

Boething Treeeland Lodi, Lodi, CA. (209) 727-9700
Cornflower Farms Elk Grove, CA. (916) 689-1015
Monrovia Azusa, Azusa, CA. (626) 334-9321
Native Sons, Arroyo Grande, CA. (805) 481-5996
Norman’s Nursery, San Gabriel, CA. (626) 285-9795
San Marcos Growers, Santa Barbara, CA. (805) 683-1561
Suncrest Nurseries, Watsonville, CA. (831) 728-2595
Valley Crest Tree, North. Sunol, CA. (925) 862-2485
Village Nurseries Wholesale Plant & Tree Grower, Orange CA. (800) 542-0209, (800) 875-1972

Materials provided for highway projects are specified in the construction documents, supplied by the general contractor and subcontractors and are not purchased directly by a public agency administering a highway project. The materials are specified on the construction drawings and in the specifications for highway projects. The contractor is required to submit shop drawings, brochures, cut sheets, laboratory analyses, reports and samples for review by the design team and Caltrans. If the reviewers find the submittal acceptable, the contractor is authorized to order the material. If the submittal is not in conformance with the contract documents, it is rejected and re-submittals are required until an acceptable submittal is approved. The following are manufacturers and materials numbers for the items included in this planning document.

Concrete Masonry Units for Sound Walls
Basaltte, Doon, CA. (707) 678-1901 – Color 389 and 428
Calstone, Tracy, CA. (209) 833-7366 – Color S304 and S1344LC

Concrete Color Admixtures
LM Scafcoff Company, Los Angeles, CA. (213) 723-5285 – Color C-12 Mesa Beige
Solomon Colors Inc, Rialto, CA. (866) 747-2666 – Color Thyme 238

Metal Color Finishes
Tiger Drylac, Ontario, CA. (800) 243-8148 – Color RAL 6005 (Green) and RAL 9005 (Black) and 3803026 (Brick Red)

Gravel Mulch
West Coast Sand and Gravel, Northern and Central California, CA. (800) 734-3053
Size 4" – 6"+ – Color Tan (Yosemite Cobble or similar approved).
George Reed Inc., 140 Empire Ave., Modesto, CA. (877) 823-2305 - Size 5" – 6"+ – Color Tan (Lodi Gold Cobble or similar approved).

Cobbles and Boulders

Cobbles
West Coast Sand and Gravel, Northern and Central California, CA. (800) 734-3053
Size 4" – 8"+. Color Tan (Yosemite Cobble or similar approved).
George Reed Inc., 140 Empire Ave, Modesto, CA. (877) 823-2305 - Size 5" – 8"+ – Color Tan (Lodi Gold Cobble or similar approved).

Boulders
West Coast Sand and Gravel, Northern and Central California, CA. (800) 734-3053
Size: 3’ – 5’ x 36’ min. depth. Color Tan (Yosemite Boulder or similar approved).
George Reed, Inc., 140 Empire Ave., Modesto, CA. (877) 823-2305 - Size: 3’ - 5’ x 36’ min. depth. Color Tan

Gabion Rock
West Coast Sand and Gravel, Northern and Central California, CA. (800) 734-3053
Size 8" - 12". Color Tan (Upland Mission or similar approved)
George Reed, Inc., 140 Empire Ave., Modesto, CA. (877) 823-2305 - Size 8" - 12". Color Tan.

Gabion Wire Cages
Gabion Supply (866) 391-6295
Reed and Graham Geosynthetics, Sacramento, CA. (888) 381-0800
Maccaferri Inc, Sacramento, CA. (916) 371-6805

All cobbles, boulders and gabion rock must be full and intact rocks and not broken pieces. Cobbles are to be smooth and oval-shaped.

5. Sustainable Practices

Sustainability is the "...endurance of systems and processes." (Wikipedia, 2016). Determined application of sustainable practices and processes with the intention of living in environments that are in balance, healthy and productive across connections and systems ranging from the natural to social, is a goal and frame of reference for planners of projects within the State Route 99 corridor. Among the many features available to us that provide opportunities to contribute toward endurance of a healthy ecosystem include water, air, soil and plants.

Water availability and conservation are topics of perennial concern in the State of California. Methods to conserve and minimize water consumption used in landscapes within the corridor include selection of drought tolerant plants, use of “Smart” irrigation controllers that are linked to internet weather stations, use of flow sensors that automatically shut off an irrigation system if there is a leak or breakage, use of bubblers or drip irrigation systems to place water only where needed at each plant and operation of irrigation systems at night to minimize evaporation. Water quality and soil erosion are discussed in the Appendices under “Slope...
Stabilization and Best Management Practices*. Use of non-potable water: Most often non-potable water has salt levels that are detrimental to plants and particularly to soil structure. To rid soil of salt build-up with use of non-potable water, more water has to be applied to the soil in order to leech out the salts. Leeching does not rid the soil of salts. It simply takes the salts to a deeper level of the soil causing damage to lower soil horizons. Only when the non-potable water has a chemistry that is similar to potable water, yet is not drinkable, is the use of non-potable water considered sustainable. Also refer to Section 4, Plants, 4.1 Introduction.

Caltrans links to information on water conservation
http://www.dot.ca.gov/hq/LandArch/16_la_design/water_conserv/index.htm
and http://www.dot.ca.gov/water.htm

Air quality in Central California is the subject of state and local planning and management. Although it is not within the scope of this document to address the issue at large, there are sustainable practices that can be implemented when planning transportation construction projects within State Route 99 to minimize airborne particulates. Soil erosion exposes raw earth to heat, thus producing dry particles that can become airborne by the strong winds in the Central Valley. See the Section B on Soil Stabilization and Best Management Practices in the Appendices for methods to reduce and prevent soil erosion. In addition, maintaining dust control by watering during construction is required for projects within the corridor. In the landscape, open soil areas are mulched with gravel, stones, boulders and arbor mulch to keep soil in place, to prevent evaporation of soil moisture and to keep down weeds. Areas planted with shrubs and ground covers will also reduce soil exposure to wind. Finishes on metals are applied in large plants specifically designed to handle large sizes and quantities of metal fabrications typically used in large highway projects and are not applied on the project site except for minor touch ups with paint. Conveyance of materials and supplies using the least amount of fossil fuel, either through purchasing locally or shipping by rail, is another way in which construction projects can minimize their contribution of airborne particulates. Avoidance of chemical sprays in the landscape and during the construction of highway features is yet another way to minimize air pollution. Finally, including in the transportation network, provisions for bicycle ways, pedestrian walkways and mass transit will further reduce air pollution.

Soil structure and health is maintained when sustainable practices are employed in its care. Like any living system, soil requires water and nutrients. It also requires minerals, organic matter and porosity. It supports and maintains a symbiotic relationship with soil organisms and the wider ecosystem where the plants that it supports ultimately create an atmosphere that nourishes the soil. Use soil in the installation of plant materials that is loamy in character. Any top soil to be used or native soil must be analyzed by a soil and plant laboratory for suitability for use on the project site and with the plant materials specified. Sustainable practices include tilling the soil only once during planting and tilling only when the soil is at an optimum condition with a medium moisture content (not wet and not dry). Repeated tilling causes the soil structure to break down. Place two layers of sheet cardboard in overlapping layers on top of the tilled soil after planting trees and shrubs. For areas planted with groundcover, install the sheets first, then make "X" cuts in the paper and install groundcover plants. The sheet cardboard holds in moisture and reduces weeds. On top of sheet cardboard, place a 2-inch layer of compost followed by a 3-inch deep top dressing of arbor mulch. During maintenance, keep small diameter clippings on site rather than hauling away and place around shrubs and trees except those plants that are mulched with gravel or stones. Chip shrub and tree wood debris and use as arbor mulch on site. Do not re-use any part of the Eucalyptus species or include invasive species listed on the California Invasive Plant Inventory Database in the landscape. Other products to retain soil moisture and to prevent erosion on relatively flat terrain are gravel and stones. Protect soil from compaction.

Refer to the Central Valley Friendly Landscaping website:
http://ucanr.edu/sites/cvlandscape/Central_Valley_Friendly_Guidelines/Nurture_the_soil

Plants considered to be sustainable are drought tolerant, low maintenance, minimally susceptible to pests and diseases, are appropriate for planting in the microclimate where the project is located and are of a size when mature that extensive pruning to keep the plants within the bounds of the landscaped area is not required. In addition, plants used in the highway landscape must not be listed in the California Invasive Plant Inventory Database, http://www.cali-ipc.org/paf. Why these criteria contribute to a sustainable landscape is due to their requiring minimal resources to remain viable and healthy. No plant is exempt from the impacts of pests and diseases; however some species are more resistant than others. The nursery industry develops new cultivars over time that are stronger and more resistant. Control of pests and diseases and fertilizers should rely on certified organic materials that are listed with the Organic Materials Research Institute, http://www.omr.org. Select plants for highway projects from the master plant list in this plan.

6. Landscape Maintenance

Detailed description and guidance on landscape maintenance procedures and methods within the Caltrans right-of-way are found in the Caltrans Maintenance Manual Volume 1 Chapter E:

Caltrans' budgets for landscape maintenance are limited. In the event the landscape maintenance costs exceed the amount available to Caltrans, a Caltrans Freeway Maintenance Agreement and Landscape Maintenance Agreement should be entered into that enables part of the maintenance to be undertaken by non-Caltrans staff. A sample agreement can be found in Section E of the Appendices to this document, and is available from Caltrans HQ in Sacramento. Non-Caltrans staff for landscape maintenance must adhere to the requirements of Caltrans for roadside safety.

If non-Caltrans staff agrees to undertake a portion of the Landscape Maintenance work, then landscape maintenance adoption signs should be placed in prominent locations within each area that is adopted by the city, business or by volunteers. These signs should include the details of the adoptees involved and should be securely installed with easily replaceable panels to accommodate changes in the maintenance agreement. Standard "Adopt-a-Highway" sign details are available from Caltrans. However, it is recommended that a unique design be created that reflects the level of involvement by the adoptee, volunteers and staff who will be on site to undertake the maintenance.

7. Recommendations for Implementation

The State of California Department of Transportation has published a State Route 99 Corridor Enhancement Master Plan, http://www.dot.ca.gov/die/6/99masterplan. Refer to Chapter 5, "Implementing the Plan". This document is described as a guide for public and private sector decisions in the development of the Route 99 Corridor by setting specific improvement approaches and themes.
Options for implementing the StanCOG Route 99 Corridor Enhancement Plan could be accomplished through cooperative agreements between Caltrans and single to multiple public agencies such as the County and local municipalities; or the plan could be implemented through individual Caltrans highway contracts as they emerge. Physical, budgetary and legislative constraints would play a large part in how projects are packaged. The StanCOG State Route 99 Corridor Enhancement Plan applies to all new projects within the corridor. The projects may range from new and reconfigured interchanges and mainline to smaller landscape replacement or soundwall projects. See Section C in the Appendices for Funding Opportunities.

The concepts shown in this document are intended to be used as the model for implementing the design of structures and landscaping into existing and proposed road configurations. Realizing that individual site configurations vary, the designer is encouraged to consider the following:

- What are the principal elements within the concept for each theme?
- How will I include the principal elements in the project, maintaining the overall theme and design intent?

For example, the agricultural theme design includes parallel lines of planting to represent rows of trees in an almond orchard and a linear cobbled swale cutting across the design representing an irrigation canal. By changing the orientation and location of these linear elements, the designer is able to fit the design within existing site constraints.

All options for implementation must include Caltrans coordination, approvals and conformance with their standards for construction documents.

8. Cost Estimating

8.1 Assessment of Cost Per Acre

“The California Department of Transportation has available cost-per-acre data for landscaping. While the costs reflect a basic design that includes trees, erosion control and shrubs and do not reflect the level of landscaping shown in the design concepts, the data can be used as a baseline upon which to add the costs required to construct the concepts provided in this planning document.

“The source of the following “Caltrans Highway Planting Cost per Acre and Water Assessment Fee Limits” is a May 4th 2011 memorandum published by the California Department of Transportation Headquarters, Principal Landscape Architect Landscape Architecture Program. Omitted from the text below are costs associated with years prior to 2013:

“Current maximum cost per acre and water assessment fee limits for highway planting are listed by fiscal year below. The costs are shown for both one and three-year plant establishment periods. Design for safety, roadside management and storm water features shall be included in the scope of all projects, but the related project costs are not to be included when determining the maximum cost per acre.

“Three years of plant establishment shall be included with the contract for highway planting projects (including Highway Planting, Highway Planting Restoration, Re-vegetation, and Replacement Planting, as defined in the Project Development Procedures Manual). A three-year plant establishment period assures that plants are healthy and established, and the irrigation systems function as planned. This policy applies to highway planting projects within State right-of-way regardless of the funding source. A plant establishment period of less than three years shall receive concurrence from District Maintenance and District Landscape Architecture through the approval of the Project Report and approval from the Landscape Architecture Program shall be in a concurrence memo attached to the Project Report. A plant establishment period of less than three years may be justified when there will be a benefit to the State.

“If cost over-runs occur after project programming and prior to the programmed year, additional funds may be available from District or program savings. If funds are not available to accommodate cost over-runs, the district must determine what changes can be made to the project to keep within the programmed amount and minimize the impact to the plant establishment period and purpose and need of the project. If cost changes are unavoidable, a Program Change Request should be submitted to the Project Management Program as early as possible in the project development process. If no cost reduction alternatives are available, the project may need to be delayed and reprogrammed when funds become available.

“Maximum highway planting cost/acre including a three-year plant establishment period are:

<table>
<thead>
<tr>
<th>Year</th>
<th>Base Year</th>
<th>Cost/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013/14</td>
<td>1/14</td>
<td>$52,000/ac</td>
</tr>
<tr>
<td>2014/15</td>
<td>1/15</td>
<td>$52,700/ac</td>
</tr>
<tr>
<td>2015/16</td>
<td>1/16</td>
<td>$53,400/ac</td>
</tr>
<tr>
<td>2016/17</td>
<td>1/17</td>
<td>$54,100/ac</td>
</tr>
</tbody>
</table>

“Maximum water assessment costs/acre are:

<table>
<thead>
<tr>
<th>Year</th>
<th>Base Year</th>
<th>Cost/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013/14</td>
<td>1/14</td>
<td>$1,640/ac</td>
</tr>
<tr>
<td>2014/15</td>
<td>1/15</td>
<td>$1,660/ac</td>
</tr>
<tr>
<td>2015/16</td>
<td>1/16</td>
<td>$1,680/ac</td>
</tr>
<tr>
<td>2016/17</td>
<td>1/17</td>
<td>$1,700/ac</td>
</tr>
</tbody>
</table>

“Projects shall be identified in the 10-Year SHOPP Plan prior to developing Project Initiation Documents for SHOPP candidate projects. It is imperative that the cost and schedule of every un-programmed project be reviewed annually to ensure they are current, complete and accurate.

If you have any questions regarding this memo, please contact Suzy Namba, Chief, Office of Landscape Architecture Coordination and Planning, at (916)-654-2594 or email at suzy_namba@dot.ca.gov.”
8.2. Cost Estimates

The document below is a useful tool for determining construction cost estimates for landscaped areas and structures aesthetics for highway improvement projects within interchanges and straight sections of State Route 99. The costs are itemized for each design theme. All costs will require adjustment to account for physical configuration and size of individual projects, inflation factors and design refinements as a project moves through the process of developing construction documents for contractors to review and submit bids for construction.

**SR99 CORRIDOR ENHANCEMENT PLAN**
**ORDER OF MAGNITUDE ESTIMATED CONSTRUCTION COSTS FOR LANDSCAPING AND STRUCTURES AESTHETICS**

Date: November 1, 2016

<table>
<thead>
<tr>
<th>LANDSCAPE</th>
<th>Agricultural</th>
<th>Light Industrial-Commercial</th>
<th>Riparian</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Interchange: (Cost Per Quadrant)</td>
<td>Mainline: Includes Both Sides (Cost Per Mile)</td>
<td>Interchange: (Cost Per Quadrant)</td>
<td>Mainline: Includes Both Sides (Cost Per Mile)</td>
</tr>
<tr>
<td>TOTAL LANDSCAPE COST</td>
<td>$913,204</td>
<td>$646,993</td>
<td>$793,172</td>
<td>$895,450</td>
</tr>
<tr>
<td>INTERCHANGE LANDSCAPE COST PER SQUARE FOOT</td>
<td>$6.03</td>
<td>$4.27</td>
<td>$5.24</td>
<td>$5.91</td>
</tr>
<tr>
<td>MAINLINE LANDSCAPE COST PER MILE</td>
<td>$616,281</td>
<td>$601,180</td>
<td>$722,449</td>
<td>$576,439</td>
</tr>
</tbody>
</table>

**NOTES ON LANDSCAPE COSTS**

Additional factors that will need to be considered:
- The landscape may be part of a larger project.
- The landscape may be a stand alone project.
- The water source for irrigation may be existing or new.
- Storm water management requirements for each interchange will vary.

<table>
<thead>
<tr>
<th>AESTHETIC FEATURES</th>
<th>Agricultural</th>
<th>Light Industrial-Commercial</th>
<th>Riparian</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Interchange: (Cost Per Quadrant)</td>
<td>Interchange: (Cost Per Quadrant)</td>
<td>Interchange: (Cost Per Quadrant)</td>
<td>Interchange: (Cost Per Quadrant)</td>
</tr>
<tr>
<td>AESTHETIC FINISHES AND COMPONENTS</td>
<td>$410,421</td>
<td>$374,000</td>
<td>$346,143</td>
<td>$552,483</td>
</tr>
</tbody>
</table>

**NOTES ON AESTHETICS COSTS**

1. Costs obtained from the 2014 Pelandale Bridge Project have been increased by 6% to reflect year 2016 estimated construction costs.
2. The costs shown here are for aesthetic finishes and features only and do not include basic structural components of an interchange such as bridges, retaining walls, ramps, paving and lighting.
3. Soundwall and retaining wall costs for mainline between interchanges will need to be determined.