Appendix J

Supporting Aesthetics Information

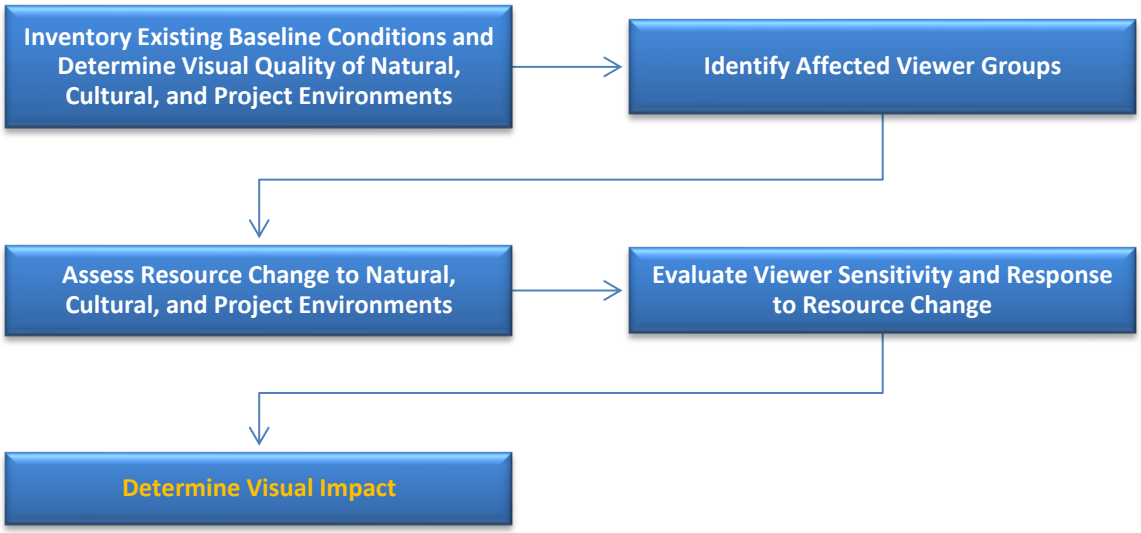
Appendix J-1

Aesthetics Terminology, Methodology, and Rating System

J-1.1 Introduction

Visual impacts are determined by assessing changes to the visual resources and predicting viewer response to those changes. Impacts can be beneficial or detrimental. Viewer response to change in the visual environment, combined with the resource change, determines the extent of visual impacts caused by the construction and operation of a proposed project. A generalized visual impact assessment process is illustrated in Diagram J-1.1.

Diagram J-1.1 Visual Assessment Process



J-1.2 Aesthetics Terminology and Methodology

J-1.2.1 Establish the Area of Visual Effect

The area of visual effect (AVE) is the aesthetic resources analysis area that comprises *viewsheds*, or what people can see in the landscape, which encompass the entire area in which views would be affected by a proposed project. The AVE and its viewsheds are defined by the physical constraints of the environment and the physiological limits of human sight. Physical constraints of the environment include landform, land cover, and atmospheric conditions. Landform is a major factor in determining the AVE because it can limit views or provide an elevated perspective for viewers. Similarly, land cover such as trees and buildings can limit views, while low-growing vegetation and the absence of structures can allow for unobscured views. Atmospheric conditions such as smoke, dust, fog, or precipitation can temporarily reduce visibility or be a more regular component of the visual landscape.

The physiological limits of human sight are affected by location, proximity, and light. Location refers to the topographic position of the viewer, such as being level with, above, or below what is being observed. Proximity is categorized into three distance zones: foreground (up to 0.5 mile from the

viewer), middleground (0.5 mile to 3 miles from the viewer), and background (beyond 3 miles). A feature in the landscape is more dominant and has a greater importance the closer the feature is to the viewer, whereas importance is reduced the farther away the feature is. In the background, the scale and color of existing landscape elements and project features blend so that only broad forms, large-scale patterns, and muted colors are evident. Light also plays a large role in affecting views. For example, during the daytime, views are more readily available than at night, when darkness conceals details and color in the landscape in the absence of bright moonlight or artificial light sources. Furthermore, light level and direction change throughout the day, affecting color and individual forms. The environment's physical constraints and limits of human sight combine to establish viewsheds that range from restrictive to expansive, and AVEs that range from smaller and more confined to larger and wider-reaching (Federal Highway Administration 2015:4-5–4-9, 6-3–6-4; Litton 1968:3–5).

For the purpose of this EIR, the AVE is considered to be a 0.5-mile radius from the project improvements in rural areas and a 0.25-mile radius from the project improvements in urbanized areas, only along sections of the three geographic segments where visible changes would occur. AVEs may be smaller than 0.25 or 0.5 mile where development or topography limits available views of the project improvements. The AVE may also be larger than 0.25 or 0.5 mile where elevated or more expansive views are present. Therefore, the analysis also considers the middleground views that are up to 3 miles from the project improvements. Background views (i.e., views beyond 3 miles from the project improvements) are not considered in great detail because details become diminished beyond the middleground, as discussed previously in this appendix. Project improvements features, most often, do not stand out in background views. However, features that are present within background views may be discussed as contributing visual elements to the AVE (e.g., mountain ranges, water features) because project improvements may affect the availability of views of notable features in the background, which may be of local or regional importance.

This EIR also considers impacts on scenic vistas. *Scenic vistas* generally encompass a wide area with long-range views to surrounding elements in the landscape. Such vistas are often available to viewers due to open, flat agricultural lands with few obstructions and from elevated vantages with views over the landscape. In addition, it is important to note that vistas have a directional range. That is to say, some areas have scenic vistas with a 360° view in all directions, while others may be limited in one direction in a manner that reduces the line of sight angle and amount of vista that is visible, resulting in a narrower vista view.

J-1.2.1.1 Landscape Units

Landscape units generally correspond to land uses, viewsheds, and landscape types that are visually similar, are spatially defined as a landscape with a particular visual identity, and are geographic units that can be considered as "outdoor rooms." Landscape units also serve the purpose of helping to frame the environmental setting and impact analysis, in which avoiding redundancies is preferred. Therefore, viewsheds with similar visual character types that would have similar visual impacts are grouped into a single landscape unit, even if there are visually unique areas within the landscape unit that create minor variations in visual character. If such areas begin to complicate the discussion of baseline conditions or visual impacts, then they would warrant independent landscape units (Federal Highway Administration 2015:4-13).

Project improvements are proposed within the three geographic segments within the AVE. Within these segments are project improvement alternatives. Each of these alternatives is considered a

landscape unit because they correspond to sites or smaller segments that have a similar visual identity.

J-1.2.2 Inventory Baseline Conditions

J-1.2.2.1 Visual Character of the Environmental Setting

The environmental setting comprises the natural, cultural, and project environments that constitute the AVE. For the purpose of defining aesthetic and visual resources, the *natural environment* is determined by the visual character of the land, water, vegetation, animals, and atmospheric conditions described in more detail below in Table J-1.1. The *cultural environment* is determined by the visual character of buildings, infrastructure, structures, and other artifacts and art. The *project environment* focuses down from the larger context of the natural and cultural environments and concentrates directly upon the project site. As such, there is overlap between the natural and cultural environments and the project environment. However, the project environment is comprised of visible elements immediately within a project site's boundaries and includes the existing development footprint, the transportation corridor geometrics within the existing right-of-way (for transportation-related projects), terrain and grading, constructed elements, vegetative cover, and other ancillary visual elements found in the corridor of a modern transportation system.

Often a proposed project is to be located on a site that is already developed or is located within an existing transportation corridor. Therefore, the existing project site coherence can be evaluated to establish existing, baseline conditions. In situations where there is no development within the proposed project site boundaries or there is no pre-existing transportation corridor present, the project would introduce a new development or create a new transportation corridor where none presently exists. In such cases, in lieu of describing the alternative environment, only the natural and cultural environment are described for existing conditions.

Table J-1.1 Visual Character Elements of Environmental Setting

Feature	Description of Element	Visual Attributes
Natural Environment		
Land	Landform and natural materials (besides water and vegetation) on the land (e.g., rocks, sand, boulders).	Landscape's form, its spatial qualities, and the nature of its materials.
Water	Flowing or impounded; natural or artificial.	Size of the water body, shape and spatial qualities of its perimeter, turbidity, the nature of its littoral or intertidal zones, and any other distinguishing visual attributes.
Vegetation	Presence or absence of vegetation; native, naturalized, or cultivated.	Height and density, artistic description (form, shading, color, and texture), and any other distinguishing visual attributes; seasonal changes (flowers, fruit, and seasonal color).
Animals	Wild or domesticated.	Domesticated farm animals in rural agricultural landscapes, wildlife as a visual indicator of a landscape's vitality and identity (e.g., whale or bird migrations, herds of large mammals, or seasonal flocks of waterfowl).

Feature	Description of Element	Visual Attributes
Atmospheric Conditions	Temporal changes; presence or absence of humidity, fog, and dust that reduce or alter visibility.	Predictable amounts of precipitation, either as rain or snow, can change the visibility of the landscape. Rain, with its darkened sky, and snow covering the ground may change a landscape's *luminosity* (i.e., level of brightness) and key views and distance zones. Noting the frequency, even periodicity, of such obscuring or altering phenomena adds to the description of a landscape's visual character. For instance, the visual quality of the enclosing fogginess of the darker Olympic Peninsula is quite different than the open starkness of the very bright Four Corners area of the desert southwest.
Cultural Environment		
Buildings	Enclosed structures that are or have been used or occupied by people.	Buildings are often the dominant human-constructed objects in a landscape. A building's visual character is determined by its form, scale, massing, materials, and architectural style and detailing. Building orientation; patterns of light and shadow; artistic attributes like color, pattern, and texture; and site-specific setting, particularly if it obstructs views, all affect visual character. The building's historic status, current and past occupants, the architect who designed the building, the client for whom it was built, or the contractor who constructed it may also be critical to the perception of the building's visual quality. Views of a proposed project from a building are also important.
Infrastructure	Railroads, airports, harbors, roads, canals, dams, electrical and telecommunication utilities, pipelines, sewer and water systems, solar arrays, wind turbines, and other infrastructure.	A major visual attribute of infrastructure is linearity because infrastructure systems can stretch for miles, even across whole states. Extended lines can affect the character of the natural and cultural landscapes. Infrastructure also provides a special set of buildings, structures, and associated artifacts that are part of an intermodal system (for moving people, goods, and services) that can affect the visual character of an AVE.
Structures	Engineered elements that provide a social function but are not buildings or part of a larger infrastructure system.	Structures may be walls, towers, and other constructed items erected to serve a single utilitarian function. Some structures have architectural treatments but most do not, and form and materials are dictated by functional requirements. A structure's visual character is determined by its form, scale, massing, materials, construction method, and engineering detailing. Structure orientation; patterns of light and shadow; artistic attributes like color, pattern, and texture; and site-specific setting, particularly if it obstructs views, all affect visual character. The structure's historic status, the architect who designed the structure, the client for whom it was built, or the contractor who constructed it may also be critical to the perception of the structure's visual quality.
Artifacts and Art	Artifacts are those items that do not fit neatly into any other category, such as cultural visual resources that are not buildings, infrastructure, or structures. Public art can also contribute to defining the visual landscape.	Artifacts and art are described in a manner similar to that recommended for buildings and structures.

Feature	Description of Element	Visual Attributes
Project Environment		
Transportation Corridor Geometrics	The corridor's alignment, profile, and cross-section. Geometrics influence what can and cannot be seen by travelers.	Geometrics are described in terms of curviness or straightness of the horizontal alignment, the slope and amplitude of its vertical profile, and the width of its surface. Documenting the existing state of these elements and how these elements will be modified by the proposed project help to establish project impacts.
Grading	Existing grades associated with the project corridor or the grading that will be necessary to accommodate a proposed project. This is closely tied to corridor geometrics.	Grading creates physical forms that affect the visual character and quality of the corridor/right-of-way by altering existing landforms. This may include the presence of existing terrain and need to create or modify slopes, areas of cuts and fills, rock cuts, and retaining wall or gabion structures. The project environment is also affected by the surface appearance of rock cuts, retaining walls, and gabions.
Constructed Elements	Pavement and structures are often the most typical constructed elements in a transportation corridor. Pavement includes any surface on which vehicles or people can travel. Pavement that could affect visual character and quality include different types of paving used for road, rail bed, shoulder, parking lots, sidewalks, and trails. Structures are major, necessary built components of the corridor such as bridges, viaducts, and culverts; retaining walls; noise walls; and other large scale visual elements.	Constructed elements are described in a manner similar to that recommended for the visual resources associated with cultural environment. The descriptions for constructed elements can define the setting and orientation of the structures; their form, scale, massing, and material; aesthetic treatments like color, pattern, and texture; and may also describe the interplay between light and shadow. Description of a constructed element can also establish the site-specific setting if it obstructs or generates views, especially for bridges. The historic status and designer of a structure may also be critical in establishing its contribution to the visual character of the project area.
Vegetative Cover	Occurs within the project corridor and outside the footprint of the corridor's constructed elements. Vegetation can occur along the outer edges of travel ways or within medians, interchange loops, or roundabouts. It can even be established to grow and cover constructed elements such as noise barriers and retaining walls. The vegetation may be native, introduced, or feral.	Vegetative cover is often established for erosion control and can be also established to improve corridor aesthetics or to buffer undesirable views. Vegetative cover is described by identifying the density, distribution, and species composition. Aesthetic attributes of the plants such as seasonal color are also described. Note that vegetated rights-of-way are not present in all regions of the country and vegetation may be minimal or even absent. However, the presence or absence of vegetation should still be described.
Ancillary Visual Elements	Generally include lighting and traffic control devices, such as signs, rail crossing signals, and ramp metering that enhance safety and direct circulation.	Existing and proposed lighting and traffic control elements are described to establish the existing and proposed visual character of the project corridor.

Source: Federal Highway Administration 2015:5-1–5-5.

J-1.2.2.2 Affected Viewer Groups and Associated Viewer Preferences

Two overarching groups of viewers are affected by a project: neighbors and users. *Neighbors* are those people who have views *of* a project site because they are adjacent to it. *Users* are those people who are within project site boundaries and have views *from* a project site. Following are the types of neighbors and users that can be affected by a project (Federal Highway Administration 2015:5-6 – 5-10).

- **Residential viewers:** Residential viewers can be owners or renters that live within viewing distance of a proposed project or within project boundaries. Residential viewers generally have a desire to maintain the existing landscape as-is because how their neighborhood looks is a contributing factor for residents choosing to live there. Therefore, residential viewers tend to be uninterested in change unless they have been able to participate in defining the change.
- **Recreational viewers:** Recreational viewers provide or participate in active and passive recreational uses such as organized sporting events, indoor and outdoor leisure activities, and cultural events. Recreational viewers are often focused on their recreational activity, and although they tend to be unsupportive of visual changes that would negatively affect the recreational setting, they tend to be supportive of visual improvements that enhance their recreational experience. Recreational services provided for visitors can be permanent, while the visitors are more transitory.
- **Retail viewers:** Retail viewers include merchants that sell goods and services and the shoppers that buy them. Merchants generally want heightened visibility, free of competing visual intrusions, while shoppers need to be able to easily find their destination and, once there, concentrate on the shopping experience. Merchants tend to be more permanent than shoppers, although shoppers often frequent the same stores repeatedly, giving them a sense of permanence.
- **Commercial viewers:** Commercial viewers are those occupying or using office buildings, warehouses, and other commercial structures. Commercial viewers' visual preferences vary depending on the business and may be more aligned with retail, institutional, or industrial viewers' visual preferences than those of residential viewers. Workers are often permanent, while visitors and customers are transitory.
- **Institutional viewers:** Institutional viewers provide or receive services from such places as schools or hospitals that serve the community. Consequently, institutions often promote a public image to adjacent viewers, and the presentation of their buildings and grounds are important and tend to be well maintained. Signage or orientation and wayfinding are commonly associated with institutional facilities. Workers and employees of the institution are present for longer durations, while visitors are more transitory.
- **Civic viewers:** Civic viewers provide or receive services from a government organization, such as a military reservation or a federal, state, or local agency. Views of government facilities may or may not be desired, depending on the particular organization and work being performed. Workers and employees of the government facilities are present for longer durations, while visitors are more transitory.
- **Industrial viewers:** Industrial viewers mine or harvest raw materials; manufacture goods and services; or transport goods, services, and people, and often require large amounts of land that has limited exposure to the public. Industrial viewers' visual preference is generally utilitarian

unless they want to enhance the public presentation and views of their facility. Industrial viewers tend to be primarily workers with few transitory visitors.

- **Agricultural viewers:** Agricultural viewers are agricultural workers in fields and pastures maintaining crops or herd animals. Cultural order and natural harmony are critical components of the landscape. Some agricultural viewers are permanent, but many are transient, although they may return to the same area seasonally.
- **Travelers:** Travelers can include pedestrians, cyclists, motorists, and rail users that use various modes of transportation for commuting, touring, and shipping. Pedestrians use only their feet (or a wheelchair or other device), most often on a sidewalk or trail. Cyclists use bicycles at greater speeds than pedestrian travel, and may use trails, traffic lanes, and sidewalks. Motorists use vehicles with engines (e.g., cars, trucks, buses, motorcycles, mopeds, or any other technology that is not self-propelled, regardless of fuel source). Motorists move at higher speeds than other groups. By necessity, the driver of a motor vehicle focuses less on the view outside the vehicle. The driver's primary interest is in project coherence, although natural harmony and cultural order also provide resources used for wayfinding. Good natural harmony and cultural order can increase driver attentiveness. Passengers within vehicles and rail cars move at high rates of speed and may be focused on views outside the vehicle or rail car or on activities within the vehicle or rail car such talking, reading, working, eating, people watching, or napping. Passengers prefer evidence of good natural harmony and cultural order. Commuters travel the same route regularly, have a repeated routine, and are often single drivers, but they may also be passengers; and trips can include commuting to work or to a favorite or frequent destination (e.g., campground, cabin, sports arena, or relative's home). Tourists travel individually or in groups through an area for enjoyment, often with a set destination, on trips that are generally more adventurous, cover longer distances, and take more time than commuting trips. Shippers are generally single drivers moving goods on routine routes of varying distances.

J-1.2.2.3 Visual Quality

Evaluation Methodology

Visual quality is affected by *aesthetics*—the study of pleasing perceptual experiences as seen by humans. These perceptions are remarkably consistent within a society and across cultures, even though an individual's experience of visual quality is unique because of previous life experiences. Visual quality is a function of what the viewer wants or expects to see and what is actually seen. If people see what they want or expect to see, then the visual quality is good or high because the viewer is pleased. However, if what is seen is lacking or not what is expected, then visual quality is poor or low because the viewer is disappointed. Expectations can be predictable for things like roadways and commercial development within a certain area. However, self-interest factors into visual preferences based on whether the viewer is a neighbor or user of a project site and how they may be personally benefited or affected. Different viewers and viewer groups value visual resources in different ways; therefore, there are different appraisals of visual quality. Regardless, there is a range of viewer responses inherent in all humans that aids in evaluating the overall landscape composition and vividness of both natural and cultural environments.

- Natural harmony: The natural environment creates a sense of natural harmony in people. The visual character of the natural environment's visual resources and viewer preferences affect the perception of natural harmony and the viewers inherently evaluate and determine if the composition is harmonious or inharmonious.

- Cultural order: The cultural environment creates a sense of cultural order in people. The visual character of the cultural environment's visual resources and viewer preferences affect the perception of order and the viewers inherently evaluate and determine if the composition is orderly or disorderly.
- Project coherence: The project environment creates a sense of project coherence in people. The visual character of the project environment in combination with viewer preferences affect the perception of project coherence; viewers consciously or unconsciously evaluate the composition of the viewscape and determine if it is coherent or incoherent.
- Visual quality: The natural and cultural environment are elements that make up the overall visual quality for a complete visual landscape. The value placed on visual resources correlates to whether those resources meet the viewer's preferred concepts of natural harmony and cultural order. The more visual preferences and expectations are met by the landscape composition, the more that landscape is revered for its views and the more memorable, or vivid, it becomes. Visual features do not intrude but belong to a landscape of a harmonious nature in an orderly society.

Viewer preferences are established using a professional observational or public involvement approach. Professional observation is used on projects with average complexity and minimal controversy by identifying standard visual preferences associated with affected viewer groups that are adjusted to reflect state and local regulations protecting visual resources. More complex and controversial projects often engage affected stakeholders (i.e., neighbors and users) through public outreach and involvement to help define visual preferences. The analysis in this EIR uses the professional observational approach (Federal Highway Administration 2015:5-13–5-14).

Evaluation Rating

The analysis in Section 4.1, *Aesthetics*, uses a descriptive means for rating and assessing impacts that is based off of a numeric rating system. Numeric values are initially assigned to these descriptors that then determine the descriptive ratings. The numeric values range from 1–7 and correlate to descriptive ratings that range from Very Low to Very High. While detailed, this rating system allows for a better means of determining the level of impact compared to a broader rating system of, for example, five rating levels. The numeric values and associated descriptive ratings are described in more detail in subsequent sections of this appendix. The rating forms used for the analysis are found at the end of this appendix.

Visual Resource Ratings

Aesthetic and visual resources are the visible components of the natural, cultural, and project environments within the AVE, as described in Section J-1.2.2.1. Aesthetic and visual resources are assessed by evaluating the visual character and visual quality of the resources that comprise the project environment before and after construction of a proposed project and how these changes affect the surrounding natural and cultural environments.

- *Visual character* includes attributes such as form, line, color, and texture and is used to describe, not evaluate, the visual environment; that is these attributes are neither considered good nor bad.

- *Visual quality* is used to describe what viewers like and dislike about the visual resources that compose a particular scene and are expressed in terms of *natural harmony*, *cultural order*, and *project site coherence*.

As described under *Evaluation Methodology*, natural harmony, cultural order, and project site coherence are independent elements that contribute to the overall visual quality. The overall visual quality is evaluated to determine if the composition meets or does not meet visual preferences and expectations. As previously described, to determine the overall visual quality, natural harmony, cultural order, and project site coherence are first assigned a numeric value that translates to a descriptive rating as shown in Diagram J-1.2.

Diagram J-1.2. Natural Harmony, Cultural Order, and Project Site Coherence Ratings

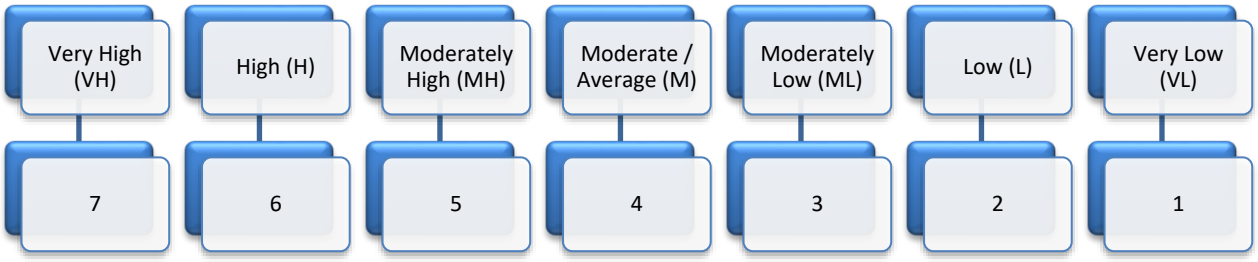


Table 1-1.2 provides guidance on how to rate the natural harmony, cultural order, and project site coherence. The overall visual quality is then calculated for existing and proposed conditions by averaging the natural harmony, cultural order, and project site coherence ratings as follows.

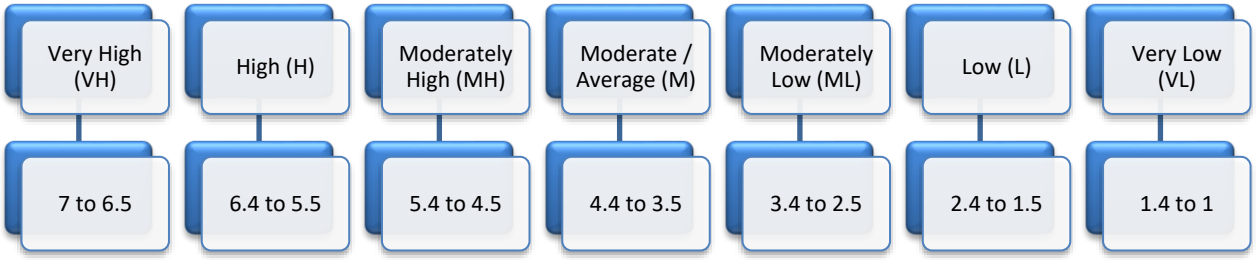
$$\text{Visual Quality} = \frac{\text{Natural Harmony Rating + Cultural Order Rating + Project Site Coherence Rating}}{3}$$

For situations in which there is no development within the proposed project site boundaries or there is no pre-existing transportation corridor present, a project would introduce a new development or create a new transportation corridor where none presently exists. Therefore, the existing, baseline conditions cannot be used to evaluate project site coherence. In such cases, in lieu of the direction provided above, the project site coherence rating is not used and only the natural and cultural environment ratings are used to calculate the overall landscape composition and vividness rating for existing conditions, as follows.

$$\text{Visual Quality} = \frac{\text{Natural Harmony Rating + Cultural Order Rating}}{2}$$

The overall visual quality is then assigned a descriptive rating, called a *Visual Quality Rating*, based on the numeric values as shown in Diagram J-1.3.

Diagram J-1.3. Visual Quality Ratings



A Very High rating corresponds to more pristine natural evironments that are untouched by humans or cultural and project environments that are extremly well designed. As such, higher visual ratings represent landscape compositions that are vivid and that may evoke feelings of awe and wonderment. A Very Low rating corresponds to highly disjunct landscapes that have been haphazardly altered by humans. As such, lower visual quality ratings correspond to landscape compositions that may evoke negative emotional responses in viewers. In general, the more a composition meets visual preferences and expectations, the more positive the viewer response. In general, the more positive the viewer response is, the more memorable, or vivid, the composition becomes. For example, a more positive viewer response occurs when a development or roadway is not perceived as an intrusion, but is seen as an integrated element belonging to a harmonious and orderly landscape.

Table J-1.2. Visual Resource Rating for Determining Visual Quality

Visual Resource	Visual Quality						
	Very High (7)	High (6)	Moderately High (5)	Moderate (4)	Moderately Low (3)	Low (2)	Very Low (1)
Natural Harmony	Landscape is pristine and untouched by human influences. Natural state is exemplary at a global level. Natural state may be very harmonious but may also be visually distinct in that the natural landscape inspires awe.	Landscape is largely untouched by natural and human influences. Natural state is exemplary to region and vicinity. Perceived as very harmonious.	Landscape has few visible modifications but they do not greatly detract from available views. Natural state is of higher quality than natural environments that are more common to region and vicinity. Perceived as harmonious.	Natural landscape has visible natural and human modifications. Natural state is common to region and vicinity. Perceived as fairly harmonious with some slight distractions.	Landscape has notable visible modifications that detract from available views. Natural state is of lesser quality than natural environments that are more common to region and vicinity. Perceived as disharmonious.	Very disrupted natural landscape. Natural state may be perceived as an eyesore. Perceived as very discordant.	Natural landscape is in disarray and severely degraded.
Cultural Order	Cultural landscape is exceptional and can be perceived as having exceptional design cohesion recognized at a global level. Land uses may blend seamlessly but may also be visually distinct in that the cultural landscape inspires awe.	Cultural landscape is exemplary and can be perceived as having exemplary design cohesion compared to region and vicinity. Land uses blend seamlessly. Perceived as very orderly.	Cultural landscape is typical of the region and vicinity. Land uses blend well. Can be perceived as having superior design cohesion to ordinary or familiar cultural environment.	Cultural landscape contains orderly and familiar design elements typical of the region and vicinity. Land uses may be slightly disjointed. Can be perceived as an ordinary or familiar cultural environment.	Cultural landscape contains some unifying elements but generally lacks design cohesion. Perceived as containing highly disjointed land uses.	Cultural landscape lacks design cohesion and sense of place. May be perceived as blight.	Cultural landscape is in disarray and severely degraded.
Project Site Coherence	Project site blends with natural and cultural landscape to the degree that it cannot be noticed or can be perceived as providing an exceptional contribution to surrounding visual environments.	Project site is a part of the natural and cultural landscape and can be perceived as a beneficial, contributing visual element to surrounding environments.	Project site responds well to the natural and cultural landscape and can be perceived as being very compatible with surrounding environments.	Project site responds to the natural and cultural landscape in an adequate manner. Would require minor to moderate improvements for better compatibility with surrounding environments. Perceived as being common to the setting with some slight distractions.	Project site does not respond to the natural or cultural landscape and can be perceived as disjunctive. Would require moderate to substantial redesign to rectify compatibility with surrounding environments. Perceived as incoherent.	Project site substantially degrades the natural or cultural landscape. Would require substantial to major redesign or relocation to rectify compatibility with surrounding environments. Perceived as very incoherent.	Project site is in disarray and severely degrades the natural or cultural landscape. Would require major redesign or relocation to rectify compatibility with surrounding environments.
Visual Quality[a]	*Used when Existing Project Site <u>is</u> Developed and for Proposed Project Conditions:* <u>Natural Harmony Rating + Cultural Order Rating + Project Site Coherence Rating</u> 3	OR	*Used when Existing Project Site <u>is Not</u> Developed:* <u>Natural Harmony Rating + Cultural Order Rating</u> 2				

[a] The combined evaluation of visual quality and memorability of natural harmony, cultural order, and project coherence. Translate the numeric calculation to the descriptive rating.

Light and Glare Ratings

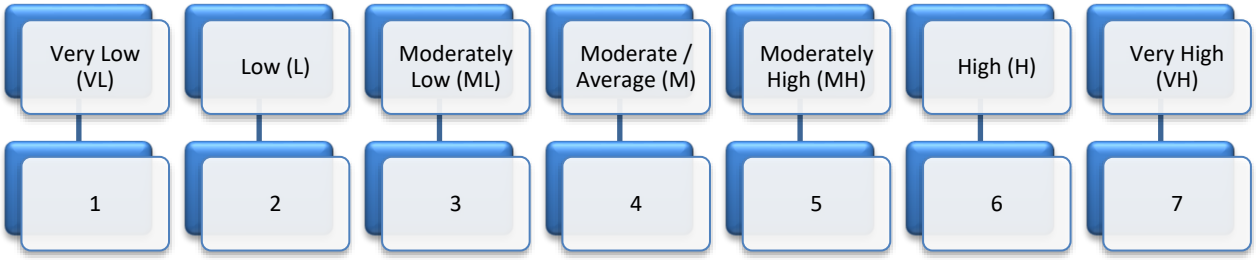
Light is a function of natural and artificial illumination that is present during the day and night within the natural, cultural, and project environments. Sources of natural light include the sun, moon, stars, fire, and lightening, and sources of artificial light can include streetlights, vehicle headlights, landscape lighting, external security lighting, internal building lighting, and stadium/playing field lighting. Levels of light are influenced by the time of day, atmospheric conditions, the presence or absence of both natural and artificial lighting, and natural and built features that may filter or screen light. The visual landscape can range from being very brightly lit to being very dimly lit to being dark and not lit at all. In addition, lighting is influenced by the color temperature of the light source that can give the appearance of warmer, more orangey lighting or brighter, more blueish or whitish lighting. The height and angle of lighting and presence or absence of shielding affects whether or not lighting spills beyond a specific boundary, creating light trespass, or radiates upward into the night sky, creating ambient light glow, which brightens the night sky.

Glare can be caused by a direct light source (direct glare) or, more commonly, by the reflection of the sun, moon, or artificial light source from a reflective surface (reflective glare). The intensity of direct glare is a function of the brightness of the surroundings and the intensity of the light source. Similarly, the intensity of reflective glare is a function of the reflectivity of the surface, the intensity of the light source, and the angle of the light source hitting the reflective surface. Highly reflective surfaces include water, glass, and metal. However, any surface may be a source of reflective glare based on its coloring and size. Lighter surfaces are more reflective than darker surfaces. For example, flat white has a reflectivity of 85–95%, whereas yellow has a reflectivity of 70%. Reflectivity decreases as the color gets darker because lighter colors reflect light and darker colors absorb light. Similarly, larger surfaces have a bigger area from which light will reflect than do smaller surfaces (Smardon 1986:126–128).

Natural and artificial light, atmospheric conditions, regional weather patterns, vegetation, terrain, water features, built structures, materials, and surface texture and color within the natural, cultural, and project environments all contribute to light and glare. While light and glare are a part of the natural, cultural, and project environments, changes in light and glare are often assessed independently and in a qualitative manner that compares existing to proposed changes in *levels* of light and glare. This assessment also includes evaluating changes to shade and shadowing that can, in turn, affect levels of light and glare.

Within the AVE, light and glare levels are assessed by evaluating existing and resultant light and glare levels associated with a project site and the surrounding project vicinity. This helps to determine the changes in light and glare levels, specifically, at a project site. This also helps to determine if, for example, vegetation removal or light fixture installation at a project site would result in an increase in light and glare levels on adjacent properties in the project vicinity. Or, perhaps, if built structures or landscaping would introduce shade or filter project lighting and result in a decrease in light and glare levels on adjacent properties in the project vicinity. Rating light and glare levels in this manner helps to frame the impact discussion and aids in determining how the overall light and glare levels are changed within the AVE and the source and location of such changes. The levels of daytime and nighttime light and glare are rated as shown in Diagram J-1.4.

Diagram J-1.4. Daytime and Nighttime Light and Glare Level Ratings



Again, it should be emphasized that while the visual resource rating is a measurement of *quality*, the light and glare ratings are a measurement of *intensity* to assess degree of change, and are not intended to imply judgment of good vs. bad.

Table J-1.3 provides a general guide to assessing and rating *daytime* light and glare levels. Table J-1.4 provides a general guide to assessing and rating *nighttime* light and glare levels. As shown in these tables, project site and project vicinity light and glare levels are evaluated using the same parameters. Table J-1.4 focuses primarily on artificial lighting levels.

In general, a project's analysis would rate existing light and glare levels for both daytime and nighttime conditions. However, proposed light and glare levels may not need to be rated when no changes are proposed that would affect either daytime or nighttime conditions. This would occur, for example, when existing nighttime lighting would not be modified and no new lighting would be introduced as a result of a proposed project. Therefore, there would be no change between the existing and proposed conditions. In addition, the level of light and the level of glare can be rated together or independently of one another, depending on project circumstances. Independent ratings for light and glare levels may benefit more complex projects because using independent ratings would make the impact discussion and assessment easier to frame and evaluate.

Unlike the visual resource ratings described under *Visual Resource Ratings*, the ratings for light and glare levels are not averaged together because doing so could skew light and glare impacts, as illustrated in the table for Example 1, below. For Example 1, the existing condition of the proposed project site is undeveloped, evergreen, forested lands and the project vicinity is forested in the same manner. Therefore, the existing conditions for both the project site and project vicinity would result in a Very Low light and glare rating. In this example, the proposed project is a multi-lane freeway that would be well-lit and have a Moderately High light and glare rating. Light from the proposed project would increase the amount of light and glare at the project site and would result in light spill onto the adjacent forest in the project vicinity. However, the tall evergreen trees would limit the amount of spill. As shown in the greyed cells for Example 1, averaging the ratings of the project site and project vicinity provides a generalized level of increase for the whole AVE but does not account for the higher levels of increase that would be experienced at the project site and elevates the level of increase affecting the project vicinity. In this example, the analysis would reasonably conclude that light and glare would be increased at the project site but the tall evergreen trees limit light spill to a small area outside of the right-of-way.

Example 1. Changes to Nighttime Light and Glare—Evergreen Forest

Light and Glare Rating	Proposed	Existing	Additive Level of Increase	Notes
Project Site	5 (Moderately High)	1 (Very Low)	5-1 = 4 levels of increase at the project site	Recommended Calculation Method
Project Vicinity	2 (Low)	1 (Very Low)	2-1 = 1 levels of increase within the project vicinity	
Averaged Level of Increase	(5+2)/2 = 3	(1+1)/2 = 1	3-1 = 2 levels of increase within the AVE	Discouraged Calculation Method

In Example 2, the existing conditions of the proposed project site and project vicinity are both undeveloped, oak woodlands that result in a Low light and glare rating. The Example 2 project is the same as the Example 1 project, and light from the project site would spill onto the adjacent oak woodlands in the project vicinity. Like Example 1, averaging the ratings of the project site and project vicinity for Example 2 also provides a generalized level of increase for the whole AVE but does not account for the higher levels of increase that would be experienced at the project site, and it elevates the level of increase affecting the project vicinity. In this example, the visual resource specialist would explain how the more open oak woodlands are naturally brighter at night but how sparser vegetation densities in the project vicinity would not block as much proposed light that would trespass from the project site. This would allow for project lighting to spill a greater distance away from the project site boundaries and farther into the project vicinity.

Example 2. Changes to Nighttime Light and Glare—Oak Woodlands

Light and Glare Rating	Proposed	Existing	Additive Level of Increase	Notes
Project Site	5 (Moderately High)	2 (Low)	5-2 = 3 levels of increase at the project site	Recommended Calculation Method
Project Vicinity	4 (Moderate)	2 (Low)	4-2 = 2 level of increase within the project vicinity	
Averaged Level of Increase	(5+4)/2 = 4.5	(2+2)/2 = 2	4.5-2 = 2.5 levels of increase within the AVE	Discouraged Calculation Method

In these examples, the level of increase provides information on describing the change in light and glare levels. However, light and glare impacts must be factored with viewer response and the type of change that would result from the proposed project. For example, a roadway project that would cut through evergreen forests or oak woodlands, as proposed in Examples 1 and 2, may not have many viewers that would be directly affected. However, these natural areas could be of local or regional importance and introducing sources of nighttime lighting would not be viewed as favorable. Conversely, an increase in light and glare may not be considered to be negative, depending on the proposed project. For example, light and glare could increase within an evergreen forest or oak woodland if invasive vegetation would be removed, allowing for natural recruitment of native plant species, which is likely to be viewed as favorable. Therefore, the analysis must determine the change in light and glare levels; evaluate affected viewers, viewer sensitivity, and viewer preferences; assess the proposed project actions; and determine if changes in light and glare are negligible, positive, or negative and if any mitigation is needed to reduce impacts.

In addition, when evaluating light and glare levels, atypical conditions may exist that require deviation from the guidance provided in Tables J-1.3 and J-1.4. For example, a suburban area with neutral colored buildings that is moderately developed, with tree cover present, may be considered to have Moderate levels of light and glare. However, if that same area was to be developed with all white buildings (e.g., due to historical preservation or local design standards) then the level of glare might be considered to be Moderately High because the white building surfaces are more reflective and create a higher degree of perceived glare.

Table J-1.3. Daytime Light and Glare Levels[a]

Location	Daytime Light and Glare						
	Very Low (1)	**Low (2)**	**Moderately Low (3)**	**Moderate (4)**	**Moderately High (5)**	**High (6)**	**Very High (7)**
Project Vicinity and Project Site[b]	**Natural Environment:** Very densely vegetated and/or heavy shading or shadowing that may result from vegetation, landforms, or natural materials that create an enclosed effect. May be typically overcast, dull, or rainy weather conditions. May be perceived as dark and muted. Details may be hard to see due to heavy shade and shadowing combined with low lighting levels and darker colored natural features. Smaller sized water bodies may be present. **Cultural Environment:** Landscape has barely perceptible or no cultural elements that contribute to daytime light and glare. This may be typical of natural areas that have very limited human influence. **Project Environment:** Project transportation corridor is not present or are very narrow with little to no built elements or vertical surfaces that result in reflective glare. Vegetation along the corridor helps reduce glare. Regular traffic levels tend to be very low, such as along a single track rural or forest roadways.	**Natural Environment:** Densely vegetated and moderate to heavy shading or shadowing that may result from vegetation, landforms, or natural materials that create a canopy effect. Understories and ground planes may be dappled with sunlight in sunny conditions or understories can be seen as greyish, foggy, or muted in overcast and rainy conditions. Details may be slightly hard to see due to heavy shade and shadowing combined with low lighting levels and darker colored natural features. Smaller sized water bodies may be present. **Cultural Environment:** Landscape has very few cultural elements that contribute to daytime light and glare. This may be typical of natural areas or very low density forested or rural areas. **Project Environment:** Project transportation corridor is fairly narrow with few built elements and vertical surfaces that result in reflective glare. Vegetation along the corridor helps reduce glare. Regular traffic levels tend to be low, such as along a two-lane rural roadway.	**Natural Environment:** Moderate to dense vegetative cover with typically bright, sunny weather conditions so that vegetation's shade and shadowing helps filter sunlight, offsetting the effects of light and glare. Smaller to medium sized water bodies may be present. Or, little vegetation in a typically overcast, dull, or rainy environment where lack of sunshine offsets effects of little vegetative cover. Smaller to large sized water bodies may be present. **Cultural Environment:** Landscape has few cultural elements that contribute to daytime light and glare. This may be typical of areas with low density development, such as in rural areas. **Project Environment:** Project transportation corridor is narrow with some built elements and vertical surfaces that result in reflective glare. Vegetation along the corridor helps reduce glare. Traffic levels tend to range from low to moderately high depending on the time of day, such as along state routes and local suburban roadways.	**Natural Environment:** Moderate mix of vegetation and open spaces that provides a balance between light and glare in a range from dull to bright environments. Smaller to medium sized water bodies may be present. **Cultural Environment:** Landscape is moderately developed with cultural elements that contribute to daytime light and glare. This may be typical of areas with higher density rural development or lower to medium density suburban development. **Project Environment:** Project transportation corridor is slightly wide, where paved horizontal and vertical surfaces are common. Surface coloring contributes to glare. Vegetation along the corridor helps reduce glare. Traffic levels tend to range from moderate to high depending on the time of day, such as along local roadways that are developed or highways areas.	**Natural Environment:** More open mix of vegetation and open spaces that does not quite offset or balance the effects of light and glare in a range from dull to bright environments. Medium to larger sized water bodies may be present. **Cultural Environment:** Landscape is quite developed with suburban or urban development that contribute to daytime light and glare. This may be typical of highly suburbanized areas; lower density urban areas; or business, commercial, and industrial areas that have a higher ratio of impervious paving and build structures. **Project Environment:** Project transportation corridor is wide, where paved horizontal and vertical surfaces are prominent. Surface coloring contributes to glare. Vegetation along the corridor is sparse or absent. Regular traffic levels tend to be high, such as along highways and interstates traveling through highly populated areas.	**Natural Environment:** Little vegetative or landform cover with typically bright, sunny weather conditions and large bodies of water or lightly colored expanses of natural surfaces (e.g. snow cover, desert sands) other naturally reflective surfaces tend to be present. May be perceived as glaringly bright and cause visual discomfort. Details may be hard to see without protective eyewear. **Cultural Environment:** Landscape tends to be highly developed with urban uses with many reflective surfaces such as high rise buildings with many windows. **Project Environment:** Project transportation corridor is quite wide and consists of a great deal of paved horizontal and vertical surfaces. Surface coloring is neutral and helps to slightly reduce glare. Vegetation along the corridor is likely absent. Regular traffic levels tend to be high to very high, such as along highways and interstates traveling through urbanized areas.	**Natural Environment:** No vegetative or landform cover with typically bright, sunny weather conditions and large bodies of water or lightly colored expanses of natural surfaces (e.g. snow cover, desert sands) other naturally reflective surfaces tend to be present. May be perceived as glaringly bright and cause visual discomfort. Details may be hard to see without protective eyewear. **Cultural Environment:** Landscape tends to be very highly developed urban environments with a substantial amount of reflective surfaces such as many, glass-faced high rise buildings. In such instances, levels of daytime light and glare may be highly dependent on time of day (i.e., sun angle) and viewer position in the landscape (i.e., ground level views in a city may be shaded where views from different building levels are not). **Project Environment:** Project transportation corridor is very wide and paved horizontal and vertical surfaces are the most dominant features. Surface coloring is lighter and contributes to glare. Vegetation along the corridor is generally absent. Regular traffic levels tend to be very high, such as along interstates traveling through highly urbanized areas.
Light and Glare (L&G) Level Increase	Proposed Project Vicinity L&G Levels – Existing Project Vicinity L&G Levels = Change in L&G Levels[c]			AND	Proposed Project Site L&G Levels – Existing Project Site L&G Levels = Change in L&G Levels[c]		

[a]The level of light and the level of glare can be rated together or independently of one another, depending on the project's needs (refer to *Light and Glare Ratings*).
[b]Project site and project vicinity light and glare levels are evaluated using the same parameters.
[c]A positive number means an increase in L&G levels. A negative number means a decrease in L&G levels. Translate the numeric calculation to the descriptive Light and Glare Rating.

Table J-1.4. Nighttime Light and Glare Levels[a]

Visual Resource	Nighttime Light and Glare						
	Very Low (1)	**Low (2)**	**Moderately Low (3)**	**Moderate (4)**	**Moderately High (5)**	**High (6)**	**Very High (7)**
Project Vicinity and Project Site[b]	**Natural Environment:** High cloud cover or haze caused by natural conditions or atmospheric pollution. Tends to have extensive overhead cover present. Conditions allow for very low levels of nighttime lighting from the stars and moon. Colors and details cannot be seen at night. **Cultural Environment:** Landscape has barely perceptible or no cultural elements that contribute to nighttime light and glare because of very limited human influence. No traditional interior or exterior lighting, including Blue-Rich White Light (BRWL[c]) LED lighting, is present. Colors and details cannot be seen at night. **Project Environment:** No project transportation corridor lighting (typically overhead lighting). Colors and details cannot be seen without artificial lighting from vehicle headlights.	**Natural Environment:** Moderate cloud cover or haze caused by natural conditions or atmospheric pollution. Tends to have overhead cover present. Conditions allow for low levels of nighttime lighting from the stars and moon. Colors and details are very hard to see at night. **Cultural Environment:** Landscape has very few cultural elements that contribute to nighttime light and glare. This may be typical of natural areas or very low density forested or rural areas. Very low levels of interior and exterior lighting is present. BRWL LED lighting is not present. Colors and details are very hard to see at night. **Project Environment:** Very limited project transportation corridor lighting, such as individual light standards at major intersections. Colors and details cannot be seen along most of the corridor without artificial lighting from vehicle headlights.	**Natural Environment:** Slight cloud cover and haze, natural or otherwise, occurs on a regular basis. Moderate to little overhead cover. Conditions allow for some nighttime lighting from the stars and moon. Colors and details begin to become more visible at night. **Cultural Environment:** Very low levels of exterior lighting in developed areas or landscape has low density development, such as in rural areas, with limited amounts of interior and exterior nighttime lighting from buildings, vehicles, streets, etc. that provide low levels of lighting to the area and reflects off of the built environment to a small degree. BRWL LED lighting is likely not present. Colors and details begin to become more visible at night. **Project Environment:** Project transportation corridor lighting is more regular, yet still sparse. Colors and details are more regularly visible. Colors and details are more visible with artificial lighting from vehicle headlights.	**Natural Environment:** Cloud cover and haze, natural or otherwise, varies. Moderate to little overhead cover. Conditions allow for moderate levels of nighttime lighting from the stars and moon. Colors and details can be seen night to varying degrees of clarity based on level of detail and brightness of colors. **Cultural Environment:** Moderate amounts of interior and exterior nighttime lighting, such as in higher density rural development or lower to medium density development suburban areas, from buildings vehicles, streets, etc. that provide fairly well-lit conditions that reflects off of the built environment to a small degree. Traditional outdoor lighting may be intermixed independent sources of BRWL LED lighting that causes small patches of "daytime" lighting conditions at night. Visual discomfort in close proximity to pockets of highly lit areas. Colors and details can be seen night to varying degrees of clarity based on level of detail and brightness of colors. **Project Environment:** Project transportation corridor lighting is regular and illuminates much of the corridor at lower levels. Colors and details are enhanced with the addition of artificial lighting from vehicle headlights. BRWL LED lighting may be present at some locations.	**Natural Environment:** Cloud cover and haze, natural or otherwise, is rare. Sparse overhead cover. Conditions allow for nighttime lighting from the stars and moon. Colors and details are fairly visible at night. **Cultural Environment:** Substantial amount interior and exterior nighttime lighting, such as in suburban or urban development, from buildings, vehicles, streets, etc. to brighten the area and reflects off of the built environment. BRWL LED lighting begins to outweigh traditional outdoor lighting and causes small islands "daytime" lighting conditions at night. Nighttime lighting may cause visual discomfort across portions of the area. Lighting may lack proper shielding. Colors and details are fairly visible at night. **Project Environment:** Project transportation corridor lighting is regular, but brighter than traditional street lighting and illuminates much of the corridor. There may be lower lit portions of the corridor where artificial lighting from vehicle headlights are needed to better see colors and details. BRWL LED lighting is likely present.	**Natural Environment:** Typically no cloud cover or haze caused by natural conditions or atmospheric pollution. Sparse overhead cover. Tends to have large water bodies or extensive snow cover present. Conditions allow for high levels of nighttime lighting from the stars and moon. Colors and details are easy to see at night. **Cultural Environment:** Landscape tends to be highly developed with urban uses with a substantial amount interior and exterior nighttime lighting from buildings, vehicles, streets, billboard, stadiums, etc. to illuminate the area and reflect off of the built environment. BRWL LED lighting is highly used and causes larger islands of "daytime" lighting conditions at night. Nighttime lighting causes visual discomfort across much of the area. Lighting may lack proper shielding. Colors and details are very easy to see at night. **Project Environment:** Project transportation corridor very well-lit, illuminating a great deal of the corridor. There may be lower lit portions of the corridor where artificial lighting from vehicle headlights are needed to better see colors and details. BRWL LED lighting is likely present.	**Natural Environment:** Typically no cloud cover or haze caused by natural conditions or atmospheric pollution. No overhead cover. Tends to have large water bodies or extensive snow cover present. Conditions allow for high levels of nighttime lighting from the stars and moon. Colors and details are very easy to see at night. **Cultural Environment:** Landscape tends to be very highly developed urban environments with a great deal of interior and exterior nighttime lighting from buildings, vehicles, streets, billboard, stadiums, etc. to illuminate the area and reflect off of the built environment. BRWL LED lighting is prominent and causes expanses of "daytime" lighting conditions at night. Nighttime lighting causes visual discomfort across a large area. Lighting may lack proper shielding. Colors and details are very similar to daytime conditions. **Project Environment:** Project transportation corridor lighting is prominent and illuminates the majority of the corridor. Corridor lighting is so prominent that artificial lighting from vehicle headlights would not even be needed during nighttime driving conditions. BRWL LED lighting is likely prominent.
Light and Glare (L&G) Level Increase	Proposed Project Vicinity L&G Levels – Existing Project Vicinity L&G Levels = Change in L&G Levels[d]	AND	Proposed Project Site L&G Levels – Existing Project Site L&G Levels = Change in L&G Levels[d]				

[a]The level of light and the level of glare can be rated together or independently of one another, depending on the project's needs (refer to *Light and Glare Ratings*). Refer to Table J-1.3 for descriptions to help determine presence features that may affect nighttime glare.
[b]Project site and project vicinity light and glare levels are evaluated using the same parameters.
[c]For more information regarding BRWL effects, refer to International Dark-Sky Association 2010a, 2010b, and 2015.
[d]A positive number means an increase in L&G levels. A negative number means a decrease in L&G levels. Translate the numeric calculation to the descriptive L&G Rating.

J-1.2.3 Analyze Visual Impacts

This analysis determines visual impacts by evaluating changes to the existing visual quality and predicting viewer sensitivity to those changes. As such, visual impacts are measured by the compatibility or incompatibility of the physical changes to the environment that are caused by a project's scale, form, and materials, which are seen by viewers, and the extent to which viewers care about—or how sensitive viewers are to—how a project changes the environment. Visual impacts can result in beneficial, adverse, or neutral changes to the visual environment and visual quality. Viewers have an inherent understanding of what constitutes project cohesion, which aids in determining the type of impact. The degree to which a project meets the preferred concept of project cohesion determines the level of impact.

Neutral impacts reflect little change to the visual environment and visual quality, retaining the existing landscape composition and vividness. Beneficial impacts can result where visual quality is improved through the enhancement of visual resources or where visual experiences are improved through the creation of new or improved views of resources. The level of beneficial impact is determined by how much a project improves the existing landscape composition and vividness and can range from small to very substantial improvements. Adverse impacts can result when visual quality is degraded through visual resource modification or by blocking or altering views in a negative manner. The level of adverse impact is determined by how much a project degrades the visual landscape and ranges from general negative changes to severe declines in the existing landscape composition and vividness (Federal Highway Administration 2015:6-1–6-8).

The type and level of impacts for Valley Link are evaluated in accordance with Appendix G of the State CEQA Guidelines (Section 4.1.5.1, *Thresholds of Significance*, in Section 4.1, *Aesthetics*).

J-1.2.3.1 Visual Compatibility

Project environment can be affected by the visual character of grading, constructed elements, vegetative cover, infrastructure, and other ancillary visual elements associated with a project that interact to form a composition. These elements are described in more detail in Table J-1.5. These changes affect the natural and cultural environments in the study area and viewers evaluate the project components to determine if the project's composition is compatible or incompatible with the existing visual landscape. This viewer response determines how the existing landscape composition and vividness would be affected by a proposed project.

Table J-1.5. Visual Character Element of a Project Environment

Feature	Description of Element	Visual Attributes
Grading	Alteration of the existing landform, or the grading, required to accommodate the project.	The visual character of the physical forms generated by grading, such as grading of slopes, the need for cuts and fills, and the presence of rock cuts and retaining walls, all affect visual quality. The surface appearance of rock cuts and retaining walls also affects the visual character of the project area.

Feature	Description of Element	Visual Attributes
Constructed Elements	Buildings, infrastructure, and structures resulting from project implementation. Buildings can include homes, businesses, institutions, and so on. Infrastructure can include new roads, parking lots, sidewalks, trails, utility lines, and telecommunication towers. Structures can include bridges, viaducts, culverts, retaining walls, noise walls, and other large-scale visual elements.	The visual character of constructed elements is described in terms of their form, scale, massing, and material compared to the existing built and natural environment. The setting and orientation of the structures, interplay between light and shadow, and artistic attributes like color, pattern, and texture also affect visual character. Whether a feature obstructs or generates views is also important.
Vegetative Cover	Vegetation associated with the project, such as hydroseeding for erosion control, plantings for habitat enhancement or restoration, and landscaping for aesthetics and shade. Also, vegetative cover may be removed by project activities.	The visual character of the project's vegetative cover; its density, distribution, and species composition compared to the existing natural environment. Attributes of the plants (such as seasonal color) and the ecological setting are also important.
Ancillary Visual Elements	May include signage, mailboxes, benches, fencing and gates, bollards, plant containers, or other features.	Such features contribute to the project's appearance as components of the project's visual character, and existing and proposed elements are described in relation to each other.

Source: Federal Highway Administration 2015: 5-1–5-4.

J-1.2.3.2 Viewer Response

Evaluation Methodology

Viewers make up the population affected by a project; they are the people whose views of the landscape may be altered by the proposed project, either because the landscape itself has changed or their perception of the landscape has changed. Viewers experience the visual landscape and respond to the natural and cultural environment and the design of built features in those environments.

There are two major types of viewer groups for projects*: site neighbors* and *site users*. Each viewer group has their own particular level of viewer exposure and viewer sensitivity, resulting in distinct and predictable visual concerns for each group that help to predict their responses to visual changes.

- *Site Neighbors:* Site neighbors are people who have views *to* the project site (e.g., views to the road, rail line, development project). They include residential, recreational, institutional, civic, retail, commercial, industrial, and agricultural neighbors or viewer groups.
- *Site Users:* Site users are people who have views *within* the project site boundaries or *from* the transportation corridor. Site users include residential, recreational, institutional, civic, retail, commercial, industrial, and agricultural users or viewer groups. For transportation projects, users can be subdivided by mode of travel or reason for travel for complex projects. Mode of travel can include pedestrians, bicyclists, transit riders, car drivers and passengers, and truck drivers. Reason for travel can include tourists, commuters, and haulers.

Viewer response is a measure or prediction of the viewer's reaction to the visual environment and has two dimensions as previously mentioned, *viewer exposure* and *viewer sensitivity*.

- *Viewer exposure* is a measure of the viewer's ability to see a particular object. Viewer exposure has three attributes: *location*, *quantity*, and *duration*. *Location* relates to the position of the viewer in relationship to the object being viewed. The closer the viewer is to the object, the more exposure. *Quantity* refers to how many people see the object. The more people who can see an object or the greater frequency an object is seen, the more exposure the object has to viewers. However, the number of viewers is relative to the total number of viewers viewing the project. *Duratio*n refers to how long a viewer is able to keep an object in view. The longer an object can be kept in view, the more exposure.
- *Viewer sensitivity* is a measure of the viewer's recognition of a particular object. It has three attributes: activity, awareness, and local values. Activity relates to the preoccupation of viewers—are they preoccupied, thinking of something else, or are they truly engaged in observing their surroundings. The more they are actually observing their surroundings, the more sensitivity viewers will have of changes to visual resources. Awareness relates to the focus of view—the focus is wide and the view general or the focus is narrow and the view specific. The more specific the awareness, the more sensitive a viewer is to change. Local values and attitudes also affect viewer sensitivity. If the viewer group values aesthetics in general or if a specific visual resource has been protected by local, state, or national designation, it is likely that viewers will be more sensitive to visible changes. High viewer sensitivity helps predict that viewers will have a high concern for any visual change. Movement also affects viewer sensitivity by creating dynamic viewsheds that change as the viewer moves through the landscape. Speed affects how long or short a view is based on the mode of travel, and the availability of views is affected by the surrounding terrain and vegetation and the presence or absence of built features. Visual sensitivity is modified by the type of viewer, viewer activity, and visual expectations. For example, people driving for pleasure; people engaging in recreational activities such as hiking, biking, or camping; and homeowners generally have higher visual sensitivity to views. Viewers using recreational trails and areas, scenic highways, and scenic overlooks usually pay more attention to their surroundings, seek views, and have higher regard for the landscape composition. Residential viewers typically have extended viewing periods and are more concerned about and aware of changes in the views from their homes. Sensitivity tends to be lower for people driving to and from work or as part of their work because commuters and non-recreational travelers typically have fleeting views and tend to focus on commute traffic, not on surrounding scenery (Federal Highway Administration 2015: 6-2–6-4, U.S. Department of Agriculture Forest Service 1995: 3-3–3-13, U.S. Soil Conservation Service 1978: 3, 9, 12).

Distance zones are based off of to the position of the viewer and are measured from one static point. As individual viewers move, so does the point from which the foreground, middleground, and background are measured. Generally, the closer a resource is to the viewer, the more dominant it is and the greater its importance to the viewer. Distance zones are defined in typical ranges as follows (subject to location-specific visual conditions) (Litton 1068:3–5):

- *Foreground*: 0.25–0.5 mile from the viewer.
- *Middleground*: Extends from the foreground zone to 3 miles from the viewer.
- *Background*: Extends from the middleground zone to infinity.

Table J-1.6 provides descriptions for the five levels used for determining viewer response, which is in part affected by distance zones. Evaluating visual quality and viewer response must also be based on a regional frame of reference (U.S. Soil Conservation Service 1978: 3). The same visual resource appearing in different geographic areas could have a different degree of visual quality and associated viewer sensitivity in each setting. For example, a small hill may be a significant visual element on a flat landscape but have very little significance in mountainous terrain.

Table J-1.6. Viewer Response Ratings

Response Ratings	Response Descriptions
Very Low (VL)	A very small fraction of total viewers* with instantaneous (e.g., highway speeds) views toward project site. Views of the project site tend to be in the middleground or background or are highly obscured in the foreground. Negligible interest in the visual landscape.
Low (L)	Very few of total viewers* with instantaneous (e.g., highway speeds) views toward project site. Views of the project site tend to be in the middleground or background. Little interest in the visual landscape.
Moderately Low (ML)	Few of total viewers* with short (e.g., local roadway speeds) views toward project site in the middleground or background. May include fewer viewers with instantaneous views of the project in the foreground. Limited interest in the visual landscape.
Moderate (M)	A number of the total viewers* with intermittent (e.g., visitors at parks) views toward project site in the foreground. May include fewer viewers with shorter viewing times of the project in the foreground. May also include viewers with extended (e.g., places of businesses) or permanent (e.g., residents) viewing times of the project in the distant middleground to closer background towards areas with high community interest. General interest in the visual landscape.
Moderately High (MH)	Many of total viewers* with extended viewing times (e.g., places of businesses) toward project site in the foreground or middleground. May include fewer viewers with shorter viewing times toward areas with high community interest in the foreground or middleground. May also include fewer viewers with shorter viewing times toward sensitive visual resource(s) in the distant middleground to closer background. Invested interest in the visual landscape.
High (H)	Most or all of total viewers* with permanent (e.g., residents) views toward project site in the foreground or middleground. May include fewer viewers with shorter viewing times toward sensitive visual resource(s) in the foreground or middleground. Highly invested interest in the visual landscape.
Very High (VH)	May include a variety of viewers with permanent (e.g., residents) or intermittent (e.g., recreationists/tourists) views toward sensitive visual resource(s) of local, national, or global interest. Extremely high invested interest in the visual landscape, due to public awareness of the resource.
*Relative to total number of viewers of the project.	

Viewer Response for Valley Link Project Improvements

The Valley Link AVE consists of the developed and undeveloped areas and viewer groups include residential, recreational, retail, commercial, institutional, civic, industrial, and agricultural viewers and travelers on local roadways. The primary viewer groups within the AVEs are categorized as people living or conducting business in developed areas; travelers using the freeways, arterial roads, and smaller local roads; and recreationists (boaters, swimmers, and anglers using canals, creeks,

and rivers; trail users; equestrians; bicyclists; joggers; and others). This analysis evaluates the sensitivity of each viewer group and describes it using five ratings: *Low*, *Moderately Low*, *Moderate*, *Moderately High*, and *High*. Affected viewer groups and their associated sensitivities are identified in Table J-1.7.

Table J-1.7. Summary of Affected Viewer Groups and Associated Sensitivities for Valley Link Project Improvements

Viewer Group	Sensitivity	Reasoning
Residential Viewers	High	Suburban and rural residents in the AVE have potential longer-term exposure to views that would be affected by project improvements. Residential viewers tend to have an invested interest and sense of ownership over nearby visual resources.
Recreational Viewers	High	Recreational viewers using parks, waterways, roadways, trails, and levees are likely to seek out natural areas and scenic views that could be affected by project improvements for both shorter and longer durations. Recreationists are more likely to value the natural environment, appreciate the visual experience, and have a strong sense of ownership over the waterways and corridors they use for recreation and that are highly valued throughout the greater Bay Area.
Road Travelers	Moderate to Moderately High	Travelers on local roadways pass areas that would be affected by project improvements. Travelers use roadways in the AVE at varying speeds; normal highway and roadway speeds differ based on the traveler's familiarity with the route and roadway conditions (e.g., rain, curvature and slope of the road). Single views are typically of short duration, except on straighter stretches where views last slightly longer. The passing landscape becomes familiar to viewers who travel routes frequently, and their attention typically is not focused on the passing views but on the roadway, roadway signs, and surrounding traffic. Viewers who travel local routes for their scenic quality generally possess a higher visual sensitivity to their surroundings because they are likely to respond to the natural environment with high regard and as a holistic visual experience.
Rail Travelers	Moderate	Rail travel occurs in the study area on Amtrak's San Joaquin Oakland to Bakersfield route and the existing ACE routes. In addition, Caltrain and VTA's Green and Blue Line passengers share the same rail corridor as the affected ACE corridor between Santa Clara and Tamien Stations. Amtrak's San Joaquin Oakland to Bakersfield route passes through and passengers would have views of the study area between Stockton and Modesto. Passengers on existing ACE routes would have views of project improvements as trains travel between San Jose, Stockton, and Modesto. Most rail passengers are commuters that are likely to enjoy the scenic qualities of the views from the train; however, their views are fleeting and temporary because they pass at high speed.
Industrial, Commercial, Government, & Educational Viewers	Moderate	Viewers from industrial, commercial, government, and educational facilities situated throughout the study area have semipermanent views of areas that would be affected by project improvements. Business workers and patrons are generally focused on tasks at hand (i.e., working or shopping).

J-1.2.3.3 Visual Impact Values

Introduction

Ratings are used to help determine the level of impact for changes in the existing visual character and quality (Impact AES-1) and to scenic highways (Impact AES-2). This rating system has been developed independently of, but using the methods and protocol contained in, the Federal Highway Administration's January 2015 *Guidelines for the Visual Impact Assessment of Highway Projects*. The rating system uses the following steps:

1. Determine the existing and proposed *Visual Quality* for visual resources using Table J-1.2.
2. Assess the Visual Resource Impact.
    a. Determine the compatibility of the project's changes.
    b. Determine *Viewer Response Rating* for near–term improvements using Table J-1.7.
    c. Determine the *Degree of Impact Change* using Table J-1.9.

In addition, ratings are used to help determine the level of impact resulting from changes to light and glare (Impact AES-3) using the following steps.

3. Determine the light and glare levels for existing conditions.
    a. Determine the *Daytime Light and Glare Level* for existing conditions using Table J-1.3.
    b. Determine the *Nighttime Light and Glare Level* for existing conditions using Table J-1.4.
4. Determine the light and glare levels for proposed conditions.
    a. Determine the *Daytime Light and Glare Level* for proposed project conditions using Table J-1.3.
    b. Determine the *Nighttime Light and Glare Level* for proposed project conditions using Table J-1.4.
5. Determine if there is a change in the Daytime Light and Glare Rating and Nighttime Light and Glare Rating.
6. Evaluate the *Viewer Response Rating* for near–term improvements using Table J-1.7, as determined for Impacts AES-1 and AES-2, and factor if the change in light and glare levels from proposed project actions are positive or negative.
7. Determine the *Level of Light and Glare Impact* using Table J-1.10.

Visual Simulations

Computer-generated photographic simulations were prepared to illustrate the visual character elements of Valley Link, the change in existing visual character, and the future visual appearance of the Key Observation Points (KOPs) with the project improvements. The KOPs used in this analysis were photographed October 19, October 20, and December 21, 2016. Table J-1.8, describes the approach that was used to select these KOPs. The locations of these KOPs are shown on Figure 4.1-1, and the corresponding photographs are provided on Figures 4.1-2 through 4.1-8. Conducting an inventory of the visible physical changes allows an analysis of future visual conditions with the Valley Link improvements.

Table J-1.8. Key Observation Point Selection

Key Observation Point (KOP)	Selection Reasoning
KOP 1	KOP 1 is a vantage for Dublin/Pleasanton Station. This vantage was selected because the existing station would be expanded within the middle of I-580 (an Eligible State Scenic Highway and an Alameda County designated scenic route), with high viewer concentration, and views to surrounding hillsides.
KOP 2	KOP 2 is a vantage for Isabel Station. This vantage was selected because the station would be located next to I-580 (an Eligible State Scenic Highway and an Alameda County designated scenic route), with high viewer concentration, and views to surrounding hillsides and canyon. In addition, Valley Link improvements would result in a higher degree of change, which are representative of more severe projects impacts, because of the pedestrian overpass that would be constructed over I-580.
KOP 3	KOP 3 is a vantage for Greenville Station. This vantage was selected because the station would located be located north of I-580 (an Eligible State Scenic Highway and an Alameda County designated scenic route) and along Greenville Road (an Alameda County designated scenic route), with high viewer concentration, and views to surrounding hillsides and canyon. In addition, Valley Link improvements would result in a higher degree of change, which are representative of more severe projects impacts, and include an aerial overpass to accommodate the rail line connection from I-580 to the station and lighting.
KOP 4	KOP 4 is a vantage for Altamont Alignment BEMU technology variant. This vantage was selected because the alignment and OCS poles and wires would be visible from Altamont Pass Road (an Alameda County designated scenic route), within the Altamont Hills, where there is already a concentration of existing aboveground infrastructure (e.g., wind turbines, transmission structures and lines, and a radio tower) and views to surrounding hillsides.
KOP 5	KOP 5 is a vantage for Altamont Alignment BEMU technology variant and Interim OMF. This vantage was selected because the alignment, and OCS poles and wires, and OMF facility would be visible from Altamont Pass Road (an Alameda County designated scenic route), within the Altamont Hills, where there is already existing aboveground infrastructure (e.g., barn and transmission poles and lines) and views to surrounding hillsides.
KOP 6	KOP 6 is a vantage for the Altamont Alignment and Stone Cut Alignment Alternative BEMU technology variant. This vantage was selected because the alignment would cross under of I-580 (an Eligible State Scenic Highway and an Alameda County designated scenic route), with high viewer concentration, where there is already a concentration of existing aboveground infrastructure (i.e., wind turbines), and views to surrounding hillsides.
KOP 7	KOP 7 is a vantage for the Altamont Alignment BEMU technology variant. This vantage was selected because the alternative would be visible from Midway Road, within the Altamont Hills, where there is already a high concentration of existing aboveground infrastructure (e.g., wind turbines and transmission structures and lines) and expansive views to surrounding hillsides.
KOP 8	KOP 8 is a vantage for Mountain House Station. This vantage was selected because the alternative would be visible from the portion of I-580 that is an Officially Designated State Scenic Highway and affect views toward the scenic Altamont Hills. In addition, Valley Link improvements would result in a higher degree of change due to the hilly terrain, which are representative of more severe projects impacts, and include a surface parking lot, station platform, and lighting. The station would be located off of Patterson Pass Road on a portion of the route in San Joaquin County, which is not a San Joaquin County designated scenic route. However, Patterson Pass Road is an Alameda County a designated scenic route, with high viewer concentration, and views to surrounding hillsides.
KOP 9	KOP 9 is a vantage for Downtown Tracy Station Parking Alternative 1. This vantage was selected because the structure would be located in downtown Tracy, near the

Key Observation Point (KOP)	Selection Reasoning
	existing Multi-Modal Station, with high viewer concentration, including residential viewers. In addition, Valley Link improvements would result in a higher degree of change, which are representative of more severe projects impacts, and include a multi-story parking facility and lighting.
KOP 10	KOP 10 is a vantage for Downtown Tracy Station Parking Alternative 2. This vantage was selected because the structure would be located in downtown Tracy, near the existing Multi-Modal Station, with high viewer concentration, including residential viewers. In addition, Valley Link improvements would result in a higher degree of change, which are representative of more severe projects impacts, and include a multi-story parking facility and lighting.
KOP 11	KOP 11 is a vantage for River Islands Station. This vantage was selected because the alternative would be located in a rural area off of I-5, next to the River Islands development, and near the San Joaquin River; with high viewer concentration; and views to surrounding hillsides.

A visual simulation was prepared to depict the view from each selected KOP as it would appear with the completed project improvement in place. Computer modeling and rendering techniques produced the simulated images. Existing topographic and site data provided the basis for developing an initial digital model. Project engineers provided plan and profile drawings of the Valley Link facilities. These were used to overlay a three-dimensional (3D) rendering of the project improvement onto a digital image of the existing conditions. Comparison of the KOP photographs with the simulations of the project improvements provided the basis for determining potential effects on views and visual quality. The visual simulation rating forms are found in Section J-1.2.4, *Simulation Rating Forms*.

Visual Resource Impacts

Viewers have an inherent understanding of visual quality and what constitutes natural harmony, cultural order, and project cohesion. The degree to which a project meets these preferred concepts determines the level of change in visual quality. To assess the degree and level of impacts to visual resources, a visual quality rating is applied to both existing and proposed project conditions. The degree of change from the existing (without project) visual quality to the visual quality with Valley Link is used to determine the level, or intensity, of visual impacts. Impacts are described in this EIR as *no impact*, *less than significant*, and *significant.* These impact intensities are defined as follows and are summarized in Table J-1.9.

- *No impact* on aesthetic and visual resources would result when the project improvements do not modify the Existing Visual Quality. There would be no construction- or operation-related changes upon a location. In addition, there would be *no impact* when visual quality is improved through the enhancement of visual resources or when visual experiences are improved through the creation of new or improved views of resources. Beneficial impacts increase the visual Quality (Proposed Visual Quality > Existing Visual Quality).
- *Less than significant* impacts related to aesthetic and visual resources are direct or indirect impacts that would reflect little change to the visual environment and visual quality, retaining the existing landscape composition and vividness and the visual Quality stays essentially the same (Proposed Visual Quality = Existing Visual Quality).

- *Significant* impacts would result when visual quality is degraded through general negative changes to visual resources or by blocking or altering views in a negative manner, decreasing the visual Quality (Proposed Visual Quality < Existing Visual Quality). Decreasing visual quality by one value rating is an impact of moderate intensity, whereas decreasing visual quality by more than one value constitutes a more severe impact.

Table J-1.9. Level of Visual Resource Impact—CEQA

Impact Intensity	Visual Quality (VQ) Effect	Visual Quality (VQ) Rating Change
No Impact	No project features	NA
	Proposed VQ > Existing VQ	VQ is increased by one or more value ratings (i.e., a beneficial change).
Less than Significant	Proposed VQ = Existing VQ	VQ remains the same.
Significant (Moderate)	Proposed VQ < Existing VQ	VQ is decreased by one value rating.
Significant (More Severe)	Proposed VQ < Existing VQ	VQ is decreased by more than one value rating.

Light and Glare Impacts

Light and glare impacts are determined by assessing the change in light and glare levels; evaluating affected viewers, viewer sensitivity, and viewer preferences; factoring in the Valley Link improvements; and determining if changes in light and glare are negligible, positive, or negative and if any mitigation is needed to reduce impacts. Light and glare impacts are described in this EIR as *no impact*, *less than significant*, and *significant.* These impact intensities are defined as follows and are summarized in Table J-1.10.

- *No impact* on light and glare would result when the project improvements do not modify the existing levels of light and glare because there would be no construction- or operation-related changes upon a location. In addition, there would be *no impact* when changes in light and glare levels result in improved light and glare conditions and result in a positive viewer response by either decreasing light and glare in areas with too much light and glare (Proposed Light and Glare Rating < Existing Light and Glare Rating) or increasing light and glare to restore natural areas or brighten unnaturally dark conditions (Proposed Light and Glare Rating > Existing Light and Glare Rating).
- *Less than significant* impacts would result when there is little change and light and glare levels remain essentially the same and result in a neutral viewer response (Proposed Light and Glare Rating = Existing Light and Glare Rating).
- *Significant* impacts would result when changes in light and glare levels result in degraded light and glare conditions and result in a negative viewer response by either decreasing light and glare in areas that are perceived as already having too little or sufficient lighting (Proposed Light and Glare Rating < Existing Light and Glare Rating) or increasing light and glare in areas that are perceived as already having sufficient or too much light or glare (Proposed Light and Glare Rating > Existing Light and Glare Rating). Substantially increasing or decreasing light and glare levels would heighten viewer response and result in more severe impacts.

Table J.1-10. Level of Light and Glare Impact—CEQA

Impact Intensity	Light and Glare Rating (LGR) Effect	Light and Glare Rating (LGR) Rating Change
No Impact	No project features	NA
	Proposed LGR **<** Existing LGR	LGR is decreased in areas with too much light and glare (i.e., a beneficial change).
	Proposed LGR **>** Existing LGR	LGR is increased, but project is restoring natural areas or unnaturally dark conditions (i.e., a beneficial change).
Less than Significant	Proposed LGR **=** Existing LGR	LGR remains the same.
Significant (Moderate)	Proposed LGR **<** Existing LGR	LGR is decreased in areas that are perceived as already having too little or enough light or glare.
	Proposed LGR **>** Existing LGR	LGR is increased in areas that are perceived as already having enough or too much light or glare.
Significant (More Severe)	Proposed LGR **<** Existing LGR	LGR is substantially decreased in areas that are perceived as already having too little or enough light or glare.
	Proposed LGR **>** Existing LGR	LGR is substantially increased in areas that are perceived as already having enough or too much light or glare.

J-1.2.4 Simulation Rating Forms

Rating forms are prepared for the existing and proposed conditions for each photo simulation. The ratings are included in Section 4.1, *Aesthetics.*

Form 1: Impact AES-1 and AES-2 Ratings

Form 1: Simulation Visual Quality Ratings

Substantially degrade the existing visual character or quality of the project site and its surroundings, including scenic vistas

Key Observation Point		Existing Natural Harmony	Existing Cultural Order	Existing Project Corridor Coherence	Existing Visual Quality	VQ Rating		Proposed Natural Harmony	Proposed Cultural Order	Proposed Project Corridor Coherence	Proposed Visual Quality	VQ Rating
KOP 1*	Existing	3	4	4	3.7	M	Proposed	3	4	4	3.7	M
KOP 2*		4	4	4	4.0	M		5	4.5	4	4.5	MH
KOP 3*		3	3.5	3.5	3.3	ML		3	3	3	3.0	ML
KOP 4*		5	5	5	5.0	H		5	4.5	4	4.5	MH
KOP 5*		4.5	4.5	5	4.7	MH		4.5	4.5	4.5	4.5	MH
KOP 6a*		4	4.5	4.5	4.3	M		4	4	4	4.0	M
KOP 6b		4	4.5	4.5	4.3	M		3.5	4	4	3.8	M
KOP 7		5	4.5	5	4.8	MH		5	4	4.5	4.5	MH
KOP 8*		5	5	5	5.0	MH		5	5	4	4.7	MH
KOP 9		4	5	5	4.7	MH		3.5	3.5	3.5	3.5	M
KOP 10		4	5	5	4.7	MH		3	4	3.5	3.5	M
KOP 11		4	5	n/a	4.5	MH		4	4	5	4.3	M

Refer to Diagram J-1.3 for Visual Quality Ratings.
* Indicates KOP is along a scenic route. Ratings also apply for Impact AES-3: *Substantially damage scenic resources within a state scenic highway*.

Form 3: Impact AES-3 Ratings

Form 3a: DAYTIME – Light and Glare (L&G) Ratings

Create a new source of substantial light or glare that would adversely affect day or nighttime views in the project area

Key Observation Point		Proposed Project Vicinity L&G Levels	Existing Project Vicinity L&G Levels	L&G Level Increase	Existing/ Proposed L&G Rating		Proposed Project Site L&G Levels	Existing Project Site L&G Levels	L&G Level Increase	Existing/ Proposed L&G Rating
KOP 1	Existing	5	5	0	MH/MH	Proposed	5	5	0	MH/MH
KOP 2		4	4	0	M/M		4	4.5	-0.5	MH/M
KOP 3		3	3	0	ML/ML		4	3	1	ML/M
KOP 4		3	3	0	ML/ML		3.5	3	0.5	ML/M
KOP 5		3	3	0	ML/ML		3.5	3	0.5	ML/M
KOP 6a		3.5	3.5	0	M/M		3.5	3	0.5	ML/M
KOP 6b		3.5	3.5	0	M/M		3.5	3	0.5	ML/M
KOP 7		3	3	0	ML/ML		3.5	3	0.5	ML/M
KOP 8		3	3	0	ML/ML		3.5	3	0.5	ML/M
KOP 9		5	4	1	M/MH		5	4	1	M/MH
KOP 10		5	4	1	M/MH		5	4	1	M/MH
KOP 11		3	3	0	ML/ML		3.5	3	0.5	ML/M

Form 3b: NIGHTTIME – Light and Glare (L&G) Ratings

Key Observation Point		Proposed Project Vicinity L&G Levels	Existing Project Vicinity L&G Levels	L&G Level Increase	Existing/ Proposed L&G Rating		Proposed Project Site L&G Levels	Existing Project Site L&G Levels	L&G Level Increase	Existing/ Proposed L&G Rating
KOP 1	Existing	5	5	0	MH/MH	Proposed	5	5	0	MH/MH
KOP 2		4.5	4	0.5	M/MH		5	4	1	M/MH
KOP 3		3.5	3	0.5	ML/M		5	3	2	ML/MH
KOP 4		3	3	0	ML/ML		3	3	0	ML/ML
KOP 5		3.5	3.5	0	M/ML		5	3	2	ML/MH
KOP 6a		3.5	3.5	0	M/M		3	3	0	ML/ML
KOP 6b		3.5	3.5	0	M/M		3.5	3	0.5	ML/M
KOP 7		3	3	0	ML/ML		3	3	0	ML/ML
KOP 8		3.5	3	0.5	ML/M		5	3	2	ML/MH
KOP 9		5	4	1	M/MH		5	4	1	M/MH
KOP 10		5	4	1	M/MH		5	4	1	M/MH
KOP 11		3.5	3	0.5	ML/M		5	3	2	ML/MH

Refer to Diagram J-1.4 for Light and Glare Ratings.

J-1.3 References Cited

Federal Highway Administration. 2015. *Guidelines for the Visual Impact Assessment of Highway Projects*. (FHWA-HEP-15-029.) USDOT (US Department of Transportation). Washington, DC. January 2015.

International Dark-Sky Association. 2010a. Seeing Blue. April 2010. *Nightscape 80*: 8-12. Available: http://www.darksky.org/assets/documents/SeeingBlue.pdf. Accessed: June 14, 2015.

———. 2010b. *Visibility, Environmental, and Astronomical Issues Associated with Blue-Rich White Outdoor Lighting*. May. Available: http://www.darksky.org/assets/documents/Reports/IDA-Blue-Rich-Light-White-Paper.pdf. Accessed: June 14, 2015.

———. 2015. IDA Issues New Standards on Blue Light at Night. April 2015. *Nightscape 94*: 10. Available: http://www.darksky.org/assets/documents/Nightscape/IDA_April2015_LowRes.pdf. Accessed: June 14, 2015.

Litton, R. Burton, Jr. 1968. *Forest Landscape Description and Inventories – A Basis for Land Planning and Design*. (U.S. Department of Agriculture Forest Service Research Paper PSW-49) Pacific Southwest Forest and Range Experiment Station. Berkeley, CA. 1968.

Smardon, R. C., J. F. Palmer, and J. P. Felleman. 1986. *Foundations for visual project analysis*. John Wiley & Sons, Inc. New York, NY.

U.S. Soil Conservation Service. 1978. *Procedure to establish priorities in landscape architecture* (Technical Release No. 65). Washington, DC.

U.S. Department of Agriculture Forest Service. 1995. *Landscape Aesthetics: A Handbook for Scenery Management.* (Agriculture Handbook Number 701).

Appendix J-2

Scenic Route Screening

Table J-2.1. Analysis Screening for Affected Proposed Alignments, Proposed and Alternative Stations, and Proposed and Alternative OMFs within 3 Miles of Officially Designated (OD) and Eligible (E) State Scenic Highways

County	Route	Designation	Affected Alignment (Proposed), Stations (Proposed/Alternative) and OMFs (Proposed/ Alternative)	Analysis Screening	Included in Analysis (Y/N)
Alameda	I-580	OD (E)	Tri-Valley Alignment, Dublin/Pleasanton Station, Isabel Station, Southfront Road Station Alternative, Greenville Station, Altamont Alignment, Stone Cut Alignment Alternative, Interim OMF, Mountain House Station, and West Tracy OMF Alternative	Portions of the Altamont Alignment and Stone Cut Alignment Alternative are approximately 1.0 mile, Interim OMF is approximately 1.5 miles, and Mountain House Station and West Tracy OMF Alternative are approximately 2 miles from OD I-580. Terrain, development, and vegetation precludes views of alternatives from OD I-580.	N
				Tri-Valley Alignment, Dublin/Pleasanton Station, Isabel Station, Southfront Road Station Alternative, Greenville Station, and portions of the Altamont Alignment Stone Cut Alignment Alternative all connect to, cross, or are located adjacent to E I-580 and would be visible from E I-580.	Y
	I-680	OD	Tri-Valley Alignment and Dublin/Pleasanton Station	Tri-Valley Alignment and Dublin/Pleasanton Station are located 0.8 mile away from OD I-680. Freeway infrastructure, curvature of the roadway, development, terrain, and vegetation would preclude views of these alternatives from OD I-680.	N
San Joaquin	1-580	OD (E)	Altamont Alignment, Mountain House Station, West Tracy OMF Alternative, West Tracy Station Alternative, Tracy OMF, and Tracy to Lathrop Alignment	Altamont Alignment cross OD (E) I-580 and would be visible from OD (E) I-580.	Y
				Mountain House Station and West Tracy Station Alternative are within 0.5 mile and West Tracy OMF Alternative, Tracy OMF, and Tracy to Lathrop Alignment are within 1.0 mile and would be visible from OD (E) I-580.	Y

Table J-2.2. Analysis Screening for Affected Proposed Alignments, Proposed and Alternative Stations, and Proposed and Alternative OMFs within 3 Miles of County- and City-Designated Scenic Routes

County or City	Roads	Affected Alignment (Proposed), Stations (Proposed/Alternative) and OMFs (Proposed/ Alternative)	Analysis Screening	Included in Analysis (Y/N)
Alameda County	I-580	Tri-Valley Alignment, Dublin/Pleasanton Station, Isabel Station, Southfront Road Station Alternative, Greenville Station, Altamont Alignment, Stone Cut Alignment Alternative	County scenic route. All same as state designation (see Table J-2.1)	See Table J-2.1
	I-680	Tri-Valley Alignment and Dublin/Pleasanton Station	County scenic route. All same as state designation (see Table J-2.1)	See Table J-2.1
	Tassajara Road	Tri-Valley Alignment	The scenic route terminates at I-580 and the Tri-Valley Alignment would be visible near the route's interchange with I-580.	Y
	Doolan Road	Tri-Valley Alignment	The scenic route terminates at I-580 and the Tri-Valley Alignment would be visible on approach to I-580.	Y
	Collier Canyon Road	Tri-Valley Alignment and Isabel Station	The scenic route terminates at I-580 and the Tri-Valley Alignment and Isabel Station would be visible on approach to I-580.	Y
	North Livermore Avenue (north of I-580)	Tri-Valley Alignment	The scenic route terminates at I-580 and the Tri-Valley Alignment would be visible near the route's interchange with I-580.	Y
	Vasco Road	Tri-Valley Alignment	The scenic route crosses I-580 and the Tri-Valley Alignment would be visible near the route's interchange with I-580.	Y
	Altamont Pass Road	Altamont Alignment, Stone Cut Alignment Alternative, and Interim OMF	Altamont Alignment, the western terminus of the Stone Cut Alignment Alternative, and Interim OMF parallel and would be visible from Altamont Pass Road.	Y
	Greenville Road	Tri-Valley Alignment, Greenville Station, Altamont Alignment	Greenville Station are located along Greenville Road and would be visible from the roadway.	Y
			Tri-Valley Alignment is approximately 0.8 mile away and freeway infrastructure, development, terrain, and vegetation preclude views of alternatives from Greenville Road. Altamont Alignment start approximately 0.4 mile away and terrain and the existing rail	N

County or City	Roads	Affected Alignment (Proposed), Stations (Proposed/Alternative) and OMFs (Proposed/ Alternative)	Analysis Screening	Included in Analysis (Y/N)
			bridge over Altamont Pass Road preclude views of alternatives from Greenville Road.	
Alameda County	West Grant Line Road	Altamont Alignment	Altamont Alignment is approximately 1 mile away and terrain and vegetation preclude views of alternatives from West Grant Line Road.	N
	Flynn Road	Altamont Alignment	Altamont Alignment are approximately 1.1 miles away and terrain and vegetation preclude views of alternative from Flynn Road.	N
	Patterson Pass Road	Altamont Alignment, Mountain House Station, and West Tracy OMF Alternative	Altamont Alignment crosses Patterson Pass Road and West Tracy OMF Alternative is approximately 0.4 mile away and would be visible from Patterson Pass Road.	Y
			Mountain House Station is approximately 1.3 miles away and curvature of the roadway, terrain, and vegetation preclude views of the alternative from Patterson Pass Road.	N
Dublin	All Alameda County-designated roadways	None	See above for Tassajara Road	See above
	Fallon Road	Tri-Valley Alignment	The scenic route terminates at I-580 and the Tri-Valley Alignment would be visible near the route's interchange with I-580.	Y
Livermore	All Alameda County-designated roadways	See above	See above for Doolan Road, Collier Canyon Road, North Livermore Avenue (north of I-580), Vasco Road, and Greenville Road	See above
	Isabel Avenue	Tri-Valley Alignment and Isabel Station	The scenic route terminates at I-580 and the Tri-Valley Alignment and Isabel Station would be visible on approach to I-580.	Y
Pleasanton	None	None	N/A	N
San Joaquin County	I-580	Altamont Alignment, Mountain House Station, and West Tracy OMF Alternative, West Tracy Station Alternative, and Tracy OMF	All same as state designation (see Table J-2.1)	See Table J-2.1

County or City	Roads	Affected Alignment (Proposed), Stations (Proposed/Alternative) and OMFs (Proposed/ Alternative)	Analysis Screening	Included in Analysis (Y/N)
Tracy and Lathrop	None	None	N/A	N

Appendix J-3

Caltrans' Designated Landscaped Freeway Screening

Table J-3.1. Designated Landscaped Freeways Potentially in View of the Proposed Project, Alternative Stations, and Alternative OMF

County	Freeway	Freeway Segment (Post Mile Limits)	Affected Alignment or Station (Proposed/ Alternative)	Analysis Screening	Included in Analysis (Y/N)
Alameda	I-580	10.22/10.82	Tri-Valley Alignment and Southfront Road Station Alternative	Tri-Valley Alignment and Southfront Road Station Alternative are located within this segment	Y
		13.17/13.41	Tri-Valley Alignment	Tri-Valley Alignment is located within this segment	Y
		14.97/15.63	Tri-Valley Alignment	Tri-Valley Alignment is located within this segment	Y
		17.55/18.31	Tri-Valley Alignment	Tri-Valley Alignment is located within this segment	Y
		18.54/19.12	Tri-Valley Alignment and Dublin/Pleasanton Station	Tri-Valley Alignment and Dublin/Pleasanton Station are located within this segment	Y
		19.76/19.96	None	Tri-Valley Alignment transitions back to existing just before this segment starts; Dublin/Pleasanton Station are nearby but would not directly affect this segment	N
		20.14/20.39	None	Tri-Valley Alignment and Dublin/Pleasanton Station are nearby but would not directly affect this segment	N