

LAND USE POLICIES
IN RAPID TRANSIT STATION AREAS:
FIVE CITIES OF NORTH AMERICA

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INTRODUCTION

The interaction between urban land use and transportation can be observed from many angles. One of these, which dominated transportation planning during the genesis of long-range land use/transportation models, was to subordinate the existing and potential demand for transportation from zone to zone to the present and forecast land use patterns in these zones. One of the problems with this approach is that it tends to ignore the effects of a new infrastructure on land use and transportation demand. The predominance of this methodology enforced a form of transportation planning which was essentially reactive to land use: transportation infrastructures themselves could not be considered as tools for shaping development in the framework of this methodology.

Major shifts have occurred in the planning process with regard to this issue; little by little, as transportation planning was increasingly linked to issues not traditionally considered as relevant to infrastructure provision, transportation infrastructures came to be seen as tools, in the hands of planners, for influencing long-term trends in urban land use as well as broad economic and social goals.

The emergence of this attitude was particularly visible with respect to rapid transit (RT) facilities. Indeed, they were considered to have an obvious impact on land use, which could be easily controlled in order to create pockets of high density development wherever desired. Not only did this emerging idea coincide with the growing size of investments in RT in North America, but it also served as an argument for RT as a mode of

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transportation, which in turn may have helped generate more investment in RT. This fruitful cooperation was the result of a line of argument which proclaimed that the land use impacts of RT infrastructures were beneficial, as opposed to other modes of transportation's, especially urban expressways. This argument very quickly entered the controversies surrounding the justification of RT as a mode of transportation suitable for large North American cities.

The object of this paper is not to add to the growing literature attempting to justify or argue against RT through land use arguments. There are many methodological problems involved with that type of study. One of them is the difficulty of separating the construction of a new RT facility from other phenomena affecting an urban area at least as strongly during the same time, such as overall regional economic trends. Another is the impossibility of positively knowing what would have happened if RT had not been built.

Rather than place myself on one or the other side of this type of argument, I would confront the question in another manner, which is perhaps more pragmatic. Assuming that there are certainly benefits as well as problems associated with land use in RT station (RTS) areas, how have policymakers proceeded to identify them, and the groups of population they apply to? How have they responded to the necessity of managing the distribution of these effects? How have the policies evolved as their knowledge of past cases became more refined? Finally, what is the future of such policies and what does this mean to the future of transportation policy in North American cities?

In order to further understand the complexities of this topic, five cities were chosen for closer examination. They were thought to highlight

the chronological evolution undergone as well as different general urban situations. These five cities are Toronto, San Francisco, Boston, Washington D.C., and Baltimore. Other important examples are also referred to in Chapter I, which sets up a general framework for the analysis of the case studies in Chapter II. Chapter III will attempt to evaluate the changing place of the issue of land use in RTS areas in the planning process.

CHAPTER I

RAPID TRANSIT AND LAND-USE DECISIONMAKING :

A GENERAL BACKGROUND

This chapter is divided into two parts. First, we will focus on the question of land values in rapid transit station (RTS) areas. Not only is the literature on this subject abundant, but the argument for the increased attention given by public agencies to these areas often revolves around predictions of increased land values. After having ascertained the extent to which new rapid transit (RT) infrastructures can increase the value of land in station areas, we will go on to identify the actors responsible for shaping land use decisions in RTS areas. The analysis of their objectives and respective positions will set the background for a better understanding of the case studies in Chapter II.

I. Land values in rapid transit station areas

1. Theoretical arguments

The purpose of this short overview is to underscore the difficulty of isolating the economic impact of rapid transit on land. However imperfect existing models of the interactions between location and land use may be, they are helpful in that they identify some of the basic economic mechanisms in play and pinpoint some of the questions to be addressed.

The general idea behind these models is to consider accessibility as an important, if not the sole, determinant of land value. The simplest model developed by Alonso (1) concerns residential location, for which accessibility is taken to mean access to the place of work. Alonso's assumptions for this model include:

- a CBD made up of one point on a featureless transportation surface (i.e. all transportation costs are only a function of the distance between origin and destination, and quality of land is uniform);
- uniform population (family size, taste, income, expenditure, housing);
- uniform building and maintenance costs;
- assumptions related to perfect market conditions: free mobility, instantaneous equilibrium, perfect knowledge,...

The allocation of land is assumed to take place in a perfect market: a parcel of land goes to the highest bidder at that site. Under these assumptions the site rent and the transportation cost at any distance from the CBD are determined:

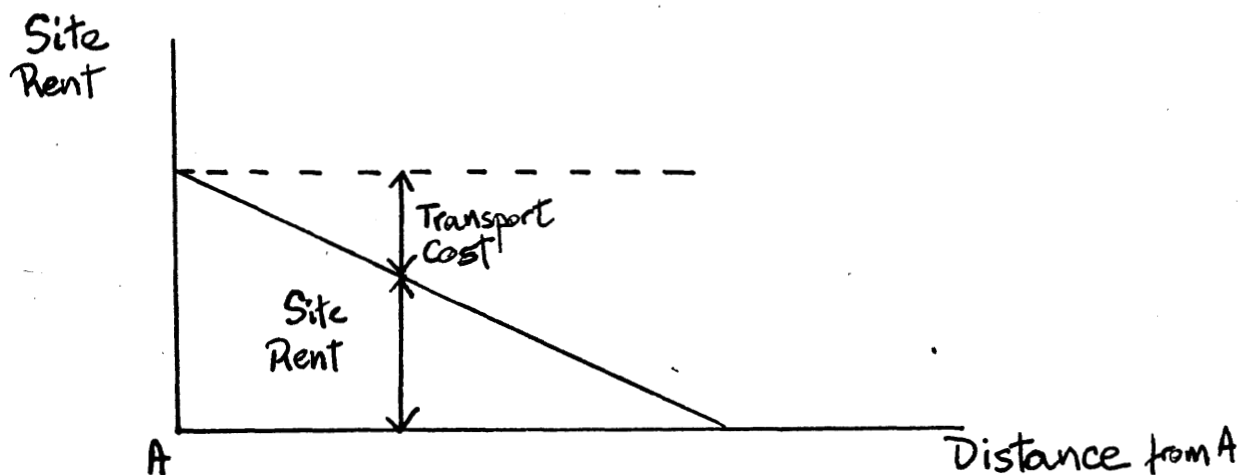


Figure 1: BID-RENT CURVE, RESIDENTIAL LOCATION, MONONUCLEAR

(1) Alonso, William Location and Land Use: Toward a General Theory of Land Rent, Harvard University Press, Cambridge, Mass., 1964

The transition from this simplistic model toward a more realistic model would require important modifications in the initial assumptions. Let us review the four directions in which changes would be necessary.

a. Introduction of a structured and polycentric surface instead of a featureless, monocentric surface: this is essential for our purpose since it means the introduction of a transportation network.

b. Introduction of a concept of "accessibility to place of work" rather than "distance to CBD": this is a direct consequence of a., since the CBD can no longer be isolated as the localized center of all activity. Employment will be distributed at different points along the network, which mandates the creation of an aggregate indicator of accessibility. For each center of employment, the simple model presented above remains valid in a limited area. The site rent at the center will be determined by the number of employment opportunities.

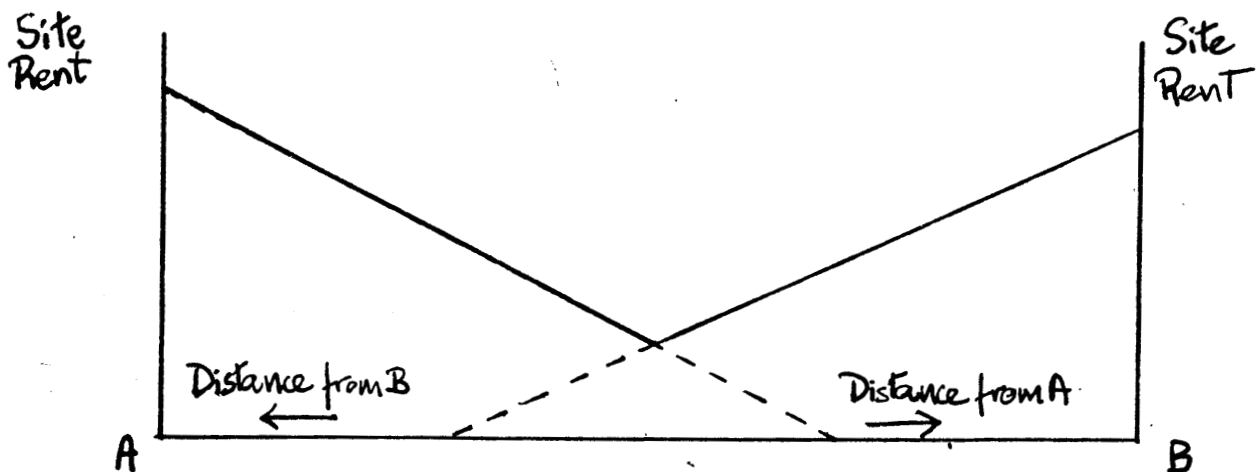
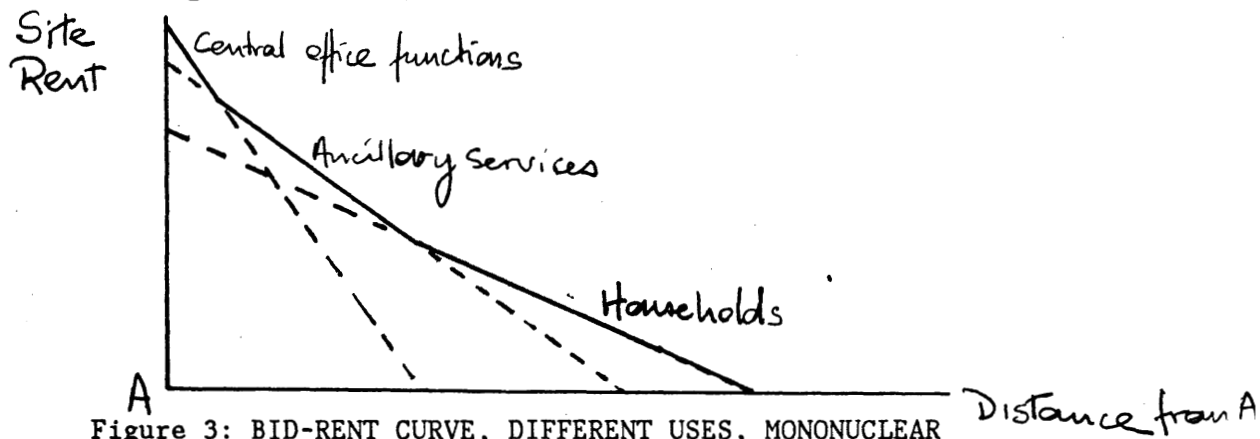


Figure 2: BID-RENT CURVE, RESIDENTIAL, TWO CENTERS

The superimposition of all the centers can only be visualized on a site-rent surface, with peaks at employment centers according to their relative importance.

c. Introduction of competing modes of transportation: this is complicated since different modes are characterized by different spatial structures and different behavioral patterns of their users. For RT, an important part of the time-cost of a journey is generated by the trip to/from the station itself from/to the origin/destination. This well-documented phenomenon (2) defines a "RTS area" as an area where RT modal split is higher than a given minimum level. Furthermore, at this level of analysis, the level of service of competing modes becomes an important factor. In turn, the introduction of competing modes modifies the concept of accessibility.

d. Introduction of competing bidders for a variety of land uses: this is certainly the most commonly attempted complication added to the basic Alonso model presented above. Given a homogeneous sub-group of population (income, behavior, travel and land needs) or other economic agents (users of office space, for example), a bid-rent curve can be established for a type of land use (office space, for example) in the same way a residential bid-rent curve was established by Alonso for residential uses. The result of the superimposition of competing bidders in the original model will be a concentric allocation of land to the highest bidder at a given distance from the CBD.



(2) for example, Stringham, M.G.P. Travel Behavior Associated with Land Uses Adjacent to Rapid Transit Stations, Journal of the Institute of Transportation Engineers, April 1982

Attempts have been made to advance in the directions suggested above. Lave (3) combines directions c. and d. Evans (4) explores directions a. and d. As mentioned earlier, d. is the most explored direction (5). The only theoretical arguments directly related to RTS areas were in Dewees (6), where directions a., b. and c. are discussed with respect to a specific empirical endeavor.

To date, no theoretical model has attempted to account for the full complexity of the issue. However, some conclusions may be drawn from this rapid overview of the theoretical literature.

- 1) An increase in property values should occur in areas surrounding a new RTS, because of increased accessibility to and from that area.
- 2) The extent of this increase will be influenced by:
 - a) the extent to which the increase in accessibility by RT to and from different purposes represents an increase in overall accessibility; and
 - b) the previous and the new characteristics of the RT network (level of service, distance between stations, station location, pricing. ..).

Have these conclusions been confirmed empirically?

2. Empirical evidence

(3) Lave, L. **Congestion and Urban Location** , Papers, Regional Science Association , 1970, in Harvey, D. **Society, the City and the Space-Economy of Urbanism** , Association of American Geographers, Resource Paper no. 18, 1972, p.18

(4) Evans, Alan W. **The Economics of Residential Location** , St. Martin's Press, New York, 1973

(5) For a discussion of the work of I.S. Lowry, L. Wingo, J.F. Kain and R. Muth, see Granfield, Michael **An Econometric Model of Residential Location** , Ballinger, Cambridge, Mass., 1975. Some aspects are also covered in E.S. Mills' important **Studies in the Structure of the Urban Economy** , the Johns Hopkins University Press, Baltimore, 1972

(6) Dewees, Donald N. **The Effect of a Subway on Residential Property Values** , Journal of Urban Economics, October 1976

The empirical studies of land values in RTS areas are centered around two themes:

- a. Can an increase in land values be observed as a direct consequence of the construction of a new RTS in an area? If yes, is this increase significant?
- b. What factors affect these possible increases in land value ?

In the framework of the theoretical arguments presented above, the hypothesis which is tested is the capitalization of travel savings in the form of investment in land.

The data for these studies has become increasingly reliable and sophisticated as the methodology of before/after studies has matured. Donnelly (7) shows how data bases were created in Washington,D.C. for instance, to monitor changes in development. Although impact studies do not usually include monitoring of land values themselves, they provide a detailed context for the studies of land value carried out.

There is a methodological problem, though, because land values themselves are very difficult to monitor. The result is that we can only estimate land value changes through proxy variables which also reflect changes in property improvements and therefore land use. This requires a departure from the framework of the theoretical models. Furthermore, it may not be valid to separate land use and land value, or even to distinguish "land use impacts" from an economic perspective alone. For the purpose of this discussion, however, and in keeping with the literature, property tax assessments or residential sales values will be assumed an indicator of land values. The reader should bear in mind that, although this is as close as we can get to an empirical test of the

(7) Donnelly, Paget (Price, Williams and Associates) **Rail Transit Impact Studies: Atlanta, Washington, San Diego** , Summary report prepared for Office of Planning Assistance , UMTA, Washington, D.C., March 1982

theoretical models, it is not a conclusive test of their validity.

Historic examples of land value increases with RT improvements are well known (8). However, since World War II and the decrease of RT modal split in cities of North America, these increases have become less obvious. Furthermore, RT systems rarely provide accessibility to undeveloped areas anymore, whereas earlier systems usually increased the net supply of developable land.

According to Knight and Trygg (9) , the Lindenwold line from Philadelphia to New Jersey "was the subject of the most rigorous and extensive set of studies ever conducted on transit's residential property value impacts". The studies were carried out in the Department of Regional Science, University of Pennsylvania, and consisted of statistical treatment of residential sales data. No evidence could be isolated for downtown Philadelphia, but the evidence of increases in suburban residential property values supports the "travel savings" hypothesis. In other words, a modest positive impact was found and determined to be proportional to users' travel cost and time savings.(10)

(8) For a summary of the famous cases of RT in NY, Boston, Chicago, Cleveland, San Francisco and streetcars in most major North American cities, see Knight, Robert L., and Trygg, Lisa L. (De Leuw, Cather and Company) **Land Use Impacts of Rapid Transit, Implications of Recent Experience** , for Office of the Assistant Secretary for Policy, Plans, and International Affairs, USDOT, August 1977
(9) op. cit., p.90
(10) Boyce et al., in Knight and Trygg, op. cit., p.93

In Toronto, early reports of substantial increases were made by Irwin (1959). Kearns (1964), Wachter (1970) (11) were able to compare overall increases in property tax assessments in areas "close to the subway". Kearns' findings were summarized in a report by the Toronto Transit Commission (12):

(All figures in thousands)

	Total City		Adjacent to Subway	
	Increase	%	Increase	%
1950-53	\$101,426	7.5	\$48,557	9.2
1954-56	127,721	8.5	69,846	12.1
1957-59	212,523	13.5	121,521	18.8
Total	\$441,670	32.8	\$239,924	45.4

TABLE 1: PROPERTY ASSESSMENTS, TORONTO, 1950-1959

The same sources report an increase of 58% in areas along the Yonge St. line from 1952 to 1962 versus 25% for the rest of the city. Using the same type of methodology as that developed at University of Pennsylvania, researchers from the University of Toronto were able to qualify these results with some interesting conclusions :

(11) Irwin, W.F. **Effect of Subway on Central City Assessments** , Toronto Transit Commission memorandum dated 30 April 1959 ; Kearns, J.H. **The Economic Impact of the Yonge Street Subway** , address to the APTA Annual meeting, 1964 ; Wachter, T.R. **The Effects of Rapid Transit Systems on Urban Property Development** , Chartered Surveyor, March 1970 ; all in Knight and Trygg, op. cit., p.42

(12) Toronto Transit Commission **Transit in Toronto** , Toronto, 1976, p.18

(13) Abouchar, Alan **The Analysis of Property Values and Subway Investment and Financing Policies** , University of Toronto, 1973, in Knight and Trygg, op. cit., p.43

These factors were identified and analyzed in a report written by Administration and Management Research Association of New York(17). A comprehensive review of the literature led them to state three important conclusions:

a. RT improvements affect the distribution of land values on a metropolitan scale, but cannot in themselves create excess value. This is essentially due to the fact that RT improvements in contemporary North American cities represent only incremental improvements to selected sites in the overall transportation system, given the predominance of automobile travel.

b. Positive land value impact in RTS areas is dependent on a large number of factors in addition to the transit itself. Land value increases related to new RT facilities have not been consistent: impacts have been anywhere from insignificant to very large even within the same RT network. This supports the view that transportation improvements can only accomodate growth if there is a preexisting demand generated by other economic factors: accessibility alone does not determine land value. The complementary factors which may strongly affect land value in RTS areas include:

- patterns of land ownership (fragmented or unified);
- previous land use;
- "market conditions", i.e. physical and social neighborhood qualities, availability of public infrastructure, income and population growth trends, and the overall real estate market and growth potential of the metropolitan region;
- timing of the RT improvement in relation to the previous factors
- finally, zoning and land use policy.

(17) Administration and Management Research Association of New York, Inc. and Office of Midtown Planning and Development, Office of the Mayor **Transit Station Area Joint Development: Strategies for Implementation** , New York, 1976

- Abouchar (13) found that once most of the system was either built or well under construction, there was no more significant impact on land values.

- Dewees, in several works, confirmed the existence of increases and was able to relate some of the effects at the micro-level to the specific performance characteristics of the transit service(14).

The most conclusive evidence concerning the impacts of the Bay Area RT System (BARTS or BART) in the San Francisco region stems from the reports of the "BART Impact Studies" (15). The principal findings of these studies were:

- property price gains attributable to BART were almost negligible;
- the influence of BART on price increases was most significant for single-family dwellings within 500 feet of some stations;
- office rents in station areas were affected more consistently than residential rents;
- increases were more prevalent during the planning and construction of BART, tapering off subsequently.

Melvin Webber (16) even reports that an initial decline in property values occurred in the Rockridge station area when BART first opened.

This brief overview of some of the better documented cases produced mixed evidence. This suggests that there may be factors that have not been taken into account thus far, and which are significant determinants of land value increases in RTS areas.

(14) Dewees, op. cit.

(15) especially Metropolitan Transportation Commission/USDOT **BART in the San Francisco Bay Area-The Final Report of the Bart Impact Program** , June 1979, and Falcke, C.O. and Schnetlage, T. (John Blayney Assoc./David M. Dornbusch and Co., Inc.) **Study of Property Acquisition and Occupancy -BART's Effect on Speculation** , for Metropolitan Transportation Commission/USDOT/HUD, October 1978

(16) Webber, Melvin M. **The BART Experience - What Have We Learned?** , Chapter 7 of Altshuler, Alan A. **Current Issues in Transportation Policy** , Lexington Books, 1979

c. In practice, effects of RT are difficult to separate from those of other factors, both on a micro and macro-scale of observation.

Thus, the evidence concerning land value increases does not entirely confirm the theoretical considerations presented above. On the other hand, it suggests that other factors may play at least as important a role as accessibility alone in determining land value in RTS areas.

3. A change in orientation

The mixed evidence presented above points to incomplete theoretical arguments which can be misleading when conceptualizing the future of RTS areas. The most obvious shortcoming of these models is their necessarily simplistic approach. More comprehensive econometric approaches would be tremendously complex, and the practical implications might be insignificant in regard to their complexity. As mentioned earlier, though, their contribution is fundamental in describing the economic processes affecting RTS areas.

More importantly, the determinants described in the purely economic paradigm may be less significant than other factors influencing land values and the ultimate land use changes in RT areas. Lowry (18) contends that "the market processes of transactions between willing buyers and willing sellers determine the spatial organization of urban activities." This is certainly not true for our purposes, since decisions of whether, how and where a transportation facility should be built are made by public authorities. Of course, market processes and conditions are major inputs in those decisions, and to a certain extent this form of planning is reactive to a demand for transportation. In any case, though,

(18) Lowry, Ira S. **Seven Models of Urban Development: A Structural Comparison**, Highway Research Special Report no.97, Highway Research Board, Washington, D.C., 1968 in Sweet, David C., ed., **Models of Urban Structure**, Lexington Books, Lexington, Mass., 1972, p.5

some of the key factors affecting land use and even land values are at least filtered, if not primarily determined, by a process of planning and policy-making which is not perfectly transparent to market conditions.

Consequently, to go any further without raising the issues and influence of policy would be misleading. When observing the case studies in Chapter 2, we will see that land values themselves do not seem to have been the object of public policy (nor do their increases seem to be so dramatic as to mandate such an attitude). Rather, it seems that policy-makers, following the economic reasoning presented above, assumed at first that values would rise, albeit incrementally, as a result of improved accessibility, "all other things remaining equal". It is striking that this trend is considered beneficial in itself, because its effects are to produce a "higher and more efficient" use of land, and because a rise in property values means a rise in tax revenue. The possible negative consequences of such value increases in terms of displacement or other social, physical or economic impacts are not usually addressed in economic analysis. However clear it may be that the overall effects on particular neighborhoods may be negative, this aspect is only addressed in the policy arena, in the process of justifying specific plans in particular station areas.

This type of approach, abstracting land use from many of its "real world complications", provides us with a theoretical and incomplete vision of the processes determining land use. Most often, the previous land use and social composition of the concerned area are not taken into consideration with this approach. Evans (19) discusses the process of change occurring in response to changes in accessibility as dependent on the cost of redevelopment, but a more detailed articulation of Alonso-type reasonings with theories of housing cycles, filtering, trickle-down or land use succession could not be found(20). Not only

(19) op. cit., pp. 171-187. In any case, the analysis remains static.

(20) In Contini, Edgar **Transportation and the Recycling of Urban Land** , Urban

can the conclusions drawn from such an approach be incomplete, they can also be false as a result of the omission of key factors. For example, in the area surrounding the Rockridge station on San Francisco's BART, economic analysis alone would conclude to increases in land values and subsequent development. However, this area was occupied by a vocal community living in single-family dwellings. According to Gruen and Gruen (21), a successful community campaign against development kept land values low through a conservative zoning ordinance. Webber (22) notes that the strong community reaction first manifested itself in the form of decreasing land prices, interrupted by the reassuring zoning ordinance. Whatever the interpretation of this case may be, community reaction and zoning changes were undoubtedly prime factors in establishing the final land use in the Rockridge area.

For these reasons, the final results concerning development in RTS areas will only be reviewed in relation to the policies carried out at the local level, which will be analyzed in Chapters II and III. The purpose of this section was rather to summarize the general reasons for which RTS areas are the object of specific attention on the part of policy-makers. Let us review these reasons.

The first and foremost of these reasons is that station location, one of the key planning decisions in these matters, is carried out by public authorities. Furthermore, if other factors are conducive to imminent development, the provision of a rapid transit facility can be decisive in suddenly increasing land values, accelerating market activity and increasing the pressure for development.

Land, April 1976, one can find a discussion in very broad terms of the use of transportation systems to accelerate the redevelopment of blighted areas in favor of "higher and more efficient" land uses. See also Rolf R. Schmitt **Predicting the Impacts of Transportation on the Spread of Urban Blight**, in Transportation Research Record no.634, transportation Research Board, 1977

(21) Gruen and Gruen Assoc. **Impact of BART on Real Estate Values Around the Rockridge Station**, a report prepared for Administration and Management Research Assn., op. cit., 1976

(22) op. cit., p.109

Increased intervention on and regulation of the land market can then be justified by the presumption of increased rates of change associated with new RTSs. The intervention will be predicated on a rationale not different in nature from actions regulating land markets in general. However, land use policies in RTS areas can be clearly distinguished as a specific policy issue by the potential strength of market forces put into play and the link between transportation and land use policies needed in order to respond to these forces effectively.

The following section will identify the actors whose interventions may contribute to the ultimate form of land use in RTS areas, and analyze their objectives as related to these areas. It was felt that the analysis of actors' objectives and positions is a significant way of filling some of the gaps left by economic reasoning alone. Their intervention defines the policies carried out, which can be seen as a compromise between their objectives. This approach was felt to be particularly relevant for RTS areas where many actors intervene.

II Actors intervening in RTS land use decisionmaking

This section should provide the reader with an understanding of the articulation of the key concepts of value capture and joint development with goals and means of action of the intervening actors. Given the variations which exist between the specific priority issues central to the planning process in different cases, this section will only relate broad characterizations found in the literature. The three types of actors distinguished are :

- public actors
- institutional actors
- private developers

This section borrows heavily from the analyses found in the **Proceedings of the Joint Development Marketplace** compiled by Public Technology, Inc. for UMTA in 1978.

1. Public actors

Subsets of the "public at large" are classified under this heading. In a given metropolitan area, three groups are potentially relevant in RTS area decisionmaking : the electorate, citizen groups and transit users. These groups can overlap.

a. The electorate, inasmuch as it modifies the priorities of local government, may have indirect influence on RTS area policies. This group is sensitive to large transformations occurring at the metropolitan level. It is not necessarily well informed of the possible impacts of policy choices. Often, local transit funding is dependent on the approval of bond issues

placed on ballot. This can put some land use issues in the spotlight of political controversy, as in the case of BART.

b. Citizen groups, especially those representing areas where a RTS is or will be located, have in some instances been decisive actors. This usually takes the form of resistance to possible increases in land values, displacement and dramatic changes in neighborhood character. The effectiveness of their action has been variable, typically higher in affluent suburban residential areas. Their participation in station location decision and area planning has become a standard procedure, but there is no evidence that this has systematically modified the outcome of the planning process. This important issue will not be fully addressed in this paper.

c. Transit users, present and potential, are not usually strongly organized as an interest group. It can be hypothesized that they would favor high density and mixed use in RTS areas since this would increase their choice of activities accessible by RT. However, RT users are often residents of a RTS area themselves, and they may desire high intensity land use in all RTS areas but one. Those who use other modes than walking to access a RTS may also be opposed to any configuration conducive to congestion and/or parking restrictions near that station.

2. Institutional Actors

It is difficult not to distinguish between the US and Canada, even at this initial level of analysis.

"The federal government in Canada has only a minimal role in urban transportation. In contrast to the United States situation, the

Canadian government has little direct contact with the municipal level, especially in the Province of Ontario. Any federal contact with the cities must be routed through the provincial governments. In Ontario, the provincial government takes a very active role in the urban sphere with respect to financing and planning, and guards its prerogatives closely. This is in direct contrast to the United States situation, where the states did not often take the initiative in attacking urban problems, and stepped aside to allow the federal government to develop and directly apply major programs in the cities. The United States federal role in urban transportation is also much more significant. The subsidies for roads (and, more recently, transit) have been considerable, and federal requirements with respect to environmental impact studies, planning studies, and public participation -tied to their subsidies- have provided forceful guidelines at the municipal level. In Ontario, the provincial government has in some cases played the equivalent role.(1)"

For all practical purposes, the provincial government of Ontario's role can be considered analogous to that of the US federal government's in this subsection.

In this subsection, then, four types of istitutional actors will be distinguished :

- local transit agencies, i.e. operators of transit in a metropolitan area.
- local and, in the US case, state governments(2).

(1) Pill, Juri **Planning and Politics: The Metro Toronto Transportation Plan Review** , the MIT Press, Cambridge, Mass., 1978, pp.19-20
(2) Redevelopment authorities will be considered as integral parts of local government structures.

- the federal government, for which the discussion will be limited to the US. An analysis of the Province of Ontario's role would be analogous as far as principles are concerned, but the specifics will only be analyzed in the Toronto case study.
- Transit Corridor Development Corporations (TCDC).

a. **Transit agencies** have consistently been supportive of RTS development. They base their support on the assumption that by the creation of land uses favorable to RT usage (i.e. high density and mixed use with a priority on office space in downtown areas , or Park-and-Ride facilities in suburban areas, basically) in RTS areas, ridership will increase. Not only does this provide enhanced prospects for RT as a future mode of transportation, but the possible financial gains in the near future are often considered sufficient to justify investments in so-called "joint development" projects.

Joint development is "a land development related functionally and physically to a public transportation facility"(3). The benefits which a transit agency can realize from joint development include :

- "- a built-in source of transit patronage.
- more adequate amenities at and around stations.
- improved intermodal connections.
- shared capital improvement costs.
- income from land sales and leases, as well as increased revenues from taxes, dedicated to the maintenance and construction of the transit system(4)."

(3) Hurd, Burckhardt and Moore in **Proceedings of the Joint Development Marketplace** ,op. cit., p.64
(4) *ibid.*, p.65

Furthermore, since it is a public agency, a transit agency will promote any form of "value capture", i.e. "the process by which the community shares to some extent in the economic benefits from publicly funded transportation improvements and facilities"(5).

Very often, transit agencies are directly involved as owners of land in RTS areas and of air rights above RT infrastructures. In principle, there are legal constraints to the acquisition of land by transportation agencies beyond that strictly needed for transportation purposes. Rivkin (6) documents how these constraints have often been overcome through a cooperative venture of local government and transportation agencies. We will see examples of this in the case studies.

The influence of transit agencies is even greater if one considers their weight in station location decisionmaking. In the past, there has clearly been a mismatch between transit agencies' responsibility in land use issues and their relative incompetence and unfamiliarity with them. Through the increasing precision of RTS problem formulation and through cooperation with other actors in a formalized RTS area planning process, transit agencies have become sophisticated about the potential impact of their decisions and actions.

b. One way in which **state and local governments** are involved is through their funding of local transit agencies. The level of this funding, both in absolute terms and relative to the transit agency's total budget, is variable. In any event, state and local governments share some of the priorities presented in a. Their involvement as owners of land can also be substantial. Beyond the objectives these institutions hold in common with transit agencies', other

(5) Southern California Rapid Transit District for USDOT **Joint Development and Value Capture in Los Angeles: Local Policy Formulation** , January 1983, p.VII-1
(6) Rivkin, Malcolm D. **Some Insights Into the Practice of Joint Development: Lessons From Experience** , Transportation Research Record no.634, Transportation Research Board, National Academy of Sciences, Washington, D.C., 1977

perceived benefits of joint development projects to state and local governments include:

- "Increased tax revenues. However, it must be recognized that development which occurs around a transit station may be the result of regional shifts and not the result of a net increase in regional growth.
- Quality design and urban environment. One of the primary objectives of joint development is to encourage high-quality development at and around stations. However, the achievement of this objective will only be assured through the development of reasonable design controls.
- Increased opportunity. Joint development projects provide increased employment, shopping, and residential opportunities.
- Reduced public costs. Joint development projects will often lead to greater mixtures of complementary uses and increased density thereby reducing the relative costs of supportive public capital investments.(7)"

Local governments also have to balance social goals with their perception that certain areas of the city need to be redeveloped at a large scale.

Because of the institutional separation from transit agencies and the necessary participation of developers and community organizations, the realization of local government objectives depends on successful negotiations with these parties. Much of the political accountability in this process is held by local government through the electoral process and interaction with community organizations. On one hand, local governments must provide private sector developers with sufficient incentives to promote the realization of public objectives, but on the other hand they must ensure that there is not an excessive

(7) Hurd, Burckhardt and Moore, op. cit., pp.68-69

rate of return to the private sector as a result of public investment. This requires a level of understanding both of the underlying processes and of private sector concerns not necessarily very developed in public agencies.

Both the extent of public involvement and the tools used may vary from station to station, and according to general economic trends of the metropolitan area. The setting can be one of competition between jurisdictions, especially between suburban and central-city priorities, or on the contrary intra-metropolitan cooperation, a situation promoted without much success in the US and achieved by the creation of a metropolitan government for Toronto.

State governments sometimes have the legislative power to authorize new administrative and financing procedures. Beyond that, the tools available to state and local governments for direct intervention and/or negotiation include:

- regulatory techniques
- public land acquisition
- taxing
- public assumption of risk
- the preferential redirection of existing public investment toward RTS areas

Chapters II and III will focus on the specific tools used, and the rationale behind their selection in different situations.

c. The interest of **the federal government** in land use policies in RTS areas is based on the perception that a successful coordination of RT and land use can favor other federal priorities and policies. This takes several forms, and is often based on assumptions about mass transportation and urban form that are not easily verifiable.

First, it is felt that RT can significantly alter patterns of urban form to limit sprawl. This in turn is perceived to promote energy conservation, since a dense urban form linked with RT is perceived as energy-efficient (8). Another perceived consequence is enhanced environmental protection (9). Secondly, joint development is seen as favoring some of the federal government's specific transportation policy initiatives, for instance favoring increases in mobility of the "transportation disadvantaged"(10). Finally, UMTA is directly involved in the promotion of value capture techniques that help transit agencies financially and joint development which can help increase RT ridership.

In 1974, the Congress, responding to the case of the Metropolitan Atlanta RT system, adopted the Young amendment to the 1964 Urban Mass Transportation Act(11). At this point, the specification of a clear federal policy has not yet been attempted.

(8)Although this may be true in absolute terms, it has been pointed out time and again in the literature that this does not imply that the construction of RT saves energy in the foreseeable future given present urban form, the energy-intensive nature of RT infrastructure construction and the quasi-ubiquity of automobile ownership. See for example Altshuler, Alan **The Urban Transportation System: Politics and Policy Innovation**, the MIT Press, Cambridge, Mass., 1978 ; or Meyer, John R. and Gomez-Ibanez, Jose A. **Autos Transit and Cities**, Harvard University Press, Cambridge, Mass., 1981

(9) See Urban Systems Research and Engineering, Inc. **The Growth Shapers. The Land Use Impacts of Infrastructure Investments**, for the Council on Environmental Quality, May, 1976. This is a detailed argumentation of this view. Again, this has been challenged by more recent studies. The burden of proof lies on the claim that RT destroys the environment less than the automobile. A definite answer is not likely to emerge soon, especially given the recent shift of focus in transportation research away from such broad questions and back to project to project studies of economic feasibility.

(10) essentially the carless and non-drivers. The extent to which this group can benefit from RT improvements is debatable after scrutiny of the social composition of RT ridership and their travel patterns in the US. Not only are the transportation disadvantaged often politically unsuccessful at obtaining adequate RT service, but they may be the first to be displaced from RTS areas in the event of increased land values. Furthermore, it has been argued that they would be better served by other modes than RT, again given present urban situations.

(11) Appendix A highlights the salient points of this legislation.

UMTA's commitment to the promotion and financing of joint development projects is very strong though, and was recently reinforced by the findings of Keefer and Assoc. in their report on a nation-wide research they conducted(12). The focus of this research was to estimate the long-term cost-effectiveness of UMTA's investments in joint development compared to other kinds of UMTA Section 3 capital assistance grants. Although some of the benefits predicted by this report seem optimistic, the findings remain pertinent:

- Transit ridership increases could be significant as a result of the joint development projects (13). Thus the cost-effectiveness of these investments, measured in terms of cost to UMTA per net additional transit rider, is rather high compared to other Section 3 capital grant investments:

City	Range of Net Additional Transit Trips	UMTA Cost per Added Trip (Dollars)
Baltimore	3,337-7,310	1,710-3,746
Boston	2,418-5,302	566 -1,241
Cambridge	5,819-12,759	627 -1,375
Miami	1,355-2,970	2,323-5,092
Philadelphia	7,093-15,553	657 -1,438

TABLE 2: ESTIMATED UMTA COST PER ADDITIONAL DAILY TRANSIT TRIP

TO RT JOINT DEVELOPMENT PROJECTS Source: (12)

To give some points of comparison: "For the first 31-mile segment of Washington's new Metro rail system, for example, the capital cost to UMTA was at least \$14,000 per net additional transit trip, and about

(12) Keefer, Louis E. (Keefer and Assoc.) **An Interim Review of Nine UMTA-Assisted Joint Development Projects**, for Office of Planning Assistance, UMTA, October 1983

(13) Although transit trips merely shifted from other origins and destinations are estimated and not double-counted, there may be a systematic overestimation due to the double-counting of bus trips previously made from the same origin to the same destination. This may be significant since many RT corridors were previously heavily traveled bus corridors.

corporations, their legal status, means of action, and financing really depend on the particular institutional structure of each city. The main advantage identified in the literature is that the TCDC, by welding together different institutional interests, provides private developers with one and only one counterpart for negotiation. Not only does this alleviate their fear of institutional disagreements, but it greatly simplifies their procedures.

The simplification is in part due to the ability of TCDCs to bypass much of the red tape. One must bear in mind, though, that there is usually a reason for the existence of this red tape. In certain circumstances, the major reason for the existence of a TCDC or a similar type of organization may be its ability to avoid a cumbersome regulation. This raises the problem of such organizations' accountability.

At all levels, therefore, institutional actors stress the importance of understanding private sector concerns and must engage in negotiations with private sector interests and public sector institutions.

3. Private actors

The business community in a metropolitan area can be a prime mover in providing support for RT construction, as was the case in San Francisco. Their support was based on the hope that BART would provide impetus to San Francisco's downtown development (16). Other private actors include land owners in RTS areas.

The most important private actors in RTS area land use decisionmaking are the developers, though. It is on their decision whether or not to build that any "impact" depends, except for entirely public projects, or the incremental

Development Handbook for Local Government Officials , supported by UMTA, Washington, D.C., February 1984
(16) See San Francisco case study.

the same cost was experienced for the first 15-mile segment of Atlanta's new MARTA rail system. More than a dozen other proposed rail rapid transit investments would cost from about \$5,000 to more than \$30,000 per net additional daily transit trip. These costs per additional new rider would be higher still were operating costs included in the comparisons, so that joint development's investment superiority is generally understated (14)"

- Other benefits such as induced private investment, permanent jobs created, value capture are also substantial.
- Although large projects are generally more successful, smaller projects can still represent an excellent UMTA investment.

The major financier of RT systems, UMTA, has thus followed a complicated path leading it toward a point where land development and transit line operation would be carried out by the same body, as they were in the past when private sector operators prevailed. It is remarkable that such an expansion of activities should be justified in the cost-effectiveness mode. This can be interpreted as a major shift from an era when RT investments were predicated on broad social and environmental goals. Not only has the ability of RT to achieve such goals been challenged by the results of new RT systems, but the shift may also be relevant of a change in focus in planning practice from the redistributive effects of public investments to their overall cost-effectiveness.

d. In some cases, local governments in the US may find it useful to create a **Transit Corridor Development Corporations (TCDC)** ,i.e. a public or quasi-public corporation under the provisions of the Young Amendment. In broad terms, these special-purpose entities are established to "plan, coordinate and implement joint development projects (15)." The specific role and function of these

(14) *ibid.*, p.iii

(15) Public Technology, Inc./Urban Consortium for Technology Initiatives **Joint**

transformation of existing uses. Their objective is profit, and they will not engage in development unless they feel that a project's potential for profit outweighs the risk involved in large investments. Their prudent stance is further reinforced by their dependence on financial institutions, who provide a second risk assessment.

A major developer summed up his approach in the following manner: "The best way to get both the developer and the financial institution interested in a project is to create a scarcity value by giving the project an appearance [sic] of meeting a seriously unmet need (17)."

The fact is that the benefits associated with development in RTS areas are more than just apparent:

- improved market potential as a result of increased accessibility.
- increases in the net supply of developable land, although this has not been a predominant factor in recent RT infrastructure provision.
- the possibility of benefiting from public power to assemble tracts of land.
- publicly funded amenities which increase the competitive advantage of the project.
- public assumption of a part of the risk, on a negotiable basis.

The expertise of private developers in assessing market potential is very high. In the case of RTS areas, special concerns may arise to affect their decisions:

- the possibility of delays because of lengthy procedures is a major deterrent. The financial costs associated with such delays can be tremendous, especially when interest rates are high.

(17) Mr. Bowen H. McCoy, in **Proceedings of the Joint Development Marketplace**, op. cit., p.55

- joint development projects are usually large and may change substantially as a result of changes in other actors' decisions, especially since these are sensitive to conditions ranging from regional economic trends to local political considerations. The high front-end costs associated with planning and negotiation can therefore be lost, and may in any case take long to recover. Balancing contractual agreements to cover high risks and yet remaining adaptable to changes during the lengthy process is technically difficult.

This overview of the actors intervening in RTS area decisionmaking completes the economic approach presented in the beginning of this Chapter. The observation of the case studies will now provide examples of how RTS area decisionmaking has occurred in different contexts.

CHAPTER II

CASE STUDIES : FIVE CITIES OF NORTH AMERICA

Because of the diversity of policies carried out in RTS areas and RT corridors, a case study approach was chosen. Each case, moreover, could have been looked at as a collection of station-specific cases, had the object of our inquiry been to describe the transformations undergone by RTS areas as a result of the presence of the RTS. Most of the time, though, station-specific information was disregarded except as an example of system-wide approaches. The focus was rather to characterize the system-wide trends in land use policy in RTS areas. The analysis of these trends as they appeared in different cities will hopefully put them in their historical context, and in the context of different economic, social and political environments. This will serve as a basis for Chapter III, where the lessons from these case studies will be analyzed in an attempt to assess the meaning of the "RTS area issue" for transportation and land use policy in cities of North America. The choice of the cases was dictated by the following guidelines:

- RT infrastructures built after World War II;
- no more than five cases could be covered in the allotted time;
- cases were selected in order to spread the study chronologically from RT lines opening in the 1950's in Toronto to the 1983 Baltimore RT line. Thanks to this dispersal in time it will be possible to analyze the evolution of the policies implemented;

- all-new systems, extensions of old systems and conversions from streetcar are included;
- cases were finally selected in terms of the availability of literature.

The five cases are Toronto, San Francisco, Boston, Washington, D.C. and Baltimore. As much as possible, different types of sources were used. Reports from local government and transit agencies were not always available and usually were heavily influenced by the objectives of the institution. Therefore research done by consultants either for institutions not directly involved in the studied case, such as local government of cities interested in the RTS area issue, or for UMTA were very valuable. A third type of source was academic research, which was used as a framework and to confirm or discredit some of the claims found in other sources.

The following presentations of the case studies depend on the literature and probably reproduce some of the shortcomings. Sources also varied from case to case, sometimes making comparable perspectives difficult to extract.

The case study presentations are structured in the following manner:

1. Background Information
 - a. Metropolitan Setting
 - b. Transportation Background
 - c. The RT System
2. Land Use Policies in RTS Areas
 - a. Sources of Information
 - b. The Policies
 - c. Concluding Remarks

I TORONTO

1. Background information

a. Metropolitan Setting

Many characteristics of Toronto distinguishes it from U.S. cities of the same size:

In 1953, the Province of Ontario, responding to very high growth rates, created a metropolitan-wide government (Municipality of Metropolitan Toronto - MMT) to improve the coordination of public service provision. At that time, the Toronto Transportation Commission was replaced by a metropolitan-wide transit authority, the Toronto Transit Commission (TTC).

The federal government has only a minimal role in the urban sphere, whereas the Province of Ontario partakes in financing and planning very actively.

Transit use in Toronto is very high. For example, in 1979, transit ridership per capita was 160 per year, as compared to 52 in Greater Boston. This is certainly the result of continuous reinvestment in public transportation, as well as a favorable urban form, two factors which have perhaps reinforced each other.

Metropolitan Toronto has a high residential density, exceeded only by those of New York and Montreal in North American Standard Metropolitan Statistical Areas (SMSA). This is in part due to policy initiatives to reduce sprawl and the absence of tax benefits for single family housing.

The central city has not experienced the kind of decline witnessed in many North American SMSAs in terms of population and economic development. Overall, the average income of residents is lower in the central city, but the social contrasts between central city and suburbs are not as marked as in U.S. cities.

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Although growth has subsided since the late 1960s, it continued at a slower pace throughout the 1970s.

b. Transportation Background

Transportation planning in Toronto since the early 1950s has been characterized by:

- a strong emphasis on transit, boosted by TTC's healthy financial situation;
- an early shift from computer-based transportation studies (MTARTS) to more innovative planning practices with the Metropolitan Toronto Transportation Plan Review (MTTPR) in the early 1970s;
- the increasing role of the provincial government(1);
- reliance on transit infrastructures to structure urban development, as demonstrated by past policies .

c. The RT System

The rapid transit network has been continuously expanding since 1949. A map and a table presenting the phases of construction can be found in Appendix B1. At present there are 49 stations.

(1) At first, transportation planning responsibilities were shared between MMT and TTC, but TTC gained relative autonomy after the 1958 decision by the Metropolitan Council, the major decisionmaking body of MMT, to approve the Bloor Street subway. The provincial government's financial role and decisionmaking power have increased since then, as evidenced by the initiatives of the Province: the cancellation of the Spadina expressway; the release of the 1970 "Toronto-Central Region" regional policy by the Province; the reduction of MMT's planning area; the formation of TATOA (Toronto Area Transit Operating Authority) in 1974, a cooperative venture of MMT with four outlying peripheral regional governments. This agency manages the "GO" commuter-rail system and is financed by the Province.

2. Land use policies in RTS areas

a. Sources of Information

The most important source for the Toronto case was Knight and Trygg(2), which synthesized previous studies very well. Other sources were Libicki (3), Baltimore City Department of Planning (4), Toronto Transit Commission (5) , Rivkin (6), and Urban Land Institute (7). All of these referred to older studies by Heenan, Wachter and Kearns(8).

b. The Policies

It is generally recognized that Toronto's zoning policies have induced intensive development in RTS areas by favoring the concentration of the strong existing demand in these areas.

"With respect to control of land development around transit stations, the City's position in the first few years following the opening of the Yonge Street line was merely to react to the proposals of the developers, which were generally for intensification of allowable densities. However, as early as 1952 the city formally designated much of the downtown area for intensive high-rise, multiple-use development, typically with a maximum floor area ratio of 12:1. This allowed buildings of fifty storeys or more on open sites, contrasting sharply with the then-existing low-rise skyline. Most of the area involved was within a few minutes' walk of a transit station. Since no other areas of the city (or of Metro, for that matter) were zoned to allow such

(2) op. cit.

(3) Libicki, Martin C. **Land Use Impacts of Major Transit Improvements: An Assessment of Current Information** , for Office of the Secretary, USDOT, Washington, D.C., March 1975 (4) Baltimore City Department of Planning **The Impact of Rapid Transit on the Metro Center** , Baltimore, 1971 (5) op. cit. (6) op. cit. (7) Urban Land Institute **Joint Development: Making the Real Estate-Transit Connection** , Washington, D.C., 1979

(8) op.cit.

intensive development, this was a powerful incentive to downtown redevelopment.

The city's planners and policymakers were also quick to realize the potential for intensive development around the subway stations away from downtown. Developers were encouraged to attempt such development, first with case-by-case spot variances in allowable floor area ratio and later by a comprehensive policy which allowed high-intensity development, within walking distance of most stations. This policy, enacted in 1959, generally defines this radius as 750 feet but typically excludes areas of stable low-density residential use where so desired by neighborhood property owners. Lesser bonuses are available farther from stations but along some of their feeder bus routes.

(...) Most of the remainder of the city (apart from downtown) is almost entirely built up in structures not over five storeys or so in height. As a result, the transit station areas are virtually unique in their ability to accomodate high levels of construction investment with relatively simple land assembly. The Toronto skyline, with its characteristic high-rise nodes at transit stations towering over an expanse of otherwise almost uniformly low buildings, is eloquent testimony to this policy's successful implementation(9)."

Apart from downtown development, successful applications of density bonuses include the High Park station, where a large complex of 14 to 16-story apartment buildings was built. Lovely (10) notes that central areas were downzoned in the late 1970s in order to establish suburban activity nodes. An evaluation of this policy was not available. Apparently, though, problems of land assembly often

(9) Knight and Trygg, op. cit., pp.44-45

(10) Lovely, Mary E. **Public Transit and Downtown Development** , Urban Land, November 1979, p.16

proved major barriers to successful implementation. The large Sheppard Centre mixed-use project is an example of this (11).

In addition to these zoning policies, both MMT and TTC intervened directly in the land and development market. In principle, land could be taken for the subway "only if needed for the construction or operation of the system. Value capture or control of land use have not been allowable rationales for further acquisition (12)." However, the process of RT right-of-way (ROW) acquisition left developable and assembled land in the hands of both public agencies after construction.

Along the first segment built, TTC owns the land. What tracts it has not leased to private developers are frozen by agreement with MMT, or used by TTC itself. In 1977, the income from this leasing was reported to be an annual \$500,000, compared to an original cost of \$3.9 million in 1949 (13). In one case, neighborhood objection to high intensity development forced local government to forbid a very large mixed-use development although a private developer is leasing TTC's air rights over a maintenance yard (14).

For the other lines ROWs were acquired after the creation of MMT. After approval by the Province, MMT made the acquisitions in its name through the "subway property committee", a body of representatives from MMT and TTC responsible for acquiring land, recommending disposition, receiving bids, reviewing plans and expediting development (15). According to Rivkin (16) "land surplus to the actual design requirements of the subway is included in the takings with the understanding that it may eventually be used for nonsubway

(11) Urban Land Institute, op. cit.

(12) Knight and Trygg, op. cit., p.45

(13) *ibid.*, p.48 (14) *ibid.*, p.48

(15) This committee is comparable to a public TCDC except that it only handles publicly-owned land.

(16) op. cit.

development", but this action must be justified by demonstrating that the acquired property's access or use will otherwise be endangered by the facility. This does not give local governments special powers in station areas (beyond zoning) unless local plot configurations and design or engineering considerations can justify the acquisition (17). However, since average station spacing is just over 1/2 mile, most points along the ROW can be considered "in station areas" (18). According to Knight and Trygg (19):

" A total of some 140 blocks (over 5 million square feet) has been bought, virtually all available for lease to private developers. Metro's policy is first to make such land available for other uses under its control, such as day care centers or senior citizens' housing. The second priority is to offer the land to the local municipality, but always at market value. Finally, land not so consumed is made available to private bidders for development. This approach has led to leasing of about 22 blocks to date, producing just under \$1 million in annual rent. Of the \$70 million spent overall by Metro for land, exclusive of the TTC-owned portion already described, Metro estimates that the capitalized income stream from rents is now \$17.5 million."

c. Concluding Remarks

In addition to a strong downtown development, well served by RT, "intensive high-rise apartment and mixed-use development have occurred at many (but not all) outlying stations (20)." It can be said that transit has shaped development, but

(17) In subsequent case studies, we will call this method of acquiring surplus land using design or engineering rationales "excess condemnation", in keeping with the literature.

(18) Definitions of "station area" vary but the usual radius of 1/4 mile seems reasonable, considering evidence indicating that this is an acceptable distance to walk to the station for transportation.

(19) op. cit., p.46

(20) Knight, Robert L. The Impact of Rapid Transit on Land Use-Evidence of a

only in an incremental way. The amount of development that has occurred in RTS areas since the 1950s is only a small fraction of all new regional development, but RT has served as one of the catalysts in downtown development(21).

But has transit caused development? In all likelihood, development would have occurred without RT, but at different locations and not with the same density. The outcome would have been significantly different at the micro-level. There may have been cases where developers were interested in high-intensity, mixed-use development per se, but this too must be seen as a consequence of a high demand for office, retail, and residential development in a fast-growing Toronto.

The question of value capture, then, must be addressed with caution in terms of the economic entities benefiting from RT's effects on land and development.

- TTC and especially MMT have secured a direct revenue form land leasing. It has been estimated that the cost of acquiring ROWs would be reimbursed by 1990.
- Ridership has probably increased as a result of concentrated development along ROWs and in RTS areas, which means a financial boost to TTC.
- It is not clear to which extent property taxes have increased as a result of RT, on a metropolitan scale. They also would have increased if there had been development on cheaper land but at a lower density. However, whereas these property taxes have accrued to MMT by favoring development in its jurisdiction (22), surrounding governments might have benefited more from metropolitan growth had there been no RT system. It must be stressed, though, that contrary to most U.S. experience, the initial funding for RT was provided locally.

Change in Perspective , 1980, in **Land Use Issues of the 1980s** , Center for Urban Policy Research, Rutgers University, 1983, p.40

(21) *ibid.*, p.41

(22) The entire RT network is in MMT's jurisdiction.

The overall effect of MMT's land use policies in RTS areas may then amount to:

- a reinforcement of Metro Toronto vs. surrounding jurisdictions in terms of development;
- a reinforcement of RT and of public transportation in general vs the automobile in terms of present tripmaking, potential for development and overall accessibility.

II SAN FRANCISCO

1. Background information

a. Metropolitan Setting

Since World War II, San Francisco's initial position as the major business and financial capital of the West Coast has been challenged by the growth of Los Angeles and Southern California. Furthermore, after a strong growth of the Central Business District (CBD) in the 1960s, suburban employment rose faster than suburban population in the 1970s. Most of the growth occurring in the metropolitan area was in the tertiary sector.

San Francisco's topography has important consequences for transportation, because natural barriers constrain travel to a few corridors. Thus high capacity infrastructures are required.

By U.S. standards, density and transit ridership are high. Transit ridership per capita is second only to New York in the U.S. The Bay Area's political and institutional structure is fragmented. There are nine counties and 100 cities in the San Francisco SMSA. The Association of Bay Area Governments (ABAG) was created in 1961, after much of the preliminary planning for BART. In fact, the only strong regional bodies existing during BART planning were transportation-oriented.

b. Transportation Background

San Francisco led the United States into the "freeway revolt" with the decision to halt the construction of several freeways by the Board of Supervisors in 1959. Nevertheless, by the time BART was completed, the existing network of streets, highways and freeways provided for "a high-level and virtually

ubiquitous accessibility (1)". As mentioned above, geographical constraints channeled trips into restricted corridors where large infrastructures were provided. San Francisco itself is transit-oriented, with an extensive network of municipally run cablecars, trolley buses and buses. BART, then, was seen as a means of reducing automobile congestion along the highly traveled regional corridors.

BART was certainly THE transportation issue in the Bay Area after WWII. Only in 1963, after BART had been approved by electors(2), was the Bay Area Transportation Study Commission (BATSC) established to prepare a regional transportation master plan. BATSC was disbanded in 1969, giving birth to the Regional Transportation Planning Committee which in turn was replaced in 1970 by the present institution, the Metropolitan Transportation Council (MTC). MTC is the A-95 review agency for transportation for the nine counties, and is now the planning body responsible for highway and transit.

The decision to build BART resulted from a long process, apparently initiated by the Bay Area Council (BAC), a group of business leaders. "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 (3)." The "conspiracy theory" which attributes vested interests to BAC activities does not seem entirely justified, in that the interests were not all that vested. In fact, it was logical for the business community to favor a RT system, for it envisioned intensive downtown office development and feared that

(1) Webber, op. cit., p.101

(2) BART construction funding was submitted as a bond issue in the three counties concerned in 1962, and approved by slightly more than 61% of the voters.

(3) Skidmore, Owings, and Merrill/System Design Concepts, Inc. **An Assessment of Community Planning for Mass Transit**, for United States Congress, Office of Technology Assessment, Washington, D.C., March 1976, vol.8: San Francisco Case Study, p.14

congestion would endanger its success. That BAC operated outside of public scrutiny and accountability in the preliminary phases of planning says more about the lack of a regional transportation policy than it teaches us anything new about the objectives of private sector initiatives. The objective of BAC may indeed have been to "Manhattanize" San Francisco, and the perception was that a RT system would provide impetus to that process. In any case, the early days of BART planning may explain the strong land use component advanced in objectives and planning.

The BART Commission (BARTC), created in 1951, recommended a two-year comprehensive planning effort which resulted in a plan for a five county 123 mile system at the cost of \$716 million. In 1957, BART District (BARTD) was created to plan, build and operate a RT system. By 1962, San Mateo County and Marin County had withdrawn from BARTD. A three-county system was placed on ballot as a bond issue in November and received the necessary financial support from voters. Construction began in 1964 and was plagued by inflation and delays. In spite of unanticipated federal funding, BART required still more local financing before its completion in 1975. The planned extensions to the three-county system will probably not be built given BART's failure to meet some of its important objectives. These were:

- "to reduce peak-hour highway traffic congestion,
- to reduce time expended on commuter travel,
- to foster central district growth,
- to generate development of subcenters throughout its region,
- to raise land values,
- to accomodate suburbanization of residence and centralization of employment, and
- to reduce land area devoted to transportation facilities (4)."

Land use objectives were an important part of the rationale for building BART. It was anticipated that such a system would favor central growth and subcentering along the selected corridors.

c. The RT System

A map can be found in Appendix B2. There are nine stations in San Francisco itself. The suburban lines more or less follow existing freeway corridors and account for another 25 stations. BART is considered to have improved accessibility only incrementally. The system runs at high speeds, the average distance between stations being approximately 2.5 miles. Station location decisions were made to favor automobile access rather than pedestrian access and to minimize acquisition costs in suburban areas, therefore not taking advantage of established subcenters.(5)

2. Land use policies in RTS areas

a. Sources of information

Again, Knight and Trygg (6) synthesized studies made earlier than 1977 very well. This includes the early reports of the "BART Impact Study" done at Berkeley. Subsequently, the federally funded BART Impact program came under the responsibility of MTC. The bulk of the results was published in 1979. For our purposes, the most important report was prepared by Ronald Jonash (7). Other sources include Libicki (8), Administration and Management Research Assn. (9), and Dingemans (10).

(4) Webber, op. cit., p.100

(5) Webber, op. cit.

(6) op. cit. (7) Jonash, Ronald (Booz, Allen and Hamilton, Inc.) **The Impact of BART on Land Use and Development Policy**, for MTC, USDOT, HUD, Washington, D.C., 1977

(8) op. cit. (9) op. cit. (10) Dingemans, Dennis J. **Rapid Transit and Suburban Residential Land Use**, Traffic Quarterly, April 1978

b. The Policies

BART's impact on land use was far less great than had been projected. High expectations had been generated from the historic examples of impact, and the recent Toronto experience (11). Let us examine the policies carried out in different areas.

In downtown San Francisco, 10% floor area ratio (FAR) bonuses were granted to office space developers locating "near a transit station", and bonuses up to 25% to those providing privately funded improvements to access BART, or other improvements such as widened sidewalks etc...(12) These measures, adopted in 1968, had been preceded by a 1963 downzoning of the downtown area. This is believed to have increased their effectiveness in concentrating development near transit stations (13). The goal of revitalizing Market Street was further linked to BART by the expansion of two preexisting redevelopment projects -Golden Gateway and Yerba Buena- to include BART-related development. This enabled the city to qualify BART expenditure as local redevelopment funding and thus obtain more federal matching funds. Furthermore, tax increment financing was used in the Golden Gateway area to finance the Embarcadero station, not initially included in the 1962 BART plan. There are several opinions as to BART's role in promoting downtown development. Most studies agree that BART and BART-induced land use policies were one of several factors which attracted San Francisco's office boom and concentrated it in RTS areas. But it is not known whether the

(11) It is interesting to note that station location modifications made after 1962 often involved land use policy questions. This shows that local governments were aware of the crucial importance of these decisions at the micro-level. Jonash (op. cit.) qualifies their interventions as coming too late to achieve more than partial success in terms of land use, except in some suburban residential areas where communities voiced their opposition to BART quite effectively.

(12) Location within the predefined "Market Street District" was a prerequisite for obtaining FAR bonuses.

(13) Skidmore, Owings and Merrill, **Transit Station Joint Development**, for National League of Cities/U.S. Conference of Mayors, USDOT/HUD, 1973, p.149

overall effect of BART was to accelerate this development or whether BART attracted development from other locations in the metropolitan area (14).

In downtown Oakland, BART stations were again included in redevelopment projects (City Center and Peralta). However, few regulations were changed since significant incentives had already been provided to attract office and retail development before BART. The ability of the Oakland Redevelopment Agency to carry out land assembly in these areas seems to have been at least as important as the increased accessibility afforded by BART.

In urban residential RTS areas, attempts by local governments to increase development were less successful. Downzoning and the defeat of redevelopment projects resulted, according to Jonash (15), from community opposition to increased development in the Mission Street and Rockridge areas. Downzoning also occurred in downtown Berkeley following the construction of one 14-storey office building at the main entrance of the BART station. In Richmond, growth has been primarily attracted to freeway-related development approved by the city, in spite of a BART-related downtown redevelopment project similar to those presented above which has attracted a 2,000 employee office complex.

Several factors have contributed to a lack of significant coordination between land use policy and BART in suburban areas. In many cases, stations were located in the median of freeways, the surrounding areas thus suffering from the same disadvantages associated with freeways (noise, pollution, esthetic disruption, displacement for ROW acquisition...). Instead of encouraging higher density and pedestrian access in these areas, BART planners promoted large Park-and-Ride lots (16). Dingemans(17) also makes the point that local agencies were inactive,

(14) Knight and Trygg, op. cit., p.77
(15) op. cit.
(16) Webber (op. cit.) points out that the availability of large lots for Park-and-Ride facilities was a more important consideration in early station location decisions than future development considerations. This may account for the fact

expecting growth to arrive as an inevitable consequence of BART. In the cases where plans for higher intensity development did exist, community opposition put an end to the projects. It is not clear whether there was or is a demand for such development anyway. In the Fremont area, where modifications to the General Plan and zoning map were made to accomodate BART-related growth, the development that did occur is not seen as a consequence of BART (18).

c. Concluding Remarks

"There are no categorical answers to the conundrum of BART's role in San Francisco's reconstruction. I incline to the guess that it would have happened anyway, but that BART made it happen bigger and quicker (19)."

The results of BART concerning the overall development impact on the metropolitan area are similar to those concerning Toronto. However, land use policies in San Francisco were not as succesful in concentrating development, especially in suburban areas. In some respects, this was unavoidable given the transportation patterns of the two cities, their differences in overall growth, RT design considerations such as station spacing etc... The processes by which BART was planned and constructed, though, did not provide a network-wide reflection on station areas as it had in Toronto. As a result, contradictions between the goals of different communities were bound to conflict. Furthermore, according to Jonash(20), local governments got involved in the land use implications too late, when most of the crucial decisions concerning station location and system design had been made. When they had finally responded to the consequences of RTS location in their jurisdiction, the communities themselves,

that many suburban stations are not located within walking distance of preexisting subcenters which have continued to attract development.
(17) op. cit., p.303
(18) Jonash, op. cit.
(19) Webber, op. cit., p.108
(20) op. cit.

who had not yet entered the process, had conflicting views. Finally, now that the system is opened, it seems that a true coordination between land use policy and BART was reached only in the downtown areas of San Francisco and Oakland.

Even in those areas, though, it seems that more could have been done. For instance, according to AMRA (21), the 10% bonus granted for development "near a transit station" in the San Francisco Market Street District may have been superfluous, since market conditions were so strong in that area. Also, public officials were late in realizing the importance of early negotiation with developers on a case by case basis. A "Market Street Task Force" was created by the city of San Francisco in 1964, too late to address the significant issues of BART-related development. Finally, the process may have been more successful in reaching the goals of BAC than it was in achieving a compromise between all the impacted groups of population.

In conclusion, although it was hoped that BART would shape the region's growth, it seems that conditions were not favorable for a strong impact, and that many of the shortcomings of the planning process further prevented it from realizing its full potential.

(21) Administration and Management Assn., op. cit., p.151

III. BOSTON

1. Background information

a. Metropolitan Setting

The Boston SMSA is fragmented. The city of Boston itself is small and surrounded by a dense urbanized ring made up by the cities of Brookline, Cambridge, Somerville, Medford, Everett, Chelsea, Revere and Winthrop, some of which are as large and populated as Boston. These cities often have long-established and separate identities, and the strength of these social and political entities tends to work against the development of regionally based constituencies and viewpoints.

The State of Massachusetts created the Metropolitan Area Planning Council (MAPC) in 1963 to serve as the A-95 agency for the region.

Transit modal split for travel to work is second only to New York in the U.S. Although ridership has been decreasing in relative terms since 1954, the number of rides by transit in absolute terms has increased steadily.

Boston has experienced a downtown office building boom since 1960. The expansion of tertiary sector employment has also fostered renewed interest in downtown high-income residential development, but this has not prevented a decentralization of population to the suburbs. Although the suburbanization of employment has not been as pronounced as in other U.S. cities, it has been advanced that the nature of the jobs shifting to the suburbs may account for some of the loss of transit ridership (these jobs are no longer accessible by transit and seem to have attracted a work force of former transit users).

b. **Transportation Background**

The State of Massachusetts engaged in a massive program of urban expressway construction through the Department of Public Works (DPW). In 1968, the results of the Eastern Massachusetts Regional Planning Project (EMRPP) (1) revised and expanded the plans for highway construction. Transit improvements were also recommended by the EMRPP, but only highway construction was securely funded. The EMPIRIC model developed as part of EMRPP probably came closer than any other to relating future land uses on a regional scale to changes in transportation infrastructures and being used for planning. In fact, neither of the conditions were met as a result of a complete change in perspective in transportation planning with the creation of the Boston Transportation Planning Review (BTPR).

During the 1960s, opposition to highway construction accumulated political strength as sensitivity to environmental issues and displacement grew. In 1968, an antihighway umbrella group, the Greater Boston Committee on the Transportation Crisis (GBC), was organized. By 1970, the Governor of Massachusetts announced a general moratorium on highway construction, planning and property acquisition. From 1971 to 1973, the 18 month BTPR study was conducted. It was probably the first "open transportation study" (2). Compared to conventional transportation studies, such a study not only examines a broader range of technical alternatives, but also integrates more participants representing different interests.

(1) The EMRPP was started in 1962 as a joint undertaking of the Massachusetts Bay Transportation Authority (MBTA), the DPW, the Metropolitan Area Planning Council (MAPC) and the Department of Commerce and Development. (Actually, MBTA succeeded to the Metropolitan Transit Authority in 1964).
(2) Gakenheimer, Ralph **Transportation Planning as Response to Controversy: the Boston Case** , the MIT Press, Cambridge, Mass., 1976

The result of the BTPR was that transit improvements were given higher priority than highway construction. Due in part to the weakness of the BTPR's evaluation of transit alternatives, though, a reflection of the BTPR's origin as a response to anti-highway rather than pro-transit sentiment (3), the implementation of transit improvements has not been as spectacular as one could have imagined. In fact, the increased citizen participation in the transportation planning process initiated by BTPR has proved an obstacle to transit extensions when specific, local, project-related decisions are made.

c. The RT System

A map can be found in Appendix B3. The RT system in Boston has developed in a piecemeal fashion over time and now includes four lines (Orange, Red, Green and Blue) which are in essence separate systems in terms of rolling stock. Extensions and modifications of the Orange, Blue and Red lines have been carried out following the 1974 MBTA Transit Development Plan.

2. Land use policies in RTS areas

a. Sources of information

Knight and Trygg (4) provided useful information concerning policies and results until 1977. Other sources include: AMRA (5), Gakenheimer (6), Urban Systems Research and Engineering (7), Public Technology (8), Keefer (9), and Urban Land Institute (10). Although the available literature was enough to describe the policies, a recent assessment of the results was not found.

(3) *ibid.*
(4), (5), (6), (7), (8) 1984, (9), (10) *all op. cit.*

b. The Policies

Through the Malden Redevelopment Authority, a major urban renewal project for the Malden CBD was coordinated with the extension of the Red line. Apparently, the success of this project was enhanced by the presence of the RTS. A zoning ordinance was under study to create an apartment district nearby. Ridership on the extension and demand for development near Malden Center remain low. On the other hand, the city of Malden maintained low-density zoning in the Oak Grove area, apparently responding to community desires.

In Medford, two bills were passed allowing the city to lease and/or develop the airspace over the proposed MBTA station and storage yard and the MDC parkway near the station site in order to better realize the development potential of the site. The city has supported joint development concepts aggressively. No results were available.

The city of Quincy also wished to take full advantage of transit, and passed a zoning ordinance in 1971 modifying boundaries in order to ensure that most of the land around stations would be developable for business. The development in North Quincy has been very strong since 1969. The site seems to have been attractive because of the presence of transit (11), good automobile accessibility and the existence of large lots nearby (12).

In the Wollaston area, the policy was basically to preserve the existing neighborhood character. The Quincy Center station was located on the fringe of the CBD, with a Park-and-Ride lot. This configuration, like some of the suburban BART stations, has not had a noticeable effect on development, except perhaps to

(11) One firm located in the area, following a survey showing that its 2,700 employees were heavily transit dependent.

(12) a factor whose importance the Mayor of Quincy seems to have understood since he intervened to change the initial station location to one where more development potential existed.

reinforce existing small-scale commercial uses in the station's immediate area.

For other extensions, no specific information was available in the literature on the policies carried out or to be carried out. It seems that in general local governments adopted the position of making slight to no zoning changes.

A most interesting case is that of the Southwest Corridor where the Orange line relocation is to take place. There, land had already been acquired for the I-95 ROW, but was left without a clear assignment after the cancellation of that project following the BTPR. The area is deteriorated. Preliminary plans suggested that public investment, in the form of public housing, schools, utilities, were to provide the impetus for private interests to invest in this area.

In the commercial core of downtown Boston, two major joint development projects were carried out. The first, involving only MBTA and existing retailers, consisted in station renovation (Washington Street) coordinated with the revamping of retail facilities (13). Agreements were reached to balance public and private investment in pedestrian amenities connecting the stores with one of the most active stations in the network. In a second project adjacent to and simultaneous with the first, the Boston Redevelopment Authority (BRA) also participated in the redevelopment of Lafayette Place. This was MBTA's first involvement in such a project, which mandated the expansion of in-house real estate competence (14).

(13) This is more than just a system interface project because of the renovation of the retail facilities included in the project.
 (14) Further involvement of MBTA in the real estate market has occurred as a result of advance acquisition of existing railroad ROWs for future transit expansion. The future of this land was unclear as of December 1982, as documented in Rice Center **A Guide to Innovative Financing Mechanisms for Mass Transportation** , for Office of Planning Assistance, UMTA, Washington, D.C., 1982, p.H-1

"Modernization of the Washington Street Station reveals the role of an innovative transit entity in exploiting its real estate assets more effectively in order to better serve its riders, to improve the physical environment of one of its major downtown stations, and to realize a new source of revenue from retail concessions. The project helped trigger a broad-scale review of MBTA's real estate policies and practices, a review ranging from the specifics of retail concession space, to joint development, to how to manage a growing portfolio of real estate holdings. From the private sector's perspective, station modernization was a concrete example of MBTA's commitment to downtown improvement (15)."

The modernization of Kendall Station in Cambridge will be directly served by and integrated in the "Cambridge Center / Kendall Station Joint Development Project", the 24-acre keystone of the Kendall Square Urban Renewal Area. This major mixed-use, high-intensity project received \$8 million joint development funding from UMTA, and is hoped to consist of 2.4 million square feet of development, to generate between 5,800 and 12,700 transit trips daily. Keeler (16) therefore estimates that UMTA investment will generate 507 annual trips per \$1,000 granted.

The evaluation of UMTA's participation in the "South Station Transportation/Air Rights Development Project" is even more favorable. The station will become a consolidated Amtrak/regional-rail/commuterbus/intercity-bus/transit complex. Air rights will be used to develop a 400,000 square foot office tower, a 600 room hotel and 250,000 square feet for hi-tech facilities. UMTA's \$3 million investment should generate 576 annual transit trips per \$1,000

(15) Urban Land Institute, op. cit., p.147

(16) see Ch. II., I.2.b., table 2

(17).

c. **Concluding Remarks**

The case of Boston spans over many years, and includes extensions, renovations and relocations on a RT network with a good pre-established ridership. Here again, it appears that policy initiatives were crucial in determining the impact of RTS on surrounding areas. This can be evidenced by the contrast between the North Quincy case and most of the extensions. The metropolitan area's fragmented institutional structure combined with the importance of local governments' roles provides us with an image of piecemeal decisions, often made in reaction to community fears of traffic problems and large parking lots associated with terminal stations.

Land use in RTS areas was not a major focus of the BTPR:

"Notice that there is little concern for the large-scale land development objectives traditional to the transportation planning field. Arguments of this sort did sometimes appear among affiliates and friends of the GBC, particularly in statements by the Environmental Coalition and in the public statements of Michael Dukakis, but they had limited trajectory. It would appear that large-scale land development is virtually dead in the participatory arena of transportation planning. It simply does not correspond to anyone's personal interest in transportation. It is difficult to conclude, even in the most general manner, what objectives are really accomplished by particular large-scale land development options. This aspect became involved in transport planning during an era when the relative absence of controversy permitted the discussion of loose, conceptual objectives.

(17) *ibid.*

Intensive participation seeks, and relies upon, more tangible issues (18)."

In recent years, the renovation of downtown stations and the relocation of the Orange line have been key factors in redeveloping station areas at a large scale. Rather than speaking of the "impact of RT on development", in the case of Boston's "T", a pre-established system, it seems more realistic to take the downtown redevelopment projects as a given goal of Boston and Cambridge, a goal complemented by a strong transit improvement program. Then, one can view the link between these projects and transit accessibility as a "sine qua non" condition for redevelopment, because of high existing transit ridership and heavy congestion. Furthermore, through joint development grants, the link of redevelopment with transit improvements is a source of additional federal funding, a factor which many U.S. cities including Boston and Cambridge are not likely to overlook.

(18) Gakenheimer, op. cit., pp.94-95

IV. WASHINGTON, D.C.

1. Background information

a. Metropolitan Setting

The Washington area has a unique institutional structure. Much of the local decisionmaking concerning the District of Columbia (DC) is made at the federal level, and the suburban jurisdictions are included in two states, Maryland and Virginia.

DC's area only accounts for 61 of the SMSA's 2,300 square miles. In 1970, the SMSA population density was 1,216 persons per square mile, and DC's was 12,231.

During the 1960s, Washington was the fastest growing SMSA in the U.S. The rate of growth was 38% from 1960 to 1970, and subsided in the 1970s although the area is still growing on the whole.

An unusually high proportion of jobs is in DC, although the recent trend has been a decline of central city employment in favor of the suburbs. The suburbs have also matched DC's declining population by strong population growth.

Nevertheless, the region's growth has encouraged substantial public and private office development in DC (and some suburban subcenters, more recently) since the 1950s.

A zoning feature unique in the U.S. is DC's absolute building height limit which has spread CBD development on a larger area than in most U.S. cities. Maximum allowable FARs are approximately 10:1.

The National Capital Planning Commission (NCPC) and the National Capital Regional Planning Council (NCRPC), created and controlled by Congress, issued a

long-range regional policy in 1961. Attempts at regional policy coordination have been hindered by the area's complex institutional structure.

DC was granted home rule in 1973, acquiring planning and implementation responsibilities for its jurisdiction except for the large amounts of federal land, still managed by NCPC. NCRPC was replaced in 1966 by the Washington Council of Governments (COG), which merged with the existing Transportation Planning Board (TPB) and became the A-95 agency for the region. COG issued a Metropolitan Policy Guide in 1980.

b. Transportation Background

The following quotation gives a good overview of Washington's transportation background:

"(...) Washington and its suburbs were served in the first half of the century by an extensive streetcar network dismantled and replaced by buses in the 1950s and 1960s.

Congress authorized the Mass Transportation Survey in 1957 to consider the region's future mass transportation needs. Conducted by the NCPC and the NCRPC, the resulting transportation plan called for a 33-mile rail transit system and hundreds of miles of new freeways.

The National Capital Transportation Agency (NCTA) was a temporary federal agency established in 1960 to plan the transportation system, secure rights-of-ways, and begin negotiations for an interstate transit compact. During its seven-year existence, NCTA made many of the decisions that would determine the characteristics of the regional transportation system. The proposed rapid rail transit system was expanded from 33 to 83 miles during the NCTA planning era(1)."

The initial goals of RT were to reduce congestion by reducing automobile traffic to the CBD, to serve non-drivers and to preserve central DC as a monument area. Skidmore, Owings and Merrill (2) judges that the system was built primarily to avoid DC's being engulfed in freeways, given the strong growth rates.

The interstate transit compact, Washington Metropolitan Area Transit Authority (WMATA) was ratified by all area governments in 1966. In 1968, following a round of public hearings, WMATA adopted a 98-mile Regional "Metro" System extending into the suburbs. This system was supported by 71.4% of the voters in the five suburban jurisdictions that held referenda. At the time, planners were predicting that the system would run at a profit.

The construction began in 1969. Construction costs were driven beyond predictions by inflation, delays and inadequate forecasts. The delays were due to institutional inefficiencies but also to growing dissatisfaction with Metro. Skidmore, Owings and Merrill (3) identifies three causes for this dissatisfaction. First, neighborhoods where RTSs were located were not aware of the possibly negative impacts of a RTS until construction reached their area. Secondly, it was felt that WMATA had not informed residents about these impacts, leaving them few ways to express their dismay other than opposition. Thirdly, lower-income groups felt that they were paying for a system they would not use. Thus the situation was similar to BART's.

Funding to continue construction has been found though, and construction continues to this day although estimates of total construction costs have tripled since 1969.

- (1) Metropolitan Washington Council of Governments (COG)/NCRTPB **Metrorail Area Planning**, Metrorail Before-and After Study, Washington, D.C., August 1983, p.5
(2) 1976, op. cit., vol.10: Washington, D.C. case study
(3) ibid.

c. The RT System

A map and a table presenting the phases of construction can be found in Appendix B4. As of 1983, 43 stations were in operation. The finished system will have a total of 101 miles and 81 stations. Ridership greatly exceeded the forecasts during the initial phase and has closely matched forecasts for subsequent phases, according to the results of COG's "Washington Metrorail Before and After Study"(op. cit.)

2. Land use policies in RTS areas

a. Sources of information

Knight and Trygg (4), and Meyer and Gomez-Ibanez (5) provided some information for preliminary impacts. Some case studies were examined in Skidmore, Owings, and Merrill (6), AMRA (7), Urban Land Institute (8).

General policies were discussed by public officials and private developers in Public Technology (9). The most important sources were reports by COG on the "Metrorail Before and After" Study (10), especially the "Metrorail Area Planning" study (11). These state-of-the-art studies deserve some attention in this subsection.

The "Metrorail Before-and-After" study has been supported since 1976 by UMTA to gather and analyze data relevant to Metro policy evaluation. Metro's effects on the Washington region, both direct such as travel changes, and indirect such as land development, are monitored. Today, preliminary before/after reports are

(4), (5), (6) 1973, (7), (8), (9) 1978, all op. cit.

(10) Dunphy, Robert T., and Griffiths, Robert E. **The First Four Years of Metrorail: Travel Changes**, 1981, and Dunphy, Robert T. **Trends Before Metrorail**, 1982 for Office of Planning Assistance, UMTA, Washington, D.C.; and Donnelly, Paget, op. cit. (11) op. cit.

available on travel, but not on land use questions. However, one report does give indications of trends before Metro, relevant all the same since station locations have in most cases been fixed for several years. Even when these stations are not opened yet, land use changes can be significant.

b. The Policies

RTS area development was not a primary objective of early Metro planning. The legislation from 1966 enabling WMATA to acquire land limited acquisition to purposes "necessary or useful for the transit system". WMATA in fact justified excess condemnation for planning, architectural design and construction reasons. In areas where there are small lots and multiple owners, this practice enables WMATA to assemble land and develop or lease for non-transit uses the excess property and the air-rights (12).

In the early phases of Metro operation, joint development and WMATA land leasing occurred with success at some sites, but maybe not to its full potential considering the strong market in many station locations. Extensive station area studies were carried out by local jurisdictions, and one of the ten overall regional strategies was to "encourage joint development of transit, housing and employment (13)". By 1981, WMATA was sufficiently convinced of the usefulness of increasing its joint development activities to create an ambitious "Station Area Development Program" within a newly organized Office of Planning and Development. An 8 member permanent staff was devoted to the matter, with experience in real

(12) This is what happened at Farragut North station, for instance. AMRA (op.cit.) judged that this process had finally not permitted the full value-capture potential of the site to be realized: because WMATA had to justify the acquisition of the property, the precise station location was determined through an engineering rationale but did not fit very well in the final design agreed upon with the developer. In this case, street level retail frontage was diminished. It is interesting that the owners of one of the condemned parcels challenged WMATA's right to acquire the land and lost in court, as documented by Urban Land Institute (op. cit.).

(13) Metropolitan Washington Council of Governments, **Metropolitan Policy Guide Summary Report**, Washington, D.C., December 1980, p.39

estate, planning, urban design, finance and selected fields.

This program has developed a clear policy statement:

"The specific goals and objectives of the Authority's development program, which provide benefits not only to WMATA but also to local governments and the Washington region, are:

Goals

- Enhancement of levels of mass transit use;
- Conservation of petroleum-derived energy;
- Allocation of scarce resources in more optimal fashion;
- Reduction of urban sprawl; and
- Encouragement of good quality development.

Objectives

- Reduction of petroleum product use in the transportation sector;
- Substitution of greater numbers of auto trips with rail/bus trips;
- Reduction of travel time;
- Addition of real property to the tax rolls;
- Increase in tax base;
- Improvement of cost/benefit ratios of public goods and services provided by local government; and
- Provision of revenue to WMATA for subsidy offset.

In order to realize the potential benefits which exist, as expressed in these goals and objectives, the development program was instituted in the WMATA Office of Planning and Development. This organizational structure recognizes the close inherent

relationship which exists between Metro system planning and development functions. It also provides an improved development mechanism to local area governments, the development community, and to the public.

Policies

1. It shall be the general policy of WMATA to promote, encourage, and assist in the creation of high-quality, more intensive development at or near appropriate stations areas.
2. It shall be the policy of WMATA to study the development potential which may exist at present or future station areas and to prepare a development program, and in a longer range time frame, with a three to five year work program, which will identify actions and positions by the Authority to enhance or protect the longer range development potential.
3. It shall be the policy of the Authority to advocate positions before the public, local government entities, the development community, and others which promote high-quality, more intensive development at or near station areas (14)."

Furthermore, a very thorough reflection has been undertaken at WMATA on the process and procedures of joint development. A flow-chart of the WMATA joint development process can be found in Appendix B4. In addition, WMATA has pre-established criteria for assessing development potential and selecting developers, as documented in Public Technology (15).

(14) COG , 1983, op. cit., pp.17-18

(15) op. cit., 1984

To date 7 joint development projects are underway or completed, and 11 more are being studied (16). The large number of stations and the sheer amount of planning that has been done in the areas surrounding them forbids a detailed discussion. Essentially, station area studies were carried out by local agencies before WMATA adopted a systematic approach to RTS area concerns. Generally, the literature conveys a sense of high awareness of the specificities of RTS areas. Many studies had to be adapted again and again as delays and changing prospects plagued Metro construction. In virtually all of the cases documented in the literature, zoning changes were implemented or are being implemented before station completion.

In many cases, RTSs have been included in major development schemes, in downtown DC and in suburban subcenters. Usually this has not required direct WMATA involvement except for the crucial station location decisions, which seem to have been responsive to the needs of these areas. Discounting system interface projects, two major WMATA land leases in DC and the inclusion of one RTS in a large renewal scheme(17), the major changes in policy due to Metro have occurred in Arlington County, Va. (Ballston-Rosslyn and National Airport-Rosslyn corridors), and Montgomery County, Md. (Silver Spring). In the first case, the goal is to concentrate new development along the RT corridors. As this is one of the fastest growing areas in the metropolitan region for housing and employment, it is hoped that density bonuses and public facility location will be sufficient to achieve this goal, thus preserving existing low-density residential areas outside of the corridor. Another technique used in Rosslyn is the transfer of development rights. In the Rosslyn and Crystal City areas, development occurred

(16) Existing projects at the following stations: Bethesda, Van Ness-UDC, McPherson Square, Farragut North, Rosslyn, Friendship Heights, Gallery Place. Projects under study for the following stations: New Carrollton, Huntington, Rhode Island Avenue, Glenmont, Grosvenor, Dunn Loring, West Falls Church, Rockville, Court House, Addison Road, Silver Spring.

(17) These cases are very similar to what has been done in San Francisco's and Boston's downtown areas.

before Metrorail and has continued since. In the second case (Silver Spring), similar policies were implemented but the development has not been occurring, perhaps because the distance to downtown DC is greater. At Friendship Heights (Montgomery County), though, pre-Metrorail development was very strong, and the location of a station there has resulted in a downzoning of the area, following community opposition to increased traffic problems and development. WMATA has exchanged a lot suitable for office development for reserved easements for its station entrance.(18)

Policies in other RTS areas have varied according to local circumstances and priorities, a situation promoted by the "station study" approach. One can safely say that of the 5 cases studied, Washington is characterized by the most diversified set of station areas and the planning process most consistently responsive to the arrival of RTSs on an area-to-area basis. The issues raised in the other cases have almost all been important in one or more stations in Washington.

c. Concluding Remarks

It is impossible, at this point, to evaluate the impact of land use policies in Washington's RTS areas. First, many stations remain to be completed. Secondly, only 7 years have gone by since the first line was opened. But one can already point to several joint development projects, and it is reasonable to expect more in the years to come. The consistency with which planners have addressed the issues concerning RTS areas is all the more remarkable given the institutional fragmentation of the region.

(18) WMATA has sold one parcel for mixed-use development in Rosslyn.

V. BALTIMORE

1. Background information

a. Metropolitan Setting

The Baltimore SMSA is composed of the central city and five surrounding counties. The Regional Planning Council (RPC) is the Metropolitan Planning Organization for this area.

Starting in the 1960s, the central city has been losing population and employment to the suburbs. In spite of an aggressive policy of neighborhood revitalization and promotion of downtown "renaissance", this trend continues. In 1978, average residential density in the City was 35 persons per residential acre versus 99 for the rest of the SMSA.

One of the most remarkable features of Baltimore is the long-standing power and influence of neighborhood organizations in local decisionmaking. Their intervention in the planning process is both direct, by repeated contacts with City Hall, and indirect, in the form of pressure and opposition. Local government needs the support of these organizations.

Baltimore can be described as a declining manufacturing city. At this point, the eroding tax base of the city remains a serious problem. It seems however that the city might be on the road to recovery with an expanding tertiary sector, thanks in part to the local government's commitment and relative success in attracting private investment. Starting with the Charles Center project in 1957, Baltimore has a long experience in creating public/private partnerships, and in using urban renewal as a legal and administrative tool. However, Baltimore's city budget is still the city budget in the U.S. that relies most on state and

Although it may have come a bit late, a remarkably clear policy formulation and a model before/after study will enable us to evaluate Washington's RTS area policies sometime in the future. When this is possible, RTS area development and land use changes will have to be evaluated not only with respect to the stated objectives, but also in terms of their redistributive effects. This very important aspect does not seem to have been a focus of WMATA policy. Its absence from the RTS area planning process challenges the contention that one of the objectives of RT systems is to serve the transportation disadvantaged.

federal aid in relative terms (62.5% in 1981). This is a worrying fact in light of possible reductions in available federal funds.

b. Transportation Background

The city of Baltimore does not contribute financially to transit. The Mass Transit Administration (MTA), which operates the buses and subway is in fact part of the Maryland Department of Transportation, which is funded by the state and the federal governments.

Although this was not the first time a subway system was proposed for the region, the first step in the present system was taken in the mid-1960s. The Baltimore Metropolitan Area Transportation Study then suggested a 65-mile six-legged system. Both the cost of the project and repeated questioning of its usefulness have substantially reduced the probability of a 65-mile system ever being completed.

In 1968, it was decided that the first phase alignment would be the Owings Mills-Marley Station line, and that construction would start with Baltimore's Northwest corridor. In 1972, Section A from Charles Center, a major downtown urban renewal project completed in the 1960s, to Reisterstown Road Plaza, was approved for funding. Construction started in 1974 and the 8-mile segment was opened in late 1983.

The reasons for starting with the Northwest corridor were numerous. First, it is the most transit dependent corridor in the region. Secondly, no highway alternative was found to be more economically feasible. The no-highway position was supported by the strong neighborhood organizations who opposed the destruction of residential areas (1). Thirdly, it seems that land acquisition

(1) In another area, interstate expressway construction was halted in the mid-1970s, leaving the region with \$800 million in federal funds that it was allowed to use for other transportation purposes.

was aided in that corridor by the presence of the Baltimore and Ohio Railroad ROW, thus minimizing disruption and land costs. Fourthly, the link between the two stations with the largest projected ridership volumes, Charles Center and Lexington Market, was completed by this line.

Finally, although this does not appear explicitly in any documents, it can be hypothesized that the city's long-standing desire to undertake a major redevelopment effort in the Lexington Market area was a factor in deciding to build the first line. By the time this decision was made, RT joint development was already a reality in the U.S., and the necessity of advanced planning for successful implementation had been recognized.

Two early reports prepared by Daniel, Mann, Johnson and Mendenhall in 1968 show the consideration given to land use and community effects even in the preliminary phase of station location decisionmaking (2). In these studies, possible impact of a RTS are assessed for all possible RTS locations, using a typology of areas. The factors taken into account range from development potential to relocation and sensory impact, and are combined to form 7 types of areas. The assessed impacts are then used in a selection procedure involving the quantitative ranking of all alternatives by a compound score. The extent to which these studies influenced final decisions is not known, but their conclusions were not followed to the letter (3). In any case, this attention given to RTS area considerations has been a prominent feature of Baltimore's subway in subsequent planning, as we will see in 2.b.

(2) DMJM/Kaiser Engineering **Rationale for Route Selection**, and **Economics Report: Route Selection and Community Impact of the Proposed Baltimore Rapid Transit System**, for RPC, 1968. To my knowledge, such detailed preliminary analyses were not carried out for other case study cities. The methodology can be criticized for its inability to properly take non-quantifiable factors into account.

(3) This is evidenced by the fact that one of them called for a new North West line to Randallstown rather than to Reisterstown Road Plaza, precisely on the basis that development potential was better in Randallstown.

c. The RT System

The first segment, 8 miles long and joining 9 stations, has been in operation since November, 1983. At this point, funding has not been secured for the next segment on the list of priorities, the North East line.

The first ridership counts show only 20,000 instead of the projected 25,000 for the first segment and 80,000 with a complete RT system. MTA is confident that the rerouting of buses and subsequent developments will improve this result.

2. Land use policies in RTS areas

a. Sources of information

An extensive before/after study is being carried out by different agencies in the region under supervision by RPC, but its results are not yet significant for our purposes.

As mentioned above, RTS area planning has been a major concern throughout subway planning. The City of Baltimore has been actively engaged in comprehensive RTS area planning since 1967, the first report of their work being a review of possible impacts and possible actions of local government (4). The first statement of goals, objectives and policies also came in 1971, in direct reference to the proposed corridor alignments(5). In 1972, a consultant analyzed the possibilities with an outsider's point of view(6).

(4) Baltimore City Department of Planning, op. cit. (5) Baltimore City Department of Planning **Transit Planning and Impact Study**, Baltimore, 1971
(6) Morton, Hoffman and Co. **Transit Impact Analysis of Three Proposed Rapid Transit Areas: Northwest Baltimore**, 1972

Real planning started when the State of Maryland and UMTA provided funds to the City in 1974 to carry out the so-called Transit Station Area Development and Access Study (TSADAS), which finally gave birth, in 1978, to the final reports of the Environmental Impact Assessment (7) and the formal presentation of joint development projects to UMTA (8).

Other sources include AMRA (9), Public Technology (10), Urban Land Institute (11), and Keefer(12).

b. The Policies

The early endeavors of the city in 1971 show that the planners had a good knowledge of the examples that were available. Some of the conclusions might have been different had they been able to know that BART and Metro were not to quite fulfill the expectations placed upon them.

The attitude of local government in 1971 is well captured by the following quotation:

"Whether transit will induce, as projected by the RPC staff, a real boom in addition to concentrating some of the naturally occurring growth in the first phase transit corridors, or whether it will have little effect, is still a matter of conjecture. The really important issue focuses on the possibilities and means of public intervention to control and guide the development process and thus assure public values and community benefits(13)."

(7) Baltimore City Department of Planning **Draft Environmental Impact Statements**, and **Environmental Impact Assessments**, Baltimore, 1978 (8) Baltimore City Department of Planning **Application of the City of Baltimore for a Mass Transportation Capital Improvement Grant...**, Baltimore, 10/16/1978
(9), (10) 1984, (11), (12), all op. cit.
(13) Balto. Dept... **The Impact of RT on the Metro Center**, op. cit., 1971, p.16

This was formalized in a statement of goals for RTS area development inspired from Baltimore's Comprehensive Policy Plan:

- "Enhance the City's economic and tax base with the aid of transit related investment;
- Provide for land uses which have the highest transit patronage potential;
- Provide for a high intensity of social and economic interaction in those station areas which show potential for becoming strong and coherent urban subcenters;
- Establish urban design concepts for each station area so as to enhance their imaginability;
- Define channels of communication for a meaningful citizens participation in transit related development planning;
- Create organizational arrangements to facilitate cooperative redevelopment ventures, devise a system of incentives for residents in the station areas, as well as for private or semi-public (profit and non-profit making) developers to invest in large scale development schemes(14)."

The formulation of policy, in this report, centered on the concept of value capture:

"The tremendous investment in the transit system, a kind of 'social overhead capital', will necessitate that at least part of the investment be recouped in the form of higher tax returns based on an increased rate in property assessments. Since the benefits accrue mostly to those residing, serving, selling or producing in the station areas, it seems logical that they be subjected to special guidelines,

(14) Balto. Dept... **Transit Planning and Impact Study** , op. cit., p.12

station location was already determined, the area had been designated for urban renewal, and land had been bought by the city beforehand (16).

In 1978, the City of Baltimore applied for -and received- an UMTA Section 3 grant as part of its "Value Capture/ Joint Development Program". Three joint development projects were identified (Lexington Market, North Avenue and Reisterstown Plaza) and the formation of a TCDC was proposed.

At this point in time, the RT line has been opened for approximately seven months. It is therefore too early to say whether all the projects presented below will be successful.

It was not difficult for the city to have owners of buildings adjacent to the Charles Center station provide direct access to the station. This area was redeveloped before the arrival of RT. MTA owned one lot for construction reasons. The lot will in all likelihood be developed for office space with first floor retail. One office building on the same block will undergo renovation, including new first floor retail. Finally, the city intervened to coordinate these actors spatially and in time, also creating the concept of a pedestrian mall linking these buildings.

The big downtown project is the Lexington Market "Market Center" or "Baltimore Gardens" project. It is hoped that this project will help to revitalize the decaying historic retail core of the city. The joint development project was included in the 30-block Retail District Urban Renewal Area and is administered, planned and managed by the Market Center Development Corporation, a non-profit

(16) Further study of this issue would be very interesting, especially since the process has now been initiated for the second line. After having attended some meetings of the "Northeast Corridor Station Location and Alignment Task Force", this researcher's feels that participants barely have the time to get familiar with the complex issues and trade-offs involved. Thus, they are able to achieve significant input only by voicing one-sided opinions. It is then up to the planners to decide upon the necessary compromise. There is a strong incentive to justify pre-established plans by such a process.

incentives to improve performance, and finally to the appropriate form of taxation(15)."

This led to the concept of "High Intensity Development Districts" centered on RTSs to achieve this goal. A review of station locations and alignments proposed by MTA, specifically in terms of development potential, also led the City to suggest changes in the proposed configuration of the Northwest line, some of which were subsequently enacted.

In the first phase of TSADAS, impact zones were defined for each RTS. Then, market analyses were conducted in each area. The general policy adopted is to define Transit Station Urban Renewal areas in RTS areas where the city feels intervention is necessary for project planning and development, land acquisition and management, relocation, public improvements, developer selection and site disposition.

The city and MTA's cooperation is defined by an agreement concerning the disposition of land acquired by MTA in excess of that needed for the station itself. Here, the rationale used for justifying excess condemnation was the economies in construction costs to MTA as a result of having additional space in RTS areas during construction.

With respect to citizen participation, Baltimore's strong neighborhood structure made some form of citizen input necessary. Meetings were held by MTA and the City during the whole process where representatives from the concerned local organizations were invited to comment upon proposed plans. It seems that previous decisions were not substantially modified by this input, except for incremental changes in some RTS area plans. In the Coldspring area, opposition to existing plans resulted in the creation of a "charrette" process in 1978, but

(15) *ibid.*, p.37

organization. The originality of this project in Baltimore is that it will be centered on historic preservation -it is not a clearance project like the Charles Center or Inner Harbor initiatives, or at least to a far lesser extent. A developer was found in 1979, agreements were signed in 1980 for provision of office space, retail, parking and pedestrian facilities. UMTA's \$12.5 million investment in this project was estimated by Keefer (16) to generate 219 annual transit trips per \$1,000.

The other two joint development projects are not as large in scale or in ambition. At North Avenue, a small-scale residential-commercial project is hoped to provide impetus to the revitalization of this declining area. The entire site is included in the North Avenue Transit Station Urban Renewal Area, and MTA owns land it acquired for construction. At Reisterstown Plaza, the present terminal point, the RTS is to be linked to a shopping mall and a major employment center is to be created. Large amounts of vacant land are available in this area, which was a major factor in the decision to locate the RTS there. There is room for both large Park-and-Ride facilities and a major office-retail complex. As of yet negotiations are underway and prospects of finding developers were estimated to be good.

The city had little influence in the development of a large state government complex at the appropriately named State Government station. It is expected that the expansion of state government activities in the next years will cover most of the impact zone.

In other station areas, public intervention was minimal. One was located in a stable residential neighborhood, one links a shopping center, a residential area and a park. Finally, the two last stations are surrounded by low-density housing, warehousing and light industrial uses and some vacant land. Small

(16) see Ch. II., I.2.b., table 2

parking and bus access facilities have been provided in the last three areas.

c. Concluding Remarks

Much was done in Baltimore to coordinate RT planning and RTS area considerations. An evaluation of the policies will not be possible before many years because the line is so recent. Furthermore, the prospects for a complete RT network are not good in the foreseeable future, and ridership is much lower than projected on the first segment. What we can say today is that regardless of transportation considerations, RT has provided the city with the opportunity to carry out some major renewal projects, especially at Lexington Market, with financial support through UMTA grants. This was achieved through the early definition of goals and continued interest in RTS areas from the city government, a situation no doubt favored by the stability of local political power and the success of previous public/private ventures.

CHAPTER III:
ANALYSIS AND IMPLICATIONS OF THE CASE STUDIES

I. Factors affecting land use in RTS areas

The analysis of the case studies presented above leads us to a better understanding of the factors affecting land use in RTS areas. The first approach examined in Chapter I analyzed the effect of transportation improvements on land value through pure increases in accessibility. This approach is fundamental in the sense that it teaches us how to apply an economic reasoning to the processes underlying changes in land use due to increased accessibility. However, it was established that this approach could not address the immediate policy questions because of the interaction of a great number of variables, which made the introduction of "real world complications" in present econometric models virtually infeasible.

In fact, land use in RTS areas is dependent on a complex interaction of factors, all of which are not quantifiable in their magnitude or in their effects. It was established in Chapter I that increased accessibility is one of these factors, and that its influence depends on:

- a. the extent to which it represents an increase in overall accessibility, i.e. for all practical purposes the extent to which the travel patterns change as a result of RT.
- b. the characteristics of the new RT network: level of service, distance between stations, station location, pricing, ridership (both in quantitative terms and in terms of its composition), etc... These characteristics determine the qualitative aspects of a. .

Other factors acting directly to change land values in RTS areas were also identified in Chapter I:

- patterns of land ownership
- previous land use
- "market conditions"
- timing of the RT improvement in relation to the previous factors
- zoning and land use policy (1)

The model developed by Knight and Trygg (2) is presented in its diagrammatic form in Appendix C. Their approach is to focus on the decision to develop as a generator of impact. This should not obscure some possible impacts which may occur without the intervention of developers. The transformation of existing uses has not been very well studied in most cases. In a strictly residential area, this might mean the subdivision of single-family homes, on a long-term basis. In a small-scale commercial area, this might mean the adaptation of small retail to the demand created by the flow of transit riders, and maybe some minor expansions. These possible long-term impacts are at most dependent on zoning and are probably dealt with consistently locally. For example, this could be happening today, as a second wave of impact, in the suburban residential areas near BART stations. The extent to which this is happening is not known, but ongoing before/after studies could give us insights into these phenomena.

It should be pointed out that factors acting both at the metropolitan level and the local level are important in their degree of influence. Also, some factors are clearly subjected to policy decisions while others are beyond their control. Furthermore, factors act within very different time

(1) see p.13

(2) op. cit., p.204. For a detailed discussion of the factors, see chapter VII of this work.

ranges, and their degree of influence is linked with the other factors. This discussion remains somewhat vague, but it is felt that a more detailed discussion would be redundant with the existing literature.

II. Policies implemented in RTS areas

Thorough discussions of techniques and their effect in different types of area can be found in several of the references cited above. Initially, the methodology of this paper was to establish two typologies, based on the five case studies:

- a. a typology of the policies implemented in RTS areas.
- b. a typology of the technical rationales underlying these policies

Later, this approach turned out to be inappropriate for analysis given the complexities involved. In fact, it was found that both the policies and their underlying rationales were essentially similar from case to case, but that the variations which did exist could be better interpreted in terms of the evolution undergone by the planning process than as elements in a typology. For example, density bonuses in RTS areas were used in many cases following a "value-capture/growth-shaper" rationale, but the expectations associated with that tool, and the type of area it was used in, evolved as the analysis of factors affecting land use in RTS areas and the process of decisionmaking for this issue became more sophisticated. The evolution undergone came as a response to the accumulation of experience, evolving urban situations, and the incorporation of new planning paradigms in the planning process, all of which enabled intervening actors to delineate the issues more clearly.

We have seen that the objectives related to RTS areas, when they are clearly stated, are rather consistent in their wish to create higher density and mixed use. But in many cases, stated or implicit policy objectives are in conflict with local objectives, and although this has often led to a reversal of policies (i.e. downzoning instead of intensification, for example), the tools themselves were not different (using the same example, zoning), and their use was predicated on similar rationales (using the same example, regulate density and types of land use to secure given goals).

In practical terms, the most operational approach, and one adopted by many planning agencies who have worked on the subject, is to establish a more or less formal typology of urban areas according to the likely impact of a RTS on them. It was not within the range of this paper to relate these typologies. However, one interesting approach for our purposes is to systematically relate techniques used to stated objectives and previous station area characteristics. Again, this leads beyond the scope of this paper, but the results of AMRA's exploration of this approach are presented in Appendix C, and were very useful as a framework for this research.

III. Implications for policy

In all likelihood, RT capital investments will not be as large in the foreseeable future as in the last 20 years in North America, especially in the United States. Partly because RT has failed to meet some of the objectives assigned to it in the planning stages, and also because the cities where RT was most justified have been or are being equipped with systems, other modes of transportation have become a more important focus of attention. The trend has been toward less capital intensive projects for

the last 10 years now. In this respect, what we have learned about land use in RTS areas may not be directly useful in North America except for the completion or the extension of existing systems. It could be very useful in a comparative perspective and/or in analyzing other transportation systems, though (1).

This section will attempt to draw the conclusions of our inquiry and answer the questions presented in the introduction of this paper. Assuming that there are certainly benefits as well as problems associated with land use in RT station (RTS) areas, how have policymakers proceeded to identify them, and the groups of population they apply to? How have they responded to the necessity of managing the distribution of these effects? How have the policies evolved as their knowledge of past cases became more refined? Finally, what is the future of such policies and what does this mean to the future of transportation policy in North American cities?

The first conclusion is that impacts are generally not as strong as expected in RTS areas. Some authors attribute this to failures of coordination between transportation and land use policies. They also stress the organizational aspects of joint development and value capture which are complicated by the need for negotiations between the public and private sectors. It seems that such approaches have been somewhat successful in helping public agencies find developers for large-scale projects in RTS areas and in establishing acceptable formulas for sharing the benefits and the costs between the public and private sectors. However, this organizational effectiveness can not attract more development than there is demand for at the regional level. Furthermore, according to Knight (2), observed development in RTS areas has represented only a small fraction of

(1) see the special issue of the Journal of the American Planning Association, Spring, 1984

metropolitan development, even in the most extreme cases like Toronto.

Although the advantages of RTS areas have been determined not to influence office location on an inter-metropolitan level, there are three ways in which the presence of RT can affect regional economic development nevertheless. First, however incremental this may be, RT provides local governments with an opportunity to prove its ability to carry out successful public/private redevelopment ventures. Secondly, by relieving downtown congestion, RT can play a role in sustaining strong office growth (3). Thirdly, RT planning and construction is a sizeable economic activity in itself, and is most often financed from exterior sources such as state and federal governments. This exterior funding in itself provides local governments with a very strong incentive to advocate RT as a mode of transportation. The arguments promoting the "positive land use impacts" of RT have certainly been somewhat misrepresented as a result of this incentive, in order to justify RT investment from exterior sources.

RT should not be expected, though, to bring about substantial changes in urban form if it adds only incrementally to existing levels of accessibility, nor should it be construed to create demand for development "ex nihilo". What it can do, however, is to radically modify land use in a few selected areas. This typically involves intensive mixed-use development physically integrating the RTS as a major design feature. This type of project is profitable to developers, can be considered a good investment for transit agencies, and helps local governments financially through increased taxes or more directly by the sharing of amenity provision with the private sector. Furthermore, RT construction offers a rationale for the acquisition

(2) Knight, Robert L., 1983, op. cit.

(3) see Black, J. Thomas, Donald P.O'Connell, and Michael J. Morina **Downtown Office Growth and the Role of Public Transit**, for the Urban Land Institute, Washington, D.C., 1982

of land by public agencies, which they can then sell, lease, or develop themselves. This intensive public intervention in selected sites in a metropolitan area can also be interpreted by the private sector as a commitment to these sites and a commitment to a public/private approach to urban policy. This can be important in alleviating private sector fears of hopelessly declining areas and reinstalling "investor confidence".

This is particularly true for downtown areas in US cities. Knight points out that "RT-induced" downtown revitalization may be the most promising tool available to local governments for large-scale redevelopment at this point: "Thus despite its high costs and uncertainty of success, rapid transit investment may literally be the 'only game in town' if major and desired urban structure changes are to be generated within the foreseeable future (4)". Knight argues for an approach where the trade-offs concerning land use and RT policy coordination be made clearer in the planning process. The first trade-off he identifies is in the objectives of such large-scale projects, between the desired urban development effects on one hand and their degree of importance on the other. Another trade-off must be more visible, he argues, in the selection of programs of action, and that is the trade-off between the costs and the uncertainty of success. Knight's approach does not fully embrace the question of how transportation and land use policy-making could become transparent to these trade-offs, or how the necessary degree of political consensus could be reached in order to select and implement one program of action. He does suggest that the problem could be addressed by establishing a referendum procedure for the selection of transportation alternatives.

(4) Knight, op. cit., p.48

One remark made by Knight on the present status of RT and land use policy coordination in the planning process points to one of the central issues:

"The firm assurance or actual presence of a new rapid transit system may provide an important impetus to other complementary changes in local public policy, which in turn help to focus and intensify urban development around the framework provided by the transit system. For example, land use controls and incentives may have much more power than rail transit to help generate desired development patterns, but the required changes in such land use policies may become politically possible only with the impetus provided by a rapid transit investment (5)."

If this is true, it brings up major questions concerning the significance of the RTS area issues we have tried to address in this paper. We have seen that a certain type of coordination has definitely been achieved between RT and land use policies, one which has facilitated large-scale redevelopment at selected sites and provided some extra revenue to transit agencies and local governments. But has this coordination been as succesful at addressing the redistributive effects of land use policies in RTS areas?

For in spite of claims to the contrary, the only overall effects of land use policies in RTS areas of which we can be certain are redistributive rather than value-creating. First, there is a redistribution of profits and costs between public and private sector entities. Secondly, there is a spatial redistribution of development toward selected sites. Finally, there is a redistribution of income in terms of groups of population benefiting from, and contributing to, public investment.

(5) *ibid.*

This is not a new discovery. For example, in the preliminary RTS area reflection in Baltimore, planners were fully aware of this (6). It seems, however, that even when this was clearly understood in early planning phases, the redistributive nature of the policies' effects were not the focus of the process of policy formulation, in Baltimore or elsewhere. The whole process seems to divert attention from addressing these redistributive aspects except in the form of value capture, i.e. the first of the three effects identified in the preceeding paragraph, and one the beneficiaries of which are the key institutional actors. But the actors concerned by more diffused effects have not been integrated in the process. Indeed, there is little research on the redistributive effects of these policies. Most of the research on these issues is procedural, and attempts to devise more effective organizational strategies for value capture. It is this approach which has favored the development of TCDCs, for instance, which can be seen as an attempt to short-circuit not only red tape but also public opposition.

It can thus be argued that the process has been more adapted to responding to the needs of key institutional and private actors than it has been geared to address the redistributive effects between areas and between groups of population. Gakenheimer noted, in the case of Boston, that RTS area issues were not tangible enough for effective citizen participation to be voiced during the BTPR (7). On the other hand, the opposition of residents of RTS areas to increased development very often manifested itself at the last minute, when the perceived menace became very tangible indeed, often nullifying years of planning efforts. Some authors (8) have noted the importance of including local concerns in every phase of RT decisionmaking. A closer study of the Baltimore case would

(6) see Balto Dept... **Transit Planning and Impact Study** , op. cit. , 1971

(7) see Ch II., III.2.c.

(8) see Witherspoon, Robert **Transit and Urban Economic Development** , in Public Technology, 1978, op. cit., pp.77-96

Beyond the significance of this trend for RT, the implications for transportation policy are important. Transportation infrastructure investment decisions are typically made at a level of government removed from local priorities. At the same time, it is crucial for the success of these investments, particularly public transit, that they be integrated in the communities they cross. Not only is this the only way to ensure that the infrastructure is needed and will be used, but in addition these communities will be transformed at the micro-level because of these infrastructures.

That this generates conflict should not come as a surprise. Such conflict is the expression of a trade-off between regional and local priorities. Of course, the technical options in transportation projects are usually numerous, and can go a long way in striking satisfying compromises. However, transportation policy must be able to address conflict when technical options fail if it is to further the public interest.

enable us to know if a real forum for the expression of local priorities was created.

For the issue is not one of streamlining procedures to secure objectives of increased development, but one of creating a process wherein the redistributive effects of the policies would be addressed directly. These effects would become the focus of such policies, rather than be relegated to the position of justificative argumentation. This takes on a particular meaning in the case of RTS areas, for they are the locus of a unique set of conflicting objectives. Their uniqueness stems from the presence of transportation priorities and land use priorities. But more explicitly, it is the conflict of regional objectives, to which RT construction and large-scale redevelopment respond, and local and community objectives which makes these areas unique. Because RT is an enormous investment, even at the regional level, and because its impact manifests itself mostly in a few relatively small areas, there is an intense discrepancy between two levels of decisionmaking. At the metropolitan level, more or less explicit RTS area policies are formulated in terms of long-term regional priorities and in the framework of value capture. At the local level, though, the intensity of the potential impact is such that the problems are formulated in terms of disruption and displacement.

If RT planning is to continue in cities of North America, a successful land use policy for RTS areas will need, as a prerequisite, a forum where the redistributive effects of the investment at the local level can be addressed with all due consideration to local priorities as well as regional priorities. In the cases we have studied, downtown RTS area redevelopment policies are generally estimated to have taken advantage of the potential of RTs, but in residential areas, the opposition arising against RT has not usually enabled a satisfying compromise.

cities would certainly benefit from the knowledge gained in developed countries, and in turn provide us with a better understanding of the phenomena affecting RTS areas and the possibility of coordinating transportation and land use goals at the regional and local levels.

CONCLUSION

Station area considerations have become a standard input in the RT decisionmaking process. The influence of a RTS on the surrounding area is now acknowledged, sometimes exaggerated, but in any case better understood and qualified than it was right after WWII. However, the case studies show that the policies implemented were not always successful, and furthermore, that their objectives were not always congruent with the transportation and land use objectives they were supposed to link. This is in part due to a discrepancy between local and regional priorities in land use and transportation. RTS area decisionmaking is unique in that it must strike a compromise between fields and levels of planning not usually brought into such close contact. Procedures have evolved, and the inherent conflicts have become more visible.

The evolution of our understanding of RTS area issues is also significant for other modes of transportation, although no other contemporary mode combines such a high capacity with such small geographical areas of impact.

A most constructive perspective could be added to this work by the elaboration of a comparative approach. In particular, the case of France, with three new RT systems built in recent years, would presumably reflect some fundamental differences in urban situations and planning approaches. Other European systems observed by Knight and Trygg (1) deserve further investigation. Finally, by far the largest RT investments planned or underway at this point are in large cities in developing countries. These

(1) op. cit.

APPENDIX A:
FEDERAL LEGISLATION PERTAINING TO JOINT DEVELOPMENT
IN THE UNITED STATES

The Urban Mass Transportation Act of 1964 marked the beginning of federal capital assistance to RT construction in the US. At first, the urban mass transportation program was an integral part of the Housing and Home Finance Agency, and of HUD after 1966. But in 1968, the Urban Mass Transportation Administration (UMTA) was created in the new US Department of Transportation (DOT): the institutional link between public transportation and urban development was severed. By 1973, most of the Section 9 funds that had been left over to HUD to urban development planning related to public transportation investment was spent, and the balance was transferred to UMTA.

The pioneering case of Atlanta made the need for flexible funding of joint development obvious, a provision not included in the 1964 UMT Act. In 1974, Congress adopted Mayor Young of Atlanta's amendment to Section 3(a) of the Act. The significant changes were the following:

- "1. It added a new authorization for the Secretary of Transportation to make grants and loans to public bodies to assist in financing the establishment and organization of public or quasi-public transit corridor development corporations or entities.

Local transit and government agencies have applauded the broad-minded approach of UMTA, but they have also sought guidance in establishing their grant applications. To my knowledge, the closest expression of UMTA's yet informal policy can be found in Public Technology (2), although UMTA has still not attempted to issue regulations.

There are some problems related to the open-endedness of UMTA's position, which will have to be addressed in order to ensure the durability of the program:

- funding levels. Specifically, will the funding of joint development projects by UMTA be tantamount to a trade-off land development and transit improvement funding themselves? So far, no funds have been specifically set aside for joint development.
- the redistribution of project income between the actors intervening financially in RTS areas.
- federal agency coordination. Can application procedures and grant management be simplified for projects jointly funded at the federal level by HUD, EDA or EPA for instance?

(2) 1984, op. cit.

2. It amended the definition of eligible facilities and equipment, which originally read:

Eligible facilities and equipment may include land (but not public highways), buses and other rolling stock, and other real and personal property needed for an efficient and coordinated transportation system.

to read:

Eligible facilities and equipment may include personal property including buses and other rolling stock and real property including land (but not public highways), within the entire zone affected by the construction and operation of transit improvements, including station sites, needed for any efficient and coordinated mass transportation system which is compatible with socially, economically, and environmentally sound patterns of land use (1)."

UMTA's approach was to let practical experience guide the future orientations of the program rather than set a priori regulations. This was a result of inexperience in joint development, and of the understanding that the success of the program would in part depend on the ability of local officials to be flexible in their negotiations with the private sector. But the practices of joint development have evolved slowly, due to the relative scarcity of sufficiently large-scale transportation investments and the length of the joint development process. Meanwhile, UMTA has sponsored extensive research on all possible aspects of joint development, presumably an attempt to establish a line of policy and make the legislation more specific as to the requirements of eligible projects.

(1) Hurd, Burckhardt and Moore in Public Technology, 1978, op. cit., p.72

Appendix B1:
TORONTO RAPID TRANSIT SYSTEM

STAGING OF TORONTO RAPID TRANSIT CONSTRUCTION

Subway Line	Segment (end stations)	Length (miles)	Construction Start	Line Opening
Young Street	Union-Eglinton	4.6	1949	1954
University Avenue	Union-St. George	2.4	1959	1963
Bloor Street	Keele-Woodbine	8.0	1962	1966
Bloor Street	Keele-Islington & Woodbine-Warden	6.2	1965	1968
Yonge Street	Eglinton-York Mills	2.7	1968	1973
Yonge Street	York Mills-Finch	2.7	1968	1974
Spadina	St. George-Wilson	6.25	1974	1977?

Source: Knight and Trygg, op. cit., p.34

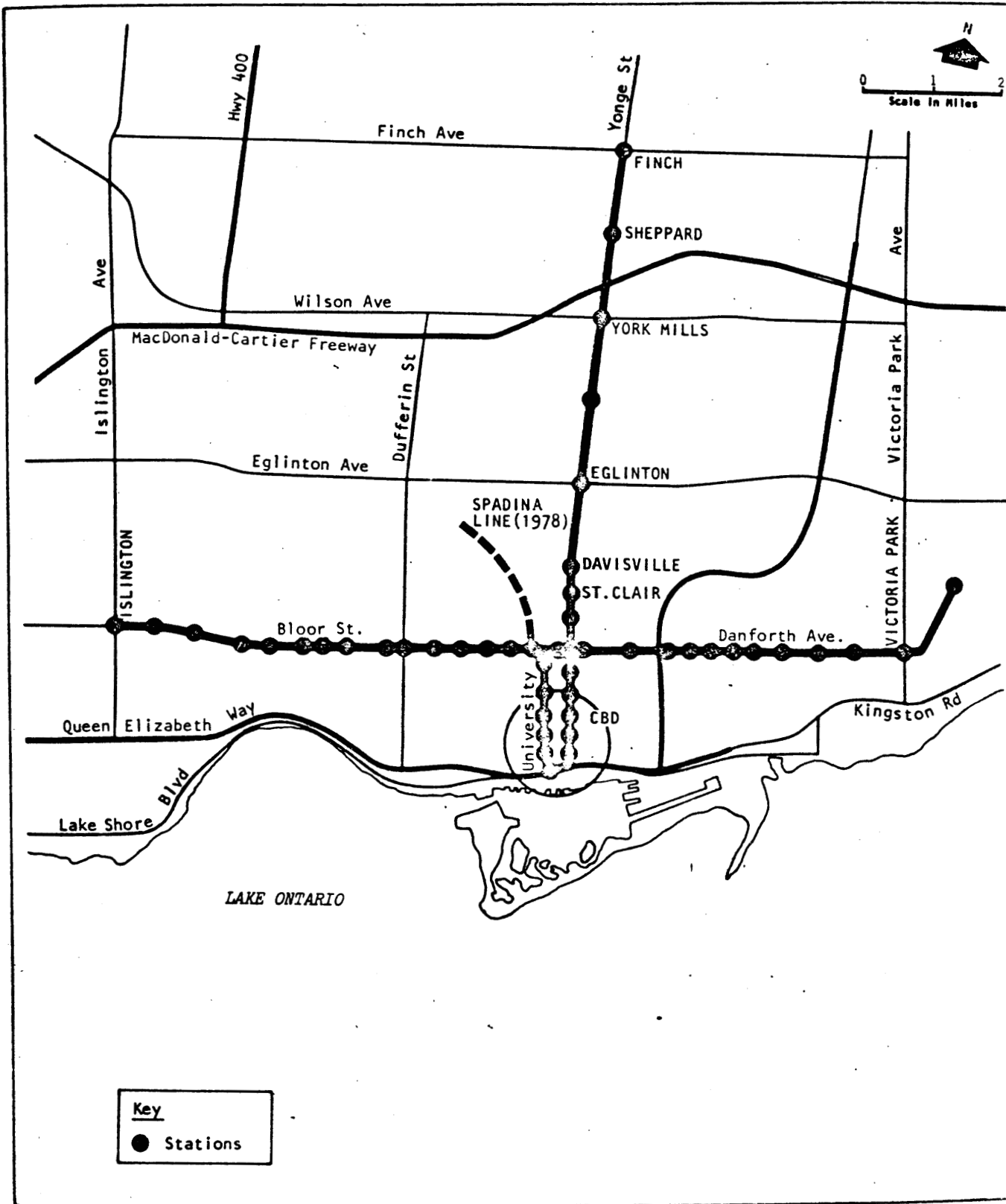


Figure 3.1
TORONTO RAPID TRANSIT SYSTEM

Source: Knight
and Trygg

APPENDIX B2:
SAN FRANCISCO RT SYSTEM

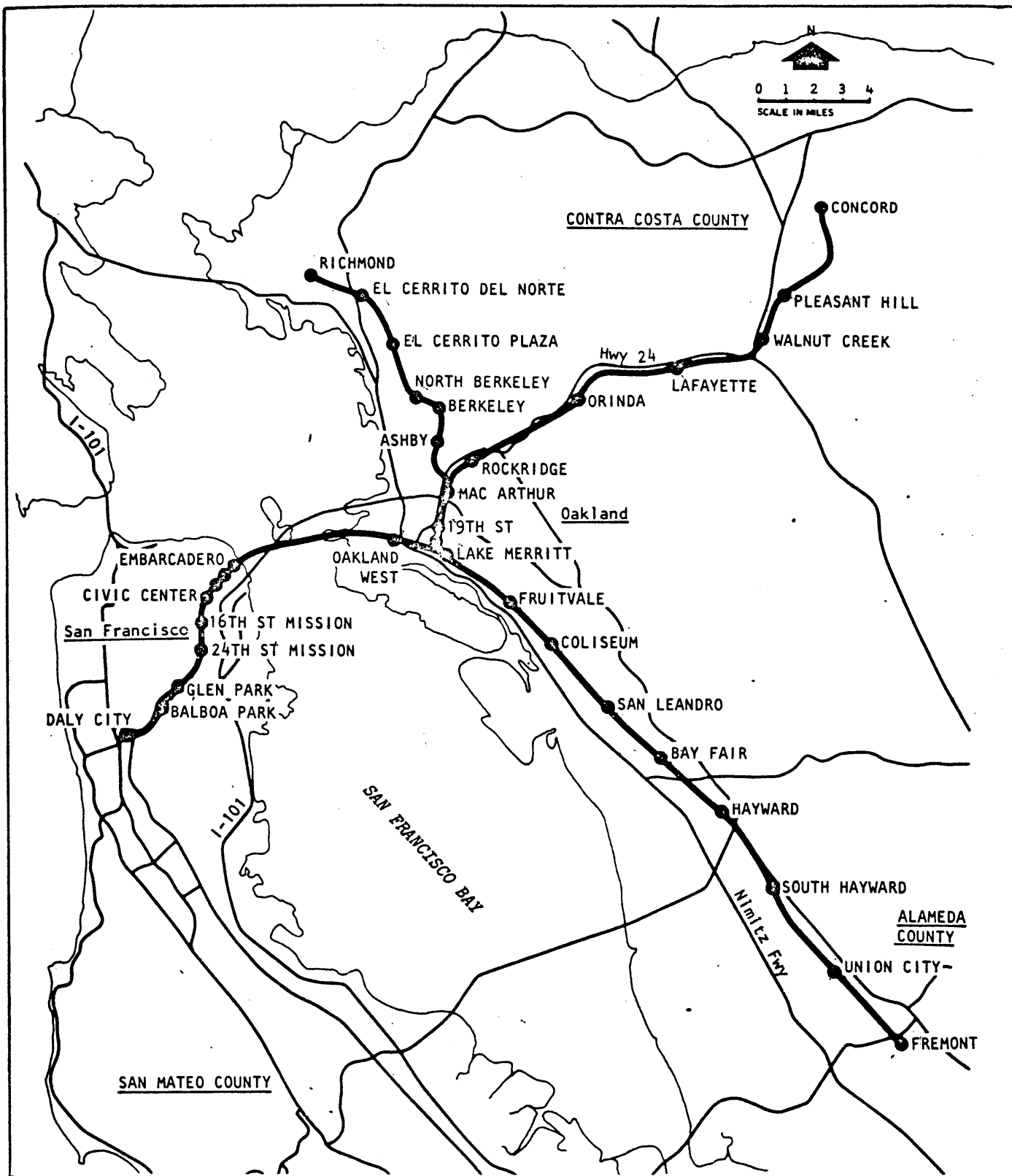


Figure 3.4
BART RAPID TRANSIT SYSTEM

APPENDIX B3:
BOSTON RT SYSTEM

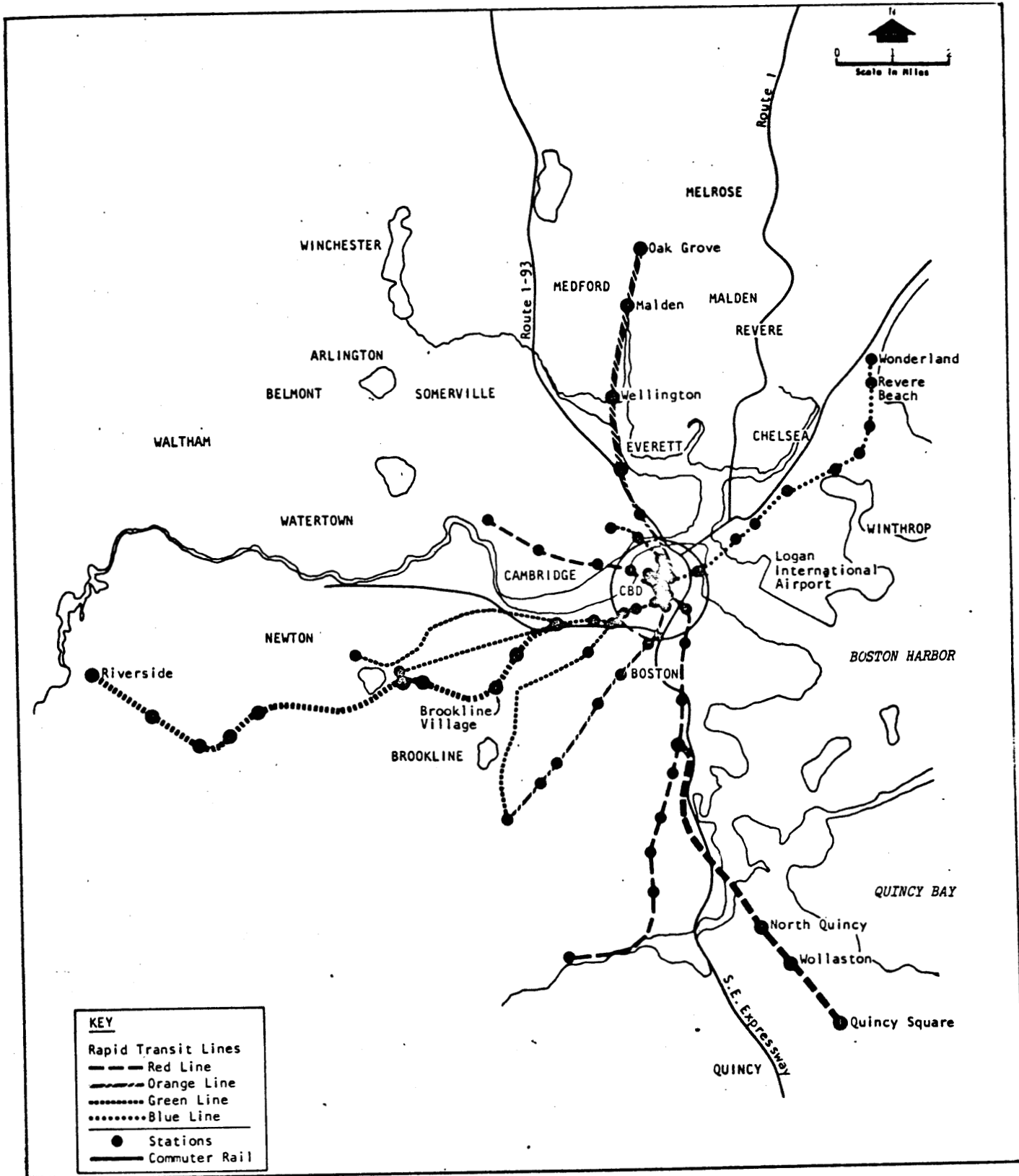


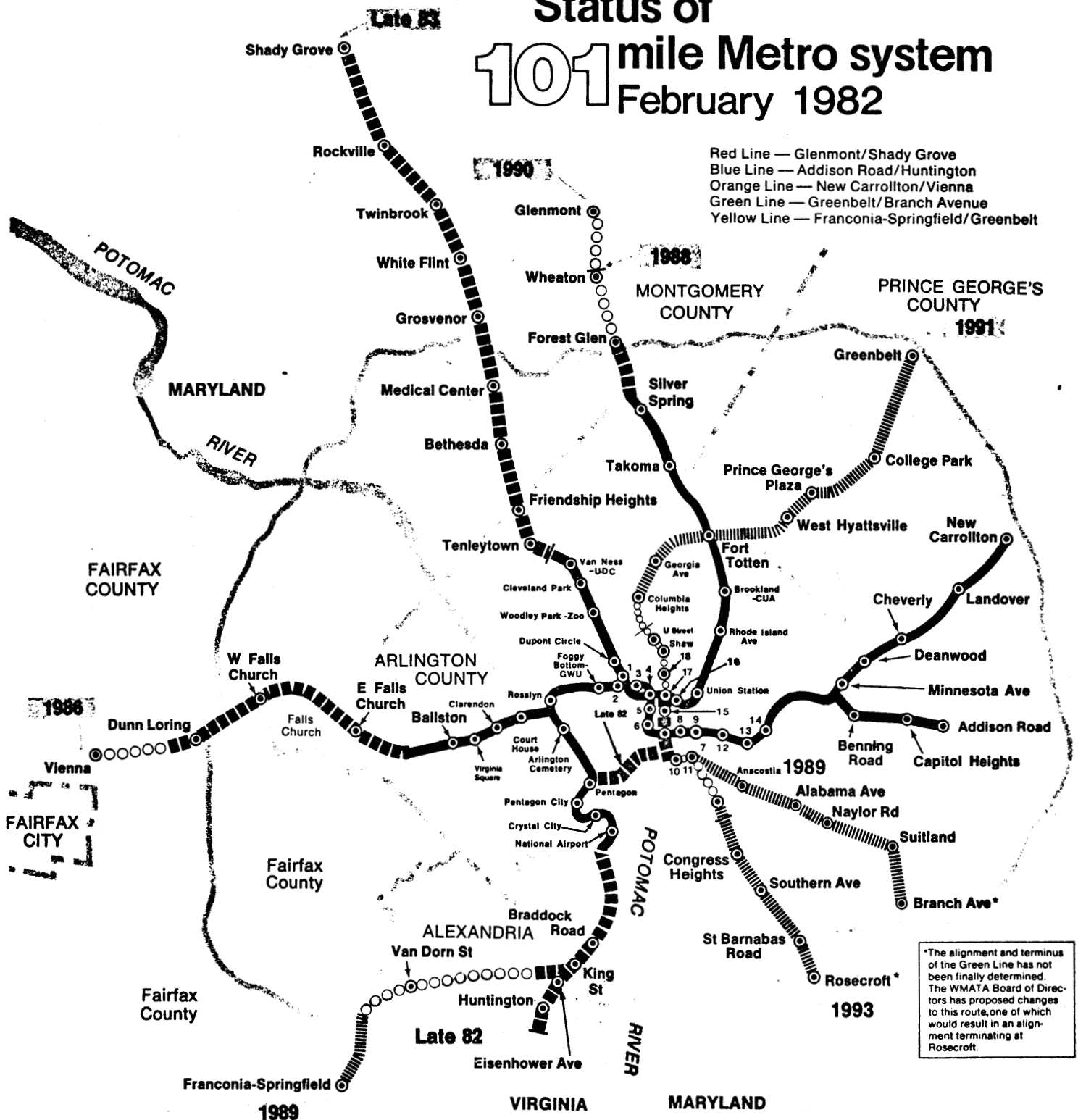
Figure 4.4
BOSTON RAPID TRANSIT AND COMMUTER RAIL SYSTEMS

APPENDIX B4:
WASHINGTON, D.C. RAPID TRANSIT SYSTEM

Line	Segment	Date of Opening (? marks scheduled dates)
Red	Farragut North-Rhode Island	1976
	Gallery Place	1976
	Dupont Circle	1976
Blue	National Airport-	
	Stadium/Armory	1977
Red	to Silver Spring	1978
Orange	Stadium/Armory-New	
	Carrollton	1978
	Rosslyn-Ballston	1979
Blue	to Addison Road	1980
Red	to Van Ness-UDC	1981
Blue	to Huntington	1982
Yellow	Gallery Place-National	
	Airport	1990?
Red	to Shady Grove	1984?
Yellow	King Street-Van Dorn Street	1990?
Orange	to Vienna	1986?
Green	to Anacostia	1989?
Yellow	to Franconia-Springfield	1990?
Green	to Rosecroft	1993?
Red	to Glenmont	1988?
Yellow	Gallery Place-Prince	
/Green	George's Plaza	1991?
Yellow		
/Green	to Greenbelt	1991?

Source: MWCOG

Status of 101 mile Metro system February 1982



LEGEND

Total mileage—101.18

Total stations—86



Washington Metropolitan Area Transit Authority
600 Fifth Street, N.W., Washington, D.C. 20001

Department of Public Services: Office of Public Affairs
Paul Willis, Editor
637-1047

APPENDIX C

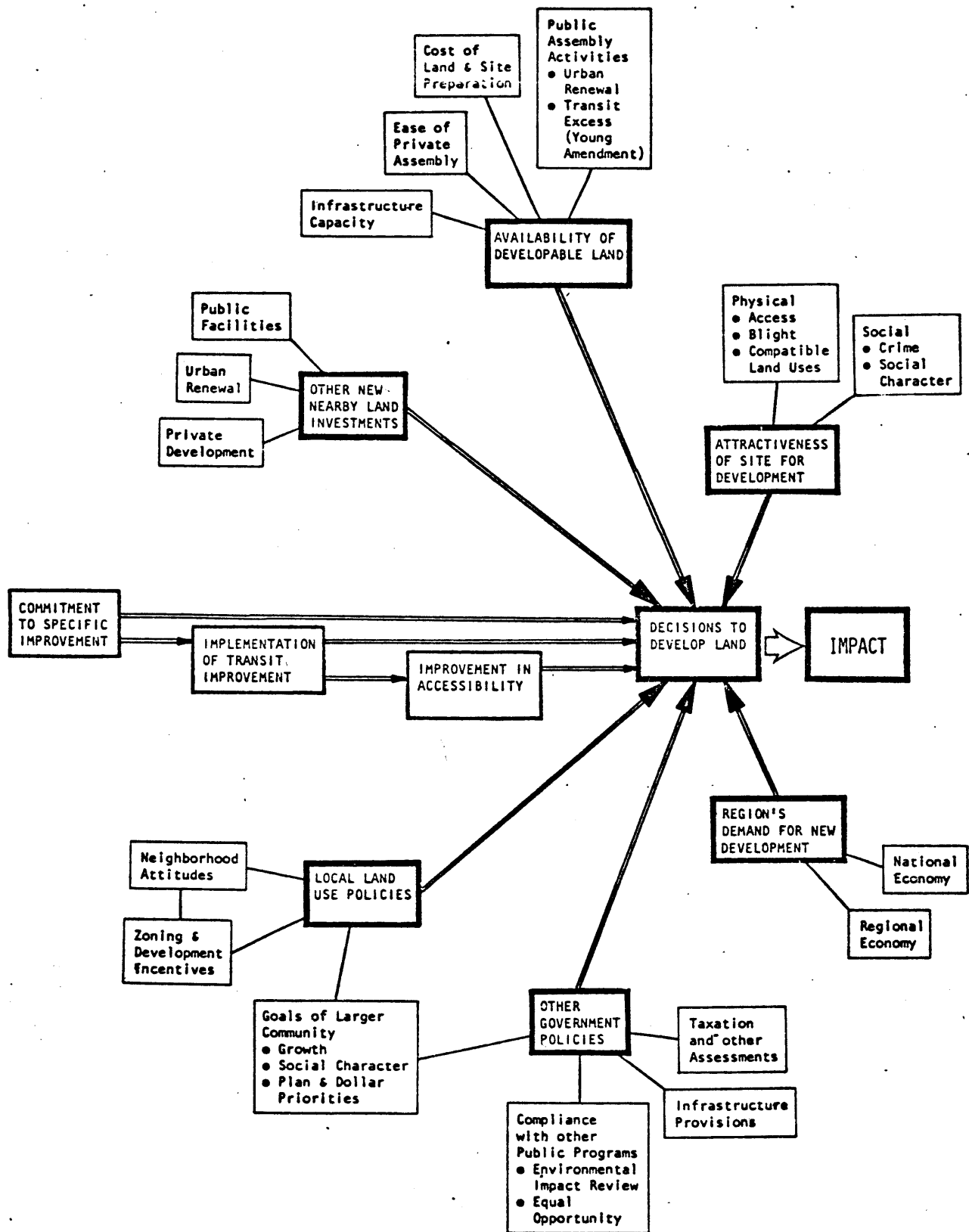


Figure 7.1
FACTORS INFLUENCING LAND USE IMPACT

TECHNIQUE	OBJECTIVES						IMPLEMENTATION ISSUES				OVERALL USEFUL- NESS
	Value Capture	Development Incentives	Property Assemblage	Land Use Controls		Design & Amenity Improvement	Legal Difficulty	Political Difficulty	Administrative Costs		
				Community Preservation	Development				Public	Private	
REGULATORY											
ORDINARY ZONING	L	L	L	H	M	M	L	L	L	L	L
SPECIAL DISTRICT ZONING	H	L	M	H	H	H	L	M	M	M	H
BONUS OR INCENTIVE ZONING	H	L	H	L	H	H	L	M	M	M	H
FLOATING ZONE	H	L	H	L	H	H	L	M	M	M	H
PLANNED UNIT DEVELOPMENT	H	L	H	L	H	H	L	M	M	M	H
CONDITIONAL ZONING	H	L	H	L	H	H	M	M	H	H	H
TIME CONDITIONAL ZONING	M	L	L	L	H	M	H	H	L	L	L
HOLDING ZONE	L	L	L	M	H	L	M	H	L	L	M
OFFICIAL MAP	M	L	L	L	M	H	M	M	L	L	M
DEVELOPMENT RIGHTS TRANSFER	L	L	L	H	L	L	H	M	M	M	M
DEDICATION AND EXACTION	H	L	L	L	M	M	M	M	M	M	H
PUBLIC LAND ACQUISITION (with or without sale or lease)											
PURCHASE OF EXCESS PROPERTY	H	H	H	L	H	H	M	M	H	L	M
EXCESS CONDEMNATION	H	H	H	L	H	H	M	H	H	L	M
CONDEMNATION OF HOLDOUTS	M	H	H	L	M	H	M	H	H	M	M
ADVANCE LAND ACQUISITION	M	L	M	L	L	L	L	M	H	L	M
H = High M = Moderate L = Low											

Source: (AMRA)

VARYING EFFECTIVENESS OF IMPLEMENTATION TECHNIQUES IN STRONG AND WEAK MARKETS

STRONG MARKET TECHNIQUES

TECHNIQUE	Effectiveness					
	Value Capture	Development Incentive	Property Assemblage	Community Preservation	Development Control	Design Improvement
Special district zoning	H	H ¹	M	H	H	H
Bonus or incentive zoning	H	H ¹	H	L	H	H
Floating zones	H	H ¹	H	L	H	H
Planned unit developments	H	H ¹	H	L	H	H
Conditional zoning	H	H ¹	H	L	H	H
Exactions	H	L	L	L	L	M
Official Map	M	L	L	L	M	H
Property tax	H	M ²	L	L	L	L
Special assessments	H	L	L	L	L	L
Supplementary purchase of land	H	L	H	L	H	H
Supplementary condemnation of land	H	L	H	L	H	H
Holdout Condemnation	M	L	H	L	M	H

¹ Incentive derives from governmental restriction on alternative development modes.

² Incentive derives from discouragement of speculative hoarding.

H = high effectiveness; M = moderate effectiveness; L = low effectiveness

Figure 3

Source: (AMRA)

BIBLIOGRAPHY

Administration and Management Research Association of New York, Inc. and Office of Midtown Planning and Development, Office of the Mayor **Transit Station Area Joint Development: Strategies for Implementation** , New York, 1976

Alonso, W. **Location and Land Use: Toward a General Theory of Land Rent** , Harvard University Press, Cambridge, Ma., 1964

Altshuler, Alan **The Urban Transportation System: Politics and Policy Innovation** , the MIT Press, Cambridge, Mass., 1978

Altshuler, Alan A. **Current Issues in Transportation Policy** , Lexington Books, 1979

Baltimore City Department of Planning **Transit Planning and Impact Study** , Baltimore, Md., 1971

Baltimore City Department of Planning **The Impact of Rapid Transit on the Metro Center** , Baltimore, Md., 1971

Baltimore City Department of Planning **Application of the City of Baltimore for a Mass Transportation Capital Improvement Grant (Project no.MD-03-0015)** , Baltimore, Md., 1978

Baltimore City Department of Planning **Draft Environmental Impact Statements** , and **Environmental Impact Assessments** , Baltimore, Md., 1978

Black, J. Thomas **Downtown Office Growth and the Role of Public Transit** , for the Urban Land Institute, Washington, D.C., 1982

Centre d'Etudes des Transports Urbains **Etudes de suivi des ouvertures des métros de Lyon et Marseille** , Bagneux, France, November 1979

Centre d'Etudes des Transports Urbains **Méthodes d'évaluation des grands projets de transport urbain** , Bagneux, France, 1981

Contini, Edgar, 'Transportation and the Recycling of Urban Land', **Urban Land** April 1976

Daniel, Mann, Johnson and Mendenhall/Kaiser Engineering **Rationale for Route Selection** , and **Economics Report: Route Selection and Community Impact of the Proposed Baltimore Rapid Transit System** , 1968

Daniels, P.W. and A.M. Warnes **Movement in Cities-Spatial Perspectives on Urban Transport and Travel** , Methuen, New York, 1980

Department of Environmental Design and Planning, State University of New York at Buffalo **An Analysis of Rapid Transit Investments: The Buffalo Experience** , for UMTA, Washington, D.C., July 1981

Deweese, Donald N. **Some Effects of Conversion from Streetcar to Subway Transit Lines in Toronto** , Research Paper no.76, Center for Urban and Community Studies, University of Toronto, 1976

- Deweese, Donald N., 'The Effect of a Subway on Residential Property values in Toronto', **Journal of Urban Economics** , October 1976
- Dingemans, Dennis J., 'Rapid Transit and Suburban Residential Land Use', **Traffic Quarterly** , April 1978
- Donnelly, Paget (Price, Williams and Associates) **Rail Transit Impact Studies: Atlanta, Washington, San Diego** , Summary report prepared for Office of Planning Assistance , UMTA, Washington, D.C., March 1982
- Dunphy, Robert T., and Robert E. Griffiths **The First Four Years of Metrorail: Travel Changes** , 1981, and Dunphy, Robert T. **Trends Before Metrorail** , 1982, both for Office of Planning Assistance, UMTA, Washington, D.C.;
- Dyett, Michael V., et al. **Land Use and Urban Development Impacts of BART: Final Report** , for John Blayney Asstes./David M. Dornbush Co., USDOT/HUD, April 1979
- Evans, Alan W. **The Economics of Residential Location** , St. Martin's Press, New York, N.Y., 1973
- Falcke, C.O. and Schnetlage, T. (John Blayney Assoc./David M. Dornbusch and Co., Inc.) **Study of Property Acquisition and Occupancy -BART's Effect on Speculation** , for Metropolitan Transportation Commission/USDOT/HUD, October 1978
- Fischler, Stanley I. **Moving Millions-An Inside Look at Mass Transit** , Harper & Row, New York, 1979 Gakenheimer, Ralph **Transportation Planning as Response to Controversy: the Boston Case**", M.I.T. Press, Cambridge, Ma., 1976
- Granfield, Michael **An Econometric Model of Residential Location** , Ballinger, Cambridge, Ma., 1975
- Harvey, David **Society, the City and the Space-Economy of Urbanism** , Commission on College Geography, Resource Paper no.18, Association of American Geographers, Washington, D.C., 1972
- Heenan, G. Warren, 'The Economic Effect of Rapid Transit on Real Estate Development', **Appraisal Journal** , April, 1968
- Heilbrun, James **Urban Economics and Public Policy** , St. Martin's Press, New York, N.Y., 1981
- Journal of the American Planning Association, Spring 1984
- Jonash, Ronald (Booz, Allen and Hamilton, Inc.) **The Impact of BART on Land Use and Development Policy** , for MTC, USDOT, HUD, Washington, D.C., 1977
- Kain, John F. **Essays on Urban Spatial Structure** , Ballinger, Cambridge, Ma., 1975
- Keefer, Louis E. (Keefer and Assoc.) **An Interim Review of Nine UMTA-Assisted Joint Development Projects** , for Office of Planning Assistance, UMTA, October 1983

WEAK MARKET TECHNIQUES

TECHNIQUE	EFFECTIVENESS					
	Value Capture	Development Incentive	Property Assemblage	Community Preservation	Development Control	Design Improvement
Official Map	L	L	L	L	M	H
Supplementary purchase of land	L	H ³	H	L	H	H
Supplementary Condemnation of land	L	H ³	H	L	H	H
Holdout Condemnation	L	H ³	H	L	M	H
Tax exemptions & abatements	L	H ³	L	H	H	H
Special capital Improvements	L	H ³	L	M	H	H
Tax increment financing	M	H ³	L	M	H	H
Loans and guarantees	L	H ³	L	H	H	M
Equity Participation	M	H ³	L	M	H	H
Public development	L	H ³	L	H	H	H

³ True economic development incentive - reduces developer cost or risk.

H = high effectiveness; M = moderate effectiveness; L = low effectiveness

Figure 4

Source: (AMRA)

Knight, Robert L., and Lisa L. Trygg (De Leuw, Cather and Company) **Land Use Impacts of Rapid Transit, Implications of Recent Experience** , for Office of the Assistant Secretary for Policy, Plans, and International Affairs, USDOT, August 1977

Knight, Robert L., 'The Impact of Rapid Transit on Land Use-Evidence of a Change in Perspective' , 1980, in **Land Use Issues of the 1980s** , Center for Urban Policy Research, Rutgers University, 1983, p.40

Ladwig, Walter C., 'Planning Central Area Land Uses to Support Mass Transportation', **Traffic Engineering** , August 1976

Libicki, Martin C. **Land Use Impacts of Major Transit Improvements: An Assessment of Current Information** , for Urban Analysis Program, Office of Transportation Planning Analysis, Assistant Secretary for Policy Plans and International Affairs, USDOT, March 1975

Lovely, Mary E., 'Public Transit and Downtown Development' **Urban Land** , November 1979

Lowry, Ira S. **Seven Models of Urban Development: a Structural Comparison** , Highway Research Special Report no.97, Highway Research Board, Washington, D.C., 1968

Marcuse, Peter **Mass Transit for the Few: Lessons from Los Angeles** , School of Architecture and Urban Planning, University of California , Los Angeles, April 1975 (mimeographed)

Metropolitan Transportation Commission **BART in the San Francisco Bay Area-The Final Report of the Bart Impact Program** , for USDOT, June 1979

Metropolitan Washington Council of Governments, **Metropolitan Policy Guide Summary Report** , Washington, D.C., December 1980, p.39

Metropolitan Washington Council of Governments /NC RTPB **Metrorail Area Planning** , Metrorail Before-and After Study, Washington, D.C., August 1983

Meyer, John, and Jose Gomez-Ibanez **Autos, Transit and Cities** , Harvard University Press, Cambridge , Ma., 1981

Mills, Edwin S. **Studies in the Structure of the Urban Economy** , for Resources for the Future, the Johns Hopkins University Press, Baltimore, Md., 1972

Minkus, David **Impacts of BART on Bay Area Institutions and Life Styles** , Jefferson Asstes., Inc., USDOT, Washington, D.C., April 1979

Morton, Hoffman & Co. **Transit Impact Analysis of Three Proposed Rapid Transit Station Areas: Northwest Baltimore** , for Regional Planning Council, June 1972

Page, John H. et al. **Impacts of Public Transportation Terminals on Land Use and Community Development. Catalog of Transit Station Impact Case Studies** , Department of Civil Engineering, School of Engineering and Applied Science, University of Virginia, Charlottesville, Va., August 1983

Peat, Marwick and Mitchell, Inc. **A Review of Some Anticipated and Observed Impacts of the BARTS** , for MTC, USDOT/HUD, May 1974

Pill, Juri **Planning and Politics: the Metropolitan Toronto Transportation Plan Review** , M.I.T. Press, Cambridge, Ma., 1979

Public Technology, Inc. **Joint Development Marketplace Proceedings** , for UMTA, Washington, D.C., June 1978

Public Technology, Inc. **Joint Development Handbook for Local Government Officials** , for Urban Consortium for Technology Initiatives and UMTA, Washington, D.C., 1984

Pushkarev, Boris and Jeffrey Zupan **Public Transportation and Land Use Policy** , Indiana University Press, 1977

Regional Planning Council **Specifications for Economic and Social Impact Studies** , mimeographed, Baltimore, Md., October 1967

Rice Center **A Guide to Innovative Financing Mechanisms for Mass Transportation** , for Office of Planning Assistance, UMTA, Washington, D.C., December 1982

Rice Center **Revenue Forecasts for Innovative Light Rail Financing Options** , for Office of Planning Assistance, UMTA, Washington, D.C., September 1983

Rivkin, Malcolm D. **Some Insights Into the Practice of Joint Development: Lessons From Experience** , Transportation Research Record no.634, Transportation Research Board, National Academy of Sciences, Washington, D.C., 1977

Schaeffer, K.H. and Elliott Sclar **Access for All-Transportation and Urban Growth** , Columbia University Press, New York, 1980

Sheldon, Nancy W. and Robert Brandwein **The Economic and Social Impact of Investments in Public Transit** , Lexington Books, Lexington, Ma., 1973

Skidmore, Owings and Merrill, **Transit Station Joint Development** , for National League of Cities/U.S. Conference of Mayors, USDOT/HUD, 1973

Skidmore, Owings, and Merrill/System Design Concepts, Inc. **An Assessment of Community Planning for Mass Transit** , for United States Congress, Office of Technology Assessment, Washington, D.C., March 1976, vols.1-10

Southern California Rapid Transit District **Joint Development and Value Capture in Los Angeles: Local Policy Formulation** , for Office of Planning Assistance, UMTA, Washington, D.C., January 1983

Steiner, Richard L. **Maximizing Economic Benefits Through Planning and Development Techniques in the Baltimore Region** , mimeographed, for Regional Planning Council, Baltimore, Md., February 1970

Stringham, M.G.P., 'Travel Behavior Associated with Land Uses Adjacent to Rapid Transit Stations', **Journal of the Institute of Transportation Engineers** , April 1982

Subcommittee on the City of the Committee on Banking, Finance and Urban Affairs, 96th Congress **New Urban Rail Transit: How Can Its Development and Growth Shaping Potential Be Realized?** , G.P.O., Washington, D.C., 1980

Sweet, David C., ed., **Models of Urban Structure** , Lexington Books, Lexington, Mass., 1972

Toronto Transit Commission **Transit in Toronto** , Toronto, 1976

Urban Land Institute **Joint Development: Making the Real Estate-Transit Connection** , Washington, D.C., 1979

Urban Systems Research and Engineering, Inc. **The Growth Shapers-The Land Use Impacts of Infrastructure Investments** , for the Council on Environmental Quality, Washington D.C., May 1976

Vidal, Henri **Recueil et analyse de quelques etudes de suivi d'infrastructure de transport sur l'urbanisme** , mimeographed, for CETUR, Bagneux, France, August 1982

Webber, Melvin M., 'The BART Experience - What Have We Learned?' , Chapter 7 of Altshuler, Alan A., 1979, op. cit.

Witherspoon, Robert, 'Transit and Urban Economic Development' , in Public Technology, 1978, op. cit., pp.77-96

Yago, Glenn **The Decline of Transit** , the Cambridge University Press, Cambridge, England, 1984

Ziv, J.C. and Ch. Napoléon **Le transport urbain-un enjeu pour les villes** , Dunod, Paris, France, 1981