Crenshaw/LAX Transit Corridor Project

Noise and Vibration Technical Memorandum to the Supplemental Environmental Assessment

Federal Transit Administration

Los Angeles County Metropolitan Transportation Authority

August 2012

Table of Contents

List of Figures

INTRODUCTION

This technical memorandum clarifies the noise analysis in the Supplemental Environmental Assessment (EA) to the Crenshaw/LAX Transit Project Final Environmental Impact Statement/Final Environmental Impact Report (FEIS/FEIR). Specifically, this analysis was provided in response to public comments received concerning the potential noise impacts to Faithful Central Bible Church (FCBC) in the City of Inglewood. This analysis confirms the noise impact determination made in the EA and provides supporting documentation.

SUMMARY OF SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

The Los Angeles County Metropolitan Transportation Authority (LACMTA) proposes modifications and refinements to the design of the Crenshaw/LAX Transit Corridor Project in the County of Los Angeles, California. The EA has been prepared pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended; 42 United States Code (USC) Section 4332(2); the regulations of the Council on Environmental Quality (CEQ) 40 Code of Federal Regulations (CFR) Sections 1500–1508; and U.S. Department of Transportation (DOT) regulation 23 CFR Part 771 and 49 CFR Part 622. The Federal Transit Administration (FTA) is the federal lead agency under the NEPA and the LACMTA serves as a joint-lead agency per 23 CFR Section 1501.5(b). The Supplemental EA for the Crenshaw/LAX Transit Corridor Project analyzes proposed project modifications and refinements to the project previously described in the FEIS/FEIR, including:

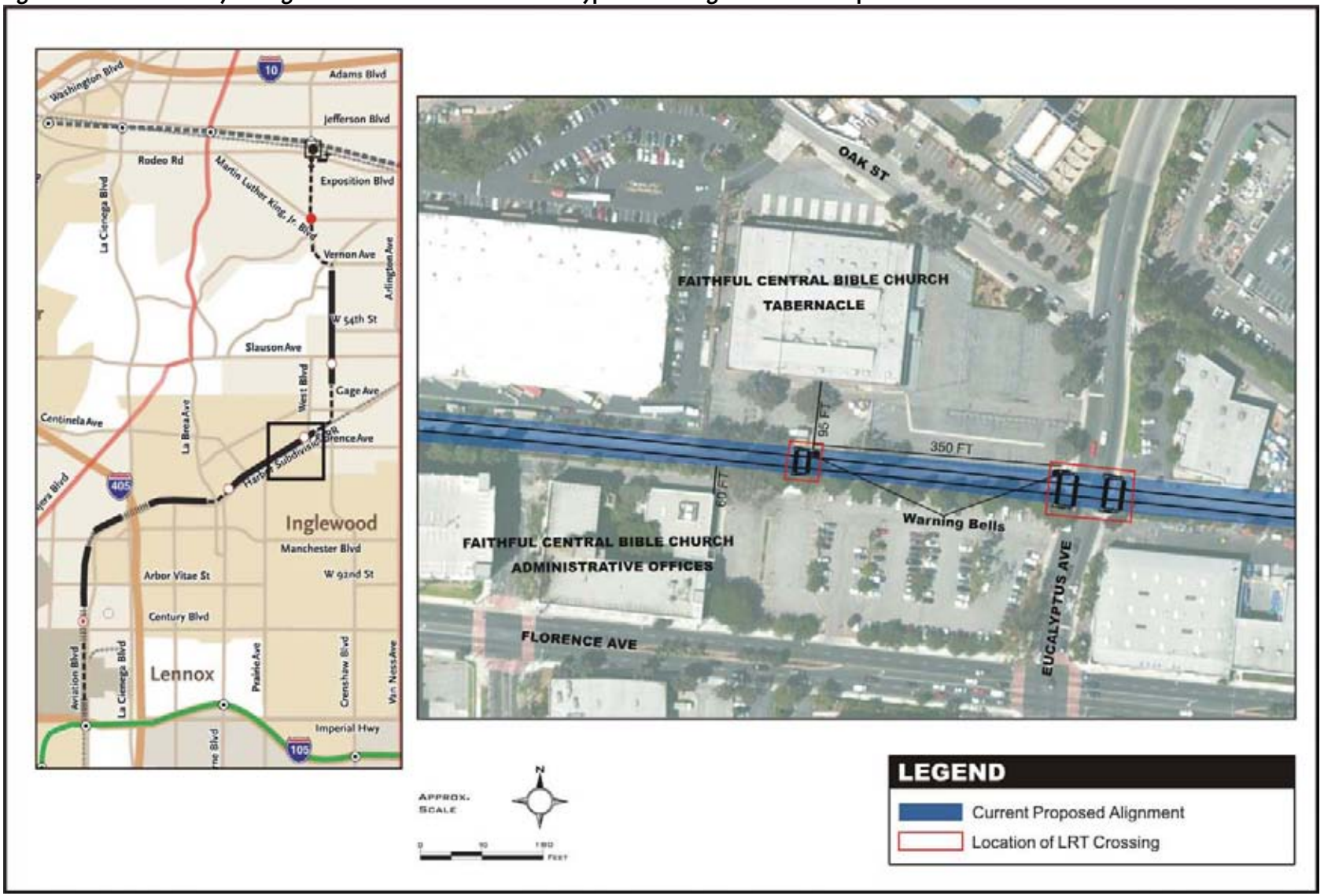
- revised design and relocation of the optional below-grade light-rail transit (LRT) station at Crenshaw Boulevard/Vernon Avenue (the optional Crenshaw/Vernon Station) from the southeast corner of Vernon Avenue and Crenshaw Boulevard to the northwest corner of Vernon Avenue and Crenshaw Boulevard or just north of West 43rd Place along Crenshaw Boulevard on the eastern side of the street;
- relocation of the optional at-grade Aviation/Manchester Station to Florence and Hindry (renamed as the Florence/Hindry Station);
- shift of portions of the LRT alignment into the former Burlington Northern Santa Fe (BNSF) railroad right-of-way (ROW), which reduces the ROW acquisitions required for the project and involves the demolition of two BNSF railroad bridges at Florence Avenue and Interstate 405 (I-405) and at Century Boulevard and Aviation Boulevard; and
- street, driveway, and sidewalk modifications and pedestrian crossing improvements, including a mid-block pedestrian crossing of the LRT tracks between Eucalyptus and Inglewood Avenues.

Based on the analysis contained in the EA and the technical studies for the project, the project actions are not anticipated to result in any adverse environmental effects that cannot be mitigated.

ENVIRONMENTAL ANALYSIS

Terry A. Hayes Associates Inc. (TAHA) has completed a revised noise and vibration analysis for the Crenshaw/LAX Transit Project proposed project modifications as it relates to FCBC. Figure 1 shows the project alignment and mid-block and Eucalyptus crossings in relationship to the Tabernacle and Administration Building on the FCBC Campus. The updated analysis included current ambient noise levels and operational noise and vibration levels based on the FTA Transit Noise and Vibration Impact Assessment (May 2006) guidance document. For the analysis of noise, the FTA Transit Noise and Vibration Impact Assessment identifies three impact categories: no impact, moderate impact, and severe impact. These determinations are consistent with the analysis used in the FEIS/FEIR.

Figure 1: Location of Project Alignment and Mid-Block and Eucalyptus Crossings in Relationship to FCBC Tabernacle and Administrative Offices



Source: TAHA, 2012.

Noise

FCBC would be exposed to project-related noise associated with rail activity and grade-crossing warning signals. The assessment of warning signal noise included both the mid-block pedestrian and the Eucalyptus Avenue crossing. The analysis was completed for 9:00 a.m. Sunday morning church services and a new Sunday morning noise reading was completed in the right-of-way between the FCBC office building and the Tabernacle. The noise monitor indicated a one-hour average noise level of 49 dBA. The following assumptions were used in the FCBC noise analysis along with the fixed guideway noise exposure equation shown in Table 6-4 of the Transit Noise and Vibration Impact Assessment document.

- Reference Sound Exposure Level (SEL): 82 dBA at 50 feet (Table 6-3)
- Distance of Sources to Receiver: 60 feet for the administrative office building and 95 feet for the Tabernacle
- Cars per Train: 2
- Train Speed: 35 miles per hour
- Hourly Volume of Train Traffic: 12 (Trains would be approximately ten minutes apart on Sunday mornings)

The following assumptions were used along with Table 6-8 of the Transit Noise and Vibration Impact Assessment document for stationary source (i.e., warning signal) noise.

- Reference SEL: 75 dBA at 10 feet (Provided by Metro and based on limits set by the CPUC)
- Distance of Sources to Receiver: 60 feet for the office building and 95 feet for the Tabernacle
- Hourly Volume of Train Traffic: 12
- Length of Event: 25 seconds (Transit Noise and Vibration Impact Assessment)

The results of the detailed analysis indicate that the trains and warning devices would combine to generate an hourly noise level 56 dBA at the office building and 52 dBA at the Tabernacle. Using the 49-dBA ambient noise reading, project-related noise levels would be less than the 59 dBA impact criteria for institutional land use identified in Table 3-1 of the FTA Transit Noise and Vibration Impact Assessment guidance document. Therefore, the proposed project would not result in moderate or severe noise impacts at FCBC.

Vibration

The FEIS/FEIR included a vibration analysis for the FCBC based on the Transit Noise and Vibration Impact Assessment document. The revised FCBC vibration analysis also used similar methodology, and estimated vibration levels for distances of 60 feet for the office building and 95 feet for the Tabernacle instead of 72 feet from the track. The vibration levels were attenuated using the train speed adjustment factor equation listed on Page 10-9 of the Transit Noise and Vibration Impact Assessment document.

The FEIS/FEIR vibration analysis for the FCBC indicated that the project-related vibration level would be 68 VdB at a distance of 72 feet from the track. The revised analysis indicated that the vibration levels would be 69 VdB at the office building and 65 VdB at the Tabernacle. Both of these vibration levels are less than the 75 VdB impact criteria for frequent events (i.e., more than 70 vibration events of the same source per day) occurring at institutional land uses, including churches, as indicated in Table 8-1 of the Transit Noise and Vibration Impact Assessment document. Therefore, the proposed project would not result in vibration impacts at FCBC.

Noise Appendix

CRENSHAW LAX DESIGN CHANGES

Computation of noise levels for rail vehicles and warning devices were based on Federal Transit Administration *Transit Noise and Vibration Impact Assessment.*

FTA's Table 6-4 for Rail Vehicles Noise Level:

Hourly L_{eq} at 50-feet: $L_{eq}(h)=SEL_{ref}+10\log(N_{cars})+20\log(S/50)+10\log(V)-35.6$

where:

S = Train speed, in miles per hour
N_{cars} = Average numbers of cars per train
V = Average hourly volume of train traffic, in trains per hour

Key Assumptions:

SEL_{ref}=	82	dBA at 50-feet
N_{cars}=	2	cars per train
S=	35	miles per hour
V=	12	trains per hour
Distance of source to receiver:	60	feet

Calculated Rail Vehicles Noise Level:

L_{eq} at 50-feet=	57.10	dBA
L_{eq} at 60-feet=	**55.52**	**dBA**

FTA's Table 6-8 for Stationary Sources (i.e., Warning Device) Noise Level:

Hourly L_{eq} at 50-feet: $L_{eq}(h)=SEL_{ref}+10\log(N)+10\log(E/3600)-35.6$

where:

N = Number of events of this type that occur during one hour
E = Duration of one event, in seconds

Key Assumptions:

SEL_{ref}=	61	dBA at 50-feet
N=	12	events of this type that occur during one hour
E=	25	seconds
Distance of source 1 to receiver:	60	feet
Distance of source 2 to receiver:	95	feet

Calculated Warning Device Noise Levels:

Leq at 50-feet =	14.61	dBA
L_{eq} at 60-feet=	**13.02**	**dBA**
L_{eq} at 95-feet=	**9.03**	**dBA**

Combined rail vehicle and warning device noise level at the FCBC Tabernacle:

Leq=	**55.52**	**dBA**