Chapter 1

NOISE AND VISUAL IMPACT OF BART: EMPHASIS ON De COTO IN UNION CITY

Joe Samoy

Introduction

The Bay Area Rapid Transit (BART) system has had a major impact on the Bay Area population; BART transports about 250,000 people a day, and has brought the suburbs closer to metropolitan San Francisco and Oakland. BART has also made an impact in the Bay Area environment. This paper will deal with the noise and visual impacts on nearby communities, with an emphasis on the residential community of De Coto in Union City. It will discuss the impacts of the three types of line configurations used by BART: subway, ground and aerial lines. An emphasis will be put on the type of track line used in De Coto, the aerial line.

The district of De Coto (Figure 1) is an old, lower-middle class and largely Hispanic neighborhood. How has the noise of BART's trains affected this type of population? Did construction of BART aerial structures affect the visual aspect of the community? If so, what is being done about it? Has the presence of BART had a negative or positive effect on housing prices?

When BART began operations in 1974, Union City was classified as open space/land under development; has land around BART lines, in De Coto, been developed in any manner? Has BART stimulated improvement in the area? I will attempt to answer these questions as fully as possible.

A Brief History of De Coto

De Coto was one of the two townships incorporated into Union City when the city was formed in 1959. Union City is located in southern Alameda County and has a present population of 40,000. When BART began service in 1974, the population of Union City was 20,000, and the district of De Coto was basically a Hispanic farming community. The district consisted mainly of newly-settled farm laborers and older residents. In 1974, 87% of De Coto's population were of Spanish-American ethnicity, 34% of the total housing units warranted rehabilitation and 58% of De Coto's population was living under the poverty level (Union City, 1976).

When BART aerial structures were constructed in the district, they were positioned around, next to, or over the existing Union-Pacific railway tracks. Although BART trains do not produce noise levels as high as the Union-Pacific trains, they do run through the district much more frequently. Therefore, BART trains do not bring higher noise levels, but they do result in a more consistent noise source to the district (Graff and Knight, 1979).

The BART lines also brought to the district a new type of structural material, stucco. Nearly all the homes built before BART's inception (houses built in the 1940's) were constructed of wood. These homes were designed for single families and were economically built; houses were small and used the cheapest available material, wood.

BART aerial structures are concrete, which 'clashes' with wood homes (Gruen Associates, 1976). Now, all the new buildings constructed near the BART tracks possess stucco exteriors. Therefore, slowly the physical appearance of De Coto has changed from a sleepy, farming community to a suburb of stucco houses.

Previous Studies

Many studies have been done on BART's noise and visual impact systemwide, but an environmental impact study has never been done specifically on Union City. Some noteworthy past studies are by Graff and Knight (1979), which presents a summary of all of BART's environmental impacts, and De Leuw and others (1977), which deals with the responses from nearby residents on the environmental impacts of BART.

Noise impacts are considered in studies by Wolfe and others (1978) and Beranek and others (1976). A study dealing with the visual impacts of BART was done by Gruen Associates (1976).

Although no noise assessment of BART in Union City have ever been done, the study by Beranek and others (1976) contains an analysis of BART and community sound levels, and the City of Union City has made an overall report on noise in Union City (Community Development Department, 1976).

Studies dealing with property prices and rents near BART lines and stations are considered in Dyett and others (1979), which deals with land use around BART; Falcke (1978), which treats BART's effect on property prices and rent; and Skaburskis (1976), which handles the property values around the Rockridge BART station.

Many other studies on BART dealing with other various issues can be found in the BART and Metropolitan Transportation Commission libraries in Oakland.

Methods

Because there is no published information on housing prices in De Coto, I questioned three local real estate agents, gathering information on house values, their views on the housing situation in the area and the views of potential homebuyers.

To obtain responses from nearby residents, I questioned 50 occupants on 10 questions pertaining to the visual and noise impacts of BART (See Appendix 1 for questions and results of survey). I conducted the survey within a two-block radius of BART aerial structures. I surveyed the neighborhood in the months of October and November, between the times of 10:00 A.M. and 2:00 P.M. This would indicate that I interviewed people who either were unemployed or worked during nights, and that the

people surveyed do not use BART regularly (defined by BART as using BART at least three times a week) because they are unemployed and are often at home during commute hours.

The area in the two-block radius contains 175 housing units. Therefore, I surveyed about 10% of those most affected by the noise and visual effects of BART. It was a door-to-door survey of the neighborhood, and I questioned the adult who answered the door. This non-scientific survey did not regard financial, education and employment status of the interviewees. In the De Leuw and others (1977) study, financial status did not influence the survey's result.

Noise Impact of BART

BART train sound levels in surrounding communities fluctuate as time, train conditions and communities change. In a "very noisy" area, a commercial center for example, BART train noise does not have as large an impact as in a "very quiet" area, such as a residential area.

Comparing the sound levels of the background noise of the community and of BART trains will determine how annoying BART trains are. A "Community sound level" is a logarithmic average of the sound level values due to community noise (Beranek et al.,]976). The sound level of BART trains is the measurement due only to BART passbys (Beranek et al., 1976). Noise is also a subjective quantity, and annoyance to sound depends on many factors (i.e., the person, house and neighborhood) (Community Development Department, 1976). Previous living conditions influence how nearby residents react to BART train noise (Wolfe et al., 1978).

The noise level of BART trains ranges from 75 to 80 db(A)* (Beranek et al., 1976, p. 19), which is comparable to a passing delivery truck. This level exceeds community sound levels, on the average, by 5 dB(A) during the day (Graff and Knight, 1979). The noise level of BART trains differs mainly due to speed and track type, though trains on curves and switches produce more noise (Beranek et al., 1976). Wayside sound levels of BART trains rise approximately 8 dB(A) between speeds of 40-80 mph (Beranek et al., 1976, p. 21). Noise levels generated by trains on aerial structures are higher by about 5 dB(A) than trains on ground lines (Wolfe et al., 1978). Noise on subway lines can be disregarded, since trains in subways have lower noise levels than community noise levels (Beranek et al., 1976).

Aerial structures produce more noise because concrete decks absorb less sound than the ground, height of elevated structures propagates noise over the surroundings, and the structure itself radiates noise (Hanson et al., 1980, p. 34). Nearby residents of BART confirm that awareness of trains is increased along aerial lines (De Leuw et al., 1977, p. 50). A train on aerial structures in a quiet neighborhood, such as a residential area, could be quite noticeable to nearby residents.

---

*(dB) = decibel, measurement of overall noise. "A" signifies that sound level expressed is weighted sound of all components of sound (Beranek et al., 1976).

Noise Impact in De Coto

The noise generated by BART trains in De Coto, 65-75 db(A)(Beranek et al., 1976), is about as loud as that of a passing auto, 70 dB(A), but not as loud as that of a Union-Pacific train, 85 dB(A). The BART equivalent sound level is 5 dB(A) higher than the community sound level in De Coto (Figure 2).

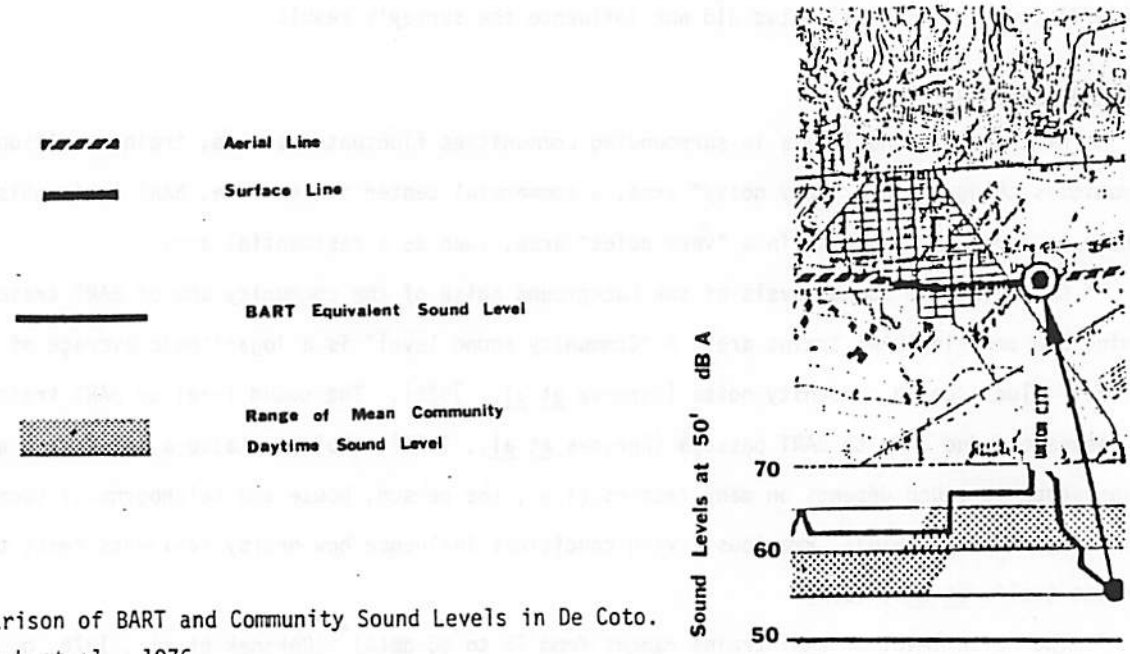

Figure 2. Comparison of BART and Community Sound Levels in De Coto.
Source: Beranek et al., 1976.

According to my survey, BART train noise has not created much of an impact in the community as a whole. A passing Union-Pacific train can drown out passing BART trains. The only complaint is due to frequency of BART passbys. During commute hours (6:30 A.M. - 9:00 A.M., 3:30 P.M. - 6:30 P.M.) a passby is every six minutes. Also, with aerial structures and absence of buildings to shield noise, BART passbys can be heard a half mile away. Even Union-Pacific trains cannot be heard at this distance. The first row of houses adjacent to BART lines reduce noise on the order of 5 dB(A) (Beranek et al., 1976).

Visual Impact of Bart Lines

The visual impact of BART lines depends on the type of track and the surroundings. Subway lines have no visual impacts on their surroundings, but of the three line types, subways are the most expensive (Glenn, 1985, personal communication). Ground lines usually run along freeways or railroad tracks, which generally mask BART's potential visual impact (Gruen Associates, 1976).

The decision on what track type is employed is based on many factors, with costs being one of the biggest (Glenn, 1985, personal communication). Another factor is that the line chosen should avoid,

as best as possible, existing traffic flow patterns (Glenn, 1985).

Aerial lines, second in cost, are the most visible BART line (Gruen Associates, 1976). About 1/3 of the 19 BART miles in suburban residential areas are on aerial structures (Gruen Associates, 1976). These aerial structures can bring both desirable and undesirable aspects to a community. Aerial structures can give definition to streets by blocking visually-confusing views from motorists (Guren Associates, 1976). They can also be visually unsettling; the open spaces of suburban areas permit easy visual comparison of BART lines with smaller-sized homes (Gruen Associates, 1976, p. 21).

Construction of aerial structures can leave gutted and unused lands beneath and around the lines. The right-of-way for aerial structures average about 40 feet in width (Gruen Associates, 1976), and it is BART's responsibility to landscape. The best ways to blend aerial structures with surroundings is with the use of linear parks or trees to screen structures, or at the least, break them to small pieces (Gruen Associates, 1976). Linear parks have been well received, even winning urban design awards (Gruen Associates, 1976), and have turned affected areas into useful places. Although linear parks immensely beautify affected areas, funds are lacking for landscaping. Between inexperience with a very new rapid transit system and inflation, BART incurred many budget overruns, which cut such amenities as landscaping (Moore-Heder, 1980). So, most of the lands disturbed by construction of BART lines have never been landscaped.

Visual Impact in De Coto

The aerial structures pose a large visual impact in De Coto, but the surveyed residents did not think they are a harmful impact. Gruen Associates (1976) acknowledge that aerial structures tend to dominate visually open spaces. The aerial lines have become a point of reference for people: they can be seen and heard from any place in the district. The BART lines are like an endless monument, a Great Wall of De Coto.

The area at the base of the aerial lines is barren, lifeless and just plain 'ugly'. The land is barren, filled with trash and left unused. Compared to nearby Kennedy Park, two blocks away, the area appears as if construction has just been completed (Figures 3 and 4).

Though many people find BART aerial structures aesthetically unpleasing, probably the same number of people find nothing wrong with the cement structures. Residents surveyed thought the aerial lines did not visually harm the community. In fact, some actually thought the structures helped the visual aspect of the area. An article in the Oakland Tribune (1978, p. 1) reported that BART lines "look like a two-story Arabian palace with its arch and palms, but it's a step into the future by the old Apostolic Faith Church. . . ."

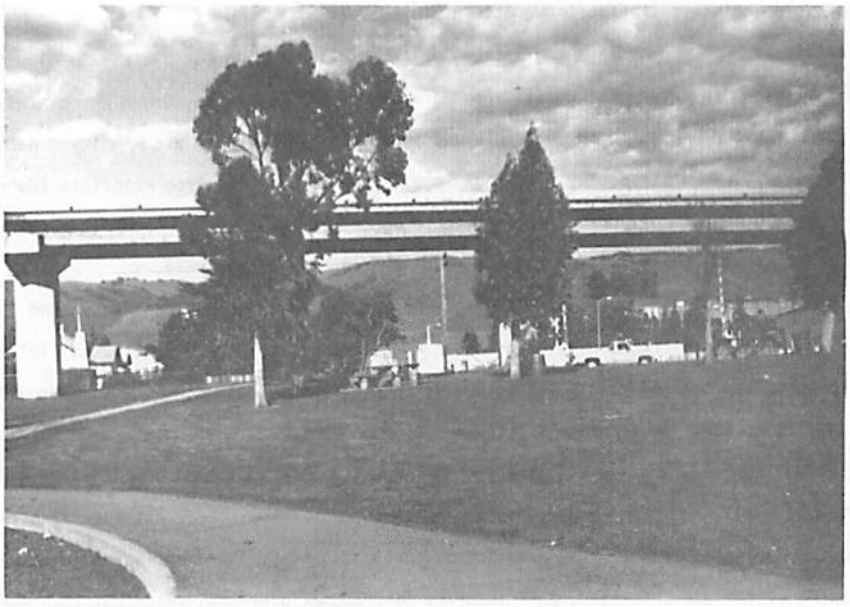

Figure 3. Aerial Structures in De Coto.

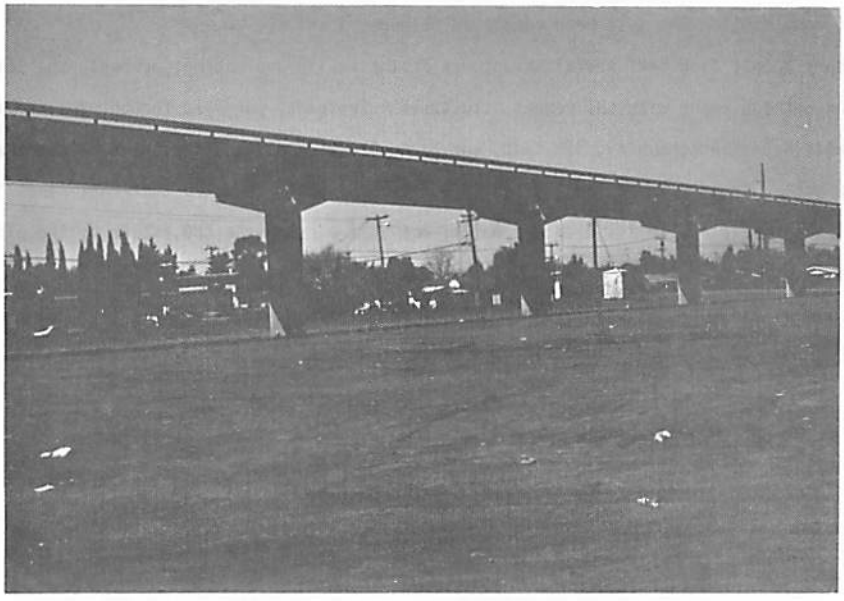

Figure 4. Aerial Structures in Kennedy Park.

BART's Impact on De Coto

With BART lines and station so close, have the living conditions improved or worsened in the area?

Since 1970 housing units have increased by 173, with the average number per household having decreased from 4.1 to 3.6 (Alameda County, 1982). But the population in the district has actually decreased by only about 100 in the last decade (Alameda County, 1982). And it is still a largely Hispanic neighborhood; around 80% of the population are Hispanic. There has been some street improvement in the last decade: in 1971, 30% of the De Coto curbs and gutters were in place; by 1978 90% were in place (Oakland Tribune, 1978). With the addition of sidewalks, along with the many murals and trees, the aesthetic quality of De Coto has improved (Oakland Tribune, 1978). Even with all these improvements, house values are still $25,000 lower than the average Union City home value (Alameda County, 1982).

Has BART been a factor in this substantial difference in housing prices? In the Falcke study, properties close to BART lines on the average have decreased values of 3% (1978). Responses from local real estate agents indicate that BART has either had no effect on housing prices or has brought house values down by $3,000-$4,000. More expensive homes are affected more (Van Landingham, 1984, personal communication). Property values have not been affected much because of the old age of the homes and because BART's benefits (e.g., transportation for the elderly and poor) outweigh the ill-effects (Van Landingham, 1984, personal communication). The three agents concurred that the affected homes did not appreciate as much as unaffected homes, and to their knowledge nobody has ever moved due to BART.

Although all of the agents said house values decreased only "a few thousand dollars", the average house value in De Coto is only $62,000 (Alameda County, 1982). To a middle-class homeowner selling a house for $100,000, $3,000 to $4,000 is not much, but to a lower-class homeowner "a few thousand dollars" is about 5 to 10% of home values.

Responses of Residents

Of the 49 residents questionsed, most felt there are no major impacts caused by BART (Appendix 1). Nobody surveyed ever considered moving due to BART, though a few long-time residents expressed that BART lines were built too close to their homes. Also, a few newer residents indicated that they had doubts about moving near BART lines.

On the average, the residents were barely annoyed with the BART train noise. Nearly all said that Union-Pacific trains were much louder and more annoying. The major irritation with BART is the frequency of trains, not the noise itself. The closer interviewees lived to BART lines, the more complaints about noise increased. Most people thought they had become anaesthetized to BART noise. A minor annoyance was distorted television reception during BART passbys.

Most of the interviewees noted that aerial structures caused no ill effects to De Coto visually. A few people even gave me strange looks when questioned about BART's visual impact. Perhaps they had

also become anaesthetized to the structures. Maybe the residents think of aerial structures as a natural part of the community.

Some residents also complained about graffiti on the concrete pillars.

Regular users of BART seemed to be less distracted by BART than non-commuters. Longer residents are less annoyed with BART train noise than newer residents. Those questioned state that BART is helping the community even though only a handful of the respondents have benefited from BART. Most interviewees use BART only three or four times a year, even though the Union City BART station is only a five-minute walk.

Summary

The only ill effect of BART appears to be the disturbance of land, which is minor and can be solved quite easily. The planting of trees would reduce the visual impact and might reduce some noise. BART owns this land, but landscaping is a low priority project (Glenn, 1985, personal communication). BART would allow Union City to beautify the land (Glenn, 1985, personal communication), but landscaping De Coto is a low priority for the Union City Planning Commission (Leonard, 1984, personal communication). The areas most viewed by Union City visitors are the top priority for landscaping in the city (Leonard, 1984, personal communication).

BART has not created new problems for the community, but it has added to the old ones. De Coto is one of the most run-down areas in Union City and massive BART lines do not help. The concrete lines accentuate the difference between the new and old. The district is the oldest part of Union City. The age shows and not much has been done to solve this problem. Streets are filled with potholes, and the current sewer system cannot handle heavy rains.

BART would be wise to run their lines in residential areas such as De Coto, where land is cheap and few people care about the land disturbances or noise. To a developing city, an economically depressed area should not slow the improvement and progress of the rest of the city.

De Coto appears lifeless, the house values reflect it and residents seem as listless as their surroundings. Improving the area will not attract new businesses to Union City, but it would help De Coto economically and give the district some much needed civic pride.

REFERENCES CITED

Alameda County Planning Department, 1982. 1980 Census Data, Alameda County, Alameda Planning Department, 40 pp.

Beranek, Bolt and Newman, Inc., 1976. Acoustic Impacts of BART: Interim Service Findings. Berkeley, Metropolitan Transportation Commission, 69 pp.

California State Automobile Association, 1980. Hayward, San Leandro, Union City, San Francisco - Cartographic Department, 2 pp.

Community Development Department, 1976. City of Union City: Noise Element. Union City, Community Development Department, 38 pp.

De Leuw, Cather and Co., 1977. Responses of Nearby Residents to BART's Environmental Impacts. Berkeley, Metropolitan Transportation Commission, 166 pp.

Dyett, Michael, David Dornbusch, Miclael Fajans, Caj Falcke, Victoria Gussman, and James Merchant, 1979. Land Use and Urban Development Impacts of BART: Interpretive Summary of the Final Report. Berkeley, Metropolitan Transportation Commission, 154 pp.

Falcke, Caj O., 1978. BART's EFfects on Property Prices and Rent. Berkeley, Metropolitan Transportation Commission, 129 pp.

Glenn, John, Member, Board of Directors, BART, personal communication, January 1985.

Graff, Donald L., and Robert Knight, 1979. Environmental Impacts of BART: Final Report. Berkeley, Metropolitan Transportation Commission, 153 pp.

Gruen Associates, 1976. Impacts of BART on Visual Quality: Interim Service Findings. Berkeley, Metropolitan Transportation Commission, 42 pp.

Hanson, C.E., M. Schafer, D. Towers, and K. Eldred, 1980. Noise Control for Rapid Transit Cars on Elevated STructures: Preliminary Investigation of Vehicle Skirts, Undercar Absorption, and Noise Barriers. Washington, D.C., U.S. Department of Transportation, Urban Mass Transportation Administration, 34 pp.

Leonard, Dennis, Community Development Director, Union City Planning Commission. Personal communication, October 1984.

Moore-Heder Architects, 1980. Aesthetics in Transportation. Washington, D.C., Department of Transportation, 28 pp.

Oakland Tribune, 1978. Skyline of De Coto Has Been Changing, Oakland Tribune, vol. 105-102, p. 1.

Rodriguez, Sam, Realtor, Rodriguez and Associates, personal communication, October 1984.

Skaburskis, Andrejs, 1976. The Impacts of BART on Property Values, A Case Study of the Rockridge Neighborhood. Berkeley, Metropolitan Transportation Commission, 87 pp.

Union City, 1976. Draft: City of Union City, Housing Element. Union City, Union City Planning Commission, 57 pp.

Van Landingham, Carol, Broker-Associate, Red Carpet. Personal communication, October 17, 1984.

Ward, Carol L., Realtor Associate, Century 21. Personal communication, October 17, 1984.

Wolfe, S.L., H.J. Saureman, and P.Y.N. Lee, 1978. Noise Assessment of the Bay Area Rapid Transit System. Oakland, Wilson, Ihrig and Associates, Inc., 210 pp.

Appendix 1

Survey Questions and Results

How long have you lived in this house?

over 10 years 29

Do you wish that the BART lines were not built so close to your house?	Yes	No
	6	23

under 10 years 20

Did you have any doubts about living so close to BART lines?	Yes	No
	4	16

Do you use BART at least 3 times a week? (Regular BART rider)	Yes	No
	5	44

Have you ever considered moving due to BART?	Yes	No
	0	49

Annoyance of BART passbys on a scale of 1 to 10 with 10 as most annoying?	Average
Residence over 10 years	3.4
Residence under 10 years	2.6
Regular BART rider	1.0
Non-regular BART rider	3.3
Total	2.9

Which is more annoying the BART trains or the railroad trains?

	BART	RR trains	Same
Residence over 10 years	1	26	2
Residence under 10 years	1	18	1
Total	2	44	3

How has the BART lines effected the appearance of the community?

	Hurt	Help	No effect
Residence over 10 years	3	4	22
Residence under 10 years	1	6	13
Total	4	10	35

What is BART's total effect in the community?

	Hurt	Help	No effect
Total	0	44	5

What has been BART's total effect on you?

	Hurt	Help	No effect
Residence over 10 years	1	21	7
Residence under 10 years	0	10	10
Total	1	31	17

Should BART reduce train noise and/or beautify around the BART lines?

	Yes	No
Residence over 10 years	14	15
Residence under 10 years	10	10
Total	24	25

If yes, would you help pay with $10 in taxes a year?	Yes	No
Residence over 10 years	2	12
Residence under 10 years	3	7
Total	5	19