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INTERSTATE CALIFORNIA 710

I-710 Corridor Project EIR/EIS

URBAN DESIGN AND AESTHETICS TOOLBOX REPORT

FEBRUARY 2012

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GATEWAY CITIES

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The Port of LONG BEACH

THE PORT OF LOS ANGELES

ASSOCIATION of GOVERNMENTS

Prepared by Gruen Associates in association with URS

INTRODUCTION

Community Design and Enhancement was identified as a community priority of the I-710 Major Corridor Study (MCS). To respond to this priority, a task of the I-710 Corridor Project EIR/EIS is to develop urban design and aesthetic treatment concepts for community enhancement for the I-710 Corridor. Over the last two years, the urban design team and the outreach team worked with the Community Design and Local Economy Subject Working Group (CSWG) analyzing the design aesthetics of the existing freeway, providing examples of local, national, and international best practices, developing aesthetic toolbox concepts, and coordinating with Caltrans and other stakeholders.

This report summarizes the work-to-date on the I-710 freeway corridor urban design and aesthetic elements, and will be used as a toolbox to assist the team in determining elements that should be addressed. The design elements presented in the following pages provide a wide range of innovative ideas that could be applied within the overall footprint of the proposed I-710 Corridor improvements, which includes not only the freeway right-of-way, but also adjacent communities and cities, and the Los Angeles River. This report is based on a presentation given at an urban design workshop attended by representatives of Metro, Caltrans, Gateway Cities Council of Governments (GCCOG), and the project team in October 2010, updated to include new images and text.

The urban design community enhancements are conceptual in nature, but are being provided to inform the public of the proposed design enhancements being considered for the I-710 Corridor Project. All renderings herein are the artist's point of view. Further details will be defined in later phases of the project.

I-710 Corridor Project EIR/EIS

An Environmental Impact Report/ Environmental Impact Statement (EIR/ EIS) is under preparation to inform the public and governmental decision-makers of environmental effects associated with the proposed project and describe the measures that would be undertaken to avoid, minimize or mitigate those effects. Additionally, federal, state, regional and local agencies will use the I-710 Corridor Project EIR/EIS to assess the environmental impacts of the project on resources under their jurisdiction, make discretionary decisions regarding the project, and exercise review or permit authority over the project. The following issues are of particular concern to the community and other stakeholders:

- Improve air quality and public health
- Improve traffic safety
- Address design deficiencies
- Address projected traffic volumes
- Address projected growth in population, employment, and economic activities related to goods movement

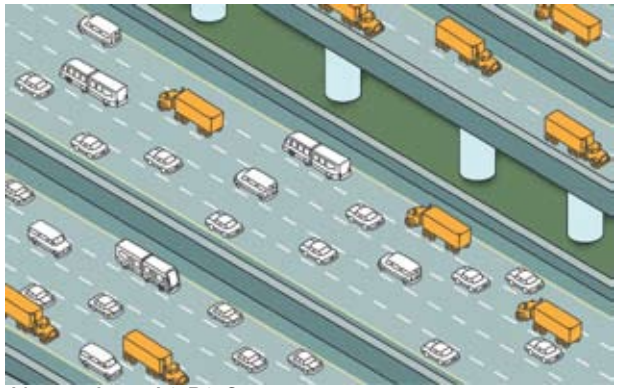
I-710 EIR/EIS Project Alternatives

The Draft I-710 EIR/EIS Project Alternatives is under preparation. No alternative has been selected to date. The following outlines the alternatives which are under consideration and are being studied equally.

Alternative 1
(No Build)

- Required under CEQA and NEPA
- Represents the Future (2035) Baseline Condition
- Consists of Planned and Committed Projects, such as:
  - Clean Trucks Program
  - Expanded Pier Pass
  - Empty Container Management
  - I-710 Pavement Rehabilitation Project
  - Added Lanes to I-5 freeway between the Orange County Line and the I-605 freeway
  - Traffic Signal Coordination Projects on Key Arterials throughout the I-710 Corridor Study Area

Alternative 5A



Alternative 6A/6B/6C

Alternative 5A

(Widen to 10 General Purpose Lanes, No Freight Corridor)

- Enhanced Goods Movement by Railroad, TSM/TDM, Transit, ITS , Arterial Street Improvements and Interim I-710 Congestion Relief Projects

Alternative 6A

(Widen to 10 General Purpose Lanes, Plus 4 Freight Movement Lanes [Conventional Trucks])

- Includes Alternative 1 and Alternative 5A
- Consistent with the Major Corridor Study Locally Preferred Strategy (MCS LPS)
- Assumes conventional diesel powered trucks will use the freight corridor

Alternative 6B

(Widen to 10 General Purpose Lanes, Plus 4 Freight Movement Lanes, Zero Emission Trucks, Automated Guidance)

- Includes Alternatives 1 and 5A
- Consistent with the MCS LPS
- Assumes zero tailpipe emissions trucks will use the freight corridor

Alternative 6C

- *Same as Alternative 6B plus a tolling feature*

Previous Presentations of the Urban Design and Aesthetics

Similar versions of the toolbox concepts in this report were presented to the following advisory committees and groups:

- I-710 Corridor Community Design and Local Economy Subject Working Group December 4, 2008 / January 8, 2009 / March 12, 2009 / May 13, 2010 / June 10, 2010 / July 8, 2010
- I-710 Corridor Project EIR/EIS Funding Partners - May 11, 2010
- Gateway Cities Council of Governments June 3, 2010
- I-710 Corridor Advisory Committee July 15, 2010
- I-710 Corridor Technical Advisory Committee - July 21, 2010
- I-710 Corridor Project Committee July 29, 2010
- I-710 Corridor Project Agency Workshop - October 4, 2010

COMMUNITY ENHANCEMENT Goals

Overarching community enhancement goals are to: highlight unique community identities within a unified overall corridor theme; strengthen physical connections and access/mobility within and between communities; implement new technologies and best practices to ensure maximum respect for the environment and natural resources; and, to design in scale with the size and speed of a freeway corridor in order to visually integrate built elements with their surroundings. These goals were derived through an extensive community outreach process, starting with the Tier 2 Community Committee in the 2005 I-710 MCS and refined later by other advisory groups, such as those mentioned previously. Toolbox concepts are broken down into five enhancement categories: theme, landscaping, freeway enhancements, community arterials, and the freight corridor.

Issues, such as: policy, funding and maintenance related to the proposed design elements will need to be addressed at subsequent design phases and will require active involvement from the cities along the I-710 Corridor and Caltrans.

Community Design Priorities

COMMUNITY BEAUTIFICATION & IDENTITY	CONNECTIVITY	SUSTAINABILITY	RESPECTFUL & APPROPRIATE INFRASTRUCTURE DESIGN
Highlight unique community identities within a unified overall corridor theme	*Strengthen physical connections, access and mobility within and between communities*	*Implement best practices and new technologies to ensure maximum respect for the environment and natural resources*	*Visually integrate built elements with surroundings; reduce massing of structures; design in scale with the size and speed of a freeway corridor*

Enhancements

• Integrated infrastructure design • Artistic treatments for structures and surfaces • Community branding • Gateways • Public art • Landscaping	• Bridges • Bike paths • Sidewalks • Bike/ped amenities • Streetscape furnishings • Signage	• Renewable energy generation • Energy efficient lighting features • Native/water-wise landscaping • Integrated stormwater management • Permeable surfaces • Recycled/locally-sourced materials	• Reduced massing • Cantilevered sections • Mindful contours • Color treatments • Texture treatments

Building Blocks

Source: MIG

Community Enhancement Topics

Many of the community enhancement elements mentioned in this report may require funding from local jurisdictions. The funding for these elements will be addressed in later phases of the project. This report is structured as follows:

- *Theme*
- *Corridor Landscaping*
  - Concept A: Naturalistic
  - Concept B: Sculptural
- *Other Freeway Enhancements*
  - Sound Walls
  - Screen Walls
  - Freeway Overcrossings / Lighting / Energy Generation
  - Aesthetic Treatments of Bents or Columns
- *Community Arterial Enhancement*
  - Pedestrian and Bicycle Circulation
  - Landscape
  - Community Branding
  - Pedestrian Lighting & Energy Generation / Railings & Guard Rails
- *Freight Corridor (Alt. 6A/B only)*
  - Sound walls
  - Screen walls
  - Landscape
  - Lighting & Energy Generation

OPPORTUNITIES AND CONSTRAINTS

Opportunities

- Create a uniform continuous theme for the corridor through materials, color and structural elements
- Incorporate sustainable features into the design including
  - Drought-tolerant and native planting
  - Water quality elements such as bio-retention areas, infiltration areas, and swales
  - Alternative and renewable energy generation
  - Light-emitting diodes (LED) for street lighting and artistic decorative lighting
- Provide sound walls or privacy walls of made of textured masonry adjacent to all existing residential properties and other sensitive uses such as parks
- Provide areas for community branding to differentiate each adjoining community
- Encourage connections to surrounding local communities by incorporating attractive landscaped streetscape, bike paths, sidewalks, and street furnishings on arterial streets crossing the freeways or bridges
- Landscape excess parcels along the corridor with drought-tolerant and native plantings
- Create attractive graceful uniform structural elements (columns, guideways, etc.) on bridges that enhance the overall theme

Constraints

- Many residential areas lie immediately adjacent to the corridor
- Proposed widening of freeway leaves little room for landscaping
- Many existing commercial and industrial properties adjacent to the freeway are unsightly
- I-710 freeway acts as a barrier to pedestrian and bicycle access
- Many of the enhancement elements will require funding from local jurisdictions

THEME

In earlier meetings with the CSWG, three potential overall urban design and aesthetic "themes" were discussed for the I-710 freeway corridor: Los Angeles River, High Technology, and Contemporary Art. The CSWG preferred a combination of the three themes. These unified themes could be manifested through the use of color, materials, structural elements and other design features, and could help to weave the existing multiple parallel corridors of the freeway, the Los Angeles River, and electrical transmission lines together and into the neighboring communities. Aesthetic treatments are not proposed on the Los Angeles River itself, but in areas adjacent to it. While a unified theme is indeed important, it is also important to provide the opportunity for unique branding of individual communities.

Overall Theme

Unified theme for the corridor through color, materials, structural elements and other design features that achieve a unified freeway corridor and unique branding for individual communities.

Provides opportunity to:

- **Weave Transportation / LA River / Energy Corridors into the Communities**
- **Create a Sustainable Corridor**
  - Transportation
  - Energy generation
  - Water quality improvements
  - River restoration
  - Connections

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LANDSCAPING

The reconfiguration and expansion of the I-710 freeway corridor, while eliminating some of the existing landscaping in and along the corridor, provides new opportunity areas for greening/landscaping. New landscaping should be drought tolerant, and lower-maintenance native and adaptive plants and tree species should be encouraged wherever possible. Deciduous plants and trees that change color with the seasons are also encouraged, as it will give the corridor a look that varies throughout the course of the year. In addition to landscaping with plants and trees, some locations along the corridor are well suited for water infiltration basins and/or bioswales. The project team worked with the CSWG and Caltrans in developing two alternative landscape design concepts for the I-710 freeway corridor, which will be discussed later in greater detail.

Potential Opportunity Areas for Greening/Landscaping

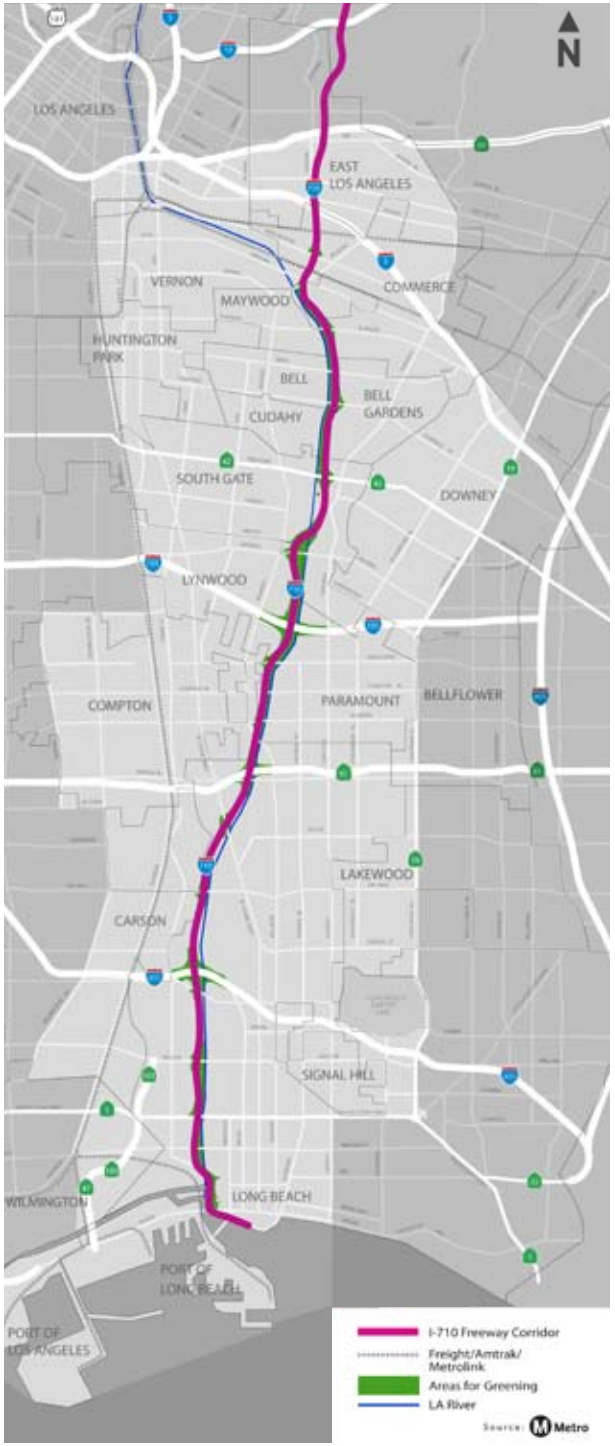
Opportunity areas for greening/landscaping along the freeway include, but are not limited to: Single Point Urban Interchanges (SPUIs), Partial Cloverleaf Interchanges (PCIs), freeway to freeway interchanges, vacated ramps and excess right-of-way, and land adjacent to the Los Angeles River. The diagram to the right illustrates the primary potential areas for greening/landscaping along the length of the I-710 Freeway corridor. Areas outside the State right of way may not be part of this I-710 project but could potentially be addressed by the local communities at their convenience.

Single Point Urban Interchanges

Nine Single Point Urban Interchanges (SPUIs) are proposed for build alternatives 5A, 6A and 6B. Areas for greening and landscaping at SPUIs exist adjacent to the freeway on and off ramps, as well as in the triangular-shaped areas where the on and off ramps intersect the arterial. Trees in these triangular-shaped areas are limited to small areas in the center to accommodate vehicular sight distance setbacks. The zone between freeway ramps and adjacent neighborhoods, which is typically larger in area than previously, is an ideal place for water retention basins or bioswales where water can percolate into the soil.

Partial Cloverleaf Interchanges

Partial Cloverleaf Interchanges (PCIs) offer increased opportunities for greening and landscaping due to their larger land requirements as compared to SPUIs. Zones adjacent to freeway on and off ramps, as well as within the cloverleaf



Potential Opportunity Areas for Greening/Landscaping

- Single Point Urban Interchange
- Partial Cloverleaf Interchange
- Freeway to Freeway Interchange
- Vacated Ramps & Excess R.O.W.
- Los Angeles River

Potential Landscaped Areas

Potential Water Infiltration / Retention Areas

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Some areas may be landscaped, others could be used for alternate purposes

itself, are optimal places for plants and trees. The area within the cloverleaf is an ideal site for water retention basins or bioswales, as the form of the terrain at this location creates a natural drainage basin. There are 4 PCIs proposed for the build alternatives.

Freeway to Freeway Interchanges

Freeway to freeway interchanges offer a multitude of locations for greening/landscaping, depending on the configuration of the interchange. Flyover ramps and freeway overcrossings offer an opportunity for landscaping beneath them. Care will need to be taken so that plants beneath freeway overcrossings will be able to receive enough sunlight and water to survive, and species should be selected with this in mind. Trees may or may not be an appropriate selection for placement beneath a freeway overcrossing or flyover, depending on the height and width of the structure. Trees, however, are highly recommended for visually screening the overpasses and flyovers from adjacent neighborhoods.

Vacated Ramps and Excess Right-of-Way (ROW)

Locations that fall within surplus parcels, excess rights of way, or vacated ramps offer great potential for greening/ landscaping along the length of the corridor. These zones are large enough to permit significant stands or groves of trees, which can help absorb pollution, decrease water runoff, and reduce the "heat island" effect. Furthermore, selected parcels potentially could be sold or leased to adjacent municipalities for use as pocket parks or community gardens if not needed for the freeway.. Some vacated ramps and right-of-ways may allow opportunities for new bicycle and pedestrian access to paths along the Los Angeles River if the land is not needed for other purposes.

Los Angeles River

The narrow strip of land adjacent to the Los Angeles River is perhaps the area of greatest potential for greening / landscaping along the corridor. Such landscaping will improve the experience from the pedestrian and bicycle path that sits along the Los Angeles River levee, and ties in with one of the themes for the overall corridor. Where transmission lines are present, landscaping may be limited. Some wider zones alongside the river may be ideal for water features and/or retention basins and bioswales. In Alternatives 6A and 6B, landscaping, pathways, and recreational areas beneath elevated sections of the freight corridor may be possible. Trees and vines are highly recommended for screening the overpasses and flyovers from adjacent neighborhoods.

Opportunities for Greening / Landscaping in Communities

Community Side of the Sound Walls

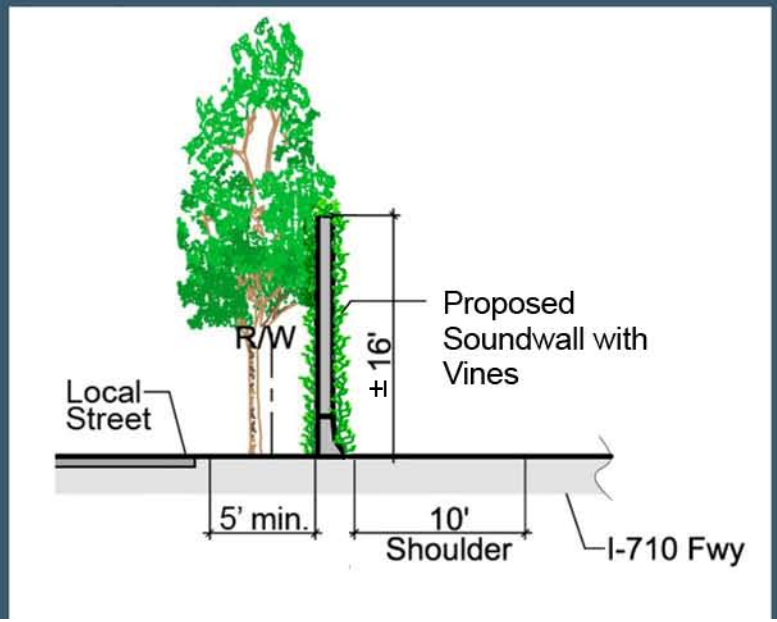
On the community side of future freeway sound walls, where neighborhood streets abut the freeway, opportunities exist to plant trees where sufficient space exists, and plant vines adjacent to the sound walls when space is limited.

Along the I-710 freeway corridor there are many places where local community streets will end in cul-de-sacs or at frontage roads adjacent to the freeway. In these cases a sound wall adjacent to the freeway may be visible. It is recommended that at least five feet minimum should be left between sound walls and local streets and cul-de-sacs, if feasible, to plant trees. This will minimize places for graffiti and help screen and soften the appearance of the sound wall from the adjacent neighborhood. Vines adjacent to the sound walls can be used in tandem with trees, or alone if space is insufficient for trees during the subsequent final design phase.

Opportunity Areas for Greening / Landscaping

Community side of sound wall

- Leave five feet minimum for trees at end of local cul-de-sacs, if feasible
- Use vines when space is limited
- Consider easements on private property for trees



Excess Parcels

Some excess parcels on the community side of the I-710 right of way may be ideal for open space, especially in neighborhoods that lack parkland. These parcels could be sold or leased to the local municipality or community group, which can landscape them and use them as pocket parks, outdoor recreation space, or community gardens. Location, access, visibility, and maintenance are important factors to consider in these locations so as to ensure these parks and community gardens will be safe and secure.

Parcels Adjacent to Freeway

Easements on private property for trees should be considered to help green the corridor, especially in areas where there is not enough room between the freeway and adjacent properties to plant trees. The trees will also help reduce the heat island effect, as well as pollution.

Landscape Design Concepts

The project team worked with the CSWG and Caltrans in developing two alternative landscape design concepts for the I-710 freeway corridor: the Naturalistic / L.A. River concept and the Sculptural concept. The concepts are discussed in greater detail below. The plant palettes for these concepts were developed with Caltrans staff to include plants that have proven to thrive along freeways. Caltrans staff suggested using as many trees as possible but less ground cover to address long-term maintenance and water issues. Therefore, both concepts would also include a mixture of gravel and ground covers. The illustrations of concepts show trees at maturity. Trees will be smaller when planted. The renderings on the following pages show both SPUIs and PCIs. These interchange types are two of three interchange configurations being considered for this project. These interchange types were chosen to illustrate how different landscape concepts could be applied.

Concept A: Naturalistic / L.A. River

This landscape design concept was developed with informal, naturalistic patterns of native and Los Angeles River plants in mind. The plant palette uses drought-tolerant native plants which visually integrate the banks of the Los Angeles River with the freeway

Landscape Concept A: Naturalistic / L.A. River

PRELIMINARY PRIMARY PLANT PALETTE:

- California Sycamore
- Native Oaks
- Canary Island Pine
- Incense Cedar
- Flannel Bush (where little maintenance needed)
- Toyon
- Lemonade Berry
- Coffee Berry
- San Diego Marsh Elder
- California Lilac
- Coyote Brush
- White Alder
- Other native or L.A. River compatible plantings

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Single Point Urban Interchange

Partial Cloverleaf Interchange

embankments. Originally Washingtonia filifera palm trees were included as vertical elements. As Caltrans and some cities were concerned with maintenance of the palms, Canary Island Pines were substituted as a vertical landscape element, as Caltrans mentioned that these trees do well in freeway conditions. However, it is not a native tree and as the project design progresses another tree may be substituted as long as it provides verticality and is successful in screening when appropriate. Indigenous boulders tie in with the riparian theme. Native vegetation areas are dedicated to the collection and filtration of runoff. open space within Caltrans right-of-way not used for water retention could create an opportunity for community uses, such as gardens or neighborhood gathering areas if fenced from other portions of Caltrans right-of-way and maintained by others. The potential for community uses will be addressed by local communities in later phases of the project. Along the arterials, flowering street trees, parkway buffers, and planter areas along freeway overcrossings allow for softening the impact of the freeway corridor from the neighboring communities. Gateway monuments, community identification for adjacent cities, and public art could occur along the arterials.

Concept B: Sculptural

The second landscape design concept was developed to be more contemporary, with masses of native and Mediterranean plants which make up a significant part of the cultural landscape of Southern California. Drought-tolerant Mediterranean plants and California adaptive plants make up the plant palette for this concept. Mass grouping of trees in a grove or curvilinear pattern creates a landmark. Dense plantings serve as a landscape buffer between the freeway and adjacent uses. Along the arterials, flowering street trees, parkway buffers, and planter areas along freeway overcrossings will soften the visual impact of the I-710 freeway corridor as seen from the neighboring communities. Gateway monuments, community identification for adjacent cities, and public art could occur along the arterials. The illustration of the SPUI on the facing page shows a community identification sign in the triangular area at freeway exits leading to the community arterials. This concept will be discussed later in the report.

Landscape Concept B: Sculptural

PRELIMINARY PRIMARY PLANT PALETTE:

- California Sycamore
- California Pepper Tree
- Canary Island Pine
- Chinese Flame Tree
- Blue Palo Verde
- Italian Buckthorn
- Rosemary
- Acacia
- Lantana
- Coyote Brush
- Blue Oat Grass
- Other climbing vegetation

Metro

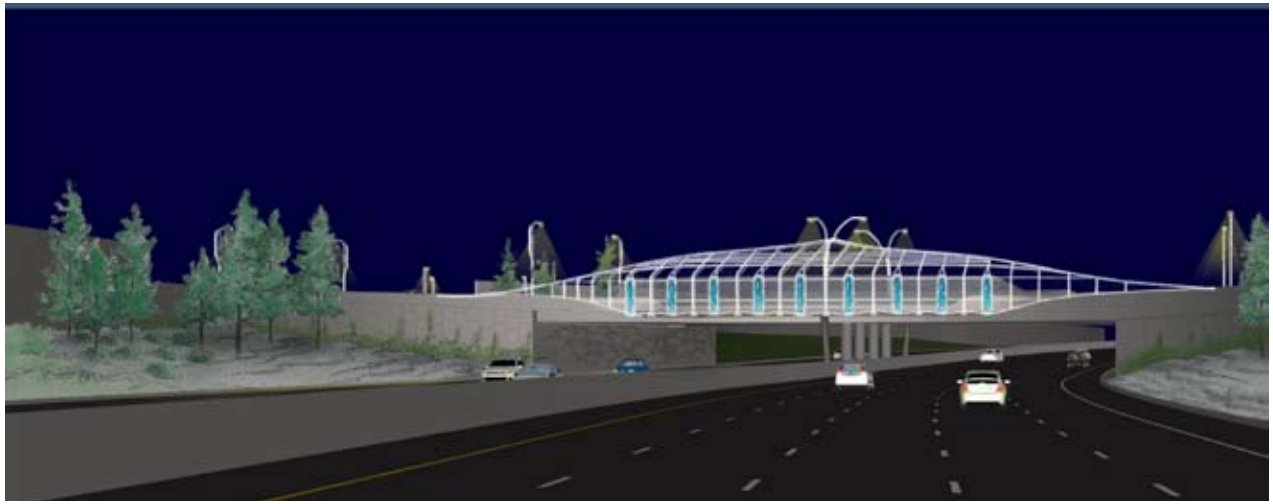
Single Point Urban Interchange

Partial Cloverleaf Interchange

FREEWAY ENHANCEMENTS

In addition to landscaping, potential building blocks for freeway enhancements include:

- Sound Walls
- Screen Walls
- Freeway Overcrossings / Lighting / Energy Generation
- Landscape
- Aesthetic Treatment of Bents or Columns (see images to the right)

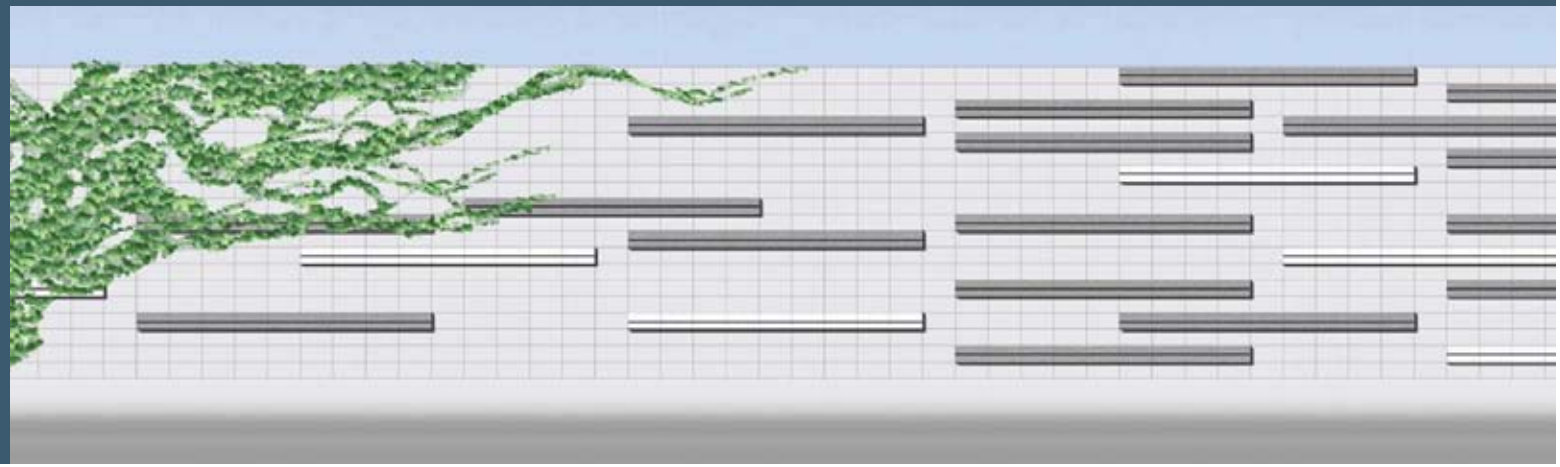


Sound Walls

Sound walls are proposed adjacent to residential land uses along the I-710 freeway corridor. Numerous wall design concepts were shown to the CSWG. It was recommended that articulated masonry block walls be used for ease of construction and repair and vines should be included on all sound walls to minimize space for graffiti. Walls with complex patterns on their surface created using form liners in the concrete finish are more difficult to repair but could be used in selected locations where vines are not possible. The CSWG recommended that sound walls be either articulated or of offset design where space allows as shown in the facing page. In one or two locations, transparent glass sound walls highlighting an adjacent use or view such as the Los Angeles River or a park site could be considered. Additionally, other structures that may be in a driver's view along the corridor, such as bents or columns, could also receive aesthetic treatments.

Freeway: Sound Walls with Vines

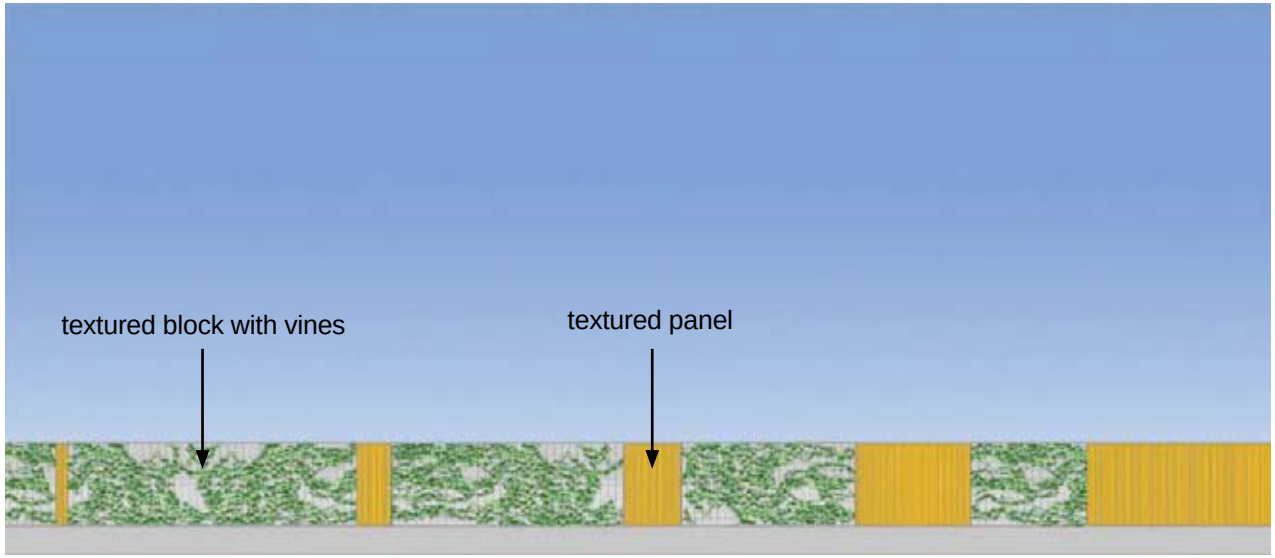
Potential design for masonry sound-wall with color and texture enhancements



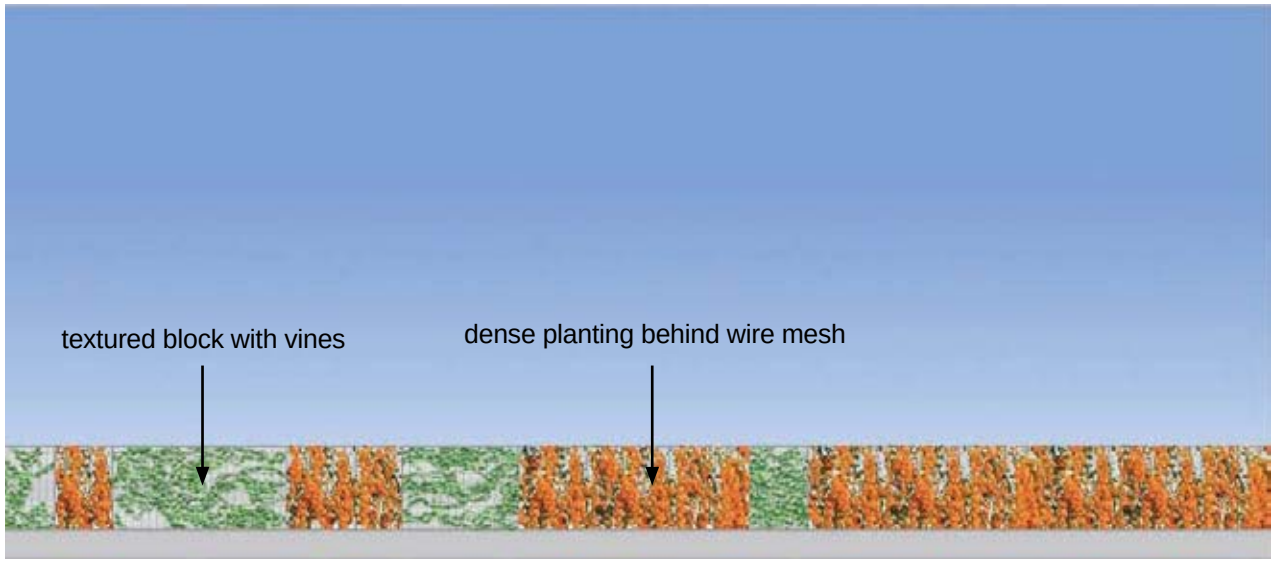
Screen Walls

In addition to sound walls, the CSWG also recommended that screen walls could be used to block industrial or unsightly properties adjacent to the freeway. These screen walls could be made of perforated metal slats or some other material and also offer opportunity for community branding. To reduce maintenance, vines should be planted to minimize places for graffiti. These screen walls would need to be funded by local communities or adjacent property owners.

The diagram at right shows potential locations along the corridor where screen walls could be used to block the view of industrial or unsightly properties adjacent to the freeway.

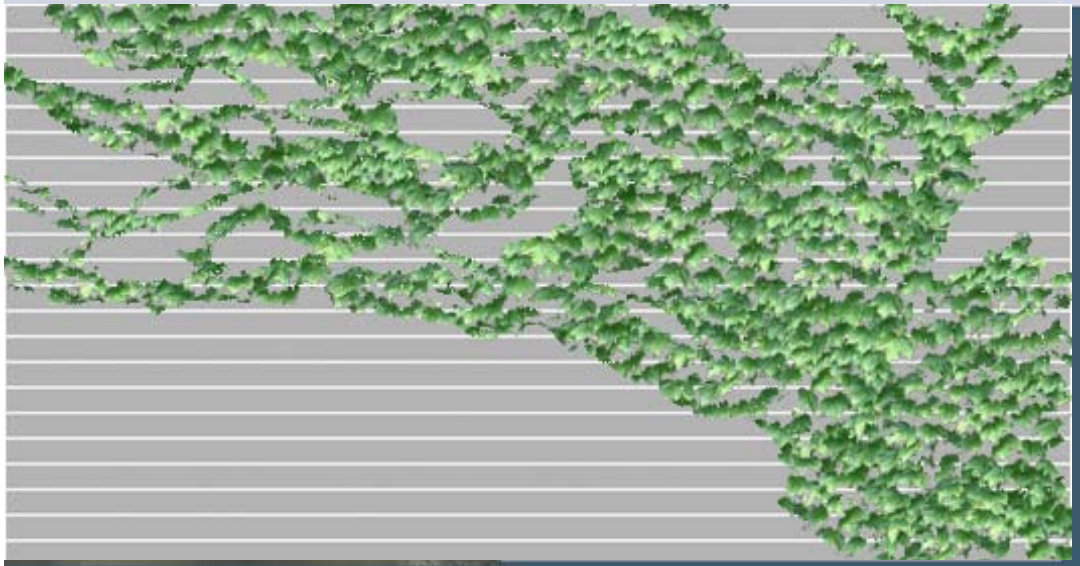


Option 1 - Textured concrete block with vines and panel screen wall

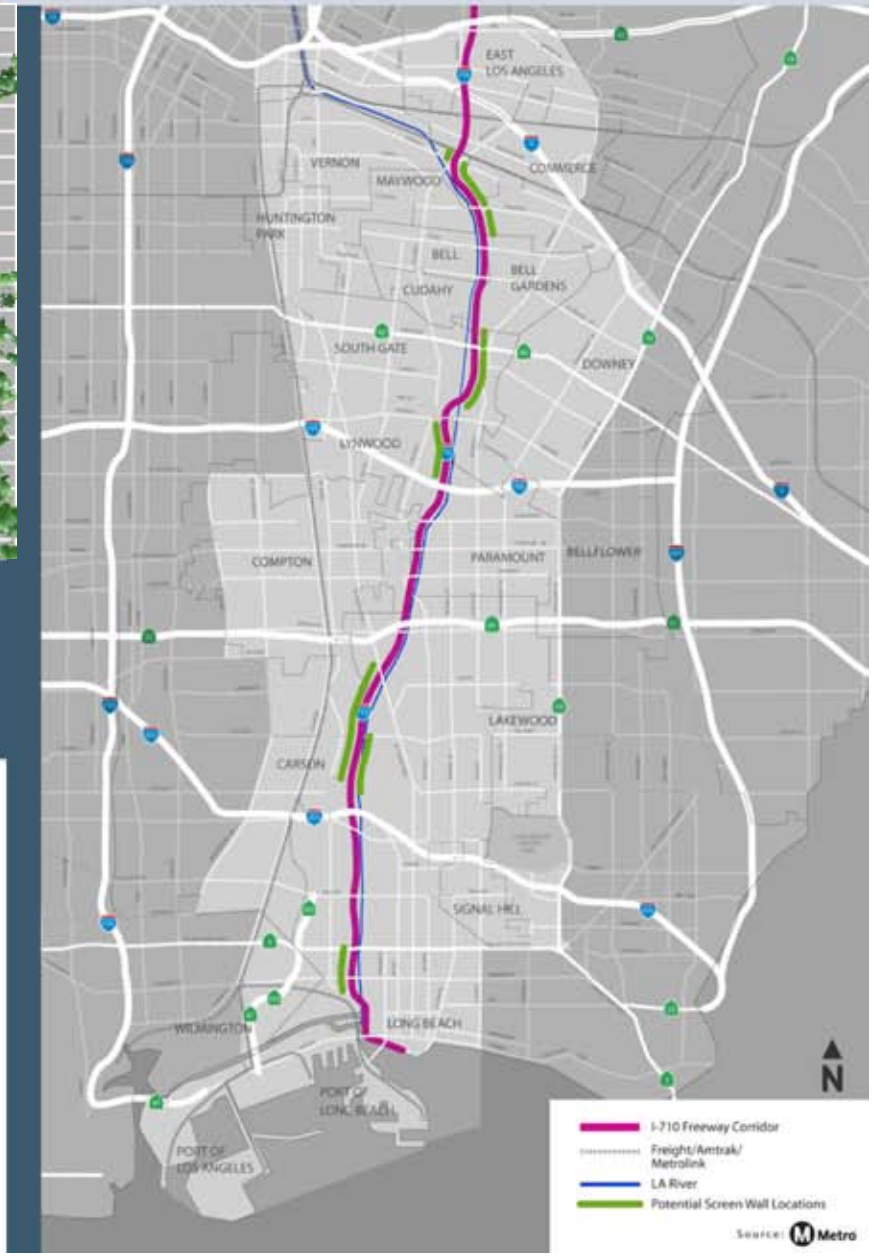


Option 2 - Wire mesh fence backed by dense planting on private property

Freeway: Screen Walls



- **Slat wall with holes or slits and vines to block industrial or unsightly properties adjacent to the freeway**



I-710 Freeway Corridor

Freight/Amtrak/ Metrolink

LA River

Potential Screen Wall Locations

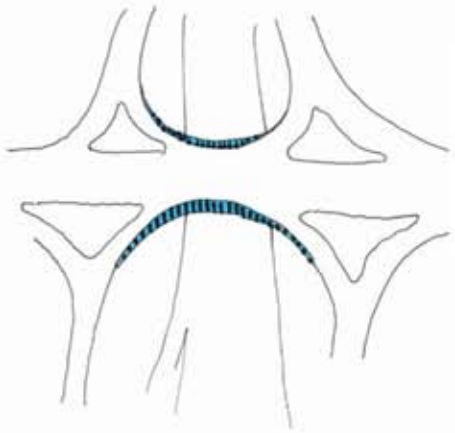
Freeway Overcrossings

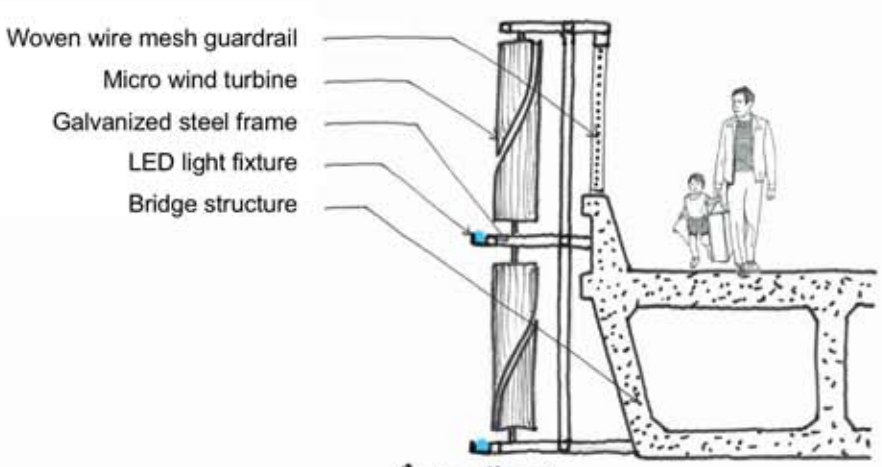
Bridges crossing the I-710 Freeway will be reconstructed and should be attractive, well-designed thematic elements of the corridor. A number of aesthetic freeway overcrossing enhancement options were discussed with the CSWG. Metro, Caltrans and GCCOG staff participated in a workshop in October 2010, which supported enhancement options that considered renewable energy and sustainability. There was some discussion of photovoltaic panels and life cycle economics. In later phases of design, new technologies for specific renewable energy options should be considered. These options should address maintenance and life cycle economics and will need to be studied to develop a cost effective, aesthetic and sustainable design. The following illustrates several of the enhancement options developed with the CSWG.

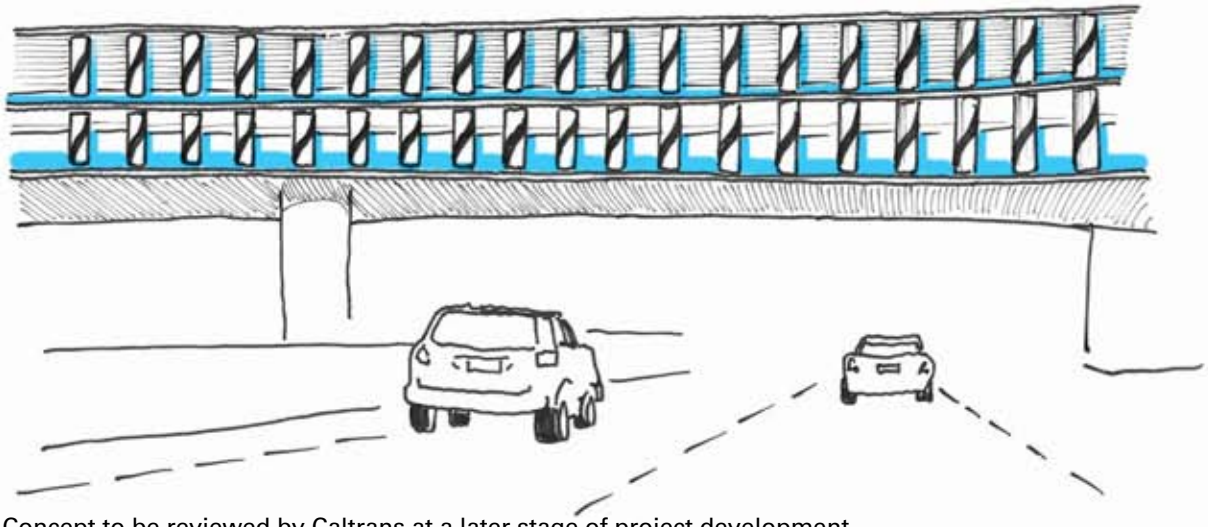
Two freeway overcrossing enhancement options were developed incorporating energy generation features such as solar panels and wind turbines. The first design of the "High Technology / Renewable Energy" concept would have wind turbines and decorative lighting along the bridge face that could power pedestrian or accent lighting. The second design concept includes solar panels for powering pedestrian and accent lighting that could also shade the freeway overcrossing's pedestrian path. The implementation and operation of these technologies on State right-of-way will require the development of Public-Private Partnerships.

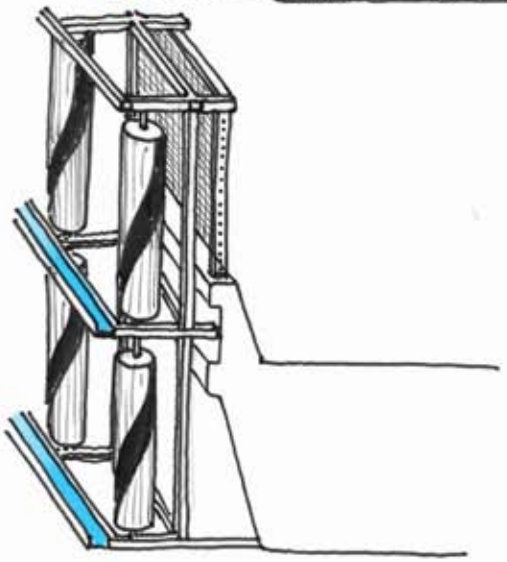
Another enhancement option incorporates landscaping on the freeway overcrossing walkway with vines that trail over its face and a light fixture in a wave pattern. This "greening" concept would help soften the visual impact of the freeway improvements on neighboring communities. Any use of LED lighting shown in these concepts should be low level as to not distract drivers.

Freeway: Bridges - *High Technology / Renewable Energy*



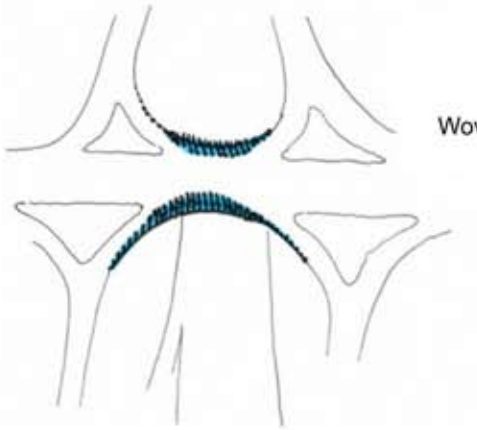


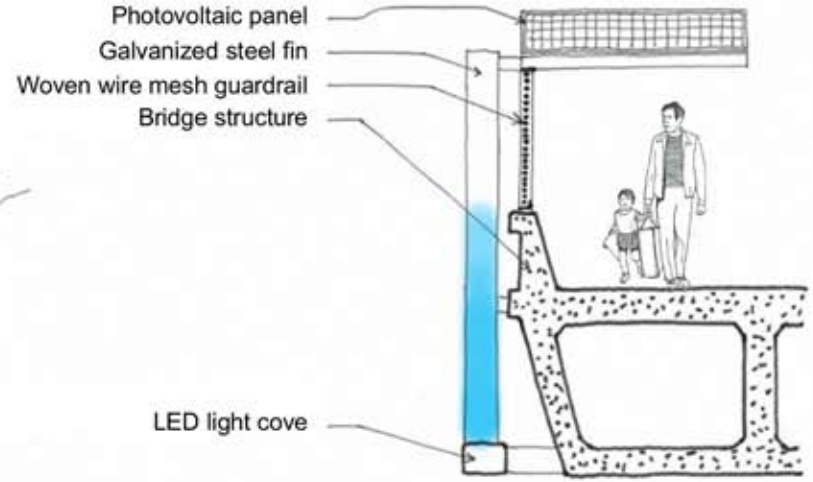


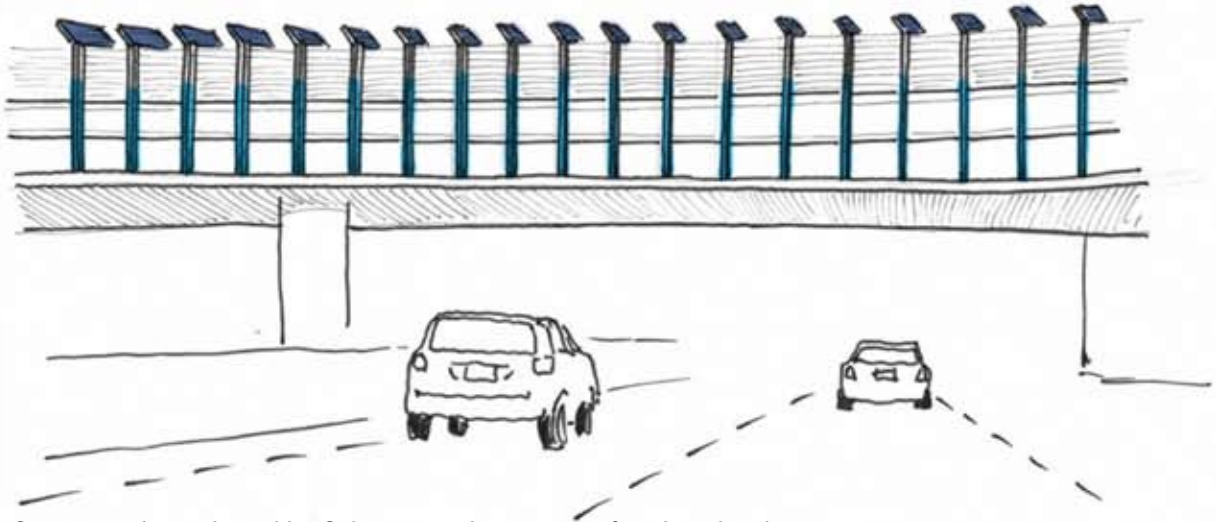


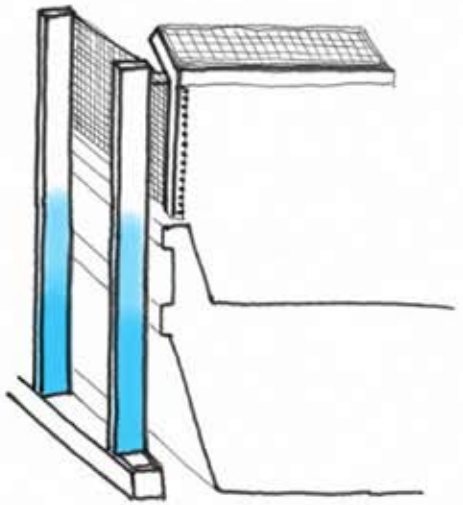
Concept to be reviewed by Caltrans at a later stage of project development.

Freeway: Bridges - *High Technology/Renewable Energy*



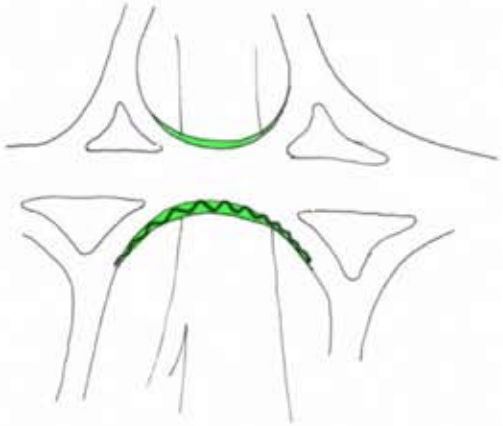


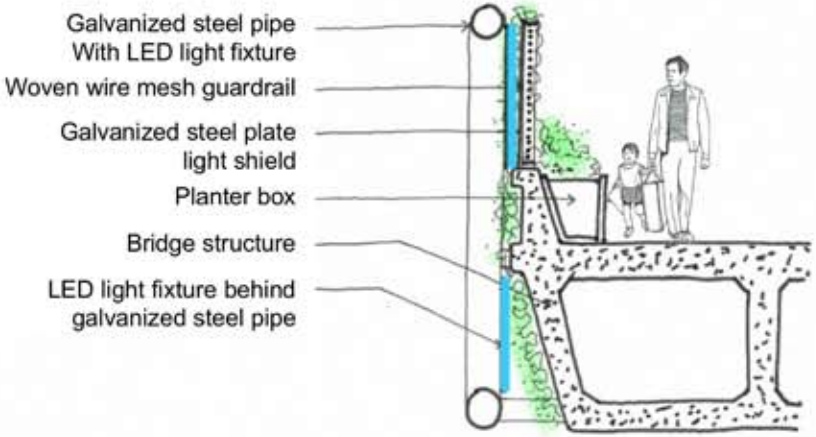


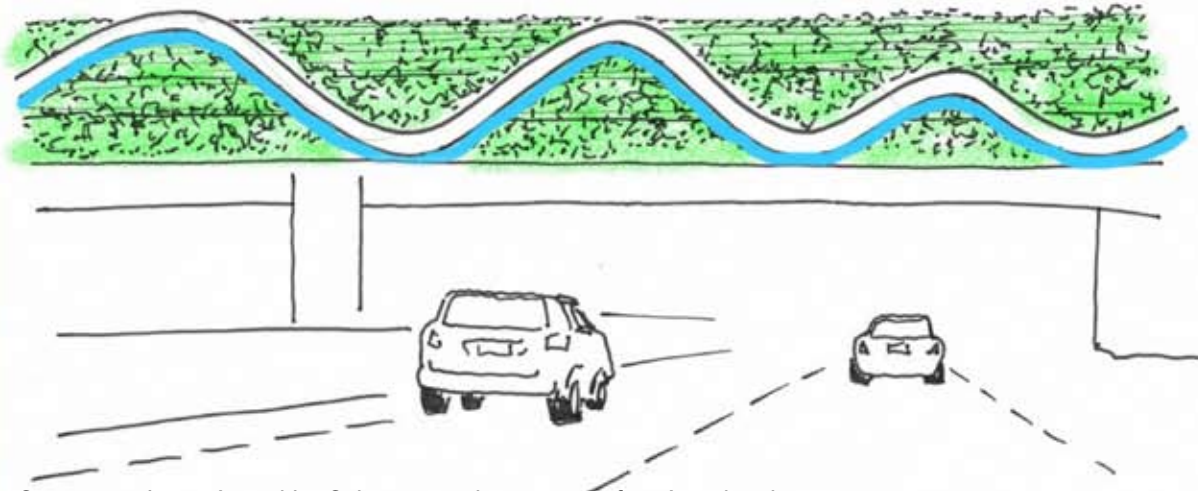


Concept to be reviewed by Caltrans at a later stage of project development.

Freeway: Bridges - *Greening*







Concept to be reviewed by Caltrans at a later stage of project development.

Lighting and Energy Generation

Sustainability is a priority of this project. In addition to the freeway overcrossings mentioned previously, there are a number of other ways that sustainable features could be incorporated into the I-710 freeway corridor. For instance, there are many attractive off-the-shelf wind turbines on the market that could be incorporated into the project. These turbines could be mounted on freeway overcrossings as discussed previously, or could be mounted on the freight corridor in some fashion. On some European freeways solar panels are mounted on top of sound walls. These enhancement options should be developed in consultation and cooperation with local utility companies in later phases of the project.

Freeway: Lighting and Energy Generation*







*Examples shown for information purposes only. Actual placement and type of facility may vary.

COMMUNITY ARTERIAL ENHANCEMENT

The arterial roadways that have interchanges with I-710 freeway corridor provide connections between communities for pedestrians, bicycles, and automobiles, and are potential locations for community identification. The arterials should be functional, pleasant, and safe for all modes, including pedestrians and bicyclists. The community arterial enhancement options include various treatments that could be used to enhance the freeway corridor as follows:

Connections

- Pedestrian
- Bicycle

Treatments

- Street Trees and Other Landscaping
- Gateways / Public Art
- Community Branding
- Lighting / Energy Generation
- Railings / Energy Generation

Several alternative freeway overcrossing profiles were developed for the single point urban interchange to accommodate both pedestrians and bicycles. The most dramatic enhancement alternative would create landscaped, multi-use paths that would sweep out over the freeway, with landscaped areas providing physical protection from traffic. Additionally, these arterials offer locations for other enhancements such as landscape, public art, community branding, lighting, energy generation, screen walls and railings.

Current Pedestrian Connections

The diagram on the following page current pedestrian connections along arterials, consisting of either freeway overcrossings or underpasses.

Community Arterials

Current and Potential Pedestrian Connections by Others

I-710 Freeway Corridor

Freight/Amtrak/ Metrolink

LA River

Pedestrian Bridge Connection

Pedestrian Underpass Connection

Source: Metro

Metro

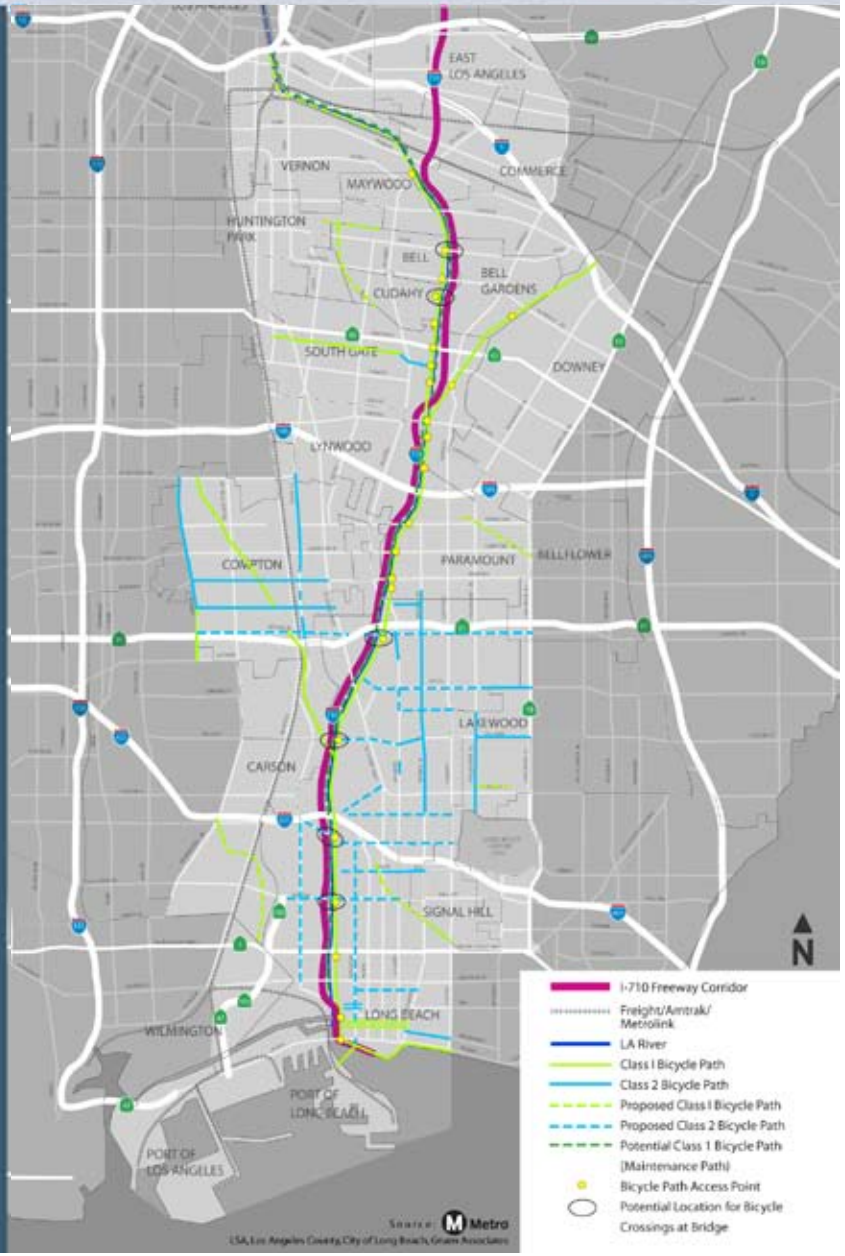
Bicycle Connections

The diagram on the following page shows current and proposed bicycle pathways in adjoining communities and potential locations for bicycle crossing that could be considered for enhancements. Current bicycle connections will be replaced if disturbed, including those to the Los Angeles River Bicycle Trail.

Community Arterials

Current and Potential Bicycle Connections by Others

- I-710 Freeway Corridor
- Freight/Amtrak/ Metrolink
- LA River
- Class I Bicycle Path
- Class 2 Bicycle Path
- Proposed Class I Bicycle Path
- Proposed Class 2 Bicycle Path
- Potential Class 1 Bicycle Path (Maintenance Path)
- Bicycle Path Access Point
- Potential Location for Bicycle Crossings at Bridge



Metro

Crossing the Freeway

The typical arterial crossing, at 0.4 miles in length (i.e., 0.4 miles is the distance to completely cross over the freeway), represents a significant connectivity barrier for pedestrians and bicycles traveling between communities on opposite sides of the I-710 freeway corridor. The diagram on the following page shows that the 0.4-mile distance from community to community includes both the freeway overcrossing and Los Angeles River bridges. A 0.4-mile walk translates to 8 minutes of walking time. A good number of bicyclists ride on the sidewalks crossing the I-710 freeway corridor, which leaves little room for pedestrians. The diagram also shows a recommended pedestrian walkway system which will be discussed later in the report.

Community Arterials: Crossing the Freeway

Potential Freeway Overcrossing Enhancement Alternatives for Pedestrian and Bicycle Crossings

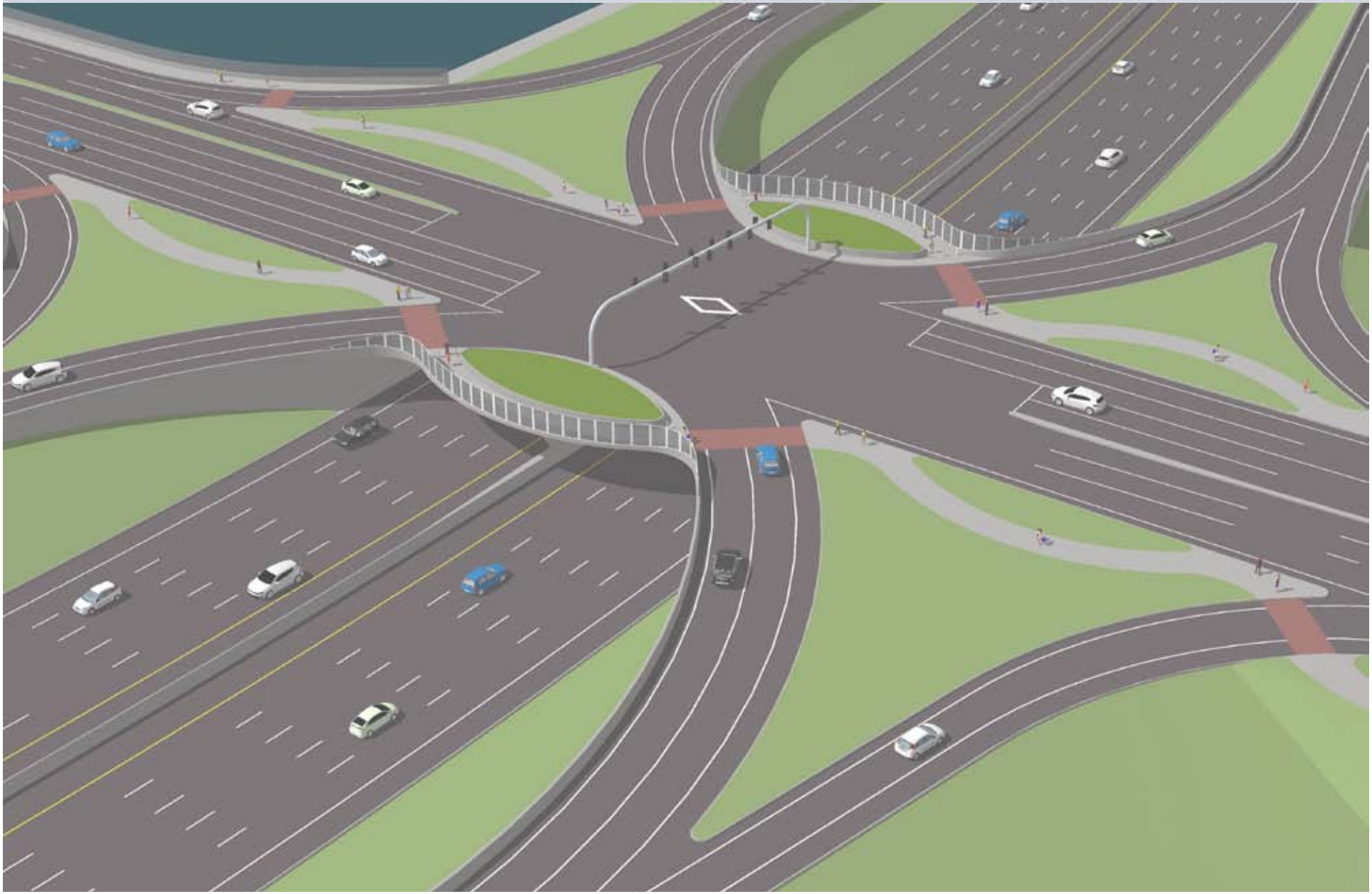
Typical conditions of existing sidewalks along many of the arterials are 6-feet wide or less immediately adjacent to travel lanes. Many bicyclists were observed riding on the narrow sidewalks. Several alternatives were explored for pedestrian/bicycle I-710 freeway corridor crossings. Issues such as these will be addressed in the environmental document.

Examples of potential community arterial enhancements are shown as applied to SPUIs. Similar enhancements would also be applied to other types of interchanges and freeway overcrossings.

Pedestrian Crossings

This rendering at right shows various pedestrian crossing enhancements. On the freeway bridge itself, a multi-use pathway for pedestrians/bicycles swings out over the freeway and is separated from traffic by a raised planter. Similar multi-use paths curve into the triangular gores between the on and off ramps. These multi-use paths are protected from traffic by low landscaped berms. Crosswalks would be signalized and have enhanced paving treatments.

Community Arterials: Pedestrian Crossing

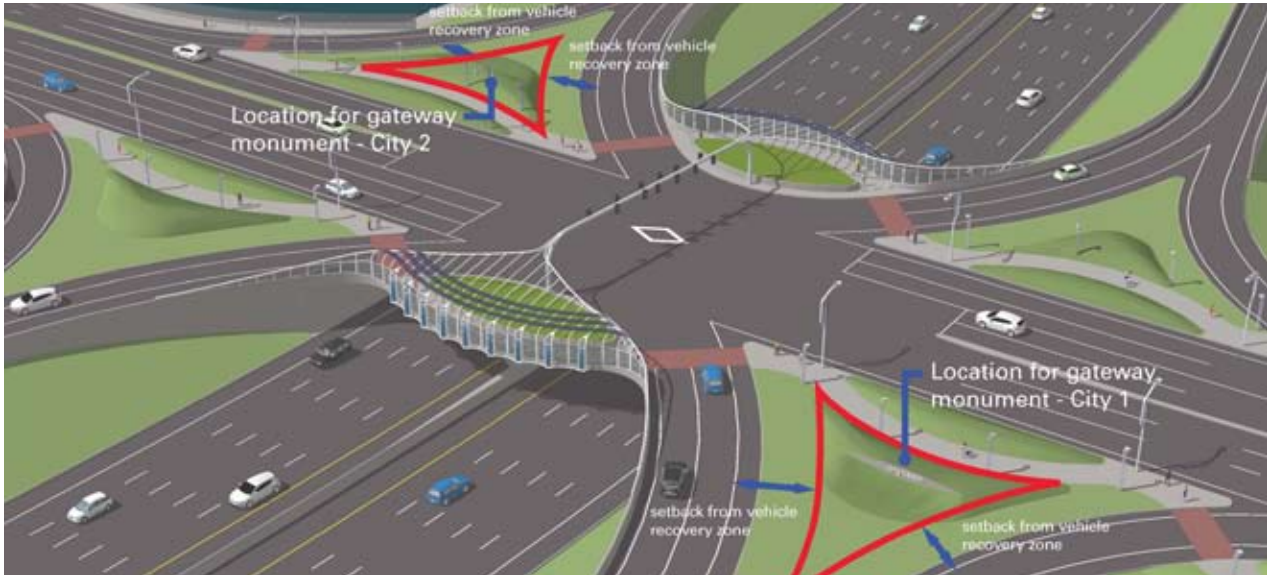


Distinctive Street Trees and Other Landscaping

There are several areas along the corridor where there are opportunities to extend the streetscape from the community onto the arterials. For instance in Long Beach, Jacaranda trees along Willow Street lead up to the freeway overcrossing. In Paramount the same is true, except the street tree of choice are palms planted along Alondra Boulevard. This could potentially occur only on the portions of the arterials that cross the Los Angeles River in some sort of raised planter. Trees would not be planted in any areas that actually span the freeway. They could however be planted along the arterials leading up to the freeway overcrossing.

Gateway / Public Art

The sculpted landscape within the large triangular-shaped areas between freeway off-ramps and the arterial creates a slightly elevated area ideal for trees or low gateway monuments for community identification. These areas follow Caltrans' clear recovery zone and gateway monument design guidelines. A safe recovery zone is an area clear of fixed objects adjacent to the roadway which allows out of control vehicles that have left the roadway to safely recover.

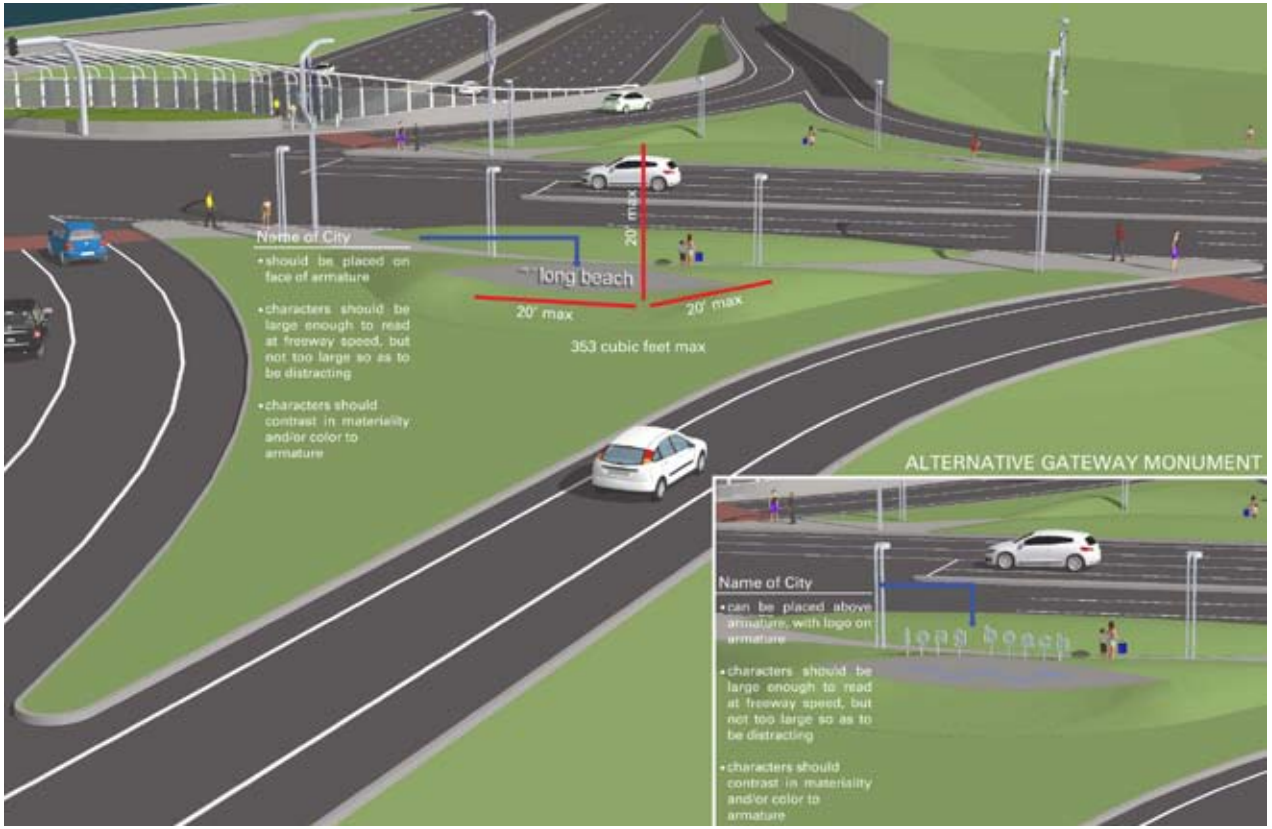


Community Arterials: Landscape

The diagrams on page 35 and to the right show an area outside the safe recovery zone.These Caltrans guidelines for gateway monuments are summarized below:

- A freestanding structure or sign that communicates the name of the community and may include a seal or slogan of the City
- Only one gateway allowed per state highway approach in each direction into a local City contiguous to the freeway
- Located beyond clear recovery zone
- Maximum size is 353 cubic feet; maximum width is 20 feet and maximum height is 20 feet above grade
- No banners or flags allowed
- Large enough to interpret at highway speed, but not so large that it demands attention from motorists
- Should not restrict drivers' sight distance
- Gateway Monuments to be paid for and maintained by Cities

As shown to the right and on the following page, monuments could take the form of a thin concrete "blade" at the peak of a landscaped sculpted berm in the gore. Individual cities could apply their own signage design to the blade. If a city did not desire a gateway monument then this area could also be used for public art (provided that it follows appropriate guidelines) or trees as shown previously.

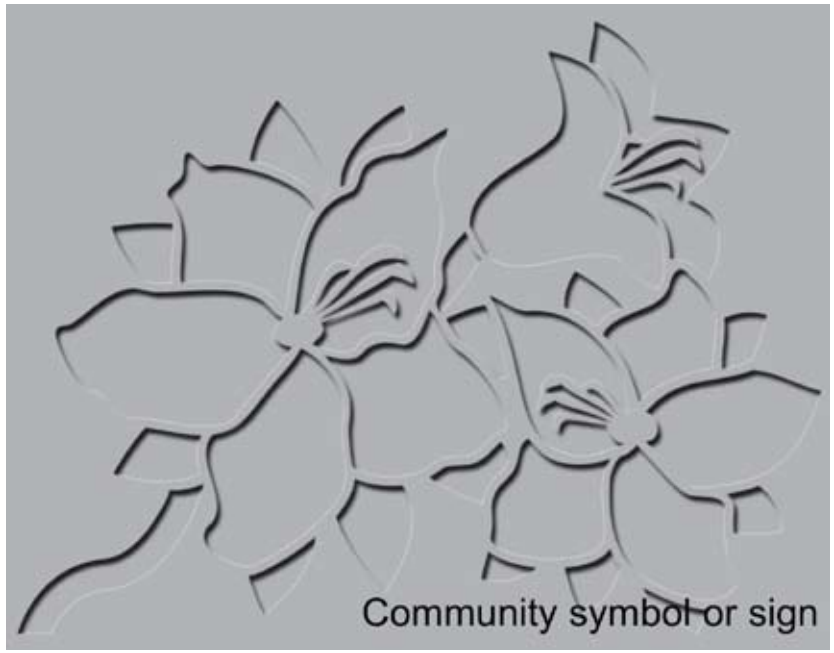


Community Arterials: Gateway / Public Art

Community Branding

The CSWG indicated that specific community identification should be a priority. Reconfiguration of the I-710 interchanges at the arterials may create excess land, providing opportunities for community identification and branding. Community identification could take many forms, from sculptures to monuments to light pole banners. Guidelines for community identification permit images or text that conveys information about the community. The community identification must be integral to, painted on, or placed on required engineering features. One idea discussed by the CSWG was to create sculptures using recyclable materials from the nearby industrial areas. These vertical sculptural elements may not be part of the I-710 project, but could potentially be addressed by the local Cities at a later date. The design to the right is a contemporary version of an azalea (South Gate's symbol) that was supported by the CSWG members from South Gate. Symbols of this type could be used in various places to identify unique communities.

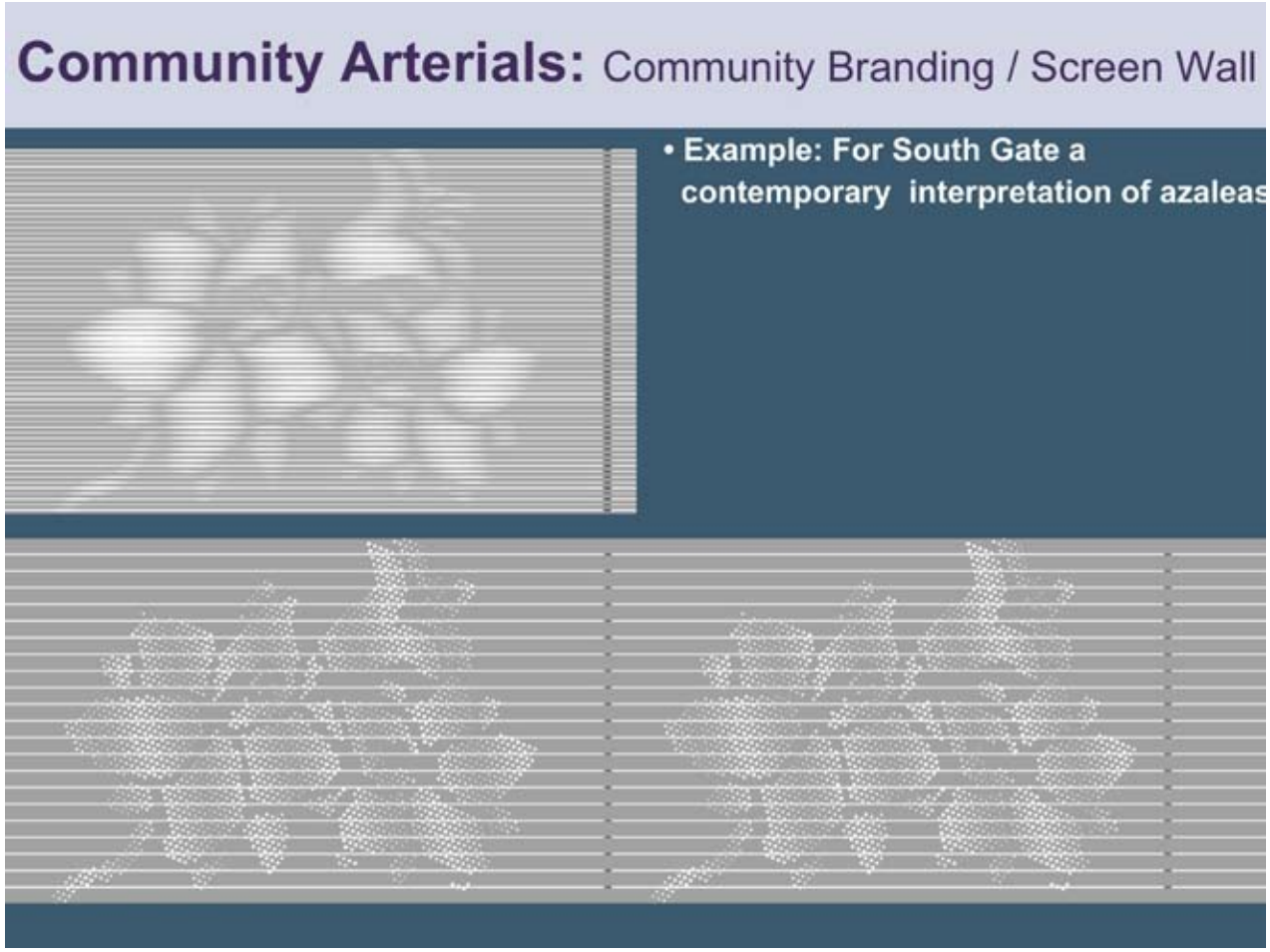
To the right are examples of existing public art and community identification on major arterials in various cities along the corridor. Similar types of public art or community identification could be extended from the arterials onto the freeway overcrossings or put into landscaped areas.



Community Arterials: Community Branding

Community Branding on Screen Walls

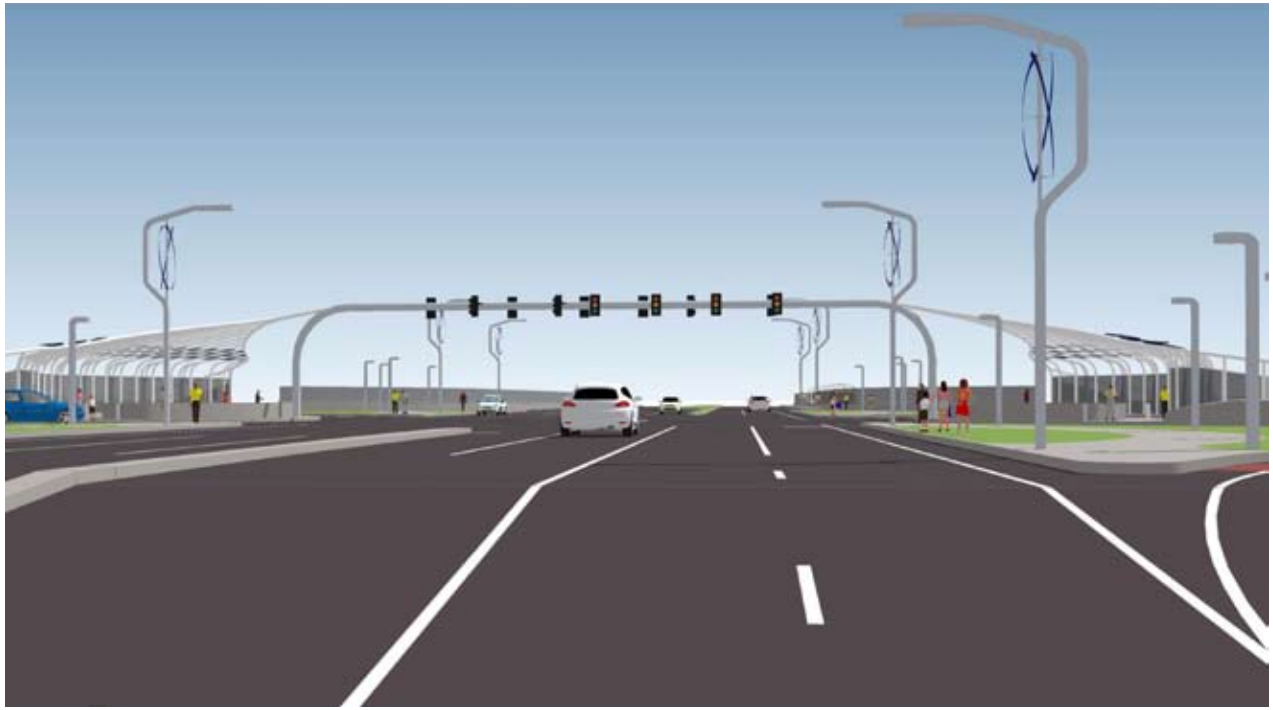
The rendering to the right shows how screen walls at freeway off ramps with stylized symbols could be used to identify a community. The screen walls are shown in the lower left and upper right of the rendering. Metal screen walls punched with holes or with slits cut into them in the form of symbols like the aforementioned azalea could be used. It is important to reiterate that these symbols would not be affixed to the screen walls; rather, they should be integral to the engineered elements. The image to the right shows close-ups of potential screen wall designs. These screen walls also offer opportunities for greening by allowing vines to grow on them, minimizing area for graffiti.



Community Arterials: Community Branding / Screen Walls

Lighting / Energy Generation

As stated earlier, sustainability is a priority of this project. For the community arterials, one possible way to do this is to integrate renewable energy into the I-710 freeway corridor through lighting combined with power generation. Examples of these types of fixtures are to the right. These types of lighting fixtures would be stand-alone in that they do not need to be tied to the electrical grid. Energy could also be generated by means of solar or wind technologies not directly associated with lighting. Either of these two types of technologies could be mounted or placed throughout the community arterial areas and because of their graceful shapes and colors, they could also be used as sculptures that could help to identify communities.

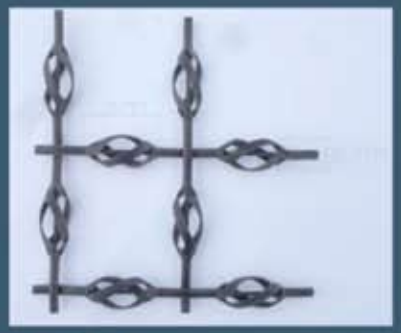


Additional non-power generating lighting options could also be used to identify the neighboring community. Several examples on pages 44 and 45 are off-the-shelf LED pedestrian lighting fixtures. LED lighting fixtures offer the added benefits of being long-lasting and using very low amounts of energy.

The rendering on page 46 shows how both types of fixtures could be incorporated into the community arterials.

Community Arterials: Lighting / Energy Generation
Examples


TAK Studio Hybrid Streetlight




Panasonic K-RHS Streetlight, Japan

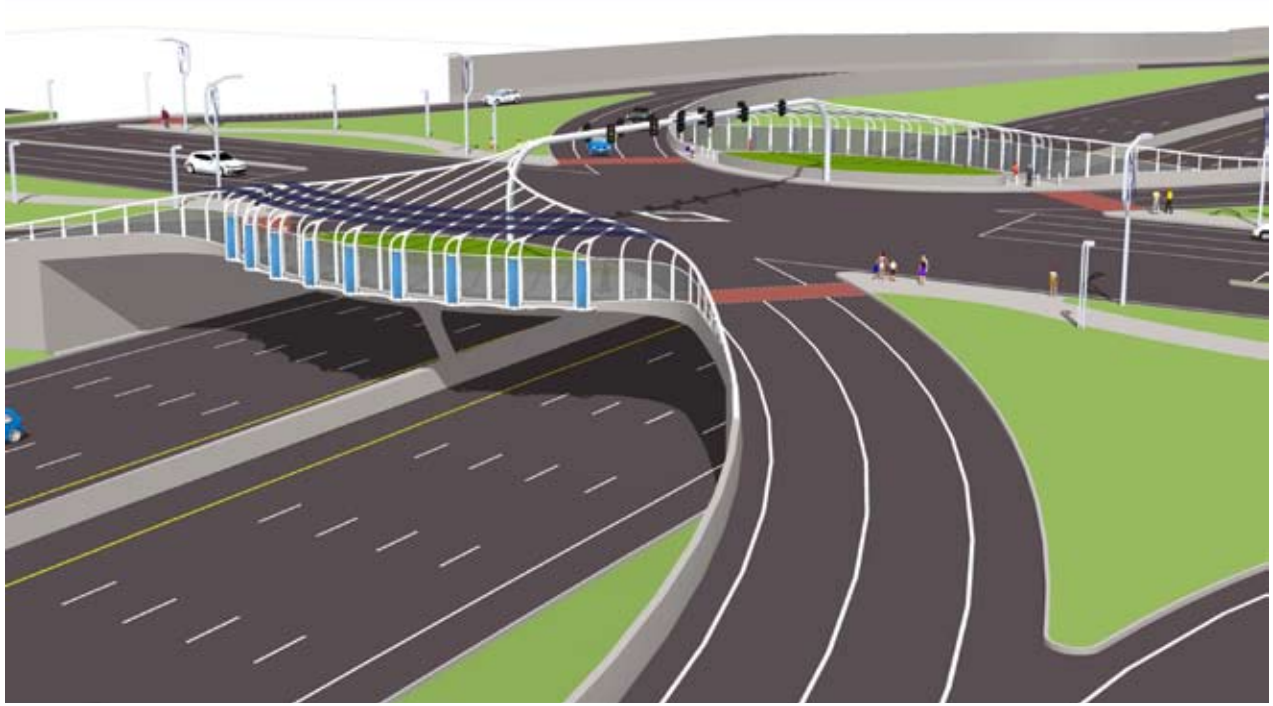
Community Arterials: Lighting / Energy Generation

Pedestrian Lighting Examples

Community Arterials: Lighting / Energy Generation

Railings / Energy Generation

Another potential location for integrating renewable energy into the corridor is a structure attached to the freeway overcrossings that would be an armature for wind turbines and solar panels. This armature would perform several functions besides being a platform for generating energy. Its form is highly sculptural and iconic. By integrating this structure into the traffic signal mast, it becomes a de facto gateway and a form of community identification. Additionally, the solar panels placed over multi-use path would provide shade for passing pedestrians and bicyclists. The renderings to the right show various views of this structure. The rendering on the facing page combines all of the community enhancement features.



Community Arterials: Railings / Energy Generation

Partial Cloverleaf Interchange

The rendering on the following page shows how enhancements similar to those previously mentioned would be applied to a Partial Cloverleaf Interchange.

Community Arterials: Partial Cloverleaf Interchange

FREIGHT CORRIDOR ENHANCEMENTS

The proposed separate Freight Corridor is a component for Alternatives 6A and 6B only. Potential Freight Corridor aesthetic enhancements include:

- Sound Walls
- Screen Walls
- Structural Elements
- Landscape
- Lighting / Energy Generation
- Community Branding at Arterials

The Freight Corridor in Alternatives 6A and 6B will be elevated in some locations and thus would be a prominent feature along the corridor and could be enhanced by aesthetic and sound abatement treatments. The relationship of the Freight Corridor to the Los Angeles River and the I-710 freeway corridor varies along the corridor depending on site constraints. The diagram on the facing page shows two of the varying relationships of the freight corridor to the Los Angeles River, with sound walls facing the residential neighborhoods and screen walls to shield vehicles from view as a potential enhancement.

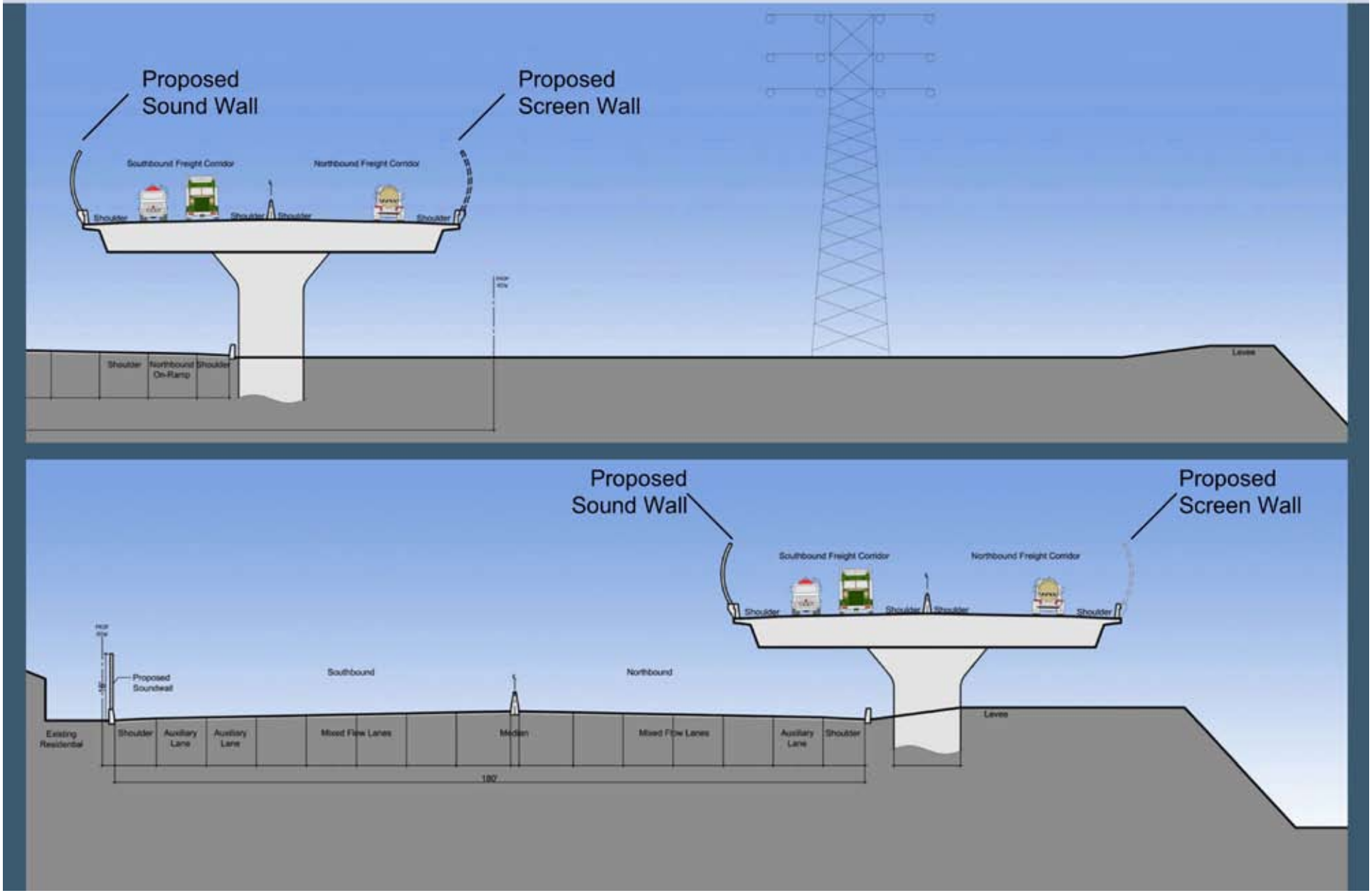
The CSWG recommended that elements of the freight corridor such as railings, sound walls and structures should be designed to reduce apparent massing as viewed from the community, should have graceful structural elements, LED and colored lighting accents at selected locations, integrated with the Los Angeles River, and should incorporate energy generation. Techniques for reduction of apparent massing of an elevated Freight Corridor structure as viewed from the community include:

- Thin cantilevered sections of viaducts as shown in the photo below
- Curved sound walls and/or walls with varied shadow patterns
- Perforated or translucent screen walls
- Light colors and materials that blend with the sky

Two aesthetic design alternatives were developed for enhancement of the freight corridor. Alternative 1 has a straight wall with a color gradient and Alternative 2 has curved walls. These alternatives are discussed further in the pages that follow.

I-70, Glenwood Canyon, CO

Freight Corridor: Elevated in Some Locations



Freight Corridor Design Alternative 1: Masonry Wall

This alternative would consist of textured masonry sound wall on the side closest to the residential community. The color gradient would be close to the color of the water and sky so as to make it less visible. Color accent blocks could also be incorporated into the design. The masonry blocks could be made of a new type of photocatalytic concrete which is both self-cleaning and pollution-mitigating or some other material. In later phases of the project, more light-weight recyclable materials could be considered that have similar aesthetics.

On the opposite side where sound attenuation is not required, a metal screen wall made of perforated sheet metal with colored acrylic inserts could be used to hide passing vehicles from the residential neighborhoods. The rendering at right shows how this alternative might look from the neighboring community.

There is also the possibility that energy generation features such as solar panels or wind turbines could be incorporated into the design of both the freight corridor sound wall and screen wall.

This would be true for both freight corridor design alternatives.

Freight Corridor: Masonry Wall Alternative*

Sound Wall with color and texture enhancements

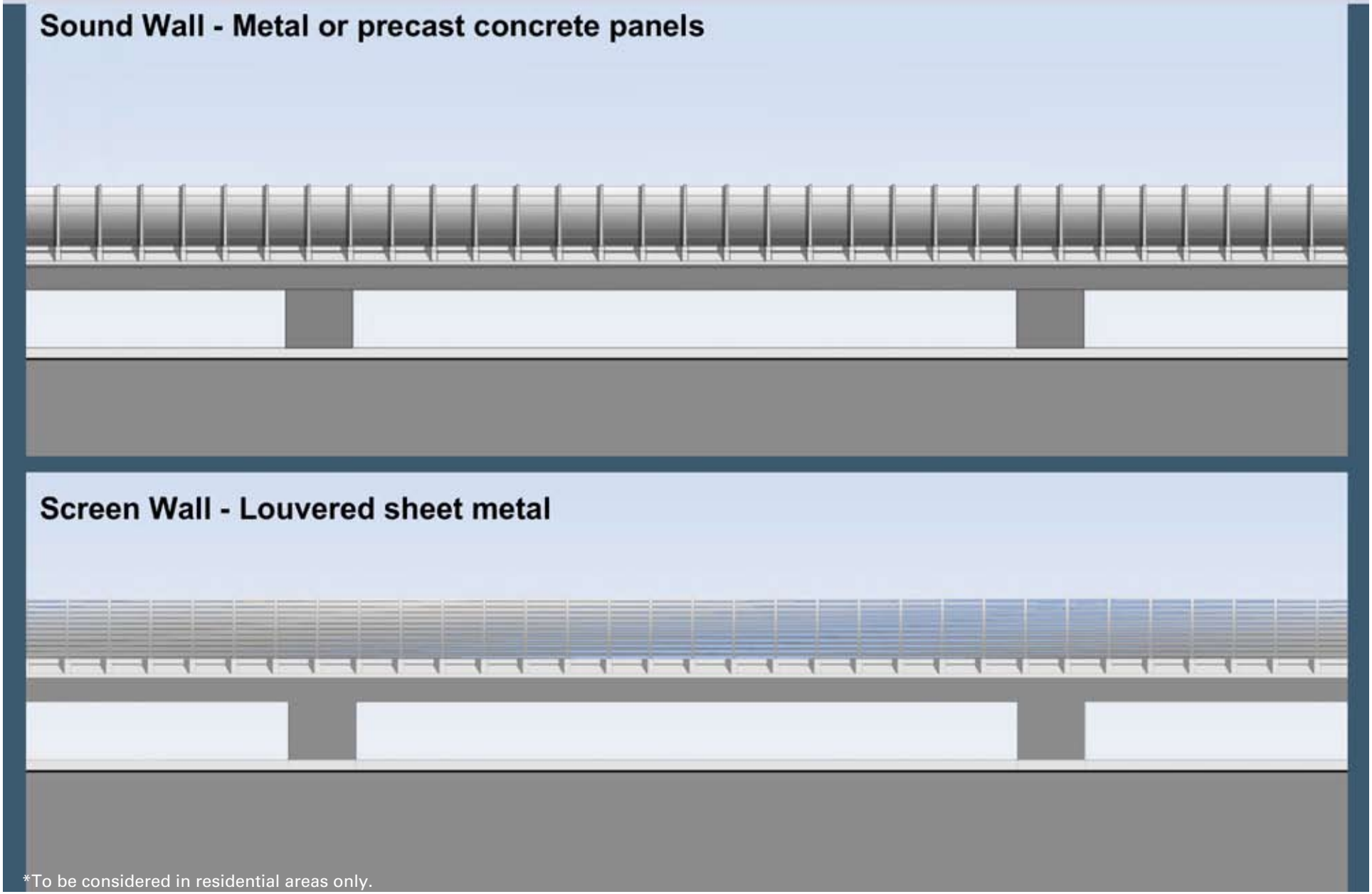
Screen Wall - Perforated sheet metal with colored acrylic inserts

*To be considered in residential areas only.

Freight Corridor Alternative 2 Design: Curved High-Tech Wall

The second alternative is a curved grey high-tech sound wall made of metal, pre-cast concrete panels, or other sound attenuating light-weight materials. The alternative would create shadow patterns to reduce the apparent massing of the structure. There are currently no curved sound walls in the State of California. In later stages of the project it will be determined if curved sound walls meet the noise abatement mitigation measures. On the opposite side, where sound attenuation is not required, a screen wall made of a more lightweight material could be used to hide passing vehicles from the residential neighborhoods. For example, the screen wall could be made of sheet metal with louvered slits cut into it or some type of expanded metal mesh. The rendering at right shows how this alternative for the freight corridor might look from the neighboring community.

Freight Corridor: Curved Wall High-Tech Alternative*

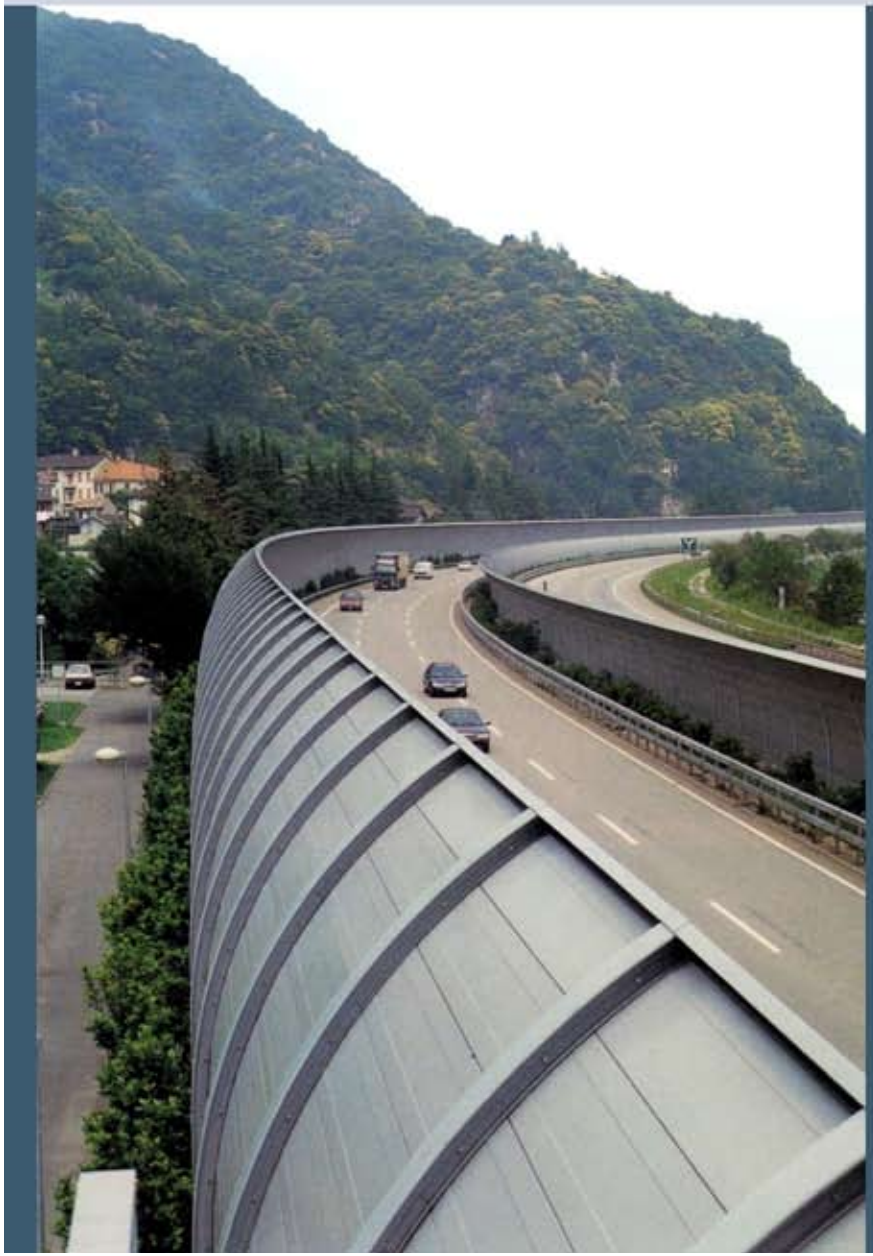


*To be considered in residential areas only.

International Examples

Alternative 2 was inspired by sound walls in Bellinzona, Switzerland. These twin sound walls are 20 feet high and made of perforated aluminum. Their high-tech appearance does not conflict with the picturesque landscape of the Swiss mountains and lakes. Rather, the landscape, road layout, and the sound wall blend together.

Freight Corridor: International Examples

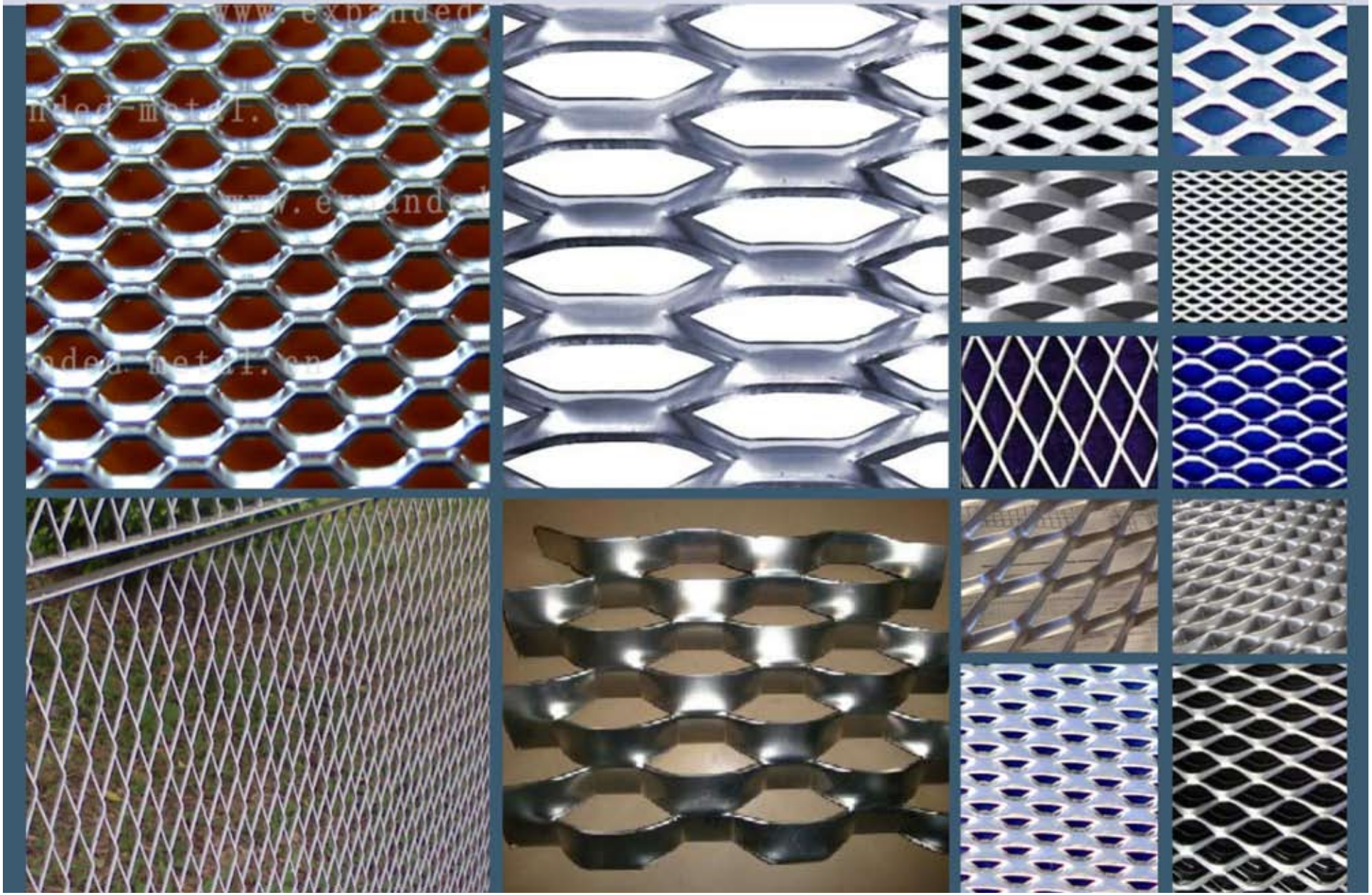


A2 Sound Barrier, Bellinzona, Switzerland

Potential Screen Wall Material

On the following page are multiple examples of expanded metal mesh that could be used to make screen walls. Depending on the pattern of the holes in the mesh, it is possible that when viewed from the exterior the screen wall would be opaque, but when viewed from the inside they would be translucent. Example materials on the following page would require further investigation in later phases of the project.

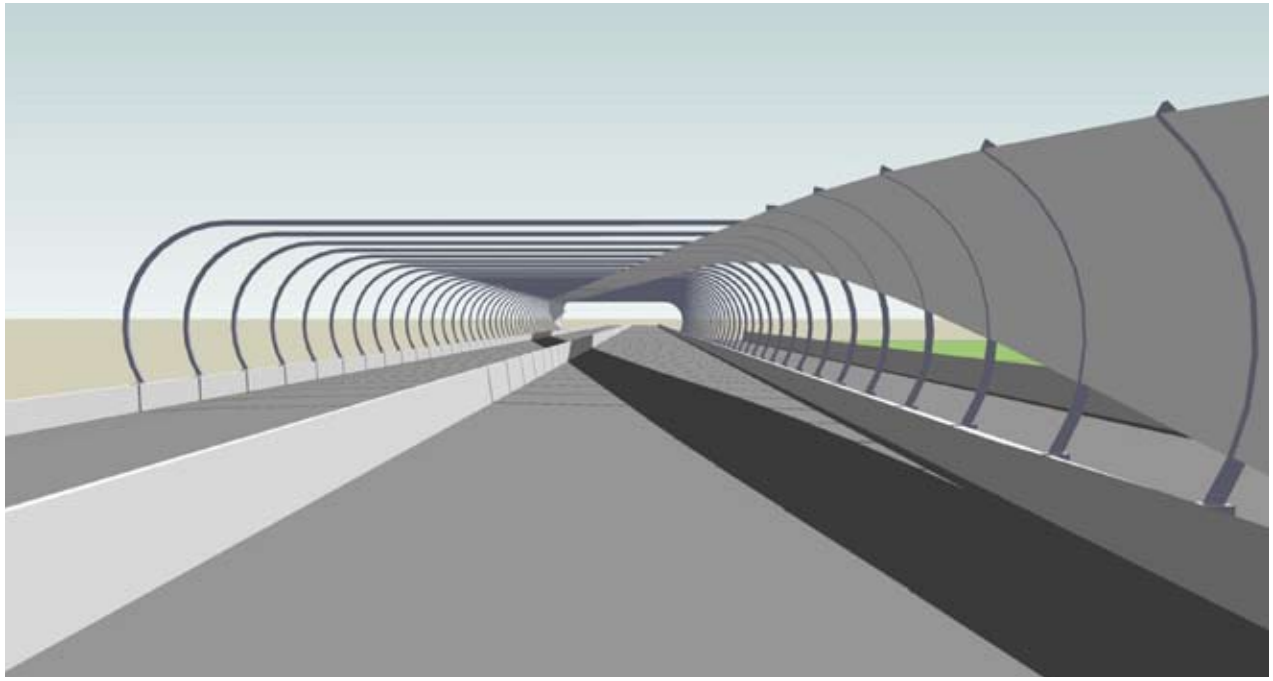
Freight Corridor: Screen Walls



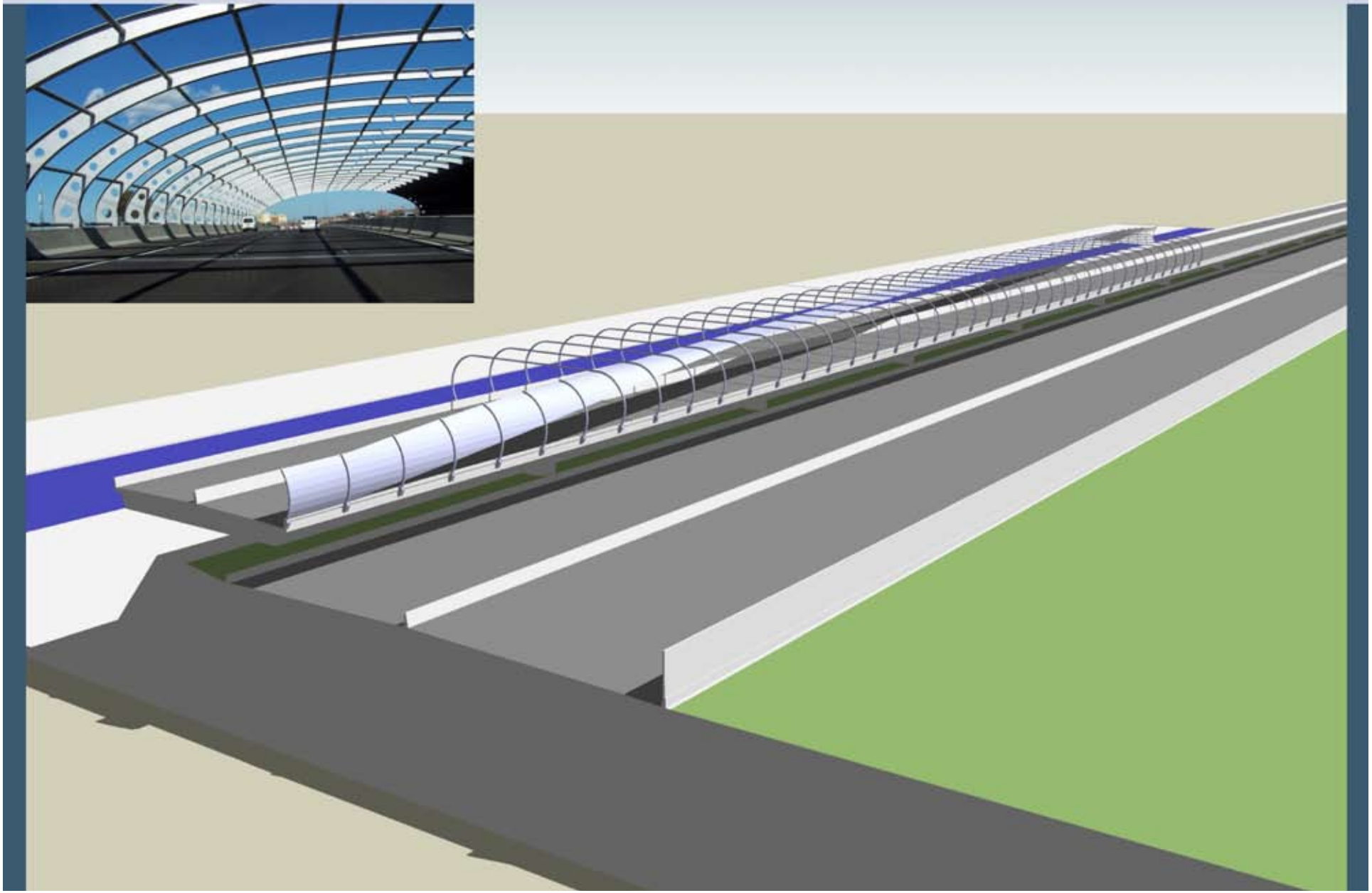
Switchover Gateway

(Alternatives 6A/B only)

Where the I-710 freeway switches from one side of the Los Angeles River to the other in South Gate, the sound wall shielding the residential community could also switch over between Shull Street to the North and Southern Avenue to the South. The structural "ribs" of the curved sound wall could span over the freight corridor allowing for the sound wall panels to smoothly switch from one side of the freeway to the other. Solar panels or wind turbines could also be easily mounted on the structural "ribs" of this design element. This dramatic design feature is also an opportunity to create an iconic gateway in South Gate.



Freight Corridor: Switchover Gateway (solar opportunity)

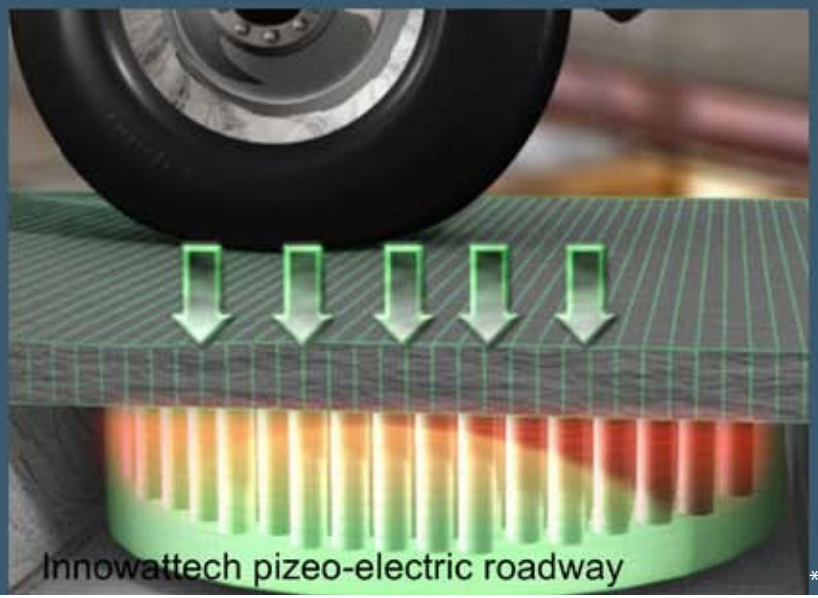


Lighting and Energy Generation Opportunities

Like many other elements within the I-710 freeway corridor, the freight corridor could also incorporate energy generation into its structure. This might include wind turbines, solar panels, pizeo-electric pucks, or some other new technology. Wind turbines and solar panels could easily be mounted onto the freight corridor in a variety of ways, adding a negligible amount to its height. Pizeo-electric pucks generate electricity through compression. Trucks driving over these pucks embedded in the roadway could generate energy. The energy generated could be used to power LED accent lighting in selected locations, which could add drama and elegance to a particular freeway overcrossing or portion of the Freight Corridor.

Freight Corridor: Lighting and Energy Generation Concepts*

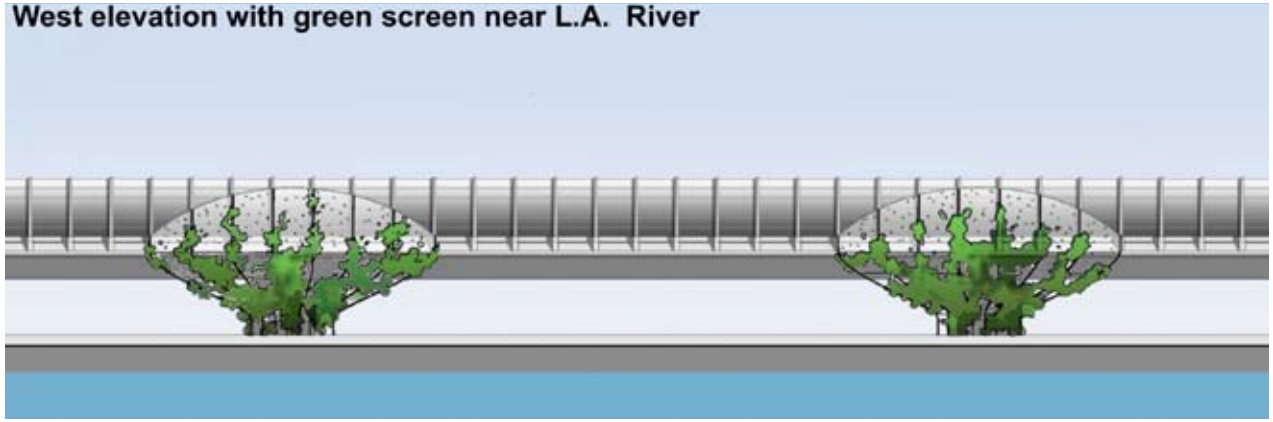

Urban Power Plant, Joe De Le Ree, Pathangay Associates

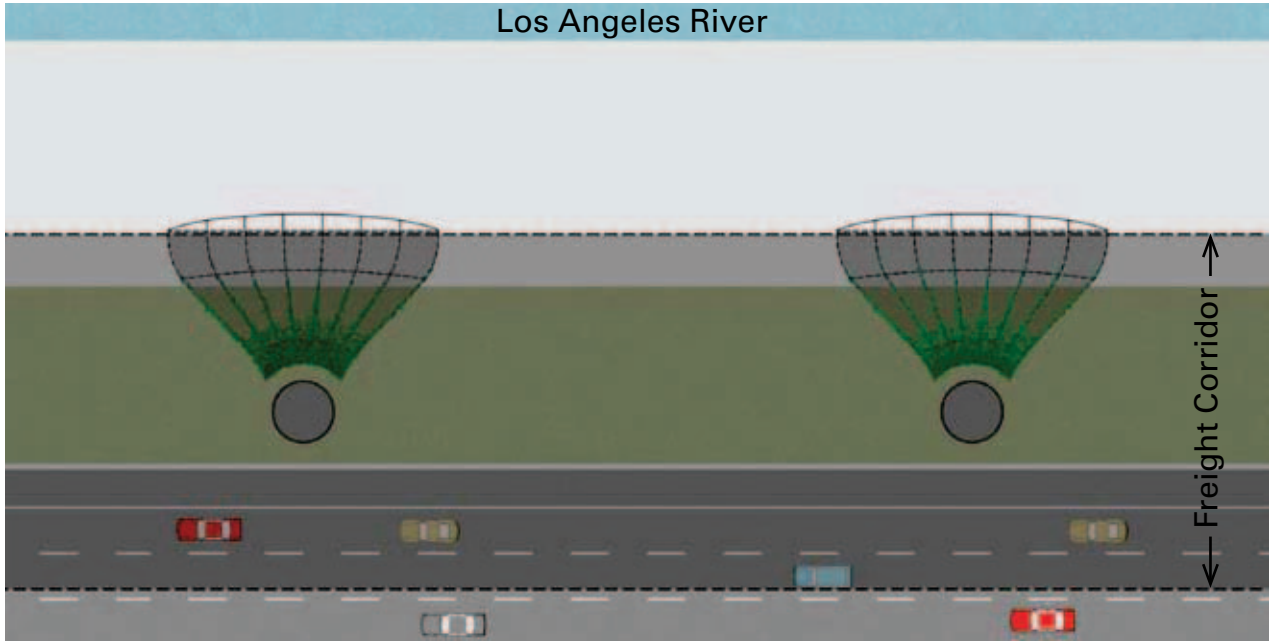

Innowattech pizeo-electric roadway

*Examples shown for information purposes only. Actual placement and type of facility may vary.

Landscape Options

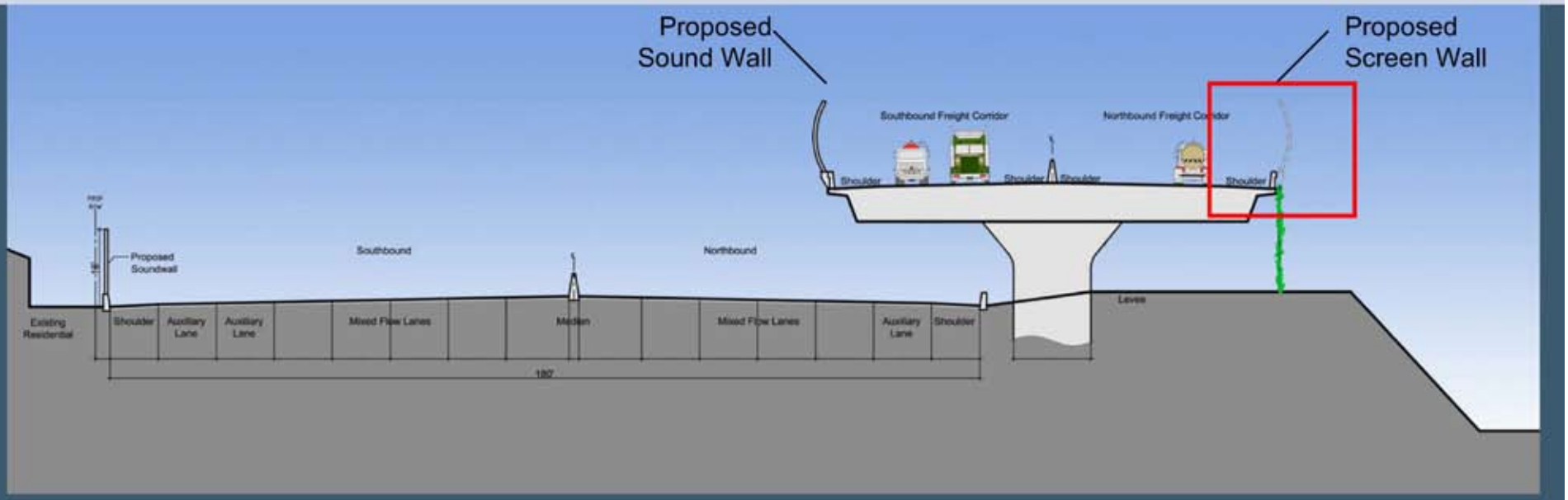
The CSWG requested that landscaping should be accommodated on the Los Angeles River side of the freight corridor. There is a possibility of adding a green screen mesh that would follow the curves of the freight corridor and around its columns without touching the structure, allowing space for visual inspection. Vines would then be allowed to grow up this green screen mesh, effectively covering the columns in a green mass. The screen wall mesh and landscaping could be maintained without needing access from the freight corridor roadway. Therefore, lanes would not need to be closed for maintenance purposes. The elevation to the right shows how the freight corridor might look with the green screen.





Plan view of green screen near L.A. River, which allows for Caltrans inspection of structure

Freight Corridor: Landscape



Metro

SUMMARY OF NEXT STEPS

This report explains urban design aesthetic toolbox concepts that depict an overall I-710 freeway corridor aesthetic design theme that incorporates sustainability, high-technology and integration with the Los Angeles River and the adjoining communities. These concepts were developed with the CSWG, Metro, GCCOG, Caltrans and other stakeholders. The concepts outlined here show many techniques and options for enhancing the aesthetic of the I-710 corridor. By the time the project is built there will likely be new options, materials and technologies that can be added to achieve the overall theme and direction. The urban design team's next steps in this process include:

- Continue to coordinate with stakeholders and the I-710 Project Team
- Continue to refine concepts and develop a unifying theme for the corridor
- Participate in the community outreach process with the I-710 Project Team