

Date: February 19, 2013

To: Glenn Kinoshita and Bernard Choy, Caltrans

From: Lynn McIntyre, URS, and Michael Thill, Illingworth & Rodkin, on behalf of Santa Clara Valley Transportation Authority

Subject: ***Supplement to Noise Study Report and Noise Abatement Decision Report, State Route 85 Express Lanes Project, Santa Clara County, CA (No. 0400001163/EA 4A7900)***

The purpose of this memorandum is to document updates to the proposed project since the Noise Study Report (NSR) and Noise Abatement Decision Report (NADR), State Route 85 Express Lanes Project, Santa Clara County, CA, were approved on September 18 and 17 (respectively), 2012. Since the approval of the NSR and NADR, the following design changes have occurred.

**Access Zones.** Certain express lane access zone locations—the freeway segments in which vehicles can enter and exit express lanes—were revised to improve projected Build Alternative traffic operations. The changes to access zones are in the following locations of SR 85:

#### Northbound

- Fremont Avenue: Extend access zone upstream up to Homestead Avenue on-ramp
- Almaden Expressway: No access zone change; add a white solid line to separate express lanes from general purpose lanes

#### Southbound

- El Camino Real-Fremont Avenue: Extend access zone downstream
- Camden Avenue on-ramp: Extend access zone opening upstream
- Blossom Hill Road on-ramp: Extend access zone opening upstream

The shift of express lane access zones would not affect the results of the 2012 NSR and NADR. The noise abatement findings would not change. Therefore, this project change will not be discussed further.

**Auxiliary Lane.** The Build Alternative was modified to include an auxiliary lane in a 1.1-mile segment of northbound SR 85 between the existing South De Anza Boulevard northbound on-ramp and Stevens Creek Road northbound off-ramp. The purpose of the auxiliary lane is to improve traffic operations during peak periods in this segment where the two express lanes merge into a single northbound express lane south of the SR 85/I-280 interchange. The existing pavement would be widened by up to 14 feet to the outside (northeast). To accommodate the auxiliary lane, sections of the existing abutments at South Stelling Road and McClellan Road overcrossings adjacent to northbound SR 85 would be removed and replaced by new retaining walls to support the embankments behind them. No culvert extensions, sound wall modifications, or additional right-of-way would be required. The depth of disturbance from the construction of roadway pavement and retaining wall foundations would be up to 5 feet. This project element was not addressed in the 2012 NSR and NADR.

The addition of the auxiliary lane is expected to increase noise levels by 0 to 2 A-weighted decibels (dBA). The increase would likely be less than 2 dBA given the change in project geometry. However,

for the purposes of a worst-case assessment, each receptor in this segment is assumed to be exposed to a noise increase of 2 dBA from the auxiliary lane.

The 2012 NADR made the preliminary recommendation that no noise abatement is proposed because none of the barriers evaluated meet the feasibility and reasonableness criteria established by 23 Code of Federal Regulations 772. A 2 dBA increase from the auxiliary lane would not affect noise levels such that the preliminary recommendation of the 2012 NADR would change.

This memorandum provides the additional information needed to document this project change.

**Auxiliary Lane Noise Analysis**

The area where the auxiliary lane would be added is in Segment 5 (SR 85 – Interstate 280 to South De Anza Boulevard) evaluated in the NSR and NADR. Both sides of SR 85 are shielded by existing noise barriers except for at the South Stelling Road and McClellan Road overcrossings and the approximately 0.5-mile segment between McClellan Road and the SR 85/Stevens Creek Boulevard interchange.

Modifications to three existing sound walls in this segment (SW6, 14 feet; SW7, 11-12 feet; and SW8, 12 feet) were analyzed in the NSR and NADR as described below. The Caltrans *Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects* (Protocol; May 2011) states that noise abatement is considered to be acoustically feasible if it provides noise reduction of at least 5 dBA at receptors subject to noise impacts. Other nonacoustical factors relating to geometric standards (e.g., sight distances), safety, maintenance, and security can also affect feasibility. Additionally, the Protocol sets an acoustical design goal that a noise barrier must provide at least 7 dB of noise reduction at one or more benefited receptors.

Sound Wall SW6: SW6 is an existing 14-foot noise barrier located along the southbound SR 85 right-of-way between McClellan Road and South Stelling Road (shown in Sheets 6 and 7 in NSR Appendix D). Even with the shielding provided by SW6, first-row receptors behind the wall, represented by ST-38 and ST-39, would experience noise levels that approach or exceed the Noise Abatement Criteria (NAC) of 67 dBA. Increasing the height of SW6 is calculated to reduce noise levels by up to 2 dBA. As a 2 dBA reduction does not meet the Protocol’s 5 dBA noise reduction threshold and 7 dB noise reduction goal, increasing the height of SW6 is not considered to be feasible.

**NSR Table 7-26: SW6 Insertion Loss**

Receptor ID	Noise Level w/Existing Wall	With Wall H=16 ft	
		L <sub>eq[h]</sub>	I.L.
ST-38	68	66	2
ST-39	68	68	0

Sound Wall SW7: SW7 is an existing 11- to 12-foot noise barrier located along the northbound SR 85 right-of-way between McClellan Road and South Stelling Road (shown in Sheets 6 and 7 in NSR Appendix D). Even with the shielding provided by SW7, first-row receptors behind the wall, represented by ST-40, would experience noise levels that approach or exceed the NAC of 67 dBA. Increasing the height of SW7 is calculated to reduce noise levels by up to 2 dBA. As a 2 dBA reduction

does not meet the Protocol’s 5 dBA noise reduction threshold and 7 dB noise reduction goal, increasing the height of SW7 is not considered to be feasible.

**NSR Table 7-27: SW7 Insertion Loss**

Receptor ID	Noise Level w/Existing Wall	With Wall H=14 ft		With Wall H=16 ft	
		L <sub>eq[h]</sub>	I.L.	L <sub>eq[h]</sub>	I.L.
ST-40	68	67	1	66	2

Sound Wall SW8: SW8 is an existing 12-foot noise barrier located along the southbound SR 85 right-of-way between South Stelling Road and South De Anza Boulevard (shown in Sheets 7 and 8 in NSR Appendix D). Some first-row receptors located behind the existing wall, represented by ST-42 and ST-44, are predicted to experience noise levels that approach or exceed the NAC of 67 dBA. SW8 was analyzed for increases in barrier height and was calculated to reduce noise levels by up to 2 dBA. As a 2 dBA reduction does not meet the Protocol’s 5 dBA noise reduction threshold and 7 dB noise reduction goal, increasing the height of SW8 is not considered to be feasible.

**NSR Table 7-28: SW8 Insertion Loss**

Receptor ID	Noise Level w/12ft Wall	With Wall H=14 ft		With Wall H=16 ft	
		L <sub>eq[h]</sub>	I.L.	L <sub>eq[h]</sub>	I.L.
ST-42	69	68	1	67	2
ST-44	67	66	1	65	2

Increasing the heights of SW6, SW7, and SW8 would reduce traffic noise levels by up to 2 dBA. Assuming that the addition of an auxiliary lane to 1.1 miles of northbound SR 85 would increase noise levels at each receptor location by up to 2 dBA, the insertion loss that would result from increasing the heights of SW6, SW7, and SW8 can be inferred to be up to 4 dBA. This insertion loss would not achieve the Protocol’s 5 dBA noise reduction threshold and 7 dB noise reduction goal required to meet feasibility standards.

New SW5: A new sound wall (SW5) was also analyzed along northbound SR 85 adjacent to De Anza College and was found to feasibly abate traffic noise at two of three receptor locations, as shown below (shaded cells with boldface numbers).

**NSR Table 7-25: SW5 Insertion Loss**

Receptor ID	Units Represented	Noise Level w/o Wall	With Wall H=8 ft		With Wall H=10 ft		With Wall H=12 ft		With Wall H=14 ft		With Wall H=16 ft	
			L <sub>eq[h]</sub>	I.L.	L <sub>eq[h]</sub>	I.L.	L <sub>eq[h]</sub>	I.L.	L <sub>eq[h]</sub>	I.L.	L <sub>eq[h]</sub>	I.L.
ST-34	1	70	64	6	63	<b>7</b>	63	<b>7</b>	62	<b>8</b>	61	<b>9</b>
ST-36	0	75	70	5	68	<b>7</b>	66	<b>9</b>	65	<b>10</b>	64	<b>11</b>
ST-36a	1	60	57	3	56	4	55	5	55	5	54	6

Without the auxiliary lane, SW5 was found to not meet the reasonableness criteria because the construction cost would far exceed the reasonableness allowance, as shown below:

**NADR Table 3-1: Summary of Key Abatement Information (excerpt)**

Sound Wall ID	Height (feet)	Acoustically Feasible?	Number of Benefited Receptors	Total Reasonableness Allowance	Estimated Construction Cost	Cost Less than Allowance?
SW5	10	Yes	1	\$55,000	\$2,490,000	No
	12	Yes	2	\$110,000	\$2,988,000	No
	14	Yes	2	\$110,000	\$3,486,000	No
	16	Yes	2	\$110,000	\$3,984,000	No

To qualitatively assess the potential for the proposed auxiliary lane on 1.1 miles of northbound SR 85 to change the results of the analysis, the auxiliary lane was assumed to result in a 2 dBA increase in traffic noise at the three receptors that would be shielded by SW5. The insertion loss for each wall would remain the same.

Receptor ID	Units Represented	Noise Level w/o Wall	With Wall H=8 ft		With Wall H=10 ft		With Wall H=12 ft		With Wall H=14 ft		With Wall H=16 ft	
			$L_{eq[h]}$	I.L.	$L_{eq[h]}$	I.L.	$L_{eq[h]}$	I.L.	$L_{eq[h]}$	I.L.	$L_{eq[h]}$	I.L.
ST-34	1	70+2=72	64+2=66 6	6	63+2=65 65	7	63+2=65 65	7	62+2=64 4	8	61+2=63 3	9
ST-36	0	75+2=77	70+2=72 2	5	68+2=70 70	7	66+2=68 68	9	65+2=67 7	10	64+2=66 6	11
ST-36a	1	60+2=62	57+2=59 9	3	56+2=58 58	4	55+2=57 57	5	55+2=57 7	5	54+2=56 6	6

**Note:** Based on NSR Table 7-25.

The two locations where noise levels exceed the NAC of 67 dBA (ST-34 and ST-36) would still exceed the NAC. Noise barrier heights of 10, 12, 14, and 16 feet would produce noise reduction of between 7 and 11 dBA, which would meet the feasibility criteria.

Location ST-36a would remain under the NAC. No barrier heights would meet the 7 dBA noise reduction criteria.

Even if an 8-foot noise barrier met the 7 dBA noise reduction criteria at all three receptors, the reasonableness allowance would still be exceeded. This would also be the case if SW5 met the feasibility criteria at all three receptors at the other wall heights (modified numbers boldfaced):

Sound Wall ID	Height (feet)	Acoustically Feasible?	Number of Benefited Receptors	Total Reasonableness Allowance	Estimated Construction Cost	Cost Less than Allowance?
SW5	8	Yes	3	\$165,000	\$1,992,000	No
	10	Yes	3	\$165,000	\$2,490,000	No
	12	Yes	3	\$165,000	\$2,988,000	No
	14	Yes	3	\$165,000	\$3,486,000	No
	16	Yes	3	\$165,000	\$3,984,000	No

**Note:** Based on NADR Table 3-1.

Therefore, although the auxiliary lane could have a minimal increase in traffic noise levels in Segment 5, the increase would not be sufficient to change the results of the barrier analyses or warrant consideration of additional barriers.

**Conclusions**

The 2012 NADR made the preliminary recommendation that no noise abatement is proposed because none of the barriers evaluated meet the feasibility and reasonableness criteria established by 23 Code of Federal Regulations 772. That recommendation remains applicable.

The measures outlined in Section 8.4 of the 2012 NSR to reduce the potential for construction-related noise impacts remain applicable to the revised project. No additional measures are needed.