



ODOT-West Linn Solar Array Scenic Impacts

Analysis

Dean Apostol, Landscape Architect, MIG Inc.

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The scope of this work is to provide a professional assessment of existing landscape aesthetic conditions and potential impacts to scenic resources as a consequence of a proposed project to install a 3 megawatt solar array along I-205 in West Linn, Oregon. Analysis work included:

- Review of the project proposal
- Review of before and after images and renderings from selected viewpoints
- A field visit that included walking the site and visits to area viewpoints

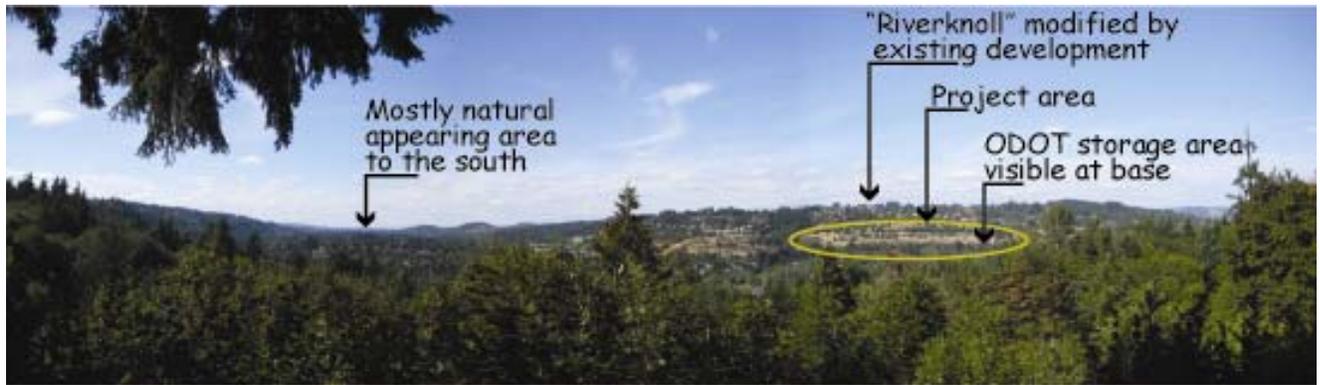
Background

This report contains analysis and findings regarding a proposed solar panel array along a portion of the I-205 Freeway in West Linn, Oregon. The project goal is to generate 3 Megawatts of renewable energy to help power Oregon's transportation system. The panels will be on the north side of I-205 on an ODOT owned right-of-way about 1/8 mile southwest of an abandoned rest area. The site is a steep south facing slope acquired when ODOT originally built I-205. To stabilize the slope and protect the highway from landslides, ODOT excavated a series of level benches, removing much of the overlying soil. The lower part of the site along I-205 is presently used for operations and maintenance storage. The combination of public ownership, level benches, south facing slope, easy access, and close proximity to existing electrical transmission and distribution systems make this site well suited for placement of a large scale solar array.

Existing Conditions & Context

The project site is within the Willamette Valley ecoregion (Oregon Natural Heritage Plan,) located in the Northwest part of the state between the Coast Range and Cascade Mountains. This is the most developed, least natural ecoregion within Oregon. The immediate site surroundings are known as the "Willamette Narrows," a part of the river and valley that is constricted by rocky bluffs and hills shaped in part by the Missoula Floods that occurred thousands of years ago. Willamette Falls is a distinct feature of these floods, as are the rocky bluffs and thin soils characteristic of this area. The thin soils favor Oregon white oak and prairie grassland habitat, with important local examples at the Nature Conservancy's Camassia Preserve in West Linn, and Metro's Canemah Bluff Natural Area in Oregon City. These habitats are considered to be regionally and locally rare, and are the focus of conservation and restoration efforts.

The landscape of the surrounding area is characterized by rolling hills, rocky bluffs, and the Willamette River. This area was one of the first settled by Euro Americans, with both Oregon City and the Willamette neighborhood (south end of West Linn, at the Tualatin River mouth) having high concentrations of historic buildings. The area is developed with residential and industrial buildings, roads, and power lines, all existing within a semi-natural setting of woodlands, and meadows.



View of project area and surrounding landscape from along Canemah Bluff

The hill that the project is located along is called “Riverknoll, a locally prominent landform. The top is fairly level and heavily developed with large homes, some of which have expansive views over the River and across the valley. It is highly visible from across the river, particularly along Canemah Bluff. Much of Riverknoll is highly modified from its natural condition. These existing modifications include:

- Housing development at the top
- The benches along the slope (partly reforested with 20-30 year old trees)
- The ODOT maintenance yard (with equipment, sheds and materials storage) near the bottom of the slope
- A decommissioned highway safety rest area
- I-205 and nearby industrial development along the river
- Powerlines, roads, and related infrastructure facilities

The topographic benches have established a linear effect (when viewed from the south) that contrasts with the natural form of the hill slope. This benching presumably removed pre-existing natural habitats, presumably woodland, at the time they were constructed. Current vegetation on and adjacent to the benches includes young Douglas fir, a few madrone, and non-native shrubs (primarily Scotch broom and blackberry) and weedy grasses. The area south and west of the project site is more forested and natural appearing. Hills in the west provide additional focal elements that draw the eye and provide visual interest.

Landscape Aesthetics & Visual Impacts

The field of landscape aesthetics and visual impact assessment has developed mostly within the past 4-5 decades through the work of the US Forest Service, the British Forestry Commission, British Columbia Forest Service, and the Federal Highway Administration. Visual preference research demonstrates that there are commonly held values with respect to what people like and dislike when it comes to scenic quality. Some key factors that influence people’s perceptions about scenery include:

- Coherence: scenes with clear patterns are favored over chaotic ones
- Legibility: clear relationships between different elements versus things that do not go together
- Complexity: variety is preferable to blandness

- Mystery: landscapes that have elements hidden from view are preferred over ones where everything is obvious.

People are drawn to landscapes that are coherent, legible, complex, and have an element of mystery. The Willamette Narrows area that encompasses the project site has all of these attributes to some degree. Even though there are existing impacts from past and ongoing development, the underlying positive visual characteristics are still existent.

The four main constituent elements that affect scenic quality are:

- Form – the shape of hills, valleys, and vegetation patterns
- Line – straight versus curving
- Color – earth tones versus bright, high contrast elements
- Texture – rough natural surfaces versus smoother man-made ones

Research shows that as a general rule, people tend to prefer natural appearing forms, meandering lines, low contrast colors, and complex, rougher textures associated with natural landscapes. An exception is found in some culturally modified landscapes, such as patchwork farms like those in the Willamette Valley, where regularity, simplicity, geometry, and straight lines create their own aesthetic. But normally when order is imposed on natural landscapes the result is negative.

The existing condition of Riverknoll and its surroundings is a culturally modified but still semi-natural landscape in which alterations due to development have introduced strong linear features and other visual disturbances that have reduced the overall visual quality compared with underlying natural conditions.

Associative aesthetics

Some project proponents have suggested that people may find the proposed solar array a positive visual element because they will associate it with clean energy and conservation. Landscape aesthetics are somewhat flexible over time, and people can adapt to elements they may have once disliked after they learn more deeply about them. A case in point is wetlands, which not long ago were felt to be useless swamps and were not considered to be attractive. But after years of learning the value of wetlands, people now like to visit them and experience them first hand, seeing beauty that they once overlooked. The same may someday be true for industrial projects like large solar arrays and wind turbines, but the current evidence is that these types of projects present changes to landscapes that are not aesthetically positive, and may be perceived as detracting from scenic quality to the extent that valued natural or cultural features are disturbed or degraded.

Findings and Recommendations

While we did not do detailed mapping analysis to determine all the places that the project site is potentially seen from, field reconnaissance and public input into the project indicates that the main concern is the potential impacts from two locations: Canemah Bluff, generally south of Oregon City across the Willamette River from the project site, and from the top of Riverknoll, north and above the project site. Canemah Bluff has approximately 50 homes that potentially have views of the project site, though some of these appear to have vegetation that partly or completely obscures the view. There is a Metro nature park on part of the bluff, but it is undeveloped and not heavily used by the public. There are about 25 homes at the top of Riverknoll that look out over the project site, though some of these have

screening vegetation. There are no public viewpoints on Riverknoll, though there is the possibility that a public trail may be developed in the future.

The project site is visible from a portion of State Highway 99E about 1 mile south of downtown Oregon City, along the base of Canemah Bluff. The angle of view is similar to that from Canemah Bluff, though since the perspective is much lower (looking up at the project site) impacts are likely less. (No public concerns have been raised about potential impacts from this area).

Effects from the top of Riverknoll

Some residents who live immediately north of the project area, at the edge of Riverknoll, have expressed concerns about visual impacts. These homes are adjacent to and overlook the project site. They are about 100 feet in elevation above the upper bench, and 150 feet above the lower bench, at a linear distance of 500-1500 feet from the lower bench. This analysis concludes that most of the project will not be visible from most of these homes. This was determined by walking the entire upper bench, from which the homes were not visible. A line of sight was plotted from the nearest home on a topographic cross section. This plot indicates that a viewer from some homes may be able to see the middle of the lower bench, meaning two or three rows of panels could be within view from some homes. However since the angle of view is sharply downward, and there is some intervening vegetation above the upper bench, it is possible that these panels would be partly or fully screened.

There may be some additional resulting impact from the loss of trees on the benches since the upper parts of the trees slated for removal may be visible from some homes.

A reasonable conclusion is that the impact of the project on the view and scenic conditions from the homes at the top of Riverknoll will be minimal for most, and no effect for some.

Effects from Canemah Bluff

From Canemah Bluff the project site has potentially high visibility, though the distance is 1 to 1.5 miles. From this distance, details are not noticeable, but form, line, and color contrasts are. Removing the trees from the benches and placing solar panels on them will increase the unnatural "line effect" already present to some extent. The dark blue-black panels will present a color contrast, though somewhat similar to the natural rock outcrops of the area. The visual scale of the project area is small relative to the wide panoramic landscape view from the Bluff.

Given the already modified condition of the project site, the view distance, and the scale, we conclude that the impacts to scenic conditions to viewers who live along Canemah Bluff will be minimal.

Possible Project Changes to lessen scenic impacts

The above findings indicate that this project will have minimal impacts to scenic conditions. ODOT could consider some project modifications that may further reduce impacts to scenic quality.

Plantings at the margins of the solar array selected to blend in with the surrounding context can help reduce the line effect of the panels. This is particularly true along the lower bench, where a line of existing trees that may be left in place could reinforce the line of the lower solar array. Plants should be selected to avoid strong colors (i.e. flowers). A mix of native deciduous and evergreen shrubs, planted in ways that finger up and down the slope, can help further reduce the linear effect of the project.

Summary

There is no question that the proposed solar array will have some impacts to local scenic conditions. However, the likely impacts are minor, the number of viewers small, and there are opportunities to reduce these impacts through attention to landscape design at the project margins.

Qualifications

Dean Apostol is a professional landscape architect and natural resources planner with more than thirty-one years of experience, including a career focus on scenic resource analysis, ecological restoration, and watershed assessment. He was chief landscape architect at the Mt. Hood National Forest from 1991 to 1996. He presently works at MIG Associates, a planning and landscape architecture consulting firm with offices in Berkeley, California and Portland, Oregon. He teaches as an adjunct professor at Portland State University and the University of Oregon. His full qualifications are in an attached resume.