

LAGUNA NIGUEL TO SAN JUAN CAPISTRANO PASSING SIDING PROJECT

NOISE

DRAFT TECHNICAL MEMORANDUM

Prepared for:



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INTRODUCTION

This Noise Technical Memorandum examines the potential impacts of the Laguna Niguel to San Juan Capistrano Passing Siding Project, located within the cities of Laguna Niguel and San Juan Capistrano, Orange County, California. The purpose of this assessment is to analyze possible changes in noise levels and identify measures to avoid, minimize, or mitigate potential noise impacts.

PROJECT DESCRIPTION

The Orange County Transportation Authority (OCTA), in coordination with Metrolink, the City of Laguna Niguel (operated by the Southern California Regional Rail Authority), and the City of San Juan Capistrano, proposes the addition of approximately 1.8 miles of new passing siding railroad track adjacent to the existing main track between milepost (MP) 193.9 in the City of Laguna Niguel (just south of the Laguna Niguel/Mission Viejo Metrolink Station) and MP 195.7 in the City of San Juan Capistrano (approximately 500 feet north of the Trabuco Creek). A portion of the project from approximately MP 194.0 to MP 194.2 passes through the City of Laguna Niguel.

The project consists of the following features:

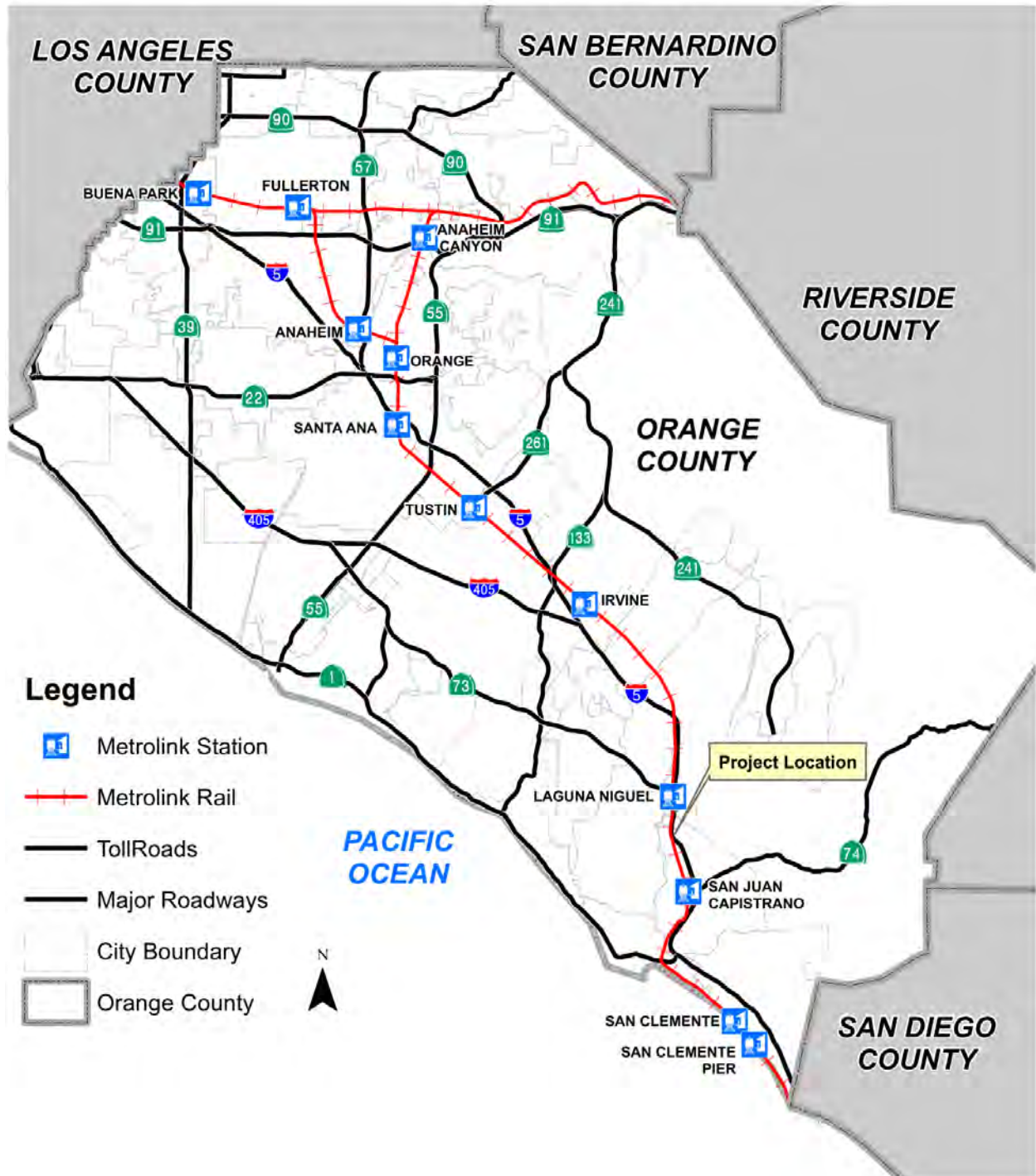
- 1.8 miles of new passing siding railroad track
- Relocation of an existing spur track currently south of the Laguna Niguel/Mission Viejo Metrolink Station with a new spur track within the City of San Juan Capistrano at around MP 194.6
- Construction of new retaining walls.
- Relocation of existing power poles, fiber optic cables, water, and sewer lines
- Extension of existing casing for gas, water, and sewer lines
- Culvert extensions and other drainage refinements
- Addition of a railroad bridge or box culvert at MP 194.6
- Asphalt paving adjacent to Camino Capistrano to accommodate parking for use by railroad at MP 194.6
- Reprofiling of approximately 600 feet of Camino Capistrano adjacent to Rancho Capistrano in order to improve grades

The new passing siding and switches would be built on a bed of ballast approximately 13 to 15 feet wide and 12 to 14 inches above existing grade, occupying about 3.2 acres within the existing right-of-way.

Construction of the proposed project would occur over a period of 24 months and be confined to the area within the existing right-of-way with the exception of the asphalt paving for parking, which would be located east of the existing right-of-way and south of the crossing at Rancho Capistrano and the reprofiling of approximately 600 feet of Camino Capistrano adjacent to Rancho Capistrano in order to improve grades.. Staging areas for personal vehicles, construction equipment and supplies would be established by the contractor. Train schedules would be maintained during construction.

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Figure 1: Project Location Map



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Figure 2: Project Area Map



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AFFECTED ENVIRONMENT

The project is located within the cities of Laguna Niguel and San Juan Capistrano in Orange County, California. The project corridor runs along the Interstate 5 Highway (I-5) and Camino Capistrano. Oso Creek is situated west of the project corridor. Regional access to the site is provided by I-5 and State Route 73 (SR-73) (Figures 1 and 2). The main noise source within the project area is the I-5 freeway and Camino Capistrano.

Land use designations adjacent to the proposed project in the City of Laguna Niguel are primarily hospitality, commercial, and open space. Automotive and commercial uses occur just northwest of the Laguna Niguel-San Juan Capistrano city line. In the City of San Juan Capistrano, land use designations adjacent to the proposed project consist of community park, general open space, medium low density, planned community, and special study. Noise sensitive land uses include the outdoor activity areas at the Rancho Capistrano Church School and the residences along Camino Capistrano.

Vegetation within the project area is primarily ruderal, with some ornamental and street landscaping. There are no designated wild and scenic rivers.

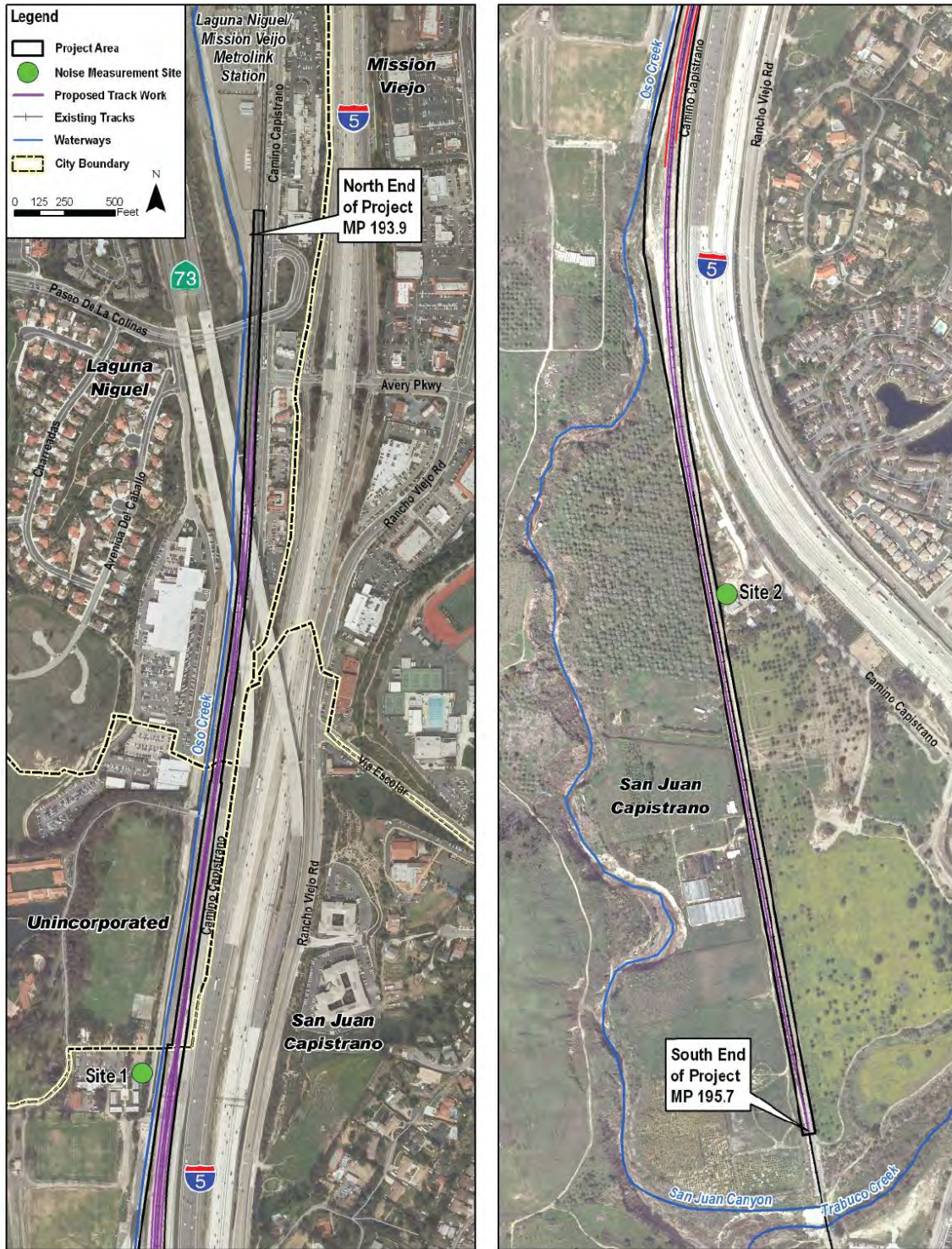
EXISTING CONDITIONS

Existing noise levels were measured at two locations in the study area; both are long-term, 24-hour sites (Figure 3), which are representative of land uses with nighttime sleep activity, such as residences. Site 1 was chosen to represent the outdoor play area at the Saddleback Church Rancho Capistrano, and Site 2 represented the homes along Camino Capistrano. Site 2 is the only area where there are residential properties adjacent to the proposed project. The long-term measurements were taken on June 14, 2011 through June 15, 2011, at the property line, closest to the train track, near the Saddleback Church Rancho Capistrano's outdoor activity area at 29251 Camino Capistrano (Site 1) and the residence at 29929 Camino Capistrano (Site 2). The measurements were used to determine the Day/Night Sound Level (Ldn) and peak hour Equivalent Sound Level (Leq) at the sites.

The Ldn noise level was measured to be 72 dBA for Site 1 and 71 dBA for Site 2. The peak one-hour noise level was 70 dBA at 7:00am on June 15th for Site 1 and 73 dBA at 3:00pm on June 14th for Site 2. The 24-hour one-hour noise levels ranged from 60 dBA to 70 dBA for Site 1 and 50 dBA to 73 dBA for Site 2. The range in levels is dependent on how close the site is to the local streets, with the higher noise levels occurring along the local street, and the lower noise levels occurring along the existing rail, in an area without local roadways. The distances between the existing track and the noise-sensitive land uses at the two sites are approximately 140 feet for Site 1 and 35 feet for Site 2. The proposed passing siding would be approximately 125 feet east of Site 1 and 60 feet west of Site 2.

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Figure 3: Noise Measurement Locations



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PROJECT NOISE/VIBRATION IMPACTS

Noise Impacts

Based on the FTA criteria, the project would not result in long term noise impacts. The Ldn levels with trains running on the passing siding track were modeled at 59 dBA for Site 1 and 58 dBA for Site 2. Neither site would be impacted by trains on the passing siding track. Based on FTA criteria, an area with an existing Ldn of 72 would need the project noise level to be above 65 dBA for a moderate noise impact to occur (*FTA Transit Noise and Vibration Impact Assessment Manual, May 2006, Table 3-1*).

Table 1: Modeled Noise Levels

Site #	Receptor	Train Speed (mph)	Distance from Alignment to Receptor (ft)	Existing Noise Level (dBA)	Modeled Noise Level (dBA)
1	29251 Camino Capistrano	45	140	72	59
2	29929 Camino Capistrano	45	60	72	58

Vibration Impacts

Ambient vibration levels were not measured. The Federal Transit Administration (FTA) Vibration Impact Criteria were used at Site 1 and Site 2 to identify potential vibration impacts.

According to FTA Criteria, 30 to 70 vibration events a day are considered “Occasional Events.” For occasional events, a project vibration impact would occur if there were 30 to 70 vibration events per day and, with each event, ground vibration levels exceeded the FTA criteria of 75 VdB for residential buildings and other structures where people normally sleep. Vibration levels were modeled at the two noise sites (Site 1 and Site 2). Vibration levels from train passby were modeled to be 63 VdB for Site 1 and 71 VdB for Site 2, with trains on the passing siding track operating at 45 mph (Table 2). Based on these results, trains using the passing siding track would not result in vibration impacts at the Rancho Capistrano Church’s school play area (Site 1) and at the residential units at Site 2.

Table 2: Modeled Vibration Levels

Site #	Receptor	Speed (mph)	Distance from Alignment to Receptor (ft)	Modeled Vibration Level at Tangent Track (VdB)	FTA VdB Criteria
1	29251 Camino Capistrano	45	140	63	75
2	29929 Camino Capistrano	45	60	71	75

CONSTRUCTION NOISE/VIBRATION IMPACTS

Noise Impacts

Temporary noise impacts from project construction would be generated by equipment used during major construction periods. Table 3 shows examples of the estimated maximum noise levels for construction

equipment at a distance of 100 feet.

Table 3: Construction Equipment Noise Emission Levels

Construction Phase	Loudest Equipment	Noise Level at 100 feet Lmax (dBA)
Clearing and grubbing	Bulldozer, Backhoe, Haul Trucks	86
Earthwork	Scraper, Bulldozer	88
Base preparation	Trucks, Bulldozer	88

Source: *Transit Noise and Vibration Impact Assessment*, FTA, May 2006.

Vibration Impacts

Common vibration-producing equipment used during construction includes jackhammers, hoe rams, auger drills, bulldozers and backhoes. Soil compaction is likely to be the activity that produces the highest level of vibration. Table 4 presents various types of construction equipment measured under a variety of construction activities, with an average of source levels reported in terms of velocity levels. Although the table provides one level for each piece of equipment, it is noted that there is a considerable variation in reported ground vibration from construction activities. The data provide a reasonable estimate for a wide range of soil conditions.

Table 4: Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 feet (inches/second)*	Approximate Lv at 25 feet.**
Pile Driver (impact)	upper range	1.518	112
	Typical	0.644	104
Pile Driver (sonic)	upper range	0.734	105
	Typical	0.170	93
Clam shovel drop (slurry wall)		0.202	94
Hydromill (slurry wall)	in soil	0.008	66
	in rock	0.017	75
Large bulldozer		0.089	87
Caisson drilling		0.089	87
Loaded trucks		0.076	86
Jackhammer		0.035	79
Small bulldozer		0.003	58
Lv = RMS velocity in decibels (VdB) re 1 micro-inch/sec			

Source: *Transit Noise and Vibration Impact Assessment*, FTA, May 2006.

* PPV (Peak Particle Velocity): Vibration can be defined as regularly repeated movement of a physical object about a fixed point. The parameter normally used to assess the ground vibration is the peak particle velocity

**Lv: Vibration Velocity Level at a specific distance from a fixed point or source.

CONCLUSION

The Ldn noise level was measured to be 72 dBA for Site 1 and 71 dBA for Site 2. The project induced noise levels were modeled to be 59 dBA for Site 1 and 58 dBA for Site 2. Based on FTA criteria, an area with an existing Ldn of 72 would need the project noise level to be above 65 dBA for a moderate noise impact to occur. Therefore, the project is not expected to have noise impacts from operation of the passing siding track.

Vibration levels from passing trains were modeled to be 63 VdB for Site 1 and 71 VbB for Site 2, with trains on the passing siding track operating at 45 mph. Based on these results, trains using the passing siding track would not exceed the FTA criteria of 75 VbB. No vibration impacts are likely to occur from operation of the passing siding track.

Noise control measures during construction would be required to minimize impacts to existing noise-sensitive land uses. All construction activities will be required to comply with City of Laguna Niguel, City of San Juan Capistrano, and County of Orange noise regulations.

General measures presented below are recommended as guidelines in developing construction plans that consider the adverse impacts of construction noise.

- N-1** Design Considerations - During the early stages of construction plan development, natural and artificial barriers, such as ground elevation changes and existing buildings, can be considered for use as shielding against construction noise. Strategic placement of stationary equipment, such as compressors and generators, could reduce impacts at sensitive receivers.

- N-2** Source Control - The contractor shall comply with Southern California Regional Rail Authority (SCRRA) Standard Specifications and all local sound control and noise level rules, regulations and ordinances that apply to any work performed pursuant to the contract. Each internal combustion engine used for any purpose on the job or related to the job shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without a muffler.

- N-3** Time and Activity Constraints - The noisier activities involving large machinery could be limited to daytime hours when most people normally impacted are either not present or engaged in less noise sensitive activities. Compliance with local noise ordinances will mitigate impacts associated with construction noise. To comply with the ordinance, all construction activities adjacent to residential uses will be limited to daytime hours (7:00 a.m. to 6:00 p.m.) on Monday through Saturdays. Nighttime construction may require a variance from local noise ordinances.

The measures above could be incorporated into site-specific construction plans to minimize noise impacts to sensitive receivers along the project corridor. Noise emission limits could be developed. Construction hours could be set, and noise level criteria could be decided upon and adhered to during construction.