7. Glossary

Affected Environment. “As defined by NEPA, this is the ‘environment of the area(s) to be affected or created by the alternatives under consideration’ (40 CFR 1502.15)” (FHWA 2015).

Area of Visual Effect (AVE). Those areas from which the project may be visible. Synonymous with viewshed. “The area in which views of the project would be visible as influenced by the presence or absence of intervening topography, vegetation, and structures” (FHWA 2015).

Background. “The zone that extends from 3–5 miles to infinity miles away from the viewer” (FHWA 2015).

Baseline Conditions. “Existing conditions of the affected environment, affected population, and existing visual quality” (FHWA 2015).

Color. “The light reflecting off of an object at a particular wavelength that creates hue (green, indigo, purple, red, etc.) and value (light to dark hues). (U.S. Bureau of Land Management 1980:15; Federal Highway Administration 1988:40)” (FHWA 2015).

Cultural Environment. The landscape features that are associated with buildings, infrastructure, structures, and artifacts and art.

Cultural Order. What people prefer to see in Cultural Environment (FHWA 2015).

Cumulative Impacts CEQA. “Two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts” (CEQA Section 15355).

Cumulative Impacts NEPA. Impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (Section 1508.1(g)(3)).

Direct Impacts. Impacts caused by the action and occur at the same time and place (Sec. 1508.1(g)(1)).

Distance Zones. “Distance zones are based on the position of the viewer in relationship to the landscape. They are measured from one static point, such as the location of a key view. There are three defined distance zones:

- Foreground: 0.25–0.5 mile from the viewer
- Middle ground: Extends from the foreground zone to 3–5 miles from the viewer
- Background: Extends from the middle ground zone to infinity (Litton 1968)” (FHWA 2015).

Equivalent Focal Length. “The zoom length needed for a digital SLR to have the same zoom length as a 35 mm film camera” (FHWA 2015). The lens focal length that provides the same field of view on a 35mm film camera.

Foreground. “The zone that extends from the viewer to 0.25–0.5 mile away from the viewer” (FHWA 2015).

Form. “‘The unified mass or shape of an object that often has an edge or outline and can be defined by surrounding space. For example, a high-rise building would have a highly regular, rectangular form whereas a hill would have an organic, mounded form’ (U.S. Bureau of Land Management 1980:15; Federal Highway Administration 1988:40)” (FHWA 2015).

Glare. Sensation produced by luminance within the visual field that is sufficiently greater than the luminance to which the eyes are adapted to cause annoyance, discomfort, or loss in visual performance and visibility. Visual impairment caused by a bright source of light, directly visible or reflected by a surface. There are two types of glare:

- Discomfort glare causes an instinctive reaction to close the eyes and look away. This is the type of glare felt when exposed to a potent high-intensity discharge light or when the sun is directly visible through a window. The presence of glare that may over time cause a sense of pain or annoyance and may increase blink rate or even cause tears.
- Disability glare impairs vision but does not cause the same reaction as discomfort glare. If a light source gets reflected on your laptop screen, for example, it does not bother your eyes but distinguishing objects on the screen may be impossible. The presence of an amount of glare so significant as to prevent an individual from seeing adequately. An example of disability glare is a driver's substantially reduced visibility caused by the headlights of an oncoming car.

Illuminance. Density of luminous flux incident on a surface, measured in foot-candles, or fc (or lux [lx]). The illuminance requirements of built environments are determined by their intended purpose, and there are two common units of measurement:

- Lux: equivalent to one lumen per square meter
- Foot-candle: equivalent to one lumen per square foot

Higher illuminance levels make surfaces appear brighter to the human eye and improve visibility.

Illumination. The process of lighting an object.

Illumination value (symbol E). The luminous flux incident on a surface, per unit area.

Illumination vector. A term used to describe the flow of light. It has both magnitude and direction. The magnitude is defined as the maximum difference in the value of illumination at diametrically opposed surface elements of a small sphere centered at the

point under consideration. The direction of the vector is that of the diameter joining the brighter to the darker element.

Impact. “Change. Change can be made to the physical environment (measured by the compatibility of the impact) or to viewers (measured by sensitivity to the impacts). Together, the compatibility of the impact and the sensitivity of the impact yield the value of the impact to visual quality.

- Compatibility of the Impact: Defined as the ability of environment to visually absorb the proposed project as a result of the project and the environment having compatible visual characters. The proposed project can be considered compatible or incompatible. By itself, compatibility of the impact should not be confused or conflated with the value of the impact.
- Sensitivity to the Impact: Defined by the ability of viewers to see and care about a project’s impacts. The sensitivity to impact is based on viewer sensitivity to changes in the visual character of visual resources. Viewers are either sensitive or insensitive to impacts. By itself, the sensitivity of the impact should not be confused or conflated with the value of the impact.
- Value of the Impact: Defined as either a beneficial, adverse, or neutral change to visual quality. A proposed project may benefit visual quality by either enhancing visual resources or by creating better views of those resources and improving the experience of visual quality by viewers. Similarly, it may adversely affect visual quality by degrading visual resources or obstructing or altering desired views” (FHWA 2015).

Indirect Impacts. Impacts caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect impacts may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems (Sec. 1508.1(g)(2)) .

Initial value of illumination. The mean value of illumination averaged over the working area before depreciation has started, i.e., when the lamps and fittings are new and clean and when the room is freshly decorated.

Intactness. The degree to which the viewed landscape represents the desired landscape character type; its visual integrity or how well its features “fit” together.

Kelvin. The kelvin is the International System of Units (SI) unit of thermodynamic temperature, equal in magnitude to the degree Celsius, and denoted by the symbol K.

Key View. “A location from which a viewer (traveler or neighbor) can see either iconic or representative landscapes, with or without the highway, of the project corridor. Usually there is at least one key view for each landscape unit. Used for visual simulations” (FHWA 2015).

Landscape Character. The distinctive visual pattern created by the landform and land cover of a place. Land cover includes the natural features of land, water, and vegetation, and cultural features, such as highways and cities. Landscape character descriptions are a combination of the objective information contained within ecological unit descriptions and the cultural values that people assign to landscapes. Together, they help define the meaning of "place," and its scenic expression. Landscape character simply exists, and its description does not include judgments about whether it is good or bad.

Landscape Character Types. The categories of landscape that are recognized as prototypical, e.g., wild, agricultural, rural, suburban, urban, or industrial.

Landscape Units. "Defined areas within the AVE that have similar visual features and homogeneous visual character and frequently, a single viewshed. An 'outdoor room.' Typically, the spatial unit used for assessing visual impacts" (FHWA 2015).

LED (light-emitting diode). Solid-state component that emits light when exposed to electric current. LED lighting represents the state-of-the-art in the industry, outclassing most other types of lighting in terms of energy efficiency, design flexibility, and colors of light available. The LED is the new standard for Caltrans lighting luminaires, replacing types of incandescent luminaires that are less energy efficient.

Light. Visually evaluated radiant energy.

Line. "Perceived when there is a change in form, color, or texture and where the eye generally follows this pathway because of the visual contrast. For example, a city's high-rises can be seen silhouetted against the blue sky and be seen as a skyline, a river can have a curvilinear line as it passes through a landscape, or a hedgerow can create a line where it is seen rising up against a flat agricultural field. (U.S. Bureau of Land Management 1980:15; Federal Highway Administration 1988:40)" (FHWA 2015).

Lumen (lm). The SI unit of luminous flux used in describing the total light emitted by a source or received by a surface. (A 100-watt incandescent lamp emits about 1200 lumens.)

Luminaire. A complete lighting unit, which includes the lamp, the ballast or driver, internal wiring, reflectors, lens, and any additional components required to deliver light. A complete lighting unit consisting of a lamp or lamps together with the parts designed to distribute the light, to position and protect the lamps, and to connect the lamps to the power supply. Sometimes includes ballasts and photocells. The assembly that houses the light source and controls the light emitted from the light source.

Middle Ground. "The zone that extends from 0.25–0.5 mile to 3–5 miles away from the viewer" (FHWA 2015).

Mitigation. The FHWA Guidelines reference the NEPA definition of mitigation located in 40 CFR 1508.1(s). Note, the definition was previously located in 40 CFR 1508.20. Mitigation under NEPA includes avoiding, minimizing, rectifying, reducing, or

compensating for impacts. Under CEQA, mitigation refers to measures that are proposed to reduce an impact that has been determined to be significant (PRC 21100(b)(3)).

Natural Environment. The landscape features that are associated with landform, water, vegetation, animals, and atmospheric conditions.

Natural Harmony. What people prefer to see in Natural Environment (FHWA 2015).

Permanent Impacts. “Impacts resulting from construction activities lasting for 2 or more years, the built project, or the operations and maintenance associated with the built project” (FHWA 2015).

Project Coherence. What people prefer to see in Project Environment (FHWA 2015).

Project Environment. The landscape features within the project area that include highway geometrics, grading, constructed elements, vegetative cover, and ancillary visual effects.

Project Features. Design features included as part of the project description; features required to meet design standards; features generally applied to most or all Caltrans projects, where Caltrans lacks the discretion in the context of a particular project to consider alternative measures, or where a range of other measures has already been considered, such as the Standard Plans and Specifications or as a Standard Special Provision; features required by a non-project specific permit, such as the Caltrans statewide National Pollutant Discharge Elimination System permit and standard Stormwater best management practices.

Project Region. “The 30-mile radius surrounding a project corridor” (FHWA 2015).

Project Vicinity. “The 0.5-mile offset surrounding a project corridor” (FHWA 2015).

Protected Visual Resources. “Components of the natural, cultural, or project environments that are capable of being seen and that are protected under local, state, or federal plans or policies. There are instances where there is an overwhelming community interest in the preservation of the aesthetic qualities of visual resources that although they are not officially protected by local, state, or federal plans or policies, they still warrant protection” (FHWA 2015).

Scenic Resources. Officially designated places or areas that have been designated as important by a recognized authority (e.g., government, conservation NGO) because of their beauty. They may be natural, cultural, historic, or recreational resources and high-use areas. See Appendix A, Identifying Scenic Resources.

Significance. The severity of a visual impact to a project, to be assessed and determined by the Project Development Team. Significance informs whether mitigation measures are required.

Simulations. “Two or three dimensional depictions of the visual character of a future state. Simulations range from artistic renderings to computer animations” (FHWA 2015).

Temporary Impacts. “Impacts resulting from construction or short-term activities that fall within a period of 2 years or less” (FHWA 2015).

Texture. “The perceived coarseness of a surface that is created by the light and shadow relationship over the surface of an object. For example, a rough surface texture (e.g., a rocky mountainside) would have many facets resulting in a number of areas in light and shadow and, often, with distinct separations between areas of light and shadow. Conversely, a smooth surface texture (e.g., a beach) would have fewer facets, larger surface areas in light or shadow, and gradual gradations between light and shadow. (U.S. Bureau of Land Management 1980:15; Federal Highway Administration 1988:40)” (FHWA 2015).

Unity. The harmony, order, or coherence of landscape features. Unity is assessed by considering the visual pattern of a view’s features: dominance, scale, diversity, and continuity.

Viewer Sensitivity. “The degree to which viewers are sensitive to changes in the visual character of visual resources. It is the consequence of two factors, viewer exposure and viewer awareness.

- Viewer Exposure: Viewer exposure is a measure of proximity (the distance between viewer and the visual resource being viewed), extent (the number of viewers viewing), and duration (how long of a time visual resources are viewed). The greater the exposure, the more viewers will be concerned about visual impacts.
- Viewer Awareness: Viewer awareness is a measure of attention (level of observation based on routine and familiarity), focus (level of concentration), and protection (legal and social constraints on the use of visual resources). The greater the attention, the more viewers will be concerned about visual impacts” (FHWA 2015).

Viewers. People who will see the project. They are divided into Travelers who are using the project, and Neighbors who are not using the project.

- Neighbors: Viewers who occupy or will occupy land adjacent or visible to the proposed project. For a complex or controversial project, neighbors can be defined by land-use, including: residential, retail, commercial, industrial, agricultural, recreational, and civic neighbors.
- Travelers: Viewers who use the existing or would use the proposed transportation project. For complex or controversial projects, travelers can be defined by the purpose of traveling, including: commuting, hauling, touring, or exercising travelers; or by their mode of travel as motorists, bicyclists, or pedestrians” (FHWA 2015).

Viewpoint Sensitivity. The sensitivity of viewpoints and areas in the view to the Visual Change associated with the project.

Viewshed. “All of the surface area visible from a particular location (e.g., an overlook) or sequence of locations (e.g., a roadway or trail) (Federal Highway Administration 1988: pp. 26-27)” (FHWA 2015).

Visual Change. The result of the project’s Visual Compatibility and Visual Contrast with the landscape.

Visual Character. “The description of the visible attributes of a scene or object typically using artistic terms such as form, line, color, and texture” (FHWA 2015).

Visual Compatibility. The project’s effect on the Intactness of the existing Landscape Character.

Visual Contrast. The result of the project’s effect on a view’s unity and vividness.

Visual Features. “Components of the natural, cultural, or project environments which are capable of being seen.

- Cultural Visual Resources: The buildings, structures, and artifacts which compose the cultural environment. These are resources which were constructed by people.
- Natural Visual Resources: The land, water, vegetation, and animals which compose the natural environment. Although natural resources may have been altered or imported by people, resources which are primarily geological or biological in origin are considered natural. A grassy pasture with rolling terrain, scattered trees, and grazing cows, for example, is considered to be composed of natural visual resources, even though it is a landscape created by people.
- Project Visual Resources: For highway transportation projects, the geometrics, structures, and fixtures which compose the project environment. These are the constructed resources which were or will be placed in the environment as part of the proposed project” (FHWA 2015).

Visual Impact. The interaction between the degree of visual change and visual sensitivity. “Changes to visual resources, viewers, or visual quality” (FHWA 2015).

Visual Quality. A description of a view’s formal attributes of intactness, unity and vividness. “What viewers like and dislike about visual resources that compose the visual character of a particular scene. Different viewers may evaluate specific visual resources differently based on their interests in natural harmony, cultural order, and project coherence. Neighbors and travelers may, in particular, have different opinions on what they like and dislike about a scene.

- Natural Harmony: What viewer likes and dislikes about the natural environment. The viewer labels the visual resources of the natural environment as being either

harmonious or inharmonious. Harmony is considered desirable; disharmony is undesirable.

- Cultural Order: What a viewer likes and dislikes about the cultural environment. The viewer labels the visual resources of the cultural environment as being either orderly or disorderly. Orderly is considered desirable; disorderly is undesirable.
- Project Coherence: What the viewer likes and dislikes about the project environment. The viewer labels the visual resources of the project environment as being either coherent or incoherent. Coherent is considered desirable; incoherent is undesirable" (FHWA 2015).

Visual Resource. Natural and cultural features (e.g., land, water, vegetative, animal, or human-created) that are visible and contribute to landscape character and visual appreciation of the landscape.

Visual Sensitivity. The result of Viewer Sensitivity and Viewpoint Sensitivity.

Visual Simulations. Perspective images of the project, typically from a key viewpoint. They may be sketches, computer drawings, animations, or videos. The current best professional practice is to use photo-realistic simulations that are created by combining a rendered digital 3D model of the project with a photograph.

Vividness. The memorability of a view. It is assessed by considering a view's visual elements: form, line, color, and texture.