Final Environmental Impact Report for the

Bayfront Trolley Station, Chula Vista, California

Prepared for: City of Chula Vista
276 Fourth Avenue
Chula Vista, California 92010

Prepared by: County of San Diego
Department of Public Works
Environmental Services Unit
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San Diego, California 92123

September, 1984

Certified by the Chula Vista Planning Commission

November, 1984

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I. Project Summary

This project involves the acquisition of land and the construction and operation of a new station for the San Diego Trolley line, to be located on the south side of "E" Street in Chula Vista. Site improvements will include construction of a station, parking for 150* vehicles at Phase I, 250 vehicles at Phase II, and for 380 vehicles at Phase III, and associated landscaping. A tourist information center, a "kiss and ride" area, and space for bus bays will all be provided at the Bayfront Station. The station will compliment services being provided at the existing "H" Street station for anticipated transit development needs in the South Bay region.

Four environmental issues are addressed in this document: land use/zoning, traffic circulation, noise, and air quality. None of these issues were found to result in any significant impacts upon the environment. The only mitigation necessary is for existing property owners who will have to relocate due to implementation of this project. They will receive fair market value for their properties and relocation compensation as necessary. No other impacts have been identified.

Effects found not to be significant include geology, hydrology, cultural resources, and biology. The fact that the project site is located in a developed urban setting makes further discussion of their impacts unnecessary. No cultural or biological resources are anticipated under paved parking lots and buildings. Geology and hydrology impacts are being adequately handled by existing storm drain systems which carry runoff away from the project site.

*This number of parking spaces is approximate and is subject to the final design of the facility.

II. Project Description

This project involves the acquisition of land and the construction and operation of the proposed Bayfront Trolley Station at the "E" Street/I-5 interchange in the City of Chula Vista. The project is located south of "E" Street, and is adjacent to and east of the existing trolley tracks and Interstate 5.

The new station will provide another stopping point for the San Diego Trolley, a 15.9 mile system operating between downtown San Diego and the Mexican border. There are currently seven stations in the downtown San Diego zone, and eleven stations in the suburban zone. The trolley operates seven days a week, between 5:00 A.M. and 1:00 A.M., at approximate fifteen minute intervals. It has been in operation since the summer of 1981 (SANDAG 1984).

The property to be acquired consists of 4.146 acres of land, which currently contains an insurance stand, a self-serve gas station, a vacant lot, a bowling alley, and a portion of the City of Chula Vista's Public Works Yard. The entire parcel would not be utilized for the initial phase of the project; however, anticipated long term parking needs necessitate the acquisition of all of the parcels at the present time.

Improvements to the property will include the construction of a station to be located between "E" and "F" Streets. It will provide space for transit and tourist information, and a sheltered area for trolley patrons. Also to be provided at the

initial construction stage are parking spaces for 150 private vehicles, with room for 380 spaces at ultimate build-out. The 175 spaces will be permanent spaces, with other areas available for "kiss and ride" commuters, and for four bus bays.

The project will be constructed in three separate phases.. Phase I is the construction of the station, provision of 150 parking spaces, and removal of the insurance stand; Phase II includes removal of the gas station and the provision of 75 additional parking spaces; Phase III would eliminate the bowling alley to provide 130 more parking spaces. The phasing would be done on an as-need basis, as parking demands necessitate expansion (between 1986 and 1994).

Access to the project site will be from "E" Street and from Woodlawn Avenue. Private vehicles will gain access to the site from either of these streets; busses will enter the facility on "E" Street and exit on Woodlawn Avenue. See Figure 3 for a detailed layout plan.

III. Environmental Setting, Impacts, and Mitigation

A. Land Use and Zoning Setting

Land use on the project site presently consists of a bowling alley and its parking lot, a small tourist information booth, a self-serve gasoline station, a vacant lot fronting "E" Street, and a portion of the City of Chula Vista's Public Works Yard. Zoning on the property is C-V-P, the Visitor Commercial Zone.

Figure 1

Project Location - Bayfront Trolley Station, Chula Vista

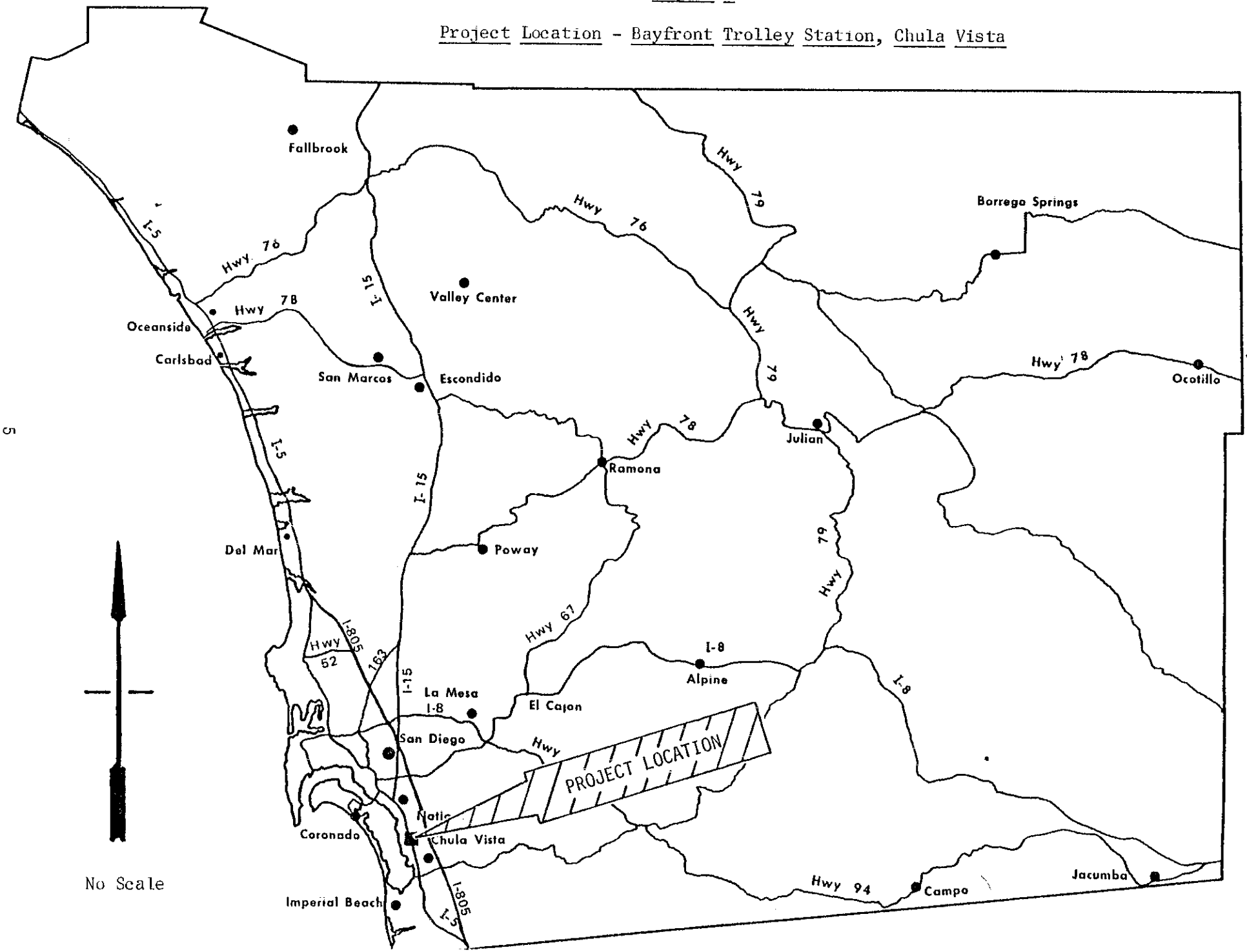
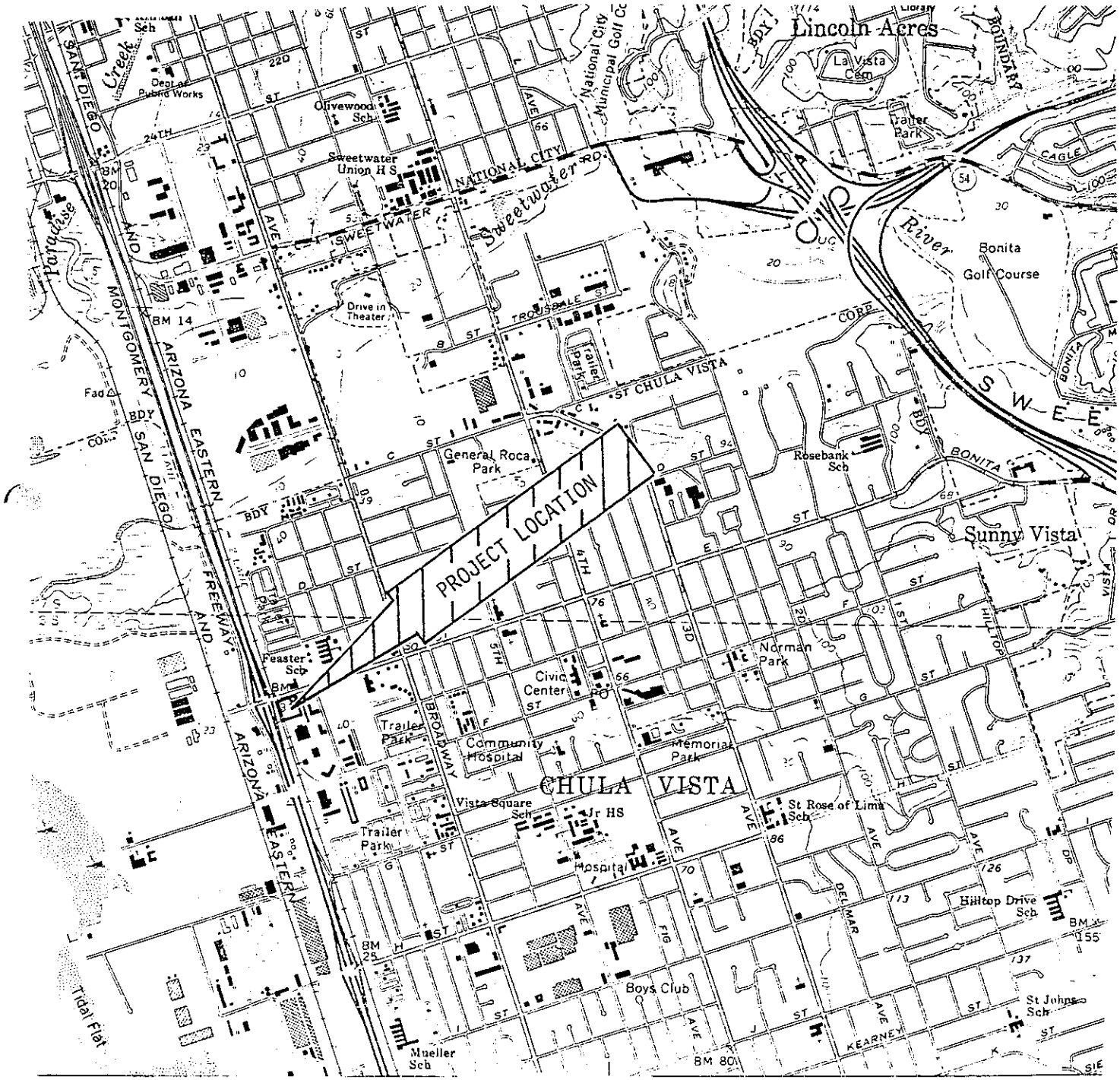


Figure 2

Project Location - Bayfront Trolley Station, Chula Vista

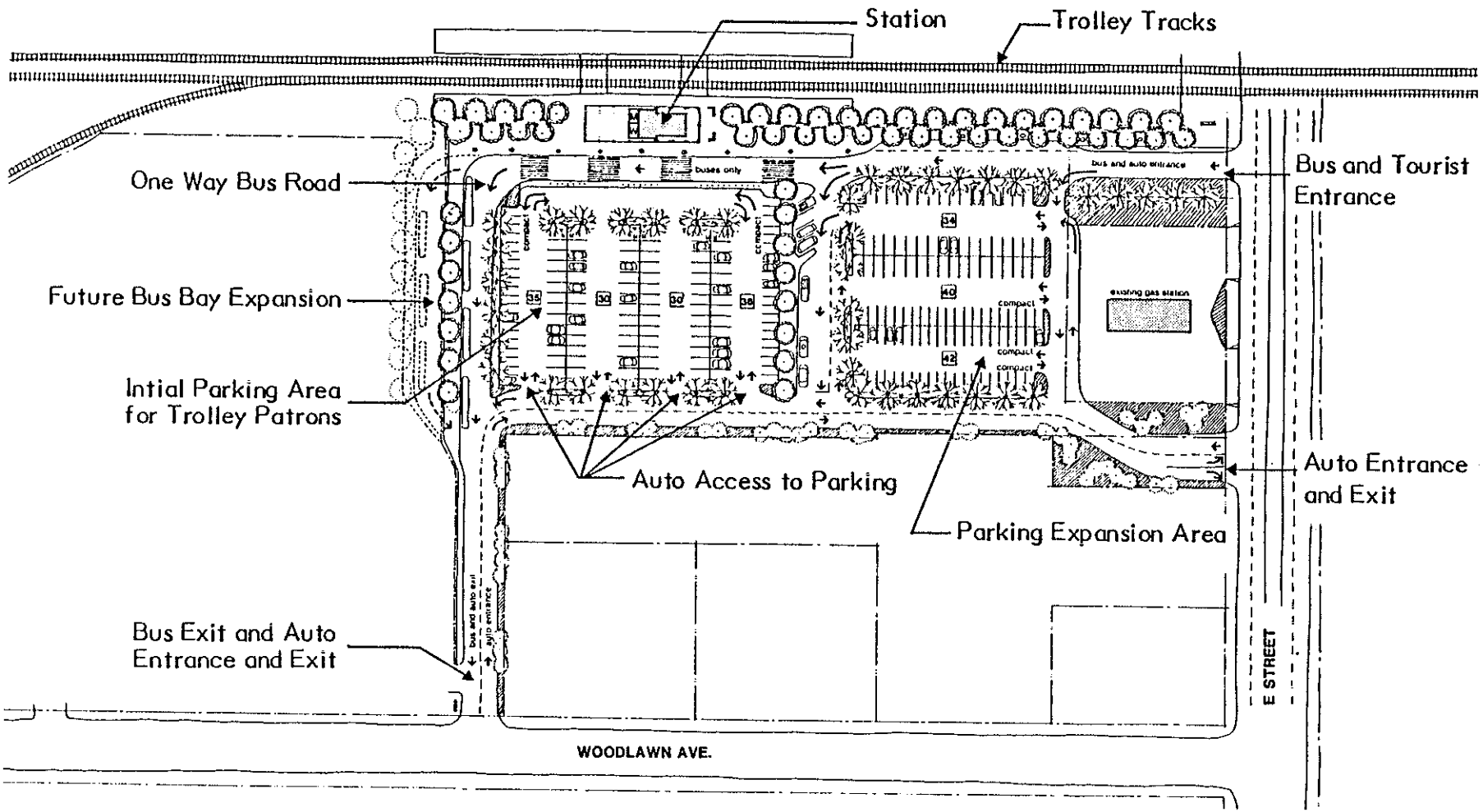


U.S.G.S. National City 7.5" Quadrangle 1"=2000'

Photorevised 1975

FIGURE 3

GENERALIZED SITE PLAN



Source: Chula Vista Trolley Station Study;
Recommended E-Street Station Development Program and Assessment
Sedway Cooke Associates, 1984

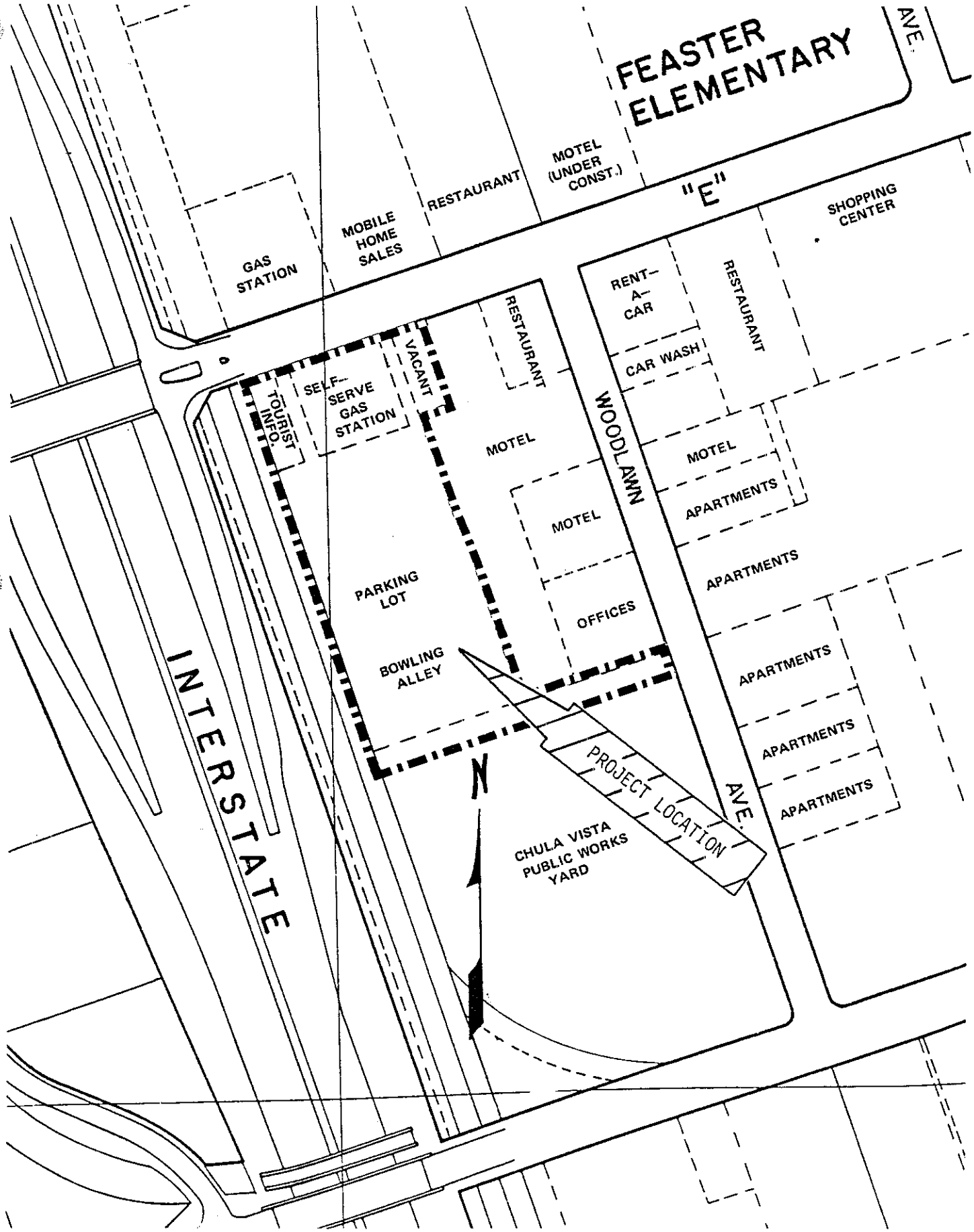
CHULA VISTA E-STREET TROLLEY STATION PROJECT

0 25' 50' 100'

SEDWAY COOKE ASSOCIATES

FIGURE 4

EXISTING LAND USE – BAYFRONT TROLLEY STATION



Land Use and Zoning Impacts

Initial station development includes construction of the station, parking for 150 vehicles, four bus bays, and associated landscaping. To provide these improvements, removal of the tourist information booth will be necessary. The owner** of this structure will receive fair market value for the land and improvements, and relocation compensation, if so desired, according to the requirements of State law. The gas station and bowling alley will remain in place until such time as expanding parking requirements necessitate their removal. They may, however, be acquired by the County now to avoid prohibitive purchase costs in the future. The owners of the gas station and the bowling alley will also receive fair market value and relocation compensation as necessary.

The portion of the City of Chula Vista Public Works Yard to be used for bus egress and auto ingress consists of .45 acres of land. Engineering staff at the City of Chula Vista indicate that it's present location is too small and is poorly located at the extreme corner of the City. In the long term they would like to relocate the yard, but no specific site selection study has been prepared by the City. They do indicate that the taking of the northern portion of their present yard can be accomodated (Sedway Cooke Associates 1984), with the yard continuing to operate.

No zoning or General Plan impacts will affect the project site, since neither designation will have to be altered as a result of the project.

The issue of changing land use patterns in the surrounding neighborhood caused by the operation of a new trolley station includes two items for discussion. A survey by the San Diego Association of Governments (SANDAG) of developers who have marketed property in the vicinity of the suburban portion of the existing trolley line indicates that the location of a trolley in relation to their property provided a positive incentive for them to develop. However, a survey of existing businesses proximal to the trolley line provided either neutral or negative responses regarding the impact of the trolley on their businesses. Common complaints included trolley patrons either asking for change for trolley fare, or asking to use local business restroom facilities. Three businesses stated they were moving as a direct result of the trolley (SANDAG 1984).

Although not a part of the present project, the adopted Bayfront Local Coastal Land Use Plan will have an effect on the proposed trolley station. The Bayfront Plan proposes a variety of uses, primarily commercial and recreational, in an area on the west side of Interstate 5, much of which is currently undeveloped land. The Bayfront Plan proposes improvements to the local circulation system which are associated with the succsssful operation of a station at the "E" Street location. In fact, "The Bayfront Plan recognizes the future connection to the trolley system as a significant benefit to the feasibility of development in the Bayfront (Sedway Cooke Associates 1983:III-18)." Additional details concerning the circulation

aspects of the Bayfront Trolley Station and its relationship to the Bayfront Plan are discussed in the Traffic section of this report.

Land Use and Zoning Mitigation

On-site impacts, the removal of existing businesses, will be mitigated by the provision of fair market value for purchase of the properties and relocation compensation to the property owners. No additional land use mitigation is necessary.

B. Traffic and Circulation Setting

The project site is located on the south side of "E" Street, east of Interstate Highway 5. "E" Street provides east-west access through Chula Vista, and connects Interstate 5 on the west with Interstate 805 on the east. The nearest cross street is Broadway Avenue. Traffic counts for these and adjacent roadways are provided on the following page:

Table 1

Current ADT's in the Project Vicinity

Location	Between	1980	1981	1982	1983
E Street	Broadway & I-5	22,970	23,880	23,580	N.C.
F Street	Bdway.& Wdlawn	5,710	5,430	6,030	5,870
G Street	Bdwy. & Oaklawn	4,290	N.C.	3,900	N.C.
Broadway	D & E	18,880	19,230	19,280	19,480
Broadway	E & F	19,990	19,920	20,490	N.C.
Broadway	F & G	19,090	20,710	20,570	

Source: City of Chula Vista Engineering Department

Current (1983) average daily traffic on Interstate 5 is 97,000 vehicles per day. Freeway on and off ramp volumes for 1981, the most recent counts available for the "E" Street overcrossing, include: northbound off ramp, 5,610 vehicles per day; northbound on ramp, 8,300 vehicles per day; southbound on ramp, 5,430; southbound off-ramp, 8,950 vehicles per day (CALTRANS 1984). Woodlawn Avenue, the street which will provide bus egress and auto ingress, did not have any counts available.

There are no bus trips being made on "E" Street between I-5 and Broadway, as no routes go that far west at the present time. All Chula Vista Transit busses either originate or terminate at the "H" Street trolley station, and have been doing so since inception of the trolley line service. Current bus volume at

the "H" Street station is 212 vehicles per day for the six bus lines serving the station.

Both "E" Street and Broadway are classified as Major Roads in the Circulation Element of the City of Chula Vista General Plan. Major Roads have a design ADT of 25,000 vehicles per day and may have 4-12 foot lanes, 2-8 foot parking lanes, and a 16 foot median within an 80 foot right-of-way.

Traffic/Circulation Impacts

A bus and traffic analysis of the project site was done by Robert Conradt, transportation planning consultant, in 1983. Passenger counts were taken at the "H" Street station, which indicated that 62.5% of all trips to the trolley station were by bus, 25% of the passengers arrived on foot, and 12.5% arrived by private automobile. Conradt (1983:5 & 6) estimates that the relative percentages of types of arrival at the Bayfront Station will be similar to the "H" Street station. Thus, average daily traffic patterns should be similar between the existing conditions at the "H" Street station and future conditions at the Bayfront Trolley Station.

Current on-site traffic generators include the tourist information booth, the bowling alley, and the gasoline station. Vehicle trip generation rates for various types of land use have been prepared by SANDAG (1983) and by the City of San Diego (1984), and will be used to determine current trip generation rates at the project site. Based on a trip generation rate of 30 vehicles per lane, the bowling alley

generates 1,800 vehicles per day. The gasoline station, based on a trip generation rate of 130 vehicles per pump per day, generates 4,160 vehicle trips per day. No generation rates are available for the tourist information booth. The total number of vehicles entering and exiting the site on a daily basis are currently 5,960 vehicles.

Future vehicle trips are dependent upon the number of total parking spaces available at the new station. Once the project is constructed, those vehicle trips associated with the gas station will be eliminated with implementation of Phase II, and trips associated with the bowling alley will be eliminated once Phase III is completed. After Phase I construction, 175 parking spaces will be available; at ultimate build-out, 380 spaces will be provided. Since the "H" Street lot contains 300 parking spaces, the ultimate build-out count at the Bayfront Trolley Station was assumed to be slightly higher; for the Phase I count, this figure was halved. The following table provides comparision between existing on-site traffic, traffic after completion of Phase I, and after completion of Phase II and Phase III:

Table 2

Traffic Comparison

	Current Traffic	Phase I	Phase II	Phase III
Bowling Alley	1,800	1,800	1,800	0
Gas Station	4,160	4,160	0	0
Bayfront Trolley	0	3,279***	4,684 ***	6,171 ***
Totals	5,960	9,239	6,484	6,171

*** Includes projected bus trips at the Bayfront Station (approx. 70/Day)

As can be seen in Table 2, on site generated traffic will be approximately the same or slightly higher with the completion of Phases II and III. It will be temporarily higher at the completion of Phase I.

Future traffic on surrounding streets will also be less, due primarily to the construction of State Route 54, about a mile north of this project. SANDAG (1984) ran a computer model for the Chula Vista Engineering Department to predict the year 2005 traffic levels on adjacent streets (Monroy 1984: Personal Communication). Their figures are outlined below:

Table 3

Future ADT's In the Project Vicinity

Location	Between	Direction	
E Street	Broadway & I-5	West = 21,200	East = 27,700
F Street	Broadway & I-5	West = 3,300	East = 6,200
G Street	Broadway & I-5	Not Available	Not Available
Broadway	at D	South = 19,200	North = 20,100
Broadway	at E	South = 17,100	North = 17,400
Broadway	at F	South = 17,146	North = 17,150
Broadway	at G	South = 17,149	North = 17,145

The proposed Bayfront Trolley Station is in conformance with the City of Chula Vista's Bayfront Local Coastal Plan, recently approved by the California Coastal Commission. This plan adopts many of the circulation objectives that support the

Bayfront Trolley Station. Sedway Cooke Associates (1984:57) state that

"While no explicit off-site roadway modifications are necessary to serve the recommended E Street trolley station project, the Bayfront Plan provides for the eventual widening of the E Street bridge over Interstate 5 and the widening of a portion of E Street east of the bridge to permit a transition to the widened bridge."

This widening, therefore, is not a recommended mitigation measure associated with the present project, but will be necessary as adjacent development occurs in the Bayfront Coastal Plan area. The present project, as discussed above, will result in a lessening of traffic impacts in the project vicinity. Peak hour traffic levels should remain the same as they are now. The project will encourage fuller use of public transportation, and will incrementally reduce traffic on a regional basis.

Traffic/Circulation Mitigation

Traffic levels on adjacent streets will be approximately the same either with or without construction and implementation of this project. On-site generated traffic will also be approximately the same as present levels after completion of Phases II and III. No traffic or circulation mitigation measures are necessary.

C. Noise Setting

A noise analysis of the project site was done in September, 1984 by Fred Bast, associate civil engineer with the San Diego County Department of Public Works. His study is Appendix B of the present report; a summary of his findings will be presented below.

Existing sound levels were monitored at three locations, as shown on Figure 1 in the Noise Analysis. The monitoring period was for three days, from a Friday afternoon through the following Monday afternoon. A summary of the sound levels is presented in Table 4:

Table 4
Existing Noise Levels

	Leq			
Location	Day	Evening	Night	CNEL
1. CV Public Works, weekday	57	56	54	61
CV Public Works, weekend	56	53	49	58
CV Public Works, weekly	-	-	-	61
2. Woodlawn Avenue	61	-	-	65**2
3. Center of Project	62	-	-	63**3

1. All values in dBA.
2. It is assumed the difference between Site 1 and Site 2 Leq's is similar for other CNEL's.
3. The CNEL at Site 3 is based on an evaluation of data from Reference 1 in the Noise Analysis Report.

Primary noise source at the project site is highway traffic from adjacent roadways. The expected noise attenuation by distance is 3 dBA per doubling of distance. Most nearby buildings are air conditioned, with the exception of apartment buildings east of monitoring Site 2.

Noise Impacts

Future traffic volumes at the transit center are expected to be similar to current traffic levels, with only minor increases. The City of Chula Vista zoning ordinance excludes transportation facilities from noise performance standards (Section 19.66.070).

Generally, a guideline for maximum acceptable exterior noise levels is 65 CNEL, with no building attenuation measures. The existing and future noise levels are near this limit, but most of the surrounding buildings with closed ventilation systems will have acceptable interior noise levels. One set of apartment buildings fronting Woodlawn Avenue currently has insufficient attenuation. Estimated CNEL at the exterior of these units is 64, and will increase to 65 when the transit facility is fully developed.

The future interior noise levels are estimated at 57 CNEL for open windows and 34 CNEL for closed windows in the front apartment units. The State requires a CNEL of 45 or less for the construction of new multi-dwelling units.

Noise Mitigation

The proposed facility meets applicable local standards and no mitigating measures are required.

D. Air Quality Setting

Local sources of air pollution are primarily transportation modes, with automobiles by far the worst offenders. Interstate

5, adjacant and west of the project site, carried 97,000 average daily traffic in 1983.

The San Diego Air Pollution Control District (APCD) maintains a monitoring station in Chula Vista. The table below summarizes the most recently available recordings at that station:

Table 5

Existing Air Quality Levels

	Maximum Value			Days Over Standard		
	1982	1981	1980	1982	1981	1980
Photochemical Smog	20pphm	17 pphm	16pphm	5	3	6
Nitrogen Dioxide	18pphm	15pphm	17pphm	0	0	0
Carbon Monoxide	9ppm	8ppm	8ppm	0	0	0
Hydrocarbons	34pptm	28pptm	22pptm	183	180	168

All readings are for one hour maximum

Air Quality Impacts

Operation of the Bayfront Trolley Station will produce minor changes on both local and regional air quality. The project site currently has air pollution generators associated with automobile use of the tourist information booth, the gas station, and the bowling alley. Once the Bayfront Trolley Station is fully operational, with the maximum 380 parking spaces to be provided auto use of the site will be approximately the same as present levels. Thus, local air quality impacts will be the same or even slightly less than they are now.

Regional impacts should be beneficial. The purpose of the trolley station is to encourage use of public transportation, including transit and trolley use. This will reduce regional air pollution and energy expenditure by encouraging more efficient modes of transportation. In addition, implementation of the project incorporates five of the Regional Air Quality Standards (RAQS) tactics. These include transportation coordination (T-1), encouraging ridesharing (T-2), expanded transit facilities (T-5), development of park and ride facilities at light rail stations (T-24), and traffic engineering improvements for transit improvement projects (T-25). These and other tactics were designed to reduce air pollution in San Diego County.

Air Quality Mitigation

No significant air quality impacts have been identified with the implementation of this project. Therefore, no mitigation measures are considered to be required.

IV. Alternatives to the Proposed Project

A. No Project

The No Project alternative would leave things as they are, with no improvements to the regional transportation system through the provision of a new trolley transit station. No impacts would result, but neither would the advantage of consolidation of transportation modes occur. Convenience to users and operators would not occur, and regional beneficial impacts to air quality and energy consumption would not accrue.

B. Project of Smaller Scope in the Same Location

Design of the project was determined by coordinating the amount and types of services which could be provided and the predicted usage indicated by site specific demographic analysis. The size of the project is consistent with its desired utility; provision has been made for phased enlargement when it becomes necessary. A project of lesser scope would result in either cramped space and inconvenience to users and operators, or a reduction in service levels. In either case, the potential for beneficial impacts on air quality and energy consumption would be reduced.

C. Alternative Site Locations

Criteria were developed by the Metropolitan Transit Development Board in 1977 relevant to locating the original stations for the San Diego Trolley Line. They included:

1. Good accessibility for pedestrians, cars, bicycles, and buses.
2. Minimal land acquisition and displacement of people.
3. Locate away from environmentally sensitive areas.
4. Minimal neighborhood impacts.
5. Compliance with existing community plans.
6. Concentrate development adjacent to the station.
7. Physically integrate the stations into the community.
8. Provide access points near population while maintaining station spacing and high speed of the system.

In addition, three new criteria were later developed by MTDB when new stations were to be located on an existing line:

1. Projected net ridership.
2. Net operating cost.
3. Development of a financial plan.

Two alternative locations were examined by MTDB prior to the selection of the present site. This was done in concert with citizen imput through various public meetings, and by a brief review of the criteria listed above. A study was done by MTDB in August, 1982, which evaluated potential trolley stations at "E" Street and at "L" Street in Chula Vista. Each potential location was evaluated using the MTDB formulated criteria. The result of MTDB's study was that the "E" Street location was the preferred alternative, based primarily upon minimal land use impacts, positive ridership projections, and operating cost projections. The name of the station was subsequently changed to the Bayfront Trolley Station, and is the subject of the present report.

V. Short Term Uses Versus Long Term Productivity

Construction of this facility would involve a capital investment and the installation of permanent paved surfaces and roofed structures will effectively preclude use of the land for any other purpose in the forseeable future. The commercial enterprises now on site will suffer the inconvenience of relocation, and the County and City will temporarily lose tax revenues from these businesses. However, the project has the potential to benefit a large number of citizens both locally and regionally, and there will be beneficial impacts on regional air quality and energy consumption. Some local increase in noise, and decreased traffic impacts, will result.

Development of the Bayfront Trolley Station will be in accord with stated County and City objectives of reducing pollution and encouraging mass transit. Committment of the land to the proposed use will assure beneficial impacts due to anticipated land use and landscaping improvements.

VI. Irreversible Environmental Impacts

Because of the highly disturbed nature of this urban site, no significant impacts upon natural resources will occur. On the surrounding human environment, some increase in noise levels will result, but the urban setting serves to make these impacts less apparent than they would be in a quiet residential neighborhood. Use of the site for the proposed project will commit the land to this use with few options for change in the immediate future.

VII. Growth Inducing Impacts

The impact of this project on regional growth is insignificant. On the local level, the presence of a new trolley station would not normally be considered as an incentive to move or relocate to an area. However, the area across the freeway, within the Bayfront Coastal Plan, is currently essentially undeveloped land. The City of Chula Vista recently received approval from the California Coastal Commission for this plan, which includes recreational, commercial, and industrial development in portion of San Diego Bay. While the trolley station cannot be

considered the primary impetus for the development of the Chula Vista Bayfront, its presence will provide a more convenient access to the bay than presently exists. Establishment of a new trolley station at this location is not, however, the sole reason that the Bayfront area of Chula Vista will develop; it has been planned by the City for many years, and will proceed on course regardless of the outcome of this project.

VIII. Organization and Persons Consulted

City of Chula Vista, Engineering Department
Edgar Monroy

City of Chula Vista, Planning Department
Duane Bazzel
Doug Reid

County of San Diego, Air Pollution Control District
Stella Willcox

County of San Diego, Department of Planning and Land Use
Steve Denney

County of San Diego, Department of Public Works
Fred Bast, Associate Civil Engineer, Noise Report
Jon T. Rollin, Environmental Management Specialist
Steven R. Ron, Senior Transportation Specialist
Gary R. Fink, Environmental Management Specialist, Report Author

Metropolitan Transit Development Board
Helene Kornblatt
Dennis Wahl

San Diego Association of Governments
George Franck

IX. References Cited

Bechtel, Incorporated, 1978. Route Alignment and Station Location Studies, Task No. 5, Guideway Planning Project. With Wilbur Smith and Associates, Paderewski-Dean-Albrecht-Stevenson.

Caltrans, 1984. Traffic Volumes on California State Highways in District 11, 1969-1983.

City of Chula Vista, 1970. General Plan, 1990, Chula Vista, California. As revised through 1-17-84, and General Plan Map.

City of Chula Vista, 1974. Noise Element of the General Plan.

City of Chula Vista, 1974. Redevelopment Plan, Chula Vista Bayfront Redevelopment Project. Redevelopment Agency of the City of Chula Vista, California.

City of Chula Vista, 1979. Zone Classifications. Planning Department.

City of Chula Vista, 1982. Environmental Review Procedures of the City of Chula Vista. Planning Department.

City of Chula Vista, 1984. 1983 Traffic Flow, City of Chula Vista. Also 1983 Traffic Flow Map. Engineering Department.

City of San Diego, 1984. Recommended Weekday Trip Generation Rates Summary (Vehicle Trips). Engineering and Development Department.

Conradt, Robert, 1983. Bus Operation and Traffic Analysis, E Street Trolley Station.

Gruen Associates and Westec Services, 1978. Draft Environmental Impact Report, Guideway Planning Project. Task Report 17. With Bechtel Incorporated, Wilbur Smith and Associates, Woodward-Clyde Consultants, Robert J. Harmon and Associates.

Metropolitan Transit Development Board, 1977. Resolution to Establish Station Location Guidelines and Procedures. Resolution No. 77-57.

Metropolitan Transit Development Board, 1982. Evaluation of Adding Trolley Stations at E Street and L Street in Chula Vista.

San Diego Association of Governments, 1983. Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region. August, 1983.

Sedway Cooke Associates, 1983. Chula Vista Bayfront Land Use Plan. With Gruen Gruen Associates, James A. Hutchinson and Associates, Robert Conradt, and Jones and Stokes Associates.

Sedway Cooke Associates, 1984. Chula Vista Trolley Station Study, Recommended E-Street Station Development Program and Assessment. With Robert Conradt, J. Warren & Associates, Hilliard Lipman and Associates, Desmond & Marcello.

X. Comments and Responses

During public review of this EIR, comments were received from the following agencies:

1. California Department of Transportation

2. MTDB

These letters of comments and responses are on the following pages.

STATE OF CALIFORNIA—BUSINESS AND TRANSPORTATION AGENCY GEORGE DEUKMEJIAN, Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 11, P.O. BOX 85406, SAN DIEGO 92138-5406

October 22, 1984

11-SD-005-8.6

Douglas D.Reid
Environmental Review Coordinator
City of Chula Vista
P. O. Box 1087
Chula Vista, CA 92012

Dear Mr. Reid:

Draft EIR for Bayfront Trolley Station, EIR-84-2

As proposed in the generalized site plan (page 7), the bus and tourist entrance from "E" Street would be very close to the railroad crossing and to the Interstate Route 5 ramp intersection. Caltrans believes that vehicles turning left toward that proposed entrance are likely to create a significant accident potential and contribute to increased congestion and confusion. It would be preferable to have buses and tourists enter the site from Woodlawn Avenue.

Sincerely,

W. R. Dotson
District Director

By
for James T. Cheshire, Chief
Environmental Planning Branch

JTC:jk

RECEIVED
BY.....
OCT 23 1984
PLANNING DEPARTMENT
CHULA VISTA, CALIFORNIA

Response

The bus access to the proposed facility has been shifted to the Woodlawn Avenue access point. This will result in a substantial reduction in congestion and the potential for safety hazards along 'E' Street. With proper stripping for left turn holding capacity on 'E' Street, there shouldn't be any substantial safety problems. It would not be preferable to have tourists enter the site from Woodlawn Avenue because they would not be familiar with the street system in the vicinity and it would be important to get them to the visitor information facility immediately after exiting from the freeway.

mtdb Metropolitan Transit Development Board
620 "C" Street, Suite 400, San Diego, California 92101-5368 (619) 231-1466

October 22, 1984

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BY..... G-E 4

OCT 24 1984

PLANNING DEPARTMENT
CHULA VISTA, CALIFORNIA

Mr. Douglas Reid
Environmental Review Coordinator
City of Chula Vista
P.O. Box 1087
Chula Vista, CA 92012

Dear Mr. Reid:

SUBJECT: DRAFT ENVIRONMENTAL REPORT FOR THE BAYFRONT TROLLEY STATION (EIR-84-8)

Thank you for the opportunity to comment on this DEIR. As you are aware, as a Responsible Agency, the MTD Board of Directors will consider the EIR when reviewing station plans and/or reports.

The DEIR adequately evaluates project impacts, however, we would appreciate the inclusion of a statement that the project design would impact future Trolley users as well as San Diego Trolley maintenance costs. Therefore, MTDB should be a participant in the project design and should receive and approve the final design.

The proposed station would be located on MTDB property. While the parking would not be on MTDB property, in order for the project to be implemented, it will be necessary to address issues of liability, maintenance, and security related to the parking. These issues should be subjects for an agreement of all affected parties.

While the agreement need not be resolved in order to complete the environmental review, the EIR should state that these issues exist and that they must be resolved in a future agreement.

Please feel free to contact me if you have any questions concerning these comments.

Sincerely,

Bill Lieberman
Director of Planning and Operations

BL:HBK:mm

cc: Steve Ron, County Department of Transportation

Response

It is noted that MTDB concludes that the EIR adequately evaluates the project impacts but would like further information included. In this letter, MTDB requested that they participate in the project design and that they receive and approve the final design. Furthermore, MTDB has stated that the issues of liability, maintenance and security of the parking area needs to be addressed and should be the subject of a final agreement for all affected parties. It is also noted that MTDB stated that these agreements are not necessary at this stage of the project review, however, they did request that they be stated in the final EIR.

The letter from MTDB and the above noted responses are incorporated into this final EIR on the project.

Appendix A: Notice of Preparation
And Responses

NOTICE OF INTENT TO PREPARE A DRAFT EIR

PROJECT TITLE: Bayfront Trolley Station, Chula Vista

The City of Chula Vista will be the Lead Agency for this project, with the County of San Diego and the Metropolitan Transit Development Board as Responsible Agencies. The draft EIR is being prepared by the County of San Diego.

The project description, location, and the probable environmental effects of the project are contained in the attached materials.

We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Please send your response, including the name and phone number of a contact person in your agency, to:

City of Chula Vista
Planning Department
276 Fourth Avenue
Chula Vista, CA 92010
Attn: Doug Reid

Due to the time limits mandated by State law, your response must be sent at the earliest possible date, but not later than 45 days after receipt of this notice.

Bayfront Trolley Station, Chula Vista

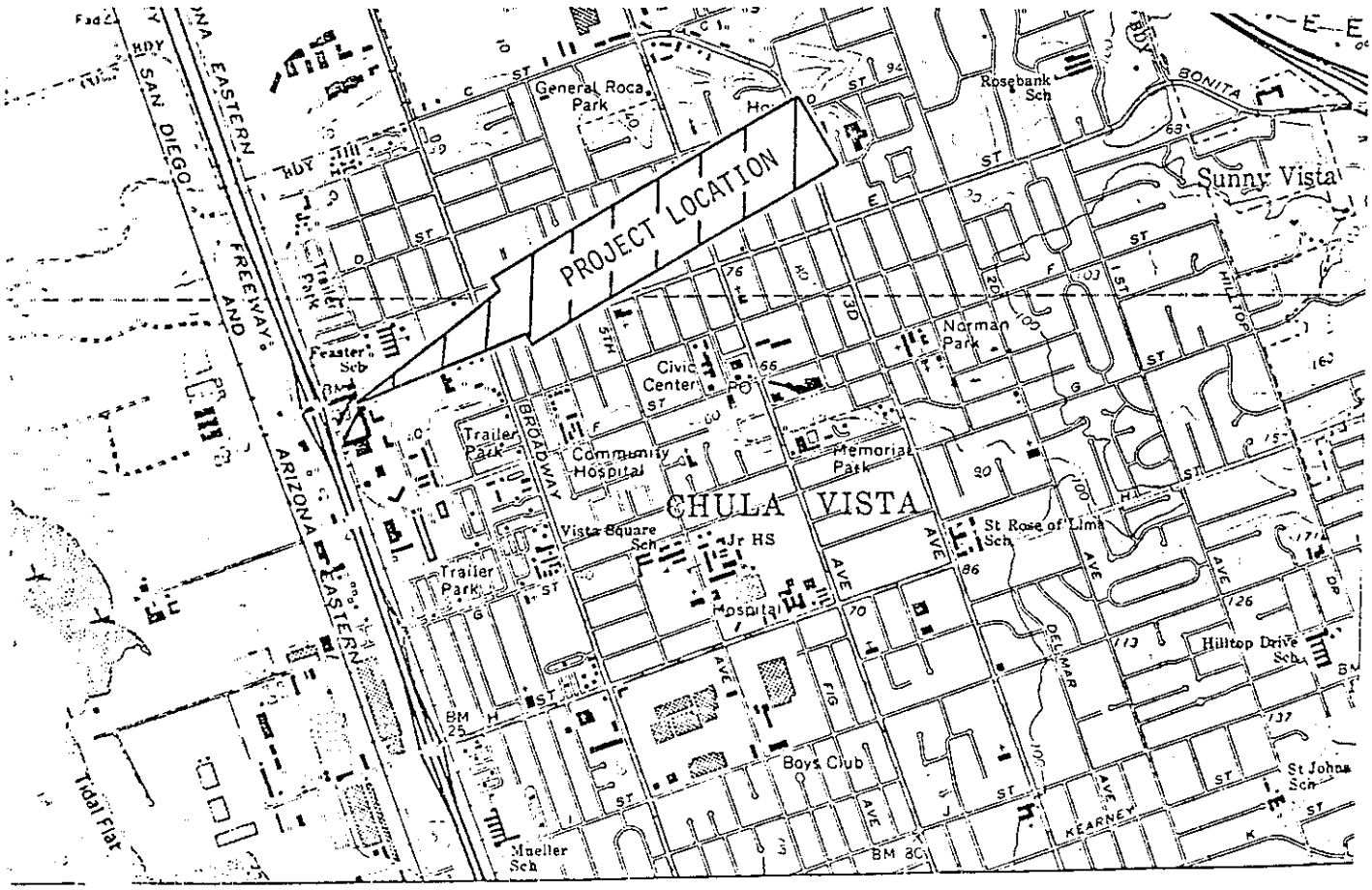
PROJECT DESCRIPTION

This project is for the acquisition of land and the construction and operation of the Bayfront Trolley Station at "E" Street/I-5 interchange in the City of Chula Vista. It would include parking for 130 vehicles in the initial phase, with provision for additional parking in later phases; acquisition of 4.146 acres of land for station development; construction of a station for joint use by the trolley and for commercial tenants; and, provision of bus bays for a bus transfer location.

The attached map outlines the exact project location.

The probable environmental effects of the project are:

1. Traffic/Circulation
2. Noise
3. Air Quality



BAYFRONT TROLLEY STATION
LIST OF INTERESTED AGENCIES/PERSONS

California Coastal Commission

SANDAG

MTDB

Santa Fe & Arizona Eastern Railroad

SDG&E

Pacific Bell

Chula Vista Chamber of Commerce

Apartments

Hope Development

Merle Palmer

Cabrillo Lanes Bowling Alley

Super Seven Gas Station

mtdb Metropolitan Transit Development Board
620 C Street Suite 400 San Diego California 92101-5368 (619) 231-1466

July 12, 1984

G-E 4

Mr. Doug Reid
City of Chula Vista
Planning Department
276 Fourth Avenue
Chula Vista, CA 92010

Dear Mr. Reid:

SUBJECT: BAYFRONT TROLLEY STATION CHULA VISTA - RESPONSE TO NOTICE OF INTENT TO PREPARE A DRAFT EIR

Thank you for the opportunity to comment on the above-named Notice of Intent. As a "Responsible Agency" for the EIR, we concur that an EIR is the appropriate document for the Bayfront Trolley Station project.

We agree with the probable environmental effects listed in the Notice of Intent. We urge that the EIR address traffic/ circulation issues that relate to trolley station access, and trolley patron parking.

We look forward to reviewing the Draft EIR. Furthermore, as a Responsible Agency, the MTD Board of Directors will consider the EIR when reviewing station plans and/or reports.

Sincerely,

Eva Lerner-Lam
Director of Planning
and Operations

ELL:HBK:gk

San Diego
ASSOCIATION OF
GOVERNMENTS
Suite 524 Security Pacific Plaza
1200 Third Avenue
San Diego, California 92101
(619) 236-5300

July 20, 1984

Doug Reid
Planning Department
City of Chula Vista
276 Fourth Street
Chula Vista, CA 92010

Re: Bayfront Trolley Station Draft EIR

Dear Mr. Reid

SANDAG staff has no comment on the notice of intent to prepare a Draft EIR on this project. However, I am enclosing information on the potential for joint use of the station site from unpublished market studies prepared by SANDAG. Please note that these are draft materials.

Following is an explanation of the tables:

- The first table is an indicator of the market potential for nine types of uses at the site, in terms of potential employment. The results are based on excess purchasing power for three areas (1/3 mile radius - walking distance, 1/3 to 1 mile radius - "band", and 1 mile radius - typical spacing between neighborhood commercial centers in the San Diego region) for 1980, 1990 and 2000, based on the 1980 census and regional growth forecasts.
- The tables titled 2.5 mile radius provide demographic, employment and development information for the 2.5 mile radius around the station site.
- The following tables present similar information for a 1/3 mile radius around the station site.

I hope this information may prove useful to the City or the group preparing the Draft EIR. Please call me at 236-5346 if you have questions.

Sincerely,

STEVE SACHS
Senior Regional Planner

SS/ce

cc: Eva Lerner-Lamb, MTDB

SDG&E

San Diego Gas & Electric

FILE NO --

July 26, 1984

City of Chula Vista
Planning Department
276 Fourth Avenue
Chula Vista, CA 92010

Attention: Mr. Doug Reid

RE: BAYFRONT TROLLEY STATION
CHULA VISTA

Dear Mr. Reid:

Thank you for notifying San Diego Gas & Electric about the subject trolley station.

While gas and electric distribution facilities can be made available to this project according to San Diego Gas & Electric's rules filed with and approved by the California Public Utilities Commission, the continued availability of gas and electric energy for this and future projects is dependent on the supply of fuel and other essential materials and governmental approval of facilities construction.

If you have any questions about this matter, please call me at 696-2388. If you have questions about the distribution of energy to or within the project please contact our South Bay District Planning office at 425-3060. Questions on distribution would probably be more appropriate when the project design is further along.

Sincerely,

Donna McGuire

Donna McGuire
Land Assistant

DMM:mae

RECEIVED

JUL 27 1984

PLANNING DEPARTMENT
CHULA VISTA, CALIFORNIA

POST OFFICE BOX 1831 · SAN DIEGO, CALIFORNIA 92112 TELEPHONE: 714 232 4252

APPENDIX B

COUNTY OF SAN DIEGO

DEPARTMENT OF PUBLIC WORKS

MATERIALS LAB

NOISE ANALYSIS

BAYFRONT TROLLEY STATION

CHULA VISTA, CALIFORNIA
(W.O. UJ3946)

SEPTEMBER, 1984

Prepared By:

Fred E Bast 9/20/84

FRED E. BAST
ASSOCIATE CIVIL ENGINEER

SUMMARY OF FINDINGS

The proposed Bayfront Trolley Station, bus stop and parking area will have little or no noise impact. The existing noise levels of CNEL 61 to 65 will increase approximately 1 dBA after the completion of the project's final phase. The City of Chula Vista excludes transportation facilities from noise performance standards and mitigation measures are not required.

PROJECT DESCRIPTION

The project is located on the eastern boundary of the San Diego Trolley and the south side of "E" Street, in the City of Chula Vista (CV). The proposed project will initially provide a trolley station, four bus stops and 150 parking spaces. Future construction will expand the facility to a maximum of six bus stops and 380 parking spaces.

The site is presently being used by a bowling alley and gas station, and the zoning is visitor commercial zone. The existing surrounding land uses are: westerly - trolley line and Interstate 5; northerly and easterly - commercial (gas stations, motels, restaurants, offices), and southerly - City of Chula Vista Public Works(CVPW) yard. Also, at the proposed facility entrance/exit on Woodlawn Avenue, there are apartment houses.

See Figure 1.

EXISTING NOISE

The sound level was monitored at three sites as shown on Figure 1 on September 14 through 17, 1984. At Site 1, the monitoring period was from Friday afternoon to Monday afternoon. Half hour readings were taken at Site 2 and 3. See Attachment "A".

A summary of the sound level follows:

Site	Leq Day	Leq Evening	Leq Night	CNEL
1. CVPW, Weekday	57	56	54	61
CVPW, Weekend	56	53	49	58
CVPW, Weekly	-	-	-	61
2. Woodlawn Ave.	61	-	-	65 (See Note 2)
3. Center of Project	62	-	-	63 (See Note 3)

Notes:
1. All values in dBA
2. It is assumed the difference between Site 1 and Site 2 leq's is similar for other CNEL's, i.e. CNEL (1) = CNEL (2) + 4
3. The CNEL at Site 3 is based on an evaluation of data from Reference 1.

The primary noise at all the monitoring site is highway traffic on the adjacent roads. The expected far field drop-off rate (noise attenuation by distance) is 3dBA per doubling of distance.

Most of the nearby buildings appeared to be air conditioned, except for the apartment buildings east of Site 2.

FUTURE NOISE

The present traffic volumes at site will be similar to the future volumes at the final project phase (III). The major difference that could affect the existing noise levels is the bus traffic. It is our understanding that the maximum number of bus trips (in or out) will be 70. Also, we assumed all the buses exiting the facility onto Woodlawn Avenue will be heading north.

The following table shows the existing and future noise levels and traffic volume.

Site	Existing		Future	
	ADT	CNEL	ADT	CNEL
2. Woodlawn Ave.	3720	65	3790	66
3. Center of Project	5960	63	6170	64

Notes: 1. Average daily traffic (ADT) is the total number of vehicles per day.
2. CNEL future = CNEL existing + CNEL bus (see attachment "B".

NOISE IMPACT

The City of Chula Vista zoning ordinance excludes transportion facilities from noise performance standards (Section 19.66.070)

Generally, a guideline for maximum acceptable exterior noise level is CNEL = 65 with no building attenuation measures. (See reference 3). The existing and future noise levels are near this limit, but most of the surrounding buildings with

closed ventilation systems will have acceptable interior noise levels. The one area affected by high noise levels with insufficient attenuation measures is the apartment units fronting Woodlawn Avenue near the facility entrance/exit. It is estimated the CNEL at the exterior of these units is 64 and will increase to 65 when the transit facility is fully developed.

The future interior noise levels are estimated to be CNEL = 57 for open windows and CNEL = 34 for closed windows in the front apartment units (See attachment D). The state requires a CNEL of 45 of less for the construction of new multi-dwelling units.

MITIGATION

The proposed facility meets applicable local standards and no mitigating measures are required.

REFERENCES

1. Assessment of Existing and Future Ambient Noise Environments for a Light Rail System in San Diego, Environmental Analysis Branch, District 11, CALTRANS, February, 1978.

2. Noise Element of the General Plan, City of Chula Vista, California, June 1974.

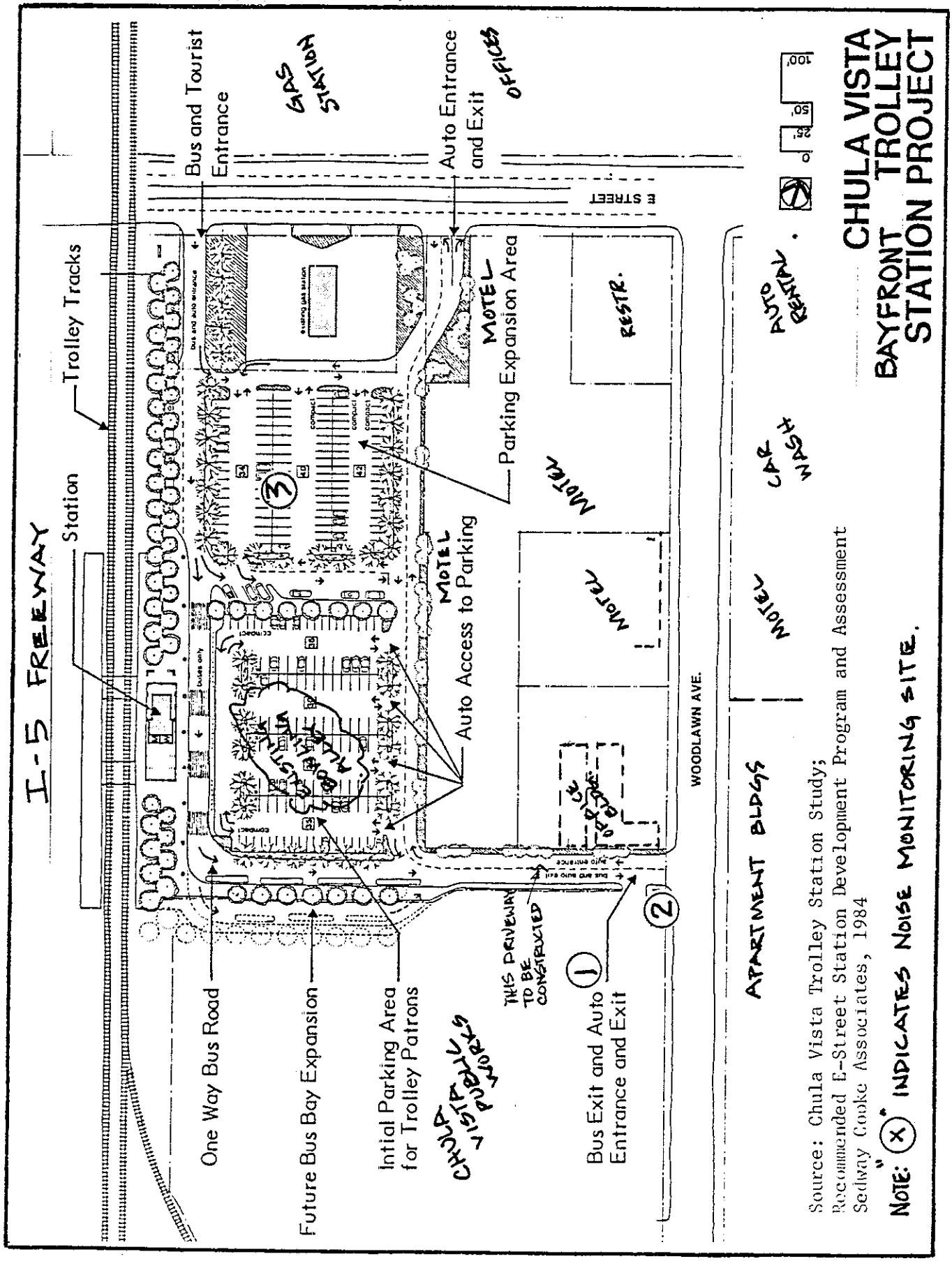
3. Guidelines for Considering Noise in Land Use Planning and Control, Federal Interagency Committee on Urban Noise, June, 1980.

4. Insulation of Buildings Against Highway Noise, Federal Highway Administration, FHWA-TS-77-702, 1977.

5. Noise Insulation Standards, California Administrative Code, Title 25, Chapter 1, Subchapter 1, Article 4, Section 28, June 1979.

BAYFRONT TROLLEY STAT.
UJ3946

FIGURE 1, NOISE MONITORING SITES



Source: Chula Vista Trolley Station Study; Recommended E-Street Station Development Program and Assessment Sedway Cooke Associates, 1984

NOTE: (X) INDICATES NOISE MONITORING SITE.

ATTACHMENT "A"

COUNTY ENGINEER DEPARTMENT - CALCULATION SHEET

Project: BAYFRONT TROLLEY STATION		No. UJ3946	Sheet 1 of 3
Subject: SITE #1 HOURLY Leq & CNEL LEVELS			
Computed by F.E. BAST	Date 9/19/84	Checked by	Date

	DATE	9/14	9/15	9/16	9/17		WEEK DAY	WEEK END	WEEKLY
	DAY	FRI.	SAT.	SUN.	MON.				
DAY	0700 - 0800		53.2	54.5	55.9				
DAY	0800 - 0900		54.7	54.3	59.0				
DAY	0900 - 1000		54.9	54.5	54.7				
DAY	1000 - 1100		55.6	54.0	54.7				
DAY	1100 - 1200		55.8	54.5	55.6				
DAY	1200 - 1300		57.1	54.9	58.1				
DAY	1300 - 1400		57.7	56.2	57.1				
DAY	1400 - 1500		55.8	54.0					
DAY	1500 - 1600		55.3	53.6					
DAY	1600 - 1700	58.8	57.0	55.1					
DAY	1700 - 1800	57.7	55.7	54.9					
DAY	1800 - 1900	57.5	57.9	55.1					
DAY	ave. L_d	58.0	56.1	54.7	56.7		57.4	55.5	
EVENING	1900 - 2000	56.8	54.7	53.0					
EVENING	2000 - 2100	56.0	52.6	52.6					
EVENING	2100 - 2200	55.6	52.3	52.1					
EVENING	ave. L_e	56.2	53.3	52.6			56.2	53.0	
NIGHT	2200 - 2300	53.2	51.7	51.9					
NIGHT	2300 - 2400	52.8	51.3	51.5					
NIGHT	0000 - 0100		50.4	52.5	50.4				
NIGHT	0100 - 0200		51.9	47.6	44.6				
NIGHT	0200 - 0300		49.1	46.8	43.8				
NIGHT	0300 - 0400		49.4	44.2	45.0				
NIGHT	0400 - 0500		47.2	42.7	55.3				
NIGHT	0500 - 0600		45.0	44.0	60.0				
NIGHT	0600 - 0700		49.6	47.4	55.3				
NIGHT	ave. L_n		49.8	49.0	54.3		54.0	49.4	
	CNEL						61.4	57.7	60.6

NOTES: 1. ALL READINGS IN dB(A)

2. $$CNEL = 10 \log\left[\frac{12}{24}\left(10^{\frac{L_D}{10}}\right) + \frac{3}{24}\left(10^{\frac{L_E+5}{10}}\right) + \frac{9}{24}\left(10^{\frac{L_N+10}{10}}\right)\right]$$

3. MEASURING INSTRUMENT - BBN 614 NOISE MONITORING

4. LOCATION - 800'± S/O "E" ST, 90'± W/O ℄ NEAR LANE WOODLAWN AVE.

ATTACHMENT "A"

COUNTY OF SAN DIEGO MATERIALS LAB SITE SOUND STUDY

Project: BAY FRONT TROLLEY STATION Sheet 2 of 3

W.O.: UJ3946 Date: 9/17/84 Time: 1410-1440 By: F.E. BAST

Measuring Instruments: BBN 614 NOISE MONITOR

Site Number & Location: #2, 700'± S/O "E" ST., 30' W/O ℄ NEAR LANE WOODLAWN AVE.

Weather Conditions: Wind 10-15 MPH, Clear X or Rain ____, Other 85°F

TRAFFIC DATA

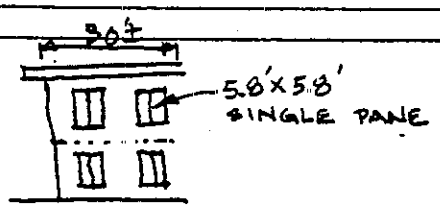
Counts Cumulative Totals Only	NEAR LANE Direction of Travel (N)SEW Passenger Pickup	2 Axle Truck Bus	3 Axle Truck Bus		FAR LANE Direction of Travel (N)SEW Passenger Pickup	2 Axle Truck Bus	3 Axle Truck Bus		PLANES
Start 1410 / 1420	16	0	0		24	1	0		1
1430	25	0	0		44	1	0		1
1440	45	2	0		60	1	0		3
Total 1/2HR	105	3	0						
Both 1 HR	210	6	0						
Directions %	97.2	2.8	0						

Average Speed: 25 MPH

No. of Lanes 2 Median Width 0

REMARKS: 1. NOISE SOURCES A. TRAFFIC ON WOODLAWN AVE., B. TRUCKS OF "E" ST., C. WIND IN TREES, D. CHULA VISTA PUBLIC WORKS YARD. 2. TWO APTS. ACROSS ST. WITH OPEN WINDOWS.

WORST CASE APT. BLDG. 40± FROM NEAR LANE.



	L_{eq}	L_{99}	L_{90}	L_{50}	L_{10}	L_1	L_{max}	TIME
	60.7	50	52	55	64	70	73	1410 1420
	59.8	50	51	54	63	69	72	1420 1430
	61.6	51	51	55	66	70	73	1430 1440
AVR.	60.8	50	51	55	65	70	—	

ATTACHMENT "A"

COUNTY OF SAN DIEGO MATERIALS LAB SITE SOUND STUDY

Project: BAYFRONT TROLLEY STATION Sheet 3 of 3

W.O.: UJ3946 Date: 9/17/84 Time: 1510 - 1540 By: F.E. BAST

Measuring Instruments: BBN 614 NOISE MONITOR

Site Number & Location: #3, PROPOSED PARKING LOT, 310' S/O "E" ST., 110' E/O W'LY PROPERTY LINE.

Weather Conditions: Wind 10-15 MPH, Clear X or Rain ____, Other 85°F

TRAFFIC DATA

Counts Cumulative Totals Only	NEAR LANE Direction of Travel N S E W				FAR LANE Direction of Travel N S E W				
	Passenger Pickup	2 Axle Truck Bus	3 Axle Truck Bus		Passenger Pickup	2 Axle Truck Bus	3 Axle Truck Bus		TROLLEYS
Start 1521 / 1520	131	1	2		157	2	3		1
1530	297	2	3		289	2	4		3
1540	492	4	4		434	4	4		5
Total ½HR	926	8	8						
Both 1HR	1852	16	16						
Directions %	98.3	0.8	0.8						

Average Speed: 25 MPH

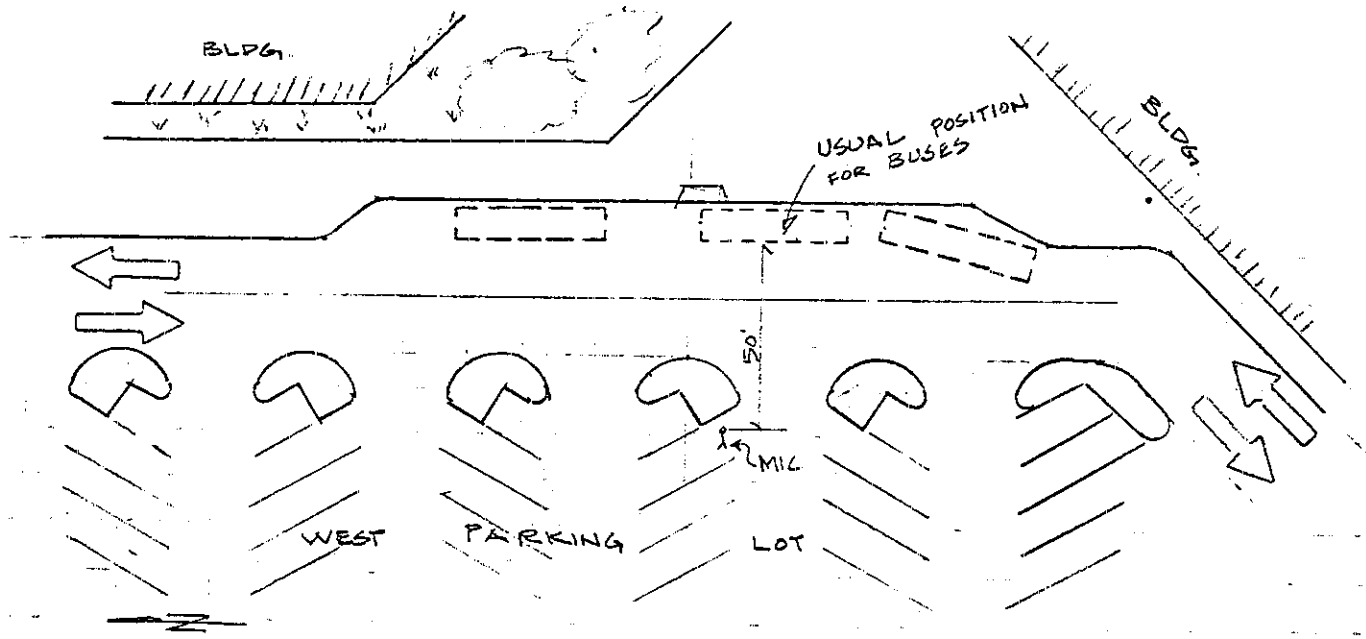
No. of Lanes 4 Median Width 18

REMARKS: 1. NOISE SOURCES: A. HEAVY TRUCKS ON I-5, B. TRAFFIC OF "E" ST. 2. STOP & GO TRAFFIC ON "E" ST. DUE TO TRAFFIC LIGHT & TROLLEY CROSSING W/O AND ADJACENT TO SITE, 3. BACK OF MOTEL ON E. SIDE OF SITE WITH SMALL (1.5'x1.5'±) WINDOW, BATHROOM?, IN EACH UNIT.

	L_{eq}	L_{99}	L_{90}	L_{50}	L_{10}	L_1	L_{max}	TIME
	61.5	58	59	61	62	65	68	1510-1520
	62.8	58	59	60	63	70	75	1520-1530
	62.0	58	59	60	63	67	72	1530-1540
AVR	62.1	58	59	60	63	68		

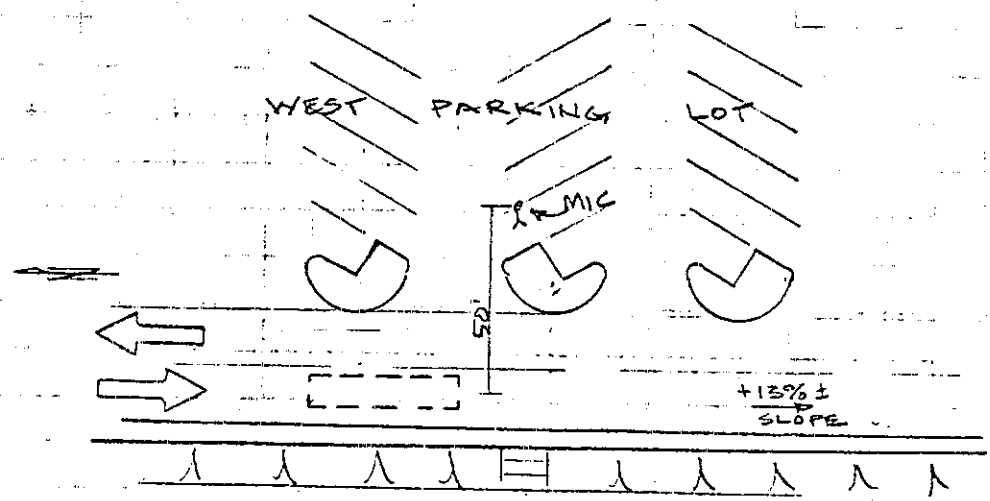
ATTACHMENT "B"

CALCULATION SHEET – DEPARTMENT OF PUBLIC WORKS			
Project ~~SDSU TRANSIT CENTER~~ BAYFRONT TROLLEY	No. ~~UT6080~~ UJ3946	Sheet 1 of 3	
Subject BUS NOISE AT UNIVERSITY TOWNE CENTRE - REFERENCE LEVEL DETERMINATION			
Computed by F.E. EAST	Date 10/82	Checked by	Date



TEST SET-UP, START - STOP

APPROX SCALE 1" = 50'



TEST SET-UP, PASS-BY

APPROX SCALE 1" = 50'

EQUIPMENT USED: BBN 614 NOISE MONITOR, GR NOISE LEVEL METER, MODEL 1933 AND GR GRAPHIC RECORDER MODEL 1523

ATTACHMENT "B"

CALCULATION SHEET – DEPARTMENT OF PUBLIC WORKS			
Project ~~SDSU TRANSIT CENTER~~ BAYFRONT TROLLEY		No. ~~UT0080~~ UT3946	Sheet 2 of 3
Subject BUS NOISE AT UNIVERSITY TOWNE CENTRE – REFERENCE LEVEL DETERMINATION			
Computed by F.E. BAST	Date 11/82	Checked by	Date

START - STOP CONDITION

TEST	BUS #	DURATION (MIN.)	NEL (dBA)	REF. $L_{eq}(h)$, (dBA/HR)
1	963	1.18	67.4	50.3
2	712	1.23	66.9	50.0
3	823	0.51	71.1	50.4
4	931	0.74	66.2	47.1
5	817	0.55	69.7	49.3
6	825	0.55	68.9	48.5
7	712	0.55	69.7	49.3
8	913	0.38	74.4	52.4
9	823	1.80	64.4	49.2
10	963	1.86	64.8	49.7
11	423	1.11	71.7	54.4
		0.95		50.5

– NOISE MONITOR READINGS DURING TEST –

DAY	TIME	L_{99}	L_{90}	L_{50}	L_{10}	L_1	L_{MAX}	L_{eq}	REMARKS
10/15	0800	(START)							
	0810	56	57	58	69	76	78	65.8	
	0820	54	56	59	66	73	76	62.8	
	0830	54	55	57	66	76	79	63.9	
	0840	53	54	56	60	72	76	60.5	
	0850	52	54	57	~~69~~	~~90~~	~~93~~	~~75.0~~	⇐ JETS PASS OVER
	0900	49	51	55	66	74	80	63.3	
	0910	49	52	59	67	78	84	66.1	
	0920	51	52	56	66	78	81	65.2	
	0930	51	54	57	67	78	81	65.0	
	AVR	52	54	57	66	76	–	64.4	

CNEL CALC., ASSUMPTIONS: 1. 70 TRIPS/DAY 2. OPERATION HOURS 0530 – 2100 ⇒ 15.5 HRS. 3 AVR. HOURLY VOL. = 70/15.5 = 4.5 BUSES/HR.

$\Rightarrow L_{eq}(h) = 10 \log(4.5 \times 10^{\frac{50.5}{10}}) = 56.5$ dBA

$CNEL_{S-S} = 10 \log\left[\frac{1}{24}\left(12 \times 10^{\frac{56.5}{10}} + 2 \times 10^{\frac{56.5+2}{10}} + 1.5 \times 10^{\frac{56.5+10}{10}}\right)\right] = 57.9$ dBA

ATTACHMENT "B"

CALCULATION SHEET – DEPARTMENT OF PUBLIC WORKS			
Project ~~CBSU TRANSIT CENTER~~ BAYFRONT TROLLEY		No. ~~UT0080~~ UJ3946	Sheet 3 of 3
Subject BUS NOISE AT UNIVERSITY TOWNE CENTRE – REFERENCE LEVEL DETERMINATION			
Computed by F.E EAST	Date 11/82	Checked by	Date

PASS-BY CONDITION

	TEST	BUS #	DURATION (MIN.)	NEL (dBA)	REF. L_{eq}(h), (dBA/HR)
10/14	1	965	0.27	75.6	52.1
	2	715	0.23	70.9	46.7
	3	963	0.21	74.1	49.5
	4	306	0.22	69.1	44.7
	5	940	0.27	68.1	44.6
	6	825	0.16	72.5	46.8
	7	811	0.18	74.3	49.1
	8	903	0.14	71.4	45.1
10/15	9	959	0.19	75.5	50.5
	10	414	0.29	76.6	53.4
	11	712	0.23	74.2	50.0
	12	803?	0.21	76.3	51.7
		AVR.	0.22		AVR. 49.6

– NOISE MONITOR READINGS DURING TEST –

DAY	TIME	L_{99}	L_{90}	L_{50}	L_{10}	L_1	L_{MAX}	L_{eq}
10/14	1304	START						
	1310	53	54	58	64	78	83	65.2
	1320	52	54	59	67	76	79	65.2
	1330	53	54	58	65	70	73	62.2
	1340	53	54	58	64	74	77	62.8
10/15	0938	START						
	0940	52	52	58	66	78	78	65.6
	0950	50	52	55	63	72	78	61.3
	1000	51	52	57	68	76	79	64.8
	1010	49	51	67	64	78	83	64.3
	1015	51	52	58	67	81	84	67.6
	AVR.	52	53	58	65	76	–	64.7

CNEL CALC., ASSUMPTIONS SIMILAR TO SHT 2, EXCEPT $L_{eq}(h) = 10\log(4.5\times10^{\frac{49.6}{10}}) = 56.1$ dBA

$CNEL_{P-B} = 10\log\left[\frac{1}{24}\left(12\times10^{\frac{56.1}{10}} + 2\times10^{\frac{56.1+5}{10}} + 1.5\times10^{\frac{56.1+10}{10}}\right)\right] = 57.5$ dBA

NOISE CRITERIA & DEFINITIONS

Noise has been defined as unwanted sound and it is known to have several effects on people. From these known effects of noise, criteria have been established to help protectthe public health and safety. This criteria is based on the following known effects of noise on people:

1. Hearing loss
2. Speech Interference
3. Sleep Interference
4. Physiological Responses
5. Annoyance

Each of these potential noise impacts on people are briefly discussed in the following paragraphs.

Hearing loss is, in general, not a concern in environmental noise problems. The potential for noise induced hearing loss is more commonly associated with occupational noise exposures in heavy industry or very noisy work environments. Noise levels in neighborhoods, even in very noisy airport environs, is not sufficiently loud to cause hearing loss. For example, the Occupational Safety and Health Administration (OSHA) has identified a noise exposure of 90 dBA 8 hours per day 5 days per week for 40 years as acceptable for the prevention of hearing loss. For shorter exposure times, higher noise levels are permissable.

Speech interference is one of the primary concerns in environmental noise problems. Normal conversational speech is in the range of 60 to 65 dBA and any noise in this range or louder may interfere with speech. There are specific methods of describing speech interference as a function of distance between speaker and listener and voice level.

Sleep interference is a major noise concern in residential areas and is most critical during nighttime hours. Interior noise levels above 45 dBA have been identified as having the potential to cause sleep disturbance. Note that sleep disturbance does not necessarily mean causing people to awaken but can refer to altering the pattern and stages of sleep.

Physiological responses are those measurable effects of noise on people which are realized as changes in pulse rate, blood pressure, etc. While such effects can be induced and observed it is not known the extent to which physiological responses cause harm or are sign of harm.

Annoyance is the most difficult of all noise responses to describe. Annoyance is a very individual characteristic and can vary widely from person to person. What one person considers unbearable can be quite tolerable to another of equal hearing capability. In selecting noise criteria it is desirable to design towards the middle of the spectrum of peoples annoyance.

Worksheet No. 1 - Calculation of Building Noise Reduction

EWNR Calculation for Wall Elements

Wall (WINDOWS ↓)	Basic EWNR (Table 1)		EWNR Adjustment (Table 2)		Total EWNR
#1 OPEN	36 dB	+	0 dB	=	36 dB
#2 CLOSED	36 dB	+	0 dB	=	36 dB

Composite Wall EWNR

From Worksheet 2 including All Windows, Doors, etc.

	Wall 1	Wall 2	Total Walls
Composite EWNR, dB including windows, doors, etc.	6 dB	29 dB	dB
Total Area, Sq Ft	120 ft^2	120 ft^2	ft^2

EWNR Calculation for Roof-Ceiling Elements

Attic Space Construction		Single Joist Construction	
Basic EWNR (from Table 3)	dB	Basic EWNR (from Table 3)	31 dB
New Basic EWNR for vented spaces (from Table 5)	dB	Adjustment for absorption (from Table 4)	5 dB
Adjustment for self-shielding (from Table 6)	dB	Adjustment for self-shielding (from Table 6)	6 dB
Total EWNR (Sum of one basic EWNR and adjustment)	dB	Total EWNR (Sum of above)	42 dB

Structure Composite Wall/Roof-Ceiling EWNR

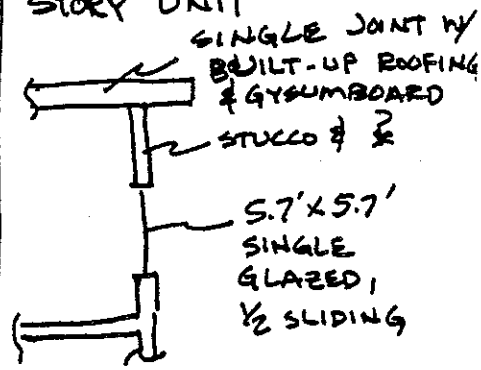
(from Worksheet 2)

	Walls	Roof-Ceiling	Total Structure
Composite EWNR, dB	6/29 dB	42 dB	18/34 dB
Area, Sq Ft	120 ft^2	300 ft^2	420 ft^2

Final Calculation for Noise Reduction

Structure Composite EWNR		Interior Absorption Correction from Table 10			Structure Noise Reduction
11/34 dB	-	(-3) dB	-6	=	8/31 dB (OPEN / CLOSED)

TYPICAL UPPER STORY UNIT



NOTE From Federal Highway Admintration Insulation of Buildings Against Highway Noise, FHWA-TS-77-202