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STATE OF CALIFORNIA
HIGHWAY TRANSPORTATION AGENCY
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

TRAFFIC NOISE STUDY
SAN FRANCISCO GOLDEN GATE FREEWAY
INTERSTATE HIGHWAY ROUTE 480
PLAN F-5 (WEST) AND PLAN F (EAST)

65-46

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Transportation Laboratory

May 1965

MATERIALS & RESEARCH DEPARTMENT

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FROM: Advance Planning - Mr Bethell DATE 6-1-65
MESSAGE Copy for your info.
Covering letter will be prepared for transmittal of report to CHC at June meeting

PLACE SIGNATURES, COMMENTS AND DECISIONS ON ATTACHED MATERIAL—NOT ON TAG

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State of California
Highways Transportation Agency
Department of Public Works
Division of Highways
Materials and Research Department

May 1965

S. F. Golden State Freeway
Interstate Route 480
04-SF-480
04107-301100
Lab. W.O. 36373

Mr. John L. Beaton
Materials and Research Engineer
Materials and Research Department
Sacramento, California

Dear Sir:

The attached report is submitted in compliance with your request of May 11, 1965:

TRAFFIC NOISE STUDY

SAN FRANCISCO GOLDEN GATE FREEWAY

INTERSTATE HIGHWAY ROUTE 480

PLAN F-5 (WEST) AND PLAN F (EAST)

Study made by . . . . . Structural Materials Section
Under general direction of . . . . . E. F. Nordlin
Unit supervisor . . . . . J. E. Barton
Measurements and report by . . . . . Louis Bourget

Very truly yours,

Eric F. Nordlin
Assistant Materials and Research
Engineer - Structural

LB:mw

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INTRODUCTION

This report is a comparison study between noise conditions from existing traffic and anticipated noise conditions from freeway traffic at carefully selected "Test Points" along the proposed Golden Gate Freeway Interstate Highway Route 480, according to Plan F5 west of Van Ness Avenue and Plan F east of Van Ness Avenue.

The Test Points are well distributed so as to represent virtually all areas where significant changes may occur, as well as areas of particular interest or controversy.

Traffic noise, of freeway origin, can be reasonably predicted at any given distance up to 800 feet over exposed terrain*. This is accomplished by the use of noise charts which have been developed from hundreds of field measurements made throughout California. These noise charts have withstood the test of time and application since 1961. Whenever a situation arises that is not covered by prior measurements, new tests are devised to meet the new condition. This is usually done by seeking out the most nearly similar freeway situation and making enough tests to include all noises that are likely to be significant. Such investigation often discovers noise sources of interest that are not of freeway origin but which are vital to an understanding of the complete problem.

All measurements reported herein were obtained with a General Radio Sound Level Meter, Type 1551-C, which meets American and International standards for sound level meters. The decibel numbers are reported with the A weighting network in use (DBA) as approved by the American Standards Association and the International Standards Organization for the evaluation of motor vehicle noise.

* THE EFFECT OF BASIC HIGHWAY DESIGNS ON TRAFFIC NOISE ATTENUATION, September 1961
Materials and Research Department
California Division of Highways

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DISCUSSION

Measurements of existing noise along Marina Boulevard frontage were taken at Fillmore Street and also just west of Buchanan Street. These two "Test Points" are marked (1) and (2) on the attached plan of the proposed freeway route. The results were similar at these two locations and are shown as one group of noise levels (bars) above footnote Test 1 and Test 2 at the left end of the attached Noise Level Chart. Sight-seeing buses produced levels of 80 to 90 DBA, sport cars from 74 to 85 DBA, and most automobiles from 68 to 80 DBA. Aircraft were less frequent but potent noise sources, and developed levels from 70 to 86 DBA, depending on distance and the type of aircraft. The lowest noise levels between vehicles or groups of vehicles were determined by prevailing winds. These usually varied between 52 and 65 DBA or more depending on wind gust velocity.

The next noise level tests were made on Bay Street at Point 3 near Octavia Street and at Point 4 near Franklin Street. These readings were similar and are shown above footnote Test 3 and Test 4 on the Noise Level Chart.

The anticipated traffic noise levels from the proposed Plan F-5 depressed freeway at Test Points 1, 2, 3, and 4 are virtually identical and are therefore shown in one set of bars above the footnote FWY 1, 2, 3, and 4. Anticipated truck noises range from 55 to 67 DBA, sport cars from 50 to 59 DBA, and most other automobiles from less than 50 to 54 DBA. This is considerably less noise than is now developed by local street traffic and is a result of the shielding effect of depressed freeway construction and the greater distance between the proposed freeway and the frontage residences, as compared to the traffic on Marina Boulevard.

Existing noise, at Test Point 5 on North Point Street between Van Ness and Polk Streets, is considerably higher than is anticipated for the proposed freeway according to Plan F. Comparative noise levels are shown above footnotes Test 5 and FWY 5 on the Noise Level Chart. The proposed plan provides a cover over the freeway in this area to protect Galileo High School. This accounts for the low anticipated noise levels at this location.

At Test Points 6 and 7, representing North Point Street at Leavenworth Street and Bay Street near Jones Street, existing local traffic noise is higher than the anticipated freeway noise, as indicated above footnotes Test 6 and FWY 6, and Test 7 and FWY 7 on the Noise Level Chart. Again, this is the result of the shielding effect of the proposed depressed freeway construction.

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In the vicinity of Test Point 8, on Bay Street near Mason Street, the proposed freeway changes from a depressed highway to an elevated structure for east-bound traffic. Some of the noise shielding effect for trucks is now lost. Therefore, the noise from east-bound freeway trucks will be about 7 DBA higher than the existing noise from automobiles now traveling on Bay Street. Freeway automobiles will be about 5 DBA less noisy than those on Bay Street, due to the greater distance to the freeway plus a partial shielding effect of automobile noises by the planned highway guard railing. Compare Test 8 with FWY 8 on the Noise Level Chart for existing and anticipated noise levels at this location.

At Test Point 9, Francisco Street and Grant Avenue, the anticipated noise levels from freeway traffic are higher than for any other location in the test series. The existing noise levels in this area are quite low even though the Noise Level Chart, Test 9, shows a 76 DBA reading for automobiles. Both Francisco Street and Grant Avenue terminate (or dead end) on the bluff in this area. Therefore, the actual automobile traffic is very sparse and the prevailing noise background is usually determined by wind conditions that vary between 55 and 65 DBA. Truck noise from the upper deck of the proposed freeway is anticipated to reach levels between 75 and 85 DBA at the bluff and may go as high as 90 DBA at the nearest possible exposure. Any set-back that prevents line of sight exposure between noise source and listener will result in 10 to 20 DBA less noise than indicated above the footnote, FWY 9, on the Noise Level Chart.

At Test Point 10 near Chestnut and Kearny Streets, the bluff exposure is higher and better shielded than at Test Point 9. Here the existing noise is often determined by wind conditions but the background is intermittently raised by noises between 60 and 70 DBA from trucks along The Embarcadero, aircraft noises between 70 and 86 DBA, and occasional local sport car or automobile noises from 60 to 73 DBA.

Special tests were made on Treasure Island above both tunnel entrances for the Bay Bridge in order to simulate the proposed freeway noise condition that is anticipated at this Telegraph Hill location. The noise on the Treasure Island bluffs was remarkably constant between 62 and 68 DBA, with trucks rarely penetrating to levels of 72 DBA.

The 50 mile per hour speed limit on the Bay Bridge may be acting to restrain the noise as well as the speed. Therefore, above footnote FWY 10 on the Noise Level Chart we have added 5 DBA, in dashed lines, over the levels actually measured. These are clearly shown and are marked "see text". Anticipated truck levels are therefore raised to 77 DBA and automobiles 73 DBA, for Test Point 10. The over-all effect

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will be a noise level rise of around 5 to 7 DBA from trucks on the freeway top level as compared to the current noise from trucks along The Embarcadero. The effect of the higher noise level is discussed in the next paragraph.

Test Points 10, 11, 12, 13, and 14 are all subject to aircraft noises and ships' horn noises that exceed noise from local vehicles. These noises are admittedly less frequent than truck noises from the commercial areas below the bluff and along The Embarcadero. The anticipated rise in noise level at these locations over that now emanating from the commercial sources will vary from 5 to 7 DBA. This is not a serious increase because the anticipated noise levels will still be lower than that of existing traffic along the choice Marina Boulevard frontage. Please compare the height of the noise bars above footnotes FWY 10 and FWY 11, 12, 13, and 14 with those above Test 1 and 2 (for the Marina) on the Noise Level Chart.

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SUMMARY

Test Points 1 through 7 will be only slightly affected by traffic noise from the proposed freeway Plan F-5 west of Van Ness and Plan F east of Van Ness. The reason is simple. The existing noise from local street traffic already exceeds the levels anticipated from a depressed type of freeway at these locations.

The area most vulnerable to a noise increase, according to Plan F east, lies between Test Point 8 (Bay Street near Mason) to just east of Test Point 9 (Francisco Street at Grant Avenue). This portion of the proposed freeway approaches many residential structures before it becomes screened by the bluff near Test Point 10. The results are shown on the Noise Level Chart above estimate FWY 8 and FWY 9. You will note that these are the highest anticipated freeway noise levels along the entire route and are the only estimates that exceed 80 DBA for freeway trucks.

Test Points 10 through 14 circling around Telegraph Hill will all experience moderate noise increases from the proposed freeway, but the levels will still be less than that of existing daytime traffic along the choice Marina Boulevard frontage.

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