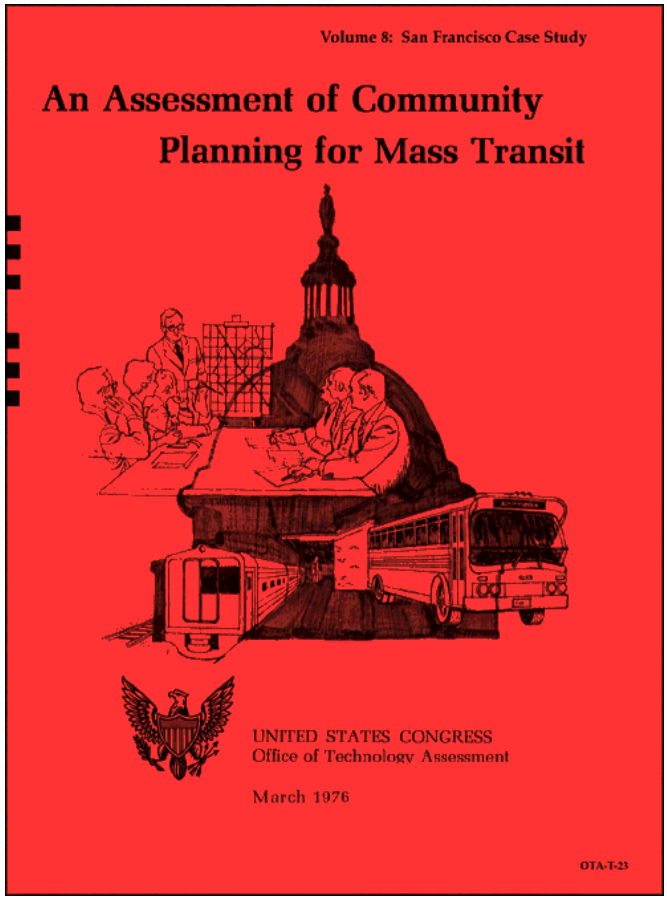
Assessment of Community Planning for Mass Transit: Volume 8—San Francisco Case Study

February 1976

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PREFACE

This report on urban transportation planning in the San Francisco, California metropolitan area is one of nine case studies undertaken by the Office of Technology Assessment to provide an information base for an overall assessment of community planning for mass transit.

The findings of the overall study are reported in the summary document, *An Assessment of Community* Planning for Mass *Transit,* which forms the first volume of this series. The assessment was performed at the request of the Committee on Appropriations of the U.S. Senate, on behalf of its Transportation Subcommittee.

The study was directed by the Office of Technology Assessment's Transportation Program Staff with guidance and review provided by the OTA Urban Mass Transit Advisory Panel. The firms of Skidmore, Owings and Merrill and System Design Concepts, Inc., were contractors for the study. This assessment is a joint effort, identifying different possible points of view but not necessarily reflecting the opinion of any individual.

INTRODUCTION

This report assesses how one of nine major United States metropolitan areas made its decisions about the development or modernization of rail transit.

The assessment of the nine cities attempts to identify the factors that help communities, facing critical technological choices, make wise decisions that are consistent with local and national goals for transit. The study investigates the following issues:

- Are there major barriers to communication and cooperation among governmental agencies involved in transit planning and operating? Do these barriers interfere with making sound decisions ?

- Do transit decisions reflect the combined interests of all major public groups, including citizen organizations, trade unions, the business community, and others?

- Does the planning process provide enough information about the advantages and disadvantages of alternative courses of action to provide a solid basis for making decisions ?

- Does the availability or lack of financing, or the conditions under which financing has been provided, unnecessarily limit the range of options that are considered?

The ultimate purpose of the work has been to cast light on those prospective changes in national transit policy and administrative programs which might improve, in different ways and to different extents, the way communities plan mass transit systems. The nine cities were selected to represent the full range of issues that arise at different stages in the overall process of planning and developing a transit system.

San Francisco, for example, has the first regional rail system built in decades, while Denver is planning an automated system, and voters in Seattle have twice said “no” to rail transit funding proposals.

The assessment of transit planning in each of the nine metropolitan areas has been an inquiry into an evolving social process. Consequently, the study results more closely resemble historical analysis than classical technology assessment.

This study employs a set of evaluation guidelines to orient the investigation in the nine metropolitan areas and to provide the basis for comparative judgments about them. The guidelines were derived from issues identified during preliminary visits to the metropolitan areas, a review of Federal requirements for transit planning, and an investigation via the literature into the state-of-the-art in the field.

The evaluation guidelines cover major topics which were investigated during the case assessment process. They deal with the character of the institutional arrangements and the conduct of the technical planning process.

GUIDELINES FOR ASSESSMENT: INSTITUTIONAL CONTEXT

Some of the most significant influences on transit planning are exerted by the organizations responsible for conducting the planning and making the decisions. Three guidelines were used to evaluate the institutional arrangements in the nine metropolitan areas:

- Agencies responsible for various aspects of transit decisionmaking should cooperate effectively in a clearly designated “forum”.

- The participants in this forum should have properly designated decisionmaking authority, and the public should have formal channels for holding decision-makers accountable for their actions.

- Citizens should participate in the transit planning process from its beginning and should have open lines of communication with decision makers.

GUIDELINES FOR ASSESSMENT: TECHNICAL PLANNING PROCESS

The technical planning process provides the information that public officials and their constituents draw upon in making plans and decisions. Four guidelines were used to assess the technical planning process in the nine metropolitan areas:

- Broad, explicit goals and objectives should guide technical planning and decision-making.
- A range of realistic alternative solutions should be developed.
- The evaluation of these alternatives should give balanced consideration to a full range of goals and objectives.
- A practical and flexible plan for financing and implementation should be developed.

During visits to each of the nine metropolitan areas, the study team interviewed the principal representative of the transportation planning institution and other main participants in the local planning process. The visits were supplemented by interviews with UMTA officials in Washington. Pertinent documents—official plans, reports, studies, and other material—were reviewed in each case.

The information thus collected was used in compiling a history of the transit planning process in each case area, organized around key decisions such as the decision to study transit, the selection of a particular transit system, and public ratification of the decision to pay for and build the system. The main political, institutional, financial and technical characteristics affecting the conduct of the planning process were then assessed in light of the evaluation guidelines.

The same set of guidelines used in assessing each case metropolitan area was employed in making a generalized evaluation of the metropolitan experience. The results of the generalized evaluation are summarized in the report, *An Assessment of Community Planning* for Mass *Transit: Summary* Report, issued by the Office of Technology Assessment in February 1976.

CONTENTS

SUMMARY AND HIGHLIGHTS 1

METROPOLITAN SETTING *3*
General Characteristics *3*
Existing Passenger Transportation System 3
Transportation Planning Institutions 7

CRITICAL HISTORY OF TRANSIT PLANNING AND DECISIONMAKING **9**
Toward A Decision To Build BART 10
The Building of BART 17
Recent Evolution of the Planning Process 25

CHRONOLOGY OF THE TRANSIT PLANNING PROCESS 29

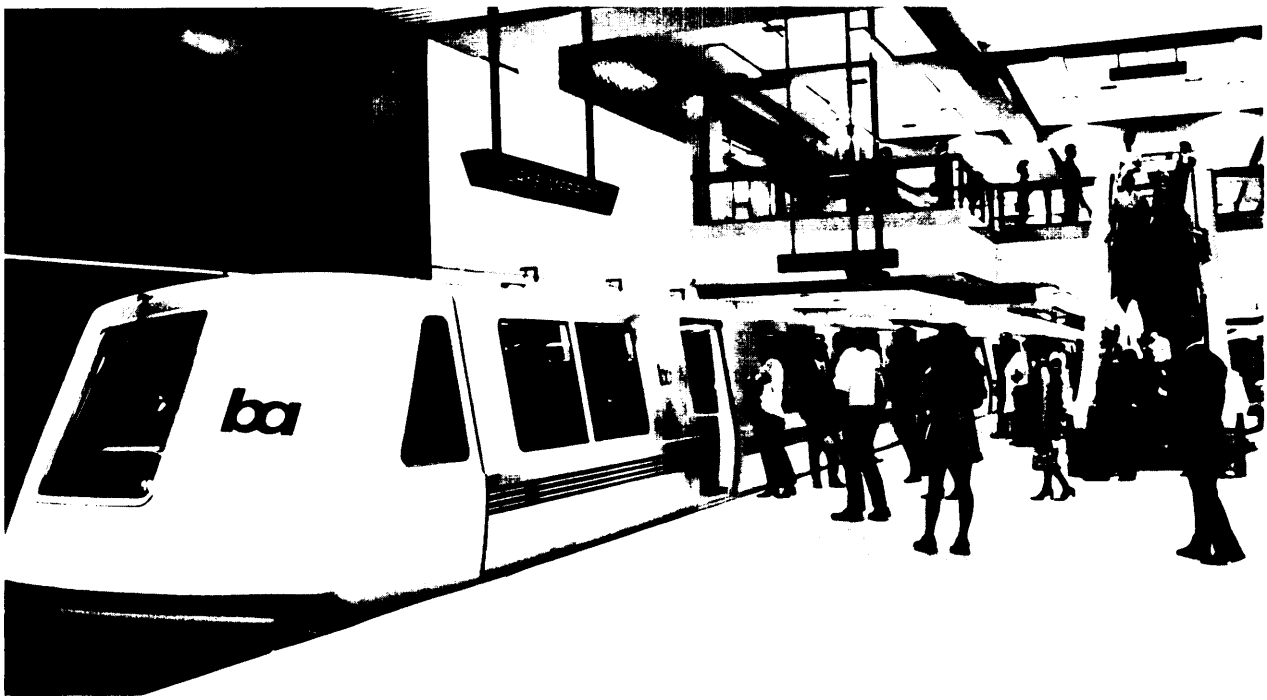
ASSESSMENT OF THE PLANNING AND DECISIONMAKING PROCESS **35**
Institutional Context **35**
Technical Planning Process 38

SUMMARY CASE ASSESSMENT **45**

68-642 0- 76 -2



Summary and Highlights



- Conditions were favorable for regional rail rapid transit in the San Francisco Bay Area during the Bay Area Rapid Transit (BART) system planning period of 1945 to 1962. There was a high-density, transit-oriented central city; a linear regional development pattern with numerous important subcenters; geographic barriers that constrained travel to a few congested corridors; and a "freeway revolt" that turned voters to BART as an alternative.

- The Bay Area has had an exceptionally fragmented political and institutional structure with no strong regional agencies until recently. San Francisco contains only 17 percent of the nine-county population; there are almost 100 cities. The State traditionally has stayed out of regional affairs. Strong traditional rivalries between the leading cities have hindered regional solutions, despite the strong need for regional approaches to many of the area's problems.

- The city of San Francisco has made an extraordinary commitment to transit. Its voters led the region in passing the largest local bond issue of any type in U.S. history with no promise of State or Federal assistance. San Francisco was the first city (191 1) to assume public responsibility for transit operations and it provides the highest per-capita transit subsidy in the country ($1 12 per person in 1974-75). Its transit system offers more service per square mile than any other city, and its per-capita ridership is second only to New York City.

- Two apparently competing hypotheses have been offered by different observers to explain how the decision to build BART was made. The "conspiracy theory" claims that a small group of businessmen conceived BART as part of a grand plan to

shape San Francisco into the center of a vast business empire. The "rational planning theory" claims that BART evolved through a model planning process as a result of enlightened and courageous leadership that considered BART to be the best solution for the Bay Area's transportation and land development problems. Both explanations are substantially correct.

- Despite the major challenge brought by the taxpayer's suit in 1962-63, the Bay Area Rapid Transit District (BARTD) failed to correct problems in management that were at the root of later serious difficulties. BARTD's board had no real ability to evaluate or oversee the work of the consultant team and little inclination to do so. The contract gave the Parsons, Brinckerhoff-Tudor-Bechtel team exceptional authority with no incentive to economize.

- BARTD's relationship with the public changed dramatically during the periods before and after the bond issue election of 1962. The initial public relations effort was well organized and successfully built up a strong pro-BART consensus by election day, Following the vote, the relationship steadily deteriorated as the inflexible construction and financing program was undermined by spiraling inflation and costly delays.

- The quality of the original planning and engineering work has proven to be remarkably good when allowance is made for unforeseeable events such as Vietnam-fueled inflation, the advent of participation politics, and other shifting values. The cost estimates were surprisingly accurate; ridership forecasts were only moderately overoptimistic; growth and land development forecasts were exceptionally well prepared.

- By contrast the implementation effort was marred by poor management of the system engineering processes, including technological development, testing, and operations planning.

- Again by contrast with earlier efforts, the BART extension studies have provided examples of successful procedures for community participation, and evaluation of alternative systems. The difference can be attributed in part to lessons learned, in part to new actors including the Metropolitan Transportation Commission (MTC), and perhaps in part to the fact that BARTD must again sell its plans to the voters if it wants to build extensions.

- MTC is one of the more important new (1970) metropolitan agencies nationally. It has virtual veto power over all regional transportation projects, authority to allocate about $35 million per year of regional taxes among the competing transit operators in the nine-county region, and responsibility for determining how the funds are to be used. MTC has major influence over programing of all regional transit and highway projects.

Metropolitan Setting[1]

GENERAL CHARACTERISTICS

Until recently San Francisco was unquestionably the most important metropolitan area on the West Coast. Today, although exceeded by Los Angeles in population, San Francisco is still the most important governmental, corporate, financial, cultural, and transportation center in the west,

Three major cities are within the San Francisco Bay Area. To the south is San Jose, a rapidly growing SMSA of over one million people in 1970. Oakland on the east side of San Francisco Bay, had a population of nearly 400,000 in 1970. San Francisco, the economic and cultural center of the region, had over 700,000 people in 1970. San Francisco and Oakland are the central cities of the San Francisco SMSA and make up 34.7 percent of the population. The data on the accompanying figures cover the San Francisco SMSA only and exclude the San Jose SMSA.

The recent growth in the SMSA has occurred entirely in the suburban ring, with San Francisco loosing 3.3 percent of its population between 1960 and 1970 (see Figure 2) and Oakland loosing 1.6 percent during the same time. (The low density characterizing most of this recent growth contrasts sharply with the high population density of the city of San Francisco. With 15,764 people per square mile, San Francisco is the second most densely populated major central city in the U.S. But the SMSA is slightly less densely populated than the average among the 33 largest SMSA's in 1970.

The difference between the city and suburban development patterns also can be illuminated by comparing transit ridership. In 1970, 35 percent of all work trips by San Francisco city residents were made on public transit, while only 8 percent of the suburban residents used transit (see Figure 3).

EXISTING PASSENGER TRANSPORTATION SYSTEM

Outside of the city of San Francisco an extensive network of freeways and bridges provides good highway access within the suburban area and to San Francisco. Within the city, however, freeways are limited, and the emphasis is on transit.

The city-owned Municipal Railway (Muni) provides extensive service that carries about 400,000 revenue passengers on an average weekday. The city-owned system was set up in 1912 and has encouraged transit ridership in the city to the point where San Francisco now has more transit riders per capita than any other U.S. city except New York. Muni is a multimodal operation with the largest fleet of cable cars and trolley buses in the United States as well as one of the Nation's largest streetcar fleets. Transit service is supplemented by over 600 diesel buses, and the streetcar service is speeded through the extensive use of tunnels.

In the East Bay region the Alameda-Contra Costa Transit District (AC Transit) has provided bus service since 1960, when this public body took over operations of the privately owned Key System. This system handles less than half the number of riders on Muni.

The third largest transit system in the Bay Area is BART, which, since opening in 1973, has been the most advanced rapid rail operation in the country (see Figure 4). The 7.5 miles of tracks serve three corridors in the East Bay while connecting these communities with San Francisco and Daly City in San Mateo County through a transbay tube. In 1975 BART is expected to serve about one-quarter the number of passengers on Muni and one-half the passengers on AC Transit.

Other major transit operations are Golden Gate Transit, which serves Marin County and provides commuter service by bus and ferry to San Francisco, and Santa Clara Transit, which serves San Jose and Santa Clara County.

The Southern Pacific Railway's operations between San Jose and San Francisco provide the only commuter rail service west of Chicago.

The support for transit in the Bay Area has been expressed not only by a willingness to support these transit services with local taxes and taxing authority but also by ridership figures. The San Francisco SMSA was one of only three major metropolitan areas to show an increase in transit

[1] See Figure 1, pages 18 and 19. This map and other figures in this section cover only the San Francisco SMSA and exclude San Jose

LAND AREA (1970)
(square miles)

Center City	45.4
Suburban Ring	2,434.6
Entire SMSA	2,480.0

POPULATION

	Suburban Ring	Center City
1960	1,908,446	740,316
1970	2,392,348	715,674

DENSITY
(population/square mile)

	Suburban Ring	Center City
1960	784	16,307
1970	983	15,764

POPULATION
Percent Change 1960-1970

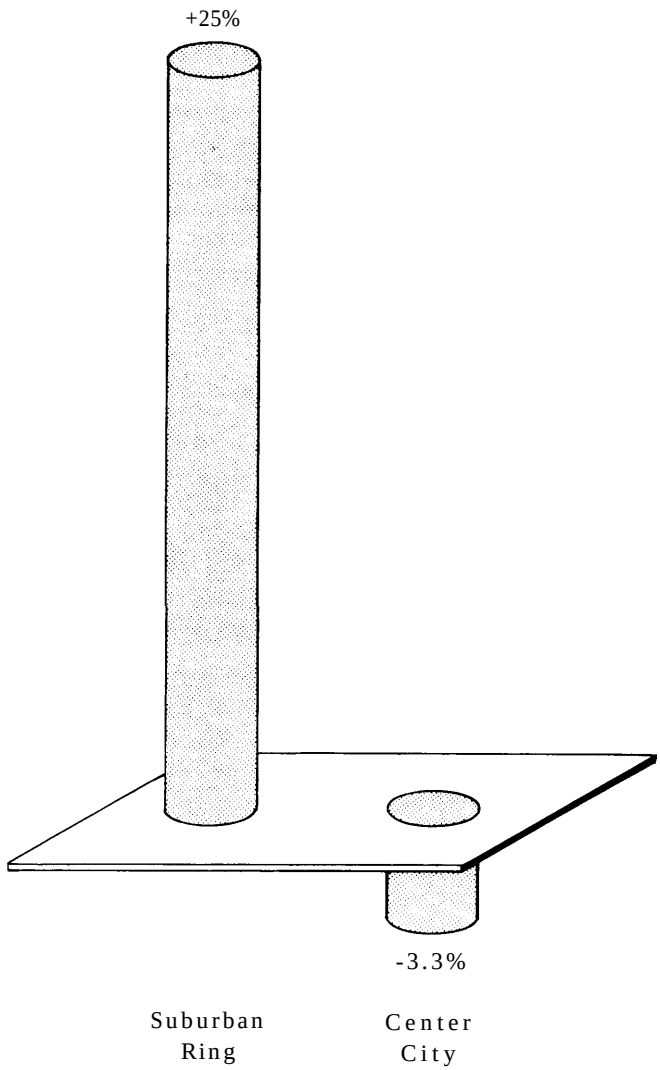
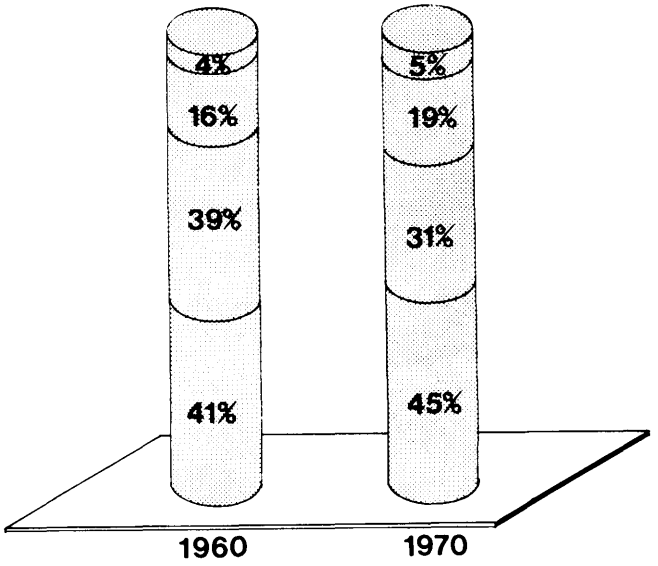


FIGURE 2 : SAN FRANCISCO METROPOLITAN CHARACTERISTICS

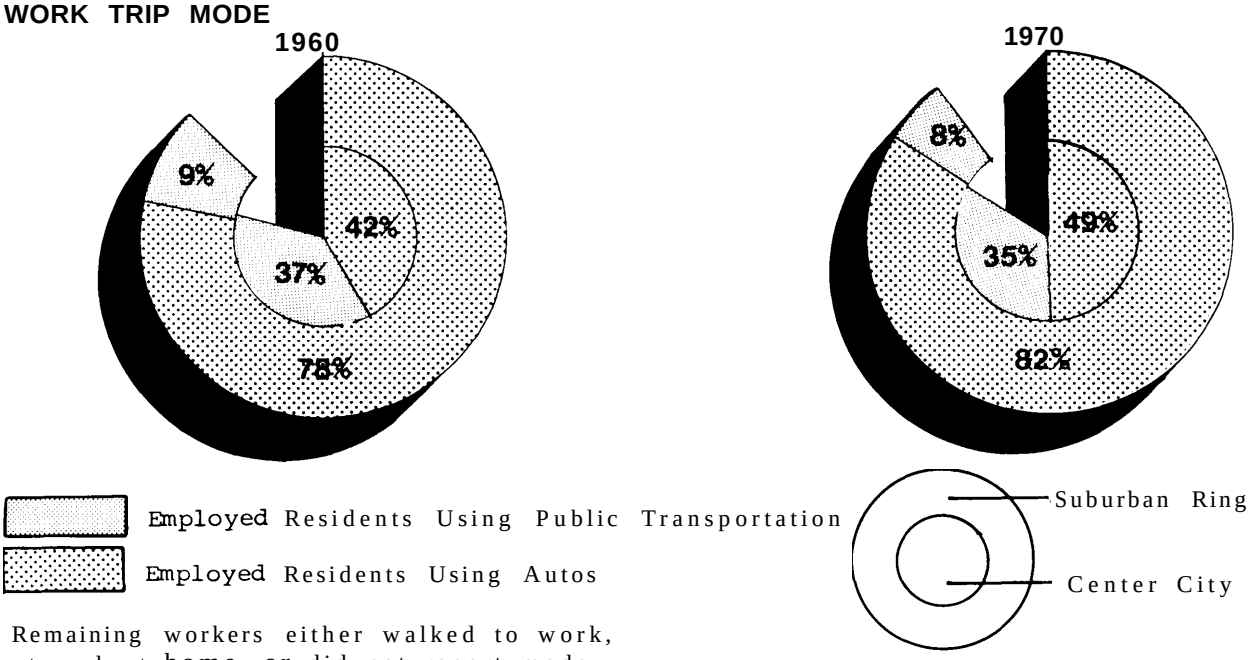
Source: Urban Transportation Fact Book, American Institute of Planners, and the Motor Vehicle Manufacturers Association of the U.S., Inc.

A Standard Metropolitan Statistical Area (SMSA) includes a center city (or cities), usually with a population of at least 50,000, plus adjacent counties *or* other political divisions that are economically and socially integrated with the central area.

WORK TRIP DISTRIBUTION



WORK TRIP MODE



Remaining workers either walked to work, stayed at home, or did not report mode.

FIGURE 3: SAN FRANCISCO TRAVEL CHARACTERISTICS

Source: Urban Transportation Fact Book, American Institute of Planners and the Motor Vehicle Manufacturers Association of the U.S., Inc., 1974.

A Standard Metropolitan Statistical Area (SMSA) includes a center city (or cities), usually with a population Of at least 50,000, plus adjacent counties or other political divisions that are economically and socially integrated with the central area.

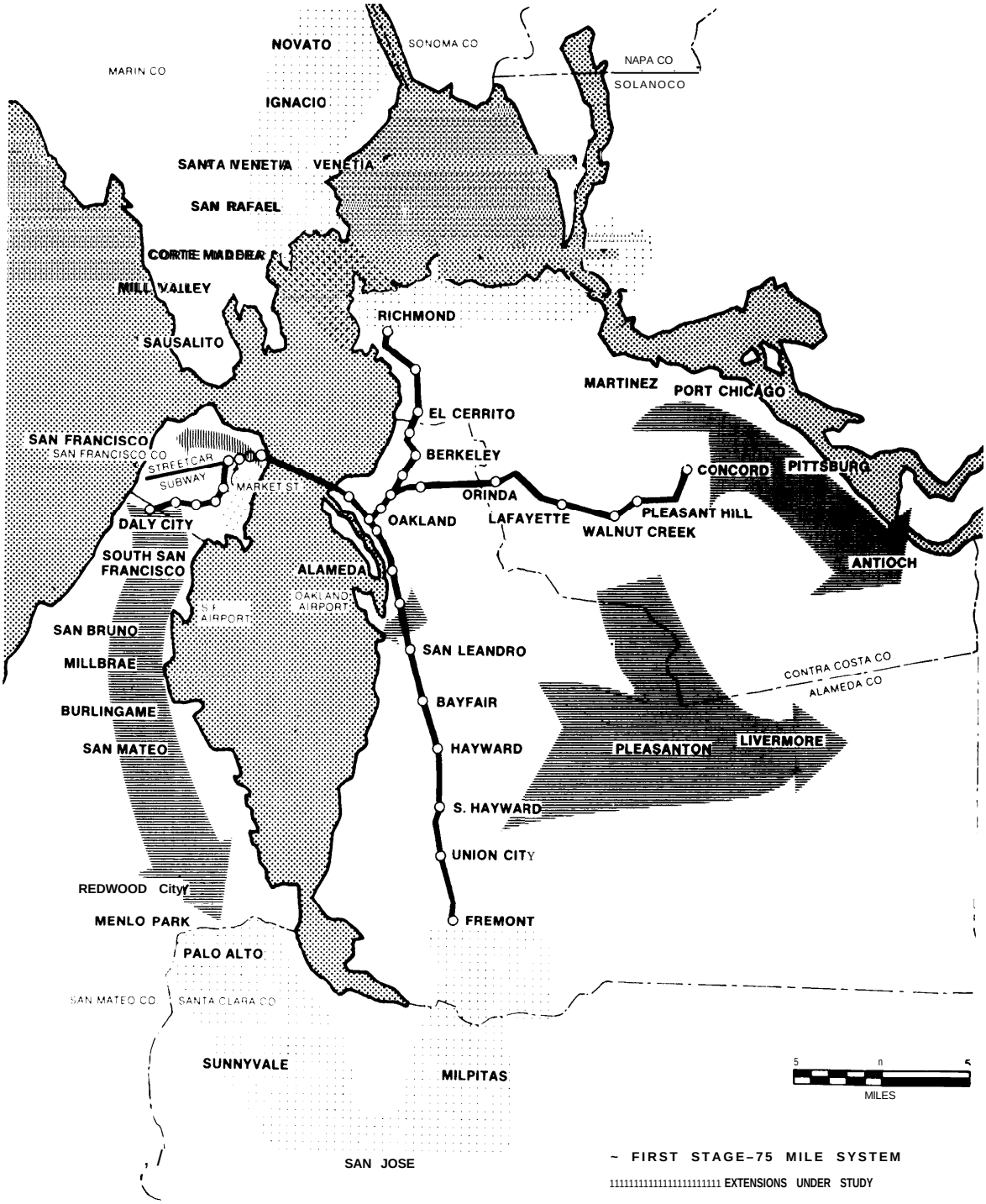


FIGURE 4: BAY AREA RAPID TRANSIT SYSTEM

Source: Bay Area Rapid Transit District, November 1971.

riders between 1960 and 1970. In this period transit patronage increased 4 percent in Washington, D. C., 2 percent in Miami, and 1 percent in San Francisco, while the 33 largest SMSA's averaged a 13 percent decrease. The San Francisco increase occurred without the help of BART, which did not begin full operations until 1974.

Residents have voted taxing authority for AC Transit, and San Francisco subsidizes Muni. With relatively low fares (25 cents is the base fare for Muni and AC), these subsidies are high. San Francisco city residents pay well over $100 per capita in transit subsidies, which is the highest per capita rate in the Nation.

Table 1 shows total Federal transit capital and technical assistance grants to transit programs in the San Francisco metropolitan area.

TABLE I.—Federal Assistance to San Francisco Transit Programs From F.Y. 1962 to May 31, 1975

Type of Assistance	UMTA Share	Total Costs
Capital Grants	$469,137,000	$931,279,000
Technical Studies	7,839,000	15,916,000
TOTAL	$476,976,000	$947,195,000

Source: Urban Mass Transportation Administration

TRANSPORTATION PLANNING INSTITUTIONS

In the Bay Area the regional transportation planning agency has been playing an increasingly significant role in transportation planning at the expense of the transit operators, which traditionally dominated decisionmaking. The local governments act through the regional bodies and thus do not play a great public role in the planning process.

Metropolitan Transportation Commission (MTC)

MTC has greater powers than most regional transportation planning bodies. The Commission is mandated to develop the regional transportation plan for highways, bridges, and mass transit. It is also the regional A-95 review agency for transportation and the designated Metropolitan Planning Organization.[3]

TABLE 2.—Federally Recognized Regional Agencies

Designation	Agency
A-95	Association of Bay Area Governments (the Metropolitan Transportation Commission has been delegated responsibility for transportation reviews)
MPO	Metropolitan Transportation Commission

In 1971 MTC was given authority to allocate about $3.5 million per year from the Transportation Development Act funds (.25 percent of all local sales taxes) among the several transit operators in the nine-county region. MTC has the authority to determine whether the funds are to be used immediately or kept in reserve for future needs, and to determine how the funds are to be used: for planning, operation, or construction, and in the more rural counties, for either highway or transit.

Fourteen of the Commission's 19 members are appointed by Bay Area county supervisors and mayors. One member each is designated by the

[2] Circular A-95 of the Federal Office of Management and Budget requires one agency in each region to be empowered to review all proposals for Federal funds from agencies in that region. Circular A-95 replaced Circular A-82, which was created to implement Section 204 of the Demonstration Cities and Metropolitan Development Act of 1966 (42 U.S. C. 3301). MTC has been delegated responsibility for reviewing transportation-related applications by the Association of Bay Area Governments, which retains A-95 review responsibilities for other subjects.

[3] The Urban Mass Transportation Administration and the Federal Highway Administration require Governors to designate a Metropolitan Planning Organization (MPO) in each area to conduct a "continuing, comprehensive transportation planning process carried out cooperatively." (the "3-C" process) mandated by the Federal-Aid Highway Act of 1962 and the Urban Mass Transportation Assistance Act of 1974. According to joint UMTA-FHWA regulations published in September 1975, MPO's must prepare or endorse (1) a long-range general transportation plan, including a separate plan for improvements in management of the existing transportation system; (2) an annually updated list of specific projects, called the Transportation Improvement Program (TIP), to implement portions of the long-range plan; and (3) a multiyear planning prospectus supplemented by annual unified planning work programs.

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Association of Bay Area Governments, the Bay Conservation and Development Commission, the California Secretary of Transportation, and U.S. Department of Transportation and Housing and Urban Development. To permit citizen participation, MTC conducts regular town meetings in each county and informal meetings with community groups.

Association of Bay Area Governments (ABAG)

ABAG is the regional planning agency for the nine-county Bay Area. The Federal A-95 review power is lodged with ABAG, but MTC reviews transportation plans, subject to ABAG concurrence.

Membership in ABAG is voluntary. As of 1970, eight of the nine counties in the Bay Area were participating, as were 84 of the region's 91 cities.

ABAG consists of a general assembly, comprising the mayor or a councilman from each county, An executive committee includes a supervisor from each member county and one representative to all the cities in each county; six at-large members appointed by the general assembly; and an elected president and a vice president, one representing a county and the other a city.

Bay Area Rapid Transit District (BARTD)

BARTD was established by the California State Legislature in 1957 to plan, construct, and operate a regional rapid transit system.

Until recently, BARTD's board members were appointed, four from each of the three participating counties. As a result of criticism and evolving interest in more direct community control, board members are now directly elected. In general, five members come from Alameda County, three from San Francisco, and one from Contra Costa, but one district overlaps San Francisco and Alameda counties.

San Francisco Municipal Railway (Muni)

San Francisco's city charter of 1900 calls for public ownership of utilities, including transportation. When it was created in 1912, Muni became one of the Nation's first public transit authorities. It is directed by a general manager who is responsible to the city's Public Utilities Commissioner and its general manager. The Public Utilities Commissioner is appointed by the mayor.

To meet increasing costs without going to the polls, the city set up a nonprofit corporation in 1968. The San Francisco Municipal Railway Improvement Corporation is able to issue bonds, backed by city credit, to raise money for purchasing equipment. This equipment—rolling stock and the like—is leased back to Muni to pay off the bonds.

Alameda-Contra Costa Transit District (AC)

AC was established by the State legislature in 1956. Since AC took over the Key System in 1960, patronage has increased by 60 percent. The AC district includes all of Alameda and the urban portions of Contra Costa County.

AC's seven-member board of directors is elected by the voters of the two counties. As of 1970 most of the district's operating costs were met by fares, but deficits are increasing. (An operating deficit of $13 million was expected in 1974.)

The local share of capital improvements is financed by AC's taxing powers.

Critical History of Transit Planning and Decisionmaking

This section provides an assessment of selected major aspects of the history of Bay Area Rapid Transit (BART), rather than attempting to narrate the entire history of transit in San Francisco. Numerous excellent descriptions of the history of transit planning in the area already exist.[4] More importantly, a long and complex historical narrative of Bay Area transit planning would distract the reader from those elements of BART's history most relevant to an evaluation from a national perspective. The key events in the history of transit planning in San Francisco are summarized in the chronology that accompanies this history (see page 29).

An assessment of transit planning in the San Francisco region naturally focuses on BART. More UMTA support has been provided to BART than to any other new transit system in the Nation. The Bay Area probably has committed more of its resources to BART than any other U.S. metropolitan region has committed to a single public project in any field.

In its original concept, BART was viewed as a completely comprehensive regional transportation system. However, in operation BART is a regional system that is largely supplementary to the region's existing transit systems.[5] It did not replace most of the existing services nor is it primarily meant to provide new local transit service within the many communities of the region where a sore need for local service is perceived.

Thus, BART is now but one part of a diverse regional transportation system that has developed over a long period to serve a multicentered urban region.

The Bay Area probably was better suited to a regional rail transit system than any other U.S. metropolitan area that did not already have regional transit service. The high density of the city of San Francisco and the geography of the region—in addition to the city's well established transit tradition—created favorable preconditions for a regional transit system.

San Francisco's transit orientation stems from an early decision by the city to operate transit. San Francisco's city charter of 1900 authorized public ownership of utilities, including transportation, and in 1911 the San Francisco Municipal Railroad (Muni) was established. It is believed to be the first publicly owned transit system in the country. San Francisco offered high quality, frequent local public transit service, with complete citywide coverage, long after transit ceased to be a profitable private enterprise.

San Francisco's dense pattern of development resulted in large part because unlike most other western cities, it grew to maturity in the preautomobile era.

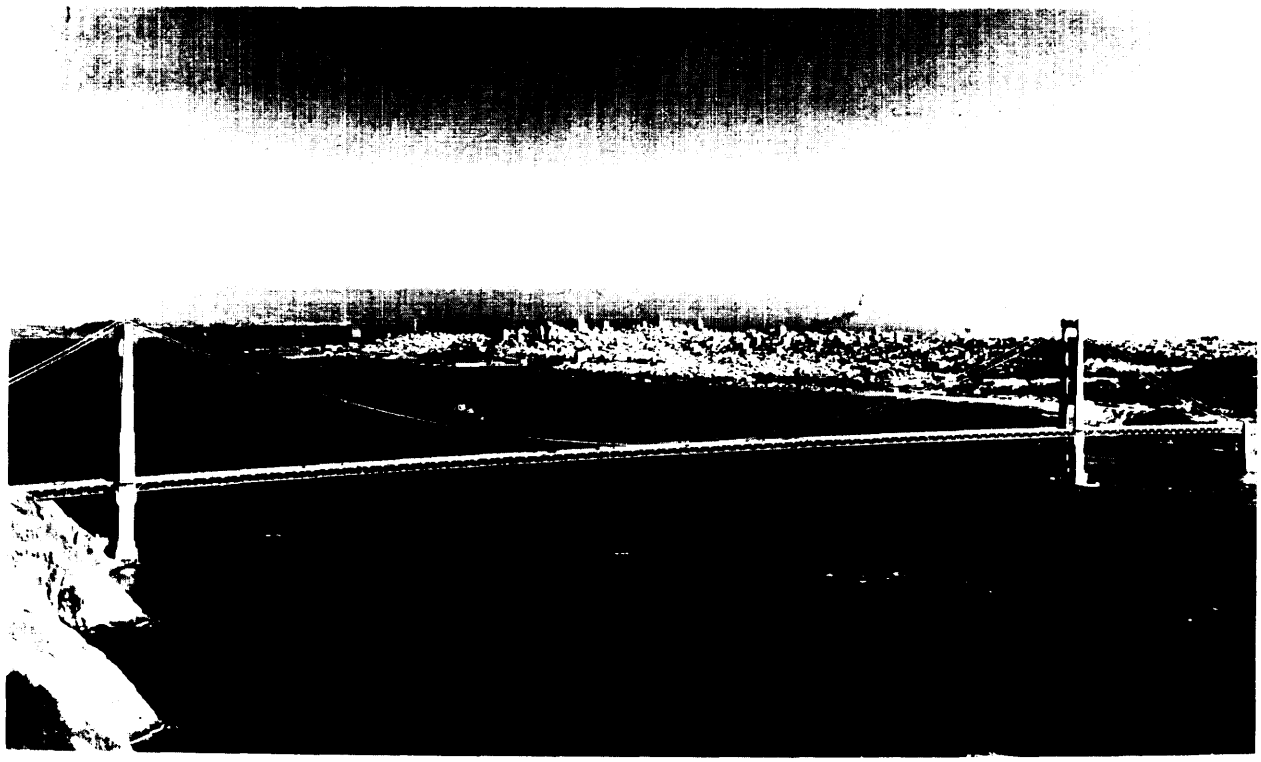
Finally, the Bay Area's water barriers encouraged development of relatively independent cities in the region with significant commercial centers of their own. By fortuitous geographic happenstance, these several centers developed generally in linear patterns around the shores of the Bay. The mountain barriers and the great cost of constructing regional transportation links across the wide, deep Bay and the Golden Gate reinforced the tendency for development to concentrate in San Francisco and the region's other cities,

On the other hand, the opening of the two major bridges (Golden Gate and Bay Bridge) in the mid-1930's and the construction of major regional

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[4] Three of the more complete histories are: (1) Frank C. Colcord, Urban *Transportation Decisionmaking.3:* San *Francisco: A Case Study.* M. I. T., Cambridge, Mass., May, 1971; (2) Norman Kennedy, *San* Francisco Bay *Area Rapid Transit: Promises, Problems, Prospects,* a paper presented at the 1971 Convention, Society of Automotive Engineers, Melbourne, Australia, October 1971; and (3) Stephen Zwerling, *Mass* 'Transit *and the Politics of* Technology, *A Study of BART and the San Francisco Bay Area,* Praeger Publishers, N. Y., 1974. A fourth and most complete history became available as final editing of this report was being prepared: McDonald & Smart, Inc., *A History of the Key Decisions* in *the* Development *of* Bay *Area Rapid Transit,* prepared for the Metropolitan Transportation Commission, September, 1975.

[5] It is important to recognize that, as explained in the Metropolitan Setting section, BART is not the only transit operator in the San Francisco region. It is not even the largest; it is the third largest of the region's five major publicly owned transit operators in terms of ridership. In addition to BART and three major regional operators (AC Transit, Golden Gate, and Southern Pacific), there are literally dozens of other local operators including one (Muni) which dwarfs BART in ridership and which operates an extensive light rail system and is completing a major subway construction effort.



Geography was a major factor in San Francisco's linear pattern of development, well suited to a regional rail system

highways linking the region's cities tended to encourage a pattern of more sprawling and scattered development. These effects were limited, however, in comparison to other metropolitan areas. Tolls and long travel distance over these gateways were restraints on auto commuting while relatively good public transportation service linked the major centers. [9] Topography continued to constrain development significantly. Meanwhile, affected relatively little by the Depression and aided by the improved access, San Francisco's CBD grew as the regional financial and institutional headquarters.

The following narrative focuses on three periods in the history of BART decisionmaking: (1) the period leading to the decision to build BART, (2) the period of BART construction, and (3) the recent evolution of the planning process. The discussion is organized under headings corresponding to these decisionmaking periods.

TOWARD A DECISION TO BUILD BART

By World War II, there was a consensus that the growth of San Francisco and its CBD would be seriously constrained unless major new transportation facilities were provided. There were—and still are—only six arterials entering the city, and traffic volumes on these routes rapidly had begun to approach capacity. Manufacturing and distribution industries were beginning to locate outside the city, and constraints on office growth and other CBD activity threatened serious economic consequences. This context gave rise to the decision to build BART.

[9] Electric rail on the Bay Bridge connected with a series of routes serving all major East Bay centers. The Southern Pacific provided commuter rail service on the peninsula, and Muni provided streetcar service to northern San Mateo County. In addition, express bus routes crossed the bridges. (The bridges put ferries out of business until recently when ferry service was restored between San Francisco and Marin County.)

Two apparently conflicting views have been articulated to explain the origins of this decision. The "conspiracy theory" holds that BART was mastermind by a self-interested business elite. The "rational planning theory" views BART as a logical answer to the region's transportation and growth needs. The findings of this assessment indicate that both explanations are essentially correct.

The "conspiracy theory" perhaps has best been expounded through a series of articles that appeared in the San *Francisco Bay Guardian,* in publications of the Pacific Studies Center, and in the book *The Ultimate Highrise.*[7] The thesis is that a very small group of the top San Francisco industrialists and bankers conceived of BART as a key element in a grand plan to shape San Francisco into the "imperial headquarters" of a vast Pacific business empire. BART would make possible the growth of a concentrated headquarters center, which would be like Manhattan in both form and role. This type of regional structure, with a highly centralized nerve center directly linked with all parts of the region by rapid transit, was understood to be essential to the functioning of a major international business capital. Although BART was to be conceived and brought into being as part of this grand plan by, and in the interests of, these giants of San Francisco banking and industry, it was to be financed primarily through regressive taxes on all Bay Area residents.

In contrast, the "rational planning theory" is that BART was an optimal solution for the transportation and land development problems which faced the Bay Area in the 1940's and 1950's. BART and its supporters contend that it evolved as a result of enlightened and courageous leadership through a planning process that should be seen as a model for other metropolitan areas.

This view holds that BART planning illustrates well how a transportation plan should relate to the desired urban form of a region. Its exponents argue that the BART process demonstrates how to develop a consensus through the involvement of elected officials at all levels of government in a very complex institutional-political setting. Finally, they suggest BART was the product of a model planning process in that the technological system selected grew out of local planning, arrived at quite independently—and indeed in spite of—any biasing influences of State or Federal financial incentives, regulations, or political pressures.

The conspiracy theory is on target in many respects. There is no doubt that early business leaders were involved, nor that they stood to benefit from BART through increases in land values, through involvement in the construction of BART, and through increased efficiency in conducting their Bay Area business. Nor is there any doubt that they were prime movers in persuading legislators, supervisors, and others to act at key decision points, nor that they (along with other private interests who joined them over the first decade of planning) were the principal financial backers of the campaign to sell BART to the voters (see Table 3).

TABLE 3.—Key Figures in BART's History

Steve Bechtel—President of the worldwide engineering firm, Bechtel Corporation, a founder of Bay Area Council (BAC); member of Board of the Stanford Research Institute, *Fortune Magazine's* **ninth richest man in the U.S. in 1957, responsible for getting his firm into the BARTD top management role in 1959; and major property owner in the Bay Area. The San** *Francisco Bay Guardian* **credits him with conceiving of the BART system as a cornerstone of "imperial headquarters" of a vast Pacific business empire.**

William E. Waste-Vice President of Bechtel, became Chairman of BAC in 1950.

Adrien Falk—President of S&W Foods, President of California Chamber of Commerce, member of BAC Board, first BARTD President, a key organizer of the public relations campaign that preceded the 1962 referendum.

John M. Pierce—An executive of the Western Oil and Gas Association, State Director of Finance for 5 years before becoming BARTD's first General Manager in 1957.

James D. Zellerbach—Chairman of the Board of Crown-Zellerbach Corporation, former U.S. Ambassador to Italy, member of finance committee of Citizen's Committee for BART campaign, and a major supporter of rapid transit in pre-BART period.

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[7] Bruce Brugmann and Greggar Sletteland, editors, *The Ultimate Highrise, San Francisco's Mad Rush Toward the Sky,* San Francisco Bay Guardian Books, 1971.

Susan Thistle, Vicki Smith, and William Ristow, "BART: Forcing the Mission Underground," *San Francisco Bay Guardian,* November 15-28, 1973.

Burton H. Wolfe, "BART: Steve Bechtel's $2 Million Toy: A Special Guardian Probe," San Francisco Bay Guardian, February 14, 1972.

"Regionalism and the **Bay** *Area,* " special issue of the *Pacific Research/World Telegram,* published by Pacific Studies Center, East Palo Alto, Calif., Vol. IX, No 1, November-December, 1972

"Vietnam, Allende, and Big Bad BART: Rapid Transit as a Tool of Foreign Policy, " Gene Marine, (publisher and date unknown).

Carl F. Wente-Chief Executive officer of Bank of America, member of BAC's Rapid Transit Committee, chairman of fund raising effort for BART campaign.

Henry Alexander—Public relations consultant, full-time manager of BART election campaign; later he was advertising consultant to BARTD.

B. R. (Bill) Stokes-Oak/and Tribune journalist and supporter of BART in the BARTC period, Director of Information in early BARTD period and first BARTD employee; General Manager of BARTD from 1963 to 1974.

Marvin E. Lewis—San Francisco Supervisor and corporate lawyer, chairman of BAC's rapid transit committee and BART Commission Chairman.

Edgar Kaiser—President of Kaiser Industries, a major BART supplier; member of Board of Stanford Research Institute; member of BAC Board and a principal contributor to the BART campaign; supporter of stronger regional organization (Golden Gate Authority).

Mortimer Fleishhacker, Jr.—A director of the Clocker Citizens Bank, member of BAC's rapid transit committee.

Kendric Morrish—Vice President of American Trust (a major East Bay Bank); President of the Oakland Chamber of Commerce, later Vice President of Wells Fargo Bank; member of BAC's rapid transit committee, and later member of BART election campaign committee.

Kenneth M. Hoover—Consultant to PBHM during initial system planning; later Chief Engineer for BARTD overseeing PBTB work.

Walter S. Douglas—Partner of PBHM, key person in getting lead role for his firm in the 1954-56 planmaking process.

John Charles Houlihan—Mayor of Oakland, 1961-62, key political supporter of BART in lining up East Bay businessmen and local elected officials.

George Christopher—Mayor of San Francisco during the BART election campaign and a key supporter of BART, closely linked with BAC.

Tom Clawson—President of Bank of America; President of BAC; key BART supporter.

Tom Mellon—City Administrator of San Francisco and close associate of Governor Earl Warren; principal supporter of early legislative efforts.

Cyril Magnin—San Francisco business leader, member of BAC and prime promoter of BART.

Alan K. Browne—Bank of America top executive, a principal BAC expert on finance and political aspects of the formation of BARTD.

Nils Eklund—Vice President of Kaiser, Chairman of Bay Area Transportation Study Commission, worked for BART support in East Bay.

Jack Beckett—Governmental Relations executive with Hewlett-Packard Corporation; member of initial BART Commission and committee to select BART system planning consultant in 1953; present Chairman of Metropolitan Transportation Commission and generally identified as a supporter of BART extensions, particularly in San Mateo and Santa Clara Counties.

Stanley McCaffrey—Executive Director of BAC during creation of BART, now President of University of the Pacific.

From numerous quotes it is clear that these men had a vision of the future of San Francisco that **was** modeled after Manhattan: a vision of high-rise offices (many of them their headquarters offices) served directly by a regional rapid transit system. The business elite was convinced of the importance of this pattern to the proper functioning of a business center for shipping, banking, and investment in industry throughout the Pacific's rim,

However, it is equally clear that a large number of planners, other professionals, and community leaders came to essentiall, the same conclusion about the desirable regional urban form and transportation system. And most of them came to this conclusion, it seems clear, quite independently—without undue influence from those who stood to gain most—through participation in a planning process that was a model for its time in almost all aspects, and a model even today in at least two ways: (1) the participation of local planners in the metropolitan transit planning process and (2) the conscious use of transit to produce a given urban form.

Need for a Coalition of Interests

Considering the obstacles that had to be overcome and the number of times the plan was nearly killed, one must conclude that under the circumstances that prevailed during the 1945 to **1962** period, the BART system could not have been built without a surprising identity between the small group of business elite and the larger body politic that came to express itself through the recognized transit planning process.

When the Bay Area Rapid Transit Commission was created in 1951, there were massive amounts of Federal and State funding available for highways—and none for transit. No Federal funds would be forthcoming for over a decade, and there was a constitutional prohibition on the use of State highway funds for transit. In addition, the State legislature was unwilling to finance even a major portion of the transit planning, except through a loan matched by local funds. Thus, no State money could be counted on to help pay for the cost of

construct ion, which was bound to be many hundreds of times the cost of planning.

In addition, the State put constraints on the regional bonding capacity. A general State requirement called for 66-2/3 percent voter approval of any regional tax-supported bond issue. Attempts to lower the percentage met strong resistance from Senator Randolph Collier, a powerful chairman of the California Senate Transportation Committee who also was father of the State's freeway program. Legislatively imposed limits on bonded indebtedness meant that additional revenues would be needed to construct a regional system.

Raising funds for BART necessitated direct confrontation with highway interests. In order to get legislative approval for using Bay Bridge toll funds for transit construction, BART backers had to muster support for a bond issue of at least $500 million by November 1962. In addition, as part of the agreement to get the legislation, BART supporters were forced to accept the removal of rail tracks from the bridge to make room for more motor vehicle traffic. (This agreement in effect made it more difficult for BART to attract trans-Bay patronage, the heart of its market.)

The financing problems were in part a reflection of the fact that the region had no preexisting institutional framework for transit initiatives. There was no established transit lobby and no significant support for transit from outside the Bay Area, which constituted only about a quarter of the State's population and representation in 'the legislature.

In addition, there was still no regional transportation planning organization, and there were major obstacles to the creation of one. A long-established rivalry assured that any proposals originating in San Francisco were greeted with great suspicion in the East Bay. Major retail business interests with investments outside San Francisco (in Oakland and San Mateo counties particularly) tended to oppose the proposed system because they were afraid that their customers would be drawn to the city.

Due to the way BARTD's legislation was written, there was difficulty gaining support from counties with large populations in rural areas and outlying towns. The legislation provided that a county had to be taxed as a unit, if at all, even though BART could offer rail service only to the higher-density areas. Rural areas and outlying towns could be counted on to vote against BART taxes because they did not stand to benefit from the transit system directly. In particular, Contra Costa County was split **about evenly between** urban and rural, for and against. It required special wooing and the promise of special favors. s

Other problems undermined BART support in San Mateo and Marin counties. g BART was rejected by San Mateo County in part because of opposition from conservative taxpayers who considered the plan fiscally irresponsible, in part because of opposition of politically powerful real estate interests, and in part because the county was already served by the Southern Pacific commuter system,

This withdrawal had further repercussions because transit planners had counted on San Mateo County's hefty tax base to balance out the weak tax base in Marin County. Once San Mateo withdrew, there was no feasible way to finance the remaining four-county system because of the high cost of the Marin portion of the system relative to its tax base,

In addition, the Golden Gate Bridge Board of Directors had rejected the use of BART on the bridge to serve Marin County. The announced

[8] Joseph S. Silva from the outlying area of Brentwood held the swing ballot on the July 1962 Board of Supervisors vote to take the BART bond issue to referendum the following November. Silva was hosted at breakfast the morning of the vote by San Francisco Mayor George Christopher and Oakland Mayor John Houlihan. Houlihan, in an interview, said that Silva was primarily Influenced by the personal appeal of the mayors, but he acknowledged that Silva's later appointment to the BARTD Board may have been his reward for the favorable vote. Houlihan denies that the mayors also promised Silva that Contra Costa County would get the first BART extension. Several others interviewed, however, believe that such a promise was made, although no direct witness to the promise has been identified.

[9] Of the original nine counties included in the 1956 long-range master plan, three counties (Napa, Solano, and Sonoma) were not to be served by the first stage system because of their remoteness and low population. No real effort was made to include them in the 1957 BART District legislation. Santa Clara County's omission, however, was a more complex matter and one that still may be seen as a decision of long-lasting consequence to the Bay area. The decision to stay out of the District was made during the legislative process in 1957 largely because PBHM's first-phase plan provided service only to the edge of the county rather than to its core in San Jose's CBD. The selection of the terminus for this line was based on technical criteria. However, this made it politically infeasible to convince Santa Clara County's elected leaders to accept inclusion if it meant countywide taxation on the same basis as other counties more fully served by the system. Efforts to work out a special taxation district for the area served proved politically infeasible as well.

opposition was based on technical engineering grounds, but in the view of many observers it was motivated by concern over the affect of BART on toll revenues,

These two events, coupled with approaching deadlines to get a plan on the November ballot, caused BARTD to force Marin County out of the District.

BART never would have succeeded in overcoming these and many obstacles if there had not been a common interest uniting the business elite and the larger public in support for BART.

Evidence of Consensus

This assessment has found no direct evidence for the claim made by the Bay Guardian writers and others that business leaders originated the BART concept. For a while after they formed the Bay Area Council (BAC) in 1945[10] the business leaders appeared to support regional highways and bridges as their main transportation goal—in particular by urging the construction of a second San Francisco-Oakland Bay crossing. Business leaders began to push for a regional approach to rapid transit only when they became convinced that a regional transit system was the best way to achieve the goal they shared with many Bay Area planners: to improve regional access to San Francisco's CBD. BAC, to achieve its goals, picked up the lead in promoting regional rapid transit only after the concept had been developed out of a planning process that focused on technical considerations.

During the Second World War military considerations gave rise to increased concerns over congestion and lack of regional access. The 1947 Army-Navy Board Report is believed to be the first serious proposal for an integrated regional rapid transit system with a tube under the Bay directly connecting transit systems on both sides. The Congressional resolution that initiated the study was introduced by San Francisco Congressman Richard J. Welch. The motivation, for the request apparently involved technical military concerns—partly a concern over the vulnerability of the bridges and the city to attack and partly a realization that the constraints on regional transportation access throughout the Bay Area had proven to be a handicap to the development of wartime industries. [11]

By the time BAC people joined with key political leaders to setup a special rapid transit committee in 1949, concerns over the role of transit in regional development began to predominate over wartime concerns, From 1949 on, BAC and the interests it represented were the nucleus of support for BART. These interests seem to have played the lead role in initiating legislation, obtaining regional political backing, and raising funds to support the 1962 BART bond issue campaign. Marvin E. Lewis, a corporate lawyer, San Francisco Supervisor, and chairman of the Bay Area Rapid Transit Committee, is given credit for much of the hard work in getting support for the formal legislative establishment of the BART Commission (BARTC) in the 1949-51 period. Despite later allegations that he sought to "Manhattanize" San Francisco, Lewis, who was later chairman of BARTC, has been quoted as saying that his goal was to alleviate congestion and provide regional access among Bay Area cities.

The charge that business interests were masterminding BART in a covert manner behind the scenes is an exaggeration. In fact, there was little need for covert activity. The business community did not try to hide its efforts, for it considered that it was acting in the public interest. It used the media to draw attention to what it considered to be goals it shared with elected leaders and the public.

It has been alleged that BAC dominated the choosing of the consultants and the content of their reports. No supporting evidence for this allegation can be found during the early period when the basic BART system concept was being developed. DeLeuw, Cather & Company, the first consultant hired in 1952, was a local firm that had done

[10] The Bay Area Council, which is governed by a board composed overwhelmingly of representatives of the region's major industries, has been the prime mover since 1945 for most efforts to organize regional government, regional planning, and public works projects which support regional integration. It has consistently played a powerful role in shaping new regional institutions; half of the original BART commissioners came from the BAC in 1951. See "Bay Area Council: Regional Powerhouse," by Les Shipnuck and Dan Feshbach, in *Regionalism and the Bay Area*, Pacific Studies Center, op. cit,

[11] In 1943, war production had become so hampered by constraints in the regional transportation system that a subcommittee of the House Naval Affairs Committee recommended that, due to the lack of regional planning, defense work should not be allowed to expand any further in the area. See "BART: Rapid Transit and Regional Control" by Greg De Freitas, in *Regionalism and the Bay Area*, Pacific Studies Center, op cit,

previous transit studies for the city—no special-interest relationship has been identified between it and BAC. That study resulted in the BART Commission's conclusion that a regional rapid transit system was needed, and it laid out the formal planning process which was to follow.

DeLeuw, Cather lost out in the 1953 competition for the major system planning contract but again no special-interest relationship has been identified between BAC and the new consultant, Parsons, Brinckerhoff, Hall and MacDonald (PBHM). This team was chosen because it had extensive rapid transit experience in Manhattan and the advantage of not being associated with one specific part of the region. The work of this consultant team resulted in the basic master plan for the BART system.

The Stanford Research Institute (SRI), which was hired under a separate contract to prepare recommendations on the organizational and financial aspects of the proposed system, was the first transit consultant whose personnel were directly involved with BAC. Several BAC people were on the SRI board at the time, including Kaiser and Bechtel and several San Francisco bankers. The recommendations on taxes were similar to those eventually used: property and sales taxes and bridge tolls. Less regressive taxes on business or income were apparently not considered; gasoline taxes were considered and rejected. [12]

It was not until after PBHM and its associated planning team had prepared the original nine-county master plan and the permanent BART District (BARTD) had been established that local firms with strong BAC ties began to play major roles in technical aspects of transit system planning and engineering. In 1959, BARTD signed a contract (the first of several) for $600,000 with the three-firm joint venture of "PB-T-B": Parsons, Brinckerhoff, Quade and Douglas (the new name of PBHM), the Tudor Engineering Company, and the Bechtel Corporation. The latter two both were based in San Francisco. The contract was negotiated without competition. Steve Bechtel used his long-standing BAC relationship to advantage in obtaining a major role for his firm for the remainder of the system planning work and the dominant management role for all engineering work after 1962. [13]

Steve Bechtel does not, however, appear to have had a dominant role in shaping the basic rail plan. By 1959, when his firm first became involved, the basic system plan had been well established (although it was to shrink in 1962 from a 123-mile, five-county, system to a 75-mile, three-county system). The process of developing the basic plan during the 1954-56 period had been shaped to a great extent by a team of urban designers and planners working with PBHM in a fairly independent capacity. This mechanism had been established at the insistence of BAC's Bay Area Planning Committee, which was composed of planning directors of cities and counties of the region. The planning team, headed by Norma Westra of the Connecticut firm of Adams, Howard and Creeley, worked closely with planning directors of the region to develop the regional land use plan upon which the rail plan was based. [14]

At that time there was widespread agreement among area planners and the planning profession generally on the concept of how a large urban region should develop. Urban renewal was needed to save the dying heart of cities; the good urban life could only be achieved through high density development of the city cores and well-defined and well-linked system of modes with clear identity. When these and related concepts were applied to

[12] Norman Kennedy, "San Francisco Bay Area Rapid Transit: Promises Problems, Prospects, "paper presented at the 1971 Convention, Society of Automotive Engineers, Australia, October 1971; and San Franclsco Bay Guardian, op. cit.

[13] According to Burton Wolfe's article in the February 4, 1973, *Bay Guardian*, Bechtel received 90 percent of the eventual $150 million management fee paid PBTB. McDonald & Smart (op. cit.), however, report that Bechtel received 25 percent of the Joint Venture's fee in the 1959-62 period and 45 percent after 1962. The total fee was $142 million through July 1, 1972. All agree that Bechtel exerted his personal power to achieve the role for his firm.

[14] Somewhat surprisingly, the importance of the role of local planners and the BARTD urban planning team in shaping the plan is completely missed in most of the histories. In particular Zwerling (op. cit.) and McDonald& Smart (op. cit.) both take the engineers to task for presuming a regional land use plan of their own in the absence of any officially recognized plan. One might reach this conclusion by talking only to the engineers and by reading only the final 1956 report, However, numerous interviews with those involved, both in and out of the team, and members of various professions confirm that the urban planners working with PBQD in the 1954-56 period did prepare a very thorough regional land development plan in close coordination with local planning staffs, and that this plan did form the primary rationale for the BART system in terms of its basic regional configuration.

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existing Bay Area conditions a plan emerged with a high degree of concensus, fairly precisely defining the BART system and even its station locations. [15]

It seems clear that BART was the result of both a rational planning process and the promotional efforts of businessmen. BART was achieved because almost all interests involved shared the initial goals of relieving congestion and preserving and rejuvenating the older city centers. However, each aspired to these goals for different reasons: the businessmen wanted to develop a regional economic headquarters center and to integrate the labor markets and productive centers of the Bay Area; whereas most elected officials and much of the public were concerned about congestion and the negative impacts of freeways. Most urban planners coupled these concerns with a strong vision of the role of transit as a catalyst in the city renewal process.

Local planners and major local officials were involved in the formal process of developing the plan, but lesser officials and the general public were not. Instead, an attempt was made to enlist their support for an already fully formulated plan through a public relations campaign that was financed by BAC members (although they did not in this case work through BAC) and by the consulting firms and other firms, including several who expected to sell their products to BARTD. The campaign itself did involve some substantial efforts on the part of other political leaders who were not identified with BAC, notably Oakland Mayor John Houlihan. But it is commonly accepted that BAC people were the principal force behind a well-run campaign that enlisted most of the newspapers, radio, and television stations.

The pre-election campaign followed 6 years of extensive press coverage that began after publication of the master plan. However, despite the fact that the approach to the public by BARTD and its supporters was entirely promotional, the public in general seems to have had a good comprehension of the plan and of its financial impacts (insofar as they were known at the time of the election).

The results of the election of November 1962, when the bond issue for financing BART was presented to the voters for approval, testified to the degree of consensus in San Francisco. The 61.2 percent favorable vote was one of the highest metropolitanwide votes ever obtained (before or since) for a major transportation bond issue and was probably the largest local bond issue of any kind ever passed. The vote was a tribute to the durability of the political alliance that had helped the BART plan obtain an amazingly high level of support.

Support for the bond issue was predictably high in San Francisco and in the most urban parts of the East Bay where high-quality service was to be provided. The vote breakdown by county was as follows:

County	Percent
San Francisco	66.90
Alameda	60.04
Contra Costa	54.48
Average	61.22

The bond issue passed, as was required in the original BARTD legislation, in the three-county District as a whole-rather than on a county-by-county basis.

In only 17 of San Francisco's 1322 precincts was the favorable vote under so percent. The vote was very high even in the northern parts of the city that would not be served by BART. Voting appears to have been influenced strongly by home ownership—there was general awareness of the impact the bond issue would have on property tax. In the East Bay, there was opposition to BART in Albany and El Cerrito because of anticipated negative impacts of elevated line and opposition of local officials. Opposition also occurred in rural areas removed from the routes, There was little or no correlation of the vote with income or

[15] Even though this view is generally accepted, one critic, Martin Wohl, has pointed out several instances where the overriding consideration was to maximize overall speed in order to serve outlying areas well and compete with the auto.

socioeconomic status apart from what could be explained by home ownership. [16]

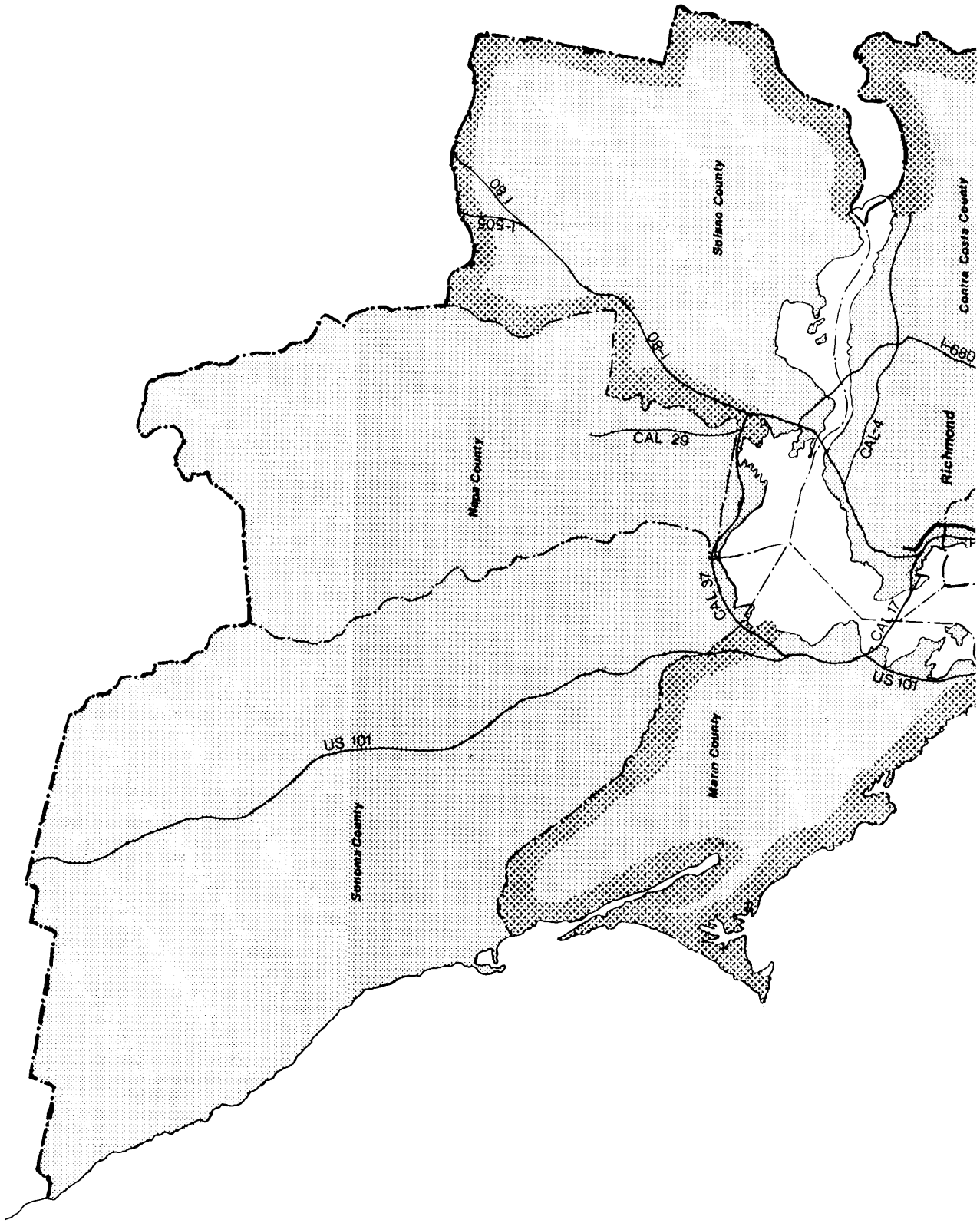
[16] Wolfgang Homburger, "An Analysis of the Vote on Rapid Transit Bonds in the San Francisco Bay Area," *ITTE Research Report No. 36*, University of California, Berkeley, June 1963. Voting results reported above differ slightly from those reported in several other sources, which show results before absentee ballots were counted. Homburger notes that in Alameda County the absentee vote was substantially more favorable (by 12 percent) than the vote cast at the polls, putting the county over the 60 percent mark. He attributes this to the last-minute anti-BART campaign. Absentee ballots had to be cast at least 3 days before election day. Two days before election day about two million people reported to local schools for Sabin polio vaccine. Homburger says that BART opponents were handing out literature at a number of schools in the East Bay.

THE BUILDING OF BART

The building of BART has spanned 13 years, 1962-75, almost as long as it took to make the final decision to build it, from about 1945 to 1962. It is likely that it will have taken a total of 32 years to conceive, plan, and build BART by the time the final station at the Embarcadero is opened and the full system is in operation with planned frequency of service under the guidance of its ultimate automatic control system.

In contrast to the first period, whose history focuses on a single overwhelmingly important decision (i.e., the decision to build BART), the implementation period has several elements that




Solano County
Contra Costa County
I-80
I-505
I-80
I-680
CAL 29
CAL-4
Richmond
Napa County
CAL 37
CAL 17
US 101
US 101
Marin County
Sonoma County

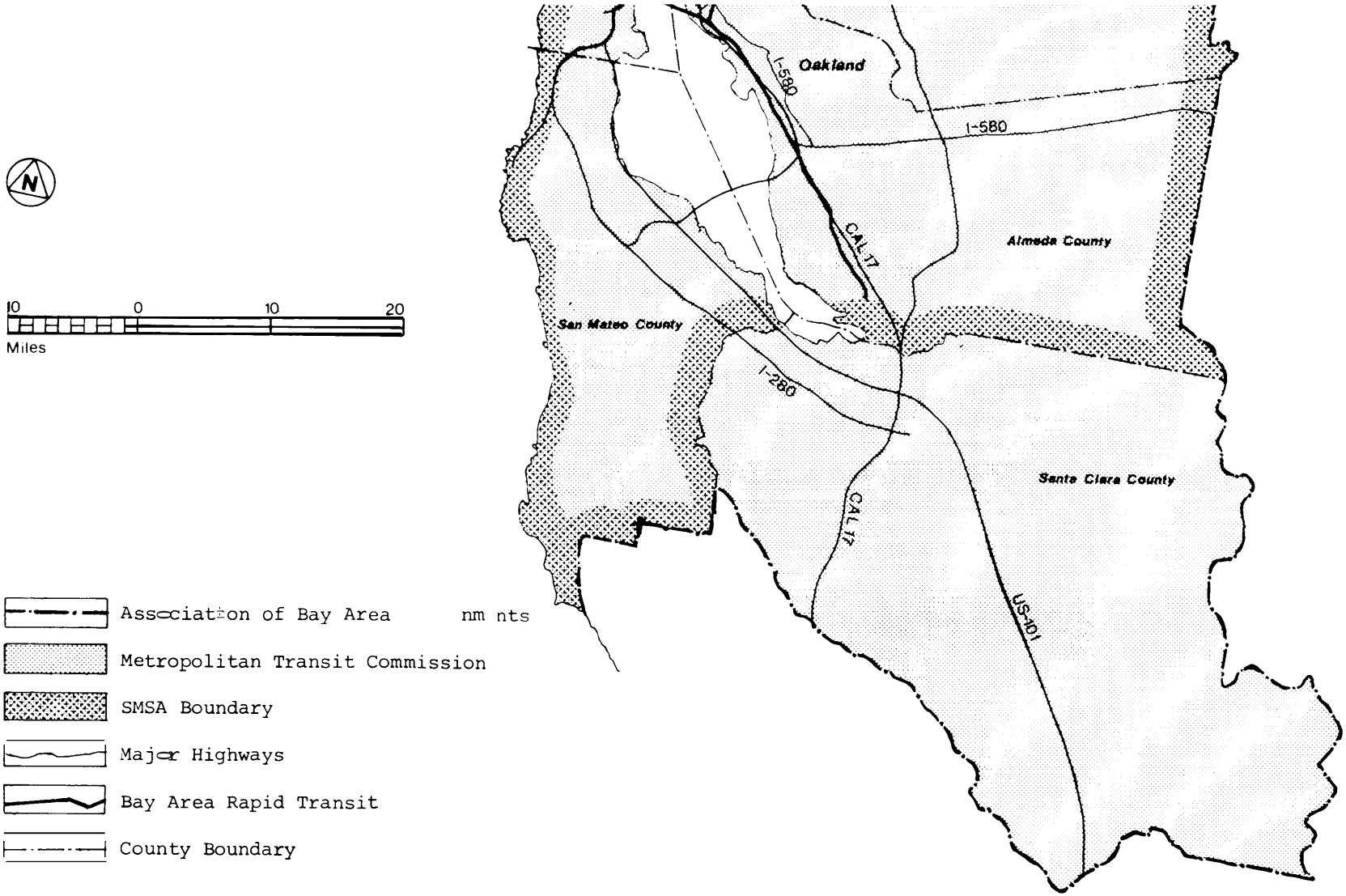


FIGURE 1: SAN FRANCISCO METROPOLITAN AREA

A Standard Metropolitan Statistical Area (SMSA) includes a center city (or cities), usually with a population of at least 50,000, plus adjacent counties or other political divisions that are economically and socially integrated with the central area.

are of significant interest to other metropolitan areas. These include:

. The taxpayers' suit against BARTD and PB-T-B;

. BARTD's battles with communities over elements of system design;

. Financing problems and relationships with the legislature.

There was a dramatic contrast in BARTD's relationship with the Bay Area community before and after the referendum, BART's honeymoon with the voters was over within weeks 'of the election. With few exceptions, the media, political leadership, and most organized groups supported BART before the election, but not afterward. After the election, BARTD seems to many to have become a well-funded, powerful, independent organization with relatively little accountability.

This change in public attitude was primarily due to a change in the nature of BARTD. After the election, BARTD changed from a public relations-oriented organization seeking voter approval to an organization that was financially independent. As a result, it became less interested in the voters' wishes and more concerned with the technical and financial problems of building a large and complex transportation system. As this happened, the control of BARTD shifted from the prereferendum leadership, which had consisted of the business community, elected officials, and public relations experts, to PB-T-B, the engineering consultants, who had little accountability or experience in community relations. This basic change in the nature of BARTD and in its relationship to the public set a new context for the second stage of BART's development.

The Taxpayer's Suit Against BARTD and PB-T-B

One week after the election, a BARTD committee recommended approval of a new PB-T-B contract for $47 million. The full board approved it 2 weeks later, at which time it was confronted with the threat of a court suit by a group of engineers who objected to the "giveaway program." The engineers' efforts were frustrated when a Contra Costa judge ruled against a temporary restraining order for the entire BART project,

Shortly after this a second group of four East Bay residents and elected officials filed a suit involving seven charges. This suit was successful in halting BART almost completely for more than half a year, at a cost to BARTD of $12 to $15 million, primarily due to inflation, but also to staff costs. Four of the charges were dismissed early; the three that were heard in court during the first half of *1963* included:

- A challenge to the validity of the November 1962 election on the grounds that public funds had been used to influence the vote.
- A challenge to the PB-T-B contract and to the mechanism established for determining fees.
- Challenges to BARTD staff salary payments.

Although the court eventually absolved both BARTD and PB-T-B of all of the charges, the case publicized significant facts about the management structure of BARTD/PB-T-B that were at the root of later problems.

BARTD's board, and in particular its Engineering Committee, had no real ability to evaluate or oversee the work of the consultant team. BARTD had only 16 employees at the time, and only one, Keneth Hoover, with engineering background. Hoover previously had been a consultant to Parsons, Brinckerhoff, Quade and *Douglas PBQD)* for about a year and a half and had been recommended for the chief engineer's position by Walter Douglas, a partner of PB-T-B.

There apparently was no competition for the consultant contract. The contract provided for fee payment as a percentage of costs, rather than stating a fixed fee, thus providing no incentive to economize—to the contrary it provided an incentive to permit costs to increase. Several informed observers have commented on the fact that the terms of the contract were exceptionally favorable to PB-T-B and that the BARTD board had no inclination to negotiate more stringent terms, The consultants were given unusually broad powers by the terms of the contract to represent BARTD in dealings with the public and local governments and to negotiate subcontracts.

The board's lack of control of the consultant's work can be attributed in part to the close personal relationships that had continued to exist between the business leaders on the board, the top staff, and the consultant team. Walter S. Douglas admitted in an interview with *San* Francisco *Chronicle* reporter Michael Harris that there was greater delegation of

authority over basic financial matters than was traditional in this field. 17 Harris notes that Douglas was primarily responsible for getting Ken Hoover the position as BARTD chief engineer, and that Hoover in turn helped PB-T-B get its management contract. Likewise two BARTD directors, Adrien Falk and Thomas Gray, separately testified in the 1963 trial that they did not feel it was their responsibility to be concerned over how much profit the consultants made.

During most of the system implementation it was difficult to distinguish between BARTD and PB-T-B staffs. Even General Manager Stokes has admitted it was difficult to know, in those days, who worked for whom. [18] This lack of clear identification of decision responsibilities was one of the issues of the taxpayers suit.

Stephen Zwerling reflected a widespread feeling when he asked, ". . . who really was running BARTD—its management, its board of directors, or the consulting engineers? The small size of the board, the nontechnical background of its members, and the highly technical nature of the task to be performed suggest that the engineers would have a great deal of autonomy, influence, and authority with little responsibility."[19]

Unfortunately, BARTD did little to correct the problems that were raised by the taxpayers' suit, and there was no formal external review or oversight of BARTD for several years afterward. Three years later when BARTD's financial problems first came to the attention of the public and the legislature, BARTD was trying to manage a billion-dollar construction program at the peak of its activity with only 19 employees trained in technical fields. It was not until after serious delays and cost overruns had occurred that BARTD began to greatly increase its in-house technical competence. By then many of the mistakes which were to cost BARTD greatly in credibility had already been made.

BARTD's Battles With Communities Over Elements of System Design

The history of BART's construction is one of almost continual battles with communities over the design of the system. [20] It is perhaps inevitable in any construction activity of this magnitude that conflict will occur between communities and those responsible for carrying out the regional mandate to build the system. However, the intensity of the conflict was raised to an unnecessary level that in some instances resulted in excessive delays and costs. Several factors were at work:

. The entire system had been specified in considerable detail in the 1962 *Composite* Report. The bond issue approval was a commitment to this plan with very little provision for changes in station location, alinement, or elevation.

- Elements of system design were often unknown to the public until after the election because copies of the *Composite Report,* or details from it, were not readily available. Only public relations material was available and this contained very general information.

- Financing limitations and political considerations had forced the engineers to prepare a system plan that contained some design elements that were unsatisfactory to the communities involved. BARTD had had to get acceptable geographic coverage within a legislatively fixed upper bonding limit determined by assessed value of all property in the district; thus BART planners were forced to economize on elements of the system design to the detriment of several communities,

17 Michael Harris, *San Francisco Chronicle,* February 4, 1966.

18 McDonald & Smart, *A History of the Key Decisions,* op. cit., p. 116.

19 Stephen Zwerling, *Mass Transit and the Politics Of Technology: A Study of BART and the San Francisco Bay Area,* Praeger Publishers, New York, 1974, pp. 43-44.

20 One of the most thorough histories of BART (McDonald & Smart, op. cit., pp. 89-113) stresses the sensitivity of the staff to the wishes of the communities and goes into considerable detail to explain how cost increases occurred in ways that were beyond PB-T-B's control. This part of that history seems particularly out of balance. Much of the text appears to come straight from the consultants and none from any of the many available sources involved on the other side of the various issues. Sources referenced in this document as a whole appear overwhelmingly biased toward the official view of BARTD's history: more than two thirds of the sources referenced are to BARTD/PB-T-B or closely related persons or firms and the majority of the remainder are to government documents or neutral observers. Well under 10 percent of the references are to sources that might be considered critical commentators and none are to any of the several sources that might be characterized as propounding or even supporting the conspiratorial view of BART's history. Nonetheless, despite the difference in tone of treatment of this subject, McDonald & Smart arrive at essentially the same conclusions regarding the need for community interaction and financing requirements.

- The fixed amount of funding for a fixed system left no room for increases in the cost of system elements during the design and construction process. This severely limited design flexibility.
- BARTD/PB-T-B staff working procedures did not provide for the development and evaluation of alternatives on most important decisions; single recommendations were almost always prepared for BARTD staff or board action, thus tending to bury potential problems within PB-T-B staff.
- The engineers' style in dealing with the public, with local governments, and with other professionals often tended to intensify the conflict. The leadership role within the Joint Venture shifted from PBQD to Bechtel, which had far less experience in community relations.
- Eventually, increased inflation rates (and other factors) exacerbated the cost squeeze.

All of these factors combined to cause spiraling conflict, delays, cost increases, inflexibility, and polarization between BARTD and many of those it was dealing with.

Some conflict arose even before the bond election. Albany and El Cerrito both objected to the elevated design through their cities and fought BARTD unsuccessfully. Berkeley managed to get early agreement on putting some of its downtown section in subway. Berkeley supported the bond issue, although that city went on record as not being satisfied with the changes that had been made.

In Richmond, BARTD fought against the original plan for the central station location because of property acquisition costs. Richmond CBD interests and others struggled to retain the original location as a catalyst for redevelopment and to better serve much of the city including lower-income areas. BARTD supported an alternative location for the terminus of the line on the route of the existing railroad right-of-way, arguing that it would cause less disruption, would provide greater access from the North where additional potential riders were located, and would be better located for possible future extensions of the route. BARTD got out of this fight relatively easily when the City Council eventually took a position supporting BARTD's preference.

BARTD's biggest fight with a city was over the remaining 2¾ miles of planned elevated line in Berkeley. The City Council had resolved to request BARTD to place the entire line underground in 1960, and the Council reopened the issue in July 1963, asking for comparative cost estimates of subway versus elevated construction. The issue raged on for over 3 years, involving an acrimonious hearing forced on BARTD by Berkeley, national publicity unfavorable to BARTD, and wildly varying cost estimates—Berkeley's as low as $6 million, BARTD's as high as $24.6 to $32.3 million. At one point BARTD issued an ultimatum: if Berkeley did not put up the funds that would be needed to finance BARTD's high estimate within 30 days, BARTD would proceed toward construction of the elevated design.

Berkeley, led by Mayor Wallace Johnson, eventually succeeded in its struggle by achieving landslide support of 82 percent for a bond referendum in 1966, which allowed up to $20 million to be committed for the extra costs of subway construction. BARTD lost heavily in terms of delays (almost 3 years) and resulting costs, and perhaps even more heavily in terms of credibility, because of the poor manner in which it handled the issue, in terms of both technical competence and community relations. The eventual extra construction cost to Berkeley was $12.4 million, not far from its 1964 estimate of $11 million and well below any of BARTD's estimates.

A subsequent fight between BARTD and Berkeley over the design of the Ashby station occurred in late 1967, It was settled in Berkeley's favor in May 1968 in a court suit after an injunction stopped BARTD from going ahead with construction.

The city of San Francisco and BARTD had a series of conflicts over subway design on Market Street and handling of Muni streetcars. Finding itself in a cost squeeze, BARTD sought to save between $500,000 and $1 million per station by eliminating a columnless vaulted ceiling and adding columns.

Another issue involved the "skylight plan." San Francisco wanted frequent skylights to open up the mezzanine level to the outside. The plan required raising the level of the ceilings and increasing utility relocation costs. BARTD fought the plan, saying it might cause delays of as much as 2 years. But after public hearings, critical newspaper editorials, and



BART's elevated structures created controversy in Berkeley and other parts of the Bay Area

pressure from civic groups, BARTD had its architects come up with a compromise plan that included the skylights. The irony of this episode is that after construction had begun in 1968, the city belatedly adopted a Market Street beautification plan that eliminated some of the skylights.

Construction on Market Street actually involved three major projects—BART, the Muni Metro subway on the level above BART, and the Market Street beautification project. Because of problems and the timing of efforts that were financed from different sources, there were considerable inefficiencies in the overall construction effort. Perhaps of equal significance, Market Street was torn up for almost twice as long as it might have been, with a resulting doubling of the social and economic disruption to the heart of the city. Allan Jacobs, San Francisco's Director of Planning, says this has had a major impact on public attitudes and the chances of implementing other subway projects in the city. He says, only half facetiously, "You can build only once every third generation. "

Certainly that is an important lesson for other metropolitan areas considering the prospect of staged decisions on fixed-guideway transit networks.

A final conflict representative of BART's rocky history is the much-publicized conflict between BARTD/PB-T-B and its design consultants, Lawrence Halprin and Don Emmons, over design of the system. The two men, widely respected in landscape architecture and urban design, had been retained to advise on design of stations and other system elements. They were continually frustrated in efforts because of the constraints placed on their design concepts by PB-T-B. Eventually in September 1966, Halprin and Emmons denounced the engineer's dominance over the work of other professionals and handed in their resignations in a

highly charged and highly publicized episode. These events brought on a sharp attack from the press and others that caused BARTD to take back some of the power it had given the engineers, at least to the extent of providing the remaining architectural staff and other design consultants with more direct access to the general manager.

Despite the attention that this fight received, Larry Dahms, BARTD's acting director in 1974, claimed, probably accurately, that quality of design is one of the BART system's outstanding achievements.

However, the importance of this clash is that it brought into the open one important aspect of the financial squeeze that BARTD was having to cope with at that time. It gave the community a grasp of the basic conflict between the engineering construction goal under a fixed budget and the goals of communities as they relate to urban design.

Financing Problems and BART's Relationship with the Legislature

In retrospect, it is highly unlikely that BART could have completed the system within its original budget, for the planners made little allowance for contingencies other than the usual percentages allowed for engineering projects. To have kept to the original budget and schedule would have required no significant delays in construction, no prolonged court fights or strikes, no major changes in design, no major unforeseen obstacles in technological development (although BART had to develop much of its own technology as it went along because it chose to push beyond available rail technology in so many areas), no external events to significantly increase inflation over the relatively low rates experienced in the 1950's, and no major localized effect on inflation resulting from the introduction of a billion dollars of new construction in one metropolitan area,

The original BARTD estimates were essentially accurate in their estimates of construction costs in terms of prevailing prices. However, they failed to account for contingencies beyond the level typically encountered in conventional engineering construction (10 percent), and they assumed an unrealistic construction schedule that did not recognize the need for interaction with communities and the design changes that would result. By far the most important of the cost escalations were the 3-year delay and Vietnam-fueled inflation.

Initial inflation estimates were about 3 percent, but the actual inflation in San Francisco was 6.5 percent, slightly above the U.S. rate for 20 cities, due in part to the effects of BART construction.

Delays were the other major factor in the cost escalations. For BARTD to have kept to its original schedule (and therefore budget), BARTD would have had to operate with total insensitivity to community pressures, exempt from legislative review and judicial restraint. As it was, BARTD frequently has been criticized for being insensitive—for trying to push through its program as rapidly as possible, even if it meant running roughshod over community preferences.

BART was caught between conflicting demands. Local communities wanted an ongoing involvement with a flexible planning and design process. From the standpoint of fiscal economy, however, the best way to build a transit system is to do it as quickly as possible. Community participation takes time and therefore costs money.

This, in fact, was a major conclusion of a 1968 review of BART's finances on behalf of the California Senate. Because delays were a primary cause of BARTD's financial problems, the review recommended that the legislature do away with the public hearing requirement—the only participatory mechanism required by BARTD's legislation.

All things considered, BART construction came in reasonably close to the original cost estimates. In November 1971, by which time most of the cost escalation had already occurred, costs had risen only about 40 percent since the 1962 *Composite Report.* An article in a prominent economic journal noted that "by comparison with other public projects, this cost overrun is not very bad."[21] It cited a study of weapons systems which found that, on the average, actual cost was 3.25 times the estimated cost; a study of Bureau of Reclamation projects in which actual costs were 2.63 times estimated costs; and Corps of Engineers projects prior to 1951 with a 2.24 to 1 ratio (improved to 1.36 by 1964). Finally, a study of ad hoc projects (one-of-a-kind projects not part of a program of similar projects under development by the same agency) found that the average cost overrun for such projects was 73 percent.

[21] Leonard Merewitz, "Public Transportation: Wish Fulfillment and Reality in the San Francisco Bay Area," Journal of the *American* Economic *Association,* November 1971.

BART's construction costs actually remained below estimates on a project-by-project basis for the first 20 months of construction (through December 1965). However, BARTD became aware of the cumulative effects of delays by May 1965, and the *San Francisco Chronicle* broke news of the money crisis in February 1966.

By July 1966, BARTD had projected a $200 million shortfall. In early 1967, BARTD General Manager B.R. Stokes projected a complete depletion of available funds by 1968 and began encouraging a new bond issue for the November 1967 ballot. This trial balloon was immediately shot down by the San Francisco supervisors, who, probably accurately, read the mood of the voters to be negative.

The debate moved to the State Legislature, with San Francisco representatives supporting use of funds from Bay Area toll bridges, and others supporting use of a local sales tax. San Francisco legislators attempted to pass a refinancing scheme based on Bay Bridge tolls throughout the 1967 legislative session, but the plan died in the Assembly after passing the Senate. Stokes began announcing plans for halting construction after only 57 miles of the 75-mile system had been completed. The legislature continued into a special fall session called by Governor Reagan, who had threatened to veto toll financing because he favored using the toll money to build a second bridge for motor traffic between San Francisco and Oakland. A one-half cent sales tax finally passed in spring 1969.

A final important element in BART financing was that UMTA did not play any substantive role during the basic decisionmaking phase nor in the first half of the construction period. A $13 million capital grant received in August 1966 was the first substantive Federal assistance BARTD received. Subsequently—and especially as BART ran further and further over its original estimates—UMTA funds came to the rescue.

As BARTD ran into financial difficulties, it became clear that its original plan to finance the rolling stock through revenue bonds would not be feasible, because no realistic appraisal of expected revenues and operating costs would provide potential investors with the required security for bonds. Rolling stock finally was acquired largely by means of UMTA grants that eventually totaled $304 million, about 19 percent of the total cost of the system and about half of BART's total cost overrun.

As BARTD ran into financial difficulties, there was a realization that not only would revenues be insufficient to secure revenue bonds, but they also would not come close to covering operating cost. Deficits were running about $27 million per year and were expected to increase. [22] This inability to cover operating costs with revenues was a national trend. In San Francisco, however, the operating losses were drastically increased by the delays in beginning full-scale revenue operations caused by extremely poor reliability y of the rolling stock, other maintenance and operations difficulties, and problems with the automated control system.

BARTD had no basis for financing continuing operating deficits and would have been forced to cease operations by late 1974 or early 1975 unless additional funds had been provided. This financial crisis precipitated generalized criticism of BARTD that was focused on BART Director B.R. Stokes, who was beginning to be blamed for all BART's technical difficulties with its rolling stock and control system as well as for the financial problems. Stokes resigned in May 1974.[23] The financial crisis was solved some 6 months later when the legislature extended the one-half cent sales tax and permitted its use for BART's operating costs.

RECENT EVOLUTION OF THE PLANNING PROCESS

In September 1970, the first permanent regional transportation planning agency for the Bay Area, the Metropolitan Transportation Commission, was created by the legislature.

Prior to this, there had been two temporary agencies involved in BART system planning. The Bay Area Transportation Study Commission (1963-69) had been set up to satisfy the 3-C planning requirements of the 1962 Federal-Aid Highway Act and to prepare the report that was submitted to the legislature and the Governor in May 1969. The Transportation Study's principal

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22 *Metropolitan* Transportation Commission, *Special Report on Transit Finance,* April 1974.

23 The fact that Stokes landed the top job at the newly created American Public Transportation Association in Washington, D. C., is indicative of the respect he had within the industry and in national circles despite his problems at BARTD.

product was a typical **3-C** planning document, containing the most comprehensive set of data ever collected on the Bay Area, and a plan that included almost all the projects that had been proposed for the area. The plan, though certainly unimplementable in full, was a good reference document on regional highways, bridges, and transit facilities, and on present and projected demographic and economic conditions and land development patterns for the entire Bay Area. The second temporary agency was the Regional Transportation Committee, set up in 1969 by a cooperative mutual agreement of the Association of Bay Area Governments and the California Department of Transportation.

Quite in contrast to its two immediate predecessors, the Metropolitan Transportation Commission (MTC) is unique among regional agencies in the power it possesses. In addition to the usual A-95 review authority and responsibility for Federal transportation planning requirements, MTC was essentially given veto power over all regional transportation projects. Furthermore, in 1971 it was given authority to allocate about $35 million per year from the Transportation Development Act funds (.25 percent of all local sales taxes) among the several competing transit operators in the nine-county region. MTC has the authority to determine whether the funds are to be used immediately or kept in reserve to be used for future needs, and to determine how the funds are to be used: for planning, operation, or construction, and, in the more rural counties, for either highway or transit.

MTC adopted a plan in June 1973 as required by the original legislation. MTC's plan contrasts strikingly with the earlier Bay Area Transportation Study plan. Instead of concentrating on long-range forecasts and plans, MTC's plan stresses policy directions. Apart from the positive treatment of new policy directions for the region, however, much of the MTC plan is reactive. It contains no serious effort to identify new opportunities or to create program initiatives to achieve regional objectives. The plan's critics have concluded that the MTC planning process is the type that might stop some bad projects but it would never result in getting a BART built, even if that was clearly what the region needed.

On the positive side, the plan has several interesting features:

- Twelve major corridors are defined in such a way that the principal issues, functions, and options in each can be examined relatively independently in subsequent subregional studies.
- The basic physical plan is composed of elements that are formally assigned "status." The categories of status are (1) projects recommended for implementation, (2) those recommended for planning evaluation, (3) areas in which an issue is recognized, and (4) projects not included in the plan at this time. This treatment is a technical contribution to the state-of-the-art of the type of planning process that is evolving around the country.
- The plan devotes substantial attention to non facility programs, such as transit system coordination, low-cost transit and highway improvements, transportation management programs, and incentive programs.
- The financial plan developed is in keeping with MTC's legislative mandate to provide a financial plan that is not constrained by existing financing mechanisms or program restrictions. An interesting attempt is made to forecast the Bay Area's ability to attract Federal aid, and a wide variety of different types of regional taxes and bonding mechanisms are examined.
- The plan is unusual among metropolitan area transportation plans in that its treatment of costs gives balanced consideration to capital and operating costs. It includes analysis of the impact of capital improvements on overall transit system operating costs.
- In keeping with the mandate of the MTC enabling legislation, the financial plan analyzes the potential of a wide variety of different types of regional taxes and bonding mechanisms. Part of this effort involved an interesting attempt to forecast the Bay Area's ability to attract Federal aid.
- The Metropolitan Transit Federation and a Traffic Management Council are recommended to accomplish needed coordination among transit operators and to achieve more efficient use of streets and highways.

MTC appears to be an appropriate structure for improving coordination among transit operators, particularly through the bargaining power it has in the allocation of the Transportation Development Act funds. It has made some efforts to set standards and to link funding to these standards.

MTC has substantial powers but has been reticent to use them for fear of legislative reprisal. It did take some initiative in exercising its powers to influence highway programing and the use of highway funds for transit (about $20 million per year are being shifted). In general, however, MTC has chosen the route of friendly persuasion, rather than risk loss of its powers by using them in conflict situations.

The mandate of MTC, the tenor of the times and the reaction to past programs and their style of management have all combined to push MTC in the direction of crisis intervention at the expense of more thorough and deliberate planning. MTC staff deliberately has sought to involve operating and implementing agencies in its planning process to give them a stake in plan implementation.

Assemblyman John Foran of San Francisco, author of the MTC legislation, sees it as a half step in the evolution of Bay Area government and a major step away from the single-mode, single-function approach at the State level.

Since 1970, BART extension studies have been conducted in several corridors:

- Geary Street in San Francisco
- San Francisco Airport
- BART-type technology versus Southern Pacific upgrading for the Peninsula (outside BARTD's jurisdiction)
- Oakland Airport
- Livermore
- Pittsburg-Antioch

In contrast to earlier BART system planning, these studies generally have been conducted in an open manner with study direction typically coming from local government, MTC and BARTD, with substantial opportunity for citizen participation.

Outcomes of these studies vary widely. If all of the extensions for which BARTD is responsible were to be constructed (i. e., excluding the full peninsula route), it would double the current 75 miles of system at an estimated cost of another $1.5 billion. [24] Based on past experience, even this probably is an optimistic price estimate. The full length of a San Mateo County extension was estimated to cost $807 million from Daly City to Redwood City near the Santa Clara County line.[25] Cost estimates for the extension of this line to its more logical terminus in San Jose are not available, but it is likely that this project would add roughly another half billion dollars to the cost for this 16-mile length. When financing costs and more realistic inflation costs are included, it is likely that the full cost of all the above extensions would be in the $3.5 to $4 billion range.[26]

How many, if any, of these extensions are likely to be built is a matter of conjecture. Forecasts vary among those interviewed from no future extensions to almost all of them.

The San Francisco airport extension is strongly supported in San Francisco and is one of the easiest to justify in a benefit-cost sense. However, a decision on it is intimately linked to the consideration of an extension down the Peninsula. This proposal raises one of the more difficult transportation issues that the Bay Area will face because of its high cost, the existence of the S.P. commuter service, the fact that three counties and many cities are directly involved, and many other ramifications.

The Geary Street line in San Francisco would almost certainly be built as a Muni route rather than a BART extension if any fixed-guideway transit were to be built—which appears doubtful as a result of the study.

The Oakland Airport extension has substantial support in the East Bay even though it would attract far less patronage than other extensions, particularly in the short term. The San Francisco airport extension may not be politically feasible within the regional decision making process unless

[24] Testimony of B. R. Stokes in hearings before the Subcommittee on Transportation of the Committee on *Public* Works, United States Senate, May 24, 1974, in San Francisco.

[25] PB-T-B-Wilbur Smith-Kirker, Chapman, San *Mateo County Transit Development Project. Airport-Menlo Park,* final draft report, April, 1974, pp. 5-14 and xvi-2.

[26] Interview with Lawrence Dahms, Acting General Manager of BART, September 1974.

it is coupled with the Oakland Airport extension, as MTC found when its staff attempted to set such a priority during the process of making its 1973 plan.

The Pittsburg-Antioch extension has a great deal of local support, apparently much greater than the Livermore extension. The former has the potential for becoming the catalyst for renewal of two older deterioratin g cities and would provide service to substantial concentrations of population and industrial employment. The costs of a BART-type system are very high, however, for the levels of ridership anticipated. The Livermore extension has a considerable amount of opposition from opponents of growth in that area. This, plus poorer economic justification for the route, make it unlikely that this route will get built in the near to medium-range future, if at all.

Chronology of the Transit Planning Process

1900 San Francisco ratified a city charter with authorization for public ownership of utilities, including public transportation.

1911 San Francisco Municipal Railway (Muni) was established and began operating streetcar routes. It is believed to be the first publicly owned transit system in the country.

1920 The Commonwealth Club supported the San Francisco Bay Regional Plan Association in developing a land use and transportation plan, including a rapid transit plan for six counties.

1928 The Golden Gate Bridge and Highway District was formed to finance, construct, and maintain the Golden Gate Bridge.

1929 The California State Legislature authorized construction of the Bay *Bridge* (it was completed in 1936).

1937 In November, San Francisco voters rejected a $49 million subway plan recommended by the city's Public Utilities Commission.

1939 In January, rail service was begun by both the Southern Pacific and the Key System on the Bay Bridge from the East Bay to San Francisco.

1946 Public hearings were held on about 20 alternative configurations for new Bay crossings developed by the Joint Army-Navy Board.

National City Lines acquired the Key System and began converting streetcar lines to bus routes.

1947 Harland Bartholomew and Associates published *Transit Facilities* and *Mass Transportation in the Oakland Metropolitan Area,* recommending an extensive system of rail rapid transit for the East Bay.

Voters approved the most recent successful Muni bond issue ($20 million), to be used primarily for rolling stock,

On January 25, the Joint Army-Navy Board published a report recommending an underwater transit tube beneath San Francisco Bay to completely integrate rapid transit systems on both sides of the Bay.

1948 In November, the *Transportation Plan for San Francisco,* prepared by DeLeuw, Cather & Company, and Ladislow Segoe and Associates, recommended an extensive freeway system, a "rapid transit bus operation" on freeways, and a bus subway on Post Street. These recommendations later were incorporated into the city's master plan.

1949 The California legislature authorized Bay Area local governments to form a rapid transit district, but provided no funds or requirements. No action was taken until the legislation was amended in **1951.**

1950 A study called The Transit Problems *in the East* Bay, prepared by John G. Marr for the Oakland Planning Commission, led to the conclusion that public takeover in the East Bay was needed, but no action was taken.

1951 On July 25, the California legislature created the San Francisco Bay Area Rapid Transit Commission (BART Commission) to study rapid transit problems in the nine-county area and provided $50,000 for the study.

1953 In January, after a 6-month study by DeLeuw, Cather & Company, the BART Commission submitted its preliminary report, which recommended development of a master plan for Bay Area rapid transit by one central agency. The

legislature loaned the Commission $4000,000, to be matched by $350,000 from the nine counties, to carry out these recommendations.

In August, a subcommittee of the BART Commission selected Parsons, Brinckerhoff, Hall and MacDonald (PBHM) to do a 2-year comprehensive rapid transit master planning effort.

1956 On January 5, PBHM submitted its Regional *Rapid Transit* report to the BART Commission, recommending a long-range nine-county master plan for a high-speed rail system, with a first-stage five-county 123-mile system. The "optimum plan" (tube under the Bay instead of use of Bay Bridge) was estimated to cost **$716** million.

In March, Stanford Research Institute (SRI) report called *Organizational and Financial Aspects of Proposed San Francisco BART System* was presented to the BART Commission and the legislature, recommending the establishment of a regional agency to build and operate the system, and the use of tolls, property taxes, and sales taxes to finance its construction.

After the legislature had authorized the establishment of the Alameda-Contra Costa Transit District (AC) in 1955, voters approved its formation, with taxing powers and a directly elected board, and authorized it to take over the failing Key System and operate public transportation throughout the urban portion of the two East Bay counties and into downtown San Francisco. No funding was provided, however, to implement these powers.

1957 On January 17, the nine-county BART Commission submitted its final report to the legislature. The report recommended creation of the Bay Area Rapid Transit District, based on recommendations of PBHM and SRI.

On June 4, the California legislature created the five-county Bay Area Rapid Transit District (BARTD) to plan, build, and operate a rapid transit system, provided ample funding for staff and consultants, and established a mechanism for issuing bonds.

1958 The Key System discontinued the last Bay Bridge interurban electric rail service. The bridge decks were reconstructed, removing the rail tracks to create new highway lanes. Express bus service replaced rail operations,

1959 On January 23, the "freeway revolt" in San Francisco reached a climax with a resolution by the Board of Supervisors to remove several freeways from the city master plan,

Voters of the AC Transit District approved a $16.5 million issue backed by property taxes after the legislature lowered the required percentage from two-thirds to a simple majority.

Legislation to establish the Golden Gate Authority to operate bridges, airports, and harbor facilities in the Bay Area was defeated.

On May 14, Parsons, Brinckerhoff-Tudor-Bechtel (PB-T-B) signed a contract to provide engineering services for BART system design and construction. The fee was $600,000.

On July 10, after a difficult fight, State legislation authorized qualified use of Bay Bridge tolls to finance construction of a trans-Bay tube.

1960 In October, AC Transit purchased the Key System, assumed operating responsibility, and began a major program of improving and extending service and attracting increased ridership.

1961 The legislature officially recognized the Association of Bay Area Governments (ABAG), which had begun on an informal basis in May 1960.

In August, Ebasco Services, Inc., submitted an economic evaluation of the five-county BART system, claiming the system would produce quantifiable benefits of $42 million per year by 1975, in addition to nonquantifiable benefits.

A bill was narrowly defeated that would have established the Golden Gate

Transportation Commission, covering a six-county area, to manage and plan transport facilities.

In June, the legislature lowered the required vote for approval of the BART bond issue from 66-2/3 percent to 60 percent, based on a bill proposed by BARTD. The bill passed in spite of opposition led by Senator Randolph Collier, the powerful chairman of the California Senate Transportation Committee and father of the State's freeway system.

In October, BARTD submitted a five-county plan to the boards of supervisors of each county (San Francisco, Marin, San Mateo, Alameda, and Contra Costa).

In December, San Mateo County officially withdrew from BARTD, citing high property taxes and the adequacy of service provided by the existing Southern Pacific commuter line. Pressure mounted to have Marin County withdraw because of the financial unfeasibility of a four-county system. Squabbling over technical feasibility of BART's use of the Golden Gate Bridge arose, threatening to delay the bond issue if Marin remained in the District.

1962 On May 17, Marin County officially withdrew from BARTD after a struggle with the BARTD board over terms of the withdrawal.

On May 24, a three-county rapid transit plan, embodied in the PB-T-B *Composite Report,* was adopted by BARTD and referred to the Alameda, Contra Costa, and San Francisco county boards of supervisors, requesting their action to place the bond issue on the November ballot.

In July, the boards of supervisors of San Francisco and Alameda counties unanimously approved placing the BART bond issue on the November ballot, as required by enabling legislation. Contra Costa County's board approved the move by a 3 to 2 vote in a cliff-hanger decision.

On November 6, a $792 million general obligation bond issue for the construction of a 75-mile system was approved by 61.22 percent of the voters in the three counties. One week later BARTD announced its intention to continue employing PB-T-B to design and supervise construction.

1963 The Bay Area Transportation Study Commission (BATSC) was established by the legislature to prepare a regional transportation master plan.

On June 10, the Contra Costa County Superior Court ruled in favor of BARTD in a taxpayers' suit challenging the validity of the bond election, PB-T-B contract and fees, and payments of salaries to staff.

On July 1, full-scale design engineering was begun by BARTD engineering consultants, PB-T-B.

1964 The West Bay Rapid Transit Authority for San Mateo County and the Marin County Transit District were established by the legislature.

On June 19, U.S. President Lyndon B. Johnson presided at the official start of BART construction in Concord.

1966 On August 25, BARTD received its first Federal capital grant for $13.1 million. Another $13.2 million grant was approved in October.

On October 5, Berkeley authorized, by an 82 percent vote, the issuance of bonds up to $20 million to pay the extra cost of placing 1.75 miles of elevated BART system underground.

In November, a $96.5 million bond issue failed in San Francisco that would have resulted in the removal of the streetcar system in the city and the purchase of new equipment to replace rolling stock, most of which had been acquired nearly 20 years earlier.

ABAG published its Preliminary Regional *Plan.*

1967 Simpson and Curtin prepared a plan for coordination of BART, Muni, and AC Transit; it called for three Muni subway

lines in San Francisco, and for new rolling stock totaling an estimated $335 million capital cost.

1968 In February, the initiation of any new construction was halted for several months because available funds were committed and no new funds had been provided by the legislature,

The San Francisco Municipal Railway Improvement Corporation was established by the city to finance Muni improvements as part of a complex alternative to the defeated bond issue.

In November, a Federal grant for $88 million was received for development and purchase of rolling stock (first 250 cars). Grants totaling another $77 million for an additional 200 cars were later approved in 1972-73. Eventually all UMTA grants totaled $304 million, 19 percent of BARTD's total system cost.

1969 The legislature restructured the Golden Gate Bridge and Highway District into a Golden Gate Highway and Transportation District with responsibility for developing a transit system to serve the corridor.

On March 28, after 3 years of legislative fighting to solve the financing crisis, the State legislature approved a one-half-cent sales tax to provide the $150 million required to complete the BART system.

In May, the Bay Area Transportation Study Commission (BATSC) submitted its final report to the legislature, recommending extensive long-term additions to the Bay Area's freeway system and to BART at a cost of $11 to $12 billion. A permanent regional structure with much stronger powers was recommended.

ABAG and the State Business and Transportation Agency signed an agreement creating the Regional Transportation Planning Committee (RTPC), the temporary successor to BATSC, which was disbanded in accordance with the legislation establishing it in 1963.

In June, San Mateo County's transit district went out of business as a result of the defeat of its plan by voters.

On July 3, BARTD awarded a transit vehicle contract to Rohr Corporation of Chula Vista, Calif.

1970 Muni announced plans to use German articulated streetcars for the Muni-Metro subway system. Muni later switched to Boeing Vertol equipment, joining with Boston's MBTA in ordering a light-rail vehicle of common specifications and higher performance characteristics.

In February, BARTD joined with the city of Oakland and Alameda County to study the feasibility of linking the Coliseum station to the Oakland Airport.

In April, BARTD joined San Francisco and San Mateo counties in conducting a study of a possible BART extension from Daly City to the San Francisco International Airport.

On July 30, *Regional Plan 1970-90,* the Bay Area's first comprehensive regional plan, was approved by ABAG's General Assembly. The plan stressed the "city-center concept" and drew on the BATS 1969 Plan as a short-range starting point.

On September 14, the legislature established the Metropolitan Transportation Commission (MTC) to replace the Regional Transportation Planning Commission as the regional transportation planning agency for the nine-county area. MTC was given responsibility for approval or disapproval of all major regional projects and grant applications and for preparation and maintenance of a regional transportation plan by June 30, 1973,

In November, Proposition 18 failed statewide, although it received a majority in the Bay Area. The measure would have made a portion of highway "user revenues available for air pollution control and rapid transit on a local option basis.

1971 The Transportation Development Act (TDA) passed, making .25 percent county sales taxes available for local transit use; the tax was extended to include previously exempt gasoline sales. MTC was given power to allocate Bay Area TDA funds among operations and projects to achieve regional coordination objectives.

1972 Studies of possible BART extensions to Livermore-Pleasanton, Pittsburg-Antioch, and the San Francisco International Airport were begun. Muni/BART and AC/BART coordination studies also were begun.

On September 11, BART opened 28 miles between Fremont and MacArthur stations for revenue service.

On October 2, component failure caused a two-car BART train to run off the tracks at Fremont Station; slight injuries to five passengers resulted. This event triggered Senate hearings later in the year.

1973 On June 30, MTC adopted a regional transportation plan after an extensive regional participation program. The plan emphasized short- to medium-range programs, the need to meet operating costs, financing options, and means to better manage and coordinate regional transportation programs.

On July 2, a BART employee strike stopped service until August 6 and resulted in a major wage increase.

On August 10, the first train traveled through the trans-Bay tube to Montgomery Street Station (San Francisco).

On November 5, service was begun between Montgomery Street Station in San Francisco and Daly City Station, bringing into operation to date 63.5 miles of the 71-mile system, all of the system except the trans-Bay tube.

1974 A bill was defeated that would have consolidated all existing regional agencies in a general purpose, limited regional government (AB2040).

On June 4, Proposition 5 passed with 60.3 percent of the statewide vote, amending the State constitution to permit use of up to 25 percent of a county's highway fund allocation for construction and maintenance of exclusive fixed-guideways for transit vehicles, subject to local referendum.

In October, BARTD filed a combined $237.8 million suit against PB-T-B for management failures, and three major suppliers—Westinghouse Electric, Rohr, and Bulova Watch—for breach of contract and warranty failures.

In October, BART service was begun through the trans-Bay tube after finally receiving the Public Utilities Commission's permission in August. Five years behind the 1962 schedule all of the system was in operation (except the Embarcadero Station, which was an addition to the original plan).

In November, new BARTD board members were elected by voters of each of the nine districts in the three-county area. A June referendum provided for this election to replace the old 12-member board, which had been appointed by mayors and county supervisors.

Assessment of the Planning and Decisionmaking Process

The preceding section has provided an assessment of rail rapid transit planning in the San Francisco Bay Area in rather broad and comprehensive terms with an emphasis on the context that shaped major decisions. By contrast this section will be more like a completed questionnaire.

To provide for commonality among case studies and ease in cross-referencing, key aspects of the planning and decisionmaking process are described here under categories corresponding to the guidelines for assessment. Many of these topics are discussed in greater depth in the critical history.

INSTITUTIONAL CONTEXT

By contrast with other metropolitan areas the San Francisco Bay Area can be said to have a greater need for regional institutions. Its political geography is more fragmented perhaps than any other excepting New York: nine counties, about a hundred cities, and several special districts. [27] By tradition, primarily because of California's large number of urban areas, the State generally stays out of regional affairs, thus leaving a vacuum of leadership.

The interdependency of the various parts of the region reinforce the need for regional institutions. The high degree of economic specialization in the various subareas have increased the Bay Area's dependence on both the passenger and goods movement transport links between communities. Different parts of the region specialize in agriculture, manufacturing, and shipping, while the City of San Francisco increasingly specializes in finance, government, and business administration. Yet until the modern era there were few good regional transportation facilities. One reason was the difficulty of meeting the enormous cost of penetrating the formidable mountain and water barriers separating many parts of the region.

Despite the need for strong regional institutions, the jurisdictional fragmentation of the Bay Area is a major obstacle to their formation. The principal city, San Francisco, may be dominant in cultural, financial and many other affairs of the region, but it comprises a smaller percentage of the metropolitan area population—about 15 percent—than any other major metropolitan area central city. San Francisco County (identical with the city) is not even the biggest county but ranks third in population among the nine, Oakland has always competed with San Francisco, making regional cooperation difficult. More recently San Jose has grown to surpass Oakland in size, and despite its close economic and social interrelationships with the rest of the Bay Area, San Jose and Santa Clara County increasingly have tended to seek their independence. Since San Jose is recognized as a separate SMSA, it often has sought to keep Bay Area regional agencies from interfering in affairs it regards as its own.

Forum for Decisionmaking

Efforts by business leaders and regionally oriented political leaders to create strong regional organizations in the Bay Area repeatedly failed because of opposition from local home rule protectors and many non-San Francisco business and political leaders who feared domination by San Francisco interests. Efforts were made to create various types of organizations ranging from general purpose regional government to transportation authorities with multipurpose transportation responsibilities. Instead of strong forums, however, weak agencies resulted that are viewed by regionalists as interim study groups created to satisfy minimal planning requirements.

The only significant regional institutions prior to the BART planning era were created for specific major projects such as the Golden Gate Bridge, the San Francisco-Oakland Bay Bridge, and several

[27] According to the *San Francisco Chronicle* (April 26, 1968, p. 40), the nine-county region had at that time 91 cities, 17 regional agencies, 194 school districts and 555 special districts—a total of 866 units of government, all with the power to tax.

other public works projects. Even the BART planning effort was essentially a project planning effort, despite the comprehensiveness of the regional land development study and other aspects of the 1954-56 work.

During the BART planning period BART was generally perceived as the regional transit planning forum because of the lack of other forums. This was somewhat of a misconception, since highway planning went on as before in the (then) State Department of Public Works; local short-haul transit needs went largely ignored in the BART planning effort, and other transportation needs (railroads, ferries, ports, airports, etc.) continued to be handled on an ad hoc basis. Between 1956 and 1962 even the regional scope of the BART project planning effort was being lost as the number of counties involved shrank from nine to three.

In reality because of the limited scope of the BART project as it moved forward to implementation, there was no clear forum for regional transit issues other than the BART project until about 1973 when the Metropolitan Transportation Commission began to prepare its transportation plan and to assume its other responsibilities. Efforts of the officially recognized regional planning agencies to provide this forum prior to the MTC period were generally unsuccessful. Such agencies as the Association of Bay Area Governments, (1960 to present) the Bay Area Transportation Study Commission (1963-69) and the Regional Transportation Planning Committee (1969-70) were all the result of compromises that satisfied Federal requirements without creating any real forum because of their lack of power. They had no taxing power, no control over the allocation of funds, no veto power over regional projects and their plans were not binding on any units of government that have the real transportation powers.

The Metropolitan Transportation Commission, created in 1970, however, does have significant powers, on paper at least (see page 7), and has become a serious forum on at least a few issues. If one counts the pressure the commission brings to get officials to reach agreement before it must act on plans, programs, or the allocation of operating funds, MTC has become one of the more effective regional transportation forums in the country.

There is a strong political momentum to create a new, more powerful regional planning agency in the Bay Area which will assume the powers of MTC, ABAG, and several other regional agencies. In 1974 a bill narrowly failed in the legislature after a compromise agreement had been reached by most interested groups. It would, in effect, have created a limited regional government. Many observers believe this effort will be successful in the near future and will result in a regional planning body that will have substantial powers, including powers to make the significant regional transportation decisions.

Accountability of Decisionmakers

The BART board, like most transit planning agency boards, was composed of officials appointed by elected officials of the local jurisdiction until 1974, when direct election of the board was instituted. The new board members each represent districts of roughly equal population in the three-county area. The drive to achieve direct election reflected a desire to achieve greater accountability of the board to the public.

The Bay Area is in the forefront of this movement within the regional planning field nationally. The AC Transit Board has been directly elected since its creation in the late 1950's. (However, the fact that AC Transit is well respected nationally as a successful transit operator probably reflects the quality of management and its direct access to property taxes more than the fruits of direct election per se.)

BARTD's board has been perceived by many critics as being unresponsive to communities during the implementation process. There is enough evidence of BARTD's insensitivity to community concerns to conclude that this drive for direct election was well motivated, although it may have been belated because it did not go into effect until the construction period was over, Direct election of a regional body is probably more logical when the regional agency is involved in a wide range of issues of general public concern and the expenditure of large amounts of money is occurring, not when **a** major project is completed and an agency's responsibilities diminish to relatively routine operating matters.

One of the problems with direct election of a board of this type is that it will tend to build a political constituency around narrowly defined agency functions and special interests, A second potential problem is that the added permanency it will tend to create for the existing agency structure will hamper the evolution of a broader regional

planning framework or more general purpose regional government. Third, there is the danger that once construction period is over and public interest in the affairs of a transit agency diminishes, the elected board will cease to be accountable to the public because of the lack of open competition for office and the lack of media coverage.

For all these reasons it makes sense to consider direct election of a transit agency board as a temporary governmental mechanism that would be replaced after the construction period by a permanent operating agency structure under control of a regional general purpose government or a board representing local general purpose governments.

MTC's Commissioners are appointed as were the members of BARTD's board before the direct election legislation. The difference in accountability to the public is not so much a reflection of differences in institutional structure in the sense of who is represented by whom as it is a reflection of the type of decisions which the legislature has given to the organization. MTC is required to make decisions that inherently force the organization to make choices among competing interests of the various local governments and State agencies.

The board of the new regional planning organization proposed for the Bay Area would be composed half of directly elected representatives and half of representatives of local elected officials, according to the 1974 bill. In this way it potentially would be accountable to the public as a whole as well as to established local governments.

One of the more important lessons of the San Francisco experience is the danger of delegating too much power to consultants, and particularly to consultants with a rather narrow technical engineering focus as distinct from **a** broad multidisciplinary approach. Some of BARTD's difficulties in carrying out a sound planning process have been attributed to the close personal relationships between the board members and PB-T-B before the consultants were hired and the lack of oversight of the consultant's work that resulted. Consultants are unlikely to place top priority in conserving public funds unless appropriate contract incentives are created. They are more likely to seek to continue work in their field of specialization, and this self-interest may provide incentives to bias the results of planning studies in the direction of projects which will utilize their expertise.

Public Involvement

The approach to the public during the BART system planning process was seen almost entirely as "educational" from the early efforts to get the planning underway with the first BART Commission until the 1962 bond issue.

The selling program was a relatively low-key effort for the first several years, involving use of the media and major political and business leadership. B. R. Stokes, a journalist supporter of BART with the Oakland Tribune, was hired as BARTD's first employee to manage the public information program. The fall 1962 bond issue drive involved an intensive, well-financed campaign organized by Henry Alexander, a local public relations consultant. Flyers were mailed out to every voter. A speaker's bureau staffed with BARTD commissioners, staff, and community leaders made presentations before various public groups. Newspapers were actively utilized throughout the campaign building up to election eve. Alexander saw to it that the bond issue became Proposition "A" on the ballot for maximum voter identify. Almost all big political names lined up as BART supporters including both Richard Nixon and Edmund G. Brown, who were running for Governor.

The only general opportunity for involvement of the public in BART planning was the public hearing requirement in the legislation that could be invoked by any city through which BART passed during the time that BARTD was seeking agreements with each city subsequent to the bond issue. On several occasions this mechanism did provide opportunities to air differences and to bring public pressure to bear on BARTD. However, most cities did not take advantage of the hearing mechanism, and for the most part it was employed only when controversy had already arisen.

By contrast the BARTD extension studies that have been conducted since 1972 in several corridors generally have made well-organized and well-run citizen involvement efforts. The dramatic change in the approach to dealing with the public is due to several factors:

- General changes in public attitudes and demands as part of a nationwide trend (in which the Bay Area has been a leader);
- BARTD's increasing staff competence and the experience it gained during implementation of the basic system;

. Demands of local governments to open up the process, partly in response to bad experience in the past and lack of trust in BARTD;

- UMTA's decision to channel all planning grants through MTC, an organization whose staff was strongly committed to an open public participatory process as part of its effort to build itself as a regional forum; and

- A basic change in the role of BARTD, Previously its primary mission had been well defined—public involvement was a source of potential delay in getting a fixed construction program completed within the framework of a fixed budget. Now BARTD needed to build popular support if any of the extensions were to be built; costs and time deadlines involved in studies were no longer serious problems.

Some of the BART extension studies provide good examples of citizen involvement in such study phases as formulation of work program; definition of goals, objectives, and evaluation criteria; definition of alternatives to be studied; and the process of selecting preferred alternatives. Some significant differences have arisen between the results of the citizen involvement and the recommendations of the "boards of control" which govern the studies on behalf of BARTD, MTC, and the local governments. It is likely, however, that the citizen involvement efforts ultimately will have a major influence on the final decisions in at least some of the corridors.

MTC's planning process has been one of the more intensive efforts in the country in involving the public in the preparation of a regional transportation plan. The staff regards its legislative mandate as reorienting Bay Area transportation programs toward a "transit first" policy. It has tried to use the citizen involvement process as a means toward that end. As a result MTC has put a very large portion of its effort into "town meetings" throughout the region. MTC frequently interacts with public interest and citizen groups and has produced and widely distributed some of the most readable and candid documents in this field.

TECHNICAL PLANNING PROCESS

Because BART's planning process was the first of the modern regional transit system planning efforts, there is less value in treating the technical aspects of this assessment in the same detail as other aspects, or in the same detail as is being done for more current planning efforts in other cities such as Denver. It is almost meaningless to rigorously apply current technical standards to a 20-year-old study because the field has evolved so rapidly, It would not be fair, nor would much be learned from it that could aid others today. Reference will be made, however, to aspects of the planning for BART extensions that carry lessons for other metropolitan areas.

Goals and Objectives

As discussed at length in the first section of the BART history, there evolved during the 1945-62 period a high degree of consensus among a wide variety of interests that BART was the regional transportation goal. The underlying motivations of the various interested groups, however, varied. The business elite wanted to develop a regional economic headquarters and to integrate the labor markets and productive centers of the Bay Area. Most elected officials and much of the public were concerned about congestion and the negative impacts of freeways. Most urban planners coupled these concerns with a strong vision of the role of transit as a catalyst in the city renewal process.

In the style of the times, no formal goal-setting process occurred, nor do the technical reports deal with goals and objectives in the manner that since has become accepted planning practice. One might speculate that had such a process been seriously undertaken, the recognition of divergent objectives might have occurred much earlier than it in fact did and even might have endangered the BART project.

Much of the recent literature that is highly critical of the dominant role of the business elite fails to recognize the wide degree of comparability that existed during the 1950's between the goals of the prime movers and those of many other interested groups. To a large extent the criticism of the role of business leaders during that period reflects the tremendous change in public values that has occurred over the last 20 years.

The urban planning team associated with PBHM worked closely with local planners throughout the

Bay Area in developing a regional land development plan that formed a primary basis for the BART system plan. This process went a long way toward ensuring that the transit plan reflected community goals and objectives of that time. In fact it was an exemplary effort—even by contemporary planning standards—in terms of the manner in which the transit plan was shaped by community land use planning objectives that had been defined as part of a regional transit planning process. BART planning was far ahead of its time in the integration of regional land development planning and transit planning, at least during the system planning process.

During the construction period, however, community land development objectives were given less and less attention as delays and inflation began to endanger the financial program. Midway through the implmentation period this situation deteriorated to frequent outright conflict between community land development objectives and BARTD, as has been discussed in detail in the history section.

As discussed in the public involvement section, the treatment of goals and objectives was exemplary in some of the recent BART extension studies, particularly the Geary Street study in San Francisco. By this time lessons learned during initial system planning and the more recent construction period led the planners to go into far greater depth in defining objectives and criteria and applying them in the evaluation process than ordinarily has occurred in transit planning.

Development and Evaluation of Alternatives

Basically BART system planning did not involve the development and evaluation of alternatives. However, it is not appropriate to be critical of BARTD and its promoters for failing to study alternatives, as many current writers have been. They were not violating planning standards accepted at the time.

In the 1950's regional planning usually was conceived of as a process of designing a desired solution. It was not until the early 1960's that several major regional planning programs began to consider land use and transportation alternatives in their work programs (for example, the Penn Jersey Transportation Study, the Southeastern Wisconsin Regional Planning Program, and the Puget Sound Regional Transportation Study).

Nor is it likely that the outcome of the planning process would have been very different had there been a systematic, thorough investigation of alternatives. As discussed in detail in the history section, a widespread consensus on BART developed among all interests who were involved; the actual system that evolved was almost a direct result of the regional land use plan that was developed in close cooperation with local planning staffs by the urban planners who were part of the PBHM team.

One basic alternative that obviously was available was the use of the Bay Bridge (which still had tracks at the time) instead of the subaqueous tube. The 1956 PBHM report did devote some attention to this but in a biased manner. The recommended plan was termed the "optimal" alternative throughout the document. Great weight was given to the several minutes of travel time savings that it would provide and the fact that the tube could readily be linked to a Market Street subway. However, despite the great additional cost of the "optimal" plan, no economic evaluation was reported to justify the added investment.

Although the legislature had asked the BART Commission to examine the economic justification for a rapid transit system, no such evaluation apparently was performed during the master planning period. The only comment on economic justification in the 1956 PBHM report is the statement that it is doubtful the Bay Area could afford not to build the proposed rapid transit system,

However, following the master planning period and prior to the bond issue an assessment of the benefits of the proposed system was conducted by Ebasco Services. [28] The evaluation would be inadequate by current standards. Benefits are not related to costs at all despite the availability of cost estimates at the time. Perhaps this is because the system could not have been justified by the benefit values estimated if such a benefit-cost analysis had been conducted.

The total projected annual benefits were $42 million. This level of benefit would justify an investment of only about half of BART's cost, based on the cost estimates available at that time and an

[28] **Rapid** Transit System Economic Review, Including a Technical Supplement for San Francisco Bay Area Rapid Transit District, Ebasco Services, Inc., June 1961.

interest rate of about 8 percent. The acceptable rate of return that would have been required to justify BART at its (then) estimated cost would have been about 4 percent. This is a value that was frequently used at that time in public works economic analyses, but nevertheless it was too low a rate to accept, even at that time. Expected returns on relevant types of investment in the private sector, which are the basic guide for benefit-cost studies, would have required the use of an interest rate on the order of 8 percent in 1961.

The estimates of time savings in the Ebasco study account for about three-fourths of the total estimated BART system benefits. These benefits probably were grossly overestimated in that time savings of 15 minutes were used for all movements through selected major gateways during the rush hours; these included not only all transit trips but also all automobile and truck trips.

These criticisms, however, ignore the fact that BART actually was justified to a large extent by land development objectives, which were not evaluated in the 1961 Ebasco study.

From the earliest period of BART planning, rail rapid transit technology had been assumed to be the only available, satisfactory technology. The 1947 Army-Navy Report made this assumption without recognizing the need to study alternatives. The 1951 legislation creating the BART Commission, however, was less clear. A "rapid transit plan" was to be developed; this term was defined to include "transportation of passengers by means of rail, monorail, or by similar means."

In spite of this implication that alternative technologies should be investigated, relatively little evaluation effort was devoted to the task. However, this criticism must be seen in the light of the lack of many of the newer systems that have since become available. The advantages of buses operating on grade-separated rights-of-way was not generally recognized at that time, although of course the technology was well known. The various types of automated guideway systems had not been developed. Nor had a design for a modern light rail system been developed, although such an option would have required far less research and development than did the actual BART technology that evolved subsequent to the basic system decision in 1956. A high-quality regional light rail system with extensive local coverage could have been a highly feasible and attractive option because of the existence of rights-of-way and tracks on several lines in San Francisco, across the Bay Bridge, and in some locations in the East Bay.

Several of the available vehicle and guideway concepts were subjected to a rather nontechnical review, but the 1956 PBHM report gave most attention to a comparison of suspended versus supported train technologies. Basically the selection of a "conventional" duo-rail system was based on the highly definitive standards that were established for speed, capacity, headways, and other features. No known analysis was conducted of the tradeoffs that were possible between these standards and system costs.

Several alternative route alinements were evaluated in some of the corridors. During the system planning process, however, little of this work was published and most of it can be traced only through personal recollections and general descriptions of the factors that were considered.

As noted previously, the regional development scheme was the basic criterion. It dictated the need for direct high-speed service with few stops linking all of the cores of the older cities. This concept left relatively little room for alternative basic configurations. The nine-county master plan linked all important cities on as direct a route as possible.

The primary evaluation then focused on the definition of the first phase system that could be implemented within the existing constraint of financial feasibility, which had been fairly well defined by the legislature in 1953 when it placed a limit on bonding for BART of 15 percent of assessed value of the District. These constraints defined the terms of the basic evaluation that was conducted—a trade-off analysis between system extensiveness and costs within an approximately fixed total cost, depending on the number of counties included in the first phase. The more extensive the system, the more cities could be served initially and the greater the potential ridership, revenue, and public and political support BART could expect. Cost considerations, of course, dictated avoidance of subsurface routing insofar as possible, use of existing rail or projected freeway rights-of-way wherever feasible, and reduction in numbers of stations at less important subcenters. (The last criterion worked in favor of higher speed capability, which was a dominant consideration in attracting the auto user.)

After the master plan was adopted in 1957 and the BART District created, the engineering design

of the system in the 1959-62 period involved the further evaluation of alternative routes within a relatively fixed master plan. At this time there was some give and take between BARTD and individual cities in order to gain their support. During this process local land use considerations were introduced in several instances to modify alinements or change elevated routing to subway (part of the Berkeley subway agreement occurred then). The extent of this was limited, however, in part because of BARTD's cost limitation concerns and in part because BART's potential impacts were not perceived as real yet by local elected leaders.

Financing and Implementation

The experience in the San Francisco area regarding financing and implementation problems has perhaps had more influence on this study's findings in this subject area than any of the other case assessments. This is true primarily because it is the only one of the nine metropolitan areas which has been through the planning and construction period for an entire regional rapid transit system during the modern period covered by this assessment. In addition, the BART system represents an extreme example (along with the Washington, D.C. area) of a long-term commitment to a master plan for a major new regional rail rapid transit system. As an extreme example it is the source of several lessons for other areas regarding the problems that can come with such a commitment.

In stressing the problems that have arisen from the BART approach to implementation, one has the danger of losing sight of the positive aspects. The building of BART was an incredible achievement that will be matched by few other metropolitan areas, if any. Without any promise of Federal or State aid, the metropolitan area recognized that it had to make a firm and major long-term commitment if it was to achieve the objective of knitting together the several separated parts of the Bay Area with a new rapid transit system, given the high costs involved in overcoming the major natural barriers and achieving sufficient speed and other standards of quality for BART to substitute for highways as the backbone of the regional transportation system. The years of financial difficulty, disruption, and conflict exacerbated by the implementation approach chosen were justified in the eyes of many BART supporters. Many of the most knowledgeable local critics of BARTD's organization, management, and technical competence acknowledge that the basic system planning and implementation decisions were wise in the context of the times.

The following discussion of BART financing is organized around subcategories that correspond to this study's guidelines for assessing transit financing: (1) achievement of national, regional and local goals; (2) stability and predictability of funding; (3) balance between long-range, regional, single-technology planning and short-term responsiveness to local needs; and (4) avoidance of unnecessary delays due to program administration at higher levels:

Financing and Implementation: Achievement of National, Regional, and Local Goals.—Several aspects of BART's history are peculiar with respect to national goals and hence of no great relevance for other areas. National defense considerations played a major role in defining the original need for a regional transit system, in outlining some of its physical configuration, and in stimulating serious planning efforts within the region. However, national goals had no influence after that during the system planning process because this planning took place before the beginnings of the Federal transit program in 1961.

On the other hand, Federal and State transportation policy had a major effect in stimulating BART in a negative sense: the insensitive approach to freeway planning and design in San Francisco in the early- and mid-1950's gave rise to vehement opposition to the program, which came to be nationally known as the "freeway revolt" and culminated in the withdrawal of half a dozen freeways from the city's master plan and the sacrifice of tens of millions of dollars of State and Federal money in the late 1950's. This was a major factor not only in generating public support for BART but also in shaping the objectives used in the BART planning process—i.e., the emphasis on providing a high-speed, long-distance alternative to freeways and bridges.

The San Francisco area took on a major responsibility which should have been a national objective; research and development of new technology. Most of the financial burden and all of the management burden for this fell on BARTD. Only a relatively small percentage of the cost of this was borne by the Federal research and development program. It is universally agreed that it was a



Public opposition to new urban highways bolstered support for BART. The halt to construction of San Francisco's Embarcadero Freeway in the 1960's led the city's—and the nation's—"freeway revolt."

mistake in retrospect to have relied so extensively on technological development within the framework of a specific transit development project.

Regional goals dominated over national, State and local goals in the BART implementation program to a greater degree than maybe permitted elsewhere in the foreseeable future. A regional organization with a clear mandate to build a regional system was provided in 1962 with guaranteed financing of a billion dollars. No mechanism for State oversight of the program was established, despite the fact that BART had been created and financed entirely through State legislative initiative. No legislative review of the program took place for about 4 years, until after it was in serious financial trouble.

Local goals played a significant, if secondary, role in system planning; however, in the implementation program the opportunity for local goals to influence BART was minimized by the nature of the implementation program—not perhaps intentionally, but effectively. The public was not granted the right to public hearings; they could be achieved only by special request of local governments. No funds or provisions were provided in the program for planning, design, or construction of local community facilities that inevitably were going to be required or desired in conjunction with the planning, design, and construction of BART. There seems to have been no recognition of the opportunities BART would provide for coordinated development of station areas during system construction and the time test would be required to take advantage of the opportunities.

The most negative aspect of the financing program from the standpoint of local goals was its inflexibility. This inflexibility almost inevitably led to conflict as a system of fixed dimensions was constructed over a serveral-year period of changing community values. This propensity for conflict was compounded by some of the optimistic assumptions built into the financing program: for example, the use of a 3 percent per annum inflation estimate and a 10 percent contingency cushion (a particularly low value in a project involving substantial technological development and the need for agreements with so many local governments). Construction was programed to take about half the dozen years that it eventually took to complete the system. At that, there is evidence that the program was forced to completion more than it would have

been—decisions were made to proceed with various construction and operation activities before they should have because of time pressures.

Financing and Implementation: Stability and Predictability of Funding.—Stable, predictable funding is one of the most fundamental requirements for sound planning. The BART financing program did appear to provide stability at the outset and therefore was able to give BARTD the momentum it needed.

However, financing stability was undermined by the absence of a mechanism for revising the financing plan to take account of changing circumstances. The BART plan contained no provision for staging construction to allow putting the most important parts of the system into operation ahead of lower priority portions in case rising costs made it impossible to complete the entire system on schedule. No source of additional or continuing revenue was identified to complete the system as defined or to cover costs of additions or changes. Partly as a consequence of these failings, BARTD took over 3 years and wasted much effort to provide the additional financing necessary to cover a projected $150 million cost overrun that came to light in 1965.

Federal funds ultimately made up about half of the total cost overrun of BART. It appears that UMTA did attempt to provide some promise of multiyear financing within the limitations of the Federal program. However, the lack of certainty regarding the amount and timing of these funds did not help. The California Legislature did not want to commit itself to the provision of additional regional taxes to cover any costs that might potentially come from UMTA. By not committing funds itself it was placing maximum pressure on UMTA to bail out BARTD. Such gamesmanship over financing can be costly and can be avoided only through the provision of more predictable funding at both the State and Federal levels.

Financing and Implementation: Long-Range, Regional, Single Technology Planning Versus Short-Term Responsiveness to Local Needs.— BART demonstrates that desirable financing arrangements should provide balance between local and regional transit needs and should avoid commitment to a single-technology regional system when different technologies may be more appropriate in different corridors.

BARTD was formed as a separate organization to take on responsibility for the new regional system. It was given no responsibilities for existing local transit services nor for the provision of new local short-haul transit services where such services were needed. This limitation inevitably set up a conflict between the two types of needs that have been more sharply drawn in the San Francisco area than elsewhere. The conflict was heightened because of the high level of tax commitment that had already been made to the Muni and AC Transit systems and the fact that all of the BART system financing obligation was assumed at the start by metropolitan area residents. San Francisco residents are subsidizing all forms of transit at the rate of well over $100 per capita per year, the highest in the country.

The BART master planning for the original nine-county area is one of the most prominent examples of overemphasis on a single-technology system throughout a region. The master plan called for extension of these costly rail rapid transit lines, basically designed for high-capacity, high-density urban corridors, many miles beyond the boundaries of existing urban development to small centers such as Santa Rosa, Petaluma, Vallejo, and Napa. At no time during the system planning process did planning appear to give serious consideration to using different modes within different corridors or to finding ways in which some of the existing transportation facilities in particular corridors could be upgraded, extended, or otherwise improved to form a better-integrated system.

In retrospect the need for such analysis is obvious because of the existence of the Southern Pacific commuter rail operation, the very successful Golden Gate express bus system, the popular and successful rebirth of the Marin County commuter ferry operation, and the existence of the streetcar tracks, tunnels and separate rights-of-way in San Francisco.

Financing and Implementation: Avoidance of Delays Due to Program Administration at Higher Levels.—The BART planning process never encountered serious delays such as have been alleged in other metropolitan areas due to indecision or policy redirection by UMTA. However, BART officials do complain about significant delays that have been unnecessarily caused by UMTA in some of the extension studies. The basic problem seems to be that the present UMTA financing mechanism requires all contract matters, including even minor

contract amendments, to be approved in Washington, BART has felt it necessary to absorb the loss of significant Federal funds rather than wait several months for such approvals.

At the State level BART has felt some frustration in dealing with the Legislative Analyst's Office while it performed reviews of BARTD's management. However, these reviews appear to have been warranted to provide the basis for consideration of new legislation to solve BARTD's financing problems. The delays potentially could have been avoided if there had been a continuing regular legislative review of the BARTD program, rather than an involvement only at the time of crisis. A well-managed legislative review might well have been able to have anticipated some of the management and financing problems before they became crises.

Summary Case Assessment

The purpose of this final section is to summarize the assessment of the transit planning and decisionmaking process in the San Francisco Bay Area in terms of the guidelines for evaluation. This material is divided into three parts: (1) Institutional Context, (2) Technical Planning, and (3) the Financing and Implementation Program.

1. ASSESSMENT OF THE INSTITUTIONAL CONTEXT

The San Francisco Bay Area has had an exceptionally fragmented political and institutional structure. Many obstacles have impeded regional cooperation despite the need for a regional strategy created by a highly interdependent regional economy and the great difficulty and cost of providing regional transportation facilities.

- **Forum for Decisionmaking.—Until the recent creation of the Metropolitan Transportation Commission (MTC) there has generally not been an effective forum for regional transit planning and decisionmaking, except during the period from 1954 to 1956** when the basic BART master plan was being formulated. The creation of MTC follows an interim period when typically weak planning agencies were established to satisfy minimum Federal requirements.

- **Accountability and Authority of Decisionmakers.—Serious community relations and technical problems in implementing BART were caused, at least** in part, by the lack of control the BARTD board exercised over the consultant team. To a large extent business interests prevailed over public interests at both board and staff levels. Perhaps belatedly, concern over BARTD's responsiveness led to instituting direct election of the board in November 1974. MTC, although its formal structure is similar to BARTD's original structure, has become one of the more effective and accountable regional forums in the country, primarily because its responsibilities force it to make choices among competing interests.

- **Public Involvement.—During the BART system planning process, public participation was seen almost entirely as an "educational" effort aimed at winning the bond election. During the implementation of the basic system, the lack of effective participatory mechanisms was partially responsible for increasing the level of confrontation between communities and BARTD.** In contrast, the recent BART extension studies have sought public participation in an open planning process reflecting lessons learned as well as BARTD's need to regain popular support if any of the extensions are to be built.

  MTC has made an intensive effort to involve the public in preparing a regional transportation plan through town meetings, frequent interaction with community groups, and good communications efforts.

2. ASSESSMENT OF THE PLANNING PROCESS

BART's technical planning process cannot be fairly judged by standards that have evolved rapidly over the last 20 years,

- **Goals and Objectives.—Although the underlying motivations of various** interests varied widely, a high degree of consensus developed during the 1945 to 1962 period that BART was the regional transportation goal. In the style of the times, no formal goal-setting process was engaged in nor do the reports deal with goals and objectives in the manner that has since become accepted planning practice. However, the transit planning team worked closely with local planners throughout the Bay Area in developing a regional land development plan that formed a primary

basis for the BART system plan, thus helping to assure that the transit plan reflected contemporary goals and objectives. Community goals and objectives played an increasingly less significant role during the financial squeeze of the mid-1960's but became major factors again during the recent extension studies.

- **Development and Evaluation of Alternatives.—BART system planning did not evaluate alternative land development configurations for the Bay Area—this approach to regional planning did not become accepted practice until several years later in the 1960's. Likewise relatively little evaluation was made of alternative system configurations or technologies. Despite a requirement** in the original legislation, no economic justification of the BART system was provided during the master planning process in 1954-56. The first analysis of benefits appeared in a 1961 report, but no benefit-cost assessment was performed, perhaps because it would not have resulted in an economic justification of the project. Alternative route alinement studies were performed in some corridors, but this work was limited.

3. ASSESSMENT OF THE FINANCING AND IMPLEMENTATION PROGRAM

Lessons learned from BART have heavily influenced this study's overall conclusions regarding problems in financing and implementing rapid transit systems. BART is the only new transit system that has been completed and opened to service in recent decades. It, along with the Washington Metro system, illustrates well the dangers of a long-term commitment to an inflexible master plan.

- **Achievement of National, Regional, and Local Goals.—Regional goals dominated over national, and local goals** in the BART program— probably more so than will be permitted anywhere in the foreseeable future. A regional organization with a clear mandate to build a regional system was provided with guaranteed financing of a billion dollars. (The figure would be double that in today's terms). The tight construction schedule and budget combined with the inflexibility of the financial program and master plan to force an almost inevitable growing conflict with community land use objectives and changing values.
- **Stability and Predictability of Funding.—** The financing program did appear to provide this important requirement at the outset and therefore was able to give BARTD the momentum it desired. However, no mechanism was built into the program to provide for revisions to the financing plan to accommodate the almost inevitable design changes, delays, and cost escalation. For this reason, resolving the refinancing problems consumed over 3 years of time and much wasted effort and resources.
- **Long Range, Regional, Single-Technology Planning Versus Short-Term Responsiveness to Local Needs.—BART** demonstrates that financing arrangements should provide balance between local and regional transit needs and should avoid commitment to a single-technology regional system when different technologies may be more appropriate in different corridors. The conflict between regional and local needs was more sharply drawn in the San Francisco area because BARTD was formed as a separate organization to assume only regional transit responsibilities and was given a large share of the area's potential tax base.
- **Avoidance of Delays Due to Program Administration at Higher Levels.—Since Federal involvement** in BART's implementation was comparatively moderate and came late in the program, it was never a serious factor in causing delays, such as has been alleged in other metropolitan areas. At the' State level BARTD reported experiencing considerable frustration in dealing with the Legislative Analyst's office while it performed reviews of BARTD. However, these reviews were a necessary and productive part of the legislative process; the delays that resulted could have been avoided and the BARTD program management probably substantially improved if there had been a well managed, continuing legislative review process from the beginning.

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