

Strategic Planning in Public Transport

by

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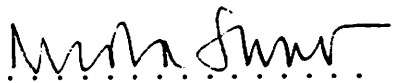
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Abstract

Strategic Planning has been used by public transport authorities over the past fifteen years, as one technique to improve their financial and ridership positions. The strategic planning process is described, as it has been understood and used in the private sector, and more recently in the public sector. Guides for strategic planning in public transport are reviewed, as are some of the early observations about the use of strategic planning in American transport agencies. A survey of eight agencies is undertaken to expose the current state of the practice, and the resulting observations are described. The survey does not reveal full scale sustained strategic planning processes, such as those used in the private sector, nor does it suggest particularly successful outcomes. The typical process can be categorized more as a long range consideration of the external environment. Critical assessment of the internal environment is unusual. Identifying particular strengths and weaknesses, then acting on that identification, appears to be particularly problematic. In addition frequently the process has not been helped by wavering top management support.

Though the external environment was often the central element in these strategic plans, no systematic or consistent process was used to develop an understanding of this environment. Hence a range of tools are suggested which broaden the base of such analysis. The tools are categorized as stakeholder analysis, "power player" analysis, systems analysis, and time line analysis. Following this the importance of market understanding in the external assessment, and its pivotal role in the development and implementation of strategy, are discussed.

Finally, the external assessment process developed here is applied in two large metropolitan areas — Boston and San Juan. The challenges of these two areas are very different since there is a single operator in public hands in Boston, and a range of different transport providers in San Juan. However, the review does highlight, for both cities, the importance of large scale transport projects in the urban environment, in funding availability, and in political connections. For the MBTA a number of possible strategies are discussed, all based in part on the dominant role of the Central Artery / Third Harbour Tunnel project. In San Juan, it is concluded that the transport environment currently being developed, places the rail operator in the dominant position. AMA should consider developing a strategic plan to deal with the changes in the external environment, whilst continuing its current focus on improving service. In order to do this, more detailed understanding of demand profiles and elasticities is needed. Público operators are unlikely to plan strategically on their own behalf, rather they will react slowly to the emergence of new markets. If integration of service is the government objective, this factor must be acknowledged.

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Chapter 1: Introduction

"The combination of these two methods of expansion and congestion, horizontal and vertical, produced the maximum opportunities for profit; this was in fact the principal motivating force. But this purely mechanical system of growth in the end is self limiting...for the time is approaching in many cities when there will be every facility for moving about the city and no possible reason for going there."¹

The history of public transport in American metropolitan areas in the last four or five decades has been one of diminishing importance in the lives of most residents. As congestion in the centre grew Mumford's prediction was realized. Firms moved to the suburbs, particularly during the 1980s, to enjoy the cheaper facilities and easier access. They followed population and the shopping and entertainment centres which had already moved out. As a result the new trip patterns were more dispersed and less easily served by public transport. The share of trips made using public transport fell, even in the older cities where a single central area remained strong in its own right. In some areas this was coupled with diminishing investment in the transport infrastructure, which reduced the quality of the services being offered still further. During the 1980s many agencies were able to increase ridership however. This was in part a result of system expansions (through the construction of light rail lines or reopening of commuter rail services for example), and in part a result of the general improvement in the economic conditions and higher employment levels.

All public transport agencies have been seeking, somewhat desperately, for means to achieve stability in their ridership levels and even mode share. At the same time they have been looking for ways to reduce the costs of service and the debt burdens which they carry. During the 1980s this desperation was further increased by the changing relationship between government and the public and the private sectors. In this period the role of government was questioned. The question mark over the verity of arguments about public sector ownership protecting consumers from monopoly exploitation, and the need to reduce budgets, produced a new emphasis on public/private partnership.

Hence the recent history of public transport providers has been that of struggling with the decision about where to go from here. Whether to make the switch to the private sector (and while several

¹ Lewis Mumford, The City in History, 1961

agencies in the US have embraced some private participation -- ranging from vehicle cleaning to transport operation -- this has stopped well short of full scale service contracting), whether to incorporate the "non-traditional modes" within the organization, how best to reduce costs etc. In effect the question is what is and what could be the role of public transport in American cities? Is that role solely restricted to the carriage of peak traffic to a central business district of ever decreasing importance? Is it to maintain some degree of mobility at all times of the day, for those without access to cars? Or is it a more general role in the fight against air pollution?

Transport agencies have adopted a whole range of techniques with which to try to regain ridership and reduce costs. These include operations research style quantitative analysis of the service and demand structure, as well as "management style" approaches to the labour relationship, the cost structure, and marketing. One of these management techniques is strategic planning. Though not adopted formally by all agencies, many claim to be approaching their services "strategically." Little assessment of the techniques which they have been using has yet been undertaken however. This thesis represents an attempt to understand the approach which is being used more thoroughly, and to present methods for its further enhancement.

Until the concept of a strategic planning process, and the benefits which can be derived from it are understood, there is no means by which to comprehend the success or failure of such attempts in the public sector transport agencies. Hence the first element of this work is to understand what a strategic planning process in the private sector involves and how this differs, if at all, in the public sector. Various models are described in Chapter 2. These have certain common elements, including the identification of stakeholders, assessment of both the internal and external environments, development and evaluation of scenarios, and finally a structured implementation with evaluation.

A consequent question is the nature of strategic planning as it is performed in public transport agencies. This question is addressed through a review of some 1980s guides to strategic planning in public transport and a small survey of the current use of strategic planning in North American agencies. The results of both the review and the survey are presented in Chapter 3. The survey was sent to planning managers at the eight organizations and requested the following information:

"1) Does your agency have a "Strategic Planning department"? (Or a department under a different title, which you feel might fit such a description?) If so, please explain its relationship to other parts of the organization.

2) Does the agency produce a "Strategic Plan"? If so, how frequently?

3) Who is the audience for the different plans? Are copies distributed to local constituencies or, in any form, to staff or riders?

4) Does your agency have a particular target market or service goal (e.g., a mode share for transit in the morning peak)? Has this changed over the last ten years or so?

5) Is there a market research department? Is there a marketing department? What is the nature of the relationship between these two groups?"

Agencies were also asked to supply copies of their most recent short and long term, capital and operating plans, and a copy of the latest strategic planning document, or any other documents which they felt would be relevant.

The strategic planning processes which the survey revealed is documented Appendix B. Following on from this review, a framework which can be used to assess the external environment is developed, in part from the techniques used in the private sector and in part, by building on the elements which are in the current repertoire of public transport agencies. This framework is presented in Chapter 4. The external assessment was the focus since it is a dynamic environment which is often a motivation for strategic planning — allowing enhanced understanding of the ramifications of different decisions.

Another central aim of strategic planning is to develop a more general market awareness within the organization. A discussion of the importance of a more developed market awareness, the way in which this can affect the strategic planning process, and some different approaches which have been used by public transport agencies to increase this understanding of the market, is also given in Chapter 4.

In order to comprehend better the implications of using the techniques and structure for external analysis developed in Chapter 4, two "case studies" are undertaken. That is, the approach is applied to the Massachusetts Bay Transportation Authority (MBTA), and in San Juan, Puerto Rico. Though there are limitations to the analysis here, not least since it was performed outside the

relevant agencies, the results are presented in Chapters 5 and 6. These two cases were selected in part since they represent two very different organizational environments. The MBTA is a multi-modal, monopoly public entity. In San Juan by contrast there are a number of different operating agencies, some in public and some in private hands. A further motivation for considering these two areas came from the fact that both are currently facing major changes in the transport environment — for the MBTA it is the reconstruction of a major artery through central Boston (the Central Artery) and for operators in San Juan it is the construction of an elevated rail line, along a major corridor into the centre — and as noted above, this is where the benefits of strategic planning can often be realized, through the setting of priorities. The transport systems and socio-demographic development of both areas is explained more fully in Appendices C and D.

Chapter 2: What is Strategic Planning?

2.1 Introduction

Strategy is a technique of warfare, and was originally considered as one of the arts of the Commander in Chief. Strategies in this context tended to be structured around the short sharp burst (the particular battle), with a longer run overarching view (means of achieving ultimate victory). Strategy in the context of the business world can be characterized in such competitive terms (seeking to find and to maintain a degree of monopolistic control in a particular market) or in terms of the skills of the Commander in Chief (or CEO) who has to consider the workings of the whole organization (its supply channels for example) in addition to achieving a degree of success on various measures (victory over opponents / competitors, expansion, contribution to social goals, minimization of required subsidy etc.). Though in essence the art of strategy formation is unchanged in its business application, new levels have been added in which strategies are the outcome of detailed analysis and measurement, based on rational concepts of the moves of the competition (as in Game Theory), and on the changes expected in other aspects of the operational environment. Private sector interest in the techniques of strategic planning was especially strong in the 1970s, and in the public sector interest grew sharply in the 1980s. This chapter seeks to consider strategic planning as it is usually understood, and where the strengths and weaknesses of the planning process lie. A generic model (largely based on the Harvard Policy Model) is first described, as are the necessary actions at each stage of the process. Consideration of some of the public sector applications will conclude the chapter.

Strategic Planning is a concern for the whole, a consideration of the future goals for the company (the strategy), and evaluation of different methods by which to achieve those goals (the planning). Hence it is an evolving process, with the typical structure being one in which long term plans are set (for a period of 3 or 5 years typically), and then these are revisited more frequently (generally annually) for updating and measurement of company success in achieving those goals. Strategic plans provide guidance for current decision making by considering the possible effects on the future, and the manner in which the most desirable future could be attained. Anthony defined strategic planning in 1965 as "the process of deciding on objectives of the organization or changes in these objectives, on the resources used to attain these objectives, and on the policies that are to

govern the acquisition, use, and disposition of these resources.”²² There are of course many other definitions of the process but all are united in agreeing that a firm will be made more effective through the use of planning.

2.2 The Strategic Planning Process

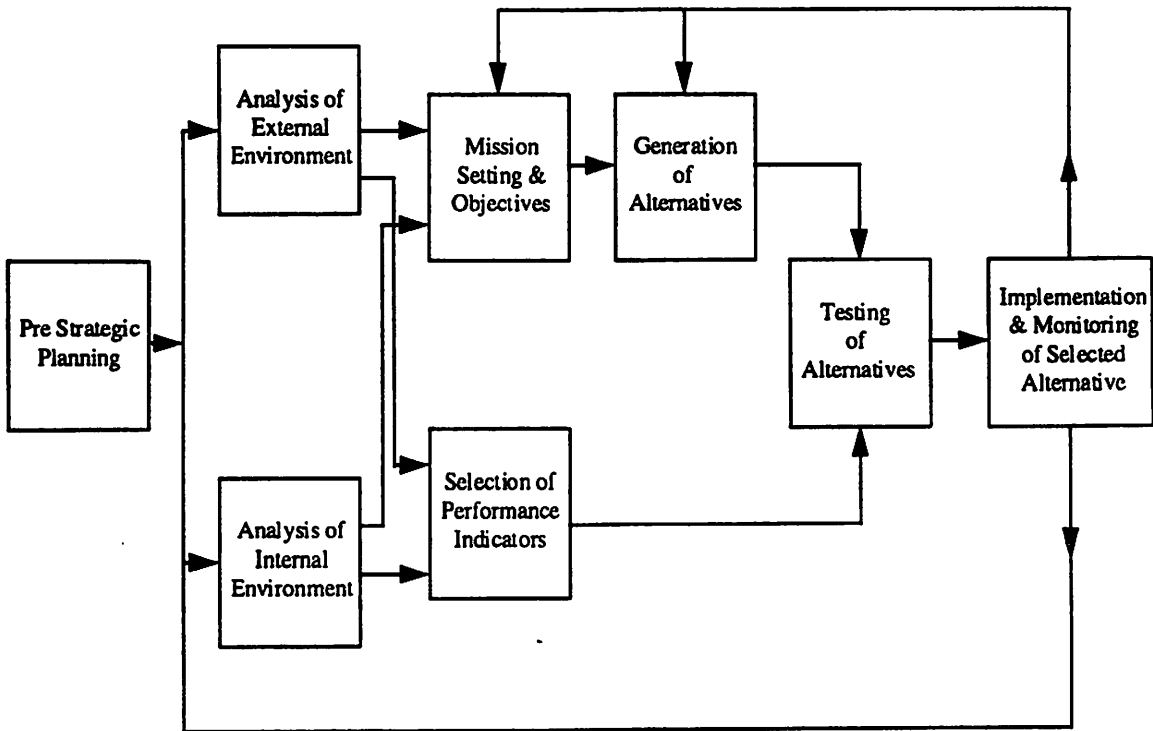
A typical framework for the strategic planning process (shown on diagram 1) would include:

- Analysis of Internal environment -- including the identification of stakeholders and strengths and weaknesses of the firm, including the reasons for past failures
- Assessment of the External Environment -- including the identification of stakeholders and opportunities and threats which await the firm
- Formulation of Objectives and setting of particular performance indicators for each objective
- Construction of alternatives
- Testing of these alternatives -- through the application of various modeling and prediction techniques
- Selection of an alternative
- Implementation
- Monitoring and Re-evaluation

There are a range of feedback loops within this general framework -- from the evaluation to the testing of alternatives or the assessment of the operating environment, from the testing of alternatives to the construction of the alternatives and so on. As with all planning processes the aim is to establish a balance between setting guidelines and objectives, and stifling creativity within the firm. Other authors have stressed a different pattern in the planning process from the one outlined above, though this is a reflection of the concerns which appear to arise most frequently. (Appendix A provides examples of some of the different strategic planning frameworks which have been proposed.)

²² R. Anthony, Planning and Control Systems: A Framework for Analysis, 1965

Figure 2-1: The Strategic Planning Process



Despite the proposal of a range of different approaches to strategic planning in the last two decades a framework of this sort, which is based on the Harvard Policy model has continued to dominate in practice, though more recently strategic planning has been seen as only a part of the overarching strategic management process. Strategic management is more an organizational methodology, focusing on the link between the strategic, the long range, the short range, and the operational plans. Writers on strategic management often stress that strategic planning cannot exist without the organizational structure to support it, and belief and commitment, to the goals and objectives, at all levels of the organization.

The Harvard Policy Model is based on the principle of investigation of the strengths, weaknesses, opportunities and threats of the firm (SWOT or WOTS - up analysis). The strategy is then built by attempting to find the best fit between the internal (S,W) and external (O,T) environment. Little in the way of guidance for how different potential responses to the environment is given by the model, which instead assumes that a top management team can agree about the firms situation and the appropriate response, and that this team is then able to enforce its actions adequately. Empirical

investigation has suggested that the model is most suitable for application at the strategic business unit level. (The SBU is a distinct business with its own competitors, which can be managed independently of the other units within the organization.)

The model described above builds on this notion of environmental assessment and supplements it with the use of strategic planning processes advocated by other authors. For example, the first element is the *Identification of Stakeholders*. Freeman³ characterized corporate strategy as the method used by corporations for relating to their stakeholders and posited that the strategy will only be successful if it satisfies the stakeholders. Stakeholders include for example, customers, employees, shareholders, suppliers, financial institutions, the media, and government. The stress on the importance of the stakeholder has grown markedly in recent years and ties into the notion of Total Quality Management, where the competitive advantage of any firm is seen to depend, to a great extent on the satisfaction of its customers and employees. The satisfaction of each stakeholder group may depend on the organizations ability to discriminate between different groups and to react to each separately. The identification of stakeholders also allows the firm to consider explicitly the importance of different interest groups to it, and hence set priorities when weighing the competing claims of each group.

There has also been much debate about the virtue of widening the field of "participants" in the planning process within the firm. Participation ensures that the analysis benefits from the knowledge of those working closely in the field (who can presumably provide a greater degree of insight into the important issues or feasibility of different strategies for example), facilitates the communication of assessments, alternatives, and choices within the organization, and, it has been argued, increases the potential for success since playing a role in the planning process will reduce the resistance of an employee to the implications of the chosen strategy. However the potential for disruption of the process by those who are concerned to maintain old working practices, or those who feel disgruntled since the chosen strategy was one which they were had not favored, may negate some of these benefits. Though the empirical results appear to be mixed on this subject, (in part due to the difficulty of integrating different terminology across studies⁴), there has been a tendency for private sector firms to move towards functional management structures and hence the

³ R. E. Freeman, *Strategic Management : A Stakeholder Approach*, 1984

⁴ J. S. Armstrong, The Value of Formal Planning for Strategic Decisions : Review of Empirical Research, *Strategic Management Journal*, Vol. 3, 1982 & A Reply, Vol. 7, 1986

managers in each area (who tend to be at a lower level in the organization than those who had traditionally formed the small strategic working team with the CEO, as was most feasible with the Harvard Policy Model) are given greater roles in the strategic process.

The next two stages in the strategic planning process as it outlined above, are the central themes of the Harvard Policy Model. In the *Analysis of Internal Environment* companies look to each sector of their operations and assess its structure and success or failure in the past. Clearly this will be a function of decisions taken in other strategic planning processes in the past (amongst other things). A concern for understanding the mistakes of the past is critical, especially in light of the uncertainty in predicting the future.

This assessment of the internal environment can be viewed as part of a "logical incrementalism" approach (a system for policy formulation identified by Quinn⁵), which in effect telescopes the situational assessment and the strategy selection, and requires decentralization of the decisions and actions. The strengths of this approach are that the policy decisions can be made by those closest to the problem, minor as well as more major issues are considered, and informal and formal structures can be used. Its weaknesses lie in the fact that there is no necessary tie up between individual decisions and the overall corporate purpose. In following the more traditional model to assess the strengths and weaknesses of the firm, the most difficult aspect can be to assess their strengths, for example if the firm has been a success in a particular market, how could that be transferred to another. Hence comparative analysis (with other divisions in the firm, or with other firms) is often used, or the performance of each unit can be assessed against some abstract standards (perhaps set in the preceding cycle of strategic planning.)

⁵ J. B. Quinn, Strategies for Change : Logical Incrementalism, 1980

There are a range of methods for the *Analysis of the External Environment* taken from economics, statistics, or the social literature, for example. These may or may not be based on some assumptions about a causal structure and may even be more subjective, for example the pooling of expert opinions. The commercial aspects of the environment will clearly be of concern but strategic planning generally requires that the firm also considers the legal, social, and political trends of potential importance for their business. The analysis generally includes assessment of the current situation, likely trends, and potential disturbances. Competitive analysis is one model which has been used to isolate the forces which shape an industry. Porter⁶ has hypothesized that there are five key forces which shape an industry:

- relative power of customers
- relative power of suppliers
- threat of substitute products
- threat of new entrants
- degree of rivalry between firms in the industry

The stronger these competitive forces, the less likely the firm is to be able to establish an area of comparative advantage, and hence the more difficult the isolation of a strategic plan. However identifying each force does allow options to be considered explicitly in each area of competition or opportunity.

Bowman⁷ proposed four areas which could be viewed as potential goals for the firm -- Profit, Growth, Risk-Aversion (or Flexibility), and Social. Economists may see the maximization of the first two of these elements as objectives with the second two as constraints. How far the *Formulation of Objectives* and the setting of goals are different will vary from firm to firm. Some isolate the strategic objective, and goals then stem from that and performance indicators are established for each goal to try to assess the strength of the policy decisions which have been made. Other firms set specific goals and then select strategies with the feasibility of achieving these goals as the constraint. As noted earlier, the firm is seeking areas in which it will be able to create some form of localized monopoly, hence the objectives may well be set on the basis of different

⁶ M. Porter, *Competitive Strategy*, 1980

⁷ E. H. Bowman, Epistemology, Corporate Strategy and Academe, *Sloan Management Review*, 1974

specializations or market niches or instead more generally in the growth rate, or return on investment of the firm as a whole, or a customer satisfaction index.

Management research has produced a range of different techniques for the *Construction and testing of alternatives*, such as brainstorming, expert opinion groups, feasibility assessment by the strategic planning group, with a range of information papers to inform the selection, or the construction of different scenarios with best and worst options compared. Surveys of relevant stakeholders can also be made with which to inform the selection and again to involve others in the strategic planning process. The construction of different scenarios with a range of different, often quantitative, techniques to isolate the absolute effect of any changes, allows the firm to consider effects of their actions in the current situation as well as in the future. Scenarios testing is often the main thrust of a planning process, and contingency measures, a critical facet of this since if the assumptions which have been made about the future environment were to prove to be false, other options would then be available.

Once the *Selection of an alternative* is over a planning document is generally drawn together. Rowe et al.⁸ have stressed four components of a strategic plan :

1. Definition of the desired future scope of the company -- including a statement of identity
2. Description of the competitive advantage of the company including its distinctive competition in relation to its competitors, and the market niche it intends to occupy
3. Statement of the purpose, goals, and objectives of the company and the measures used to evaluate performance.
4. A statement of how to allocate resources needed to implement and execute the plan.

In effect the plan should include elements of an organizational guide for action, not merely a "wish-list". Whether or not the firm includes specific budget decisions in this plan is a role for the strategic management. However *implementation* of the plan and the *monitoring and re-evaluation* are critical to the success of the project.

⁸ Rowe, Mason, Dichel, Synder, Strategic Planning : A Methodological Approach

2.3 Success in a Strategic Planning Process

If the strategic planning process is only viewed from the competitive standpoint, then success will be characterized in terms of a growth in the market share or demand levels. However when the more general view is taken in which it is the role of the strategic planner to act as the Commander in Chief so that the "whole" picture is viewed, then success could be measured in increasing returns, higher shareholder dividends, capital replacement, level of customer/employee satisfaction, extent to which identified problem areas are avoided or future trends are predicted etc. Clearly if particular thresholds were set in the objectives of the strategic plan then achieving these would be a form of success, though whether they were the most appropriate goals may depend in the assumptions made about the operating environment and the actual developments there. Characterizing the success of the planning system itself should depend on the stage which has been reached in its development. Thus, since the current state of the company will be a function of past strategic choices, an evaluation of certain facets of its performance as the new strategic plan is introduced may not be constructive. Hence in the early stages a measure of success could be that the key planning objectives are being stated, and ways to incorporate these goals into the working practices are being sought, in different divisions of the company.

As noted earlier possible threats to the planning process include a lack of commitment, insufficient resources, dysfunctional management behavior such as not accepting the outcomes of the planning process, or a lack of involvement of the line managers in the planning process. One strand of debate has been the need for formal as opposed to informal planning. Formal planning would be structured within the company along the lines laid out above and used to produce regular strategic and short term plans, to set budgets, and to analyze (and perhaps then modify) the responses to the new plans. The senior management would be involved, requesting background reports from a planning division on particular aspects of the two environments and these would be put together using different planning tools (market research or incremental cost models for example.) Informal planners would not follow such a structure and the combination of tools used would vary. There has been no conclusive empirical evidence to suggest that the formal model produces a much superior outcome for the firm, though it tends to mean greater investment of resources and commitment from top management, in themselves necessary criteria for the success of the process.

Venkatraman & Rammanujam⁹ postulated that organizational context influences the orientation of the planning system, its coverage, emphasis on techniques, and attention to the internal and external factors. This in turn determines the capacity of the system to support overall strategic management. The model which they developed suggested that the indirect effect of resources (e.g., motivation for planning success may be greater if the resources devoted to the task are more substantial) on the system capability was significant and stronger than the direct effects. It is the integration of the external and internal facets which lies at the core of effective strategy development in their model, since each affects the system capability in a more significant manner than does whether or not formal planning techniques are used. The formal techniques in this instance can range from the use of simple heuristics to far more complex models. The other concern which they model is the extent to which the planning system covers a broad range of functional areas within the firm and they note that "The quality of the strategic decisions is considerably enhanced if the system is capable of meeting the various requirements of strategy formulation, evaluation, and implementation." In the public sector Meyer¹⁰ among others has stressed the importance of the evaluation phase.

Bowman identified four aspects of the control phase of a strategic plan:

1. Continuing Measurement of Performance on Particular Goals. The goals which he specified were Profit, Growth, Flexibility, and Social.
2. A check of programs, budgets, and other instruments of the plan implementation to ensure that they are consistent with the plan, that they flow from it, and that they serve the strategic goals. He stresses the importance of this aspect since it is likely that the specific instruments will be developed within functional areas by those who were not as involved in the strategic planning process as were the top management, and will be developed at different stages of the life of the plan.
3. Reports on the performance of various programs against specific standards. These may be lost in the general budget control figures and hence should be reported separately for key programs.

⁹ Venkatraman & Rammanujam, Successful Implementation of Strategic Planning Systems : A Path Analytic Model, Sloan Working Paper, November 1985 & Modeling the Effectiveness of a Strategic Planning System, April 1987

¹⁰ M. Meyer, Strategic Planning in Response to Environmental Change, Transportation Quarterly, April 1983

4. Continuing monitoring of the assumptions and predictions made about the environment, so that the strategy can be modified in some manner if necessary. It is at this stage that the earlier contingency analysis may prove to be valuable.

2.4 The Public Sector and Strategic Planning

The rise of strategic planning in the public sector came about in the 1980s, at much the same time as the planners of the corporate world were beginning to consider new options, largely in the sense of devolving more responsibility for the planning decisions to lower levels in the managerial hierarchy, and beginning to view strategic planning techniques as only one element in "Strategic Management".

Public agencies and local governments have generally had a strong commitment to the process of planning. The elements of strategic planning which were perceived as new for the public sector are characterized below.

- The concentration on the public organization, rather than the community, and the focus on its results. i.e., how can the division or government improve its performance.
- Asking the question "what should the role of the government/public sector be?", rather than considering performance in the existing roles alone.
- Consideration of the whole. Though public planning had in the past required comprehensive plans these had been drawn up sector by sector and released as a single plan, rather than by combining the various functional parts for assessment as a whole.
- It was being adopted in a period of fiscal constraints and hence the strategic planning provided a new tool for approaching priority setting under the need for cutbacks.
- The strategic model of planning was seen to come out of the private sector.

The last point may be indicative of the notion that the process and terminology of strategic planning are merely representative of another managerial fad. However in a small survey of public planners in 1987, Kaufman and Jacobs¹¹, found that despite the acknowledgment by planners that the techniques of strategic planning did not differ markedly from those of the comprehensive planning of the past, the revival of interest was invigorating the process. This was less significant

¹¹ J. L. Kaufman & H. M. Jacobs, A Public Planning Perspective on Strategic Planning, APA Journal, Winter 1987

in communities which had already a high level of commitment to participation of the wider audience in the planning process and where the public planning function tended to be weak, the tools of strategic planning were more favored.

Often the terminology of Strategic Planning has been used in the public sector in a loose manner. Hence comprehensive planning programs have been left intact and retermed "strategic". This it is argued by some (including Bryson and Roering) detracts from the potential for strategic planning to be useful in the public sector. A full appraisal of the tools available should be made before the appropriate techniques are selected in each instance. Contingency models, stakeholder analysis, and objective setting may be the most critical aspects of the strategic planning process for the public sector for example.

The next chapter will discuss the use and understanding of the strategic planning process in the transit industry.

Chapter 3: Public Transport Strategic Planning

This chapter provides a brief review of the history of strategic planning in North American public transport agencies, and of the past papers written on this subject. Most of these papers originate from the early to mid 1980s and hence were written at a time when the experience with strategic planning was limited. These reports could therefore draw only few conclusions about success or failure and instead took the form of manuals to guide agencies considering a strategic planning exercise.

The results of a recent survey of strategic planning experience at a number of North American agencies are also reviewed and some comments are made about the most effective use of strategic planning, the critical elements for success, and some pitfalls in the process.

3.1 Past and Documented Experiences with Strategic Planning in Public Transport

Since the early 1980s the notion of strategic planning has been increasingly discussed and applied in the field of public transport. The Port Authority of New York and New Jersey, New Jersey Transit, and the Toronto Transit Commission (TTC) were amongst the first agencies in North America to adopt a strategic planning process. Interest in the United States was stirred in part because of a widespread perception that the federal funding levels would be declining in the coming years and that therefore a public transport agency would benefit from a conscious focus on the objectives and goals which it was trying to meet. Optimal allocation of a diminishing resource pool would be facilitated by having such established priorities. Local Federal Transit Administration officials were amongst those urging the use of strategic planning techniques. The mental association of strategic planning with private sector managerial effectiveness increased the perception of value in such a process. Associating changes within public sector agencies with private sector initiatives was generally accepted as useful, since funding bodies would feel reassured that there was a higher likelihood of efficient operation.

In Canada, by contrast, the motivation for commencing the Toronto strategic planning process was a 1978 review of policies and an assessment of the future for public transport in the metropolitan region, undertaken by the TTC itself. This review determined that, for TTC to survive through the

1980s, a fundamental review of the environment, and some serious decisions would be required. Hence establishing strategic planning processes was driven, in both the United States and Canada, by a sense of crisis in the external environment for public mass transport service.

Since this upswing in interest in public transport agencies came in the early 1980s a number of review papers and reports were published in the later years of the decade. Many of these summarized strategic planning concepts in the private sector, noting particularly the differences between the public and the private sector, and undertook case studies of different processes adopted by public transport agencies. Processes for strategic planning in public transport were then laid out. Within these reports there is also an explicit consideration of strategic planning for the smaller agency (of which there are many in the United States), where planning staff and resources are in short supply and the ability to retain quantitative information for monitoring is more limited.¹²

For example, The TRB Committee on Strategic Management¹³ drew up a check list for public transport organizations considering strategic planning which included the following points :

- Organization's Mission — what is its mission? Where does it want to be in five years?
- Environmental Scanning — What role do factors outside the agency play in its ability to achieve its mission? What effect might external trends have?
- Market Analysis — Who are the customers (now and in the future)? Are there markets which are currently under served? Are there new markets to be identified? Is the agency customer oriented?
- Strengths and Limitations — What does the agency do well? What is inadequate in its service?
- Stakeholders — Who are the agency's friends? Who are its enemies?
- Opportunities and Threats — What areas lead to success and growth in the future? Are there factors which threaten?
- Critical Issues and Strategies
- Strategic Management

¹² Boyle and Ouderkirk, Strategic Planning for Transit Agencies in Small Urbanized Areas, TRR 1402

¹³ As reported by Boyle and Ouderkirk

The reports reveal that the central areas of concern in the strategic planning processes were the evaluation of options, and monitoring of implementation. The stress also tended to be internal, and fairly quantitative, with some reference to external funding sources and developments in urban areas. The Department of Transportation's guide for strategic planning¹⁴ suggests that evaluation should be in terms of :

- Costs
- Personnel requirements
- Agencies and organizations involved
- Time frame
- Impact on environment
- Legal implications

The DOT guide also provides a seven step planning process which could be used by a public transport agency to structure its strategic planning process:

1. Organize management team and planning staff
2. Environmental analysis and situational audit
3. Establish mission, goals, and objectives
4. Develop broad strategies
5. Establish programs and budgets
6. Monitor program and measure results — feedback loop with step 5
7. Monitor environment — feedback loop to step 2

Others were also considering the problem of strategic planning in this period. For example, Meyer too proposed a framework within which agencies might work through a strategic planning process.¹⁵ He stressed the importance of implementation being considered during development of plans, and then being monitored in its progress towards the goals and objectives. These goals and objectives should consider both the internal and external environments. He outlined the following four steps :

¹⁴ US DOT, A Guide to Strategic Planning for Transit Properties, Final Report, December 1988

¹⁵ M. D. Meyer, Strategic Planning in Response to Environmental Change, Transportation Quarterly, 1983; M. D. Meyer, Strategic Management in a Crisis Oriented Environment, TRR 1156, 1988

- **Assessment** — of the opportunities and constraints in an organization's environment
- **Analysis and evaluation** — an examination of alternative courses of action to enhance the organization's position in meeting future needs
- **Choice** — including a clear articulation of an organization's goals and objectives as well as a choice of decision making framework and authority structure for implementation
- **Implementation** — with monitoring of progress

All of the reports stress the importance of top level management, who directly influence the course of any planning process and affect its probability of success. Just as in the private sector literature on this topic, strong support from top management is regarded as crucial. This support will ensure that sufficient resources are devoted to the planning process and that commitment to the investigation of different scenarios is more likely. Importantly too, top management will ensure that the plan is fully implemented and that the organization's focus is turned in the direction advocated by the strategic plan. The importance of tying personnel performance criteria, and reviews, to the attainment of strategic objectives was also stressed in these reports.

Hemily notes that the process of strategic planning is particularly important in an unstable operating environment.¹⁶ He surveyed North American public transport operators, who provided a list of factors which they considered to be significant deterrents to successful strategic planning in public transport. These factors were changing federal policies and state politics, local politics, the complexity of the environment, a lack of staff resources or good information, the "fishbowl" environment, high rates of management and Board turnover, the rapidly changing environment, and a strategy which was set informally by the Chief Executive Officer.

There has also been a wider discussion of elements working against strategic planning in publicly owned transport agencies. For example:

- **Relatively intense public scrutiny and political pressure** — which make a long term investment in strategic planning a less attractive proposition, since results are not likely to be realized in the short run (financially and to a lesser degree operationally)

¹⁶ Brendon Hemily, Strategic Planning in Small and Medium Sized Transit Agencies -- A Discussion of Practice and Issues, URTP, UMTA Technology Sharing, August 1986

- Mandated objectives for a public agency — hence, for example, shifting the core business is unlikely to be feasible
- Ambiguous and numerous goals (service, social, fiscal, employment etc.) in a publicly owned transport authority — by contrast with the small number of clear goals in a private sector firm (profits or growth)
- Loose financial controls within public sector organizations — these tend to be far less strict than in private firms. In addition the allocation of resources through the political process can make commitments to certain objectives more difficult in the public sector.
- Complex and indirect decision making processes in public organizations — by contrast with those in private sector organizations
- Frequent changes in top management

The Department of Transportation report on strategic planning¹⁷ characterizes three different types of planning with longer horizons, as follows :

- Long Range Planning : Assumes relatively stable and perhaps closed environments, and focuses on factors within the organization's control.
- Strategic Planning : Externally driven and assumes a changing environment. Analysis of external change, formulation of organizational objectives, and the establishment of priorities for resource allocation.
- Strategic Management : Involves decision making as the formulation, implementation, and evaluation of actions that will enable an organization to achieve its objectives.

Though this involves only a limited definition of strategic planning, the conclusions which the DOT report draws from this breakdown — that strategic planning and management should be interwoven — is interesting as it ties in with the views of Meyer, and others, that implementation and evaluation are critical aspects of any strategic planning process. There are also a number of reports which stress the importance of integrating the budgetary and strategic planning processes. Once budget considerations are tied in then the strategies become more feasible, and the timeframe for changes more likely to be achieved.

¹⁷ US DOT, A Guide to Strategic Planning for Transit Properties, Final Report, December 1988

The DOT report also stresses the importance of creating an explicit scope for strategic planning and management in the organization, and that this should be clearly communicated both internally to all employees and externally. The validity of this recommendation was illustrated during the first application of strategic planning at the New York Metropolitan Transportation Authority.¹⁸ A group of managers from each of the operating subsidiaries developed an initial set of assumptions as a common basis from which to draw together the authority's first year strategic planning priorities. Among these assumptions was the assertion that the available funds might fall short of the level required for full plan implementation. This laid the authority open to charges that the top management was pursuing a strategic planning exercise with the sole purpose of reducing services. This was at odds with management objectives and created a more difficult climate for the implementation of the full strategic planning process. The effect of poor communication and the importance of clear communication were thus highlighted.

Hemily, in his report on strategic planning in smaller public transport agencies¹⁹ noted the following benefits of strategic planning:

1. Provides a systematic process for charting the organization's course
2. Assists individual decisions and establishes an overall system for policy development, which implies a more effective organization
3. Helps to ensure effective use of the organization's resources
4. Identifies future problems and opportunities
5. Provides an opportunity to recognize the constraints
6. Forces an articulation of the agency's goals and objectives
7. Helps to reduce delays through explicit consideration of implementation strategies
8. Provides a basis for measuring organizational performance, and
9. Provides opportunities for all levels of management to participate in development of the agency's strategy

Most of the reports do not however discuss the relative importance of involving the riders, taxpayers, other government bodies, or elected officials in the planning process. In some cases this was undertaken at an early stage, for example Meyer describes the TTC process and notes that the

¹⁸ Mark P Howard, Successfully Establishing a Strategic Planning Process, TRR 1156, 1988

¹⁹ Hemily, Strategic Planning in Small and Medium Sized Transit Agencies, 1986

early stages involved much data gathering, which led to the identification of three critical aspects: 1) gaining political support for funding programs, 2) working with the three levels of government and their urban policies, and 3) establishing a constituency among the general public. In New York on the other hand, after the common set of assumptions had been drawn up by the managers from different subsidiaries in 1985, each subsidiary worked towards a first year planning document. The Metropolitan Transportation Authority worked with elected officials and local communities concurrently, to ascertain areas of interest and concern. These were then addressed in the second and third years of the strategic planning process.

To summarize, the major points emerging from these reports were:

- a) The central role which implementation should play — and more particularly how this is tied into the development and evaluation of scenarios and then monitored
- b) The critical impact of top management support for a process and a clear set of objectives
- c) The importance of evaluation and quantification

The reports, as noted, discussed a whole range of techniques, drawing mostly on literature from private sector implementations and general observations about the state of the public transport industry. There has now been more experience with using these techniques in public transport and some of these experiences are reviewed in the next section.

3.2 State of the Practice

During 1994 a survey of seven North American public transport agencies was carried out in order to determine the extent of strategic planning within these agencies, what the term meant to them, and how successful these initiatives had been. Each agency was selected since there was reason to believe that there was, or had been, a serious attempt at establishing a strategic planning process. The survey was in effect an attempt to understand the state of the practice. The agencies contacted were as follows:²⁰

²⁰ with thanks to Peter Benjamin, WMATA, Carol Lavoritano, SEPTA, Linda Kleinbaum, Darwin Stuart, CTA, G. B. Arrington, Tri-Met, Peggy Willis, Metro, and Juri Pill, TTC

• Metro (Seattle, WA)	Metro
• Tri-County Metropolitan Transportation Authority (Portland, OR)	Tri-Met
• Chicago Transit Authority	CTA
• New York Metropolitan Transportation Authority	NY MTA
• Southeastern Pennsylvania Transit Authority (Philadelphia, PA)	SEPTA
• Washington Metropolitan Area Transportation Authority	WMATA
• Toronto Transit Commission	TTC

More details about the processes followed by each of these authorities is contained in Appendix B. Information on the strategic planning process in London is also included in this appendix. These examples are used below to illustrate how far the comments made in the 1980s, and discussed above, remain true within the public transport industry today. However this presentation is not a full discussion of all strategic planning which has been undertaken within North American public transport systems since the late 80s, rather it is a sample with some different approaches to, and experiences with, the process.

This small group of agencies do shed more light on some of the important aspects and some of the potential pitfalls of a strategic planning process when used in the public transport industry, as well as some of the factors which can lead to a process contributing significantly to an agency's development. The discussion in the next few paragraphs concentrates on those aspects of the strategic planning process discussed in the past reports and noted above, i.e., 1) motivations for introducing a strategic planning process, 2) implementation, monitoring, and budgetary control, 3) level of management support, 4) scope or definition of strategic planning, and 5) breadth of involvement in the process. This is followed by a more detailed evaluation of different factors which have been important in contributing to the "success" or "failure" of these processes. Finally, a brief discussion of some other conclusions which arise from these more recent reviews is presented.

1) Motivations for introducing a strategic planning process — In both New York and London legal requirements (state and national respectively) mandate strategic planning processes. In New York, this takes the form of a yearly review of a five year strategic plan, produced to ensure that each subsidiary has considered its environment, both internal and external, and priorities. The

subsidiaries are required to address four central questions about their perceptions of the way ahead. In London on the other hand the strategic planning process is undertaken every three years. It provides scope for London Transport (the oversight and planning agency for bus services, planning agency for new rail schemes, and holding company for Underground operations) to consider the direction in which current investment and operating expenditure is taking them, in conjunction with a review of the desires of customers (in the widest sense), to determine whether some changes to the current policies are warranted. The subsidiaries are less involved with this process than is top management, in part since it is not viewed as an exercise for analysis of different options or for decisions on implementation procedures. Detailed, quantifiable goals are not set in this process, though the broad strategies and highest investment priorities are discussed.

At WMATA the impetus for a strategic review came following a change in top management at the agency. The new General Manager brought a perception that having focused on the development of a heavy rail system, the central questions for the agency had shifted to those of ongoing development and operations. However after only a year of the strategic planning process, in which a number of areas of interest or concern were highlighted, including a very wide range of internal and external factors, another change in General Manager signaled the end of the project. In other cases the motivations were similar to those discussed in the past reports, particularly in response to perception of some change in the external environment — whether through the availability of funding or from changing socio-demographic structures.

Some commentators have stressed the importance of a sense of crisis in encouraging the introduction of a strategic planning process. However, at another agency, the Massachusetts Bay Transportation Authority (MBTA), a sense of crisis developed in the early 1980s, as a result of costs having escalated to such an extent that funds were exhausted before the end of the fiscal year. The crisis led to legislative intervention in the management of the agency and not to the implementation of a strategic planning process. Similarly management change and a market orientation have been slow to develop.

2) Implementation, monitoring, and budgetary control — For many of the agencies reviewed here, strategic planning is a question of development of a long range plan and an awareness of marketing. Hence in these cases there is less of an orientation to the traditional private sector

external and internal environmental analyses and ensuing evaluation of different alternatives. Perhaps as a result of this more fluid definition of strategic planning, few of the cases produced a detailed strategic plan in the sense described in previous research or in the mainstream management literature. Rarely are there structured internal and external reviews followed by scenario evaluations nor is a consideration of implementation always a part of any evaluation which is performed. A notable exception to this is NY MTA, where each subsidiary produces quantitative as well as qualitative goals towards which to strive. Progress towards each of these goals is then measured through the year, and reported in the subsequent strategic plan. (Each subsidiary is given leeway to establish the most appropriate balance between the qualitative and the quantitative, given their current state of operation.)

Since 1991 federal regulation has required public transport agencies (through the Metropolitan Planning Organizations) to ensure that their published plans are fiscally realistic, over a 20 year horizon. Hence investment strategies are tempered by the constraints of plausible budget assumptions. However the strategic plans are not in all cases directly related to the budgetary process, and in most cases are not produced within the financial/accounting department of the agency. At SEPTA, the long range plan and capital budget program are fully compatible. However there are few quantifiable objectives in the "Vision of the Future" document, which could be considered the SEPTA strategic plan.

3) Level of Management Support — As noted earlier the level of top management support has been cited in much of the management literature as a key ingredient for success in strategic planning. The literature on strategic planning in public transport would seem to endorse this view and the recent experience reviewed here lends further support to the thesis. In New York, management support boosted the instigation of a strong strategic planning process in the mid 1980s, and continuing senior management commitment to the process has meant the production of detailed and continuing strategic plans, at the subsidiaries as well as the regional body. There has also been some continuity in the management body, with the Chairman of Metro North Commuter Railroad, where strategic management may have been one factor in the development of a strong operating agency, moving to the Chairmanship of the NY MTA in the early 1990s. By contrast in Chicago where there were five different executive directors in the nine years from 1985 to 1994, the strategic planning process only received whole hearted support under one of these men. Despite

the different internal and external goals and an implementation framework, which were established in 1991, the process was abandoned in 1994. CTA does appear to have become more customer oriented, in part as a consequence of the strategic planning initiative, however the abandonment of the overall process was a direct result of change in top management.

4) Scope and definition of strategic planning — As noted above different agencies have defined their strategic planning processes in different ways, whilst for some the focus of the process has evolved with the changing needs. For example at Tri-Met the early strategic planning efforts were directed internally, when it was clear that operational difficulties threatened the agency. Having made improvements in this area, the strategic outlook shifted to customers and the manner in which the agency could more fully respond to their needs. Most recently the agency became aware that trends in ridership were not conducive to continued long term operation. As a result the strategic process has turned its focus towards leading change in the nature of development in the metropolitan area. Other external factors were reviewed before this strategy was adopted, and this provided the agency with sufficient grounds for taking the view that such a strategy had a chance of success. Such flexibility may provide the best indication of success in strategic planning.

The processes adopted by these agencies, as noted before, have not, on the whole, been structured along the lines of the private sector strategic planning processes outlined in chapter 2. Nor have they been equivalent to a management review, or to a re-engineering effort. There has also been little attempt to alter the core business or to consider other operating structures for public transport in the region. The failure to reconsider the core market results in part from a failure to clarify and more specifically, to limit objectives. Though most agencies have not considered other operating structures there are notable exceptions. For example, in both Seattle and New York it has been accepted, at different times, that there are some markets in which conventional public transport service cannot compete. The agencies have therefore either halted their provision of service in these markets or have expanded into unconventional modes.

Those agencies which have used the strategic planning process for a thorough review of the structures through which public transport services are provided, and for assessing needs, include NY MTA and London Transport. Those which have focused more on the long range goals and generalized strategies include SEPTA and TTC. It may be at this level therefore that the nature of

the political and institutional environment becomes relevant. Both LT and NY MTA are regional bodies, with operating subsidiaries or contractors. Both are required to undertake strategic reviews and both have questioned the structure for service provision within their region, though this has been more extensive at London Transport. Not one of the agencies reviewed has questioned the geographical limits of the area in which it provides service, or from which it receives funding. (Though this has been done at the national government level in the UK, on a number of occasions.)

Almost every one of the processes adopted by the agencies reviewed here led to the development of a mission statement accompanied by a set of goals and objectives. Only at NY MTA, WMATA, and LT (which has a mandated mission) was a mission statement not developed within the strategic planning process. However NY MTA did consider the reasons for its existence, and has a set of four questions relating to service provision and fiscal constraints, which each subsidiary answers in its strategic planning process, and WMATA has developed a mission statement outside the strategic planning process.

5) Breadth of involvement in the process — Broadening involvement in the strategic planning process to customers, or to employees, is rare. In London there is a mandated consultation process. LT has chosen to interpret this requirement very broadly, and solicits input from riders as well as institutions, other government agencies, and governing bodies in different areas of the city. However the process is conducted internally at a relatively high level of management. In Toronto, the TTC did attempt to solicit the views of its riders in the most recent round of plan development, but was not successful in generating many responses. Most agencies do distribute copies of their plans to a wide audience, particularly to local elected officials. The plans tend to be produced with professionalism, and with a clear awareness of the impact that the presentation of a concept can have. Hence for example, in Tri-Met's recent strategic plan — where the emphasis has moved to an attempt to alter the external operating environment and to affect the perceptions of a wide stakeholder group — the plan is produced with many drawings, plain English, quotations from American heroes, and is printed on recycled paper.

3.3 Aspects of the different processes which contributed to "success" or "failure"

The factor most likely to affect the chance of success is the level of top management support for a strategic planning process. Few of the agencies reviewed demonstrated evidence of a steady commitment to the strategic planning process. This fluctuating support stemmed from changing

top management attitudes. Where strategic planning has been successfully introduced (notably NY MTA and Tri-Met), there are a number of important factors in the success, and top management support is among these. However where attempts at strategic planning have had only moderate success or have failed, top management support has not been consistent (CTA and WMATA for example).

Another important factor is the structuring of a process for planning and implementation. Explicit objectives to be monitored during the implementation of the strategic plan are key elements in achieving success. Most of these large agencies are sufficiently developed in the analytical and quantitative areas so that staff capable of such detailed assessments of the environment are available. There are of course significant costs associated with this sort of data collection and more generally with a full strategic planning process. Had the implementation goals of each of these strategic plans been as explicit as those being presented by NY MTA (e.g., Metro-North has a target Cost Recovery Ratio for 1998 of 54.1%. In 1992 they achieved 53.7%), some evaluation of the degree of success of these processes might be obtained. However as it is, with few explicit and quantifiable goals, the evaluation must be more subjective.

In the table below (Table 3-1) the strengths and weaknesses of the different strategic planning processes are highlighted, as are the factors which were important in the development of such processes. As is clear from the preceding comments, these agencies have taken very different approaches to strategic planning. Some consider the process at a very general level, of setting a few targets, usually not quantifiable, towards which to work. These are not translated into specific management actions. At the other end of the spectrum some agencies have used the strategic planning process to involve lower level staff in the managerial framework, have related budget and strategic plans, and have produced specific quantifiable targets against which to measure progress.

Table 3-1: Strengths and Weaknesses of, and important factors in, the strategic planning processes

Authority	"Strengths" and "Weaknesses"	Important Factors
Metro	Strengths — long & short term plans produced Weaknesses — limited quantification.	Top management support. Customer awareness. "Non-traditional" services developed.
Tri-Met	Strengths — continuing process & full integration of strategy in the agency Weaknesses — falling mode share, no quantified strategic goals	Strong management and clear success in early years. Awareness of external environment, and hence a flexible process.
CTA	Strengths — market focus Weaknesses — fluctuating level of management support	Changes in top management. Customer orientation built through this process has however been retained.
NY MTA	Strengths — process guides development of business plans in each subsidiary and allows priorities to be established.	Ongoing top management support, initially driven by need for change in internal focus. Institutional structure — regional agency with operating subsidiaries.
SEPTA	Strengths — socio-demographic analysis Weaknesses — limited quantification.	Awareness of external developments. Attempt to build consensus for change
WMATA	Weaknesses — general rather than focused from start	Changes in top management halted planning process after first year.
TTC	Strengths — long running process, with integration at the regional level.	Top management support. Quantification skills and data available.
LT	Strengths — long running process, involving many constituencies. Weaknesses — no quantifiable goals	Legislated requirement. Political and top management support. Limited involvement with detailed budget and operating process.

As discussed earlier, Hemily conducted a survey of public transport operators in the 1980s which highlighted factors which reduce the probability of successful strategic planning in the public sector. Some of the successes reported above imply that the factors in his list are not always relevant or at least can be converted into neutral, or even positive, attributes in a particular situation. For example two of these facts were local politics and a "fishbowl" environment, yet in New York the Metropolitan Transportation Authority is required by state legislation to conduct and make use of a strategic planning process. Strategic plans are required each year, and these are presently produced on a five year rolling horizon, with goals and objectives updated each year for the four remaining plan years, and an expansion of the horizon to a new fifth year. These reports have been used by the agency, and its subsidiaries, to prioritize and to assess each program in more quantifiable terms, as well as to air publicly some of the more innovative/controversial strategies which are being considered, well in advance of their proposed implementation. The assessment of different scenarios and prioritization of different investments, through the strategic planning process, is proving particularly valuable in the current era of funding reductions. Other agencies have found that instituting and developing a strategic plan has allowed them to provide elected officials with reassurance that the operation is being conducted on a professional and well managed footing, hence reducing political pressures for change or immediate results in a particular sphere.

One of the key motivations for strategic planning at many agencies, and a motivation cited in both the literature, is that of a changing external environment. For public transport the major changes in the external environment have been:

1. reductions in the willingness of government to increase financial support, and at the same time,
2. changing socio-demographic structures which have reduced ridership, and have negative ramifications for costs and revenues

Hence indications of the value of a strategic planning process might be the extent to which it has enabled these agencies to maintain governmental support, to increase passenger numbers, or to shore up the attractiveness of the central city and limit the process of suburbanisation. Funding levels and ridership numbers are published in the 1983 Section 15 Annual Report and the 1993 National Transit Database. Information from these submissions for 1983, and 1992 is presented below (in Table 3-2.) These should not however be read as comparative figures between agencies, since there were different developments within each which might have affected ridership in

different ways. (For example, in Portland a light rail line was opened in the 1980s.) However the figures do help to suggest how difficult it is to assess the benefit of a strategic planning process at the aggregate level, and how each case must be considered on its own terms rather than in a comparative frame of reference. The picture which the funding figures present is not simple but it seems clear that as a group public transport agencies have been unable to ensure continuing high levels of federal operating funding. (Of course the aggregate effect is likely to be beyond the scope of the individual agency's planning effort.) Though federal capital funding is not shown here it has been maintained at a higher level through the period. The importance of the state as a funding source has grown in most cases, offsetting the decline in federal support.

Table 3-2: Some Section 15 data for selected public transport agencies

Agency	% Change in Ridership ²¹ (1983-1992)	% Change in External Operations Funding (1983-1992, current dollars)			
	All Modes	Dedicated Taxes	Local	State	Federal
Metro	2%	108%		-98%	-4%
Tri-Met	28%	116%	40%	424%	-29%
CTA	-26%		-6%		-14%
NY MTA	-28%		65%	36%	-14%
SEPTA	-5%		45%	147%	-52%
WMATA	27%		-9%	514%	6%

Similarly the ridership figures are difficult to interpret. Of particular note though is the substantial fall in ridership in Chicago and New York. One reason for this is the reduction in service provided combined with fare increases. Tri-Met and WMATA on the other hand have both been able to increase ridership significantly through system expansions, and particularly the introduction of rail services.

²¹ The data is for annual unlinked passenger trips. All contract services are included.
Metro: Bus and Trolley Bus Data. **Tri-Met:** Bus and Light Rail Data. **CTA:** Bus and Rail Data.
MBTA: Bus, Rapid Rail, Light Rail, Trolley Bus, Commuter Rail, and Ferry Boat Data.
NY MTA: NYCTA, LIRR, and MNRD Data. **WMATA:** Bus and Rail Data.
SEPTA: Bus, Rapid Rail, Light Rail, Trolley Bus, and Commuter Rail Data.

As a whole US public transport properties have been fairly successful in influencing development of government policy. For example there has been pressure for change, via the Intermodal Surface Transportation Efficiency Act (1991) for example, which represented a significant break with tradition, as well as continued emphasis on the importance of capital funding from the federal government. In other countries there has been a strong drive towards privatization over the last decade, yet this drive has not been mirrored in the United States. The political influence of the agencies in each state may be relevant in this regard, though again at the macro level, the effects of strategic planning, by an individual agency, are not clear.

It is interesting that both LT and NY MTA have strong and successful strategic planning processes. The agencies are strong in part because of the importance of public transport in these Metropolitan areas, which provides the political and social focus on service. In Portland the success of Tri-Met in its strategic planning process may have been aided by the high profile of the agency in city life, with the construction of light rail lines since 1980 and the dominant role of the bus and pedestrian mall downtown.

Measures at finer detail would be the degree to which public transport has been able to meet its main competitors, and to maintain market share where there is some degree of competitive advantage for a shared mode. Such markets would include for example the journey to work, trips from the suburbs to the central city, trips made by lower income groups, children, and the elderly, and trips made to special large scale events.

Journey to work information can be determined from the 1980 and 1990 census data, and data for the cities considered here is shown in Table 3-3. It is important to note that these figures are compiled using the same counties to represent the metropolitan area in both years (the 1983 definition). This definition increased the size of each metropolitan area, except Seattle where the geographic area was unchanged. The public transport mode share for the journey to work didn't increase in any of these areas over the decade, despite large investments in rail infrastructure in several cases. In the 39 metropolitan areas with more than one million inhabitants in 1990 public transport mode share for the journey to work was an average of 8.98%. In 1980 this had been 10.94%. Hence in almost all these metropolitan areas, the fall (in percentage terms) in public transport mode share was greater than the average for all large metropolitan areas. (Only in Seattle

and Washington DC was the fall slightly below the average.) On this evidence then strategic planning does not appear to have been overly successful in maintaining ridership over the decade.

Table 3-3: Public transport mode share for the journey to work in selected metropolitan areas

Metropolitan Area²²	1980 (%)	1990 (%)
Seattle	8.12	6.18
Portland	8.35	5.36
Chicago	16.43	13.38
New York	29.61	26.85
Philadelphia	12.65	10.10
Washington, DC	15.07	13.34

The very fact that some metropolitan areas have grown outwards might imply public transport agencies had little success in affecting urban development. However this is only now beginning to be a major focus of strategic plans for some public transport agencies. Whether or not the campaigns are successful in ensuring that future development is more public transport orientated or that metropolitan expansion is "transit friendly" will be a key measure of success of these strategies in the next decade. Though these figures are all moving downwards suggesting that public transport services have presented a less attractive alternative for the majority of the urban

²² The data shown in this table were taken from Journey-to-Work trends in the United States and its major metropolitan areas 1960-1990, US DOT. The definition of the metropolitan area is county based (except in Boston) as follows:

Seattle: King, Pierce, and Snohomish counties in Washington.

Portland: Clackamas, Multnomah, Washington, and Yamhill counties in Oregon. Clark county in Washington.

Chicago: Cook, DuPage, Grundy, Kane, Kendall, Lake, McHenry, and Will counties in Illinois. Lake and Porter in Indiana, and Kenosha county in Wisconsin.

Boston: miscellaneous towns and cities in Massachusetts and New Hampshire.

New York: Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Ocean, Passaic, Somerset, Sussex, and Union counties in New Jersey. Bronx, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, and Westchester counties in New York.

Philadelphia: Burlington, Camden, Cumberland, Gloucester, Salem, and Mercer counties in New Jersey. Bucks, Chester, Delaware, Montgomery, and Philadelphia counties in Pennsylvania. New Castle county in Delaware, and Cecil county in Maryland.

Washington, DC: The District of Columbia. Calvert, Charles, Frederick, Montgomery, and Prince Georges counties in Maryland. Arlington, Fairfax, Loudoun, Prince William, and Stafford counties, Alexandria City, Fairfax City, Falls Church City, Manassas City, and Manassas Park City in Virginia.

area, there are clearly instances of success when looked at in still finer detail. For example the figures from the central New York boroughs indicate the success of the agency in revitalizing the system over the decade, and suggest that the heavy investment did show a return in increasing mode share for the journey to work in two of the central counties (Putnam and Richmond). Similar pockets of increased market share are evident in other metropolitan areas.

In Toronto the public transport share of AM peak trips by residents was 32% in 1986 but this had fallen to 28% by 1991.²³ The fall in public transport mode share for the journey to work can be explained in part by the decentralization of employment and residential locations. Suburban employment growth in this period is highlighted in table 3-4. Suburban densities combined with the dispersed origins of suburban workers means that these areas are less effectively and efficiently served by public transport. This phenomenon has been well documented elsewhere.

Table 3-4: Population and Employment Growth Trends 1980-90

City	Employment Growth ²⁴		Population Growth	
	Central County ²⁵	Suburban Counties	Central County	Suburban Counties
Seattle	43%	48%	19%	28%
Portland	19%	72%	4%	-4%
Chicago	15%	40%	-3%	10%
New York	18%	39%	4%	0%
Philadelphia	8%	40%	-6%	8%
Washington	22%	51%	-5%	3%

Table 3-4 shows clearly that the suburban share of employment and population increased over this decade and that the growth was greater in some metropolitan areas than others as would be expected. Suburban population decreased in Portland, which may however only reflect growth of

²³ Transportation Tomorrow Surveys 1986 and 1991

²⁴ These figures represent the percentage increase in metropolitan area residents employed in each area. Those who work within the metropolitan area but live outside are not included in the data. Employment growth therefore is likely to be underrepresented.

²⁵ The central county for each metropolitan area is as follows:

Seattle: King; Portland: Multnomah; Chicago: Cook; New York: New York; Philadelphia: Philadelphia; Washington: District of Columbia

the metropolitan area as a whole (i.e., there was a greater increase in areas beyond the area defined here). Given the large increase in suburban population in Seattle the relatively stable public transport mode share for the journey to work is noteworthy. The large growth in both central area employment and total population is noteworthy too, and may have helped to produce the increase in total ridership. In Portland, Tri-Met expanded its operations into light rail during the second half of the decade. Yet despite this, and the earlier arguments that Tri-Met has adopted a successful strategic planning process,²⁶ the public transport mode share for the journey to work fell markedly. The increase in suburban employment shown here may help to explain this.

Most of these strategic planning processes have also led the agencies towards a more customer / market driven orientation. At CTA for example, though the strategic planning process has been discontinued, the market analysis, which was a key part of the strategic planning, has continued with riders now being classified and targeted in a more detailed fashion. SEPTA's "Vision of the Future" document presents changes in car ownership levels, and other socio-economic factors in the Philadelphia region, with attractive graphics. It goes on to discuss the challenges which the public transport providers face in the light of these factors. Such market orientation also helps to build an awareness of changes in the need for service in different areas, and in the desired level of service. Being able to react to such market changes may help the agency to retain local support, which will in turn help to influence the political climate, as noted above. However cause and effect in this relationship between levels of customer support, political influence, and strategic planning is not clear.

3.4 Reflections

"The longer a regulatory regime is in place, the greater is the possibility of regulatory failures associated with assorted inducements and regulatory capture. Demand for regulatory reform thus tends to arise from changes in the perceived balance between the opposing dangers of the market and regulatory failure. This simple paradigm suggests that regulation can best be judged in terms of the specific objectives of government and the history of the regulatory environment."²⁷

²⁶ More information on the linkage between suburban employment and Tri-Met ridership can be found in Zhi Liu, Determinants of Public Transport Ridership: Analysis of Post World War II Trends and Evaluation of Alternative Networks, 1993, Unpublished Harvard University Thesis

²⁷ Gwilliam and de Velde, Journal of Transport Economics and Policy, September 1990

The dangers of regulatory capture and multiple objectives (coupled with a changing political framework and under funding) have been factors contributing, in most of the instances referred to earlier in this chapter as well as in the majority of metropolitan areas in the United States, to a long run deterioration in urban public transport. This deterioration has not just been in the market for mass transport services but also in the ability of the public transport agency to produce cost - efficient and effective, high quality, transport services.

As discussed above, strategic planning initiatives have been one mechanism by which management (not only in public transport) has attempted to reverse downward trends and react to adverse trends in the external environment. Detailed case studies of strategic planning in public transport agencies have been presented by several different authors in the past, particularly in the late 1980s. These authors built on their reviews to develop guides for other agencies considering a strategic planning process. This chapter presented some of their frameworks, and reviewed the state of strategic planning within a sample of public transport agencies today, in an attempt to evaluate the benefits which a strategic planning process can bring, and the factors necessary for success.

From the resulting picture it is clear that generally the standard management science definition of, and approach to, strategic planning is not that being used by public transport agencies. Perhaps only NY MTA has followed such an approach with the preparation and publication of its "strategic business plans" on a yearly schedule, with quantifiable objectives towards which to work, and tying the implementation and budgetary processes into the planning. Tri-Met's strategic planning process has also survived, in this case by evolving. During the first phase the focus was the internal environment and structure, in the second the customer needs, and finally, in the most recent phase, the external threats. For other agencies the creation of a new market orientation rather than the traditional operational focus has been important — for example in Chicago and in Philadelphia the awareness of changing socio-demographic factors was central to the strategic planning process. Constant wholehearted top management support, appears to be a key factor in successful strategic planning e.g., NY MTA, Tri-Met, TTC, and LT as opposed to WMATA and CTA.

Often what is known as strategic planning in these agencies might better be characterized as long range consideration of the external environment. An assessment of the internal environment is unusual and identifying particular strengths and weaknesses appears to have been particularly

problematic (or at least acting on any such identification within the strategic planning process). Again the two key exceptions are NY MTA, which represents one of the most extensive examples of such assessments, and Tri-Met where one of the phases of strategic planning held the internal assessment as its' central focus. Reviewing internal strengths and weaknesses and then comparing these with the external environment could lead to substantial revisions of service structure. However there are significant factors which act against the elimination of service, or the introduction of new "non-traditional" services, in these publicly owned organizations (such as the political pressure from those who would be inconvenienced by the elimination of services which they have used in the past) which may well act against such a review. Clearly where strategic planning does help to eliminate ineffective services, whether through identification of the need to establish a process for evaluating services, or through creation of the political will to reduce services, it would be working to the long run benefit of the transport authority, since ineffective services increase costs without producing a corresponding return on investment.

The experience of the public transport agencies reviewed here does not present a picture of significant success with strategic planning thus far. In the private sector the process has been used to understand the nature of the business and the environment in which a firm operates more clearly, and to position the company better given that understanding. Failure to carry out some of these evaluations in public transport agencies has left strategic planning in a situation where the benefits are not clear, and as a result support for the process is reduced. Though some of the literature on strategic planning in public transport has stressed the differences between the public and private sector, the New York example at least illustrates that it can be implemented by public sector agencies in a similar fashion to that used in the private sector. When this approach is adopted, benefits such as an ability to analyze the effect of different (usually lower) funding levels on current plans, or then to prioritize based on the strategy, given the other factors in its environment, can be achieved. Setting out a strategy, and various associated objectives, also allows the agency to evaluate each step on the basis of these objectives, and to ensure that employees are aware of the overall goals towards which they are working. Continuous evaluation of the implementation ensures that the agency is making progress towards objectives which remain relevant as the situation changes.

However it must be recognized that strategic planning incurs short term costs for the authority, some of which, such as data collection, can be significant. Though analysis of the current scenario is important, the authority will need to analyze the effects of past actions and proposals for the future. In order to do this data must be collected over a longer period and before, during, and after particular actions. Return on these investments in the short term is limited — another factor which may have been acting against the needed top management support.

There does not appear, at least in North America, to have been a broad reassessment of other organizational or institutional structures for the provision of public transport services. Nor have public transport firms considered the option of broadening their business base. In part this may be a protective mechanism — since questioning the rationale behind the existing structures and funding mechanisms opens political debates which may change the environment more substantially than the agency would wish. The likelihood of such open questioning of the status quo is further reduced by the fact that senior public transport managers are generally political appointees.

Hence it does not seem that strategic planning in public transport agencies has always been implemented fully. Some of the aspects most central to the complete process described in management literature have not been adopted. These include the review of internal strengths and weaknesses, and then accepting these areas of comparative (dis)advantage, acting on that knowledge to eliminate inefficiencies or to focus on areas of strength, and more generally implementing change. Instead public transport agencies tend to have concentrated efforts on understanding the external environment, particularly more recently, and the market, in the broadest sense.

There are a few instances in which public transport operators have focused on a particular market or set of markets. For example, New Jersey Transit evaluated their services on three dimensions²⁸ — market attractiveness, competitive position, and alternative coverage. Similarly there are instances when an agency has accepted that there are markets in which their services are not competitive with private sector operators (as with the van operators in New York City), but these are rare. By contrast the smaller number of objectives for private sector companies means that eliminating service in an unproductive market, or where the resources of the company are

²⁸ As described in US DOT, A Guide to Strategic Planning for Transit Properties, December 1988

stretched, can be a sensible business decision. These decisions also tend to be acted on more quickly in the private sector. For example, Stagecoach was the largest British operator in 1993, with around 4% of the British urban bus market. It made a tactical decision to pull out of long distance express intercity bus markets in 1989, since they "had been confirmed as a relatively low profit earner compared with the local bus operations and were taking up a disproportionate amount of senior management time. The express coach business was therefore sold."²⁹ Historically terminating services in the US has proved difficult. Standards for service, such as passengers carried per vehicle mile, or farebox return ratio, which would guide service changes, are not used in many public transport agencies.³⁰

The long run deterioration of the US industry and the institutionalization of an inefficient monopoly provider has been the focus of many different studies, most recently perhaps that of Gomez-Ibanez and Meyer.³¹ The thesis which they outline suggests that the root cause of the failure to establish more efficient management structures and to adapt to changes in the metropolitan markets which these firms are seeking to serve, is the lack of competition in the provision of service.

Competitive models can in fact produce a number of different outcomes, depending on the behavioural assumptions made about the management of these private companies. The lost benefits of service integration under a single authority (particularly scheduling, interchange facilities, and ticketing) have to be weighed against the benefits of cost savings from "an efficient management structure" in each case.³² Nash has argued that though there may be distinct losses in economic efficiency through a deregulated and un-integrated network of transport services, there are a variety of ways in which to use competition to stimulate improvements in management efficiency. Full scale privatization and market deregulation is not the only option available — as has been witnessed around the world. For example the London contracting framework provided comparable

²⁹ Stagecoach Holdings PLC. Placing and Offer Documents 1993

³⁰ Of 109 public transport agencies in the US surveyed in the early 1980s, only 41% had a cost/recovery criterion for service planning, whilst still fewer (32%) had a passenger/mile criterion. Bus Service Evaluation Methods : A Review, Report prepared by Metropolitan Transit Authority of Harris County, Houston, Texas for UMTA, Office of Planning Assistance.

³¹ Jose A. Gomez-Ibanez & John R. Meyer, Going Private: The International experience with transport privatization, 1993

³² For a review of the different economic models of competition and integration in urban transport services see Christopher Nash, Integration of Public Transport: an economic assessment, in Dodgson and Topham eds., Bus Deregulation and Privatization, 1988

cost savings to those achieved in the fully deregulated network in the rest of the UK, though the London cost reductions were realized over a longer period. Using these different methods to introduce competitive pressures can therefore allow the transport sector to maximize economic efficiency, through both cost and level of service avenues.

Despite considerable political interest in privatization in the last decade and the introduction of privatization in public transport provision worldwide, there have been relatively few such initiatives in the North American public transport industry. Hence it seems unlikely that the competitive model of transport service provision will be adopted soon in the US. There are however other options for reforming public firms and increasing the economic efficiency of the services which they provide. Strategic planning is one such option, as is evident from the examples described earlier. Comprehensive strategic planning can allow the publicly owned operating agency to alter management processes, and introduce efficiencies which provide for quality service, just as it can the private firm. Conspicuous success has been achieved by NY MTA for example, by adopting those strategic planning methodologies (internal and external assessments, objective setting, scenario development and testing, and the continuing evaluation of implementation and policy) developed in the private sector.

Most public transport agencies have focused on the external assessment and related this to the internal strengths and weaknesses only to a limited degree. In particular an ability to affect the course of development in the urban area is becoming central to the strategic thinking of some of the public transport agencies reviewed earlier.³³ At Tri-Met the most recent and third phase of the strategic planning process has been structured around the agency's attempt to work explicitly for a more centralized compact form of urban development. At SEPTA there is an expressed awareness that demographic and geographic changes in the metropolitan area are central to the potential for continued success of the agency, and must be central to its operating decisions. Other agencies have demonstrated their awareness of the land use-transport connection, as this development

³³ This concern for development patterns is at least partially a result of the cost structure of bus operations in which though there is no return to scale (or only a limited return in the purchase of vehicles for example) there are significant returns to density of traffic. This result is explained in many papers for example, R. J. Windle, *Transit Policy and the Cost Structure of Urban Bus Transportation*, in Dodgson and Topham eds., *Bus Deregulation and Privatization*, 1988. At the level of a particular urban area, a full econometric analysis of these trends can be found in, Zhi Liu, *Determinants of Public Transit Ridership: Analysis of Post World War II Trends and Evaluation of alternative Networks*, 1993, unpublished Harvard University Ph.D. dissertation.

dimension is sometimes known, through their support of "transit oriented development", "sustainable" development, or "livable communities" initiatives.

The success of the European and Canadian public transport companies in retaining a higher market share in their respective markets is related to the process of urban development in these areas as well as to the level of government subsidy. TTC is an example of one provider which was able to influence (to a degree) the development of the urban area through its decision making structure and through its high level contacts with other major institutions and political processes within metropolitan Toronto.

Public transport agencies are often among the few service providers, or government institutions, which operate across the full extent of the metropolitan area. This can mean that the institution is in a better position to influence regional development than any other organization. However these attempts to affect the course of urban growth, or to affect local zoning regulation (e.g., by encouraging public transport supportive Floor/Area Ratios), can also represent additional burdens on those agencies where the real focus is operational, rather than on the market or on urban development. At the other extreme there are urban areas where a range of operators and government bodies play a role in transport provision. How far without a longer term plan for transport services and land development in the metropolitan area at some level, whether it be operator or government led, any of these individual organizations can exert pressure for positive change or at least high quality services, and maintaining the status quo in terms of urban form, seems debatable.

It has been noted that the assessment of the internal operating capabilities is critical for success in strategic planning. The analysis which follows however focuses on the aspect of strategic planning which has been the major focus for public transport agencies in the past — the external assessment — and on the development of a more market (in the widest sense) orientated organization. Just as awareness of external dynamics has been one of the motivating factors for strategic planning initiatives, the lack of market orientation has been one focus for criticism of public sector companies. At the same time public agencies have been criticized for being too aware of their political market. Through the external and internal assessment process agencies gain a better understanding of their markets and changes therein. In most of the successful cases reviewed here,

the mission, goals, and objectives developed following these assessments were market based. Even where a continuing strategic planning process has not been fully developed, the increased market orientation has been one of the elements of strategic planning to survive. This is perhaps because strategic planning has begun to illustrate the importance of, and benefits which can accrue from, this outlook. It does not however merely represent a trend in public transport but it is a more general business trend — which when taken to its extreme is “customization”. There is also a degree of simultaneity in the process since the understanding gained from analyzing the markets affects objectives which in turn affect the agency’s response to the market.

Though the past literature on strategic planning in this industry focused particularly on the full process and important steps within that, there has been little previous work on the individual steps and the techniques which can be used therein. The steps which are considered in more detail in chapter 4 and considered in relation to two different metropolitan environments in the following chapters are the assessment of the external environment and the development of a market orientation.

Chapter 4: Strategic Planning — External Scanning and Market Orientation

4.1 Assessment of the external environmental

The typical focus of strategic planning in public transport agencies has been the different trends and influences within the operating environment. The analysis of these elements has rarely however been particularly tightly or consistently structured. Areas of central interest have included:

1. *Political and Organizational Spheres* — How many different political jurisdictions does the organization deal with? What is the extent of control which each can exert and in how many different areas? How far do these affect the management of the public transport system — internally (through the effect on funding and top appointments) and externally (through the effect on road conditions, priority, land use controls etc.)? How many public transport agencies are there in the metropolitan area? How far do these interact with one another? What are the roles of each e.g., which plays a stronger role in the political life of the region? Which has a stronger managerial and operational structure?
2. *Social* — How are social and economic factors in the city changing? Where are these factors changing and why? What ramifications does this have for the provision of public transport service? Again these changes may affect the public transport organization both internally and externally — the age structure of the population will affect the employee pool as well as the level of ridership for example.
3. *Development* — Who are the main developers in the region and where is their investment going? How do different municipalities deal with development proposals? What are the long range plans of each community? These development questions are critical since serving areas of lower density is less cost-effective and more resource-intensive than serving densely developed areas. In addition if suburban development continues as it has, financial pressures on the agency will be increased through a less favourable political climate and rising costs.

These elements are rarely considered or evaluated systematically. This section will initially discuss some environmental assessment procedures used in the more successful planning processes reviewed in the previous chapter (NY MTA, Tri-Met, and LT) and then build on these to discuss various frameworks within which the external assessment could be conducted. The attempt is thus

to make use of past experience in the more successful processes to suggest approaches for use in other agencies. The methods outlined in this chapter will then be applied, in a preliminary manner, to two urban areas in the following chapters.

New York Metropolitan Transportation Authority

The factors which are affecting the external operating environment for the MTA and which are assessed in the strategic planning process include :

- The regional economy and economic cycle — The plan notes that the strength of the economy has a significant effect on public transport ridership in the region since the journey to work is one of the main market segments which the authority serves. As the economy picks up, demand for the services is expected to increase which creates the need to protect against overcrowding. The other side of the coin is the need to protect against a reduction in service (at the route or vehicle unit level) during a recession, since replacing a lost route or increasing the number of vehicles available quickly when demand returns, may be problematic.
- The importance of regional mobility — The relationship between the economy and ridership is viewed from the other perspective, stressing the importance of the public transport system to the region's economy. Again the stress is on the journey-to-work market segment, where the congestion effects of more traffic on the roads and fewer passengers on public transport would be significant. (In terms of an economic argument, though not made explicitly here, these points rely on the theory of the second best and the fact that optimal pricing strategies on one mode may be altered by pricing strategies on another, and by the external benefits which will accrue from altering the modal split.)
- Demographic Changes — the region is expanding geographically and patterns of demand are changing. New markets are identified such as those commuting to work in areas other than Manhattan and non-work travelers during the off-peak and at weekends. The policy document stresses the need for the MTA to "serve these markets more efficiently." These demographic changes are made explicit at a very detailed level from census data, and the implications of each change for the MTA operating units are noted.
- Legislation — The Clean Air Act amendments and ISTEA are stressed as providing opportunities for public transport. These opportunities increase as the need to reduce the number of vehicle miles traveled becomes more pressing (to meet the federal standard for air quality by 2007) and the renewal of the federal transportation legislation comes closer.

- **Highway network** — The documents note that an alternative to increased public transport service would be development of the highway network but that given the state of land development in the region, such a solution to the congestion problem would be “nearly impossible.”

From this analysis the agency concludes that regional development and external changes mean that the focus of its development should be on these new markets, protecting the economic life of the region and, meeting the air quality goals. However given this regional perspective and the infeasibility of new road construction the stress is then on development of links to other regional operators (who also have capital projects and with which there should therefore be common assumptions and evaluation criteria, to maximize the benefits for the region as a whole.) The Metropolitan Transportation Council, and other funding agencies are emphasized, as is the need to develop an intermodal transport planning process which reflects the importance of regional mobility given the current trends of development and transport patterns.

Lastly the importance of including all interested parties in the process (e.g., communities, urban planners, and developers) is stressed. This inclusive planning approach has already been adopted by the MTA in its' Fare Deal Strategy. For example it has “hosted a comprehensive consensus building process” with various constituencies (customer groups, government leaders, and service providers) through its fare policy advisory task force.

Portland Tri-Met

Concerns about the nature of urban growth dominate the most recent Tri-Met strategic planning document. (The 1993-1998 document is entitled “Our Future : A Choice”.) Tri-Met adopted this approach following an analysis of its operating environment, which had also suggested that stimulating debate on these issues was a possibility given the changes in other areas. The external changes noted include:

- **Population Growth** — The regional population is expected to increase by 500,000 in the next 20 years.

- Increasing congestion on the highway network — it is noted that the development of the light rail network on the west side would “alleviate some of the traffic in Washington County but it will mainly just keep it from getting worse.”
- Air Quality — the highway congestion will also negatively affect the quality of air in the metropolitan area.
- Development of the urban area — though urban growth is prevented from moving beyond the Urban Growth Boundary (UGB) the more recent development projects have been built out at less than 70% of the planned density.
- Recent plans from cities in the region, 1000 Friends of Oregon, the Land Use and Transportation Regional Air Quality, as well as other plans, have stressed the need for mixed-use, public transport oriented development.

The strategy document notes that these trends will put more stress on the infrastructure and public works of the region and that investment in these areas is lagging development. Building on these observations and noting the financing environment as well as recent legislative changes (such as the Clean Air Act amendments) Tri-Met sought regional debate and discussion of their strategic plan aiming to:

1. Determine what the region expected of its public transport agency, and to begin to work towards a common vision of the future.
2. Gain a better understanding of how Tri-Met could best serve its customers and the region as a whole.

The local debate included representatives of regional government, interested businesses, citizens, and Tri-Met employees, in various working sessions through two drafts and over the course of a year. Different funding and development scenarios were discussed which resulted in a strategic plan for Tri-Met. The plan stressed the importance of team work within the region, with the aim of containing development within the existing Urban Growth Boundary. This would also ensure that the costs of public service utilities and road construction were kept down. Also stressed was the need to concentrate development in public transport corridors, and the importance of ensuring that developments are designed such that they can be served efficiently by public transport.

London Transport

London Transport follows a different pattern in developing its strategic plan, which includes soliciting (through a consultation document) comments and suggestions from interested parties within the region, in a very general manner, at the outset of the plan development process. This involvement is mandated, but LT has used a broad interpretation of the requirement. After the review of these comments (from for example the London Boroughs, the London Regional Passengers Committee, politicians and political parties, trade unions, and the general public) the strategy for London Transport is set out in a second document. The external factors noted in the 1991 - 1994 document included:

- Limited roadspace and little prospect of development of further road capacity
- High levels of congestion which affect bus services and make public transport important
- Variability in funding levels and government support
- The changing legislative environment in which London Transport seeks to maintain its power over bus route planning and contractual authority for the urban area
- The increasing importance of environmental concerns
- Developments in the urban area — particularly the revitalization of Docklands
- Plans of other operators in the region
- The desire to protect the position of London as a World City

There is however less stress in this document than in the two from the United States discussed earlier, on the development and growth of the urban area. In part this is because the operating area for London Transport is specifically delineated by the legislation which created it. Rather the stress is laid on transport development plans — the agency notes that reduction in central area congestion is of critical importance and therefore higher priority for new rail construction will be given to schemes which provide the greatest relief to central area roads.

Two policies do appear to result directly from the assessment of the external environment, or at least are in harmony with the needs identified in that assessment. Firstly the “Bus Priority Initiative” in which London Transport seeks to work with the road authorities to ensure that buses have priority on the roads and at junctions, thereby reducing the negative effects of congestion on

bus service reliability. Secondly, a review of methods by which LT services can contribute to the improvement of environmental quality in the metropolitan area.

From this brief review of the approaches taken by these three agencies, a few common elements stand out:

- Inclusion and involvement of many players in the urban area in the strategy development process.
- Environmental concerns — these are considered as important since agencies can themselves contribute to improvements in air quality (by using cleaner vehicles), since reducing traffic levels and vehicle miles traveled will assist in improving air quality, and since the quality of the environment is an important political question, particularly for organizations which support public transport. In the US these political sensitivities are heightened by the threat to federal funding which failure to comply (with air quality standards) would mean.
- Plans of other operators in the region — this is doubly important where there is substantial passenger transfer between operators and where there are other operators under different regimes (i.e., privately owned) or with different development plans.
- Congestion and road space limitations — these are important for their effect on regional economic growth and on bus service reliability and quality.
- In the American authorities, there has also been a stress on understanding the development of the urban area, where potential areas of change exist, and how these will affect public transport service structure and costs.

It should also be noted that only London Transport considers the structure for provision of services, despite the pressure on costs and the changing nature of the service area (and a recognition in New York for example that there are other services which can provide for the needs of travelers more efficiently than can MTA subsidiaries.) This does not reflect a spontaneous action on the part of LT, rather it was stimulated by past external actions, and is a reflection of the political environment within Britain at the time in which the strategy was being developed. The environment was one in which LT was expecting its role in securing and providing bus services for London to be significantly curtailed.

The assessment of the external environment is important in the formation of the overall framework for the strategy. The relationship between an external assessment and the internal capabilities will be different for each agency, or in each urban area, and there are clearly different reactions to the same external developments. In Portland, for example, Tri-Met developed a strategy which encouraged the urban area to make choices. In Pennsylvania, on the other hand, SEPTA reviewed its external environment and stated boldly that what was needed was an attempt "to bend the trends", in car ownership, car use, population growth and employment locations towards a more favourable operating environment for public transport services. In London the operating and planning agency focused attention on building the attractiveness of services in the core (relieving congestion) before adding capacity at the edges of the urban area. What implications this will have for future development of the urban area is unknown at present.

Starting from the basic approach taken by these agencies, that of socio-demographic trend analysis, there are other methods by which the changes in an urban area can be categorized. For example a standard strategic planning approach would stress the importance of isolating the stakeholders in the region, the power that each has, how that power is changing and what those factors mean for the public transport systems or services. In public transport systems there are often strong interest groups, among users and non users, which could be classified as follows:

- Users of the transport system and city — e.g., commuters, low income groups, choice riders, public transport dependents, car drivers, freight shippers and carriers, businesses, tourists, unions, and taxpayers
- State and local government — with different political atmospheres, legislated requirements, development plans, responsibilities and contributions to the funding of the public transport system
- National Governments — with control over funding and the legislative environment
- Environmentalists
- Politicians

There are likely to be a range of different classifications depending on a particular urban area and what its critical issues are. For example in London the national government provides funding and the strategic plan is approved at that level, hence strategies at odds with the prevailing political

approach are more difficult to adopt. In this case the power of the local authorities is weaker since they are not the funding body. However local control of much of the road space and of the parking controls does present significant possibilities for local influence in LT operations. In Boston, by contrast, the local political environment is the critical one. The Commonwealth government dominates policy-making with the Secretary of the Executive Office of Transportation and Construction (an appointee of the Governor) acting as Chairman of the MBTA Board. At the same time the budget is also reviewed by an Advisory Board with representatives from local government in each area served by the MBTA. The involvement of many different groups in the strategic planning process was one of the common features to each of the strategic processes discussed here. Understanding the motivations of each group must therefore form part of this external assessment.

A slightly different approach would be to consider not merely the stakeholders but the "Power Players" within the urban area. This is likely to be particularly important where there is more than one operator in the region, since the dominant role of the unified public transport planning, funding, and operating agency will be lost. Rather the public transport provider becomes one among many elements in the metropolitan environment. Stakeholder analysis is important in setting strategy since it helps the agency to understand where its' supporters are, and who they are, as well as which groups are likely to be affected (to gain or to lose) by each potential action. When these are combined with an understanding of the allocation of power in the area then the potential ramifications of each strategy can be analyzed.

Alternatively a systems analysis of the environment would suggest that the operators should consider :

1. The Activity System — under this heading the agency would evaluate the aggregate necessities of mobility and accessibility, the spatial, temporal, and modal distributions, and the changing nature of society in general. Hence for example changes in the demographic profile of the area would be considered in detail, the economic cycle and predictions for future growth patterns would be noted, the level of car ownership and usage evaluated, and so on.
2. The Transport System — under this heading the agency would evaluate the technologies and facilities available to it, or the networks, links, facilities, and operating policies of the other operators in the region for example.

To move away from these more traditional ways of analyzing the external environment there are two other frameworks which might provide useful insight into the changes which public transport operators face. The first could be considered as a "fixed and floating point" analysis. This approach would have particular value where there are significant changes within the urban area at a number of different levels and an agency, or governmental body for example, wishes to understand clearly where the opportunities for influencing those changes lie. The fixed elements to the system would then be categorized by their effect on the public transport system and the floating (or changing) elements noted. The public transport agency would develop plans to focus on the specific floating elements which would build on the strengths of the fixed points as well as the strengths of its operations.

The second alternative method for viewing the environment would be a time line analysis, in which the critical (or pinch) points for public transport were noted. Such an approach has been expounded by several recent studies,³⁴ particularly since it enables the operator to attempt incremental changes or more radical experiments at critical stages and to build on the opportunities which exist at particular times to reach a certain goal. The analysis of these critical points will be important in allowing the public transport provider to remove from consideration those solutions, or objectives, which are infeasible, given the constraints of the future. It also ensures that important opportunities are not missed and the danger of certain periods ignored.

Though these methods have each been discussed separately, the framework proposed here would use each method to assess the critical factors in its operating environment. By combining the insight from each, a more in-depth understanding of the different forces in the area can be developed, than that which a uni-dimensional analysis would give. The processes used by the three agencies reviewed above were not as explicit in each step as the ones recommended here. Though many of the same areas were touched upon, these agencies may not have wished to be so explicit, for political reasons, or may have wanted to give themselves more freedom of movement in later development plans. However this approach does not need to present a threat, since the full

³⁴ See for example, D. J. Turk, A Dynamic Framework for Transportation Policy Design: The Case of the Boston Olympics, MIT Thesis, 1994, and a variation on this theme, for example, see Carl Martland and Bill Cowart, Zonal Traffic Management in Bangkok, in MIT Consultant Team Final Report, Strategic Planning for Metropolitan Bangkok, January 1995

evaluation should suggest both the short and the long run ramifications of each action or inaction. It also allows the consideration of similar questions from different angles.

Even if such a process is not adopted explicitly, the themes common to all the successful strategic planning processes reviewed here have been the fostering of debate, and the notion of a collaboration within the urban area. Building on existing planning skills in these agencies is likely to be important in developing a full strategic plan. The following section considers further the different methods through which to understand the markets and to develop a "market orientation".

4.2 Market Orientation

The collaboration and involvement of other agencies or individuals in the planning process is at odds with the traditional engineering approach. Emphasis on engineering and operations orientations have become the fashionable criticism of public transport agencies — these organizations are seen as being unresponsive to their customers and providing services which are difficult or unpleasant to use. This is another version of the debate about the suitable trade off between avoiding regulatory capture and removing the possibility of exploiting monopoly power. The rigidity of these systems has been seen as one reason for the success of the automobile, which provides mobility limited only by cost, road space, and the availability of parking at the destination. It has also been regarded as one factor behind the growing political will to introduce the "discipline of the market" into the system. The market discipline it has been argued promotes the flexibility and market awareness which public transport agencies lack, and which all public transport providers need in order to provide services which those who use them will find convenient, and which will attract new users.³⁵

The market understanding in some public transport organizations has been developed, in part at least, during the external assessment process which was discussed in the previous section. There are two particular classifications which illustrate how these agencies have come to develop an appreciation for, and understanding of, the importance of their markets:

³⁵ The extent to which a private provision mechanism would increase customer satisfaction, through integration for example, is however disputed and depends directly, in a theoretical discussion, on the behavioural assumptions made about the private operators, as noted before. In the British case the market since deregulation has been much more fragmented than previously and the benefits of integration of service planning, scheduling, ticketing, and information provision have largely been lost to the traveler.

1. **Political Forces**— Funding is ensured through serving the relevant markets, whether those which are viewed as the critical ones in the future, those with the most powerful voices in the urban area, or through a maximization approach, in which the agency serves as many different markets as effectively as possible.
2. **Cost Pressures** — Changes in urban form affect the cost structure and revenue returns for different services. Hence the agency looks to the shape of the market place and how it can influence development or minimize its exposure to costly areas in which to provide service. Similarly the authority will wish to establish the most effective trade off between maximizing ridership and providing costly services.

Advocates of transferring private sector management practices to the public sector often claim that doing so would increase market awareness in public agencies. In most cases reviewed here strategic planning has indeed taken the agency closer to the market. One principal objective of strategic planning is to relate the external and internal environments, and then to build on both opportunities in the market place and strengths in the organization. This guidance from the market can lead to the provision of different services. More broadly it can also enable the agency to affect the development of markets at the regional level, through provision of services, and through involvement in the political and land use development process.

There are different approaches to developing a market understanding. These approaches have a somewhat simultaneous relationship with the external and internal assessments, scenario developments, and the evaluation of implementation. However generally the influence of the markets in the external and internal assessment allows development of market based objectives. This enhanced understanding can then influence the strategic planning process in various ways. In Portland, for example, the most recent orientation of the strategic planning process has been towards the importance of regional growth patterns. This resulted from a review of the market which persuaded management within Tri-Met that were existing patterns of development to continue, then service would eventually not be sustainable since higher costs would be incurred for each rider. In earlier strategic planning the agency moved from an attempt to develop the internal structures needed to improve management (and hence revitalize public opinion of the agency and to ensure that the political will to create a multi-modal operating authority on the completion of the first light rail line was sustained.) Subsequently the emphasis was shifted to a realization that

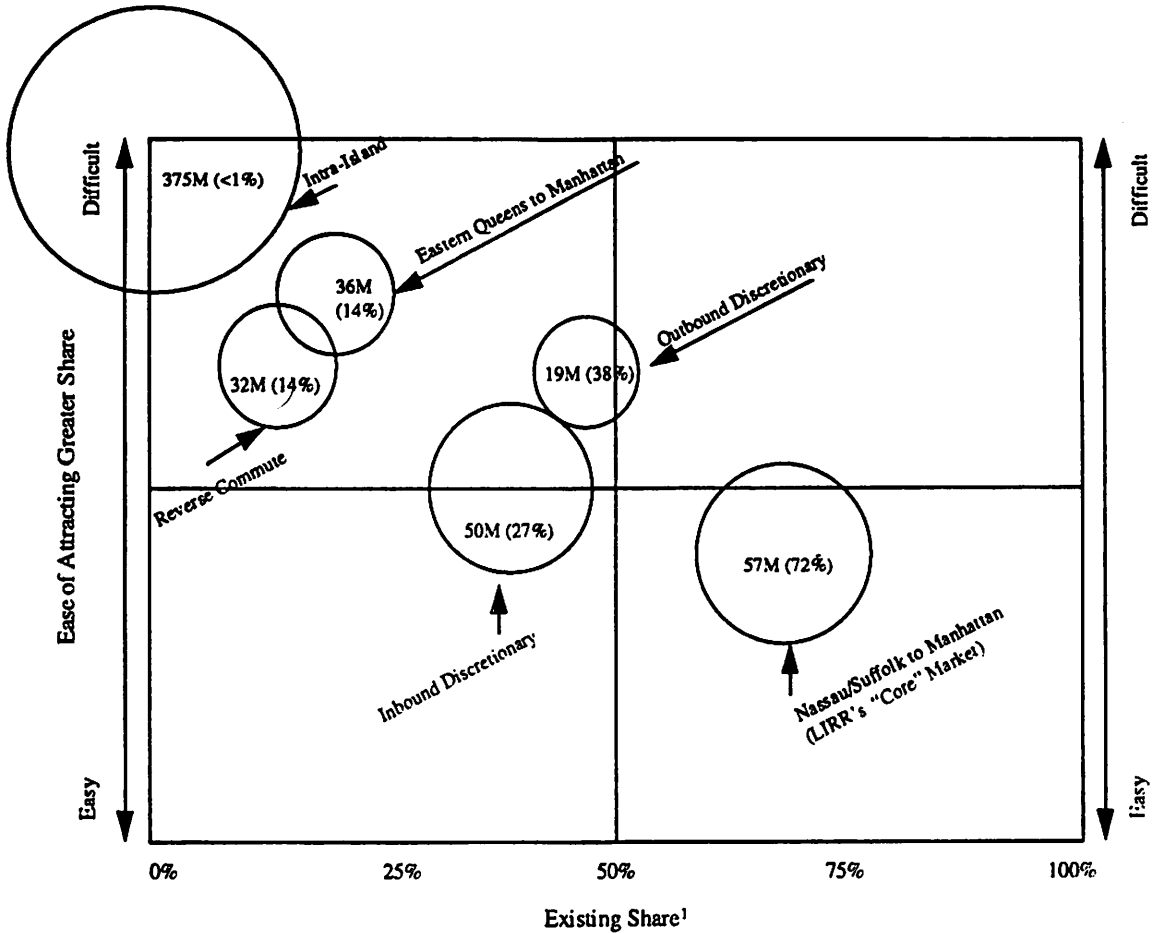
customers required high quality service and the orientation of the planning process was then around achieving that goal.

In New York by contrast the strategic planning process at Long Island Railroad (LIRR) has been built around customer service and satisfaction. This more clearly replicates a private sector approach. The critical element in the strategic plan is the notion that service should be of such a high level that the customers will be surprised and become "apostles" for the railroad, using their word of mouth to attract more customers. The "breakthrough service quality" concept has been adopted by the railroad in its attempt to provide service which can compete with the automobile, which provides all "the creature comforts". Before the introduction of this strategic initiative, the service which LIRR was providing was that of the "creature comforts of automobiles a century earlier." In order to achieve this breakthrough in customer service the company restructured internally consolidating all direct customer service-related activities under a vice-president of Customer Services. At the same time a market development group was established to sharpen the programmatic focus on various market segments and on the special needs of each of these segments.

Each market segment was studied in detail to understand where possibilities for increasing LIRR market share existed. The study also highlighted actions which the railroad had taken in the past which had affected the customer base, and attempted to pinpoint the reasons for the reaction which was observed. Thus for example improved trains had been introduced on the Ronkonkoma Main Line Branch with electric propulsion and sufficient capacity for each existing passenger to be seated. However this higher quality service attracted passengers from other poorer quality diesel lines, which in turn led to overcrowding on the new trains and at Park and Ride sites, and a reduction in levels of passenger satisfaction. However when these transferring commuters faced the crowding problems, surveys suggested that rather than returning to their old diesel services they switched to automobile commuting. Recognizing that experience, the agency went on to develop new approaches to the provision of one-seat rider services. (By ordering dual powered locomotives, and retrofitting stations for low floored coaches, for example.) In another market segment (intra island commuters), the agency made an assessment that attracting ridership would be expensive since the trips are not oriented in the same manner as the current network of services, however at

the same time it noted that the size of the market itself (around 1 million daily commuters) would make any gain in market share in this segment welcome.

Figure 4-1: Long Island Rail Road Market Shares



¹ The first number in each circle is the total market size shown in annualized millions of trips. The number in parentheses represents the LIRR share.

Figure 4-1 (above) illustrates the “matrix” developed by the agency which allows it to assess the position of the services it offers in each market segment and the possibility for attracting a higher market share in that segment. It shows that the larger and potentially more attractive markets for the LIRR to pursue are also more difficult to capture.

For the 1994-8 Business Plan the railroad also focused its attempt to increase market share in two areas 1) the discretionary (non-commuter) markets and 2) the long-haul commuter markets. These two markets were selected for specific attention because the analysis suggested that improved

services and new equipment would provide significant opportunity for increasing market share. The market awareness of the agency allowed it to realize the danger of creating false expectations (high levels of service could not be provided for all market segments) and meant that it was willing to narrow the focus of development plans to specific market segments, realizing that a longer period would be required, with higher levels of investment, to attract riders in other markets. These decisions were made within the overall strategic framework which had as its underlying objective: "Getting and keeping vehicles off the highway".

It is clear from just this brief discussion that there are significant data requirements in analyses of this type. Not only do the current characteristics of the market have to be understood, through user surveys, but general trends and area-wide attributes are also relevant. Even where the data is not available in such fine detail, or resources for such data collection are not allocated, strategic approaches to the planning process have allowed agencies to consider their markets in different ways. For example, approaches taken at the CTA and Tri-Met are shown below. Chicago adopted a macroscopic system-wide analysis of market developments with forecasts made in 1991 for the year 2000. Three basic conclusions were drawn from this analysis as follows:

- "The range of ridership impact was fairly large, with population and employment directly affecting CTA ridership.
- The bus network is much more sensitive to population change, while the rail network is more dependent on employment levels.
- The forecast range of market change represent reasonable "outside" limits on expected future CTA ridership levels, assuming present mode choice patterns hold relatively constant."

At the same time the agency noted that the reverse conclusions could be drawn (i.e., level of service could affect mode share and economic growth) and that markets could be affected at a lower level of aggregation, with specific targeting of campaigns. Hence a submarket level review was also conducted in which the variation between different travel markets — by corridor or trip purpose for example, was highlighted. Some of the different markets and the level of understanding of trends within them are illustrated below.

<u>Market</u>	<u>Size</u>	<u>Direction</u>
Central Area Employment	Very Large	Increasing
Central Area Residents	Small	Increasing
O'Hare Air Travelers	Small	Increasing
O'Hare Extension Corridor Employees	Small	Increasing
Ravenswood Residential to Downtown	Moderate	Increasing
South Corridor Residential to Downtown	Large	Declining
West Corridor Residential to Downtown	Moderate	Declining
Off-Peak, Non-Work Travelers	Large	Potentially Increasing
City Residents Employed in Suburbs	Small	Increasing

The agency went on from this review to assess the financial implication of different scenarios of market change. Within its final strategic initiatives program one aspect was the need for specific market development strategies with three particular components — high quality service, identifying, understanding, and explaining individual markets, and lastly, reinforcing the positive image of the CTA. Since the failure of the strategic planning process, CTA has developed the market awareness through a Total Quality Management program — in some senses thereby considering the internal as well as the external market.

By contrast Tri-Met classified both riders and non riders into different categories depending on the degree to which they were in favour of, or opposed to, public transport (a psycho-graphic approach). These groups were then subdivided into those who ride Tri-Met services frequently and those who use them rarely. Those who are categorized as being in favour of public transport are viewed as likely to choose to use public transport for reasons other than convenience, and those riders who are anti-public transport would rather not be using the service. The relative size of each group was assessed through rider surveys and the areas for concentration of resources thereby highlighted. It was also accepted in this analysis that there were market segments in which investment of resources in an attempt to increase market share would be less rewarding than others. This assessment of the market was not conducted as an explicit part of the strategic planning process. It can however be seen as an illustration of the market orientation which can develop within those firms where a strategic planning process is successfully implemented, where overall objectives are clear, and where the planning process takes on a significant role in the development of the agency.

Clear objectives are of great importance in the complete successful strategic planning process. Simultaneity is clear since the objectives will in part be determined from the external analysis. The external analysis will also identify and analyze the markets and allow agencies to structure service for each market in order to meet the objectives. The "markets" will be considered at various stages during a successful strategic planning process as follows:

1. In the external assessment at the aggregate social level (for example, population densities, car ownership levels, and changes in these) and at the more disaggregate level, the particular characteristics of the users of particular routes, or the potential markets in certain corridors.
2. In the stakeholder analysis at the individual market segment level — where each group, e.g., commuters or politicians, is isolated and their needs analyzed.

Following these stages the authority will have established objectives which will then guide the rest of the process. Since these objectives are derived from the different (internal and external) assessments, the market orientation will have influenced them. However the new market based objectives will then affect the rest of the strategic planning process.

3. In the alternatives analysis — how each group identified earlier can best be served, and what the implications of such service would be on cost and revenue, given the market based objectives.
4. During the implementation phase — the objectives and market orientation will be important in determining how the agency is restructured to provide the services required by the objectives for each market.

The extent to which this is possible within each agency will vary depending on the resources available to it and its existing level of market awareness. However as the Chicago example illustrated, even at an early stage in the development of a strategic orientation, basic categorization can be used to make progress in this direction. Furthermore, as the Tri-Met and LIRR experiences demonstrated, over the longer run, new analysis capabilities can be developed and more specific marketing strategies undertaken.

Chapter 5: The Massachusetts Bay Transportation Authority — A Case Study

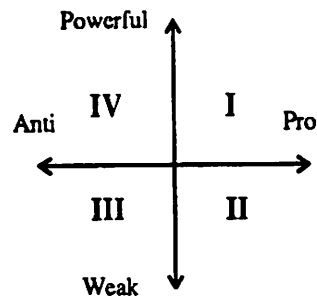
Over the course of the last twenty years or so the MBTA strategy has evolved, from a focus on development of capital assets to its current focus on internal “organizational” issues. The extension of the rapid rail network and the refurbishment of commuter rail lines, was accompanied with a commitment to maintaining low fares. Ridership grew but the deficit also grew. In the last 5 years interest has turned towards the internal structure of the organization, its cost structure, and the possibility of making savings. There is still also an interest in extending the commuter rail network further from the Boston core. These strategies have not resulted from a planning process along the lines of the one described here, nor has the authority issued many statements relating to them. Rather the development of the organization suggests to the observer that it is acting (or has acted) on such strategies.

This chapter considers the external environment in which the MBTA operates using the different approaches proposed in Chapter 4. By assessing this environment an understanding of the “market” can also be developed. The ramifications of this understanding for the MBTA and for various strategies are discussed. Among the benefits of using the approach discussed in Chapter 4 is the explicit consideration of local knowledge and changing influences. This contrasts with a strictly socio-demographic approach which would make these factors implicit. Such an approach has been used in past long term planning processes for the MBTA region.³⁶

The limitations of acting from outside the authority and the goal of illustrating how the different approaches might enable a different understanding of the environment, restrict the discussion offered under each category presented below. However the potential benefits of such a more straightforward and comprehensive approach are illustrated.

The following sections take each aspect (stakeholder, power player, systems, fixed and floating point, and time line analyses) of the external assessment process proposed in Chapter 4, in turn. After this, the implications for MBTA strategic development are drawn.

³⁶ A fuller description of the plans developed in Boston since the 1960s can be found in Appendix C, which also contains a description of the authority as it exists in the 1990s, and information on regional demographic trends and predictions.



The unions will therefore be in quadrant IV, with political power but opposed to the privatization process. Similarly the taxpayers will be in quadrant I, in favour of the privatization process (though of course only to the extent that their concerns about service quality can be allayed) and with power. The private contractors on the other hand will be in the second quadrant with limited power, but in favour of further privatization. The relative strength of each will be important therefore for the MBTA in its own position on privatization and then in how it acts on any decision.

5.5 Time Line (Critical or Pinch Point) Analysis

Clearly Boston's transport system as a whole, given the CA/T construction, is in a state of flux at present and despite the traffic disruptions, new employees in Boston itself (which is predicted to experience the largest absolute growth in employment in the region) will need to be assured of its attraction as a place of work. The attraction of the city as a tourist destination (one of the principal economic influences in Boston) will also diminish with a poor quality transport service.

In considering the Olympics in Boston in the twenty first century, an awareness of the importance of the temporal dimension in transport planning for the region has been developed.⁴⁷ This work shows that changes in a mode choice model's coefficients are path dependent (i.e., based on the past trajectories of the values of the coefficient and that of many others.) This argument seems plausible, though not of great encouragement to the short term improvement of public transport mode share. Since there has been a long run deterioration in roadway conditions⁴⁸ growth in the transit market would have been predicted. Ridership has increased but it is still the growth in automobile mode share which threatens public transport. Even if the factors which have detracted

⁴⁷ See D. J. Turk, A Dynamic Framework For Transportation Policy Design: The Case of the Boston Olympics, Unpublished MIT Masters Thesis, 1994

⁴⁸ Though there is little evidence to back up such an assertion, this is suggested by the fact that trip making has increased while total pavement capacity has not, for example.

Chapter 5: The Massachusetts Bay Transportation Authority — A Case Study

Over the course of the last twenty years or so the MBTA strategy has evolved, from a focus on development of capital assets to its current focus on internal “organizational” issues. The extension of the rapid rail network and the refurbishment of commuter rail lines, was accompanied with a commitment to maintaining low fares. Ridership grew but the deficit also grew. In the last 5 years interest has turned towards the internal structure of the organization, its cost structure, and the possibility of making savings. There is still also an interest in extending the commuter rail network further from the Boston core. These strategies have not resulted from a planning process along the lines of the one described here, nor has the authority issued many statements relating to them. Rather the development of the organization suggests to the observer that it is acting (or has acted) on such strategies.

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5.1 Stakeholder Analysis

The Boston region and the MBTA has had a strong history of public participation in the planning process, dating from the Boston Transportation Planning Review (BTPR) in the 1960s. This public represents just one group with a stake in the development of transport services. Other important groups include:

Public transport unions and workers — Unions and workers certainly have a stake in seeing the survival of the MBTA, since wages and employment are both guaranteed in this structure. Their stake is given strength particularly through the effect of wages and benefits on the budget, through federal legislation, and through the threat of a strike to disrupt service.

MAPC (and the MPO, on which the MAPC has one vote) — Federal funding (e.g., from ISTEA) is channeled through these bodies. Were the MBTA to fail to provide service, or even high quality service, to some of the areas chosen as development centres in the MAPC plans (such as Metroplan 2000 which is described more fully in Appendix C), viability of these plans would be threatened.

Passengers and Taxpayers — each of these groups has a stake in ensuring that services continue to be offered but at reasonable cost. Those who do not make use of the services also have a stake in the survival of the MBTA since the use of services by others provides them with benefits as a by-product, particularly through lower levels of congestion. Passengers have a clear motive for supporting the low fares. Passengers can be classified on various dimensions in order to gain a better understanding of particular stakeholding groups. Some possible classifications would be by mode used, demographic group, trip purpose, and car availability. Each group (and the groups are clearly not independent) will value certain MBTA services above others. For example those without access to a car may value the network coverage which the MBTA maintains, however those who are commuting from the suburbs to downtown Boston may be concerned only with frequent peak service on commuter rail routes.

The simultaneous relationship between increased customer orientation and external assessment is certainly evident in this sphere. Though the structure of, and influences on, demand in these groups has not been analyzed in depth here, it is a crucial element in the strategic planning process.

Without such a full understanding, setting service objectives and authority goals is difficult, if not irrelevant.

Property Owners and Developers — these groups have interest in ensuring the success of the public transport system, in that it brings workers to their buildings and increases revenues. For example the success of the proposed downtown transitway will affect property values on the land at the southern edges of Boston Harbour and the financial district.

The Central Artery Contractors — this group has an incentive to ensure that public transport services are produced in an effective manner during the construction of the Central Artery / Third Harbour Tunnel project (CA/T) since the agreement is that service levels on highways should not deteriorate. If demand for travel in the corridor increases, or even stays the same, whilst roadway capacity is reduced, a deterioration appears inevitable. However if the public transport service is able to attract new passengers during this period, deterioration would be minimized.

Private Transport Contracting Companies — these companies are pulled in two directions. They clearly have a stake in seeing the survival of the MBTA, since the remuneration which they receive is channeled through the MBTA, and since private operation of these bus routes is not likely to prove profitable.³⁷ On the other hand the companies also may have an incentive to see the dissolution of the authority if that would mean more state managed contract service, for example.

5.2 Power Players

What is clear from much writing in political economy is that power is not easily relinquished once attained.³⁸ An illustration of this point in the MBTA context, as well as the power of both the unions and the Commonwealth in the MBTA organization, can be seen in the passage of the Management Rights Legislation in 1981.

³⁷ General experience is that cost reductions in the order of 10-30% at most can be achieved through privatization of transit services. At present the MBTA services are operating with a much larger gap between revenues and costs.

³⁸ For an explicit recognition of this factor and an interesting discussion of authority and organizational structures (albeit in a rather dated presentation of the structure of the European economy) see K. M. Gwilliam, *Institutions and Objectives in Transport Policy*, Journal of Transport Economics and Policy, January 1979

Following this several legal challenges were made.³⁹ Though the legality of the legislation was upheld, MBTA management has acted cautiously in using the restored powers, which it had previously negotiated away. However the power of the unions is, of course, less threatening to the MBTA when it considers growth than when it considers reductions in service. The bus drivers, train conductors, and station staff represent particularly powerful groups in that they are the front-line service representatives of the authority, and it is this relationship which will be most noted by passengers.

Probably the dominant influence on MBTA actions is the Commonwealth of Massachusetts, through the Governor-appointed Secretary of the Executive Office of Transportation and Construction (EOTC), who sits as Chairman of the MBTA Board. The Commonwealth provides almost two-thirds of the net cost of MBTA service and has exercised its power clearly in the past. (Examples of the Commonwealth wielding this power include passage of the Management Rights legislation in the 1980s, and then more recently the guarantee of full fringe benefits for part time workers, and the Gubernatorial directive that Commonwealth departments should accept office space with the lowest rental costs, which is likely to mean a gradual relocation of these offices away from central Boston.)

The different political parties have come together in one major cross-party transport initiative — the CA/T project. This sort of congruence was developed following the BTPR, when citizen participation and discussion of a multitude of issues allowed the construction of an overall strategy for transport in the region. However such congruence has not always been the case at the operating level, and is less clear now, when much of the BTPR programme has been completed. Different approaches at the operating level may have created situations in which the management objectives of the MBTA have become unclear or management-labour relations deteriorated (since promises made by management under one administration are not honoured under another for example.) This sort of fluctuation makes adopting a strategic planning process more difficult, though perhaps also more important. As was noted in Chapter 4, in New York, where political interventions and linkages are also complex, the MTA's strategic planning process facilitated consideration of

³⁹ For a discussion of the specifics of the MBTA case, and reasons for the successful introduction of legislation of this sort, by comparison with attempts made elsewhere in the United States see Marc G. Warner, *Transit Management Rights: A Critical Appraisal and Assessment of Prospects*, Transportation Quarterly, Jan. 1988

various possibilities before they arose, and therefore minimized the associated confusion when funding levels changed.

Another important arm of the Commonwealth government is the CA/T project office. The dominance of the project in state transportation funding for the next ten years, means that there is a lower level of funding available for the other modes or projects (given the allocation formulae in the 1991 federal transportation legislation — ISTEA). At the same time, as is discussed elsewhere in this chapter, the CA/T - CLF agreement also ensured that funding had to be provided for some public transport improvements. The work schedule will clearly affect the service provided by the MBTA, and the relationship between the two agencies will therefore be critical. A CA/T coordinator is now employed by the MBTA to ensure that the transfer of information between the two organizations is smooth and that this information is acted on swiftly.

The Massachusetts Environmental Protection Agency also wields significant power — particularly in the case of fare setting. The state environmental protection act requires that the MBTA file an environmental notification before implementing any fare change that would result in “systemwide fare increases” of 30% or more during any three year period. In 1991, the environmental review of the fare change required the MBTA to mitigate its effects by using the difference between revenue collected from March to July 1991 and that which would have been collected had previous fares still been in effect (some six million dollars).

Conservation Law Foundation — This group has a power which was witnessed during the decisions on the appropriate mitigation measures for the Central Artery relocation work, and in recent initiatives in conjunction with the MBTA to improve service quality, monitoring, and planning. The real power however perhaps lies in the possibility of disruption to the CA/T process — for example by protestations that the mitigation measures are not achieving the desired goal or are not being implemented effectively — which would of course be costly and politically difficult in a project of this magnitude. In the past the power has been exercised through law suits, which has left some legacy of distrust between the two organizations.

MAPC — As noted earlier, MAPC has developed a plan for the Metropolitan region which focuses on concentrated and mixed use development and sets out requirements for levels of transit use and

the amount of parking space available at stations. The MAPC represents all communities within the MBTA area and has a voice in the funding decisions of the MPO, hence its' support for MBTA goals may be critical. It is also a representative body, of which the MBTA is part. In fact the MBTA Chairman (the Secretary of the EOTC) is a member of the executive committee. Hence though the body has power, the MBTA has an avenue through which to influence its' decisions.

MBTA Advisory Board — the Advisory Board is made up of representatives from each of the cities and towns in the MBTA area and has powers to review and approve the budget, the appointment of a General Manager, and the fares for rapid transit services. The capping of the increase in contributions from the cities and towns in the 1980s, to 2½% per year, has meant that the relationship between the state and the Advisory Board has changed. Where previously the incentive for the Advisory Board was to ensure that budgets were not excessively high, the balance has now shifted in the direction of being primarily concerned about ensuring high quality service.

Other federal agencies — Through the provision of both operating and capital funding the Federal Transit Administration (FTA) is a critical support for operation of the full range of MBTA services. At the same time each federal contribution has certain strings attached — for example, vehicles purchased with federal funding have designated life expectancies. The Federal Environmental Protection Agency (EPA) is also an important force in shaping transport policy, as the Boston area is classified as a “non-attainment” area. This classification means that an action plan is required, detailing actions for emission reduction and air quality improvement before a certain date. Though current legislation appears powerful, with the most stringent levels of acceptable air pollution yet issued (the first air quality guidelines were issued in the 1970s) and with penalties for non compliance (in the form of withholding federal funds at the discretion of the EPA), there is pressure nationally for some of the more stringent standards to be relaxed. This trend may erode both the symbolic and the actual power of the EPA.

The Massachusetts Port Authority (MassPort) and the Massachusetts Turnpike Authority (MassPike) are also influential in state government thinking. Both are transport providers, and both are successful quasi-governmental organizations. These agencies have two avenues therefore through which to affect the public transport service provided by the MBTA. Firstly there are the more direct avenues such as operation of competing services, by both organizations. Another direct

line is through the Logan development programme, which currently calls for the construction of a people mover to connect the terminals, hotels, and the MBTA services. Secondly, the less direct avenues of influence are through the success of the public/private operating model. Such success may influence the thinking of the legislature on transport questions. This discussion illustrates another point, which is that the truly powerful voices may have no clear relationship with public transport or the MBTA. For example, welfare spending is an important and politically powerful category in the state budget. Changes in this area may therefore, by extension, affect the funding for public transport. Similarly the importance of both the Transportation and Ways and Means Committees of the legislature should not be underestimated.

During the BTPR, groups could be classified as either pro or anti road, in the sense of lending their support to the construction of new roads or to reduction in the road program and transfer of funding to public transport services. Presently classification of those who support the MBTA and those who are more antagonistic to it (or at least antagonistic towards spending to support public transport services) could be structured as shown below in Table 5-1.

Table 5-1: Support and Opposition for Increased Public Transport Expenditure

	Pro - Public Transport	Anti - Public Transport
Local	Core Communities Property Owners / Large Employers	Suburban Communities Property Owners
Regional	MAPC	
State	EPA; CLF	EOTC?

Clearly these classifications are very crude, as the inclusion of the property owners as both supporters and opponents of increased spending on public transport, and the suburban communities as opponents, illustrates. The property owners could be said to be in favour of increased spending on public transport, were it to make their properties more accessible, reduce the cost of the requirements of trip reduction ordinances for their tenants, or reduce the need for costly parking provision for example. At the same time these same companies are generally unwilling to contribute more for such facilities (e.g., through increased taxation) nor are they necessarily in favour of developments which allow easy access for public transport users (who may be deemed an

unimportant constituency in their demand.) Such divided loyalty was recently exhibited clearly when the South Boston transitway was proposed. In that instance the property owners accepted the view that improved access would increase the value of their properties in the long term. This acknowledgment did not however make them willing to contribute to the transitway.

Nor is such a structuring of the analysis simple — for example it is by no means clear that the EOTC is anti-public transport. However the pressures of the MBTA, through the CLF CA/T mitigation process, have been uncomfortable for the EOTC, which is itself sponsoring the CA/T project. This does not create good relationships on which to build. Similarly public transport takes much of the Office's finances and carries, statewide, fewer voters than other means of transport. Hence it might be seen to represent a diversion of time and resources.

State Government is aware of the population trends in the area and in Massachusetts as a whole, which will gradually make the Boston metropolitan region less important as a population (therefore taxation and voting) centre in the next few decades. This reduces the political importance of Boston centered institutions such as the MBTA and MAPC. At the same time the importance of Boston as an attractor of investment in the state, acts in favour of the metropolitan region in the political arena.

Stakeholder analysis is important in setting strategy since it helps the agency to understand where its' supporters are, and who they are, as well as which groups are likely to be affected (to gain or to lose) by each potential action. When these are combined with an understanding of the allocation of power in the area then all the potential ramifications of each strategy can be analyzed.

5.3 Systems Analysis

Systems analysis can be divided into two distinct elements — at least. The socio-demographic analysis and consideration of the transportation systems themselves. From available MBTA ridership data it is difficult to develop any long term evaluation of the changes in ridership by corridor, or at the community level. However trends in journey to work mode shares are available by community, from census data.

In mode share terms only 14 communities⁴⁰ had public transport mode shares, for residents' journey to work, of over 15% in 1990. Each of these communities is in the central area as would be expected and in eleven, public transport share had been higher in 1980 (only in Brookline, Malden, and Melrose was a high public transport share increased during the decade). Arlington, Belmont, Cambridge, Medford, and Milton are all centrally located, and in each the public transport mode share for the journey to work in the 1980s fell by more than 3%. (Only two other communities — Lincoln and Duxbury — witnessed such large falls.) This is of particular concern given that public transport service to Arlington, Belmont, and Cambridge was increased significantly in the 1980s, with the extension of the Red line to Alewife, and hence public transport would have been expected to be more attractive to residents of these communities by 1990.

However public transport journey to work mode share was increased in a number of MBTA area communities. There are two distinct pockets of mode share growth, as well as some scattered growth all across the area. The first pocket of growth is to the north east of the central core. Public transport mode share rose by more than 3% in Malden, and by more than 1% in Melrose, Nahant, Salem, and Wakefield. The second pocket of increase was at the south western edge of the area. Natick, Norfolk, and Norwood, had increases in mode share of more than 2% and Ashland, Sharon, Sherborn, and Walpole had increases of more than 1%. The other areas with increases of more than 1% were Hull and Cohasset.

Demographic and Employment Trends — The development of the Boston region and particularly the newer patterns (of dense central areas with other dispersed centers of less concentrated employment and population) have been extensively discussed elsewhere.⁴¹ The general pattern since the 1960s has been one of decentralization, reflecting the national trends. The metropolitan region has grown such that MAPC now considers the "commuter shed" area for the Boston region employers to be all cities and towns within a 60 mile radius of the core.

The historic development trends in the Boston area are discussed more fully in appendix C, where there is also a discussion of employment and population predictions made by the MAPC. Two sets

⁴⁰ The 14 communities are Arlington, Boston, Brookline, Cambridge, Chelsea, Everett, Malden, Medford Melrose, Quincy, Revere, Somerville, Watertown, and Winthrop.

⁴¹ See for example, Central Transportation Planning Staff (CTPS), Demographics of Commuting in Greater Boston, 1989

of predictions are presented and discussed — those published in 1989 and those published recently following the 1990 census. These two sets of forecasts differ significantly, suggesting that the expected growth patterns in the region have changed within only a few years. This is important for strategic planning, since the traditional public transport approach to long range planning is to base analysis on these long term forecasts alone. Using the forecasts accepts the assumptions implicit in the planning process, which as the MAPC themselves stated was not their aim in producing the predictions. Rather MAPC is planning and working to alter some of the trends which these forecasts reflect.

Implications of the trends for the MBTA — Factors which affect public transport ridership levels have been considered in detail by many researchers.⁴² Downs has shown that higher population densities, lower levels of car ownership, and higher numbers of people both living and working in the central city positively affect public transport ridership.⁴³ In the MBTA case, levels of income and distance from the central city are also important.⁴⁴ The relationship between income and public transport use is however becoming less significant whilst the importance of the central city is related in large part to the structure of the network. Income levels are often also closely correlated with levels of car ownership. It has recently been posited that though in the past an aging population has been favourable for trends in public transport usage this may not be the case in the future. (Only approximately 9% of all transit trips in 1992 were made by those over 61, whereas 11% of all other trips were made by those in this category. At the other end of the age range, 50% of transit trips are made by those under 30, as opposed to only 43% of all other trips.⁴⁵) Those who are now entering the older age groups are used to the spontaneity which their vehicles afford them and enjoy lifestyles which are automobile dependent. Another important MBTA ridership group is the college population. Hence continued growth in the universities will be important.

⁴² For a detailed case study of one urban area and the effects of recent trends on transit ridership see Zhi Liu, Post World War II trends in transit operations in Portland, Oregon, unpublished Harvard Ph.D. dissertation 1993

⁴³ Anthony Downs, Stuck in Traffic - Coping with peak hour traffic, 1992

⁴⁴ Paul Schimek, Commuting Trends and Land Use in the Boston Metropolitan Area: Lessons from the 1980s, unpublished MIT term paper 1993

⁴⁵ Federal Transit Administration, Public Transportation in the United States: Performance Condition, Report to Congress, June 1992

In the analysis which follows, these factors are accepted as being the most important when considering the outlook for the MBTA. The analysis focuses on the threats to, and opportunities for maintaining or even increasing, MBTA ridership levels.

Threats — To reiterate, negative trends for public transport ridership include decentralization of employment and population, increasing car ownership levels, increasing female workforce participation rates, and (perhaps) aging populations.

The fact that the highest rates of population and employment growth in the next 20 years will be in the communities at the edge of the MBTA area suggests that large ridership growth is unlikely. This is particularly the case with a network and operating policies similar to those which currently exist. The emerging antipathy of communities within Route 128 to further population growth, as well as to development in general, is likely to act as a further downward pressure on public transport ridership levels.

One significant threat to MBTA ridership might be the 1989 prediction of falling population in the north/north eastern quadrant, just outside the inner core. This is the area where the major growth in public transport mode share for the journey to work was experienced in the 1980s. As noted earlier, public transport mode share rose more than 1% in Malden, Melrose, Nahant, Salem, and Wakefield. This threat may grow if the congestion on the Central Artery in Boston has been one factor in the high public transport mode shares. Were public transport to be less competitive on the completion of the CA/T work, then the pressure on levels of ridership would increase.

Increasing female participation in the workforce is predicted. This is likely to have a negative effect on public transport usage, though of course the location of the employment opportunities is important in determining the effect on mode share for work trips. For non work trips the only effect of increases in car ownership levels, another by-product of increased workforce participation rates (which are predicted for both men and women), is negative. The aging population (growth in the over 75 years group in the 1989 predictions) may have a negative effect on public transport ridership as may the increasing numbers of very young children, though at present the effects of these trends on ridership is not certain.

Opportunities — To reiterate, factors affecting public transport ridership positively include increases in employment in central areas, and falling levels of income or car ownership. Dense housing and employment centres are also likely to have positive effects.

Favourable trends for public transport ridership can be seen in the predictions that much of the affordable housing construction will be in the inner core, and that Boston and Quincy will experience the highest absolute increases in population in this period (if the 1989 predictions are accepted). However the outlook is significantly changed by the later predictions that the largest absolute increases in population will occur in Ashland, Duxbury, and Norfolk, all at the edges of the area. Both Boston and Quincy, if these predictions are correct, will experience population losses. (Throughout this discussion it should be remembered that what is being considered here is the result of these location changes on the transport system. The changes themselves are a product of many factors including for example the quality of schools and the perception of crime.)

Employment trends in Boston and Cambridge, with large absolute increases predicted, are favourable, though the increasing dispersal of employment across the region in the later predictions is less so.

As noted earlier, dense development and a congruence between levels of employment and population are positive for public transport usage. For example, in Lynn and Quincy which are each regional centres in their own right, levels of public transport usage have been high. Both cities are predicted to experience increases in employment levels to 2020 (in the 1989 predictions), whilst Quincy is expected to enjoy one of the highest increases in population. In the second publication however the figures are less favourable for public transport mode share since though employment in Quincy would increase, employment in Lynn would fall by over 10%. Population trends are also less favourable for public transport, with Quincy population falling, whilst Lynn's would grow slightly.

MAPC's Metroplan 2000 also implies that the regional group will be leading a movement towards more public transport oriented development, and increased public transport usage. However the concentrated development centre (CDC) policy is not all to the good of public transport services as

provision is currently structured by the MBTA. The 11 CDCs⁴⁶ which have been designated thus far, and with which the MAPC is working to ensure that mixed use development occurs, are scattered across the MBTA region. Most already enjoy relatively good public transport access, particularly those with commuter rail stations. However much of the newer development in these communities is not easily accessible from either the town centre or the rail stations. More generally those working at these sites are likely to be drawn from a wide catchment area. Waltham for example, draws its workers from communities all across the MAPC region, and extending further to the communities within the newly defined commuter source area — up to 60 miles from Boston. These dispersed origins make high frequency public transport service more costly to provide, and less competitive with cars (in terms of travel time). Supporting community development to match employment and housing also means supporting reduced commuting distances. In some instances these can be reduced to allow the journey to be made on foot. In others, the short distance means that automobile travel times (given low levels of congestion) are likely to be competitive or generally lower than public transport times. Neither of these options necessarily bodes well for public transport mode share in the mixed use communities, although the importance of pedestrian friendly environments to encourage use of public transport should not be underestimated. Other regulations might be needed to deter car use — such as stringent air quality controls, or parking priced at the cost of its provision.

The other facet of the systems analysis will be an analysis of the transport system. The MBTA has been able to maintain ridership levels, through a period in which other trends have been acting against it, and in which public transport agencies nationwide have experienced declining ridership. This may well be related to other factors such as increased route mileage and service frequency, relatively dense network coverage, clean, comfortable vehicles, low fares, and the related high levels of subsidy. Areas not covered above and in which the MBTA will be particularly interested include the need for road maintenance (because of the effect of poorly maintained roads on the life expectancy of buses, and the comfort of the passengers traveling in buses along these roads), the levels of congestion and the particular needs for bus priority in certain congested areas or at certain intersections, the opportunity for further system development, and the effect of poorly performing routes on the rest of the service. Increased ridership is likely to be possible where service quality is

⁴⁶ The 11 Concentrated Development Centres are: Salem, Gloucester, Peabody, Natick, Malden, Waltham, Chelsea, Framingham, Lynn, the urban economic core (Boston), and Cambridge.

high. This can be measured through improved frequency and greater reliability as well as through reductions in total travel times. The importance of the internal assessment in the full strategic planning process is therefore illustrated once again.

Apart from the CA/T, few new roads are planned for the metropolitan area in the next 20 years (in fact the CA/T plans also include the transformation of some Metropolitan District Commission roads into parkways.) This limited road construction is a positive sign for public transport ridership. Congestion levels have been increasing steadily, and air quality is poor. Legislation to increase vehicle occupancy levels, and improved facilities for public transport vehicles (such as HOV lanes) are all likely to mean reductions in public transport travel times, in contrast with travel in cars through congested streets. Faster public transport service (particularly when the speed increases relative to that achieved by automobiles) has been shown to be more attractive to travelers and hence is likely to increase public transport mode share.

The work on the Central Artery and construction of the Third Harbour Tunnel poses threats and also presents opportunities for the MBTA. The work poses threats to its quality of service, through disruption of downtown bus routes for example, and offers opportunities from the disruption of the road network, related deterioration in automobile travel times, and the new resources which have been provided to mitigate the effects of the construction work.

5.4 Fixed and Floating Point Analysis

The current network seems to be fairly fixed, and the rail network certainly so. Some bus routes may be under-performing in comparison with other routes in the network and revisiting the use of resources on these routes is warranted. (Part of the current CLF work is focusing on these issues.) At the same time, some service extensions are virtually assured, for example rail services into the South East on the Old Colony Line and the South Boston transitway. However the restoration of service in the Washington Street Corridor and the introduction of a complete "urban ring" service are both being treated as relatively unlikely possibilities.

As noted earlier one major change on the horizon is the importance of the Boston area in the Commonwealth. The MBTA needs to make an assessment of whether these changes may not increase the importance of tourism in its ridership and power base. For example it may be that the tourists entering Boston will become a more critical economic driver relative to the Boston

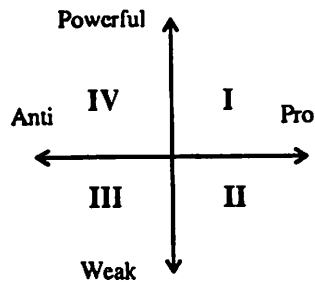
population itself, therefore the MBTA would be more influential were it to be supported by representatives of the tourism industry. In this light, particularly, an alliance with hotels and tourist agencies may also be valuable. Similarly the importance of college students as a ridership group suggests that alliances with universities are beneficial.

Though the structure of the Boston legislative and managerial systems for transport are unlikely to be changed in the short term, and despite what appears to be a fairly "fixed" environment for transport in the region, there are also possible points of change on the horizon. For example, significant privatization efforts are now beginning to be seen at the MBTA, reflecting one of the key areas of concern to the current Republican administration: the cost of service. In order to try to reduce these costs, budgeting methods have also been changed and lower budgets proposed. In the longer term it is likely that, particularly if these budgetary steps are not successful, further privatization efforts will be made. This could therefore be categorized as another floating point.

Given the stakeholder and "power player" analysis the authority will wish to structure the objective setting process to ensure that those areas in which change is possible (the floating points) are affected in the manner most favourable to its long term development. Isolating these different floating points is therefore critical. If the possibility of privatization is the principal floating point in the environment, then the affected stakeholders would include:

- Public transport unions and workers
- Passengers
- Taxpayers
- Private Transport Contracting Companies

In theory the unions and workers should be opposed to such a process since jobs in the public sector would be reduced. The other three groups would be in favour of privatization, if the level of service was not affected, since on the one hand the cost of service should fall, and on the other hand income for the private contractors would increase. However it is only the unions and the taxpayers who represent true power players as described earlier. The diagram below illustrates the positions which the MBTA will need to reconcile.



The unions will therefore be in quadrant IV, with political power but opposed to the privatization process. Similarly the taxpayers will be in quadrant I, in favour of the privatization process (though of course only to the extent that their concerns about service quality can be allayed) and with power. The private contractors on the other hand will be in the second quadrant with limited power, but in favour of further privatization. The relative strength of each will be important therefore for the MBTA in its own position on privatization and then in how it acts on any decision.

5.5 Time Line (Critical or Pinch Point) Analysis

Clearly Boston's transport system as a whole, given the CA/T construction, is in a state of flux at present and despite the traffic disruptions, new employees in Boston itself (which is predicted to experience the largest absolute growth in employment in the region) will need to be assured of its attraction as a place of work. The attraction of the city as a tourist destination (one of the principal economic influences in Boston) will also diminish with a poor quality transport service.

In considering the Olympics in Boston in the twenty first century, an awareness of the importance of the temporal dimension in transport planning for the region has been developed.⁴⁷ This work shows that changes in a mode choice model's coefficients are path dependent (i.e., based on the past trajectories of the values of the coefficient and that of many others.) This argument seems plausible, though not of great encouragement to the short term improvement of public transport mode share. Since there has been a long run deterioration in roadway conditions⁴⁸ growth in the transit market would have been predicted. Ridership has increased but it is still the growth in automobile mode share which threatens public transport. Even if the factors which have detracted

⁴⁷ See D. J. Turk, A Dynamic Framework For Transportation Policy Design: The Case of the Boston Olympics, Unpublished MIT Masters Thesis, 1994

⁴⁸ Though there is little evidence to back up such an assertion, this is suggested by the fact that trip making has increased while total pavement capacity has not, for example.

from its services were to be identified and the effects reversed in the near future, the mode share would remain unchanged for a longer period given the path dependent mode choice pattern. The delayed behavioural change also creates difficulties for building a political base in favour of current spending for future returns.

A time line analysis for the MBTA might include the opening of the new Commuter Rail services, the construction period of the Central Artery (with particular focus on the period of most intense construction work downtown), the opening of the depressed Central Artery, the creation of a new federal transportation bill (ISTEA will be revisited in 1997), the completion of a megaplex, the opening of the Downtown transitway, and the Olympics.

In relation to the CA/T work, the MBTA has dedicated an office, at South Station, to act as a liaison point. This office carries information in two directions, from the MBTA to the CA/T project about the particular requirements of public transport services and the effects which the construction work is having on service quality, and from the CA/T to the MBTA, on the project schedule and the needs of CA/T construction. The status of the relationship between the two organizations has thus far been a good one, however it will be during the major construction work downtown, when the highway conditions start to deteriorate, that the pressures from both sides may grow more intense. At that stage, the MBTA will desire to maintain service levels (particularly frequency and reliability) in order to ensure that existing passengers as well as those who may be induced to try an alternative mode (because of the increased journey time by car for example) are offered a sufficiently attractive service. However if delays are caused to bus movements, just as to cars, service quality will deteriorate. Passengers lost at this stage may not return to public transport.⁴⁹ Hence this period is a critical one for the MBTA. Similarly however the MBTA needs to be aware that it is a critical period for the success of the CA/T project. The CA/T has made a commitment to maintaining traffic conditions, and given the cost pressures, is also eager to ensure that the construction schedule is not delayed.

The time sensitive analysis would however make the MBTA aware of:

⁴⁹ Richard Oram has shown, in a number of cities, that a large proportion of passengers at any given time ride only occasionally. If these occasional riders can be induced to make use of the MBTA facilities during the period of CA/T construction and the quality of the service which they experience is high then there are possibilities for inducing them to make more frequent trips.

- the potential problems in advance
- the need to clarify its service objectives, so that these can be presented clearly to those with whom the MBTA will need to discuss mitigation measures
- the need to monitor routes before changes begin to affect them — allowing documentation of any changes
- recognizing the challenge of the CA/T project, the MBTA will advertise its services, and communicate problems or changes in service, for example, with its passengers early and often

5.6 Strategies

What would such an analysis lead the agency to conclude? — It is not clear that the more general analysis above would lead to very different conclusions for development of the MBTA services than would a strictly systems analysis approach. However it does reinforce the importance of the Central Artery project — in terms of its potential effect on MBTA service provision, its dominant position in the political arena in the next few years, and the increased funding for MBTA services which has resulted from it. At the same time the analysis highlights the power of state government particularly whilst the size of the MBTA budget continues to grow. The role of the CA/T project is so central to all aspects of the environment that any chosen strategy will need to reflect its importance, making use of the opportunities which it provides whilst minimizing the associated threats.

The “geographical” extent of service is the other key strategic question. Considering only the communities in the MBTA area, as was the case in the earlier discussion, excludes a further 51 communities where the MBTA currently provides service, and more generally the rest of the metropolitan region. More precisely the continuing sprawl of the metropolitan area is being ignored. This may hide the possibility that the real threat to maintaining MBTA mode share lies outside the present service boundaries. However this restriction was adopted for two reasons. Firstly the present political climate in Massachusetts, and that of the country as a whole, means that an expansion of powers of taxation to fund MBTA services to other communities is unlikely to be approved (taxpayers represent a powerful force in the environment) and secondly, this analysis was undertaken outside the authority, solely to illustrate the methodology. The authority itself could identify other important factors, with a more detailed analysis. Political linkages are tight in Massachusetts and the MBTA is in a position to make use of these connections to construct a view

of the "political" climate on issues such as the growth of the urban boundary. (As is discussed below however it is also the case that since the state is dominant in MBTA financing, serving the 78 cities and towns may become less important if current development trends continue.)

Before the CA/T project was approved, the EOTC made commitments to maintain traffic flow in the vicinity of the construction work. However travel demand model predictions for 2020 show a significant increase in the number of trips being made to Downtown Boston, and along the Artery. The trip total will grow gradually over the course of the next 20 years (rather than jumping from one model state to the next.) Therefore in order to ensure that the level of service provided for the current users of the road does not deteriorate during this period, the CA/T will need to institute new traffic management measures.⁵⁰ Assisting the MBTA to increase its ridership, would also help the CA/T to honour the EOTC commitment. Hence if the MBTA strategy stresses working with the CA/T and develops support within the project team, it would be able to build on the opportunities which that the work presents, whilst reducing the significance of its threats.

Experience with past transport projects suggests that the trips currently made by car are unlikely to be diverted to public transport. Thus an initial goal might be to attract all new trips to downtown Boston to public transport. The table above (table 5-2) illustrates what this would mean in terms of public transport capacity specifically, using data from the CTPS models and for the morning peak period only, with a 1.2 vehicle occupancy factor in 1990 and 1.1 in 2020. (These factors are those used in the CTPS model for home-based journey to work trips.) A four corridor structure is used. The vehicle numbers are taken from a select link analysis.⁵¹ "To Boston" refers to all traffic which is destined for sites to the east of Massachusetts Avenue, north of the Fort Point Channel, and south of the Charles River. "1990" Rapid transit and Green line ridership data is taken from the MBTA 1994 counts and is that which is used in the CTPS model.

⁵⁰ The experience of the reconstruction of the SouthEast Expressway showed clearly that improved traffic management measures could allow the level of service to be improved, in some circumstances, even when traffic volumes were increasing and fewer lanes were available for traffic.

⁵¹ Thanks are due to Fernando Lasaga, who provided the information, having developed new methods for extracting it from the CTPS model.

Table 2: Corridor Style Analysis of the Commuting Patterns to Central Boston 1990-2020											
Corridor	1990 Trips AM Peak			2020 Trips AM Peak			PT Capacity 1990		Inc. to Boston to 2020	PT Demand if all downtown inc. to PT	Use of PT cap if all downtown increase to PT
	Total	To Boston	Through	Total	To Boston	Through	#	V/C			
North East											
Tobin Bridge	9763	4418	5345	10863	5438	5424			1020		
Sumner Tunnel	10902	5898	5004	9957	5925	4033			27		
Third Harbour Tunnel				10067	2270	7797			2270		
Total Highway	20665	10316	10349	30887	13633	17254			3317		
Blue Line	16104			17596			22800	71%	1492		
Rockport & Ipswich Lines	4706			6394			5025	94%	1688		
Total Transit	20810			23990			27825	75%	3180	27307	98%
North- North west											
I-93	23202	11591	11611	23920	12069	11850			478		
Lowell Line	3441			3853			4402	78%	412		
Haverhill Line	3036			3381			4000	76%	345		
Orange Line (N)	18203			19479			28200	65%	1276		
Red Line (N)	19989			21178			36600	55%	1189		
Total Transit	44669			47891			73202	61%	3222	48369	66%
West- South west											
Turnpike E.	20366	14495	5872	21501	12903	8598			1134		
Storrow Drive	12865	7586	5279	11505	7283	4222			-1360		
Total Highway	33232	22081	11150	33006	20186	12819			-226		
Fitchburg Line	3059			3853			3079	99%	794		
Framingham Line	4246			6440			4327	98%	2194		
Needham Line	3151			3404			4294	73%	253		
Orange Line (S)	18276			19556			28200	65%	1280		
Green Line	18954			19558			29400	64%	604		
Total Transit	47686			52811			61894	77%	5125	52811	85%
South- south east											
SE Xway	25001	11874	13127	24907	11162	13746			-712		
Fairmount Line	690			897			3870	18%	207		
Franklin Line	6012			6555			5480	110%	543		
Attleboro & Stoughton Lines	9936			11339			9869	101%	1403		
Middleborough Line				4232			4220		4232		
Plymouth Line				2484			4220		2484		
Red Line (S)	28092			35850			36600	77%	7758		
Total Transit	44730			61357			64259	70%	16627	61357	84%

The directional split of peak demand is taken from 1989 counts for rapid transit and 1985 counts for the Green Line. Predictions for 2020 are those in the CTPS model for 2000, and will hence underestimate the public transport ridership in relation to the highway traffic.⁵² "1990" commuter rail data is 1994 ridership on all peak period trips. The commuter rail capacities are actual peak period capacities calculated from peak period schedules in 1993 except in the case of the Old Colony lines. For each Old Colony line the capacity is based on 5 peak period trains, each with capacity of 844 passengers.⁵³ The 1990 capacity figures are used for the later date since there are currently no firm plans for further capacity expansion.⁵⁴ Capacity of each rapid transit line differs slightly due to the variations in car capacity and is taken from MBTA data.⁵⁵ The forecasts also assume the Newburyport extension and the Worcester full build option.

Though this is still a crude approximation it does illustrate the need to increase capacity on rail lines if all the new trips are to be attracted to public transport services. If capacity were not increased, only in the north west corridor would less than 80% of the peak period capacity be used, and in the north east corridor approximately 98% of capacity would be required. This means a deterioration in service for existing passengers and may make it more difficult to attract new riders whose demands of a public transport system, in terms of comfort and convenience, may well be higher. One benefit of this sort of analysis, for the strategic planning process, would be that the figures produced here could be used to quantify performance objectives / goals for the system.

In addition this analysis does not truly capture the effects of peaking, which will be critical in assessing performance. Instead it is assumed that the demand is spread evenly over the three hour peak period. The relationship of peak hour peak point demand to peak hour capacity in 1994 is shown below.

⁵² CTPS is currently refining predictions for 2020 public transport ridership.

⁵³ A capacity of 844 passengers per train is the average peak period train capacity of routes on the commuter rail lines into South Station.

⁵⁴ Even if the capacities are increased in the future, as noted above it is the gradual development of demand which is important here. If capacity is not available when needed, riders may well be deterred.

⁵⁵ The peak period capacity is simply three times the peak hour capacity. (See MBTA, Ridership and Service Statistics, sixth edition 1994)

Line	Peak hour volume at peak point/ Peak hour capacity
Blue Line	83%
Orange Line (N)	89%
Red Line (N)	60%
Orange Line (S)	82%
Red Line (S)	78%

Even these figures do not take the demands down to the train level and therefore still underestimate the true effect of capacity constraints. However the Orange Line was reaching capacity levels and all but the northern branch of the Red Line, were above 75% of capacity in the peak hour. The upgrading of the signaling systems on the Blue Line and platform lengthening will allow six car train operation at three minute headways, however currently vehicle numbers do not permit such an operating pattern.⁵⁶ Given this information it appears that peak hour capacities are likely to be stretched within the next twenty years, if no capacity changes are made.

It seems a reasonable assumption that in order to accommodate demand of this level on these public transport routes, and particularly to attract those who currently use cars for their commute, significant park and ride facilities would be required.⁵⁷ It is also the case that park and ride lots increase the awareness of MBTA services among the suburban communities, where the need to build support is strongest.

⁵⁶ The MBTA is considering various options for replacement and development of the Orange and Blue Line fleets.

⁵⁷ It should be noted that the MBTA has already made the provision of a larger number of parking spaces a priority. For example the supply of spaces increased by more than 10,000 from 1980-1993.

Table 5-3: Station parking: Availability and requirements 2020							
Corridor	1992 Parking Spaces			Recently added	Possible Spaces	2020 Available Spaces ²	Additional PT Trips if all inc to 2020
	Available	Used ¹	% used				
<i>North East</i>							
Blue Line	2334	2759	118%		191	-234	
Ipswich and Rockport Lines	1988	831	42%	965		2122	
Total	4322	3590	83%	965	191	1888	6805
<i>North - north west</i>							
Lowell Line	1679	1108	66%	235		806	
Haverhill Line	1152	869	75%	160		443	
Orange Line (N)	2403	2799	116%	950	4650	5204	
Red Line (N)	2255	2474	110%		1000	781	
Green Line (N)	323	346	107%			-23	
Total	7812	7595	97%	1345	5650	7212	4014
<i>West - south west</i>							
Fitchburg Line	1051	653	62%	210		608	
Framingham Line	915	728	80%		1700	1887	
Needham Line	862	688	80%		225	399	
Orange Line (S)	226	242	107%			-16	
Green Line (B,C, &D)	1800	1574	87%		830	1056	
Total	4854	3885	80%	210	2755	3934	5135
<i>South - south east</i>							
Fairmont Line	83	25	30%			58	
Franklin Line	2701	1854	69%	150		997	
Attleboro & Stoughton Lines	3687	4954	134%	185	955	-127	
Middleborough Line					2200		
Plymouth Line					2770		
Red Line (S)	6054	5672	94%		2800	3182	
Total	12525	12505	100%	335	8725	9080	10881

Table 5-3 above gives information (from the report on public transport services to mitigate the effects of the Central Artery work,⁵⁸ the 1992 MBTA Service and Ridership Statistics document, and recent CTPS information⁵⁹) about the level of parking availability at rail stations and compares this with the demand forecast for these routes were public transport to capture this increase in demand for travel. (Figures on current use of the spaces can be over 100% since all demand for parking through the day is included.)

Though the figures quoted are for the complete line (by direction) in each case there are clearly different stress points at particular stations. The CTPS modeling structure does not provide sufficiently detailed data for analyzing this further since the predictions are based on large district structures outside the CA/T Study area. For example, as would be expected, demand in the Northern Corridor, crossing the I-93 screenline, is dominated (10892/19335) by those vehicles which originate in two districts. The districts encompass the communities of Haverhill, Lawrence, Andover, Melrose, Methuen, North Andover, North Reading, Reading, Stoneham, Tewkesbury, Wakefield, Wilmington, Winchester, and Woburn. In a similar fashion the trips entering Boston on the SouthEast expressway are dominated by those originating in communities on the south shore. Parking demand tends to be more intense however at the outer ends of each line, as would be expected given the time costs involved with transferring between the car and the train.

The MBTA is currently considering this issue in more detail, in order to assess whether its current proposals can meet the requirements of the CLF commitment. Specifically it is assessing whether the number of new parking spaces proposed for express bus stops would create demand which outweighs the number of seats offered.

There are other plans for increasing the availability of parking spaces at various stations, as noted, but such plans must be agreed at the community level. In general communities have not tended to be well disposed to park and ride lots since the perception is often that the lots will induce trips to the community for parking purposes only, which in turn will lead to a deterioration in traffic

⁵⁸ MBTA, Vanasse Hangen Brustlin Inc., and Multisystems Inc., Central Artery/ Tunnel Project Regional Transit Mitigation Program, July 1993. The parking facility information in this report dated from September 1991.

⁵⁹ Vijay Mahal at CTPS kindly provided these figures, as well as those for the assumptions on MBTA ridership used in the table 3-2.

conditions and increase the financial burden on the community. For example the southern part of the Orange Line has not been developed as a Park and Ride corridor since there is a limited radial highway network in that area, and there are significant local concerns about traffic. This is likely to be one of the motivations behind the MBTA approach to the development of new parking facilities, which has been to seek locations at the junction of major regional highways. Perceptions of these facilities can change swiftly however. The experience of the reconstruction of the SouthEast expressway in the 1980s suggests that when there is a sufficient threat to other modes of transport the interest in public transport grows. In this case, support for public transport and particularly park and ride lots grew so much that the MBTA introduced lots in areas where previously the opposition had been strong. This may be another lesson for the period of the CA/T work. The construction of further parking facilities is also not without cost for the MBTA. For example, the mitigation measures proposed for the CA/T project included the addition of 9890 spaces (through both construction and leasing) at an estimated cost (in 1993 dollars) of approximately \$2.5 million.

As has been noted, what is critical in this scenario is maintaining CA/T support. At the same time however the influence of the CLF will be important. Balancing the two forces is critical if the MBTA is to achieve the desired result.

Demand for travel will increase over time and generally it is "catching" that demand at an early stage which is important in achieving increased public transport ridership in the long run. For the CA/T this will be doubly important since the constant monitoring of road conditions, and its very public commitment to maintaining service levels, will create intense media interest. Even if levels of service deteriorate only for a short period, the support could be lost. Hence marketing will play a key role. The MBTA will need to assess its ability to undertake such a marketing campaign through the internal analysis and develop proposals for enhancing its resources where necessary.

What is the current MBTA strategy? — As was noted earlier the current MBTA strategy is fairly reactionary. One reason for this is of course the dominant role of the CA/T project, which the authority acknowledges. Similarly there is an explicit recognition (in the current Plan for Mass Transportation) that the CA/T agreements with CLF are among those with highest priority. As a result the MBTA has purchased new buses, embarked on a service standards and planning study in conjunction with the CLF, is working towards the construction of new parking spaces around its

stations, and has created the position of CA/T coordinator. The coordinator passes construction phasing and transport service information between the two organizations.

Another strategic decision has been to develop the commuter rail network, extending service further from Boston. This affects various stakeholders and power players at the same time as it is altering the transport environment and may have a long run effect on the nature of development patterns. The Old Colony line is to be restored, the line to Worcester has been opened, and the MBTA is also developing plans to extend service to Newburyport and Providence. The affected stakeholders include of course state and local taxpayers. Currently the MBTA debt levels are high. These will increase with the development of commuter rail services and further capital investment. The increase in local tax support is capped at 2½% per annum, hence the relationship with the state taxpayers is likely to be the more important one. Given that the extensions will allow MBTA service to penetrate further into the state and serve a larger number of municipalities, the MBTA may be hoping to build a greater base of support among the taxpayers in these communities. Clearly critical to this will be the extent to which the community is aware of and uses the services. The level of service itself will also be important in creating a positive image.

Generally environmental groups, important power players in the region, support the expansion of rail services. However in this case there are some negative factors — in the sense that the further outward extension of the system may encourage urban sprawl, with workers being able to live further from their work site — which may reduce their support. Nor is this sort of expansion a strategy which falls in line with the notion of CDCs as espoused by the MAPC. CDCs, as their name suggests, are concentrated developments. Encouraging more long distance commuting (through extending the commuter rail services) is at odds with such a concept. This may mean that the MBTA and the MAPC would find it more difficult to develop a fully supportive relationship. Given MAPC's influence in transport funding decisions, this may be important for the MBTA.

The current MBTA strategy also looks inwards, to the cost structure and the possibility of privatization. The first few (11) bus routes are to be privately operated from October 1995. Currently the affected groups are largely those discussed earlier under the power player analysis, particularly the MBTA staff. One garage (Albany Street) will also be leased to the contractor if so required. The "pre-qualify, low bid" approach is being used in order to derive the most benefits for

the authority in terms of cost reductions. Such internal decisions also affect the climate in which the authority operates.

The potential benefits for the MBTA include the support of local taxpayers, through a reduction in costs, and potentially through improved service levels. In addition if this contracting is successful, union power will be reduced, since the threat of competition becomes more real. Improved service levels may well be realized since the monitoring of the contractor (to ensure that service is provided as specified) will likely be at a higher level than the monitoring of in-house services. Service on the express bus services (some of which will be provided by the contract) is also going to be affected by the work on the CA/T, and will hence again be subject to a high level of monitoring. One of the most important groups in terms of taxpayer support for the MBTA, will be the suburban residents who use these commuter services. Hence achieving a successful transfer of service provision from the MBTA to the contractor will be crucial.

The relationship with the MBTA staff will however be negatively affected. At the same time union power may be threatened. Understanding the balance which will be reached, between increasing intransigence on the part of the residual labour force, and their willingness to cooperate to achieve further in house costs savings which could reduce the political will for further contracting out, will be important.

Other MBTA strategic options — If the MBTA were instead to focus solely on the core, the development of the South Boston transitway, the improvement of downtown bus circulation, and the development of the inner circumferential services would be brought up in the priority list. In this instance, effected stakeholders would include central area businesses and of course, residents. However residents of suburban areas could also be encouraged to support such a strategy were the importance of the circumferential services to be couched in terms of acting as a means to reach employment locations at the edges of the central area, from commuter rail, without having to travel into the Central Business District. This strategy would require the development of commuter rail stops slightly outside the core, at Boston University for example, as well as drawing on existing facilities at Ruggles and Porter Square. It would also be a means to present the MBTA, and commuter rail, as a way to avoid the congestion, in the CBD, caused by the CA/T project.

Similarly the core focus could be developed were the MBTA service area to be reduced. The area could be scaled back to include only the densely populated areas. Other organizations could be created to provide radial service from each CDC and some other employment centres. An example of such a structure is that in the Washington DC metropolitan area. The growth of suburban privately operated services (under contract to the county governments of Virginia and Maryland), at lower cost, with non-union labour, may gradually threaten the existence of the Metrobus system, which has been scaled back considerably.⁶⁰ It is not inconceivable that as the local governments in the MBTA area become aware of the cost savings which can be achieved through contracted operations, they will consider this option for their communities, and lobby for a reduction in the size of the MBTA.

Powerful groups (such as the EOTC and the Governor or the MAPC) would be provided for in a new structure since these are area-wide bodies which would take similar roles in the new institutions. They would also have significant influence over the creation of the new institutions and hence could ensure their continued influence in the new arenas. Union power is clearly threatened by such a move, though federal provisions for grant allocations (13(c)) do reduce these threats somewhat. This would make it likely that such a break up of the authority might well take place over many years as union power was gradually eroded. It might also be however that the groups who would gain from such a strategy would gain insufficiently to allow them to support it.

The key player in adopting this strategy might however be MBTA management itself, which would certainly have a diminished sphere of influence under the new structure. Their support for such a scheme would depend on the political views within the Commonwealth government, which appoints these leaders and is their paymaster.

5.7 Conclusion

Though many different strategies may be derived from the analysis of the external environment, the full strategic planning process must include an internal analysis as well. The final selection must balance the two considerations. Cost modeling will clearly also be required to ensure that the

⁶⁰ More information about the development of these suburban services, many of which act as feeder services to Metrorail, is given in Ronald F. Kirby, Case Study of the Washington Metropolitan Area Transportation Authority, in TRB Special Report 217, New Organizational Responses to the Changing Transit Environment, 1988

optimum balance is reached between provision of service and generation of ridership.⁶¹ Calculations of this sort are particularly critical in the decision on whether or not to extend rail lines further into the suburbs or to increase parking capacity at the outer ends of each line.

In the earlier chapters the importance of managerial support for any strategic process has been stressed. A strategy represents, when fully elaborated, not only a culmination of the planning process and the development of an implementation structure with quantifiable objectives and goals, but a policy for the MBTA to announce to its stakeholders. Alignment of management with the most powerful positive forces associated with the selected strategy therefore becomes more crucial.

The MBTA has not developed a mission statement, though various publications give some indication of goals.⁶² This should be viewed as the critical first step on the way to clarifying the role of the agency in the eyes of its employees, passengers, funding agencies, and other stakeholders. The discussion of each potential mission statement would, in itself, provide the authority and management with more information about the structure of relationships and the value placed on different aspects of its service. As a marketing tool this mission statement can be important too. It is clear from many of the scenarios developed above that since, usually, growth of demand for travel is only gradual, the marketing of services will be critical in achieving increased public transport ridership and hence maintaining CA/T support. Similarly the stakeholder analysis illustrated the importance of alliances with particular groups such as tourists and students. More directed marketing and targeting of service would allow such relationships to be developed.

⁶¹ As noted by Zhi Liu in the Portland case study, for example, it is important to remember and acknowledge the cost implications of a heavily peak oriented system.

⁶² For example the 1993 Fare Policy Statement issued by the MBTA Board sets the mission as being to attract and retain riders, and to provide quality service efficiently. As noted earlier the budget review process has meant the development of mission statements for each department.

Chapter 6: San Juan — A case study

6.1 Introduction

Change is the order of the day in San Juan's public transport system in the second half of the 1990s. The public bus system is being restructured around shorter routes and the transit centre concept, removing the long, winding routes of the present network. Following the success of the private contract operation of Route 1, from Río Piedras to San Juan,⁶³ two or three other routes are now being considered for private operation. The planning stage for a new rail line, from Bayamón in the west to Santurce in San Juan, is well advanced (the public hearings on the draft environmental impact statement were held in April 1995) and construction work is expected to begin in 1996, with the service opening in 2001.

Public transport ridership levels have been declining over a long period. By 1990 public transport carried only 12% of residents to their place of work. Privately owned and operated services in the region are therefore under financial pressure. These include *carros públicos* (shared ride, fixed route, unsubsidized privately owned van services), as well as a few privately owned bus services.

All of these transport changes have either added to the congestion problem or are driven by the desire/need to reduce it. Car ownership levels and trip making have been increasing steadily for many years. In 1990 a household survey was conducted, the results of which can be compared with a similar effort in 1964. Trip rates increased by 52%, from 1.62 to 2.47 trips per person per day. In the five municipalities of Bayamón, Carolina, Cataño, Guaynabo, and San Juan the average number of cars per person almost tripled from 0.141 in 1964 to 0.405 in 1990. New roads are planned, both for the centre of San Juan and leading out to other parts of the island, some of which will be built using toll financed private operations, similar to those pioneered in the Moscosco bridge in 1994.

At the same time the structure of the city is changing with large population growth, and expansion of the regional boundary to include Naranjito following the 1990 census. Predictions for the period to 2010 suggest that the growth rate will decline but that the growth which does occur will be

⁶³ This route has been operated under the brand name "Metrobús." The project to upgrade the public transport service in the corridor has been known as "Metromovil."

concentrated at the edges of the metropolitan area. Land use regulation and the planning procedures have also recently changed, so that each municipality now has more power over its own development than in the old centralized system (with the island wide Planning Board.)

Public transport in the region has been studied fairly extensively over the last 30 years or so, both from a regional standpoint, and at the operator level. AMA has been a particular focus of interest during the last few decades, initially because the preferred option for reducing congestion was extension of the bus system and bus priority measures, and latterly because of its poor performance. The cost of the operation is higher than those of peer agencies, fewer miles of service are provided, and fewer riders are carried. The recent studies and changes at AMA have an internal focus — working to try to eliminate these problems. The changes were given further immediacy by sunset legislation passed by the Commonwealth legislature in 1990. Despite not meeting the goals of this legislation, the organization was not disbanded.

Given all these changes, the external assessment would be particularly important for any transport agency considering a strategic planning process at the moment. This chapter uses the framework set out in Chapter 4 to try to illuminate the trends which affect public transport services. This in itself is however a multifaceted problem, since there are currently five different types of public transport available and with the completion of “Tren Urbano” there will be a sixth. The current five are públicos (regulated by the Public Service Commission — PSC), the Metropolitan Bus Authority (AMA), the Metrobús service (contracted by the Highway and Transportation Authority — ACT), private carrier buses, and acua-expreso services⁶⁴ (operated by the Port Authority). It is clear from this that there are a number of different governmental agencies involved with transport at the commonwealth level. Local governments are also involved, since they are responsible for regulating the use of street and curb space, and for controlling traffic and parking. In addition some municipalities provide público and bus terminals. Further details about the development of San Juan’s transport system and its geography are given in Appendix D.

Strategic planning could help to isolate different forces acting on an organization, and their implications. (New York has recently shown that in a rapidly changing environment the explicit

⁶⁴ There is in fact only one ferry service, from Cataño to Old San Juan, operating at present. There are plans to dredge a channel in the Martin Pena canal to reintroduce a three route triangle service across San Juan Bay.

consideration of various scenarios, through a strategic planning process, can help to clarify the areas of true importance for an agency.) The importance of fixed points is one of the questions addressed by the analysis in this chapter. Consideration is also given to the implications of these for the derivation of scenarios.

Another question addressed here is that of the feasibility and the implications of developing strategy at any of these different levels within the transport arena. The possible levels include government agencies and each transport operator. At the government level, the internal review is narrowed somewhat, taking into account the nature of the different public transport providers, and their current and future potential. What is more critical at this level is the implication of any action on the performance of the total system, and how this affects voters. Keeping these different levels in mind, the following analysis uses the structure proposed in Chapter 4, to review the operating environment for all public transport services.

6.2 Stakeholder Analysis

Though a number of stakeholding groups are identified below what may be most significant is the absence of any tradition of extensive community involvement in the public decision making processes. Though political views are strongly held in Puerto Rico, as is evidenced by the high turn out of voters for example, activism has not been important in economic and geographic development. This represents a significant contrast with experience in many mainland cities where stakeholders have played important roles in the planning processes, for many years (as was noted in the last chapter in the case of the MBTA.) Nevertheless these stakes are important for operators, not merely when reactions are demonstrated, but in financial, operational, and ridership terms.

Taxpayers — As with all publicly owned systems the importance of the taxpayers should not be under estimated. The majority of these taxpayers are car drivers and rarely use public transport. Hence they have conflicting requirements for the system. On the one hand, as car drivers they have a stake in public transport — as a means to reduce traffic levels and improve (or at least to prevent further deterioration in) traffic flow. On the other hand they also have a stake in reducing the level of state and local investments in the system.

Users — There are at least three groups of public transport users at present — those who use AMA buses, those who use the Metrobús, and those who use públicos. These groups are not

independent though there is little evidence of the extent to which transfers are being made between systems. There is also an important fourth group of users — those who will use the rail system in the future. It is known that there is a greater use of public transport by those who have fewer cars,⁶⁵ as would be expected. Users clearly have a high stake in the system, particularly in the low fares which are presently charged. The fares are lowest (\$0.25) on the slow and unreliable services of the AMA network. Metrobús fares (\$0.50) have risen since the service was first introduced and ridership levels have fallen as a result — illustrating the importance to the rider of these considerations.⁶⁶ Público fares are distance based, with an average fare per passenger of \$0.76. No público fares are as low as AMA's but services tend to be more direct than the current AMA network. The Público operators are also authorized to charge a premium of between five and ten cents on night services.

A large proportion (60%) of Tren Urbano riders are predicted to be transfers from either buses or públicos.⁶⁷ The models used to estimate Tren Urbano ridership in 2010 assume that the bus and público networks will have been restructured such that the routes are not competing with the rail line and that they are instead providing feeder services. In the new service structures (the transit center concept, and the Tren Urbano system with feeder routes) transfer passengers will be a significant market group. Serving this group will be important in achieving the objectives of the Tren Urbano system, as well as increasing public transport ridership and thereby reducing the pressure on the road system.

Those passengers who will have to make a transfer to use Tren Urbano services, or will have to transfer when using the newly structured bus network, may have had a direct journey under current conditions. For example in the 1985 Público Car Public Policy Study it was found that over 55% of riders did not transfer during their trip. Fewer than 5% transferred more than once. Since the perceived inconvenience of transfers is high, these riders may perceive themselves to have a stake in the current system.

⁶⁵ The 1990 Home Interview Survey showed that households where no car was available used public transport services for 64.5% of their trips, those with one car use public transport for 9%, those with two cars for 3.6% of their trips, and those with three or more, for only 2% of their trips. On a related note, the survey showed that only in the lower income brackets were more than one percent of any connections to either bus or público made by car.

⁶⁶ Ridership on the Metrobús route may also have been affected by the aggressive stance taken by AMA. AMA services were increased in the corridor in response to Metrobús success.

⁶⁷ FTA, and DTOP, Draft Environmental Impact Statement for Tren Urbano, 1995

Employees — employee wages and benefits are expected to represent 60% of operating costs for the rail line.⁶⁸ A higher proportion of AMA operating costs (around 75%) are due to employees.⁶⁹ Given this, and the high level of unemployment in Puerto Rico, employees have a considerable stake in the continuation of the public transport system.

AMA staff and management have a relatively poor relationship, though there are signs that this is improving. Both sides were pressured to consider change in part by the competition from Metrobús, which provides a fast frequent service, reliably, though at a higher price. The introduction of Metrobús within the AMA network area, and the taking of the premier route for the line, made it clear that the Government was willing to consider other options for providing bus service. The employees therefore have a stake in maintaining / regaining support from government leaders, and hence ensuring that AMA service is not further reduced. Achieving the optimum balance between improvements in service (for political support) and maintaining their currently preferred style of work is the struggle for these operators. The importance of a change in work rules and other conditions of employment will form part of the internal analysis. What is critical in the external analysis are the union's political connections (which are currently not powerful since AMA services are of such poor quality⁷⁰) and the effect of employee morale on the service which they provide. Front-line employees (i.e., drivers) can play a critical role in enhancing the attractiveness of the services since they are the main interface between the passengers and the authority.

Público operators — The status quo has not been of great assistance to the público operators. In particular financially the effects of the current transport system and demand trends have been strongly negative. The operators therefore have a stake in both the current situation, since it can probably be assumed that those who have survived know and trust their operating plans, and that of the future, since they will hope to operate so as to profit from any future transport environment. Currently they have been able to ride out the financial difficulties brought on by the low ridership levels. It has been calculated that a gross revenue to cost ratio of at least two signifies break even público operation. Only four routes had recovery ratios over 3.5 in 1991 and the system average was 2.2. Clearly many operators are not achieving success on their routes and in fact many

⁶⁸ *ibid.*

⁶⁹ 1993 Section 15 data.

⁷⁰ The lack of respect for AMA has been illustrated in recent media reports and cartoons even.

registered drivers do not operate. There are some 3022 vehicles licensed to operate on 124 routes, however on any given weekday it seems that only about half this number actually operate.⁷¹ Despite these relatively small returns to público operation from the current system, few operators are in favour of significant changes from the status quo. In a recent survey (for the bus and público integration plan) the operators were split on the question of PSC control of routes and fares, and were similarly split on the question of limits on vehicle size. Not surprisingly, support for elimination of all local tax on public transport vehicles, subsidized petrol, vehicle maintenance, and subsidies for vehicle purchase was expressed. At the same time there was support for the construction of more terminals and shelters, more exclusive lanes for the use of públicos, and the limitation of each operator to one route.

Despite the stake which they have in the shape of the bus network,⁷² the público operators have not been particularly vocal, either in the past or through the Tren Urbano consultation programme. In part this is a result of the fact that the bus system operators are funded by government and therefore have a ready made mechanism through which to exert influence and to make their feelings known. This mechanism is unavailable to the público operators. In part it may be a result of the culture of the system, in which the operators exert political pressure through discussions with their riders. Where their concerns have been vocalized however, particularly on the question of subsidies or increased loans for vehicle purchase, the arguments have not always found favour in government circles.

Metrobús operators — The firm operating this service has conflicting concerns. On the one hand the demise of AMA would mean that in all likelihood other routes would be contracted out through DTOP and it would be in a strong position to win the franchise or contract. On the other hand, the continued operation of a high cost operator (AMA) within the region reduces the downward pressure on its operating costs.

⁷¹ Barton Aschmann and Associates, Integration of San Juan Metropolitan Region Público and Private Bus Routes into the Metrobús Transportation System, 1992. It should be noted however that some of this discrepancy can be accounted for through the management of operations by the route associations, through their enforcement of shift operation for example.

⁷² AMA operates mostly within the central municipalities of San Juan, Guaynabo, and Carolina. There are also routes which operate along the major highway corridors to Bayamón, Cataño, Toa Baja, and Toa Alta. The PSC does not normally authorize público routes in this area, except with the concurrence of AMA. There are however a few routes which were in operation before AMA was created and these have continued. Competition between the two systems is most marked in the Bayamón - Río Piedras corridor.

Municipalities — All municipalities have a stake in the transport system, in as much as good network coverage through their area ensures accessibility for their residents. As noted earlier, they also have a stake through the provision of terminal facilities for bus and público services. Furthermore they have a stake in Tren Urbano, in that it will introduce a new form of transport in their area, thereby providing residents with more travel options, presumably increasing access to employment and lowering the burden of poverty on the community as a whole. Similarly the communities have an interest in ensuring that there are transit centers in their area and that the bus service provides connections for their residents. This benefit is particularly noticeable for the three municipalities through which Tren Urbano will pass, but some benefit will also presumably accrue to residents of other municipalities. A key factor in this however is whether or not the current central development pattern is sustained. Municipalities at the edge of the metropolitan area are expected to experience rapid population growth in the next twenty years or so. Such growth will strain community resources and require further infrastructure development. The municipalities are not therefore a single stakeholder, but rather each will have different objectives for its community, based in part on their access to different transport services. Currently there are no long term published plans for these communities and it is only recently (1991) that community development powers have been decentralized. Only one metropolitan municipality currently has individual planning authority (Bayamón).

For público operators extensive development in the suburbs may not hold as many threats as for Tren Urbano or AMA (since the municipalities towards the edge of the urban area form their ridership base, as a result of the AMA enabling legislation.)

Commonwealth — the Commonwealth has a financial stake in each of the transport options available in the area. (The financial stake in Tren Urbano and the highway system will be a long term issue since bonds will be floated for much of the required debt.) Given that the level of congestion is at present very high, and the Governor has made a strong political commitment to reducing this with further road improvements (both construction and IVHS), Tren Urbano, and the restructuring of the bus network, there is significant political impetus behind the changes. The commonwealth has a further stake in improving the congestion situation, as part of its economic development strategy. Similarly the effects of government decisions are felt directly by the

transport operators particularly over Tren Urbano, and they therefore have a stake in the development of government policy.

FTA — has a financial stake in the operation of the bus system, and, since the inclusion of data on público operations in the section 15 report, in the público system. Similarly under current plans FTA funding would be requested to support one third of the construction costs of Tren Urbano. Politically it already has a significant commitment to San Juan since the Tren Urbano procurement process has been adopted as a demonstration Turnkey project.

Environmentalists — This is one group which seems to hold little influence in San Juan, in increasing contrast with other Metropolitan areas in the US. However there is reference to the environmental lobby in the Tren Urbano documents and there are clearly growing concerns about the natural environment. The environmentalists have a stake in seeing the success of public transport improvements, through the potential benefits these could have in reducing emissions and, depending on the effect of these improvements on development, could also help to reduce urban sprawl.⁷³

Politicians — These are an important stakeholding group who need to be distinguished in their own right in the San Juan case, due to the importance attributed to the Tren Urbano project. There is clear support in the community for actions which will alleviate congestion. At the same time however, it is also clear that the coming of the rail system will not reduce congestion levels in the community. Hence though the politicians have a stake in the successful lobbying of congress for funds (the short term goal) and the start of construction (to be seen to be acting before the elections in 1996), this stake could be viewed as a double edged sword, in that the construction may not realize the hopes and expectations of the electorate (particularly that of eliminating congestion — the long term goal.)

⁷³ The public transport organizations also have a stake in the development of these environmental groups, and of their "visibility" in the region. The nature of the future urban form will also depend heavily on the strength of the environmental groups, as they attempt to protect the rural areas of the island.

Generally such long term considerations are less of a concern to politicians however — since their focus is more in the immediate term. As long as the community continues to support actions like the construction of Tren Urbano, it is likely that the politicians will too.⁷⁴

Employers — Particularly those in Hato Rey and the central areas, where parking and land costs are high, are another group with a stake in the public transport situation. This is particularly important in the case of the Banco Popular which owns a significant parcel of the Hato Rey land. Similarly the University of Puerto Rico and Centro Médico are important stakeholders in the construction and operation of the new rail service, as well as in the provision of current bus and público services, since these provide their employees (and in the case of the University, students) with options for access and may change land use patterns in their vicinity.

Students — this is an important group of (potential) riders particularly for Tren Urbano. Student riders would create an image of respectability for the system (a great threat to which would be a perception of danger) and are a sizeable constituency. Similarly increasing student ridership would represent part of a longer term strategy — in which the graduating students were so familiar with the system that they continued to make use of it when working.

The Tren Urbano Comprehensive Plan for Community Communication and Participation isolates various “publics” which it aims to reach. These include corridor and metropolitan area residents, corridor and metropolitan area business people, University of Puerto Rico students, civic leaders, municipal and legislative leaders, local and mainland media groups, the general public (by demographic group), different levels of government, the engineering and construction trades, and professional associations. This list is another illustration of the perceived significance of the public transport system (and poor level of service on the roads) in the area. It is clear that transport plans have a broad constituency to serve.

6.3 Power Players

The Status Quo — in most instances the power wielded by the existing situation is great. In the case of San Juan however, where there are so many changes on the horizon, and the existing

⁷⁴ Possible reasons for faltering public support would be expense, public safety concerns with such a system, concerns over the probability of poor service (which might be tied to the experience of the acua-expresso services or AMA) or an awareness of negative experience with rail schemes in other areas, particularly the negative relationship between the hispanic population and the rail system in Miami.

system appears to be approaching a crisis point, the influence is much less significant. This is also a reflection of the fact that many players in the area have agreed that some changes are necessary. The público operators are one group for whom the status quo may be less threatening than the changes in the environment, as noted earlier. The current situation is also that favoured by AMA, and particularly by AMA employees. AMA does not face competition from other bus systems, except in the Metromovil corridor, where it has reacted to the competition in an aggressive fashion.

Though as noted, the current situation is not favourable for the government and it has made significant public commitments to change, there are also significant concerns with the wholesale restructuring of any transport network. These concerns arise since new services may leave some worse off than under the old system (through enforced transfer) — particularly if the transit centre concept does not work effectively. This discussion brings home again the need to undertake comprehensive internal analysis of the strengths and weaknesses of the firm. If AMA is unable to achieve the frequencies and reliability of service called for under the transfer system, passengers may incur significant losses from the change, which could result in a diminution of support for the government.

Tren Urbano — the strength (through the high level of expertise within it) of the team at the General Management, Architecture and Engineering Consultancy,⁷⁵ their control of the station designs, and the operating plans for the system, as well as the political desire to ensure that the project runs smoothly all give Tren Urbano, in which ever form, significant power in the urban area. Clearly the political importance of a billion dollar project and the unifying aspect of the project (in the sense that many support the provision of an alternative⁷⁶ — whether for their own use or in the hope that it will relieve congestion on the roads) in the urban area are all also factors which contribute to its strong position of influence. After construction, the operating funding required for a rail line, its ability to attract passengers and to relieve congestion, the safety of the system, and then the extensions which are made, will all be important in enabling the system to retain a high political profile and therefore a powerful position. Power will also come with high ridership levels.

⁷⁵ This group has been appointed to develop the Tren Urbano scheme for the Commonwealth.

⁷⁶ The general support for the project was shown in an opinion poll in the early months of 1995, and perhaps in the small number of objections made to the Draft Environmental Impact Statement.

The strategy which this group has currently stressed, with government support, has been that of integrated services and planning. The difficulty of such an approach was highlighted in the report on integration of private bus, Metrobús, and público systems.⁷⁷ “Realistically, there is no effective means of providing a fully integrated service. Each element whether it be bus or público has numerous issues associated with them that must be considered within the context of service integration.” This report goes further to discuss the issues which are involved in integration of public transport services:

- Definition of service areas for each mode
- Fare integration
- Distribution of incentives
- Interagency coordination and assignment of responsibilities
- Monitoring of service performance
- Enforcement of regulations regarding vehicle safety standards and route franchises
- Transfers and accessibility

The assumptions about ease of transfer between different public transport modes means that under current projections 60% of Tren Urbano passengers will have transferred from either a bus or a público. Integration may in fact build power into the project, for example, on the introduction of rail service in many of the US publicly owned agencies (which have generally taken responsibility for bus and rail) have altered their bus route structures to act as rail feeder systems. Clearly the adoption of such a strategy depends in large part on the marketing strategy of the rail operators, fare and frequency decisions in particular. These basic Tren Urbano decisions may influence those of other operators in the region.

Within the Tren Urbano structure there are other power players however — for example the Tren Urbano Advisory Committee and the neighbourhood committees. These groups will be formed in order to consider both system wide and local planning, design, construction, and operational issues. They are important in helping to increase passenger / user influence in the system.

Municipalities —The municipalities have increasing power over development and zoning, resulting from the new planning act of 1991, which decentralized the process from the island-wide Planning

⁷⁷ Barton Aschmann and Associates, Integration of San Juan Metropolitan Region Público and Private Bus Routes into the Metrobús Transportation System, 1992.

Board, as noted earlier. However few of the municipalities have yet taken on the newly available powers and instead are maintaining the existing zoning maps and development policies. The power may however be demonstrated at different moments:

1. In the period of construction and before operation. During this period the outer areas of the metropolitan region are predicted to experience growth in population and employment and municipalities may seek to increase this economic development (to offset the financial implications of the new infrastructure requirements of new residents) which could alter travel patterns dramatically, affecting viability of each of the public transport providers.
2. Long after the physical completion of Tren Urbano and after operation has started. In other US cities development around stations has lagged the introduction of rail service considerably. Though the San Juan system is a special case, in that the density of development is already high in most of the area around the rail alignment, there are clearly vacant sites for development, both in this central area, and at the edges of the region. The approach which the municipality takes to these development possibilities will be important for ridership.
3. In general, with or without Tren Urbano, the nature of the developments allowed by all municipalities will affect the ability of public transport operators to provide efficient services.

Thus far the mayors of the largest San Juan municipalities have been in favour of Tren Urbano. It must seem likely that if the system is a success the mayors of other communities will begin to lobby for extensions.

Públicos — have significant political influence, and currently dominate the public transport market, both elements which translate into power in the transport arena. Given the nature of público vehicles, operators and riders are in close proximity for the duration of the trip, and given the Puerto Rican tradition of political discussion, the drivers are in a good position to influence opinions of their riders. However riders may well be getting conflicting messages since the operators are split on the question of PSC control of routes and fares, as they are on the question of limits on vehicle size. As noted before, the reaction of operators to Tren Urbano plans is unclear.

The power of the público operators derives from their domination of the public transport market. Were this service to be withheld then the activity system in San Juan would feel the impact,

through more vehicle trips and reduced mobility generally. Hence the government cannot afford (politically or financially) to alienate público operators.

AMA Management, Staff, and Riders — Given government (political and financial) investment in the system, the perceived importance of public transport, and the extent of service, AMA represents a significant power in the environment. Resolution 4, which passed the legislature in 1990, required AMA to restructure and refinance its debt, to improve service levels and reduce operational inefficiencies, and to meet a set of performance targets for fiscal years 1991, 1992, and 1993. It also required the DTOP to monitor AMA progress in these areas and to develop a transit service plan if the standards were not met by 1993. Despite failure to achieve the specified targets within that period, the underlying threat to close the system was not realized, which may reflect the political weight in the current system. Similarly the lack of substantially developed, well managed private bus companies on the island reduces the possibility of a strongly competitive bus service market to which the government could turn for alternative providers.

It also seems that the power of AMA is being demonstrated through the current negotiations between AMA and ACT on the restructuring of the network and contracting of a further route. Though AMA has a cost structure significantly higher than that of the current Metrobús operator there is concern that to award another contract to an outside operator would reduce AMA morale, will allow the outside operators (of whom few were willing to bid for the initial contract) to establish a monopoly in the market, and miss an opportunity to encourage cost reduction within AMA. Hence the next contract award seems likely to go to AMA despite its higher costs. This stake and the relationship between continued operation, and wage or condition concessions on the part of the employees, is a delicate one.

PSC — In its authorization of público routes, this agency clearly has power over the viability of público and bus operations. Rarely are the full network implications of a new route assessed, in large part as a result of the paucity of available data.

ACT — The power of this body in the transport arena is clear. It is the agency responsible for the road system, Metrobús, and Tren Urbano. Also significant in this power must be its perceived success — Metrobús has attracted riders and been operated efficiently, ACT has managed to

develop and sustain public/private infrastructure projects, and it has taken Tren Urbano to a position whereby the government can hope for a start to construction before the end of its term.

Businesses — The businesses have a particularly strong influence in the success of different plans for transport in the region — through their policies on parking for their employees, and for the financial support of different projects. This is particularly noticeable in the case of Tren Urbano where the alignment may be affected by UPR, Centro Médico, or other major property owners. The Corporation for the Development of the financial centre at Hato Rey (CODEFIN) has expressed its support for the Tren Urbano project. This support is important for Tren Urbano since the member institutions are key economic drivers for San Juan.

Though there are a large number of players in the region, the one element which stands out as being absent is a body representing the total metropolitan region. Though the públicos operate in much of the area, they do not play a major role in development decisions. Similarly there is no body such as the Boston Metropolitan Area Planning Council, and the other transport operators do not cover all municipalities. ACT, the DTOP, and the Planning Board have power in the island as a whole, but do not have development objectives for the metropolitan area as a specific, separate, unit.

Though the Commonwealth government was described here as a stakeholder and power player, this implies a static relationship between the operator and the government. Instead government decisions and actions will affect these agencies directly. Hence strategic decisions and plans can be made at both levels. The government strategy will, as noted earlier, focus less on the internal questions of each operation, instead it will be concerned with the congestion question, return on investment, and political profile. The operator, in following its strategic planning process, must therefore be aware of government strategy and will be directly affected by it.

6.4 Systems Analysis

A division between socio-demographic analysis and that of the transportation system similar to that adopted in the previous chapter is used here. As with the MBTA, historical ridership data is limited, furthermore there has been little market analysis over the years. Hence it is difficult to develop any long term evaluation of the changes in ridership by mode, by corridor, or at the

community level. However trends in journey to work mode shares are available by community, from census data.

The relationship between density of settlement and proximity to the center and the use of public transport, so well documented in other cities and discussed in greater detail in the previous chapter, also appears to hold for San Juan. From 1980 to 1990 the percentage of commuters who used public transport for their journey to work was highest in Lofza, San Juan, and Cataño. The público commuter mode share is higher, as would be expected given the service pattern, in the communities at the edge of the area — Canovanas, Lofza, Río Grande, and Toa Alta. What stands out however in the data on mode of transport for journey to work, is the fact that not only has the public transport mode share fallen, but the absolute numbers using public transport have also fallen in all municipalities except Guaynabo. This fall was a result of lower público ridership, with ridership on AMA and the ferry system rising slightly in most municipalities. Only in San Juan did AMA ridership fall in absolute terms, although again, given the service pattern, a decline in ridership here is the most significant for AMA.

Activity Systems — One of the most noticeable facets of San Juan, as compared with other US cities, is the density of its development. At the same time the city also has severely congested streets and unenforced parking restrictions. The density of development is particularly noticeable in the Santurce-Hato Rey, North-South Corridor. It is clear however that the development of the last 20-30 years has brought with it increasingly dispersed development and lower densities at the edges of the community and development patterns (e.g., cul-de-sacs and gated communities) which are more difficult to serve efficiently with public transport. Further analysis of the socio-demographic trends is given in Appendix D.

The predictions for 2010 employment and population in the metropolitan region, suggest that growth will be modest and concentrated at the edges of the region. Though San Juan will continue to dominate the region's economy, with over 50% of the employment being concentrated in this municipality, its importance will continue to decline. Over the twenty years from 1990 to 2010 employment growth of 10% is predicted in San Juan. In the same period the employment growth expected for the complete metropolitan area is 19%, with Dorado and Río Grande both expected to more than double their workforce. The downward trend in central area population is expected to be

somewhat reversed with San Juan's population growing 12% (in contrast with the decline of 6% from 1970 to 1990.)

Implications of the trends for Public Transport in San Juan — Unlike the MBTA case where the implications of these trends were discussed in the light of a relative wealth of data, there is little available here for considering ridership by mode, or community over time. Hence, working from what is available, the following trends emerge:

- Car ownership levels have been rising for many years and are predicted to increase further.
- Levels of trip making are still lower than those of the mainland United States and hence are expected to continue to increase.
- AMA journey to work ridership was fairly constant from 1980 to 1990, though its mode share rose in six municipalities (Bayamón, Canovanas, Carolina, Lofza, Río Grande, and Trujillo Alto.) The level of ridership however was very low and overall AMA ridership fell in this period — reflecting a decrease in its competitive position, particularly in the off peak.
- Público ridership has fallen significantly in the last ten years, as has the system's mode share in every municipality.

The fact that the highest rates of population and employment growth in the next 20 years will be in the communities at the edge of the metropolitan area, suggests that large growth in bus and público ridership is unlikely. It is also more of a concern for AMA than for the públicos. The employment growth on the outer edges is a significant concern, both for these operators and Tren Urbano. At the same time the growth predicted for San Juan population (especially that of San Juan, Guaynabo, Carolina, and Bayamón) is a positive trend.

The fear of crime in San Juan is high, and a factor encouraging residents to make use of their cars. The fears are also reflected in the enclosure of some communities within the metropolitan area, a growing trend. This closure means that the communities are accessible only at one point, making the provision of transport services, which compete with the door to door transport offered by an automobile, more difficult. The Tren Urbano route runs through some of the more affluent neighbourhoods in Guaynabo and it is here particularly that there are significant attempts at enclosure.

Transportation system — The other facet of the systems analysis is an analysis of the transportation system. In a strategic planning process much of this analysis would form part of the internal analysis for the firms which are operating in the area. There are however some factors which cut across all, and which are important as elements in the transport environment. As was noted in the MBTA case the time lag and path dependency in choice decisions may well be important. In fact this has been recognized explicitly by DTOP. One of the motivations behind the restructuring of the AMA network is to improve the perception of public transport in San Juan, well before Tren Urbano service opens. At the same time stress is being placed on the difference between rail and other services, in order to remove the influence of the current perception of public transport, as far as possible, on the impressions formed by potential Tren Urbano riders.

It seems clear that there is considerable service-related elasticity (high quality, frequent service generates demand whilst lower quality, slower service loses passengers) and similarly some degree of price elasticity of demand in San Juan. This of course bodes well for Tren Urbano, which will represent a higher quality service and which may be able to charge a higher price. Current modeling has been on the basis of a \$0.50 fare, i.e., less than the average público fare and the same as the current Metrobús fare. Further modeling, using the patterns of change observed in other modes would be useful in further refining the fare-related analysis, particularly to take account of the systemwide effects.

Though both bus and público ridership has fallen over the last few decades it is not clear whether there have been mode shifts between them. If data were available, some elasticity assumptions could be made to assess the possibility of transfer from bus to público under the new bus system. Nor is there a significant amount of data available on the characteristics of users of the different systems. It is thought however⁷⁸ that most of the público market is non-work trips. Similarly it is known that the higher income groups use public transport less frequently than those in the lower income groups, but that a higher proportion of these higher income riders use AMA services than do those in the lower income groups.⁷⁹ Were público operators to have some data on the

⁷⁸ 1990 home interview survey.

⁷⁹ 59% of public transport home-based work trips in the highest income bracket are made using AMA, whilst 52% of those in the lowest income brackets use AMA. Similarly 42% of the home-based non-work public transport trips by those with the higher income use AMA as opposed to 37% of such trips made by those in the lowest income bracket. (Here again the service areas of the different modes are important.)

characteristics of their riders, or the reasons for a mode change to AMA for example, their concerns and desire to maintain the status quo might be reduced. Similarly the fact that those in the higher income groups do not currently prefer público service, may suggest that there are some needs which are not effectively addressed by their current mode of operation.

The current regional transport plan⁸⁰ calls for an increase in highway capacity of 25% in the short to medium term. Some of this expansion will be through better management of the existing system, the rest from construction of new roads. There is some history of with, and contra, flow bus lanes in the area,⁸¹ which has allowed the provision of reliable services, particularly in Old San Juan and on the Metrobús route. This is a positive factor which may provide a precedent for further provision in the future.

The tolls which are currently charged on some roads in the urban area, and may well be charged on some of the proposed system (since private financing mechanisms are preferred by ACT) are another positive aspect in the external environment for the public transport operators. Charging fees for the use of other systems increases the potential for higher fares. In addition it reduces the attractiveness of the automobile. However at present these tolls are generally only charged to those making relatively long journeys into the urban area. These are not the riders being targeted by Tren Urbano, they are the riders who may have the option of taking a público service, with low headways, at these more remote sites.

6.5 Fixed and Floating Point Analysis

As noted at the beginning of this chapter, the transport system is anything but fixed at present. Tren Urbano, is perhaps the largest floating point (in the sense that it has not been built, the funding and approval is not certain, fare structures are undecided, relationships between the operators, their passengers, and the government are not fully developed etc.) At the same time it is also somewhat fixed, in the sense that there is significant political support for the concept and that construction is planned to begin within the next year. Other floating points include the structure of the público network after the reorganization of AMA's routes, the relationship between públicos and government, and more generally all institutional relationships.

⁸⁰ Barton Aschmann Associates Inc., San Juan Regional Transportation Plan, March 1993

⁸¹ In 1993 AMA buses were using 17.1 miles of exclusive right of way.

The current institutional relationships in San Juan have been questioned by many of the recent transport studies. The numerous organizations and their lack of integration creates inherent ambiguities with each institution taking different roles (as described above). However the recommendations to change these arrangements, particularly to transfer control of the público service from the auspices of the PSC to the DTOP, have not been successful. This may in part be related to the "power" issue — i.e., once power is attained, an institution/group is unwilling to relinquish it. Since the PSC currently has influence over the público system, the control of an institution which has a relatively high political profile, as do the públicos, is something which it has been reluctant to relinquish. Furthermore it may in fact be that the other publicly owned operators are reluctant to see a change in the organizational structure. Currently the público system receives no direct subsidy and relationships between AMA, Metrobús, and the públicos do not have to be placed in the arena for debate / parity.

These subsidy arrangements themselves are one of the floating points in the operating environment at present. Similarly the route network and horizontal competition (i.e., competition between modes offering similar services) arrangements are uncertain. The current structure is such that AMA has some influence over the acceptance of a new público route within its service area, at the same time as it receives subsidy for operation from the commonwealth and federal governments. Público operators by contrast receive no such subsidy. Consideration is being paid to these issues currently — through the general consulting contract for the restructuring of the bus network. This work has considered all institutional relationships as floating and has lacked a goal around which to structure the analysis. This is the function of strategic planning — to establish the goals and objectives through evaluation of the internal and external operating environments. Instead the suggestions made by the consultants accept that there is a necessary level of political involvement in the process and spell out options. The floating points, or areas in which decisions are deemed necessary, were classified as:

- Operator roles in service provision

Operators could be distinguished by geographical area of operation, by vehicle size, service type and subsidy, or by combinations of these elements

- **Regulatory process and service contracts**

Different methods by which to control entry were discussed, as were different structures for producing the AMA, Metrobús, and público services. Contracting for service outside the normal público operating hours was suggested. The question of with whom to contract for such services was noted as problematic.

- **Subsidies**

The central questions here were to which operators subsidy should be granted, what level was appropriate, and how it should be paid.

- **Fare integration**

The discussion ranged from no fare integration to different pass structures and allocation of revenues between operators.

- **Marketing and user information**

- Given the national and Tren Urbano emphasis on intermodalism, integration of these functions was stressed. However where the lead role should be was questioned.

This method does not involve the providers or users of the transportation services in the decision making process. The lack of data on which to base some analysis of the different strategies is also clear. The full ramifications of any of these options could not be fully exposed without more of the external analysis carried out at a preliminary level in this chapter. For example, given the desire of the PSC to retain its influence over the públicos, it may be that subsidy for the operators could only be administered there.⁸² Similarly the increased number of transfers and higher levels of car ownership predicted may make provision of individualized service most critical. It may also be that there is a need to make some early determinations to set some overall objectives within which the other decisions can then be made. The necessary government decisions would i.e., be better informed following a strategic planning process, since different scenarios would have been considered, as they affect the system as a whole.

Parking Policies — These policies are set by the Department of Consumer Affairs and the policy for the San Juan region until recently was a minimum space constraint for each development. The

⁸² Though there are other models on which to draw, where the regulatory control of a particular group of operators is divorced from subsidy provision. For example in Boston, the private bus operators are under the regulatory supervision of the Department of Public Utilities, whilst at the same time the MBTA also contracts with them for the provision of some services.

new policy proposes to remove the minimum constraint, given a certain level of public transport service in the area. Hence the presumption would then be that parking rates would rise and better investment could be made in the parking structures themselves. There are no mechanisms for introducing these changes yet though the Mayor of San Juan has made statements in favour of the change, and has begun to use police details to enforce regulations in Santurce and Hato Rey. The evolution of this policy therefore represents another floating point in the environment.

Other floating points include government support for AMA, viability of the público and private bus systems, and the focus of economic development within the region, for example.

6.6 Time Line (Critical or Pinch Point) Analysis

Clearly just as in Boston, the transport system in San Juan is in a state of flux. In San Juan it also seems likely that the construction of Tren Urbano and various highways will mean that the disruption continues until at least the early years of the twenty first century. Again in a parallel with the Boston case, the attraction of the city as a place to invest, to work, or to visit, would deteriorate with a poor quality transport system. The construction of more highways around the island (and improvements in other infrastructure) is also likely to increase the attractiveness of other more remote sites as places in which firms and people could locate. Hence there is a possibility that though Tren Urbano will increase accessibility within the center, edge city⁸³ style developments of the US mainland could also develop. The beginnings of the sprawl have already been noted with the expansion of the designated urban area to Naranjito in 1990.

A time line analysis for San Juan might include the restructuring of the AMA network and opening of the transit centers, the reintroduction of ferry services across the bay, the construction period for Tren Urbano, the Gubernatorial elections, the opening of Tren Urbano to passenger service, and perhaps the Olympics. Meanwhile the construction of the other highways, and the re-authorization of ISTEA to include federal financing of Tren Urbano will also be critical points.

Given all the floating points which have been noted in the San Juan transport environment, there is a particular need to identify those which are of greater significance and the possible implications of each. One particularly critical point will come early on. That is the decision on the nature of the

⁸³ For a full description of the Edge City phenomenon as it has come to be known see Joel Garreau, The Edge City: Life on the New Frontier, 1991

operating agreement with the Turnkey contractor for Tren Urbano. This will be critical to the other operators since it will include the competition / marketing policies for Tren Urbano.

Another critical change in the transport environment would be provision of subsidy to the público system. This would not merely have short term results but would alter the nature of the transport system in San Juan over a longer period and hence the ramifications should be fully thought through as a critical element in any transport policy. Nationwide the United States has been rather reluctant to reduce subsidies for public transport systems over the course of the last fifteen years or so, or to privatize services. This despite the pressure on budgets and the domination of the political environment by those who were in favour of the introduction of more competition and the reduction in state intervention. Hence it seems unlikely that there will be an opportunity to eliminate the subsidies once embarked on. At the same time there is no guarantee that subsidy will produce results desired by the government (witness AMA.)

As noted earlier there are several critical points in the decision making process for Tren Urbano. These are also on the critical path for settling other questions, such as the nature of the station layout, and the role of the públicos in the transport environment. Foremost among these are the contract structure, and the fare and integration policies.

6.7 Market Orientation

In the previous chapters the importance of a market orientation in the development of goals, objectives, scenario testing, and strategy implementation has been stressed. In the San Juan case however there are a number of factors which constrain the process somewhat, particularly the lack of data. There is very little data available currently with which to understand the needs of system users. In part perhaps this results from the poor quality of service, and low levels of ridership on the current system. Some elements are known though and these can be used, in conjunction with knowledge of common reactions to transport services by passengers in other cities. For example it is known that:

1. Users of the San Juan public transport services are more likely to be in the low income brackets rather than higher ones — which would suggest the importance of low fares, to retain ridership.

2. Demand for public transport services in San Juan is fairly price and service elastic — which suggests that users will pay a higher price for a higher quality service, but that there is a limit to this. Analysis of these relationships is not developed sufficiently at present to allow insight into the relative strength of these two phenomena.
3. The public transport market is still relatively large (almost 200,000 passengers per day) despite the poor quality service — suggesting that there are captive riders, but also that there might well be significant latent demand for public transport service.

Some of the more successful strategic planning processes have been those which have evolved over time. Tri-Met, as described in chapter 3, provides a good example of such evolution in strategy setting. The AMA situation is such that the needs of reforming internally appear to be the most critical. Once these changes have been introduced, creating a more efficient basic service which provides for the needs of the total market, further analysis will be needed to help the agency understand the needs of individual markets, and to relate their strategy for service provision to these needs.

A key conclusion drawn from the analysis of the strategic planning practices of other agencies was the need to include a wide range of players in the decision making and strategy setting process — particularly the users of a system, or those with a stake in it. In the case of Tren Urbano there are currently no users to form such an interest group, nor is there experience with a similar mode on the island from which to draw. Though the government can draw from experience of rail operating agencies in other parts of the world, and introduce service and performance requirements into the contract, the true market awareness that comes from operating a service for the consumer (whether to increase profits through increasing ridership, and hence fare revenue, or to achieve a certain social objective) is not available. Public involvement in other decisions has been rare and is not currently being sought intensively in the re-design of the AMA network. This may, in the long run, represent another threat to AMA. In general, public sector monopoly providers have often been criticized for their lack of attention to their customers. If the evolutionary strategy-setting method is used, then what is critical for AMA at this stage may well be the successful implementation of the transit centre concept, and associated higher frequencies, which will rely on the internal environment.

6.8 Implications, Strategies, and Reflections

The analysis above seems to suggest that for San Juan an element of particular importance in any strategic planning process will be the determination of fixed and floating points, and also perhaps the gathering of more information about the needs of different markets. Many of the questions tend to revolve around Tren Urbano services. Given that at this stage the government has already stated that the key goal of Tren Urbano will be integration of services, this would seem to imply that competition between services will not be encouraged. Stemming from this the público or bus operator could also assume that the government will therefore allow / encourage the Tren Urbano operators to:

- provide frequent service with low fares (or fares close to those currently charged for Metrobús), and
- provide interchange facilities at stations, allowing passengers who use other public transport services to gain easy access to the rail system

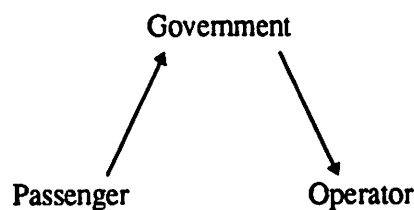
If these are taken as fixed by the other public transport operators then the environment in which they are operating changes. It appears (from forecasts on transferring passengers) that the developers of the rail line expect to see públicos in continued operation, but with a different operating pattern, providing shuttle type services to and from transit centres and the rail line, and probably with increased service within the AMA area.

At this stage in the development of the transport system in San Juan a full strategic planning process could probably only be adopted by AMA. The público system is faced with pressure both from the restructuring of bus routes, and falling passenger numbers (in the short run). In the long term Tren Urbano will place further pressure on the público system. Such pressures (or a changing environment) suggest that a full scale evaluation of the strengths and weaknesses of público style operation and the ramifications of these pressures (i.e., a strategic planning process) would enable the operators to comprehend and meet them more successfully. The pressure may be for changes to the route structure, changes to the fare payment mechanism or fare level, changes in the executive system which organizes their operations and so on. However the operators are not organized in such a manner as to make collective strategic planning possible. Further, the financial investment required in such a process is likely to be beyond either the single operators or the cooperatives.

Another barrier to the adoption of strategic planning is the relationship between the systemwide effects and those perceived by the individual operator. For the individual operator the threats may seem more remote.

Similarly a strategic planning process is not likely to be undertaken by Tren Urbano in its current incarnation. In effect the strategy is being set by government decisions on the nature of the contract for the Turnkey. These decisions could be illuminated by the discussion above, and would focus particularly on the power players in the environment. The government may wish to require a strategic planning process to be adopted by the operators (as is the case in both London and New York), to ensure that there is a regular review of the internal/operating structure and its relationship with the San Juan region. One objective for such a requirement would be to increase the role of the public in the strategy setting process. This is not to suggest however that strategic considerations at the government level are not warranted. In fact, particularly at present when decisions being taken at this level will affect the long term environment, and in the future when the multi-operator environment will be still more complex, governmental strategic planning efforts would be important.

One critical element in the strategic planning process, and particularly in the setting of objectives and discussion of goals, is a broad involvement of many players in the process. This has not been achieved in planning for either Tren Urbano or the restructuring of the AMA network, to date. What this means is represented simplistically in the diagram below.



Passengers, and more broadly residents of the urban area, are represented primarily through their contact with governmental bodies. Taking the influence to one remove ensures that its effect is reduced, changes the incentive structure for the operators, and may increase the costs of the process.

Given that currently there are some strong political agents in the arena, "power players", creating some sort of user forum with which to inform the planning and operating process at Tren Urbano would be useful. There are already plans for some involvement through the Tren Urbano action committee and the related sub committees for each neighbourhood. These committees will provide input into the planning and construction phases of the project. Building on this structure, or retaining it in the operating phases would help to ensure that services meet expectations and that data for future decisions is collected. (This paucity of data makes planning more difficult at present.) The structure of the new relationship is clearly a difficult one — one which returns to the question of control of monopoly exploitation as contrasted with regulatory capture. Where the operator maintains the relationship with passengers and the data from this, the monitoring role of government is increased. Similarly making the operator / passenger interaction more direct increases the asymmetry in information between the operator and the government and in the long run reduces government leverage in the contract re-negotiation process. However the importance of passenger involvement, so that true needs can be identified and met, is something in which the government also has a stake.

Feeder services to the Tren Urbano station will be important in an integrated network. Depending on the incentives provided for the Tren Urbano operators, e.g., if there are strong incentives for them to increase ridership, there may or may not also be a need for government intervention to secure such services. The government has a stake in high ridership levels on the train (given the substantial capital investment which it will represent.) However were the incentives to the operator structured in such a manner that they also had a high stake in increasing ridership, it could be hypothesized that a Tren Urbano operator would contract for such services on opening of the line. As ridership built up however the need for this contract would be reduced since público operators may well find that the possible profits were sufficient to sustain an operation. It should not be expected however that service would be started by the público operators independently of incentives from either the government or Tren Urbano. Experience with transport policy elsewhere in the world has shown that both incumbents and new entrants have been slow to act on new opportunities.⁸⁴ In the case of the público operators as noted in the power player analysis there is strong resistance to change.

⁸⁴ See for example Beesley, Bus Deregulation: Lessons from the UK, Transportation Planning and Technology 1991

AMA has been facing many pressures of late, including:

1. The new privately run bus route, which operates under contract to ACT.
This represented competition for AMA services and has been a catalyst for some change (particularly in the labour contract and maintenance controls).
2. The radical transformation in route structure which is about to take place will further increase the pressure on management and operation personnel.
3. Following this, the introduction of a rail line (Tren Urbano) will add new competitive pressures (or at least pressures for change).
4. Population growth at the edge of the urban area — outside the region in which it provides service. At the same time the population of San Juan, its major market, has been falling. Though this is predicted to change, San Juan growth will remain considerably less than that of communities at the edge of the urbanized area.

Strategic planning within AMA could therefore be critical in assessing how it can deal with the changes in its environment and how it should best adapt to those. (One option would of course be to extend service further into the periphery of the urban area (which is allowed under current legislation). The resistance from público operators would be significant however and it is likely that the routes operated in these less dense areas would require increased subsidy.) Similarly relating the changes which are needed internally to those which take place in the external environment, when there is rapid change in both, would help the agency to “determine its own destiny”. This internal assessment has been the principal focus of planning until now. In fact this is a comment which could apply to the complete transport network in San Juan — and that is partially why a more general assessment of the external environment becomes so necessary in developing strategy.

Chapter 7: Conclusions

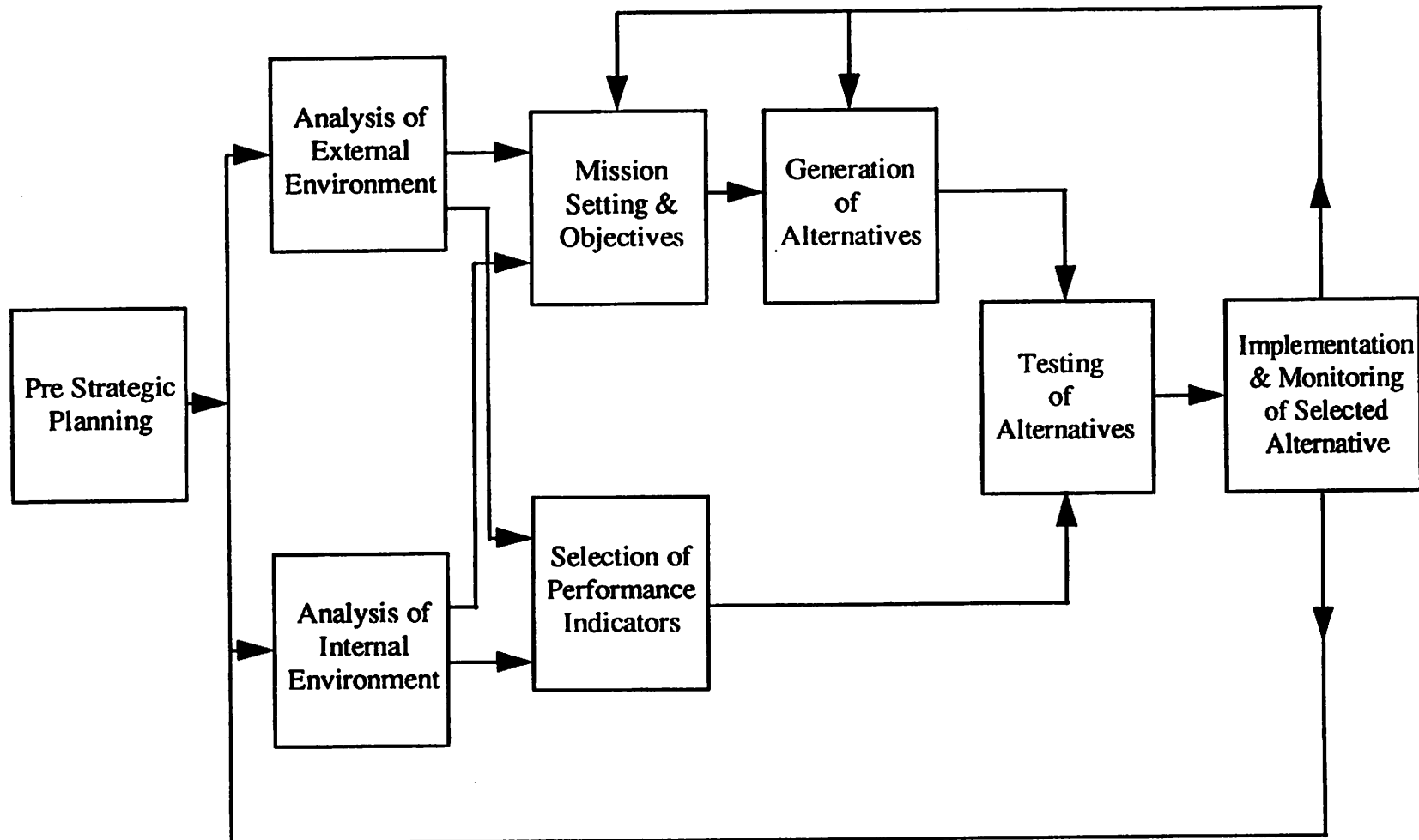
7.1 What is strategic planning? What is a strategy?

The first few chapters addressed these questions. Firstly in terms of what constitutes strategic planning in the private sector (where Porter was among the first to coin the phrase in the late 1970s) and then in terms of what this means in the public sector and has meant for public transport agencies. Public transport agencies first made use of more formal strategic planning techniques in the early 1980s. A small survey of public transport operators was also undertaken, to ascertain the current practice in the industry.

In the private sector, the key elements of a strategic planning process have been accepted fairly widely. Such a process is described by the diagram (figure 1) below. However this process is not being used to any significant extent in the public transport industry, where what is known as strategic planning might better be characterized as long range consideration of the external environment. A critical assessment of the internal environment is unusual and identifying particular strengths and weaknesses, then acting on that identification, appears to have been particularly problematic.

The review of strategic planning in public transport agencies, suggests that the process which has been adopted has not been particularly successful. In the private sector by contrast, the process has been used to understand better the nature of the business and the environment in which a firm operates, and to position the company more effectively given that understanding. Failure to carry out some of these evaluations in public transport agencies has left strategic planning in a situation where the benefits are not clear, and as a result support for the process is reduced. The New York Metropolitan Transportation Authority does perhaps provide one counter example, where the strategy has produced quantifiable goals and yearly business plans. The business plans discuss progress, new targets, and implementation strategies for the coming five years. When the more formal approach is adopted benefits can be achieved. These benefits include for example an ability to analyze the effect of different (usually lower) funding levels on current plans, and then to prioritize based on the strategy, given the other factors in its environment. The ability to prioritize is one of the key factors associated with strategic planning.

Figure 7-1: The Strategic Planning Process



Setting out a strategy, and various associated objectives, also allows the agency to evaluate any decision on the basis of these objectives, and to ensure that employees are aware of the overall goals towards which they are working. Continuous evaluation of the implementation ensures that the agency is making progress towards objectives which remain relevant as the situation changes. One factor of importance in the strategic planning process is the ability for the agency to change its course. The evolution of strategy is clearly of importance in a dynamic environment. One agency which has taken itself through different "eras" of strategic planning, is Tri-Met. The strategy there evolved from an initial internal development focus, to one of the customer, and finally in the most recent incarnation the process has focused on influencing the development of the metropolitan area.

A strategy is developed from an understanding of the areas which the agency wishes to serve, those fields which offer the most potential for return, and the constraints under which it is operating. Thus the strategy is the definition of the goals towards which the agency as a whole is working and the strategic plan defines the path which will be followed to achieve them. Often within the public transport industry the strategy is known as the Mission Statement, and is accompanied by a range of goals and objectives, set at a finer level of detail. Quantification of the objectives is important not least since easily demonstrable results can help to retain the support of top management for the process. Top management support can be critical for these processes, since it ensures continued funding and resources. Similarly top management actions often dominate the atmosphere and orientation of the organization, and if these are not structured around the strategy it will be undermined.

In the case of the MBTA, the strategic planning process could help to prioritize schemes, and to develop a framework within which to assess current services, an area which has been particularly problematic for the organization. For AMA, the current strategy is built around the development of an efficient bus network, though with a lower level of area coverage than that which is currently being achieved. The evolution of strategy is therefore particularly important in this case, since the current focus is internal. A means to prioritize would also be central to strategic development.

7.2 Why would a public transport agency embark on a strategic planning process?

Strategy setting requires the agency to know which markets it wants to serve and how it proposes to do so. In North American public transport agencies however there appears to have been little in the way of a broad reassessment of other organizational or institutional structures for the provision

of public transport services. Which perhaps indicates that this question is important to answer — if there are significant benefits to be had from strategic planning these should be exploited.

The motivations for adopting a strategic planning process include for example, concern that ridership levels are falling, or that the agency's political capital has diminished. Similarly other changes in the external environment can be used as justifications for embarking on a strategic planning process, which takes as its rationale the notion that setting a strategy can allow an agency to react to external changes, exploiting positive trends and minimizing the threat posed by negative developments. Of course a legislated requirement for strategic planning is another possible motivation for adopting a process.

The importance of being seen to act is not insignificant. When public transport agencies are able to develop their own strategy, and are seen to be acting more in a manner usually associated with private sector firms, the political weight of their actions is often enhanced. Hence another motivation for adopting a strategic planning process is to deflect the frequent criticism that public agencies are unresponsive to their markets or that they are organizations of another era.

On the other hand, the overriding fear of change and the unwillingness to reveal information to those who oppose a particular decision or public transport in general, may be one reason why public transport operators have been reluctant to embark on a full scale strategic planning process. Similarly the short term costs which are incurred to achieve the longer term goal of an improved understanding of the market, in order to improve the service for passengers, can be substantial. A politically appointed General Manager, who typically only has a few years to make a mark at a given agency, may wish to adopt a route with fewer potential political drawbacks and more immediate, visible returns.

7.3 What can a public transport agency gain from strategic planning?

Perhaps the key motivation for strategic planning is to allow an agency to set priorities, particularly in an environment of declining levels of financial support. The other benefits likely to accrue to a public transport agency which undertakes strategic planning include the development of:

- an improved understanding of the market place (in the broadest sense) through the external assessment
- evaluation criteria with which to measure the services, and progress towards the objectives
- through the evaluation criteria, an open decision making process

There are also potential drawbacks to the adoption of a strategic planning process — though if implemented fully, there is no reason to suppose that these should be insurmountable. The drawbacks include the initial costs of the process. These are often incurred long before the benefits are realized (for example in the introduction of a management information system). Similarly given the dynamic nature of the environment there is no “control” against which to compare future costs or revenues after embarking on a strategic planning process, hence it is difficult to establish direct cause and effect relationships.

7.4 What is an external assessment and what role does it play in the strategic planning process?

Public agencies are held to high standards by the public and by politicians. These standards often mean that the goals which they are trying to achieve are more complex than those under the private sector profit (or growth) imperative. However the external assessment represents one attempt at understanding the needs of stakeholders. In addition it allows the agency to discern the trends in the area which may affect it, positively or negatively, and to assess the level of support which it enjoys or can build on.

In most instances of strategic planning reviewed here, even where the external review was made an explicit part of the analysis, it was not approached systematically. The following methods with which to structure an analysis of the external environment were proposed in chapter 4:

- **Stakeholder Analysis:** Each interest group and the implications of their interest for the operating agency are assessed. This is important since it will allow the agency to determine which groups will gain and which lose from the adoption of a particular strategy.
- **Power Player Analysis:** This is used in conjunction with the stakeholder analysis, to assess the potential ramifications of each strategy.

- **Systems analysis:** This has been categorized as including two elements — the assessment of the activity system and that of the transport system. Assessment of the transport system as part of the external analysis will be more important for an operator with many competitors, whether for passengers or for investment. It is also important in that, particularly for a bus system, the performance of the road system will have significant effects on the ability of the organization to provide its desired level of service. Analysis of the activity system is the traditional focus for transport agencies, since information on demographic and social trends tend to be widely available and is used in demand prediction models. One particular benefit of adopting all these methods for assessing the external environment though is that it makes the assumptions overt and allows sensitivity testing at each level.
- **Fixed and floating point analysis:** This approach is of particular importance where the environment is changing rapidly and when an agency wishes to understand clearly its opportunities for influencing those changes. The fixed elements to the system would then be categorized by their effect on the public transport system and the floating (or changing) elements noted. The public transport agency would develop strategies which focus on the specific floating elements, whilst building on the strengths of the fixed points, as well as its own internal strengths.
- **Time line (Critical or Pinch Point) analysis:** such an approach enables the operator to attempt incremental changes, or more radical experiments at critical stages, and to build on the opportunities which exist at particular times to reach a certain goal. It ensures that important opportunities are not missed and that the danger of certain periods is not ignored.

By combining the insight from each of these processes, a more in-depth understanding of the different forces in the area, than that which a uni-dimensional analysis would give, can be developed.

For the MBTA the external assessment presented in Chapter 5 suggested that the areas of true importance might well be hidden by a traditional activity systems analysis, in part because of the variability in recent demographic predictions. It also highlighted the power of the Commonwealth and the CA / T project, and the importance of building a close relationship between the MBTA and the project. Similarly the importance of the MBTA connections in the political realm was stressed. In San Juan the environment is dominated by the unknowns (or floating points). It also appears that

the integration strategy selected by the government for Tren Urbano is building power into that body. Strategic planning at AMA would therefore build on the changes which are being made internally (such as the reorganization of the route network, and the renegotiated employment contracts) and try to match these with the developments in the external environment, including the new constraints imposed by Tren Urbano.

7.5 Why is market orientation important?

Just as awareness of external dynamics has been one of the motivating factors for strategic planning initiatives, the lack of market orientation has been one focus for criticism of public sector companies. At the same time public agencies have been criticized for being too aware of their political market. The common themes in all the successful strategic planning processes reviewed included the encouragement of some debate, and the notion of a collaboration within the urban area. This sort of inclusionary planning does not however merely represent a trend in public transport but it is a more general business trend — which when taken to its extreme is “customization.” The market analysis forms part of the assessment of the external environment as noted above. There is however a degree of simultaneity in that the understanding gained from this analysis affects objectives which in turn affect the agency’s response to the market. The response to the market will be made at a macroscopic level, but carrying this through to inform the real-time trade offs between quality of service and operational ease or cost saving, will also be important, and will be one reason why an inclusive planning process within the organization can also be useful.

For the MBTA, understanding the importance of the local and the regional markets, as well as those of the tourists will be critical. Similarly for the operators in San Juan, urban development may be of central importance. The público operators would be less threatened by further outward growth in the urban area than would AMA or Tren Urbano for example. At the same time little is known about the public transport rider of San Juan — other than that they are likely to be poorer than the average citizen. This information gives few insights into methods by which the operators could match service and needs.

Finally to reiterate the over used phrase, the support of top management will make or break any strategic plan. Unless the top management support a market focus the organization as a whole is unlikely to develop in that direction. Strategic Planning should not be seen as a short term fix

rather it is a fully fledged redevelopment of the organization, increasing its market awareness and sensitivity. It offers one method by which public transport agencies can seek to "regain the initiative."

7.6 Possible Areas for Future Research

The work here touched on many different disciplines and areas of interest. It also leaves a number of questions still to be answered. Perhaps most immediate of these is the need to monitor current attempts at centring strategies on the question of urban development. Many researchers in urban planning are considering the nature of development itself. This work would instead focus directly on the effects of development on public transport, and the success of the different techniques used by public transport providers as they attempt to affect the development process. One approach would be to develop a range of indicators of success, related to the strategy selected by an agency, and then monitor these over the course of the next decade or so. The indicators are needed in advance since, as has been seen above, understanding the success or otherwise, of these processes is not simple.

Other research could focus internally on the process of internal assessment and the evaluation of strengths and weaknesses. Though there is some work in this field⁸⁵ the questions are still current, not least because of the lack of "self-criticism" which was revealed by the recent survey. Similarly a comparison of the benefits of strategic planning with the benefits which could be derived from some other "management techniques" might be appropriate.

At the local level, for the MBTA further work on the effect of the commuter rail development strategy would be warranted, and as would careful monitoring of the contracted bus routes. In San Juan the critical missing piece is a deeper understanding of the market. Further work therefore on existing Metrobús data, and a structured data collection pattern for the move to the transit centre service concept could produce useful information.

⁸⁵ see for example, Gordon J. Fielding, Managing Public Transit Strategically, 1987

Appendix A: Frameworks for Strategic Planning

Karger⁸⁶ provides a simple step by step guide to a "proper" planning process as follows:

1. Selection of the Planning Director. This should be publicly announced as should the fact that the company is embarking on a planning process.
2. Education of the Planners. This should focus on the planning process, the use of the plans, and the expected results.
3. Formation of a standard view of the company.
4. Definition of the internal and external planning horizons.
5. Selection of the planning site.
6. Definition of current businesses
7. Definition of future businesses
8. Establishment of strategic objectives
9. Production of a Short Term Plan. This will contain some items that are not a part of the strategic plan.
10. Monitoring of performance against the plan goals and objectives.
11. Annual revision of the plans.

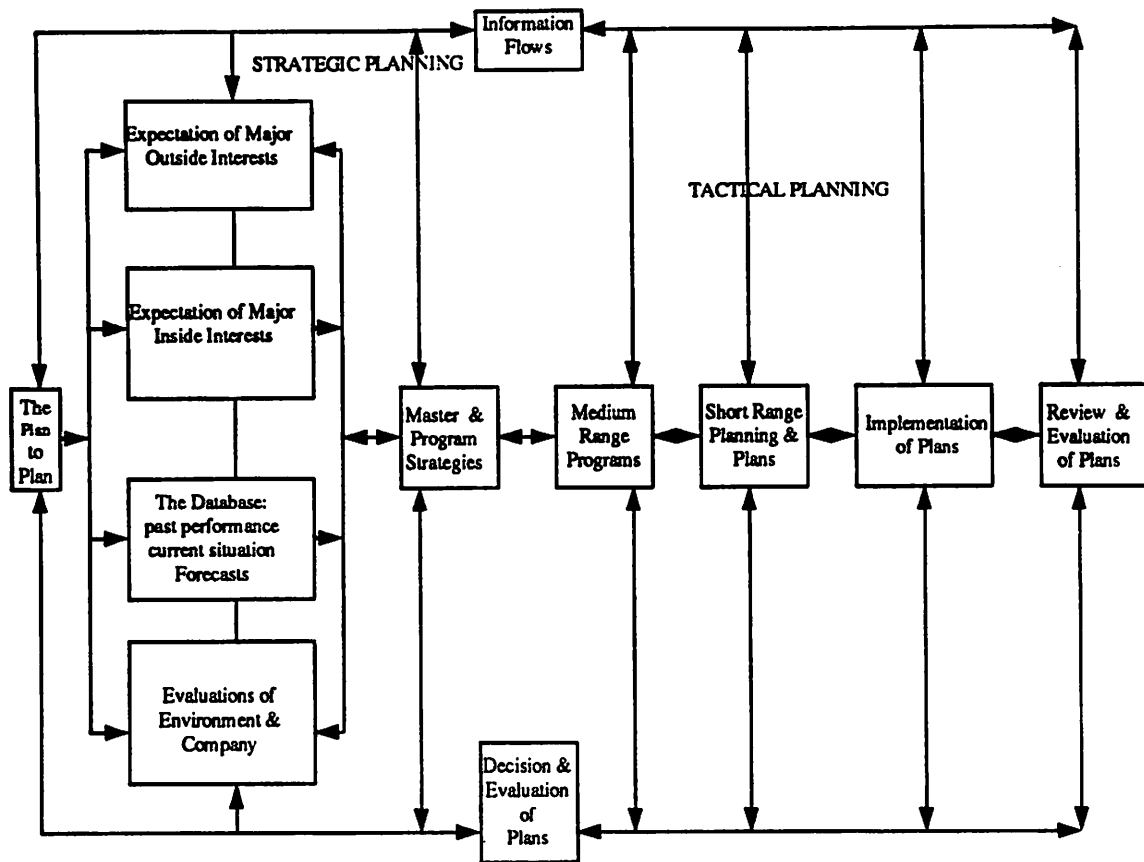
His work is a practical guide for those in management positions and is written from the perspective of one who believes that American industry has lost its competitive edge because of the lack of planning. Hence the guide stresses the importance of introducing planning into an organization which has previously had little or none, and takes the reader through the process step by step.

Steiner⁸⁷ illustrates a conceptual model of strategic planning as shown below. The model is followed within many of the companies which he has considered and the conclusion he reached was that effective planning follows this model either explicitly or implicitly. In the operational systems diagrams of these same companies, he did not find precisely this model structure, though the basic elements were found in the better systems.

⁸⁶ D. W. Karger, Strategic Planning and Management: The Key to Corporate Success, 1991

⁸⁷ G.A. Steiner, Strategic Planning, What Every Manager Must Know, 1979

Figure A-1: Steiner's Model of Strategic Planning



Lorange⁸⁸ characterized strategic planning as an attempt to answer four critical questions :

1. Where are we going? (mission)
2. How do we get there? (strategies)
3. What is the blue print for action? (budgets)
4. How do we know if we are on track? (control)

The questions therefore leave the planner with the freedom to develop a particular framework which would be most appropriate, given the organizational structure of a particular firm.

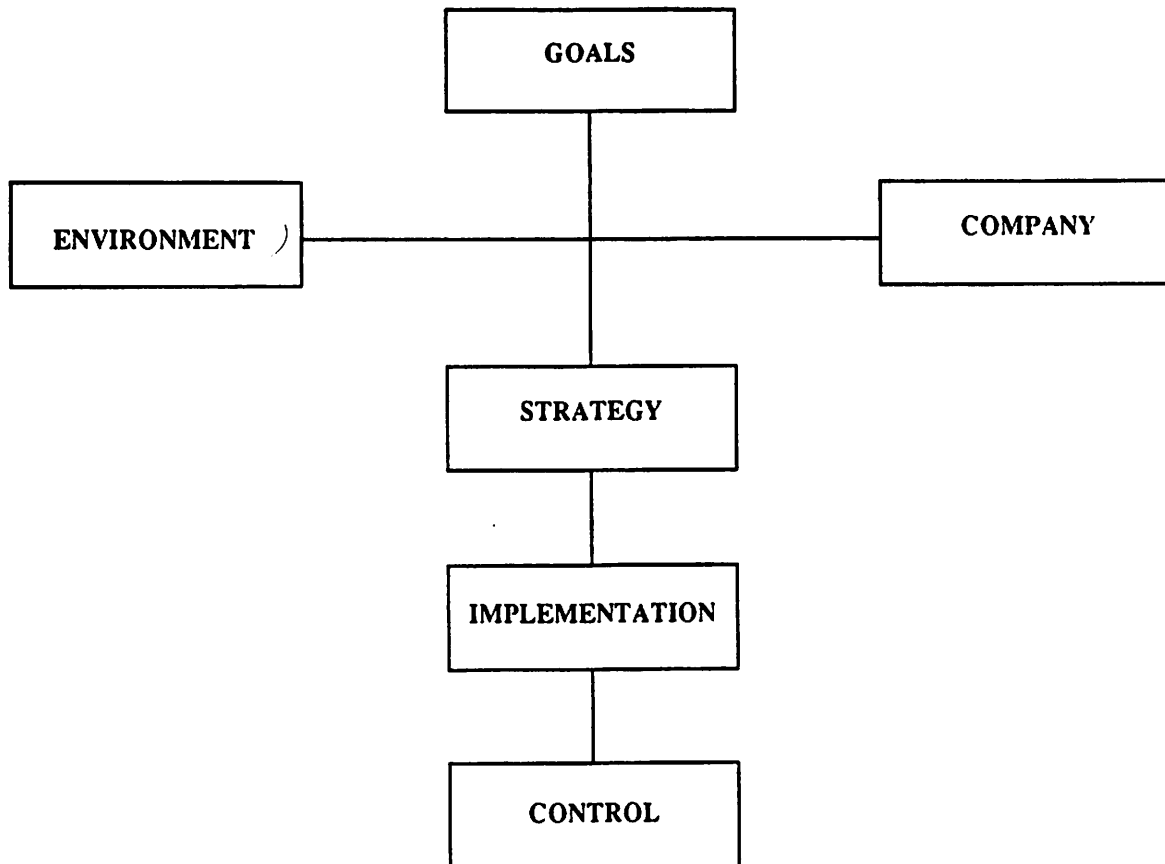
In considering the research interests and foci of different corporate strategists, Bowman⁸⁹ characterized an analytical approach which considered the process of strategic planning as a

⁸⁸ P. Lorange, *Corporate Planning : An executive viewpoint*, 1980

⁸⁹ E. H. Bowman, *Epistemology, Corporate Strategy and Academe*, Sloan Management Review, 1974

sequence of questions and methods being applied to answer questions of the appropriate interactions between the firm and its chosen environmental domains (products/markets). The model is shown below, and strategy is defined as “an integration of the goals of the firm, the nature and competence of the firm, and the opportunities and risks in the environment.”

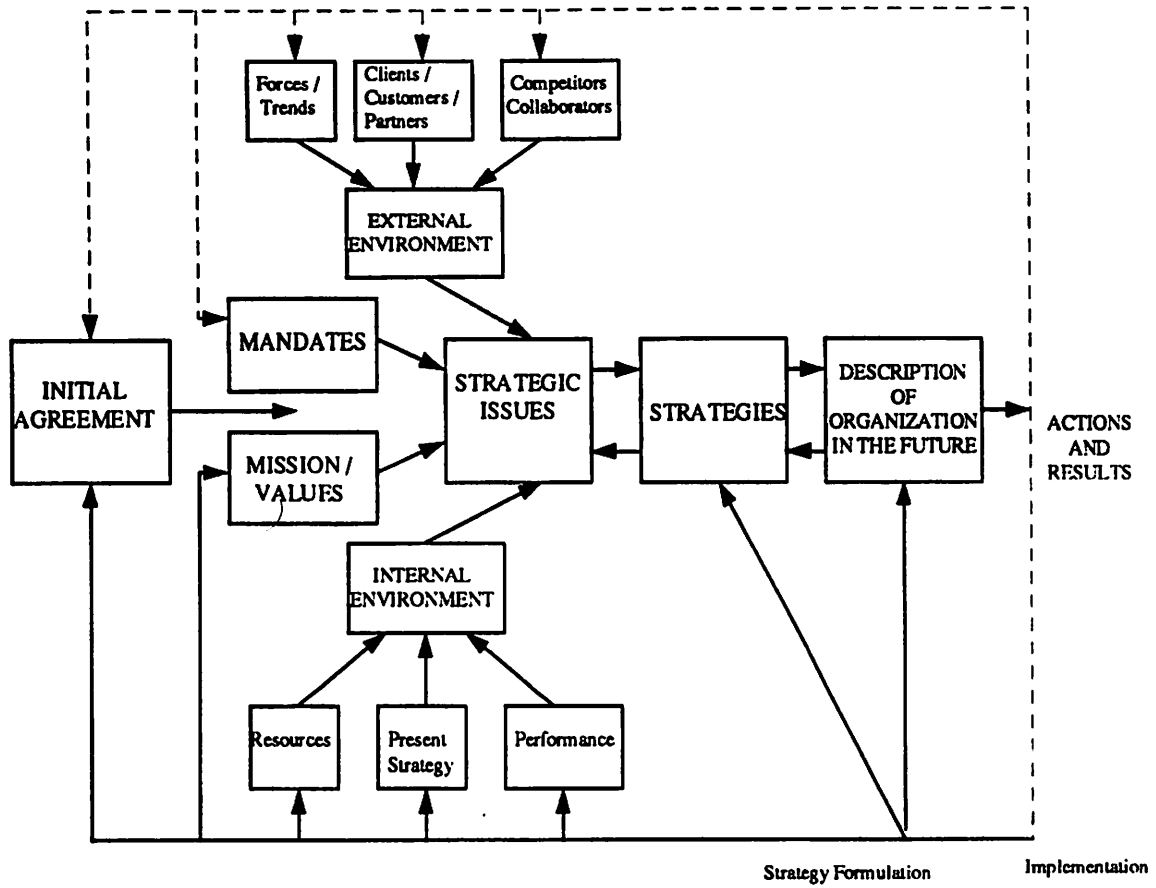
Figure A-2: Bowman’s Model of Strategic Planning



Bryson and Roering⁹⁰ distinguish strategic planning from other long term planning with its stress on action, consideration of a broad and diverse set of stakeholders, attention to external opportunities and threats and internal strengths and weaknesses, and in its attention to actual or potential competitors. The strategic planning process and the linkages which it requires are illustrated in the schematic below.

⁹⁰ J. M. Bryson and W. D. Roering, Applying Private Sector Strategic Planning in the Public Sector, *APA Journal*, Winter 1987

Figure A-3: Bryson and Roering's Model of Strategic Planning



Appendix B: State of the art review.

Strategic planning experience at selected agencies

1. The Seattle Metro Experience

The strategic planning efforts at Seattle Metro are currently divided into two sections. The Transit Department Management Plan provides a short range strategic plan and has been developed annually since the mid 1980s. A new six year plan is also being developed which is to be consistent with the long-range transit plan being developed for the region by the recently formed Regional Transit Authority for the three county (Pierce, King, and Snohomish) region.

The yearly management plans, coordinated by the Research and Market Strategy Division, are drawn up for the use of the elected officials of the area and emphasis shifts from time to time as the employment and residential populations shift and as legislative aims change. However the common theme of policies over the years has been a focus on the customer. Metro makes use of customer research in both its long and short term strategic planning efforts to identify priorities and new ways of meeting changing customer needs. The most current statement of Metro's policies is found in the 1994 Mission Statement and Goals, as follows:

“To provide excellent public transportation services to improve the quality of life for our total community.”

- **GOAL 1 : Provide quality products and services - plan, construct, and operate a reliable, safe, and convenient public transportation system that provides choices to driving alone.**
This is to be done through the three objectives : being responsive to community and customers, innovating to enhance service, and maintaining financial well being.
- **GOAL 2 : Be an outstanding place to work.**
Two strategies are proposed to achieve this. The first to promote cultural change in the organization, to pursue goals of collaboration, quality, customer orientation, and diversity. The second is to smooth the transition to the new government.
- **GOAL 3 : Be an active regional planner - working with others to develop and carry out plans for transportation, land use, and growth management.**

This is to be done through a six year service and capital plan, integrated with regional land use and transport plans. Other objectives include developing ensure strong public / private partnerships and preserving environmental quality.

The mission statement continues to evolve each year and the goals appear to be becoming more outcome oriented as the years go on. In 1994 for instance under the objective of community and customer responsiveness the development of a public involvement process for identifying service needs was initiated. Innovation was a new requirement, as was smoothing the transition to a new government. The emphasis on public-private cooperation was introduced in 1994, in 1993 the focus had been the development of relationships in the new legislature.

The 1995 statement was issued with that for 1994 but is more detailed in its specification of each target. Growth management becomes an issue. This is one area in which Metro is required to work within the policies of the local jurisdictions. Processes to be introduced and analyses to be completed are specified. This includes the promotion of employer flex pass programs, the completion of design work on the van distribution center, and the testing of new scheduling system for example. As mentioned earlier the reports are updated annually, as are the six year plans but both are required to be compatible with the 2020 plan. The mission of the long range plan is identical to that in 1994 whilst the 1995 version, in line with the greater detail in the goals is more explicit — “to provide excellent quality products and services, to provide an outstanding place to work, and to be an active regional planner.” The goals for the long term plan are oriented towards larger regional issues of mobility, growth management, and economic vitality and the objectives are set in terms of improvements to the transit mode share, general mobility, cost, environmental improvements, and feasibility.

Metro undertakes extensive market research projects in order to understand customer responses to, and satisfaction with, different aspects of the service. The market research is used to rank different projects within the capital planning process.

Metro's six year plan is being coordinated by the Advance Planning Section of the Service Planning Division. This longer range plan stratifies into the local (sub area), the inter-community, and the regional. At the local level all modes of transportation such as bicycles and private taxis as well as

The plan highlights negative effects of spreadout growth, in terms of air quality deterioration (and the effect of non-compliance on the level of federal funding), infrastructure costs, and dependence on the automobile. It highlights the benefits which can stem from well planned growth in terms of downtown Portland where the region made decisions in steering development and investing in transit in the 1970s. The choices facing the residents of the area are now therefore posed in terms of a rational continuation of the successful policies which Portland and other cities such as Vancouver, British Columbia, have adopted in the past and the lack of policy making which has led to the sprawl and congestion of cities such as Seattle and Los Angeles.

A portrait of transit centered clustered development of the city in twenty years time is painted as is a portrait of a well funded extensive transit system operated by Tri-Met to link the different regions of the Metropolitan area as well as providing neighborhood services linking residents into the regional system. The philosophy of Tri-Met is taken as "Customers, one at a time."

The Portland region was planning for 2040 and has developed a new RTP. In the strategic plan, Tri-Met stressed that regional cooperation was important, hence they would only update the strategic plan in line with this. In fact the RTP is consistent with Tri-Met's strategy.

Tri-Met advocated three major public policy initiatives:

1. Containing growth within the existing urban growth boundary
2. Substantially increasing development in transit corridors
3. Helping to assure development is designed to be served efficiently by transit

Tri-Met will give top priority to those areas which are compact and oriented to transit when it makes decisions on service expansion. However Tri-Met was not successful in its lobbying for increased funding from 1994 onwards (since the legislature did not approve the total transportation package, reducing the potential for development of either highways or transit) and hence proposals for 1995 had to be modified. The goal in these modifications was still to maintain the framework and general objectives from the strategic plan and to work with local agencies and groups to promote that vision.

Tri-Met also undertakes general capital planning and marketing work based on the strategic planning goals. The marketing department has sought to identify segments in the population, those who are pro transit and regular users, those who are anti transit and not regular users and so on. They have assessed the size of these segments and begun to develop marketing plans which will allow them to target these segments. The key marketing policy is however that customers are individuals with different needs. This guides staff training programmes as well as the marketing plans for each segment.

3. The CTA Experience

The Chicago Transit Authority had undertaken different elements of strategic planning for about 9 years, until January 1994 when the strategic planning department was formally dissolved and the members of that unit were transferred to the market research and service planning departments. The 5 executive directors through the 9 year period had different opinions of the role of strategic planning and hence there were different emphases during those years. However the top level support from the board members and the executive committee was only occasionally very strong, with only one executive director, in this period, giving the process full support. Several reorganizations also made it quite difficult to sustain any momentum.

A strategic framework was produced in 1991, with short and long versions which were distributed internally as well as to other transit agencies and to political bodies in the region. Grants from UMTA were obtained to undertake this work and the agency was assisted by two management consultancies.

The document produced a mission statement and specific goals for the CTA. It also broke down the analysis into external and internal agendas and produced strategies, initiatives, and goals within each of these two broad areas.

The mission statement ran as follows:

“The mission of the Chicago Transit Authority is to provide high-quality transit service that meets the needs of metropolitan Chicago and positively influences the region's development”

The goals were:

1. To deliver convenient, on time service to people in the service area
2. To maintain the highest possible standards of passenger safety and security
3. To establish sensible, efficient, and equitable fares to generate needed revenue
4. To tailor routes and schedules to the changing travel patterns of the public
5. To maximize the CTA's share of the local travel market through better understanding of consumer preferences
6. To enhance communication with the public
7. To coordinate transit with urban development so that the region's resources are used most efficiently and environmental quality is improved
8. To strengthen and stabilize the CTA's financial position through the application of new technologies or strategies and the redeployment of existing resources
9. To enforce the highest standards of professionalism and integrity
10. To increase fairness in hiring and contracting
11. To foster a working environment conducive to safety, productivity, and excellence
12. To ensure sufficient levels of basic mobility for those travelers who, for whatever reason, are without ready access to a private automobile

Hence there was explicit acknowledgment of the customers of the service as well as "land use-transportation" interactions.

The external agenda was oriented towards ensuring positive public perception of the CTA, with a strong marketing program, linking the CTA to long term economic viability of the city, to an improved environment and to the positive aspects of urban lifestyles. It was also concerned with the alteration of the funding structure for the agency. The document is explicit in its criticism of the funding structure, which though when introduced served the region's needs well, by 1991 was providing disproportionate funding for the suburban authorities. Disproportionate here refers to the difference between the percentage of regional trips made on the CTA system and the percentage of the regional funding it receives.

This agenda also addressed the agency's capital investment priorities, with engineering assessments of different costs, needs, timings, and options in order to improve programming capability. It also stressed the importance of a long range plan for the CTA, including the need for an informed

public in discussions about the optimum size of the agency. This would require more studies to highlight different tradeoffs.

The internal agenda focused on producing high quality services and to do this whilst emphasizing productivity (especially cost containment in the face of the increased calls from ADA and CAA.) To ensure that this was possible changes were needed in the vehicle, facility, engineering, and capital works maintenance programmes and priorities and in the development of the organization, through restructured executive management, strengthened staff development, and improved internal communications. Attention was also paid to service for the disabled and to pricing policies.

“Recent” strategic initiatives and their success or otherwise were also discussed in the document. For example the alteration of the fare structure, the introduction of new management and operating employee training programmes, increased state funding assistance, especially in the reimbursement of reduced fares offered to senior citizens, to disabled people, and to students, and the consolidation of the capital planning and construction branches of the organization.

An implementation framework was proposed, which established a strategic planning committee to focus on the longer term external goals and set the internal goals as a task for executive management. There would be a yearly review process.

The strategic planning process did allow a more detailed understanding of the agencies market goals and required service levels, however these are no longer referred to in any systematic way, rather customer sensitivity measures are being stressed through Total Quality Management training programmes.

4. The New York MTA Experience

The NY MTA has a strategic planning process, coordinated by the Policy Research Division of the Policy and Planning Department. Other divisions within that department are Planning, Arts for Transit, and Marketing and Corporate Communications. The policy research division provides the guidance for the operating subsidiaries, who each prepare a section for the strategic planning document which is published annually (as required under New York state public authorities law) and covers a five year span. In some years the plan is more an update of the previous year, focusing on analyzing current strategies, in others major changes are introduced. For example the

Fare Deal Program was introduced in the 1993 Strategic Business Plan, as an attempt to provide the NY MTA with a comprehensive strategy with which to meet customers needs. The introduction of this program will dominate plans for a few years and already in both 1994 and 1995 the strategic plan has been used to announce further alterations in the Fare Deal System and the plans that the NY MTA has for it.

Each operating subsidiary, as noted above, produces its own input for the plan, taking the strategic business plan and fare deal forward to implementation, and each follows a similar format. The 4 key corporate issues identified in the 1994 plan were:

1. How will MTA continue to develop as a customer driven organization dedicated to providing higher quality and regionally integrated transportation service?
2. How will MTA achieve fiscal stability for its operating budget in an uncertain economic period?
3. How will the MTA maintain progress in its capital program?
4. How will the MTA enhance the skills, performance, and job satisfaction of its employees in a fiscally constrained environment, recognizing that they are critical to its success?

There is no agency mission statement nor are there specific goals but it is claimed that "The MTA exists to provide transportation services to our customers. As the MTA moves closer to the 21st century it must provide transportation services through a system so appealing that it ensures the mobility and consequently the economic well being of the entire region." It is this theme of customer focused high quality service which runs through the document as the means to increase ridership and hence to maintain the viability of the region. There are target markets for each subsidiary and an awareness that as well as the downtown commuters, there is a growing reverse commute and suburban travel market which must be served.

The high quality service which the MTA plans to provide will be expensive and hence it is looking to build new mechanisms for making funding allocation decisions in the region, ensuring that the appropriate level of ISTEA and other funding goes to public transport. In order to ensure that the desired audience receives this information the Strategic Business Plan is circulated to the Albany legislators, to senior management, the Board, as well as to ridership groups.

The "vision of the future" does discuss land use and development issues but the concerns of funding and higher quality service (to be measured through customer satisfaction surveys) are critical. Market research is carried out by the Policy Research Division, who manage the research requested by the marketing department. (As noted earlier both of these divisions fall under the auspices of the Policy and Planning Department.)

5. The SEPTA Experience

SEPTA has a long range planning department, within the planning and development department of the finance division. In 1991 the division produce a "A Vision of the Future", which was distributed to the SEPTA board, to elected officials, to regional planners, and to SEPTA staff. This distribution does not correspond to what appears to be the aim of the document. It was drawn up in conjunction with regional planners and the citizens advisory committees, amongst others and appears to suggest that the next step forward in the process of planning for the future of the region is public participation. In fact public participation is invited, in the form of service suggestions to SEPTA and lobbying of elected officials on SEPTA's behalf and in continued SEPTA ridership.

SEPTA established a mission statement and 7 goals, with accompanying objectives for 2010. These were drawn up through a participatory process in conjunction with the City of Philadelphia, the suburban counties of Bucks, Chester, Delaware, and Montgomery, the Delaware Valley Regional Planning Council, Penn DOT, SEPTA's citizen advisory committee, the SEPTA board's long range planning and development committee, and SEPTA staff. The mission statement is as follows:

"To promote economic development and enhance the quality of life in the region by excelling in the efficient delivery of safe, reliable, and attractive public transportation services by courteous, professional, and dedicated members of the SEPTA team."

The goals and accompanying objectives are:

- **Public Transportation Service Delivery** - to provide transit users with clean, safe, reliable, and convenient service responsive to their travel needs.

This will involve maximizing passenger safety and security on the system, preserving existing services and responding to new travel patterns, improving and promoting access to transit and making the system more convenient for all trip purposes and repairing, replacing, and maintaining the system.
- **Public Transportation Effectiveness and Efficiency** - to minimize operations and maintenance cost, by establishing productive, effective, and efficient working on the system.

This will involve allocating operational and capital funds effectively, maximizing the return of fare revenues, and incorporating new marketing and pricing techniques.
- **Public Transportation and Economic Development** - to foster and promote a transit system which aids development and is compatible with land use and development plans.

This will involve providing services to help business to remain competitive, promoting the transit system as a factor in attracting and shaping development, coordinating future transit and land use developments, and planning for regional transportation centers, with multimodal transfers.
- **Financing Public Transportation** - to reverse the physical deterioration.

This will involve the identification of stable funding sources and pursuing public-private partnerships.
- **Non-Traditional Public Transportation Services** - to respond to the region's changing needs.

This will involve looking at new technological opportunities as well as new types of service targeted to particular groups.
- **Social, Cultural, and Recreational Benefits** - to develop a system which promotes accessibility for all.

This will involve maximizing efforts to serve those with mobility limitations, ensuring employment and service accessibility for the economically disadvantaged, providing access to cultural and recreational resources, and providing good system information.
- **Environmental Quality and Energy Conservation** - to operate a system which reduces energy consumption and attempts to mitigate harmful environmental impacts.

This will involve the operation of fuel efficient vehicles, using new technology to minimize noise and vibration impacts, and minimizing ecological and visual intrusion of new transit developments.

The vision of the future considers how the area has changed in the recent past, in terms of population, employment, income, household vehicle ownership, and vehicle miles traveled and projects towards 2010 in the transport related areas. Questions of mobility difficulties in suburban areas, environmental concerns, as well as the decaying infrastructure on SEPTA's system are covered before suggestions are made for addressing system preservation questions as well as those of system development. The specifics will be refined with feasibility studies and participation processes.

It is clearly recognized that the adoption of a long term plan will not be a final step however and that changing environments (within SEPTA and outside it) will require continued updates to these plans.

6. The WMATA Experience

A strategic planning process was initiated at WMATA by the General Manager and Board Chair in 1989. The process ended in December 1990 (it was abandoned then due to a change in leadership) with the publication of a phase I report entitled *The Strategic Plan : Charting a course into the next century (Phase 1: Examination of the issues, challenges, and opportunities)*. In the early 1980s some strategic planning work had led to the creation of an Office of Policy and Long Range Planning and this office produced a draft strategic planning report in 1986. This was never endorsed by management or approved by the Board however, and the office was disbanded.

The 1990 report was produced by the Office of Planning and was wide ranging. It was stressed that this was the path finding report which attempted to establish principles within which the more specific details of the plan could be formed.

The General Manager and Board Chair seemed to be clear about the objectives which they had for this report i.e., to lay out a future for the agency which had previously been concentrating on creating an integral network, to provide critical support for the Washington area. However as the development of the network was almost complete, the view was taken that Metro needed to assess its status and explore its' future.

The company stressed the following challenges:

- Maturing bus and rail systems
- Continued rail construction
- Expansion of transit services
- New Federal Requirements
- Constrained Resources - both human and financial

The plan demonstrated an awareness of the need to contain costs (innovative funding techniques, improved control systems, innovative fare collection mechanisms, and electronic fund transfers were all mentioned) and to increase revenues through the addition of new riders (with aggressive and focused marketing, improved information, and coordination of services with other transit providers in the regions) and through more entrepreneurial use of the Metro facilities and staff.

Marketing attention would be paid to pockets of low usage, with analysis of where capacity existed on the network, and with the aim of filling those gaps to improve the efficiency of service provision.

MetroBus

The following questions would have to be addressed to maintain high quality bus service to 2010:

- Bus Replacement
- Bus Garage Requirements
- Effects of ADA on fixed route accessibility and supplemental paratransit services
- CAA and other environmental requirements
- Bus Service Levels

MetroRail

The following were identified as the critical issues for maintaining the high service standards:

- Equipment and Facilities Rehabilitation
- Maintenance and Operations
- Materials and Parts
- Safety
- System interfaces
- Modifications to the current system

Though the authority acknowledged that future extensions to the 103 mile rail system would help to shape the development of the Metro region, it did not provide guidance about the optimum extent to which fixed rail investment should be provided across the area. Metro provides support to any group endeavoring to determine potential for new rail routes in Washington. There was also an awareness that new technologies might allow them to serve particular areas more cost effectively than through fixed rail investments and that these possibilities should be investigated.

There was a stress on the importance of maintaining inter-governmental cooperation, the linkages between land use and transportation planning, and the need to promote the use of transit through both the public and the private sector. Awareness, within the agency, of the financial and human resource constraints was also stressed. Actions to confront these difficulties are suggested but in very broad terms, in keeping with the nature of the document.

The strategic planning process as instituted at Metro seems to have been one in which the concerns incorporated both market oriented decisions and specific internal agency concerns. The process considered anything outside the normal 5-year capital and operational horizon and outside the immediate and previously committed goal of completing the 103 mile rail system. It did not envisage a framework on which to build the development of Metro and the Washington area, or highlight any priorities, but this would have been part of the continuing strategic planning process.

Multiyear budgets continue to be produced and market research is undertaken. There are however no specific long term target markets, rather there are specific goals for levels of participation in the various fare payment programmes. The Authority's mission statement is "to provide the region safe, reliable, attractive public transportation service, within available resources, including operation and maintenance of the bus and rail systems, and completion of the adopted regional system."

7. The TTC Experience

The TTC has a developed long term planning process and has produced two long term plans since the mid 1980s, following on from two reports in the early 1980s which had been used as tools for management direction. These had no public input but were instead based on a series of background studies with external (governmental) and internal representations. The 1986 plan followed this framework whilst in 1990 a cooperative planning process was used which included participation

from the general public as well as other public bodies in the region. The report preparation took about 3 years, It included background studies, draft reports for comments as well as a final Long Range Plan and Implementation Plan. The motivation and primary goals of the agency are based on the Commission's legal mandate. The long range planning process focuses on the possible difficulties which the agency may face in the upcoming 20 years.

The legal mandate for the TTC is very broad and the 1990 Long Range Plan breaks it into dual goals of transport mobility and social goals. Hence it reports that whilst providing "a basic level of mobility the TTC can also meet certain social objectives, including :

- contributing to the attractiveness of Metropolitan Toronto as a place to live, work, and invest
- alleviating congestion by reducing dependency on automobiles and lessening the need for road construction
- meeting social equity concerns, through provision of a reasonable level of transit service to all Metro residents regardless of age, sex, income levels, and physical abilities; and
- protecting and enhancing Metro's physical environment."

All of these objectives are tempered by the restraints of funding.

The questions posed in the Long Range Planning process are discussed in various background studies and papers, and range from social and demographic trends, to inter regional transit issues, environmental concerns, security, and new financing mechanisms. TTC planning is coordinated with that of Metropolitan Toronto Planning Department and other government agencies, including GO Transit, which operates the commuter rail in the region. Hence the long range plan reflects the intermodal transport plans for the Metropolitan area, and to a lesser extent those of Greater Toronto.

There is a corporate planning department within TTC which is responsible for undertaking these periodic strategic reviews, working on the background papers which are used to illuminate the questions posed during the planning process. The Corporate Planning Group has broad responsibilities to coordinate, develop, and recommend the long range plan policies as well as to inform the Commission and senior management about changes in external factors affecting the

TTC. The Commission must approve the Long Range Plan before any of its policies are implemented. The Corporate Planning Group has also been directed to encourage the integration of transit services and land use planning in Metropolitan Toronto and the surrounding regions of the Greater Toronto area. Hence Corporate Planning staff act as the commission's representatives in planning studies performed by others in the region.

For the 1981 report, public input, through written submissions, was invited in major Toronto newspapers. However only four replies were received, each of which is summarized in the final document. In addition only a handful of people attended a special meeting held by the Commission, to present the Draft Long Range Plan Report and its recommendations to the public.

The following are the primary goals set for the agency in 1991, for the purpose of meeting its' legal mandate, and building on the transportation mobility and social goals of the 1990 report. The accompanying objectives were identified (through the Long Range Planning Process) for the purposes of monitoring the TTC's performance on a Commission wide basis throughout 1991.

- **Transportation Mobility** — To Provide all residents, commuters and visitors to Metropolitan Toronto with a high level of safe, reliable, courteous, and clean transit mobility at a cost which is within the financial capabilities of Metropolitan Toronto, and the Province of Ontario.

The objectives to be monitored relating to this goal are grouped under the following headings:
Mobility; Financial; Productivity and Human Resources; and Customer Service

- **Social Objectives** — To contribute to the attractiveness of Metropolitan Toronto as a place to live, work, and invest, and to support the socio-economic, environmental and land use goals of the local community, Metropolitan Toronto and the Province of Ontario.

The objective to be monitored under this goal is identified under the following heading:

Land Use and Economic Development

The Commission takes the view that there should be a continuous updating of the plans. The most recent update occurred at a time when ridership levels had just begun to decline. Annual ridership

fell from a peak in 1988 of 464 million riders to 451 million in 1989. Though the TTC recognized that the decline was not solely the result of a 41 day labour dispute, neither did they anticipate the full extent of the continuing downward trend.

The report, published in 1991 with details for implementation published in 1992, highlighted the challenges which must be overcome if the TTC is to maintain or increase ridership over the coming decade. The following are some examples:

- increasing expectations of their customers regarding service quality.
- reduced operating speeds caused by increased traffic congestion, and the resultant inefficiencies.
- concerns about service reliability; and
- the need to increase ridership levels despite demographic trends which favour increased auto usage.

Recommendations made by the report fell into 4 groups :

1. Service Quality
2. Social Objectives
3. Transit Funding
4. Productivity

Within these categories some broad objectives were set down for the year 2000. The more specific service objectives are outlined in the Metropolitan Toronto Official Plan which is produced by the Metro planning department. This department takes the lead role in transit planning studies in the region.

As noted above the process of planning in the TTC was not closed by the publication of this report, though at present there is no timetable for the next strategic plan. There was wide spread dissemination of the document and the agency itself continues to evaluate the market place. The Long Range Plan Implementation Report assigns responsibility within the agency and specifies detailed targets and time frames.

8. The LT Experience

London Regional Transport (known as London Transport, or LT) is required, under the Act of Parliament which established it in 1984, to prepare a regular statement setting out the policies it intends to adopt, to provide or secure public transportation services in Greater London. It is required to produce this document at least every three years, to report on actions which it has taken to achieve the policies adopted and to consult with various parties, including other transport providers in the region, passenger representatives, local governments and any other bodies which LT sees fit. Since 1984 the company has chosen to involve riders and other interested individuals as widely as possible. Advertisements are placed in the company's vehicles and in newspapers, for example, which inform the public of the process and encourage them to participate. Information on LT's current policies is then sent to interested people, in a short version (a consultation document) whilst a longer version of the document is sent to the agencies which it is required to consult.

The planning is coordinated within the LT Corporate Policy and Planning department which is also responsible for the yearly business plans and 5 year capital plans. It is not however responsible for implementation which falls under the auspices of individual directorates within the company.

The consultation period lasts approximately 4 months and in the last round of consultation (for the 1991-4 strategy document) over 1600 individual members of the public replied, whilst a further 100 groups sent responses. The specific goals of different departments within the agency are not incorporated in this process rather they are fed into the yearly planning review and that is where binding fiscal constraints are dealt with.

The 1991-4 strategy highlighted the following areas as major priorities:

1. Continue to give the highest priority to safety
2. Improve the quality and reliability of Underground service, with particular attention to combating overcrowding.
3. Promote efficiency in all areas, including tendering, notably of bus services and by developing the management structure within London Underground.
4. Plan and implement major developments in the rail infrastructure of London for construction of new lines, for the extension of existing ones, and promoting the development of Light Rail.

5. Prior to deregulation, promote the role of the bus. London Buses and the Tendered Bus Division will concentrate on improving the quality of bus services while London Transport strives to achieve a fairer allocation of road space and improvements in the passenger infrastructure.
6. Post Deregulation, ensure that the new system settles down quickly and smoothly and make the contribution to the operation of the new system which London Transport's past experience puts it in a position to make.

The goals are broad and not, on the whole, applied to direct questions. Formal detailed goals for service levels and safety are laid down in agreement with the central government in other arenas. However the planning process is continued at London Transport between these reports, through regular meetings with passenger committees, with local governments, through yearly business plans, and through extensive market surveys and analysis. The yearly business plans make reference to the statement of strategy goals and should ensure that the developments are adhering to the overarching framework laid down in the three year strategy.

The planning process therefore does not touch on the concerns of land use and transport relations which are a major concern in the North American cities, this may be related to the higher density of development in London and to the statutory limitation of service to the Greater London area. Development of new light rail networks in different areas of the city are described but detailed description of necessary densities or other criteria for new services is not included in these documents. Nor is there a complete description of market changes over the three years, in either the consultation or the final strategy documents. The focus instead is on operational developments instigated by LT itself.

Changes in population composition and distribution are monitored, as are changes in the employment market place and in land uses. However these are fed into the strategic planning process only indirectly. The Planning department within LT produces background analysis continuously and these inform the consultation documents as well as the final strategies.

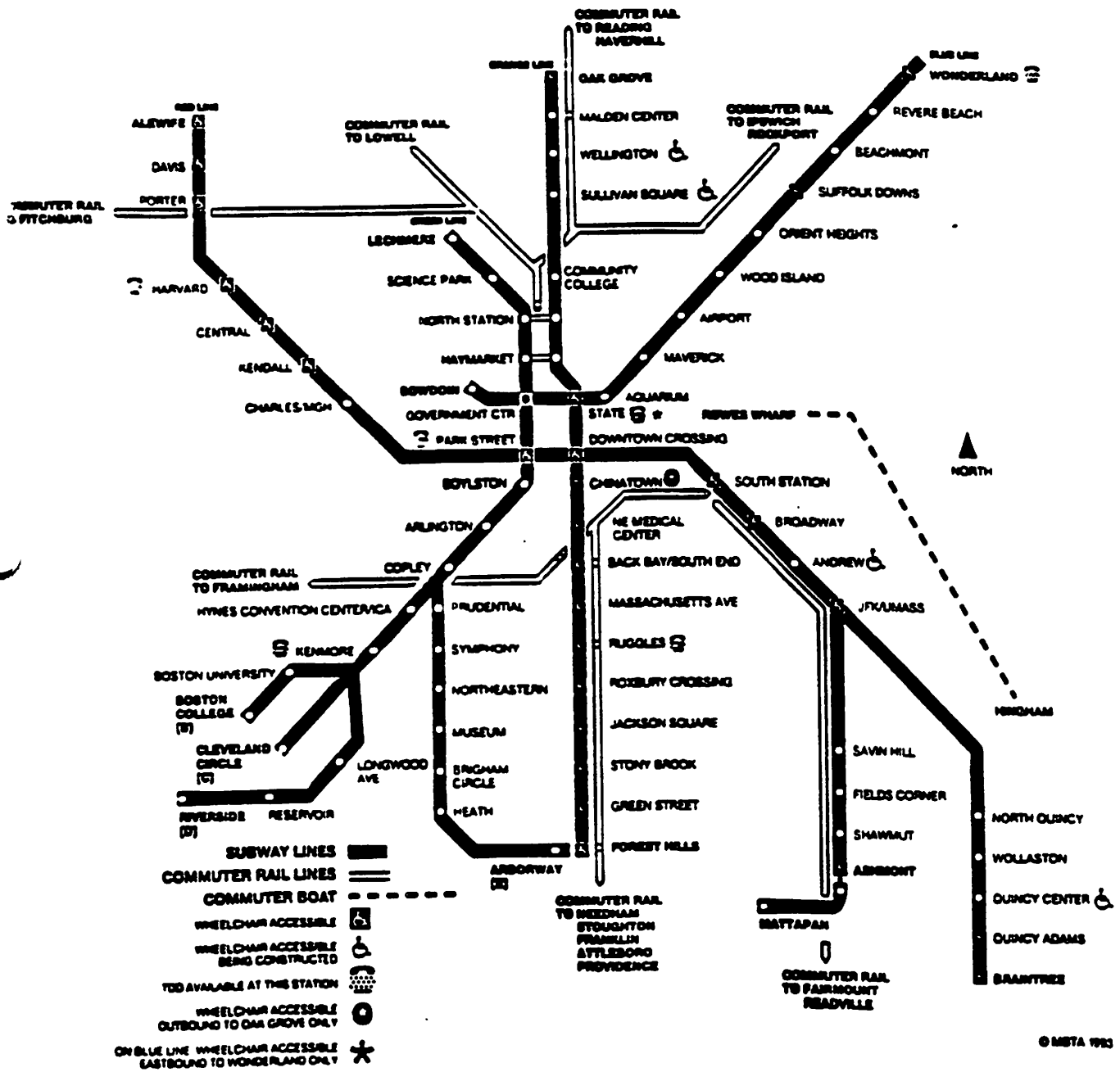
Appendix C: An Introduction to the Massachusetts Bay Transportation Authority

The Massachusetts Bay Transportation Authority — serves 78 cities and towns in eastern Massachusetts, with Boston as its focus. Daily ridership on the system was estimated to be about 700,000 in 1994. The authority runs services directly on 155 bus routes, three rapid transit lines, and a light rail line, and also contracts for services on a network of 11 commuter rail lines, two commuter boat routes, and Dial-a-Ride services for 55 cities and towns. Maps 1 and 2 show the present extent of the rail systems. Other services in the area are operated by private companies either for their own revenue or under contract to other private organizations (a mall management company, or large employer for example.)

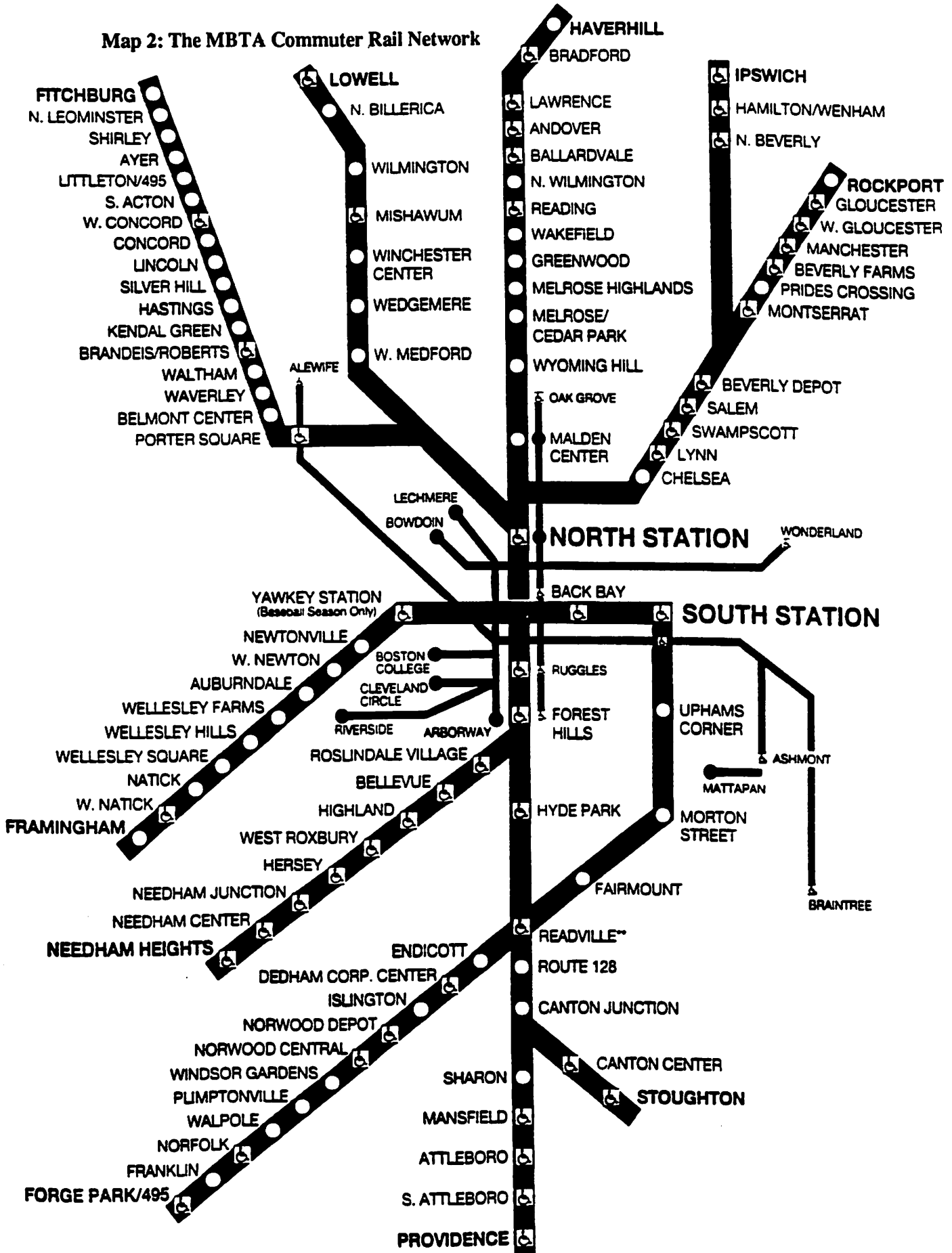
The transit network has a strong radial orientation, operating into and out of central Boston, which is reflected in the importance of Boston employment levels for MBTA ridership.⁹¹ Linked and unlinked trips numbers for MBTA services from 1983 to 1993 are shown in Table C-1. The increases in ridership (particularly to 1990) should be compared with the census journey to work data. The proportion of journey to work trips made on public transport services by those who live within the MBTA area, has declined from 16.4% in 1980 to 15.5% in 1990. The figures in the table may also be slightly misleading since there was significant investment in the MBTA services over the past 15 years. Many of the commuter rail services were upgraded during the 1980s and rapid transit services were also developed through extensions of the Red Line to Braintree and Alewife and relocation of the Orange Line.

⁹¹ MBTA and CTPS, MBTA Environmental Impact Report on the 1991 Fare Increase, January - November 1993. Regression analysis in this report, which used quarterly data from 1983 to 1991, shows that for every new job in Boston, 0.98 daily transit trips result.

Map 1: The MBTA Rapid Transit Network



Map 2: The MBTA Commuter Rail Network



The 1994 budget for the authority was almost \$797 million. Operations was of course the major expenditure category at \$564 million, with \$371 million of this being for salaries and fringe benefits. Another major category of expenditure was "fixed charges" or payment of debts. This was budgeted at \$232 million in 1994 and is an increasingly important element. These fixed charges result in part from substantial capital investments since the 1960s. The MBTA budget deficit grew 639% (after adjusting for inflation) from 1964 to 1991. Gomez-Ibanez⁹² has used time series models (1970-90) to estimate the effect of different factors on the deficit. These factors include MBTA fare and service policies (real fares and vehicle miles run), the costs of maintaining pre-1970 services (inflation and depreciation of pre-existing assets), attempts to control costs of service provision (cost per vehicle revenue mile), and exogenous factors affecting ridership levels. Two models were developed (differing only in their treatment of the ridership change/level of service relationship) which suggest that the two factors which most strongly influenced the growth of the MBTA deficit were fare and service policy and inflation and depreciation. These two factors each caused approximately 45% of the deficit increase. Furthermore only approximately 7% of the increase was a result of costs per vehicle mile rising faster than inflation and 3% to exogenous effects leading to lower levels of ridership.

Table C-1: MBTA Ridership Figures

For all Bus, Light Rail, and Rapid Transit Services		
Fiscal Year	Unlinked Trips (millions)	Linked Trips (millions)
1983		151
1984		157
1985		163
1986	235	163
1987	246	169
1988	252	174
1989	255	176
1990	255	177
1991	248	
1992	237	
1993	240	

⁹² J. A. Gomez-Ibanez with Zhi Liu and Baher El-Hifnawi, Boston's Transit Future: The Dilemma of Maintaining Ridership while controlling the MBTA deficit, unpublished background paper for "The Boston Conference: Shaping the Accessible Region", 1994

There have been two recent fare changes — in 1989 and 1991 — though the base fare remains among the lowest of all public transport systems in the US and the cost/recovery ratio is low. 17% (\$136 million) of the budget funding came from farebox revenue, another 1.5% from other operating revenues. Only \$18 million of the budget funding comes from the federal government, which contributes a much larger portion of capital funding (up to 80%) than operating. Almost 2/3 of the net cost of service (or \$274 million of the \$412 million) is funded by the Commonwealth of Massachusetts, and the rest from the municipalities. Proposition 2½ was passed in the 1980s to limit increases in the contribution of the municipalities to the MBTA budget, forcing an increased Commonwealth contribution.

Past funding difficulties have led to changes in the organizational structure for provision of public transport services in the Boston area, with the expansion of services from the 14 communities which were part of the Metropolitan Transportation Area (MTA) in 1964. The expansion was driven by the bankruptcy of some suburban bus companies, the changing nature of the urban area, and the need to expand the funding base. In addition the new MBTA was to receive state funding, to embark on a rapid transit extension program, and to be responsible for retaining commuter rail services. Important changes have continued to occur periodically — in 1978 changes were made in the binding arbitration rules, in 1981 the Management Rights Act was passed (which restored to management many of the powers which they had previously lost through negotiations with the unions) following a budgetary crisis, and the introduction of proposition 2½ in 1982, to limit the contributions of the local authorities to MBTA budgets. Gomez-Ibanez concluded that these budgetary crises are occurring on a fairly regular pattern, about every 14 years, and therefore another crisis is likely within the next few years.

The Commonwealth of Massachusetts has an institutional structure for transport which is far from uncomplicated. The Secretary of the Executive Office for Transportation and Construction (EOTC) sits as Chairman of the 7-member, Governor-appointed, MBTA Board of Directors. There is also an Advisory Board with representatives from the funding cities and towns, which meets to review and approve the budget and comment on strategies. The other responsibilities of the Secretary of the EOTC include major roadway projects, most notably the Central Artery/Third Harbour Tunnel (CA/T) project. Local agencies maintain roads in their own municipalities, control

parking availability and pricing, and make land use development decisions. There is also a regional planning agency (the Metropolitan Area Planning Council, MAPC) which has adopted a policy of concentrated growth centers throughout the region (Metroplan 2000) based on the subregional development structure which is already in place. MAPC is a member of the Metropolitan Planning Organization which controls ISTEA funding allocations, and has responsibility for many of the plans required for compliance with the various federal transport and clean air requirements. Despite recent efforts to introduce some form of statewide growth management measures, these bills have not met with success on Beacon Hill. Hence each town is relatively autonomous in terms of its own development policy. The MBTA area is a subset of the larger MAPC area of 102 cities and towns.

Past Long Range Planning Initiatives in the Boston Region

Longer range planning at the MBTA has been structured around the "Program for Mass Transit". There have been three distinct plans in the last 30 years. The first, prepared in 1966, was entitled a Comprehensive Development Program for Public Transportation in the Massachusetts Bay Area. The stress in this document was the need to serve all parts of the region, and for a public transport system which complemented other transport facilities. Six goals were set for the provision of public transport services:

1. Provide essential public transport service, directly or indirectly, in an economic manner
2. Provide public transport services needed to complement and/or reduce highway programmes and needs
3. Act to promote favourable economic development of the area
4. Improve present services and costs
5. Anticipate future customer wants and regulate development
6. Seek improved attitudes to public transport

A corridor approach to the development strategy was adopted, with six sectors fanning out from the regional centre — the City of Boston. Projections of travel demand and characteristics in 1990 were used as the planning horizon. The dominance of the journey to work trip was acknowledged as was the particular need to provide for efficient downtown distribution services to increase the convenience of peak period travel. The poor downtown distribution system was seen to be placing a limit on the development of corridor rapid public transport services.

The recent transformation to a publicly operated area-wide transport system was still evident, through the existence of privately operated suburban services. The emerging focus on network issues and equity for all tax payers in the region was clear in the discussion of these private operations and the determination that, where services were funded by the MBTA, the needs of the network should be uppermost. A number of short term development plans were made which included substantial capital spending on rapid transit extensions, the replacement of rolling stock, the modernization of stations, the introduction of feeder bus systems to express routes, and increases in park and ride capacity.

Though the role of the authority in shaping regional development was noted, this was not the primary focus of the plan, which was revised in 1969. The revision focused particularly on modernization costs, in contrast with the earlier version which had concentrated more on the system extension costs. The 1969 plan was also explicit in its acknowledgment that the planning process was action oriented, identifying opportunities for major service improvements, comparing costs and benefits of different proposals, and preparing detailed action plans for implementation of the chosen alternatives.

In 1974 a new plan was published, the Ten Year Development Program 1974-1983, in which the policy had "emerged from a determination to develop an integrated transport network with the maximum possible beneficial impacts on the regional economy, the regional environment, regional equity, and future patterns of metropolitan development." In fact the plan went on to stress the importance of maintaining urban services despite the need to serve suburb to downtown traffic. Emphasis was also placed on the provision of improved access to already densely developed areas of the city whilst acknowledging that though this would not reverse the trend towards dispersed suburban development, it would at least not accentuate it. A major feature of the program was further commuter rail development and even some mention of introducing new minibus operation. Many different agencies were involved in drawing together these plans and the four major elements stressed were:

1. Improvements in the fiscal and institutional context for the delivery of public transport services
In particular it was this plan which first mentioned the need to make the planning process an open and participatory one.

2. Operational improvements on existing services, particularly surface routes
3. Capital improvements to improve the public transport network
4. Improvements in the highway and parking system to favour public transport

This plan too was revised (in 1978). In preparing for the revision many local agencies were involved and 10 public sessions were held to solicit citizen input. Again the structure was corridor based, focused on the central core. The principal objectives of the planning process were restated in the revision.

The latest plan was published by the EOTC in 1993 — *Commuting in a New Century — The Program for Mass Transportation*. Public input was again solicited and representatives from a number of state agencies (including the MBTA) were represented on the working committee which prepared the plan. Predictions were made for 2020, based on 2010 scenarios updated with MAPC projections, and the plans were produced to be in compliance with the requirements of ISTEA. The requirements of the Americans with Disabilities Act were also addressed. The objectives of this planning process were established as being to “identify and recommend projects that will result in a cost effective public transport system that serves the greatest number of people in a way that respects the environment and enhances responsible economic development.” It was also noted that the planning process should be a continuous one and that therefore strategies and ideas set out in the past should be revisited. This plan looked in more detail at regional commuting patterns using the 1990 census data and illustrated that the public transport share of the core work trip market had been relatively stable over the previous decade (at 31.9% in 1980, and 31.6% in 1990.) The development of suburban employment centers however was noted and particularly that of three communities — Waltham, Burlington, and Braintree. Projects were screened initially for consistency with regional and local transport goals, with ISTEA and the 1990 Clean Air Act amendments, and with the judgments of the working committee. Further evaluation was on the basis of ridership forecasts, cost effectiveness, financial viability, and air quality issues.

Travel in Eastern Massachusetts was divided into four categories: 1) Trips where the traveler has a choice between whether to use a car or public transport services, 2) those where a car is necessary for work (or other reasons), 3) those where a car is necessary since no public transport service is available, and 4) those where public transport must be used.

Various ways to improve existing services and to extend service to other areas were discussed in the report, with improved travel times as a central objective. The MBTA priorities for future service improvements and expansion were set out in the following order:

1. Preserve the existing system
2. Make the system accessible as required by the Americans with Disabilities Act
3. Expand and improve the system as required by the Clean Air Act Amendments
4. Expand and improve the system as required by the Central Artery/Third Harbour Tunnel mitigation measures
5. Additional expansion

Interest was also shown in “non-traditional” public transport modes — such as car and van pooling programs. It was noted that the traditional forms of public transport service are best suited to serve a dense central core, whereas the current development patterns are producing dispersed origin and destination patterns which make public transport service less competitive. Hence it was stressed that the public/private partnerships now being developed in the Boston area, such as Transportation Management Associations (TMAs) and the CARAVAN for Commuters Inc., might represent the way forward for increasing vehicle occupancy on the journey to work.⁹³

From the review of strategic planning in other agencies the most recent development in their visions has been the awareness of the importance of regional growth and the role which different growth patterns play in affecting the viability of public transport services. The 1974 Boston transit development program appears to have been an ambitious one for its era, in that it tackled goals which are still being brought on to the planning horizon for some other agencies today, and which are seen as the current issues in the 1990s. Even in 1966 the PMT acknowledged that peak hour work trips to concentrated employment centres were most easily fed by public transport. It is also interesting to note that despite this early recognition of the importance of regional development in planning for the viability of public transport services, the abandonment of a corridor based analysis in the later plans was a reflection of the changing patterns of development in the urban area

⁹³ It should be noted here however that, following the national trends, the use of car or van pools for the journey to work fell dramatically in the 1980s. Car pools carried 17% of workers living in the MBTA area in 1980 but only 10% in 1990.

(discussed in more detail later in this appendix). These new patterns have meant that despite increasing the number of passengers on the MBTA system, public transport mode share has fallen, both for the journey to work and for other trip purposes. One hypothesis could be that the earlier recognition of these complex linkages, between viability of high quality public transport services and urban form, was one of the factors behind the MBTA success in retaining a higher proportion of the work trips in its metropolitan area than did some other agencies in the last decade. (See Table C-2: Transit Mode Share for the journey to work in selected cities.) However these long range plans do not represent strategic planning processes. The plans were developed outside the MBTA itself, focused on capital investments, and did not produce quantified objectives or a detailed implementation strategy. Despite stating the view that the purpose of long range planning is to identify and recommend projects which are cost effective and will generate public transport passengers, the latest plans and particularly the development priorities therein, show the MBTA as a reactive agency, pushed by these outside forces.

The development of these long range plans also illustrates in a small way the history of significant citizen participation in the development of the Boston region and of its infrastructure. The most extensive and well documented example of this came in the mid 1960s with the revolt against the proposed inner belt highway, and the ensuing Boston Transport Planning Review (BTPR). The BTPR led to the termination of the plans for further inner city highway development and transferred investment to the public transport network. Relocation of the Orange Line and extension of the Red Line, two projects finished in the 1980s, were direct results of the BTPR discussions. Since the 1960s there has also been considerable renovation of the Commuter Rail network in the region, with the refurbishment of track and station still continuing. Each of the long range planning documents published since the 1960s has been drafted following significant citizen participation in the planning process. There have also been more recent examples of citizen participation in the transport planning process in the wider sense — in the Central Artery Business Committee, and the Charles River Crossing Committee for example. As the development decisions of the BTPR are now complete, the area has begun to look for a new consensus on realms of development importance, as was witnessed in the 1994 conference on The Livable Region.

Other current transport plans for/in the Boston area

Another long range planning initiative is the MAPC's Metroplan 2000. This was developed at the end of the 1980s, adopted in 1990, and includes some ambitious goals for increasing public

transport use. For example it calls for 5% increases in public transport ridership every year, 2000 additional car commuter rail parking spaces per year, and reductions in vehicle traffic by setting goals to cap total vehicle miles traveled. The plan is based on seven sub regions, which had provided the structural framework for development plans since 1983. Goals are established in nine different areas: Economic Development, Housing, the Environment, Cultural Resources, Energy, Infrastructure, Public Safety, Transportation, and Public Policy. Six policy areas were defined on the basis of existing infrastructure and development trends, and were related to the nine goals. Shown below (in Table C-2) are the objectives established for public transport services. (Separate objectives were established for the road network.) In order to achieve these objectives MAPC staff will work with community officials trying to assist them in establishing land use and development decisions which encourage development that is in concert with these transport goals.

Table C-2: Metroplan 2000: Planning Area Matrix

Planning Area	Transit Services
Urban Economic Core	All modes
Urban neighborhoods	All modes with high levels of service
Subregional growth centres	Local transit within growth centres Access to regional transit Fringe Parking
Fully suburbanized growth areas	Good access to core on fixed rail Associated fringe parking Bus access to subregional growth centres
Suburban/Rural areas	Bus access to subregional growth centres Some areas with commuter rail parking
Resource Protection Overlays	As for the policy area which it overlays

Internally the structure and organization of the budgetary and planning processes at the MBTA have also been changing recently. For example the program-based budgeting methods being introduced at present include the setting of objectives (or missions) for each department together with activity (and sub-activity) based costings. The 1995 mission statement for bus operations was, for example, "To provide reliable, clean, and comfortable bus service for 360,000 daily

passengers; to build a more productive and diverse workforce; and to incorporate new technologies into current practices to improve service and ensure compliance with regulations." This marks a change on which a strategic planning process could be built, since quantification of objectives is often a critical aspect of strategic planning. However the main body of the program was drawn together by an outside consultant. Establishing the process within the organization may prove more troublesome.

Population and Employment Trends in the Region

The development of the Boston region and particularly the new patterns of dense central areas with other dispersed centers of less concentrated employment and population, has been extensively discussed elsewhere.⁹⁴ The general pattern since the 1960s has been one of decentralization, reflecting national trends. The metropolitan region has grown such that MAPC now considers the "commuter shed" area for the Boston region employers to be all cities and towns within a 60 mile radius of the core.

Central Boston population peaked in 1960, as did the population of each of the other older cities in the region. Meanwhile regional growth has been concentrated in the suburbs, initially through population migration to the inner suburbs (growth concentrated largely within Route 128), followed by employment relocation at the edge of the metropolitan area. These growth patterns were facilitated by the early construction of some major highways (such as Route 128, I-495, and Route 93.) From the mid 1960s the inner suburbs lost population, whilst the outermost cities and towns grew. The trend was slightly reversed during the 1980s as the central cities began to experience small increases in population (even Boston) and at the same time those cities and towns at the edges of the urban area continued to experience growth. However of the 15 MBTA communities which had more than a 15% increase in the number of occupied housing units in the 1980s, only one (Natick) was not at the edge of the area. High residential costs are often shown to be one motivation for the dispersal of population, and it was certainly the case that residential costs in the inner suburbs were rising. MAPC analysis suggests that the housing price differential between the communities inside I-495, and those outside, was a decisive factor in the population changes of the 1980s. Population in the MAPC area itself peaked in 1970.

⁹⁴ See for example, Paul Schimek, Commuting Trends and Land Use in the Boston Metropolitan Area: Lessons from the 1980s, unpublished MIT term paper 1993 and Central Transportation Planning Staff (CTPS), Demographics of Commuting in Greater Boston, 1989

Employment patterns have also changed markedly since 1960, with growing numbers being employed outside the central core, and in the suburban, previously dormitory communities. In fact from 1960 until the late 1980s, 75% of the new jobs created in the MPO region were located in the suburbs. The 1980s saw strong job growth particularly along major highway corridors, such as Natick and Framingham in the Route 9 corridor, the southern edge of the Route 128 corridor, and in a northern triangle, bounded by Routes 128, I-93, and 3 north. As the MAPC report states "It is clear.... that access to a major highway is a virtual prerequisite for suburban job growth." Boston and Cambridge, the two central communities, also experienced high levels of job growth during the 1980s, though with growth rates less than half those of the region as a whole. Schimek estimated a density gradient using employment (by workplace) and population (by town of residence) for 164 towns in Eastern Massachusetts (an area extending approximately to the I-495 perimeter). This shows clearly that the importance of the central area as an explanatory variable, for job creation, was falling through the period (proximity to the core was also becoming less important as an explanatory variable), reinforcing the view that development was becoming more dispersed.

The different growth centres for employment and population meant that more communities were importing a larger percentage of their workforce by the end of this period than at the beginning. Communities around Route 128 were importing at least two thirds of their employees by 1980 for example. These changes have had substantial effects on levels of suburban trip making as well as on community development. The density of land use in these suburbs is generally below that which supports cost effective public transport services, whilst that in the urban core is able to support such services. However at the same time these suburban areas have developed to a level at which pressure on road infrastructure is causing congestion related delays. Commuting trips in the Boston region covered longer distances in 1990 than they did in 1980. (Schimek shows that the straight line average commute trip distance increased by 12% over the 1980s.) Travel times increased to a lesser degree suggesting that speed of travel was increasing. There was little highway construction in the decade and congestion levels at certain places (into and out of certain town centers and on some major routes for example) rose. Hence the explanation for the increased speed of travel might lie in two factors. Firstly the rerouting of trips to avoid the most heavily congested central areas, and secondly, an increase in the number of suburban commuting trips which are made for the most part at higher speeds, but with significant delays at discrete points. Unfortunately there are no consistent data series with which to make a full assessment of roadway congestion in this period.

Downs⁹⁵ has shown that throughout the United States the most intense public transport users are those who live in densely populated areas, live and work in a central city, and do not own a car. In Boston the radial structure of the public transport network means that the level of public transport use also depends on distance from the CBD and degree of residential density. Schimek has shown that, in the Boston region, the share of public transport use declines with increasing town median household income and distance from the CBD, and increases with residential density. The effect of income in this relationship was less significant in 1990 than it had been in 1980, though the importance of density of population was increasing. Hence if population density continues to decline and if employment trends away from the central area continue, public transport mode share is likely to decline further. There are however significant variations within these relationships, which lower the correlation between public transport use and the level of density or income. For example there were net losses in public transport commuting in Arlington and Cambridge over the 1980s, despite increases in Boston, Brookline, Malden, and Somerville.

Other trends in the Boston region in the last few years have included higher levels of female participation in the workforce and increases in the level of in-commuting to jobs in the region. Working women tend to make fewer public transport trips and to have higher levels of car ownership than others, and to make use of these cars for their journey to work. Most commuters from outside the region also use automobiles to get to work, in large part because of the dispersed nature of their origin-destination patterns. Car ownership levels have increased substantially, again following nationwide trends. The long run trend is an increasing proportion of households with more than one car. Detailed break downs of the trends in commuting behaviour and levels of car ownership in the MBTA region over the last decade are shown in tables C-3 and C-4 below.

⁹⁵ Anthony Downs, Stuck in Traffic - Coping with peak hour traffic, 1992

Table C-3: Census (Home Based) Journey to Work Data for MBTA Area 1980 and 1990											
	1980		1990		Change In PT Share		1980		1990		Change In PT Share
	Auto	PT	Auto	PT			Auto	PT	Auto	PT	
Arlington	72%	21%	77%	16%	-4%	Nahant	84%	8%	84%	10%	2%
Ashland	93%	2%	92%	3%	1%	Natick	87%	5%	87%	7%	2%
Bedford	89%	2%	89%	2%	0%	Needham	83%	9%	83%	10%	1%
Belmont	75%	17%	80%	13%	-4%	Newton	76%	13%	77%	12%	-1%
Beverly	84%	6%	87%	5%	-1%	Norfolk	88%	4%	87%	6%	2%
Boston	47%	34%	51%	32%	-2%	North Reading	93%	3%	93%	2%	0%
Braintree	85%	9%	88%	8%	-1%	Norwell	90%	5%	91%	3%	-2%
Brookline	54%	26%	54%	27%	1%	Norwood	84%	7%	84%	10%	2%
Burlington	93%	3%	94%	3%	0%	Peabody	93%	2%	94%	2%	-1%
Cambridge	41%	28%	45%	24%	-4%	Pembroke	93%	4%	93%	2%	-2%
Canton	85%	10%	87%	9%	-1%	Quincy	72%	21%	76%	18%	-3%
Chelsea	61%	24%	64%	23%	0%	Randolph	88%	6%	91%	6%	0%
Cohasset	82%	9%	80%	10%	2%	Reading	87%	6%	89%	5%	-1%
Concord	84%	5%	83%	6%	1%	Revere	72%	22%	73%	21%	-1%
Danvers	89%	2%	93%	2%	0%	Rockland	89%	2%	92%	3%	1%
Dedham	86%	8%	86%	8%	-1%	Salem	79%	6%	82%	8%	2%
Dover	86%	8%	84%	8%	0%	Saugus	87%	7%	90%	6%	-1%
Duxbury	86%	7%	88%	3%	-4%	Scituate	89%	5%	89%	5%	0%
Everett	69%	20%	76%	18%	-2%	Sharon	85%	9%	84%	10%	1%
Framingham	88%	3%	91%	3%	-1%	Sherborn	91%	3%	89%	5%	2%
Hamilton	86%	5%	88%	4%	-1%	Somerville	59%	28%	57%	27%	-1%
Hanover	89%	6%	93%	4%	-2%	Stonham	88%	4%	92%	5%	0%
Hingham	81%	11%	84%	9%	-2%	Sudbury	92%	3%	91%	2%	0%
Holbrook	88%	7%	88%	7%	0%	Swampscott	84%	9%	85%	9%	0%
Hull	87%	7%	85%	8%	0%	Topsfield	90%	2%	94%	2%	0%
Lexington	87%	6%	88%	5%	-1%	Wakefield	86%	6%	87%	7%	1%
Lincoln	81%	8%	84%	4%	-4%	Walpole	90%	6%	88%	7%	1%
Lynn	77%	11%	83%	9%	-2%	Waltham	81%	6%	82%	6%	0%
Lynnfield	93%	3%	93%	3%	0%	Watertown	73%	17%	77%	16%	-1%
Malden	72%	20%	69%	24%	4%	Wayland	93%	3%	89%	4%	1%
Manchester	79%	8%	81%	6%	-2%	Wellesley	71%	11%	74%	9%	-2%
Marblehead	81%	6%	82%	7%	0%	Wenham	75%	4%	75%	2%	-1%
Marshfield	91%	4%	93%	2%	-2%	Weston	80%	6%	79%	7%	0%
Medfield	89%	4%	88%	5%	1%	Westwood	87%	8%	87%	7%	0%
Medford	72%	20%	76%	17%	-3%	Weymouth	87%	8%	87%	7%	-1%
Melrose	78%	14%	79%	16%	2%	Wilmington	94%	2%	93%	3%	1%
Middleton	92%	1%	96%	1%	0%	Winchester	84%	8%	84%	9%	0%
Millis	93%	3%	92%	3%	-1%	Winthrop	67%	27%	68%	25%	-2%
Milton	78%	15%	83%	10%	-5%	Woburn	90%	5%	91%	4%	-1%

Population and Employment Predictions in the Region

MAPC has produced employment and population predictions for each of the communities within its area until 2010. The predictions⁹⁶ were formed on the basis of time series regression analysis combined with reasonable assumptions on levels of unemployment and household size, an assessment of vacant land available for development, other national, state, and local forecasts, and the analysis of the actions of local officials which might affect the likelihood of additional population or employment growth. Officials of each community were also asked to review and comment on the forecasts. The MAPC has published two different sets of these figures, the first in 1989 and the second after the 1990 census data became available. The trends in the first published figures (herein after referred to as the 1989 figures) are discussed in detail for the MBTA region below. Following this discussion the implications of the different, more recent, predictions are noted. At the regional level the differences are not substantial, though at the town level there are significant changes, including the possibility of lower employment levels in 2010 than in 1990. These differences reflect a change in methodology which gives more weight to the smaller communities and hence predicts a pattern of growth in the region with large growth at the outer edges and declines in the inner suburbs. Each set of MAPC predictions for the figures for the 78 cities and towns in the MBTA region is shown in tables C-5 and C-6 below.

The MAPC figures are produced as predictions, based on current trends and they are published in part to act as pressure for support of the Metroplan 2000 initiative, which seeks to concentrate development and to redress the jobs-housing imbalance. Hence the predictions do not present a picture of the outcome favoured by this body.

Population Trends — The 1989 figures suggest very little change in overall population levels in the MBTA area in the next few years (0.4% growth from 1995-2010, which is slightly smaller than the predicted rate of growth of population in the complete MAPC area of 1.2% for the same period.) Population will be stable in 20 of the 78 communities.

⁹⁶ A full explanation of the methodology used, and a comparison with other predictions made for the area, is given in Carnahan and Mohanty, A manual on regional and local demographic and economic analysis, MAPC 1990

Table C-5: MAFC Population Forecasts

	1995 Forecast			1989 Forecast			1995 Forecast			1989 Forecast		
	1990	2010	Abs #	1990	2010	Abs #	1990	2010	Abs #	1990	2010	Abs #
Arlington	44,630	36,795	(7,835)	45,000	44,740	(260)	3,828	3,487	(341)	3,940	3,790	(150)
Ashland	12,066	17,663	5,597	11,000	13,500	2,500	30,510	32,363	1,853	31,000	32,000	1,000
Bedford	12,996	15,561	2,565	13,020	13,040	20	27,557	25,535	(2,022)	27,900	27,900	0
Belmont	24,720	21,518	(3,202)	25,800	25,800	-	82,585	76,454	(6,131)	81,900	80,400	(1,500)
Beverly	38,195	37,689	(506)	37,850	38,000	150	9,270	15,338	6,068	8,350	8,700	350
Boston	574,283	570,443	(3,840)	572,000	578,000	6,000	12,002	12,640	638	12,100	12,550	450
Braintree	33,896	26,868	(6,968)	35,400	36,900	1,500	9,279	10,225	946	10,100	10,350	250
Brookline	54,718	52,377	(2,341)	54,700	55,200	500	28,700	24,696	(4,004)	29,700	29,700	0
Burlington	23,302	21,007	(2,295)	23,100	22,230	(870)	47,039	47,099	60	44,900	43,550	(1,350)
Cambridge	95,802	93,038	(2,764)	91,800	90,200	(1,600)	14,544	17,245	2,701	15,100	15,800	700
Canton	18,530	18,647	117	18,200	18,200	-	84,985	82,560	(2,425)	86,500	92,500	6,000
Chelsea	28,710	32,526	3,816	25,500	25,300	(200)	30,093	31,842	1,749	28,600	28,600	0
Concord	7,075	6,506	(569)	7,250	7,250	-	22,539	25,214	2,675	22,980	22,330	(650)
Concord	17,076	18,187	1,111	16,500	16,500	-	42,786	41,888	(898)	43,800	46,000	2,200
Danvers	24,174	23,386	(788)	24,410	23,690	(720)	16,123	19,715	3,592	15,700	15,700	0
Deerham	23,782	20,246	(3,536)	24,300	24,300	-	38,091	36,426	(1,665)	39,000	41,250	2,250
Dover	4,915	5,158	243	4,700	4,700	0	25,549	26,069	520	25,150	24,480	(670)
Duxbury	13,895	17,899	4,004	13,500	14,300	800	16,786	18,821	2,035	17,200	17,200	0
Everett	35,701	31,704	(3,997)	35,990	33,900	(2,090)	15,517	18,738	3,221	14,800	15,800	1,000
Frammingham	64,989	62,246	(2,743)	64,900	64,700	(200)	3,989	4,716	727	4,500	5,000	500
Hamilton	7,280	8,210	930	7,300	7,650	350	76,210	71,317	(4,893)	72,000	72,800	800
Hanover	11,912	13,231	1,319	12,500	13,200	700	22,203	22,741	538	22,000	22,200	200
Hingham	19,821	21,703	1,882	21,500	22,300	800	14,358	16,197	1,839	14,000	14,000	0
Holbrook	11,041	10,420	(621)	10,880	10,880	-	13,650	12,858	(792)	13,610	13,700	90
Hull	10,466	11,323	857	10,000	10,400	400	5,754	6,222	468	5,850	6,100	250
Leighton	28,974	26,804	(2,170)	29,500	29,500	-	24,825	23,181	(1,644)	24,510	23,300	(1,210)
Lincoln	7,666	8,632	966	7,300	7,500	200	20,212	22,010	1,798	20,500	21,700	1,200
Lynn	81,245	82,822	1,577	79,700	75,170	(4,530)	57,878	55,165	(2,713)	58,200	58,200	0
Lynnfield	11,274	10,725	(549)	11,170	10,570	(600)	33,284	30,197	(3,087)	32,450	31,900	(550)
Malden	53,884	52,777	(1,107)	54,250	52,300	(1,950)	11,874	10,401	(1,473)	12,200	12,200	0
Marblehead	5,286	4,855	(431)	5,480	5,440	(40)	26,615	23,961	(2,654)	27,200	27,200	0
Marshfield	19,971	19,000	(971)	19,970	18,680	(1,290)	4,212	4,508	296	3,870	4,250	380
Marshfield	21,531	26,399	4,868	22,800	24,400	1,600	10,200	11,168	968	10,800	10,800	0
Medford	10,531	12,388	1,857	11,200	11,800	600	12,557	10,372	(2,185)	13,200	13,200	0
Medford	57,407	54,265	(3,142)	56,400	55,400	(1,000)	54,063	47,241	(6,822)	56,900	56,900	0
Melrose	28,150	23,749	(4,401)	28,650	26,670	(1,980)	17,651	21,206	3,555	17,900	18,900	1,000
Middleton	4,921	6,392	1,471	4,800	5,700	900	20,267	18,332	(1,935)	20,720	20,250	(490)
Mills	7,613	8,886	1,273	7,010	8,230	1,220	18,127	15,507	(2,620)	18,380	17,600	(780)
Total MBTA	2,558,080	2,525,700	(32,380)	2,553,340	2,565,020	11,680	2,922,934	2,935,336	12,402	2,917,000	2,953,230	36,230
			-1.3%			0.5%			0.4%			1.2%

All of the 16 communities⁹⁷ which will lose more than 2% of their population in this period, are in the north/north eastern quadrant of the MBTA region, just outside the inner core. By contrast the 13 communities with growth of over 5% are all, bar Quincy and Revere, at the edge of the area, which seems to tally with the importance of house prices (which are lower towards the edge of the area) and the emerging resistance of communities within Route 128 to further growth. Much of the affordable housing construction will take place in the urban core and the three communities of Boston, Quincy, and Revere are expected to have the largest absolute increases in population.

Increases are expected amongst the youngest and oldest groups in society (0-14 years and over 75), whereas reductions are expected in the age brackets of 15 to 34 and 54 to 75. The largest fall is expected in the 25 to 34 year old age group. Median household income is expected to increase slightly (by approximately 1.3% per annum.)

The initial MAPC figures projected a continuation of the long established trend of new population growth in less densely settled areas at the edge of the MAPC region, with fewer people making up each household, but, at the same time rates of suburbanisation will decrease. This results from what will be a slower rate of new household formation, since housing costs will remain high, and the very small changes in total area population levels.

The newer figures however suggest rather a different scenario. In these figures almost half of the communities are predicted to lose more than 2% of their population by 2010. Though the same pattern for the north and north eastern communities exists, there are a number of other areas of substantial population loss. One swathe just inside the southern part of Route 128 (Cohasset, Weymouth, Braintree, Quincy, Holbrook, Milton, Dedham, Westwood, Norwood, Needham, Wellesley, Weyland, Weston, and Framingham) is also expected to experience significant population losses. In fact the largest fall predicted (over 20%) is in Braintree. In addition the central communities (bar Boston and Chelsea) also experience population losses. The communities which achieve growth of over 5% (bar Chelsea) are again situated at the edge of the area. Changes in particular cohorts are similar to those in the 1989 data, though the greatest increases are expected in the 5-19 and 45-65 cohorts.

⁹⁷ Predictions suggest that Everett, Lynn, Lynnfield, Marblehead, and Melrose will lose more than 5 % of their population in this period, whilst the populations of Burlington, Danvers, Malden, Nahant, Peabody, Reading, Saugus, Wakefield, Winchester, Winthrop, and Woburn will fall by between 2 and 5%.

Employment Trends — The MAPC figures suggest that employment in the region will increase by only 7.5% from 1990 to 2010. (This is slightly lower than the MAPC areawide predicted increase of 8.4%, again suggesting that employment growth will be greater at the edge of the MBTA area.) The largest absolute increases will be in Boston, Cambridge, and Framingham which between them account for nearly 40% of the new jobs in the MBTA area. Communities with high rates of growth — there are nine communities with growth rates over 15% — tend to be on the outer edges of the area, whilst those with low growth rates — there are another nine communities with growth rates under 4% — are more scattered, though most are centrally placed. There are no predictions of reductions in employment in this period.

The MAPC predictions also suggest that the predominant sources of new workers from 1987-2010 will be non residents and increased female participation in the labour force. These two factors between them will account for over 60% of the growth, with the residual being provided by growth in the 16-65 year old population, an increase in the male participation rates, and a fall in unemployment levels. Many new commercial developments are planned for I-495 and at the outer edges of the MAPC region, which will allow easy access to these employment opportunities for those living outside the region.

Service and high technology industries are likely to dominate the job creation whilst the manufacturing share of employment will continue to fall. These trends will create "a difficult challenge for high school drop outs and black and hispanic workers who are underrepresented in the fastest growing occupations and over represented in the declining occupations."⁹⁸

⁹⁸ Massachusetts Department of Employment and Training, Employment 2000: Massachusetts Employment Projections by Occupation, 1991

Table C-6: MAFC Employment Forecasts

	1995 Forecast				1989 Forecast				1995 Forecast				1989 Forecast			
	1990		2010		1990		2010		1990		2010		1990		2010	
	Abs #	%	Abs #	%	Abs #	%	Abs #	%	Abs #	%	Abs #	%	Abs #	%	Abs #	%
Attlington	9,300	12.9%	10,500	12.9%	9,400	7.4%	10,100	7.4%	500	20.0%	600	20.0%	530	5.0%	550	3.8%
Athland	4,100	29.3%	5,300	29.3%	4,710	12.5%	5,300	12.5%	18,700	16.0%	21,700	16.0%	21,850	22.400	22,400	5.0%
Bedford	24,900	26.5%	31,500	26.5%	27,290	5.0%	28,650	5.0%	18,600	16.7%	21,700	16.7%	21,840	23,340	1,500	6.9%
Barnet	7,000	8.6%	7,600	8.6%	7,500	2.7%	7,700	2.7%	45,300	14.3%	51,800	14.3%	53,970	57,420	3,450	6.4%
Beverly	15,600	28.2%	20,000	28.2%	15,440	7.1%	16,540	7.1%	2,400	45.8%	3,500	45.8%	2,350	2,650	300	12.8%
Boston	543,400	10.4%	599,900	10.4%	587,535	5.7%	620,780	5.7%	3,500	1.40%	4,900	1.40%	4,270	5,070	800	18.7%
Brantree	29,900	25.4%	37,500	25.4%	35,300	11.6%	39,400	11.6%	5,600	6.60%	6,600	17.9%	4,600	5,200	600	13.0%
Brookline	18,300	3.8%	19,000	3.8%	18,800	0.9%	18,970	0.9%	23,200	5.2%	24,400	5.2%	26,000	27,465	1,465	5.6%
Burlington	33,500	6.40%	39,900	6.40%	40,800	6.6%	43,500	6.6%	21,900	33.3%	36,500	66.7%	24,350	26,750	2,400	9.9%
Cambridge	104,400	10.5%	115,400	10.5%	105,800	6.4%	112,600	6.4%	3,900	1.30%	5,200	33.3%	3,850	4,250	400	10.4%
Concord	19,300	46.1%	28,200	46.1%	19,800	10.1%	21,800	10.1%	40,400	20.4%	47,000	20.4%	44,500	48,150	3,650	8.2%
Chelsea	9,800	-9.2%	8,900	-9.2%	10,220	11.5%	11,395	11.5%	9,800	2.00%	11,800	2.00%	10,300	11,570	1,270	12.3%
Chelmsot	2,000	3.00%	2,300	3.00%	2,275	2.05%	2,480	2.05%	8,300	27.9%	9,300	27.9%	6,500	6,690	390	6.2%
Concord	11,800	30.5%	15,400	30.5%	13,100	5.3%	13,600	5.3%	6,100	1.70%	7,800	1.70%	8,510	9,040	530	6.2%
Danvers	22,500	33.8%	30,100	33.8%	23,560	5.3%	24,810	5.3%	6,700	34.3%	9,000	34.3%	6,900	8,770	1,870	27.1%
Deerham	14,200	31.0%	18,600	31.0%	14,530	7.6%	15,630	7.6%	20,400	0.0%	20,400	0.0%	20,600	21,450	850	4.1%
Dover	600	33.3%	800	33.3%	700	8.6%	760	8.6%	10,000	29.0%	12,900	29.0%	10,700	11,900	1,200	11.2%
Duxbury	2,300	21.7%	2,800	21.7%	2,300	8.7%	2,500	8.7%	2,900	17.2%	3,600	17.2%	3,350	3,670	320	9.6%
Everett	12,200	8.2%	13,200	8.2%	14,060	7.4%	15,100	7.4%	2,900	3.40%	3,400	3.40%	3,290	3,590	300	9.1%
Frammingham	39,500	16.5%	46,000	16.5%	53,700	12.3%	60,320	12.3%	600	50.0%	900	50.0%	510	540	30	5.9%
Hamilton	1,300	30.8%	1,700	30.8%	1,820	8.8%	1,980	8.8%	20,400	17.6%	24,000	17.6%	21,990	23,460	1,470	6.7%
Hanover	6,600	30.3%	8,600	30.3%	7,080	8.8%	7,700	8.8%	8,200	9.8%	9,000	9.8%	7,750	8,050	300	3.9%
Hingham	9,800	17.3%	11,500	17.3%	11,520	19.9%	13,815	19.9%	9,800	18.4%	11,600	18.4%	10,500	12,000	1,500	14.3%
Hollbrook	3,100	6.5%	3,300	6.5%	2,630	6.5%	2,800	6.5%	2,800	0.0%	2,800	0.0%	3,020	3,140	120	4.0%
Hull	1,100	9.1%	1,200	9.1%	1,290	6.2%	1,370	6.2%	1,800	16.7%	2,100	16.7%	1,750	1,900	150	8.6%
Leatington	18,700	1.6%	19,000	1.6%	20,730	9.1%	22,615	9.1%	11,000	39.1%	15,300	39.1%	13,940	15,630	1,690	12.1%
Lincoln	1,700	17.6%	2,000	17.6%	1,850	13.5%	2,100	13.5%	7,700	27.3%	9,800	27.3%	8,660	10,460	1,800	20.8%
Lynn	30,000	-13.3%	26,000	-13.3%	35,200	4.0%	36,610	4.0%	63,800	5.0%	67,000	5.0%	20,010	21,410	1,400	7.0%
Lynnfield	3,400	5.9%	3,600	5.9%	3,190	5.6%	3,370	5.6%	17,400	19.0%	19,000	19.0%	16,600	17,020	2,120	3.1%
Malden	19,300	11.4%	21,500	11.4%	24,010	4.5%	25,100	4.5%	3,300	4.00%	4,000	4.00%	3,250	3,550	300	9.2%
Manchester	1,300	30.8%	1,700	30.8%	1,400	6.4%	1,490	6.4%	18,400	9.2%	20,100	9.2%	18,370	19,940	1,570	8.5%
Marblehead	4,500	13.3%	5,100	13.3%	4,850	1.0%	4,900	1.0%	700	28.6%	900	28.6%	590	640	50	8.5%
Marshfield	4,200	28.6%	5,400	28.6%	4,500	14.4%	5,150	14.4%	3,000	3.3%	3,100	3.3%	3,900	5,180	1,280	32.8%
Medford	3,500	22.9%	4,300	22.9%	3,970	7.6%	4,270	7.6%	9,300	33.3%	12,400	33.3%	9,490	10,790	1,300	13.7%
Medford	19,700	24.4%	24,500	24.4%	20,600	15.8%	23,850	15.8%	14,800	10.8%	16,400	10.8%	15,940	18,690	2,750	17.3%
Melrose	6,100	9.8%	6,700	9.8%	6,640	6.9%	7,100	6.9%	20,000	30.0%	26,000	30.0%	25,100	29,850	4,750	18.9%
Middleton	2,500	24.0%	3,100	24.0%	2,600	23.1%	3,200	23.1%	6,800	5.9%	7,200	5.9%	6,700	7,000	300	4.5%
Millis	2,100	14.3%	2,400	14.3%	2,050	9.8%	2,250	9.8%	3,000	20.0%	3,600	20.0%	3,020	3,080	60	2.0%
Million	5,200	9.6%	5,700	9.6%	5,390	13.5%	6,120	13.5%	36,000	43.6%	51,700	43.6%	38,020	42,500	4,480	11.8%
Total	1,578,600	15.2%	1,819,200	15.2%	1,727,310	7.5%	1,856,180	7.5%	1,715,630	17.7%	2,019,640	17.7%	1,874,220	2,032,500	158,280	8.4%

Gomez-Ibanez has used the results of his time series models to project ridership and deficits for the MBTA to 2010 under a variety of policy scenarios.⁹⁹ Clearly using these models to project into the future assumes similar underlying relationships in the transport environment as those which existed in the earlier period, which suggests that the inferences made from the models should be treated with caution. The scenarios tested do however show that:

1. Were the MBTA to maintain real fares, vehicle miles and real unit costs at 1990 levels then the deficit would grow with the inflation rate, but ridership would fall (by about 17%.)
2. Were the MBTA to continue 1970-90 policies of reductions in real fares, expansion of service, and increasing real costs, then ridership would grow by 8%, but the deficit would increase by 68% in real terms.

The models are used in a similar fashion to suggest that fare reductions are a less costly method of retaining ridership than service expansions, and that if costs were to grow at 1970-80 rates (between 1980 and 1990 costs were lowered) then the deficit would grow to almost \$400 million by 2010. If the MBTA could reduce costs per vehicle mile by 20% (to bring its costs in line with those of other large public transport operators) then the deficit would be \$200 million less than if costs grew at the average 1970-1990 rate and \$600 million less than if they grew at the 1970-1980 rate. The models are also used to assess the impact of congestion toll charges for the use of urban roads.

⁹⁹ These projections assume inflation at 4% per annum from 1990 to 2010 (lower than the average for the 1970-1990 period), real per capita income growth of 1.89% per annum, and Boston employment growth of 0.39% per year. These last two assumptions are the average values experienced in the region from 1970 to 1990.

Appendix D: The transport system and development patterns of San Juan, Puerto Rico

San Juan is the capital city of Puerto Rico, a Caribbean island, where Spanish is spoken as the first language, though its status as a commonwealth of the United States means that institutional ties are with the English speaking North American continent. The city dominates the island with 1.3 of the 3.6 million inhabitants in 1990 living in the metropolitan region, which (as of 1990) consists of 13 municipalities¹⁰⁰ (shown on Map 3) and covers 11% of the land area of the island. This gives it one of the highest population density levels of all United States' cities, though at the same time the recent history of the metropolitan area has been characterized as one of "suburban growth."¹⁰¹

The transport system of San Juan — There is very little public transport on the island as a whole. The only publicly operated system is San Juan's bus system (AMA). The público network is however the dominant provider of public transport. Car ownership in San Juan (and the rest of the island) has been growing fast, to a level of 0.405 cars per person in 1990 from 0.141 in 1964.

The commonwealth government, through its different executive arms, controls the provision of all forms of transport on the island. A rail line (Tren Urbano) is being planned for San Juan through the Highway and Transportation Authority (ACT). The general manager of AMA reports to the Secretary of the Department of Transportation and Public Works (DTOP) as do the managers of the Port Authority (which operates the acua-expreso services) and the ACT. The carro público system is overseen by the Public Service Commission (PSC). The commonwealth is presently working on the basis of the 1993 long term transportation plan for the San Juan Metropolitan Region. This plan was intended to guide the actions of both the private and the public sector in their transport related actions. The Plan recommends major transportation investments in Tren Urbano, in an expanded Metrobús, local bus, and público system, in actions to increase the highway system capacity by 25%, and in new regional parking policies to relieve shortages and improve traffic flow. Attempts to alleviate the road congestion are those which are most central to the development of the plan. This focus resulted from analysis which shows that grid-lock

¹⁰⁰ Bayamón, Canovanas, Carolina, Cataño, Dorado, Guaynabo, Loíza, Naranjito, Río Grande, San Juan, Toa Alta, Toa Baja, and Trujillo Alto. Naranjito was first included following the 1990 census.

¹⁰¹ Aníbal Sepúlveda, Río Piedras: a Town in Convalescence -- The Tren Urbano as an Urban Generator, unpublished paper presented to the MIT and UPR conference on Tren Urbano, January 1995

congestion is experienced on the streets of San Juan for many hours of the day, with 25% of the total route miles in the area considered to be congested in 1990.¹⁰²

Table D-1 provides data on the change in mode shares for the journey to work in each municipality from 1980 to 1990. The data is taken from the US census figures. The journey to work represents a less important market for públicos than off peak ridership, though the declining use of públicos for work trips reflects its decreased use overall. What stands out here is that in those areas where private transportation had been used by fewer members of the population in 1980, for example in Loíza, there was a dramatic shift over the decade. Overall the variation (across communities) in the proportion of residents using cars to travel to work was much reduced by 1990 and the average was higher (83% in 1990 up from 72% in 1980.) At the same time the mode share for públicos fell considerably. In fact it appears from these figures that much of the private mode share gain was achieved at the expense of the públicos.

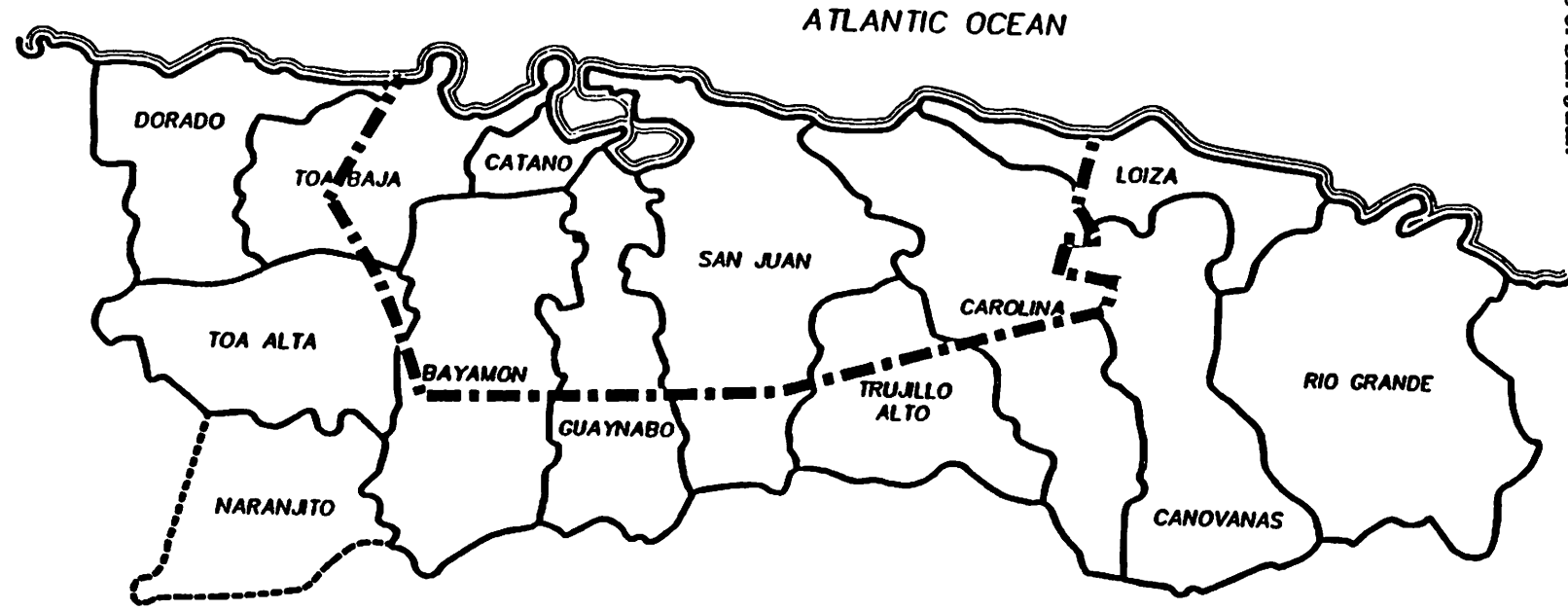
Overall San Juan residents are estimated to have made 3,200,000 trips per day in 1990. Público ridership was estimated at 166,260, AMA ridership at 78,240, and Metrobús at 23,000, whilst private car trips accounted for 2,950,030 of the total trips.

Table D-1: Mode share for the Journey to Work — home based census data

	1980				1990				% increase PT modeshare 80-90
	Private	Total PT	Bus	Publico	Private	Total PT	Bus	Publico	
Bayamon	77%	15%	3%	12%	85%	10%	4%	6%	-5%
Canovanas	68%	21%	1%	19%	77%	12%	2%	10%	-8%
Carolina	78%	15%	5%	9%	84%	10%	6%	4%	-4%
Catano	61%	27%	7%	19%	80%	14%	6%	6%	-14%
Dorado	66%	21%	1%	20%	85%	7%	1%	6%	-13%
Guaynabo	79%	10%	3%	6%	89%	6%	3%	3%	-4%
Loíza	47%	35%	1%	34%	71%	18%	4%	14%	-17%
Río Grande	64%	23%	1%	21%	80%	13%	2%	11%	-10%
San Juan	69%	18%	13%	4%	76%	15%	11%	3%	-3%
Toa Alta	71%	19%	1%	17%	72%	10%	1%	9%	-8%
Toa Baja	73%	18%	4%	14%	83%	11%	3%	7%	-8%
Trujillo Alto	76%	16%	3%	13%	85%	10%	4%	6%	-7%
Total	72%	17%	7%	10%	83%	12%	7%	5%	-5%

¹⁰² Barton-Aschmann Associates, Inc., San Juan Regional Transportation Plan, March 1993

Map 3: The Municipalities of San Juan



----- 1967 Boundary

The público system is the dominant form of public transport throughout the island.¹⁰³ These are shared ride, privately owned and operated services, run on fixed routes either within or between cities, using vans (or in a few cases cars or minibuses). Público operations resemble a hub and spoke network, with the terminals acting as hubs and allowing economies of scale (from the operation of larger vehicles) and economies of density (with higher frequency services on a particular route through the route associations) and economies of scope (by concentrating the joint costs of service e.g., the dispatcher, at terminals.)

There are some 3022 vehicles licensed to operate on 124 routes. However on any given weekday it seems that only 1515 operate.¹⁰⁴ The system (operators, routes, fares, and vehicles) is regulated by the PSC, which also administers the system for hearing complaints. The operators receive no subsidy but some relief on license, import tax exemption on the vehicles, and the use of layover facilities and terminals. The terminals are constructed for público use by some municipal governments (often with federal assistance). The Commercial Development Company (another Government office) does provide the público operators some access to lower interest loans with which to purchase new vehicles. These loans do not approach the full cost of a new vehicle however. Operators have the right to sell or transfer their vehicle with the license plates and permits intact. Similarly they may replace the vehicle without replacing plates. Generally service is only provided from Monday to Saturday and from 6am to 6pm, though this is not regulated.

Público operators on some routes have joined together in associations and some of these have formed co-operatives. The associations are relatively formal and are often registered as unions. They charge entry fees, in order to provide some insurance for members. The cooperatives tend to be more formal, with members pooling resources to create operator benefits programs, and to pay wages to night shift drivers. Often they also operate revenue producing businesses such as gas and maintenance facilities and benefits programmes. The cooperatives aim to improve the service provided on the routes, for example, by operating "trailer" vehicles running behind a heavily loaded vehicle in the peak period. In addition drivers on a particular route often segment it between

¹⁰³ Much of what is known about the details of the operation and management of públicos comes from the work of Felipe Luyanda, Professor of Civil Engineering, UPR at Mayaguez. See for example, Felipe Luyanda and Poduru Gandhi, Characterization of the "Público" system of Puerto Rico, TRR 1212.

¹⁰⁴ These are 1991 figures. Barton-Aschmann Associates Inc., Integration of San Juan Metropolitan Region Público and Private Bus Routes into the Metrobús Transportation System, 1992

themselves, or operate on a shift system to better match supply and demand. These associations and cooperatives may also organize the dispatch system at terminals. The associations are also grouped into federations, which are principally lobbying organizations, and have been described as antagonistic to “any attempt to change their mode of operations or to introduce new operations or administrative concepts.”¹⁰⁵

The San Juan público service is dominated by those routes from Bayamón and Río Piedras, with 464 and 342 vehicles registered for local service in each. This contrasts with a maximum of 97 such registrations in any other municipality (Carolina.) These municipalities are also those where the routes with the highest cost recovery ratios and highest number of passengers per vehicle trip operate. Law 5, May 11, 1959 created AMA and established the current relationship between the público system and the bus network. The act also curtailed público service since expansion requires review and permission from AMA. The resulting network is one with bus service dominating in the central city, the two systems operating together in the inner suburbs, and públicos offering the only service in the outer suburbs.

Since 1994 público ridership figures have been included in the Section 15 report made by the Puerto Rican DTOP. This was accepted by the Federal Transit Administration when it was argued that público services were “purchased transportation” with the investments in infrastructure being considered as the “price paid” for the services provided by the público drivers. The result of this is that the region receives higher levels of Section 9 federal operating funding — through the formula allocation process.

Bus services are provided by the public sector for the most part, though Metrobús has been operating, with 25 buses, under contract to ACT since 1991. There are also a few private bus lines carrying passengers into the city from more suburban areas. AMA’s current service includes 43 routes, primarily in San Juan, Carolina, and Guaynabo. The peak vehicle requirement is 155 buses.

¹⁰⁵ DTOP, Público Car Policy Analysis, Final Report, 1985

AMA services have been of very poor quality in the last few decades with low reliability, slow speeds, high costs, and few passengers.¹⁰⁶ In 1994, a new action plan for the improvement of AMA services was proposed and accepted.¹⁰⁷ The objectives of this plan were to:

- provide AMA a reasonable opportunity to improve its performance and become the reliable carrier that the community expects it to be
- improve the area's transit service, regardless of how AMA performs in the next three years

The key features (many with quantifiable targets) of the plan are:

- Provision of specified service levels by DTOP.
- Setting of performance standards, particularly for vehicle appearance, miles between roadcalls, percent of scheduled revenue miles provided, and on-time performance
- Performance monitoring by DTOP staff
- Introduction of a Strategic Improvement Program, to address AMA's key strengths and weaknesses in the functional areas of planning and scheduling, transportation, vehicle and facility maintenance, human resources/labour relations, finance, marketing, paratransit, and management information systems.

This therefore represents a significant attempt to analyze the internal environment and to create a new situation more favourable to efficient operation. Additionally the plan highlighted the need to transform labour/management relationships.

There are also some ferry routes operated by the Port Authority. Currently only one of the three routes which would form a triangle across the harbour is in operation. The other routes will be reinstated once the Martin Pena canal to Hato Rey has been dredged.

The planning for Tren Urbano is well underway, with the first construction work due to begin in 1996. The first phase is for 19 miles of mostly at grade and elevated track, and 16 stations in the three municipalities of San Juan, Guaynabo, and Bayamón. The project has been proposed in

¹⁰⁶ Multisystems Inc., AMA Performance Review and Strategic Improvement Plan, January 1994

¹⁰⁷ *ibid.*

different forms, though focused on these central municipalities, since the 1960s. The six goals, and the associated objectives, of the project are:

1. To improve the levels of transportation mobility within the San Juan region by:
 - reducing travel time for public transport patrons
 - connecting key institutions, job centres, and residential populations
 - improving service to the disabled and other transit dependents
 - lowering the financial burden of car ownership on low income households
2. To provide for a major expansion in public transport service capacity:
 - to accommodate existing demand
 - to accommodate 2010 passenger volumes, and
 - with the flexibility to allow expansion to other corridors
3. To improve public transport service efficiency, convenience, and reliability by:
 - increasing public transport service frequency
 - improving speed and schedule reliability of public transport services
 - promoting integration of all public transport service and improving intermodal transfers
4. To minimize impacts on the Commonwealth's natural environment by:
 - maintaining regional air quality, through a reduction in vehicle miles traveled
 - minimizing the need for highway construction and associated environmental and community disruption
5. To support economic growth in the San Juan Metropolitan Area by:
 - stimulating job growth through project operation and construction
6. To design, construct, and operate the system in the most efficient and effective manner with
 - an accelerated construction and opening schedule
 - lower project costs
 - opportunities for local architectural, engineering, and construction firms, and
 - bringing public transport expertise to Puerto Rico through technology transfer.

These goals and objectives were used in the development, screening, and evaluation of alternatives in the DEIS. The goals were not quantified, in the sense of setting absolute targets. However the relative merits of different options in these areas were compared.

Throughout the DEIS however it is the stress on service integration which comes through the most strongly. A determination to increase citizen participation in the project is also clear. The goal is to increase participation to a level above that which has been achieved in any large project on the island in the past. There is no history of strong public participation in Puerto Rico generally.

The planning system — From 1942 until 1990 Puerto Rico had a centralized comprehensive planning process, which sought to maintain regulatory and budgetary controls in the center. Some of the motivation for this centralization was the desire to exploit any possible economies of scale. However it was also a sector-based planning environment, in which transport and urban planning were considered independently. In the transport field, priority was given to mobility and accommodating present development trends. In the urban and economic development field the priority was for industrialization and “economic growth”, and to that end tax incentives were provided for investors. The trend towards suburbanization was spurred by the availability of federal funding for infrastructure, low interest financing deals for mortgages, new international views of city planning practice, and vacant cheap land following the agricultural collapse. The island wide Planning Board was established in 1942, and oversaw the land use plans of all municipalities.

In 1991 however urban planning was decentralized. Municipalities were given the legislative right to take control of their zoning codes and development approval process. At the same time the zoning legislation was updated. New provisions included allowances for 10% of land in any new development to be returned to the government for public facilities, provisions for the transfer of development rights (in particular to allow protection of areas of particular historical significance), and authorization of specific impact fees and linkages. However there is no explicit development of incentive based zoning techniques, no preferred growth pattern for San Juan or the island was registered, and each municipality was given the power to regulate its own development independently. One incentive for this change was to include some greater degree of community participation in the planning process, with five public hearings being required before any development decisions. Offices are also to be established in each community to provide residents with information. Thus far only one municipality within the San Juan metropolitan region controls its own planning process (Bayamón) and this was the case before the new legislation was passed.¹⁰⁸ Other municipalities continue to make use of the old regulations and zoning plans. The designated focus for the Metropolitan Transportation Planning Organization (MPO) is the DTOP, and hence the ISTEA funds are allocated according to central government plans.

¹⁰⁸ In fact only two communities on the island control their own development law -- Ponce and Bayamón. Neither was granted these powers as a result of the 1991 legislation. Though a number of communities have sought new powers under the act, these have yet to be granted by the Planning Board.

Socio-Economic Development of San Juan — Despite the emphasis on investment and economic development since the second world war, average living conditions in Puerto Rico are still below those of the US as a whole. In fact GDP per capita was approximately 28% of that of the United States in 1992.¹⁰⁹ Employment in the San Juan metropolitan area is still concentrated in the municipality of San Juan itself (over 60% of employment), though the recent trends have seen increasing employment in the suburban communities. The predictions are that these trends will continue, with the central areas diminishing in importance. The Metropolitan area as a whole will however continue to grow in importance as the major employment centre on the island. This is particularly important since the overall unemployment level is also high.

Table D-2: Employment by Municipio

Municipio	1990	2010	Increase
Bayamon	46,931	55,188	18%
Canovanas/Loiza	9,092	13,977	54%
Carolina	34,710	42,818	23%
Catano	7,072	10,445	48%
Dorado	6,341	16,819	165%
Guaynabo	26,068	35,417	36%
Rio Grande	3,784	7,753	105%
San Juan	256,617	282,187	10%
Toa Alta	2,702	3,553	31%
Toa Baja	9,619	11,938	24%
Trujillo Alto	6,587	7,885	20%
Naranjito	2,939	4,569	55%
Total	412,462	492,549	19%

Population trends also indicate growth, particularly at the outer edges of the metropolitan area. The paving of roads and new techniques for land clearance have made this possible. In fact, as can be seen from the table below (Table D-3), population more than doubled in two municipalities (Río Grande and Toa Alta) between 1970 and 1990. It is expected that these communities will experience continued population growth in the next twenty years, though at a slower rate. The downward trend in population in San Juan is expected to be reversed in this period, though the increase will still be less than the average for the region as a whole and the importance of San Juan population in the metropolitan area will continue to decline (33% to 31% from 1990 to 2010).

¹⁰⁹ World Bank Development Report, *Infrastructure for Development*, 1994

These figures of course rely on the presumption that the boundaries of the metropolitan area will not be increased further (following the 1990 census the metropolitan area was expanded to include Naranjito).

Table D-3: Population by Municipio

Municipio	1970	1990	2010 Prediction	% change 1970-1990	% change 1990-2010
Bayamon	156,192	217,879	247,000	39%	13%
Canovanas/Loiza	39,062	66,123	87,000	69%	32%
Carolina	107,643	177,806	201,000	65%	13%
Catano	26,459	34,587	48,000	31%	39%
Dorado	17,388	30,759	44,000	77%	43%
Guaynabo	67,042	92,886	128,000	39%	38%
Rio Grande	22,032	45,648	72,000	107%	58%
San Juan	463,242	435,639	488,000	-6%	12%
Toa Alta	18,964	44,101	63,000	133%	43%
Toa Baja	46,384	89,454	98,000	93%	10%
Trujillo Alto	30,669	61,120	74,000	99%	21%
Naranjito	19,913	27,914	43,385	40%	55%
Total	1,014,990	1,323,916	1,593,385	30%	20%

This data is taken from the Regional Transportation Plan — Naranjito addition 1994.

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