

4.11 VISUAL RESOURCES AND AESTHETICS

4.11.1 Methods and Impact Definitions

Federal agencies that have not created their own regulations and guidance for visual resource management and analyses generally rely on methodologies promulgated by other federal agencies. The best known of these include the analytical frameworks developed by the U.S. Forest Service (USFS); U.S. Department of the Interior (USDOI), Bureau of Land Management (BLM); and U.S. Department of Transportation (USDOT), Federal Highway Administration (FHWA), as described in the National Cooperative Highway Research Program Report 741, Evaluation of Methodologies for Visual Impact Assessment (Transportation Research Board 2013). The methodology used in this EIS reflects the concepts and principles of the Visual Resource Management methodologies in use by these federal agencies.

The impact evaluation considers both construction and operation activities within the Visual Resource study area (VRSA). Potential effects to visual resources were assessed based on a comparison between Visual Intensity and Viewer Sensitivity. Potential obstruction of scenic views, both panoramic (such as a broad expanse of water or mountain range held over a considerable distance) and focal views (close-in views of a visual or historic resource), possible changes in the visual character of the existing landscape, and potential viewer sensitivity and viewing distance, can each contribute to the evaluation.

4.11.1.1 Viewer Sensitivity

The determination of viewer sensitivity, ranging from none to high, considers the potential number of viewers, duration of the views, context of the viewing setting, viewing distances, and viewer expectations; for example, viewers would be more sensitive to landscape changes to foreground and middleground views. Viewer sensitivity is defined as follows:

High Sensitivity (H): The potential for public concern over change in scenic/visual quality is great. Effected views are rare, unique, or in other ways are special and highly valued in the region or locale. Even the smallest perceptible change in visual conditions (Impact Intensity Level 3 [see below]) would be considered to be a substantial (significant) lessening of visual quality.

Moderate Sensitivity (M): The potential for public concern over adverse change in scenic/visual quality is appreciable. Affected views are secondary in importance or similar to views commonly found in the region or locale. A moderately to highly intense visual impact (Impact Intensity Levels 1 or 2) would be perceived as a significant lessening of visual quality.

- Low Sensitivity (L):** Generally, there may be some indication that a small minority of the public has a concern over scenic/visual resource impacts on the affected area. Only the greatest intensity of change in the condition of aesthetics/visual resources (Impact Intensity Level 1) would have the potential to register with the public as a substantial (significant) reduction in visual quality.
- No Sensitivity (None):** The views are not public, or there are no indications of public concern over, or interest in, scenic/visual resource impacts on the affected area.

Based on the described methodology, viewer sensitivity is identified for each of the seven selected viewpoint locations (Table 4.11-1). It should be noted that sensitive viewers do not include commercial or industrial uses; for purposes of this analysis, sensitive viewers include residents, recreational users, motorists, bicyclists, and pedestrians.

Table 4.11-1
Viewpoint Sensitivity

Viewpoint	Sensitivity
1. Southern boundary of the Union Heights Neighborhood	Low
2. Intersection of Baxter Street and Spruill Avenue	Low
3. Chicora-Cherokee residential neighborhood east of Spruill Avenue	Moderate
4. Chicora-Cherokee residential neighborhood west of Spruill Avenue	Moderate
5. Intersection of McMillan Avenue and Spruill Avenue	Moderate
6. River Place and Horizon Village facing east across Spruill Avenue	Moderate
7. Riverfront Park and Noisette Creek east of Spruill Avenue	High

Source: Atkins 2016.

4.11.1.2 Impact Intensity

When a potential visual impact is identified, it is further defined and described in relation to the intensity of the impact. The intensity of a visual impact depends upon how noticeable the change may be. It is indicated by the degree to which existing visual conditions (the baseline for the analyses) would change as a result of features of project construction and operation. Viewer exposure is affected by the physical distance from and location of viewers relative to a resource, the number of viewers, and the duration of their view. For example, a passenger in a car will have a substantially different appreciation for a view than a driver. The same is true of a pedestrian who can linger to enjoy a view, rather than a motorist (either driver or passenger) who cannot stop to experience a view but passes it while moving.

The severity of an effect is partly dependent on the duration of the effect and whether the effect would last for an appreciable period of time, usually one year or longer (as opposed to being ephemeral or brief); however, visual effects enduring for less than one year may also be moderate or major, depending on the temporal context (assuming criteria for impact intensity and viewer sensitivity have been met). For the purposes of this evaluation, duration includes:

- Temporary Visual Effects—Those lasting for 1 year or less
- Short-Term Effects—Those lasting for more than 1 year, but less than 5 years
- Long-Term Effects—Those lasting for 5 years or more

Considering the above criteria (degree of change, viewer exposure, duration of effect), the intensity of an impact is defined as follows:

- Level 1: A substantial change in visual character and quality or complete obstruction of view; introduction of elements that would be substantially inconsistent with the surrounding visual character in a historic district, specific plan area; or other area that is designated in a policy document or is otherwise identified as being important visually; and introduction of substantial new sources of light or glare that could disturb nighttime sleep or outdoor nighttime activities. The effect would be perceptible over a large geographic area by a substantial proportion of viewers for a longer duration (more than one year).
- Level 2: The change would partially obstruct a scenic view and/or introduce elements that would be somewhat inconsistent with the surrounding visual character in a historic district, specific plan area; or other area that is designated in a policy document or is otherwise identified as being important visually. The effect would be perceptible to a large number of viewers and the effect would be of greater extent (i.e., not limited to a short distance from the Project site). Duration could be temporary but over an extended period of time (greater than one year).
- Level 3: The change in visual character would be visible to a limited number of viewers and/or the activity would result in very limited obstruction of scenic views. There would be only minor introduction of inconsistent visual elements in a historic district, specific plan area; or other area that is designated in a policy document or is otherwise identified as being important visually. Nighttime views would not be substantially impaired. Any disruption of sleep or nighttime outdoor activities, as a result of light and glare, would be perceptible to few and would be localized to an extremely limited geographic area. The effect would typically be of limited duration and occur at long intervals.
- Level 4: The change in visual character would be barely noticeable. There would be minimal disruption of sleep or nighttime outdoor activities as a result of light and glare. The effect would typically be of very limited duration and/or not occurring often.

4.11.1.3 Impact Determination

The intensity of the impact is compared to the sensitivity of the affected view to determine whether a substantial reduction in the visual setting would likely occur. Note that a perceptible reduction in visual setting is not treated in this methodology as significant unless it is estimated to persist for more than one year. Also, an adverse visual impact may be major if it is inconsistent with applicable ordinances; the impact, however, must be estimated to last more than one year.

Table 4.11-2 provides a matrix of the level of effect for each viewer sensitivity category and impact intensity level. *Impact level* is determined by comparing viewer sensitivity to intensity of effect.

Table 4.11-2
Impact Definitions, Visual Resources and Aesthetics

		Viewer Sensitivity			
		<i>High</i>	<i>Moderate</i>	<i>Low</i>	<i>None</i>
Impact Intensity	Level 1	Major adverse	Major adverse	Minor adverse	Negligible
	Level 2	Major adverse	Moderate adverse	Minor adverse	Negligible
	Level 3	Moderate adverse	Minor adverse	Negligible	Negligible
	Level 4	Minor adverse	Negligible	Negligible	Negligible

Source: Atkins 2016.

Note: Negligible impact level includes beneficial impact.

Potential impacts to visual resources and aesthetics discussed in this section include both temporary construction impacts and permanent impacts resulting from operation of the Navy Base ICTF. The analysis focuses on each alternatives' impact to viewer sensitivity, as it relates to scenic views, scenic resources, visual quality and character, and light and glare. In addition, the alternatives analysis includes a discussion of impacts to the selected viewpoints identified for the analysis.

4.11.2 No-Action Alternative

Under the No-Action Alternative, land uses on the Project site and River Center project site would be consistent with local zoning and ordinances as described in Section 8 (Regulatory Environment Overview). The Project site would continue to be used for mixed-use industrial activities. Activities would likely include the demolition of existing buildings and infrastructure, the alteration of the ground surface, and the installation of new buildings and structures necessary to support the light industries and warehousing/shipping entities that may occupy the future industrial space. Construction activities and equipment would alter the current viewsheds within the Project site and River Center project site. The two existing intermodal rail yards (Ashley Junction and the 7-Mile Yard) would continue to handle and process current and projected future intermodal container

traffic that would be transported by rail, and that CSX and NS would undertake operational and structural modifications to Ashley Junction and 7-Mile rail yards. The Corps assumes that the River Center project site uses would remain as under existing conditions.

Scenic Views

As there is abundant vegetation in the study area and the topography is flat, scenic views are limited, and include the scenic overlook at Riverfront Park, the banks of Noisette Creek, and views of the Cooper River facing east from near the water's edge (i.e., beyond the existing and adjacent Port facilities east of the site). Potential redevelopment of the Project site and/or construction within the River Center project site would not obstruct or alter these scenic views, and there would be no effect.

Scenic Resources

As defined in Section 3.11 (Visual Resources and Aesthetics), visual resources are those visible natural or manmade elements that are particularly valued by a community and are afforded protection from alteration or obstruction through an adopted policy or regulation. Several resources identified in Section 3.10 (Cultural Resources) are also considered scenic resources, such as the CNYOQ Historic District. Under the No-Action Alternative, there would be no effect to these cultural (scenic) resources. As identified in Section 3.4 (Vegetation and Wildlife), the City of North Charleston requires protection of mature trees, considered in this analysis to be a scenic resource. Any mature tree removal must comply with the City of North Charleston's policy. There would likely be significant removal of mature trees under the No-Action Alternative, and removal would have to comply with the City of North Charleston's policy. The impact on viewer sensitivity to scenic resources from the No-Action Alternative would be minor adverse because of the loss of mature trees, though new plantings and other landscaping efforts would minimize the adverse effect as trees and other vegetation matured.

Visual Quality and Character

The Project site is currently developed, and includes industrial buildings (e.g., high-tech, maritime, aerospace, and manufacturing facilities), vacant parking lots, a recreational facility (Sterett Hall) and associated baseball fields, warehouses, federal office buildings, and a few private businesses interspersed within a network of private roads. The Project site is also located in the CNH Historic District, which contains numerous contributing elements (e.g., structures).

Redevelopment by others would likely improve the visual quality and character over existing conditions, which includes expanses of vacant parking lots, grass fields (formally storage tanks and storage facilities), chain link fencing, and overhead power and telephone lines. The Corps assumes that any changes will conform to city zoning and building codes, contain landscaping, and be compatible with the existing industrial uses along the waterfront, and mixed uses, including residential to the west and north. Cranes from shipyard operations, ships, and shipyard buildings are

highly visible. There is some existing vegetation in the form of mature trees, but overall the vegetation is not of high quality or dense enough to screen views of or from the Project sites. Redevelopment efforts that did not introduce substantial new vertical elements (above 3-4 stories), or adversely impact the cultural resources within the Project site, would likely result in a minor beneficial impact to the visual quality and character of the VRSA.

Light and Glare

There is limited to no lighting currently on the Project site and River Center project site, and no nighttime port activities. Existing lighting is for security, street illumination (e.g., street lights), and what is required to operate low-level cranes. Future development could increase levels of light and glare in the VRSA above existing conditions; however, this level of light and glare would be consistent with adjacent land uses and likely result in no impact to viewers and/or to adjacent residents during nighttime.

Selected Viewpoints

Redevelopment efforts under the No-Action Alternative would have limited adverse impacts to the selected viewpoints. Table 4.11-3 identifies the impact determination for each selected viewpoint as well as the rationale for the determination. Selected viewpoints were identified as locations where the greatest amount of change would occur that could affect viewer sensitivity.

Table 4.11-3
Impact Determinations for Selected Viewpoints, No-Action Alternative

Viewpoint	Impact Intensity Discussion	Impact Determination
(#1) Southern boundary of the Union Heights Neighborhood	Redevelopment efforts would likely consist of new built features within the existing mixed use and industrial area of the Project sites that are currently dominated by built features and vacant land. A lack of new ROW acquisition and placement of new rail would limit visual changes at this selected viewpoint. Impact intensity would be Level 4 in conjunction with the Low Viewer Sensitivity.	Negligible
(#2) Intersection of Baxter Street and Spruill Avenue	Redevelopment efforts would likely consist of new built features within the existing mixed use and industrial area of the Project sites that are currently dominated by built features and vacant land. Two story or higher buildings may be seen on the Project site above existing vegetation and trees by drivers. Impact intensity would be Level 3 in conjunction with the Low Viewer Sensitivity.	Negligible

Viewpoint	Impact Intensity Discussion	Impact Determination
(#3) Chicora-Cherokee residential neighborhood east of Spruill Avenue	Redevelopment efforts would likely consist of new built features within the existing mixed use and industrial area of the Project sites that are currently dominated by built features and vacant land. Increased lighting on the Project site would increase illumination during nighttime hours. Two story or higher buildings may be seen on the Project site above existing vegetation and trees by residents and drivers. Impact intensity would be Level 3 in conjunction with the Moderate Viewer Sensitivity.	Minor Adverse
(#4) Chicora-Cherokee residential neighborhood west of Spruill Avenue	Redevelopment efforts would likely consist of new built features within the existing mixed use and industrial area of the Project sites that are currently dominated by built features and vacant land. Increased lighting on the Project site would increase illumination during nighttime hours. Two story or higher buildings may be seen on the Project site above existing vegetation and trees by residents and drivers. Impact intensity would be Level 3 in conjunction with the Moderate Viewer Sensitivity.	Minor Adverse
(#5) Intersection of McMillan Avenue and Spruill Avenue	Redevelopment efforts would likely consist of new built features within the existing mixed use and industrial area of the Project sites that are currently dominated by vacant land and some built features. Increased lighting on the Project site would increase illumination during nighttime hours. Two story or higher buildings may be seen on the Project site above existing vegetation and trees by residents and drivers. Impact intensity would be Level 3 in conjunction with the Moderate Viewer Sensitivity; however, replacement of vacant parking lots with built structures and associated landscaping would likely result in a beneficial change to the visual quality of the selected viewpoint.	Minor Beneficial
(#6) River Place and Horizon Village facing east across Spruill Avenue	Redevelopment efforts would likely consist of new built features within the existing mixed use and industrial area of the Project sites that are currently dominated by built features and vacant land. Three story or higher buildings could be seen in the distance on the Project sites above existing vegetation and trees by residents and drivers. Impact intensity would be Level 4 in conjunction with the Moderate Viewer Sensitivity.	Negligible
(#7) Riverfront Park and Noisette Creek east of Spruill Avenue	Redevelopment efforts would likely consist of new built features within the existing mixed use and industrial area of the Project sites that are currently dominated by built features and vacant land. Residents and drivers may likely see new three story or higher buildings in the distance across Noisette Creek on the River Center project site above existing vegetation and trees; recreationists would not likely be able to see such structures while on Noisette Creek. Impact intensity would be Level 4 in conjunction with the High Viewer Sensitivity.	Minor Adverse

4.11.3 Alternative 1: Applicant's Proposed Project (South via Milford / North via Hospital District)

Construction activities would change visual conditions within the Project site in the short-term, lasting for approximately two years. Activities would consist of short-term ground disturbance, construction staging and activities, and construction associated with implementation of mitigation measures. Construction equipment such as backhoes, tractors, cranes, and trucks would be in active use throughout the construction period. Soils and building materials would be stockpiled until removal or use. Construction fencing and nighttime security lighting would be visible from areas that have views of the Project site, primarily from McMillan Avenue and Reynolds Avenue, the streets in the Chicora-Cherokee residential neighborhood, and the residential uses along St. Johns Avenue. Upon completion of the construction of the Navy Base ICTF, new visual elements would be introduced into the VRSA that include arrival/departure rail tracks, a cut and retention wall creating an embankment and two 10-foot high sound walls along the northern rail connection, an at-grade railroad crossing, a renovated rail bridge over Noisette Creek, the Cosgrove-McMillan Overpass, an earthen berm (10 feet above the top of the rail elevation) and two sound walls along the western border of the Project site, electric wide-span gantry cranes (up to 103 feet tall initially, then up to 125 feet at full build-out), mast lighting poles (85 feet tall), a container stacking area, administrative buildings, a drayage road, and roadway realignment in the vicinity of Hobson Avenue and Bainbridge Avenue. Existing visual elements that would be removed include the Viaduct Road overpass, all existing built structures within the Project site, and homes, apartments, and security fencing along and within the western Project site boundary (e.g., Chicora-Cherokee neighborhood).

Scenic Views

As noted for the No-Action Alternative, flat topography and abundant vegetation limit the number of scenic views in the VRSA. Scenic views in the VRSA include the banks of Noisette Creek, the scenic overlook in Riverfront Park, and views of the Cooper River. The renovated rail bridge across Noisette Creek would increase in elevation by approximately 1 foot, but would largely resemble the similar, built structure in this largely natural setting. The impact intensity of this renovated rail bridge and subsequent train activity would be Level 4, as it would not affect a large number of viewers, would be intermittent in duration, and would occur in a very limited geographic area. Viewers of high sensitivity (e.g., recreationalists on the creek) would primarily be affected by this activity, thus resulting in a minor, permanent adverse impact to scenic views.

Scenic Resources

Scenic resources to the east of the Spruill Avenue CSX ROW include Noisette Creek, Riverfront Park, the CNH and CNYOQ Historic Districts, the USMC Barracks, and the Cooper River. In addition to the renovation of the existing rail bridge across Noisette Creek, new arrival/departure rail tracks would require the removal of CNH contributing structures to the historic district and would alter the setting

of the USMC Barracks. Additionally, construction of the new tracks, and clearing and grading of the Project site, would remove numerous mature trees, including those along the border of the Project site with the Chicora-Cherokee neighborhood.

The substantial number of mature trees along the border of the Chicora-Cherokee neighborhood, which are considered to be scenic resources, would be permanently removed for construction and replaced with a vegetated earthen berm. Because of the permanent removal of a substantial number of mature trees the removal of contributing elements of the CNH historic district, and the altered setting of the USMC Barracks, the intensity of this impact would be Level 1. With moderate viewer sensitivity, Alternative 1 (Proposed Project) would have a major, permanent adverse impact to scenic resources.

Visual Quality and Character

The majority of construction and operation activities of the Navy Base ICTF would not introduce visual elements that are inconsistent with the existing industrial/mixed uses and visual quality and character of the Project site because the dominant visual elements in the VRSA are professional and industrial buildings, vacant parking lots, and the Port with its appurtenant structures (e.g., cranes); however, several construction and operation activities associated with Alternative 1 (Proposed Project) would result in a change to the visual quality and character of the VRSA. The use of wide-span gantry cranes and high mast lighting on the Project site would introduce new vertical elements to the skyline of the VRSA that would be seen by a large number of viewers (residents, motorists, recreationists) during the day and night. While existing cranes can be seen adjacent to the Project site along the bank of the Cooper River, the wide-span gantry cranes would be located in a much closer proximity to residential neighborhoods and transportation networks, such as Spruill Avenue. The construction of the Cosgrove/McMillan overpass would also introduce a new vertical element to the study area as this bridge structure would be visible from multiple viewpoints in the VRSA. While the overpass would partially block views of gantry cranes and lighting masts on the Project site for viewers north of McMillan Avenue, the wide-span gantry cranes and new overpass would result in a Level 2 intensity impact, and with moderate viewer sensitivity for this area, result in a moderate, permanent adverse impact to visual quality and character of the VRSA.

The construction of new built structures on the Project site, such as the locomotive shop and administrative buildings, would incorporate architectural elements from historic naval buildings to maintain and enhance aesthetics with other structures surrounding the Project site on the CNC. Additionally, landscaping within and around the facility footprint would be installed. In light of these mitigation measures committed to by Palmetto Railways, the intensity impact from construction of Project structures would be Level 3, and with low viewer sensitivity for this area, result in a negligible impact to the visual quality and character of the VRSA.

The removal of mature trees throughout the Project site, and particularly along the border of the Chicora-Cherokee neighborhood, would alter the visual quality and character of the VRSA; however, with adherence to the City of North Charleston's regulations for mature tree removal, placement of new mitigation trees (if applicable, the Applicant will replace under the City's regulations), and maturation of newly landscaped vegetation/trees, the impact intensity would be Level 3. With moderate viewer sensitivity, the removal of mature trees would result in a minor adverse impact to visual quality and character of the VRSA.

The placement of new rail tracks to the North through the Hospital District would require the demolition of several contributing elements to the CNH Historic District, and would alter the visual setting of the USMC Barracks. This activity would result in a Level 1 intensity impact, and with moderate viewer sensitivity for this area, result in a major, permanent adverse impact to the visual quality and character of the VRSA. Construction of the renovated rail bridge across Noisette Creek, and subsequent operation of the Navy Base ICTF, would maintain a permanent, but similar, built structure in this largely natural setting. The increased rail activity associated with the operation of the Navy Base ICTF would increase the number and visibility of trains in the VRSA; however, there is already a notable amount of rail activity in the VRSA. The construction of the northern rail connection would require excavation, or a cut, through a natural embankment, which would result in a visual barrier from trains for some residents to the west along St. Johns Avenue. In addition, the construction of a noise abatement wall along portions of the northern rail connection will further act as a visual barrier for residences in the River Center site. The concrete used for the noise abatement wall will be aesthetically pleasing and, per the Applicant, may incorporate a community mural project or other design. The Applicant will work with the community to determine the appropriate design. This increase in train activity and construction of visual barriers would be a Level 3 intensity impact, and with moderate viewer sensitivity, result in a minor, permanent adverse impact to the visual quality and character of the VRSA.

Placement of arrival/departure tracks to the south of the ICTF would occur in a largely industrial area with existing rail tracks and train activity. The impact intensity of the construction and operation of new rail in the southern portion of the Project site would be Level 4 as it would not affect a large number of viewers, would be intermittent in duration, and would occur in a very limited geographic area. With the low viewer sensitivity in the area, there would be a negligible impact to the visual quality and character of the VRSA.

The roadway realignment of Hobson Avenue near Bainbridge Avenue would represent a Level 3 intensity impact as the area is industrial and the roadway network would stay primarily in place. With the low viewer sensitivity for the area, there would be a negligible impact. The removal of Viaduct Road would represent a Level 3 intensity impact, and with moderate viewer sensitivity for the area, result in a minor, permanent adverse impact to the visual quality and character of the VRSA.

Construction and operation of the drayage road would represent a Level 3 intensity impact, and with low viewer sensitivity, result in a negligible impact to visual quality and character of the VRSA.

The construction of the earthen berm (approximately 10 feet above the top of the rail elevation) on the western boundary of the Project site would block views of subsequent ICTF construction and ground-based operation activities of the Navy Base ICTF. While the removal of residential structures to accommodate the earthen berm would result in a change to the visual quality and character of the neighborhood, the presence of a landscaped berm and remaining residential structures, would result in a Level 3 impact intensity. With the moderate viewer sensitivity for the area, the construction of the earthen berm would result in a minor, permanent adverse impact. The following images show Orvid Street as it is today and a visualization of how the earthen berm of Alternative 1 (Proposed Project) would change the view.



Photo Visualization of the Project site facing east on Orvid Street from North Carolina Avenue.



Facing east on Orvid Street from North Carolina Avenue with the Construction of the Earthen Berm.

Light and Glare

New vertical elements that would be sources for light and glare include the 85-foot-tall mast lighting that would be illuminated from dusk to dawn, as well as new train activity using the arrival and departure tracks. As per Palmetto Railways' proposed mitigation measures, the lighting on the ICTF would be directed downward and shielded to reduce spill light onto adjacent residential uses, and the photometric design would result in less than 0.5 foot-candles outside of the Project site. Analysis of lighting effects on residential structures adjacent to the Project site within the Chicora-Cherokee neighborhood indicate that illumination would result in the desired mitigation of light illumination of less than 0.5 foot-candles (Appendix N). As a result of these mitigation measures, the impact intensity from high mast lighting would be Level 3, and with moderate viewer sensitivity, would result in a minor, permanent adverse impact. Lighting of the ICTF during night time would not be of sufficient illumination as to disturb sleep and other nighttime activities off of the Project site.

49 C.F.R. Part 229, Subpart C, Section 229.125 prescribes the minimum levels of lighting required for locomotives and rear train cars. It requires that each headlight is to be aimed to illuminate a person at least 800 feet ahead and in front of the headlight, which can be composed of either one or two lamps. A peak intensity of at least 200,000 candela⁷³ is required to be aimed directly ahead, 3,000 candela at an angle of 7.5 degrees and at least 400 candela at an angle of 20 degrees from the centerline of the locomotive, when the light is aimed parallel to the tracks.

⁷³ Candela is defined as the amount of energy emitted by a light source. One foot-candle (ftcd) is equivalent to 0.981 candela.

Table 4.11-4 summarizes common outdoor light levels for comparison.

Table 4.11-4
Outside Light Levels

Condition	Illumination	
	(<i>ftcd</i>)	(<i>Candela</i>)
Sunlight	10,000	9,810
Full Daylight	1,000	981
Overcast Day	100	98.1
Very Dark Day	10	9.8
Twilight	1	0.98
Deep Twilight	.1	0.098
Full Moon	.01	0.0098
Quarter Moon	.001	0.00098
Starlight	.0001	0.000098
Overcast Night	.00001	0.0000098

Source: http://www.engineeringtoolbox.com/light-level-rooms-d_708.html

When trains operate at night, train headlights could shine into residential windows at points where the track turns, primarily affecting structures within the Hospital District (e.g., near McMillan Avenue and St. Johns Avenue). Even in daylight, train headlamps are required to be illuminated for safety.

Apparent brightness is different from candela, which is the measure of the energy output of the headlamp. Apparent brightness refers to how the energy output is perceived by the viewer, which is a function of both direction and distance. The farther away a viewer is from the light source, the less bright the lamp will appear. Similarly, when viewed from an oblique angle, apparent brightness also decreases with the increase in angle of view. As noted above, federal law requires that train headlamps emit 200,000 candela directly ahead to a distance of at least 800 feet. This intensity is approximately 20 times the intensity of sunlight. The intensity of the illumination decreases to 400 candela at an angle of 20 degrees from the horizontal. An intensity of 400 candela at an angle of 20 degrees from the horizontal would only be approximately four times greater than the apparent brightness on an overcast day. Therefore, the effect on residential uses would be substantial only where the train headlamps shine directly ahead into the residences, the residences are less than 800 feet from the tracks without visual obstruction, and where the tracks curve (otherwise the tracks are parallel to residential uses).

This effect would be similar to the flash of vehicle headlights, although substantially more intense. Residences and other structures within the Hospital District are most likely to be affected by train headlamps at night, with the likelihood of no more than 2 trains at night with full build-out (2038). Only those residences within 800 feet of the direct beam of the trains would be affected, though intervening vegetation, trees, the natural embankment, noise abatement wall, and other structures would help to block the light. Although the effect of train lighting on viewers in locations where the tracks curve could be intense, the effect would be momentary and occur seldom, and few viewers over a minimal geographic area would be impacted. The impact intensity would be Level 3, and with moderate viewer sensitivity, there would be a minor adverse impact from light and glare.

Light from increased truck traffic along the drayage road would not be anticipated to affect adjacent residential uses given the earthen berm wall that would be constructed at the western boundary of the Project site.

Selected Viewpoints

Redevelopment efforts under Alternative 1 (Proposed Project) would have adverse impacts to the selected viewpoints. Table 4.11-5 identifies the impact determination for each selected viewpoint as well as the rationale for the determination.

Table 4.11-5
Impact Determinations for Selected Viewpoints, Alternative 1 (Proposed Project)

Viewpoint	Impact Intensity Discussion	Impact Determination
(#1) Southern boundary of the Union Heights Neighborhood	Redevelopment efforts would consist of new arrival/departure rail tracks within an industrial area that contains existing rail tracks and activity. Impact intensity would be Level 4 in conjunction with the Low Viewer Sensitivity.	Negligible
(#2) Intersection of Baxter Street and Spruill Avenue	Wide-span gantry cranes would be visible (up to 103 feet tall initially, then up to 125 feet at full build-out), and other Project features, such as the earthen berm and noise abatement wall may be visible above existing vegetation and trees by drivers. Impact intensity would be Level 3 in conjunction with the Low Viewer Sensitivity.	Negligible
(#3) Chicora-Cherokee residential neighborhood east of Spruill Avenue	Increased lighting on the Project site and from train activity would increase illumination during nighttime hours. Wide-span gantry cranes, stacked containers, and other Project features, such as the earthen berm, would be visible by residents and drivers. Impact intensity would be Level 3 in conjunction with the Moderate Viewer Sensitivity.	Minor Adverse
(#4) Chicora-Cherokee residential neighborhood west of Spruill Avenue	Wide-span gantry cranes, stacked containers, and other Project features, such as the earthen berm, would be visible by residents and drivers. Increased lighting on the Project site and from train activity would increase illumination during nighttime hours. Impact intensity would be Level 3 in conjunction with the Moderate Viewer Sensitivity.	Minor Adverse
(#5) Intersection of McMillan Avenue and Spruill Avenue	Wide-span gantry cranes, stacked containers, the new Cosgrove-McMillan overpass, and other Project features, such as the earthen berm, would be visible by residents and drivers. Increased lighting on the Project site and from train activity would increase illumination during nighttime hours. Impact intensity would be Level 3 in conjunction with the Moderate Viewer Sensitivity.	Minor Adverse
(#6) River Place and Horizon Village facing east across Spruill Avenue	Wide-span gantry cranes would be visible in the distance on the Project site above existing vegetation and trees by residents and drivers. Impact intensity would be Level 4 in conjunction with the Moderate Viewer Sensitivity.	Negligible
(#7) Riverfront Park and Noisette Creek east of Spruill Avenue	Residents and drivers would see renovated and slightly higher-elevated rail bridge, as well as train activity across Noisette Creek; recreationists would not likely be able to see wide-span gantry cranes while on Noisette Creek. Impact intensity would be Level 4 in conjunction with the High Viewer Sensitivity.	Minor Adverse

4.11.4 Alternative 2: Proposed Project Site (South via Milford / North via S-Line)

Construction and operation activities under Alternative 2 would be similar to those identified under Alternative 1 (Proposed Project), with the exception that the northern arrival/departure track would utilize the inactive CSX ROW (S-Line) along Spruill Avenue and tie into the NCTC rail line at the Bexley Street corridor before linking into the existing rail along Virginia Avenue.

Scenic Views: Under Alternative 2, impacts to scenic views would be similar to Alternative 1 (Proposed Project), which resulted in a minor, permanent adverse impact from construction of a new rail bridge across Noisette Creek, and new train activity.

Scenic Resources: Under Alternative 2, the northern rail connection would be relocated along Spruill Avenue within an existing CSX ROW. The scenic resources in the CNH Historic District and the USMC Barracks would be avoided. Mature tree removal would still occur across the Project site and along the Chicora-Cherokee neighborhood, and would be a Level 3 impact intensity. With the moderate viewer sensitivity, there would be a minor adverse impact to scenic resources.

Visual Quality and Character: Under Alternative 2, impacts to visual quality and character would be similar to those identified under Alternative 1 (Proposed Project), with the exception that there would be no major adverse impact to visual quality and character resulting from the loss of historic properties within the Hospital District. Instead, there would be a moderate, permanent adverse impact to visual quality and character from the placement of new vertical elements (e.g., wide-span gantry cranes and the Cosgrove-McMillan Overpass) into the VRSA.

Light and Glare: Under Alternative 2, light and glare impacts resulting from the high-mast lights on the ICTF would be similar to those under Alternative 1 (Proposed Project). Impacts from train head lamps at night would still occur at curvatures of the northern arrival/departure tracks; however, affected residences would include those near the St. Johns – McMillan Street intersection, those along St Johns Avenue and Spruill Avenue, and those located adjacent to Bexley Street and Aragon Avenue. Unlike Alternative 1 (Proposed Project), most residences within the Hospital District would not be subjected to nighttime train headlamps because of the intervening vegetation and structures.

Selected Viewpoints: Under Alternative 2, impacts associated with selected viewpoints would be the same for viewpoints #1–#5, and #7. For viewpoint #6, the presence of intermittent trains using the in-active CSX ROW along Spruill Avenue would result in an increased impact intensity of Level 3 because of the more numerous viewers along Spruill Avenue (e.g., motorists). With the moderate viewer sensitivity for the area, the increased train activity would result in a minor adverse impact.

4.11.5 Alternative 3: Proposed Project Site (South via Kingsworth / North via Hospital District)

Construction and operation activities under Alternative 3 would be similar to those identified under Alternative 1 (Proposed Project), with the exception that the southern arrival and departure track would pass through Kingsworth Avenue.

Scenic Views: Under Alternative 3, impacts to scenic views would be the same as Alternative 1 (Proposed Project), which resulted in a minor, permanent adverse impact from construction of a new rail bridge across Noisette Creek and new train activity.

Scenic Resources: Under Alternative 3, impacts to scenic resources would be the same as Alternative 1 (Proposed Project), which resulted in a major, permanent adverse impact from the demolition of contributing elements within the CNH Historic District and altered setting of the USMC Barracks.

Visual Quality and Character: Under Alternative 3, impacts to visual quality and character would be the same as Alternative 1 (Proposed Project), which resulted in a major, permanent adverse impact from the demolition of contributing elements within the CNH Historic District and altered setting of the USMC Barracks.

Light and Glare: Under Alternative 3, light and glare impacts resulting from the high-mast lights on the ICTF and nighttime train activity would be the same as Alternative 1 (Proposed Project), which resulted in a minor, permanent adverse impact.

Selected Viewpoints: Under Alternative 3, impacts associated with selected viewpoints would be the same as Alternative 1 (Proposed Project) for viewpoints #1-7.

4.11.6 Alternative 4: Proposed Project Site (South via Milford)

Construction and operation activities under Alternative 4 would be similar to those identified under Alternative 1 (Proposed Project), with the exception that the northern train arrival and departure track would be a tail track used for building trains and stop short of Noisette Creek. A second arrival and departure track located at the southern end of the ICTF would parallel the southern route to Milford Street.

Scenic Views: Under Alternative 4, there would be no impact to scenic views, as ICTF construction and operation activities would occur south of any identified scenic views in the VRSA.

Scenic Resources: Under Alternative 4, impacts would be similar to Alternative 1 (Proposed Project), as there would be major, permanent adverse impacts to scenic resources from the demolition of contributing elements of the CNH Historic District and mature trees, as well as the altered setting of the USMC Barracks.

Visual Quality and Character: Under Alternative 4, impacts to visual quality and character would be the same as Alternative 1 (Proposed Project), which resulted in a major, permanent adverse impact from the demolition of contributing elements within the CNH Historic District and altered setting of the USMC Barracks.

Light and Glare: Under Alternative 4, light and glare impacts resulting from the high-mast lights on the ICTF would be the same as Alternative 1 (Proposed Project), which resulted in a minor, permanent adverse impact. Nighttime train activity would result in a negligible impact, as there would be few curvatures on the southern route to Milford Street where residences would be affected.

Selected Viewpoints: Under Alternative 4, impacts associated with selected viewpoints would be the same for viewpoints #1-6. There would be no impact to viewpoint #7 as there would be no construction or ICTF train activity across Noisette Creek or in the immediate vicinity.

4.11.7 **Alternative 5: River Center Project Site (South via Milford / North via Hospital District)**

Construction and operation activities under Alternative 5 would be similar to those identified under Alternative 1 (Proposed Project), with the exception that the ICTF would be located at the River Center project site, and there would not be the need for a Cosgrove-McMillan Overpass.

Scenic Views: Under Alternative 5, there would be Level 1 impacts to scenic views around Noisette Creek, as the Navy Base ICTF construction and operations would be adjacent to the creek. With the high viewer sensitivity at this location, a major, permanent adverse impact to scenic views would occur.

Scenic Resources: Under Alternative 5, the overall impact to scenic resources would be similar to Alternative 1 (Proposed Project), resulting in a major, permanent adverse impact; however, in addition, two additional historic districts, the CNY and CNYOQ, would be adversely impacted and the USMC Barracks would be demolished. Contributing elements of the CNY would be demolished, and its visual setting altered, and the visual setting of the CNYOQ would also be altered.

Visual Quality and Character: Under Alternative 5, the overall impacts to visual quality and character would be similar to Alternative 1 (Proposed Project), including the major, permanent adverse impact to visual quality and character from the demolition of contributing elements of historic districts within the Hospital District (CNH and CNY), demolition of the USMC Barracks, and altered settings of the CNH, CNY, and CNYOQ.

Light and Glare: Under Alternative 5, light and glare impacts resulting from the high-mast lights on the ICTF would be the same as Alternative 1 (Proposed Project), which resulted in a minor, permanent adverse impact. Nighttime train activity would result in a negligible impact, as there

would be few curvatures on the southern route to Milford Street where residences would be affected, including the Chicora-Cherokee neighborhood.

Selected Viewpoints: Redevelopment efforts under Alternative 5 (Proposed Project) would have adverse impacts to the selected viewpoints. Table 4.11-6 identifies the impact determination for each selected viewpoint as well as the rationale for the determination.

Table 4.11-6
Impact Determinations for Selected Viewpoints, Alternative 5

Viewpoint	Impact Intensity Discussion	Impact Determination
(#1) Southern boundary of the Union Heights Neighborhood	Redevelopment efforts would consist of new arrival/departure rail tracks within an industrial area that contains existing rail tracks and train activity. Impact intensity would be Level 4 in conjunction with the Low Viewer Sensitivity.	Negligible
(#2) Intersection of Baxter Street and Spruill Avenue	Wide-span gantry cranes may be visible in the distance to the north above existing vegetation and trees by drivers. Impact intensity would be Level 4 in conjunction with the Low Viewer Sensitivity.	Negligible
(#3) Chicora-Cherokee residential neighborhood east of Spruill Avenue	Increased lighting from drayage road and train activities would increase illumination during nighttime hours, though it would be mostly blocked by existing trees and vegetation. Wide-span gantry cranes may be visible in the distance to the north above existing vegetation and trees by residents and drivers. Impact intensity would be Level 3 in conjunction with the Moderate Viewer Sensitivity.	Minor Adverse
(#4) Chicora-Cherokee residential neighborhood west of Spruill Avenue	Wide-span gantry cranes may be visible in the distance to the north above existing vegetation and trees by residents and drivers. Impact intensity would be Level 3 in conjunction with the Moderate Viewer Sensitivity.	Minor Adverse
(#5) Intersection of McMillan Avenue and Spruill Avenue	Wide-span gantry cranes, stacked containers, and other Project features would be visible by residents and drivers. Increased lighting on the Project site and from train activity would increase illumination during nighttime hours. Impact intensity would be Level 3 in conjunction with the Moderate Viewer Sensitivity.	Minor Adverse
(#6) River Place and Horizon Village facing east across Spruill Avenue	Wide-span gantry cranes would be visible in the distance on the Project site above existing vegetation and trees by residents and drivers. Impact intensity would be Level 3 in conjunction with the Moderate Viewer Sensitivity.	Minor Adverse
(#7) Riverfront Park and Noisette Creek east of Spruill Avenue	Residents and drivers would see new rail bridge and train activity across Noisette Creek, as well as other elements of the ICTF such as container stacking and wide-span gantry cranes. Impact intensity would be Level 1 in conjunction with the High Viewer Sensitivity.	Major Adverse

4.11.8 Alternative 6: River Center Project Site (South via Kingsworth / North via Hospital District)

Construction and operation activities under Alternative 6 would be similar to those identified under Alternative 5, with the exception that the southern train arrival and departure would pass through Kingsworth Avenue.

Scenic Views: Under Alternative 6, impacts to scenic views would be the same as Alternative 5, which resulted in a major, permanent adverse impact from the placement of the ICTF alongside a portion of Noisette Creek.

Scenic Resources: Under Alternative 6, impacts to scenic resources would be the same as Alternative 5, which resulted in a major, permanent adverse impact from the demolition of contributing elements of historic districts within the Hospital District (CNH and CNY), demolition of the USMC Barracks, and altered settings of the CNH, CNY, and CNYOQ.

Visual Quality and Character: Under Alternative 6, the overall impact to visual quality and character would be similar to Alternative 5, which resulted in a major, permanent adverse impact to visual quality and character from the demolition of contributing elements of historic districts within the Hospital District (CNH and CNY), demolition of the USMC Barracks, and altered settings of the CNH, CNY, and CNYOQ.

Light and Glare: Under Alternative 6, light and glare impacts resulting from the high-mast lights on the ICTF would be the same as Alternative 5, which resulted in a minor, permanent adverse impact. Nighttime train activity would result in a negligible impact, as there would be few curvatures on the southern route to Kingsworth Avenue where residences would be affected, including the Chicora-Cherokee neighborhood.

Selected Viewpoints: Under Alternative 6, impacts associated with selected viewpoints would be the same for viewpoints #1–7 as those under Alternative 5.

4.11.9 Alternative 7: River Center Project Site (South via Milford)

Construction and operation activities under Alternative 7 would be similar to those identified under Alternative 5, with the exception that the northern train arrival and departure would be a tail track used for building trains and stop short of Noisette Creek. A second arrival and departure track would be located at the southern end of the ICTF and parallel the southern route to Milford Street.

Scenic Views: Under Alternative 7, impacts to scenic views would be the same as Alternative 5, which resulted in a major, permanent adverse impact from the placement of the ICTF alongside a portion of Noisette Creek.

Scenic Resources: Under Alternative 7, impacts to scenic resources would be the same as Alternative 5, which resulted in a major, permanent adverse impact from the demolition of contributing elements of historic districts within the Hospital District (CNH and CNY), demolition of the USMC Barracks, and altered settings of the CNH, CNY, and CNYOQ.

Visual Quality and Character: Under Alternative 7, the overall impact to visual quality and character would be similar to Alternative 5, which resulted in a major, permanent adverse impact to visual quality and character from the demolition of contributing elements of historic districts within the Hospital District (CNH and CNY), demolition of the USMC Barracks, and altered settings of the CNH, CNY, and CNYOQ.

Light and Glare: Under Alternative 7, light and glare impacts resulting from the high-mast lights on the ICTF would be the same as Alternative 5, which resulted in a minor adverse impact. Nighttime train activity would result in a negligible impact, as there would be few curvatures on the southern route to Kingsworth Avenue where residences would be affected, including the Chicora-Cherokee neighborhood.

Selected Viewpoints: Under Alternative 7, impacts associated with selected viewpoints would be the same for viewpoints #1–7 as those under Alternative 5.

4.11.10 Related Activities

If the project is constructed, a section of unimproved CSX ROW would have to be activated with rail lines that would accept intermodal trains at the proposed new at-grade crossing at Meeting Street in the vicinity of Herbert Street. This Related Activity would apply to Alternatives 1, 2, 4, 5, and 7. This new at-grade crossing would result in a Level 3 impact intensity, and with moderate viewer sensitivity for the area, result in a minor, permanent adverse impact on visual quality and character of the VRSA.

Under Alternatives 3 and 6, the Related Activity construction would begin at the proposed new at-grade crossing at Meeting Street in the vicinity of Kingsworth Avenue. This new at-grade crossing would result in a Level 3 impact intensity, and with moderate viewer sensitivity for the area, result in a minor, permanent adverse impact on visual quality and character of the VRSA.

Alternative 2 requires the reactivation of an out-of-service ROW and construction of a new railroad bridge to connect the northern arrival/departure tracks from the ICTF across a portion of marsh which drains to Noisette Creek to the existing NCTC track along Virginia Avenue. This new railroad bridge would be built parallel to an existing rail trestle bridge, and as such would be a Level 4 impact intensity. With high viewer sensitivity, it would result in a minor, permanent adverse impact to the Noisette Creek scenic view.

4.11.11 Summary of Impacts Table

Table 4.11-7 provides a summary of impacts on visual resources and aesthetics from Alternative 1 (Proposed Project) and all the alternatives.

Table 4.11-7
Summary of Impacts, Visual Resources and Aesthetics

Alternative	Scenic Views	Scenic Resources	Visual Quality and Character	Light and Glare
No-Action	No impact to scenic views.	Minor adverse impact to scenic resources through the removal of mature trees.	Potential minor beneficial impacts to visual quality and character from redevelopment efforts as vacant parking lots and other areas are replaced with newer built structures and associated landscaping.	No impact from light and glare.
Alternative 1: Applicant's Proposed Project (North via Milford / South via Hospital District)	Minor, permanent adverse impact to scenic views from renovation and slight elevation of existing rail bridge over Noisette Creek along Noisette Boulevard.	Major, permanent adverse impact to scenic resources from the removal of contributing elements of the CNH Historic District and mature trees, as well as the altered setting of the USMC Barracks.	<p>Major, permanent adverse impact from demolition of contributing elements of the CNH historic district and altered setting of the USMC Barracks.</p> <p>Moderate, permanent adverse impact from new vertical elements in the VRSA (wide-span gantry cranes, high mast lighting, and the Cosgrove McMillan Overpass).</p> <p>Minor, permanent adverse impact from renovation and slight elevation of existing rail bridge over Noisette Creek.</p> <p>Negligible impact to visual quality and character from the arrival/departure tracks to the south of the ICTF.</p> <p>Negligible impact from the realignment of Hobson Ave/Bainbridge Ave and construction of the drayage road; minor, permanent adverse impact from the removal of the Viaduct Road Overpass.</p> <p>Minor, permanent adverse impact from the construction of the earthen berm adjacent to the Chicora-Cherokee neighborhood.</p>	Minor, permanent adverse impact from light and glare associated with the new 85-foot-tall mast lighting that will be illuminated from dusk to dawn, and from nighttime train head lamps.

Alternative	Scenic Views	Scenic Resources	Visual Quality and Character	Light and Glare
Alternative 2: Proposed Project Site (North via Milford / South via S-Line)	Minor, permanent adverse impact to scenic views from construction of a new rail bridge over Noisette Creek along Spruill Avenue.	Minor adverse impact to scenic resources from the removal of mature trees.	Similar impacts to visual quality and character as described under Alternative 1 (Proposed Project), but no impact to CNH historic district and USMC Barracks.	Similar impacts from light and glare as those described under Alternative 1 (Proposed Project).
Alternative 3: Proposed Project Site (North via Kingsworth / South via Hospital District)	Same impact to scenic views as Alternative 1 (Proposed Project)	Same impacts to scenic resources as Alternative 1 (Proposed Project)	Same impacts to visual quality and character as Alternative 1 (Proposed Project).	Same impacts from light and glare as those described under Alternative 1 (Proposed Project).
Alternative 4: Proposed Project Site (South via Milford)	No impact to scenic views.	Same impacts to scenic resources as Alternative 1	Similar impacts to visual quality and character as described under Alternative 1 (Proposed Project), but without renovated rail bridge over Noisette Creek.	Similar impacts from light and glare as those described under Alternative 1 (Proposed Project), but negligible effect resulting from nighttime train head lamps due to lack of curvatures (and affected residences) on the southern arrival/departure tracks.
Alternative 5: River Center Project Site (North via Milford / South via Hospital District)	Major, permanent adverse impact on viewer sensitivity to scenic views from renovation and slight elevation of existing rail bridge near Noisette Boulevard over Noisette Creek and placement of the ICTF adjacent to Noisette Creek.	Major, permanent adverse impact to scenic resources from the removal of contributing elements to the CNH and CNY historic districts, the USMC Barracks, and mature trees, as well as the altered setting associated with the CNH, CNY, and CNYOQ.	The overall impacts to visual quality and character would be similar to Alternative 1 (Proposed Project), including the major, permanent adverse impact to visual quality and character from the demolition of contributing elements of to the CNH and CNY historic districts, demolition of the USMC Barracks, and altered settings of the CNH, CNY, and CNYOQ.	Minor, permanent adverse impact from light and glare associated with high mast lighting, but negligible effect resulting from nighttime train head lamps due to lack of curvatures (and affected residences) on the southern arrival/departure tracks.
Alternative 6: River Center Project Site (North via Kingsworth / South via Hospital District)	Same impact to scenic views as Alternative 5.	Same impacts to scenic resources as Alternative 5	The overall impacts to visual quality and character would be similar to Alternative 5	Similar impact from light and glare as those described under Alternative 5
Alternative 7: River Center Project Site (South via Milford)	Same impact to scenic views as Alternative 5	Same impacts to scenic resources as Alternative 5	The overall impacts to visual quality and character would be similar to Alternative 5	Similar impact from light and glare as those described under Alternative 5

Source: Atkins 2016.

Please see Section 4.11.1 for description of impacts determinations based on viewer sensitivity, viewpoints, impact intensity.

4.11.12 Mitigation

4.11.12.1 Applicant's Proposed Avoidance and Minimization Measures

The Applicant has committed to several measures that avoid and/or minimize potential impacts of Alternative 1 (Proposed Project). These measures are taken from Palmetto Railways Mitigation Plan provided in Appendix N. Some of these measures are required under federal, state, and local permits; others are measures that Palmetto Railways has incorporated into the design and operations of Alternative 1 (Proposed Project). Each mitigation measure is also designated as one that either helps to avoid an impact or one that minimizes an impact.

- Trains transiting from the north will travel through the base of a cut section (trench) that will serve to minimize the visual impacts associated with the site. (Minimization)
- Construct an earthen berm (approximately 10 feet above the rail elevation) and sound walls (10 feet in height) within a 100-foot buffer along the western boundary of the site to minimize visual impacts. (Minimization)
- The material used for the noise/visual barriers will be aesthetically pleasing and may incorporate a community mural project or other design. (Minimization)
- Landscaping will be installed within and around the facility footprint to reduce visual impacts from adjacent roadways for residences and businesses. The landscaping will meet City code requirements and architectural elements will match surrounding buildings. (Minimization)
- Completed a photometric design for facility high-mast lighting that would result in less than 0.5 foot-candles outside of property boundary. (Minimization)
- The construction of the earthen berm between the facility and adjacent neighborhoods may also help to minimize visual impacts of light sources at the site. (Minimization)
- LED lighting fixtures will be installed over bridges and other areas where practical. (Minimization)
- Buildings on the facility (locomotive shop and administration buildings) will be architecturally designed to match the historical characteristics of other buildings in the area. (Minimization)
- Implement four-container tall stacking limits to reduce visual impacts on surrounding neighborhoods.
- To minimize the impact of lights from the site on adjacent areas, all operating lights will be directed downward to shield light sources minimizing any light bleed off the facility footprint. (Minimization)

These avoidance and minimization measures, except the items noted with an asterisk (*), have been considered in the preceding impact analysis. The complete list of Applicant-proposed avoidance and minimization measures for the Navy Base ICTF is provided in Chapter 6, Table 6-1.

4.11.12.2 Additional Potential Mitigation Measures

No additional mitigation measures for Visual Resources and Aesthetics have been identified by the Corps. Additional avoidance, minimization, and mitigation may be considered by the Corps in its decision-making process. Final mitigation measures may be adopted as conditions of the DA permit and documented in the Record of Decision (ROD).

4.12 NOISE AND VIBRATIONS

4.12.1 Methods and Impact Definitions

The project alternatives are expected to generate additional automobile and truck traffic; alter automobile and truck traffic patterns; alter the existing railway network with additional future tracks and at-grade rail crossings; change the number of freight train operations along certain track segments; and introduce construction noise (temporary) and operational noise. These changes have the potential to cause traffic noise impacts, rail noise and vibration impacts, and construction (temporary) and operational noise impacts for land uses located adjacent to the components of the project. The following sections provide a summary of the methods used and impact definitions for the various noise and vibration sources.

4.12.1.1 Traffic Noise Methodology and Impact Thresholds

A noise screening procedure, which is detailed in Appendix H, was developed in order to determine road segments within the study area where the alternatives may cause a traffic noise impact. As a result, eight road segments were identified for detailed noise modeling and are shown in Figure 4.12-1⁷⁴:

- North Rhett Avenue between I-526 ramp and Braddock Avenue;
- Montague Avenue between Spruill Avenue and Virginia Avenue;
- Virginia Avenue between Montague Avenue and Buist Avenue;
- Noisette Boulevard between Twiggs Street and McMillan Avenue;
- Cosgrove Avenue (SC-7) between Spruill Avenue and Rivers Avenue;
- Spruill Avenue between Noisette Creek and N. Carolina Avenue;
- St. Johns Avenue between O'Hear Avenue and McMillan Avenue;
- Port drayage road (future) between Port access road and NBIF.

⁷⁴ For modeling purposes, in Figure 4.12-1, St. Johns Avenue was split into two segments and Spruill Avenue was divided into seven segments. Some road segments also share boxes in the figure. This is why there are twelve boxes used to represent eight road segments in the figure.