Initiating the Strategic Planning Process at NJ Transit

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The adoption of a strategic planning process is becoming more important to public transportation agencies as the industry faces declining subsidies and increased competition from other carriers as a result of deregulation. Valuable as strategic planning may be, processes and structures developed by and for the private sector are unsatisfactory for the public transit industry. During the past year and a half, New Jersey Transit Corporation (NJ Transit) has been adapting these processes and structures for its own strategic planning efforts. In this paper is described NJ Transit's strategic planning process, which involves critically assessing NJ Transit's opportunities and threats in a market and its performance relative to competitors. These assessments are used to position NJ Transit's services in a matrix that recommends strategic roles and actions. Strategies and resource allocation decisions are then based on the location of services in the matrix.

American corporations were introduced to formal strategic planning in the mid-1950s. Since that time, strategic planning has become so widespread that managers of most large corporations around the world practice it in some form. According to a recent survey, strategic planning ranked as the most important responsibility of 62 percent of the chief executives of the 550 largest industrial, banking, diversified financial, life insurance, retailing, transportation, and utility companies identified by *Fortune* (*1*, p. 36). Strategic planning, the systematic identification of future opportunities and threats and attendant strategies, appears firmly entrenched in business management.

In contrast, only a few state and local transportation agencies use strategic planning systems to help allocate resources among their different services. The Pennsylvania Department of Transportation, for example, has restructured its operation using strategic planning to initiate productive activities. The Port Authority of New York and New Jersey is using strategic planning to reconceptualize and manage its transportation businesses so that they support economic development objectives in the New York metropolitan region (2, p. 20).

INITIATING STRATEGIC PLANNING AT NJ TRANSIT

NJ Transit is a statewide public transportation agency created by an act of the New Jersey Legislature in 1979 to manage and improve bus and rail passenger services throughout the state. During the first few years of its operation, the agency was primarily concerned with improving a transit system characterized by declining ridership, attributable in part to deteriorated services, equipment, and facilities. NJ Transit delivers bus and rail services under the auspices of three operating subsidiaries created between 1980 and 1984. Under its first subsidiary, NJ Transit Bus Operations, Inc., bus service is provided to 20 of the state's 21 counties on a variety of routes ranging from local urban routes to long-distance commuter runs to Newark, New York, and Philadelphia. Approximately 430,000 daily passenger trips were taken on NJ Transit buses in 1985. NJ Transit's second subsidiary, NJ Transit Rail Operations, Inc., provides commuter rail service in New Jersey. In 1985 NJ Transit served 150,000 daily passenger trips on its nine railroad lines spanning 12 counties. A third operating subsidiary, NJ Transit Mercer, Inc., operates the former Mercer Metro bus system in Trenton.

In January 1985, NJ Transit formally marked its transition to an agency planning for the future by hiring AT&T's Organization Effectiveness Group to teach their strategic planning process. At a 3-day conference facilitated by AT&T, managers analyzed environmental trends, evaluated the strengths and weaknesses of NJ Transit's services compared with those of its competitors, and formulated strategies to take advantage of external opportunities and internal strengths (*3*). Major products of the conference included initial mission statements and action plans for bus and rail operations.

NJ Transit was unable to complete an analysis of its strengths and weaknesses at the conference, in part because AT&T's process was inappropriate for analyzing a public-sector transportation agency. Nevertheless, top management believed that an in-depth analysis of bus and rail services should be performed. To this end, NJ Transit's Office of Strategic Planning adapted various strategic planning processes to meet the particular needs of transit.

USING THE MATRIX AS A DECISION-MAKING TOOL

Portfolio Evaluation

Since the late 1960s, several large corporations, among them General Electric, Mead, and Olin, have been using a strategic planning device called portfolio evaluation to help them make investment choices among different product lines, companies, or divisions (*4*, p. 3). Portfolio evaluation identifies the contribution of the corporation's business units (product lines, companies, or divisions) to overall performance and clarifies their roles. Management can then decide which business units should be used to generate cash and which should receive investment funds (*4*, p. 3).

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Investment choices among the individual business units have typically been based on the unit's projected profitability and market share and depicted on a growth/share matrix. Strategic roles for the units accompany the matrix and suggest specific management actions. Many variations of this matrix have resulted, including approaches by Arthur Little, Inc., the General Electric Company, and AT&T (*4*, p. 3).

MacMillan's Matrix

Ian C. MacMillan of the Wharton School of Business, the University of Pennsylvania, recently developed a matrix to guide resource allocation decisions in not-for-profit agencies. MacMillan asserts that it is much more difficult for not-for-profit organizations than for private industry to decide how to allocate extremely limited resources because service agencies must choose among a portfolio of needy programs. Whereas discontinuing a product may cause only minor inconveniences for former customers, eliminating or trimming necessary social services can cause human suffering (*5*). Contrary to private-sector–oriented models, MacMillan's matrix incorporates the complex allocation alternatives faced by public service agencies.

MacMillan's matrix is used to analyze all current and potential programs on the basis of program attractiveness, competitive position, and alternative coverage. These three major dimensions determine the location of an individual program in the matrix, shown in Figure 1, and the role the program plays in the overall portfolio of social service activities.

The basic assumptions of the matrix make MacMillan's approach appropriate for public transportation agencies. For nonprofit agencies to survive, they must be willing and able to compete for limited resources with other agencies. Because resources are limited, agencies should not directly duplicate others' services thereby wasting resources and creating inefficiencies. This situation requires sacrificing some duplicative, low-quality programs to provide quality service to more focused markets (*5*).

Given these assumptions, the ideal portfolio or mix of programs is one in which an agency only serves markets in which its competitive position is strong. An agency builds this ideal portfolio by easing weaker competitors out of markets it can serve better and by conceding its weaker programs to stronger competitors. A social service agency is required to serve both attractive and unattractive markets as long as it is the superior provider. The agency uses attractive programs to support less attractive programs that have no or few alternative providers.

NJ Transit's Matrix

NJ Transit adopted salient features from both MacMillan's and AT&T's approaches. MacMillan's matrix was modified to create NJ Transit's matrix as it appears in Figure 2. The interpretation of the matrix cells is given in Table 1. NJ Transit then adapted both MacMillan's and AT&T's processes for evaluating and placing services in the matrix. The agency's various bus and rail services were arrayed on this matrix according to three dimensions: market attractiveness, competitive position, and alternative coverage. Market attractiveness, as defined by this matrix, is the degree to which services are able to cover costs through fares or subsidies. Competitive position is the degree to which NJ Transit is superior to its competitors. Alternative coverage is the extent to which alternative transportation agencies could serve riders if NJ Transit ceased operating.

As the matrix suggests, a public transportation agency such as NJ Transit operates like a private operator in some markets and provides a necessary (unprofitable) public service in others. Like a private operator, in attractive markets with no or few providers, NJ Transit is free to expand its services unhindered by a competitor. But NJ Transit must compete aggressively for the whole market or for selective submarkets (routes) to maintain its services if it competes with another provider. On the other hand, as a public agency, it must provide service in unattractive but necessary markets where riders have no other travel alternatives.

MATRIX INPUTS

Market Segmentation

As a first step, NJ Transit divided its market into appropriate market segments. A market segment was defined as a group of

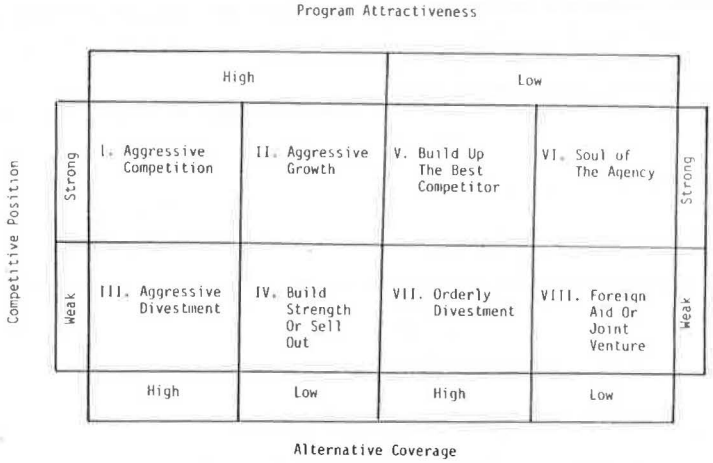

FIGURE 1 MacMillan's matrix.

TABLE 1 MATRIX CELL INTERPRETATION

Cell No.	Name	Definition	Primary Features	Strategic Imperatives
I	Aggressive competition	Strong competitive position Attractive market to serve Many alternative providers	Many transportation providers are competing for riders in an area in which NJ Transit has clear superiority	Identify key competitive variables (such as speed) and build these capabilities to capture the market; use these services to provide funds for growth in other markets
II	Aggressive growth	Strong competitive position Attractive market to serve Few alternative providers	The market is wide open to NJ Transit	Expand services rapidly and build competitive capabilities to ward off future competition Provides a reason for future existence
III	Contract out or exit market	Weak competitive position Attractive market to serve Many alternative providers	There are many providing services similar or superior to NJ Transit	Using the least amount of resources possible, NJ Transit should ensure the competition provides high-quality service
IV	Build strength or contract out	Weak competitive position Attractive market to serve Few alternative providers	Although these services have been recently initiated to fulfill a growing need, NJ Transit lacks the resources and skills to be competitive even in the absence of competing providers	If necessary resources are unavailable to respond effectively, encourage others to assume the service through contracting out; if resources are available, the service may be moved into Cell II or other position
V	Aggressive service maintenance	Strong competitive position Moderately attractive market Many alternative providers	Many competitors are providing services but to different degrees	Aggressively maintain all current services in the market to preserve strong competitive position
VI	Selective growth	Strong competitive position Moderately attractive market Few alternative providers	Opportunities may exist to expand or develop services because few providers exist in an attractive market	Expand services if the market can absorb them and NJ Transit can provide them economically
VII	Prove viability	Weak competitive position Moderately attractive market Many alternative providers	NJ Transit is a poor competitor in a moderately attractive market that is served by many others	Because others serve this market better, NJ Transit must justify its presence or contract out the service and exit market
VIII	Restructure service or contract out	Weak competitive position Moderately attractive mark Few alternative providers	Although there are few competitors in a moderately attractive market, NJ Transit is still in a weak position that could be the result of inefficiencies and misallocation of resources	Help other modes and operators provide service so NJ Transit can exit If services cannot be replaced, decide to maintain, reduce, or end service • Is the service necessary? • Does the service make financial sense? • Could better service be provided if NJ Transit reduced and focused service? • Are there alternative ways of providing the service?
IX	Selective service maintenance	Strong competitive position Unattractive market to serve Many alternative providers	Nonproductive competition occurs between providers who vie for a market share	NJ Transit should only maintain services that cannot be provided as well by another operator Leave remaining services to other operators
X	Soul of agency	Strong competitive position Unattractive market to serve Few alternative providers	Riders have no other services to depend on and, because the market is unattractive, it is unlikely another provider would appear	Pursue creative ways to provide these services Find ways to use other services to support those that fall into this cell
XI	Orderly divest or contract out	Weak competitive position Unattractive market to serve Many alternative providers	Market is unattractive and the services of many other providers are superior to those of NJ Transit	Concede these services to another provider Ensure smooth transition of riders from present services to competitors so that there is minimum disruption to riders
XII	Joint ventures	Weak competitive position Unattractive market to serve Few alternative providers	NJ Transit may be required to provide service for political or social reasons	Transfer riders to alternative providers if possible and give support to these services

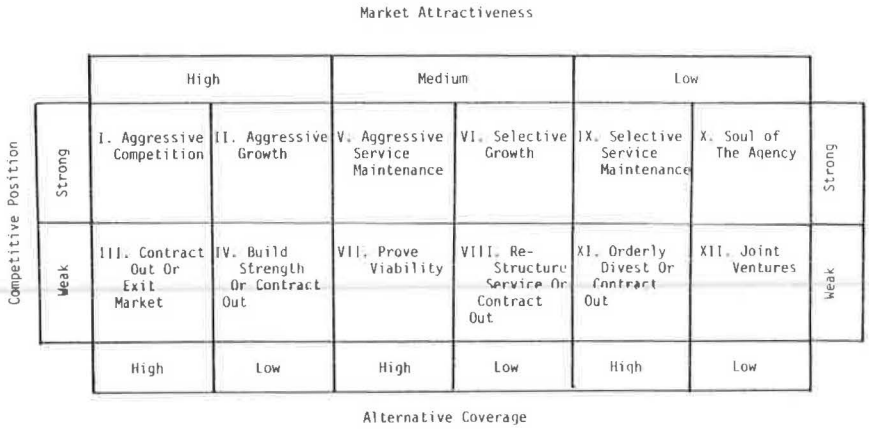

FIGURE 2 NJ Transit's matrix.

riders who have similar travel behavior and system use. A list of possible criteria for segmenting riders into markets included: geography, trip purpose, direction of travel, time of day, destination, and type of service. NJ Transit found it easiest to evaluate its services by segmenting its markets according to geographic criteria because data are generally collected by rail line or by bus route groups.

Market Attractiveness

After appropriate market segments were chosen, the market attractiveness of each was evaluated. A market segment is attractive from transit's perspective if it generates enough revenue to cover costs. Revenue for public transportation can be obtained through fares and, if there is political support, from state and federal subsidies. Thus, both economic and political criteria are used to determine market attractiveness. The criteria used to judge market attractiveness and their definitions appear in Figure 3.

To show how the market attractiveness of a market segment is determined, the evaluation of one of NJ Transit's bus segments, the Short Distance PABT routes, is given in Table 2. These routes run between densely populated New Jersey cities in Essex, Hudson, and Bergen counties and the Port Authority Bus Terminal (PABT) in nearby Manhattan.

After the segment had been rated according to each of the criteria, five or fewer of the most important determinants of market attractiveness for the segment were chosen. Overall market attractiveness (high, medium, or low) was based on an average of the most important criteria. Because the Short Distance PABT segment received a high rating for four of the five most important criteria, the overall market attractiveness of the segment was rated high.

Competitive Position

Next, the ability of each segment to fulfill rider needs and wants was compared with that of other modes such as automobile, rail, private buses, and vanpools. The definitions of the travel attributes important to users of all forms of transportation are presented in Figure 4.

In the Short Distance PABT market, NJ Transit competes with private cars and fixed-route vans. As the data in Table 3 indicate, NJ Transit's bus services were first analyzed to determine if they met the criteria to a high (H), medium (M), or low (L) degree. This same analysis was performed for each competitor. An H, M, or L was written in the first column to indicate the absolute degree to which both NJ Transit and the competitor met customer needs and wants. For example, NJ Transit's buses and private vans are considered moderately reliable whereas cars are believed to provide a high degree of reliability.

The numbers in the second column of each group indicate the relative competitiveness of NJ Transit's services and those of each transportation provider in a market. A 1 was assigned to the superior competitor, and the provider without the competitive advantage was given a 0. Both were assigned 0 if

Economic Factors

Revenue/cost ratio: A segment with a high revenue/cost ratio is attractive.

Concentration of riders: A segment with highly concentrated riders is attractive.

Absence of competitors: A segment with no competitors is attractive.

Proximity to NJ Transit facilities and infrastructure: A segment close to current facilities is attractive.

Condition of facilities: A segment with good facilities is attractive.

Land use: A segment supporting efficient land uses is attractive.

Political Factors

Rider influence: A segment is attractive or unattractive depending on the effectiveness of rider support or criticism.

Market share: A segment with a large market share is attractive.

Number of riders: A segment with many riders is attractive.

Appeal to stakeholders: A segment with appeal to those who either affect or are affected by transit operations or policies is attractive.

Mobility for transit dependent, seniors, and disabled: A segment providing mobility to these persons is attractive.

Quality of service: High service quality is attractive.

Economic and Political Factors: A segment experiencing growth in ridership is attractive.

FIGURE 3 Definition of key market attractiveness terms.

TABLE 2 MARKET ATTRACTIVENESS

	Short Distance PABT		
	High	Medium	Low
Economic criteria			
Revenue/cost ratio[a]	X		
Concentration of riders[a]	X		
Absence of competitors[a]	X		
Proximity to NJ Transit facilities, infrastructure	X		
Condition of facilities			X
Political criteria			
Rider influence	X		
NJ Transit's market share[a]	X		
Number of riders	X		
Appeal to stakeholders		X	
Mobility for transit dependent, elderly, and handicapped	X		
Quality of service[a]		X	
Economic and political criteria: growth rate of riders[a]	X		
Overall attractiveness	X		

[a]Criteria considered the most important determinants of market attractiveness.

Comfort: Physical conditions in the vehicle
Convenience: Number of transfers and ease of transfer (or ease of movement between modes)
Reliability: Arrival at destination on schedule
Safety: Perception of accidental injury or death
Security: Perception of incidence of crime
Cost: Entire cost of travel including parking and all transit fares or all car operating costs
Accessibility: Ease of traveling to and from major mode
Proximity to destination: Distance from major mode drop-off point to ultimate destination
Travel time: Door-to-door travel time
Frequency: Degree of flexibility in departure and arrival times
Lack of stress: Travel situations have various degrees of stress

FIGURE 4 Definition of key terms related to rider needs and wants.

neither service was superior to the other. Because the automobile is more reliable than NJ Transit's buses, a 1 appears in the second column under automobile and a 0 in the Short Distance PABT column. Vans and buses are equally reliable so both have 0 in the second column.

Because anticipated service modifications can change present assessments, the third column in each group was used to predict future competitive advantage. A 1 was assigned to the competitor who was expected to remain or become superior in the future because its performance probably could not be imitated by the other. A 0 was given to the provider without the competitive advantage or to both providers if neither was expected to capture the competitive advantage. In the latter case, 0 in the third column for both competitors indicates that their services were expected to remain or become equal to each other. The 0s in the third column of ratings for Short Distance PABT buses and automobiles indicate that in the future both will be equally reliable. Buses are expected to become as reliable as cars when a second express bus lane or other remedy is implemented to reduce bus delays in the Lincoln Tunnel. When buses were compared with vans, buses were assigned a 1 and vans a 0 in the third column because reduced bus delays will make buses more reliable than vans in the future.

In summary, the analysis in Table 3 shows that in the Short Distance PABT market the automobile is superior or equal to NJ Transit's buses in all areas except safety, cost, and lack of stress. And, with the exception of travel time, the automobile is expected to be superior or equal in those areas in the future. NJ Transit buses are much more competitive with vans, however. Buses are equal or superior to vans on all counts, and their superiority is expected to increase in the future.

Alternative Coverage

As was mentioned earlier, the alternative coverage dimension indicates the extent to which other transportation providers could serve riders if NJ Transit ceased operating. On the basis of its knowledge of competitors in the state, NJ Transit judged the probability of alternative coverage as high (H) or low (L) for each market segment. Vans and cars could probably replace NJ Transit's Short Distance PABT bus service, so alternative coverage for this segment was rated as high.

Placing the Services in the Matrix

As shown in Figure 5, the Short Distance PABT segment was located in a high market attractiveness cell because of its rating. It was also positioned to reflect high alternative coverage. Locating the segments according to strong or weak competitive position, however, was more complex. Although the analysis of rider needs and wants (Table 3) indicates areas of competitive advantage, it does not determine overall competitiveness. One approach is to base competitiveness on the services' market share because it accurately reflects which services people believe are superior.

For trans-Hudson trips, NJ Transit used data that describe the modes used by people traveling from specific geographic corridors in New Jersey to Manhattan to determine the bus and rail market shares of all trans-Hudson trips. Trans-Hudson services were considered strong competitors if they were

1. Dominant in a market: NJ Transit captures 50 percent or more of all trips to Manhattan from a specific corridor.
2. Dominant in a submarket: NJ Transit captures more than 50 percent of all trips to either midtown or downtown Manhattan from a specific corridor.
3. Equal to other modes: NJ Transit and its competitor or competitors are the strongest in the market and capture equal shares of all trips to Manhattan from a corridor.

Because 58 percent of trans-Hudson commuters from the area served by NJ Transit's Short Distance PABT bus service use buses, this mode is dominant in the market and thus a strong competitor.

Judging the competitiveness of local bus service compared with other modes was more difficult. According to the 1980 census, an average of 5 percent of all New Jersey intracounty work trips are taken by bus. Using intracounty bus work trips as an estimation of local bus patronage, NJ Transit decided that bus is a strong competitor if it captures more than 5 percent of all work trips.

When the market segments had been analyzed and rated for market attractiveness, competitive position, and alternative

TABLE 3 COMPETITIVE POSITION

Rider Needs and Wants	NJ Transit (Short Distance PABT)	Competitor (automobile)	NJ Transit (Short Distance PABT)	Competitor (van)
Comfort	**M 0 0**	**H 1 1**	**M 0 0**	**M 0 0**
Convenience	**M 0 0**	**M+ 1 1**	**M 0 0**	**M 0 0**
Reliability[a]	**M 0 0**	**H 1 0**	**M 0 1**	**M 0 0**
Safety	**H 1 1**	**M 0 0**	**H 1 1**	**M+ 0 0**
Security	**M 0 0**	**M 0 0**	**M 0 0**	**M 0 0**
Cost[a]	**H 1 1**	**L 0 0**	**H 1 1**	**M 0 0**
Accessibility	**M 0 0**	**H 1 1**	**M 1 1**	**L 0 0**
Near destination	**M 0 0**	**H 1 1**	**M 0 0**	**M 0 0**
Travel time	**M 0 1**	**M 0 0**	**M 0 1**	**M– 0 0**
Frequency[a]	**M 0 0**	**H 1 1**	**M 1 1**	**L 0 0**
Lack of stress	**M 1 1**	**L 0 0**	**M 0 0**	**M 0 0**

[a]Criteria considered the most important determinants of competitive position. Short Distance PABT's share of the trans-Hudson market is 58 percent. Bold codes indicate areas of clear current and future superiority.

coverage, they were placed in NJ Transit's matrix represented by a circle whose size indicated its share of total bus or rail ridership. As shown in Figure 5, Short Distance PABT ridership is 6 percent of NJ Transit's total bus ridership, so it is represented by a circle that is half the size of the Bergen, Passaic, Middlesex, Union PABT that carries 13 percent of NJ Transit's bus riders. The size of the circle could also be based on deficit per passenger.

FORMULATION OF STRATEGY

After confirming that the services were correctly placed in the matrix according to the criteria ratings, management reviewed the matrix to determine if NJ Transit's current service mix was satisfactory. Service mix is simply the pattern created by the services depicted on the matrix. In general, NJ Transit's service mix was considered acceptable because it was a strong competitor in both attractive and unattractive markets. In some markets, however, NJ Transit's competitive position was weak, suggesting an inefficient use of public resources. In these cases, management had to decide whether to develop strategies to improve market share, thus changing the service's location in the matrix, or to exit the market gracefully.

NJ Transit management reviewed the market attractiveness and competitive position criteria ratings assigned to the individual route groups and rail lines and formulated strategies for improving or maintaining ratings. To improve the Short Distance PABT's revenue-to-cost ratio and thus overall market attractiveness, for example, management proposed using articulated buses. To improve the Short Distance PABT's reliability, travel time, and nearness to destination, and thus competitive position, management proposed working for a second express bus lane in the Lincoln Tunnel, preferential bus lanes in Manhattan to allow NJ Transit buses to serve the East Side, and other remedies.

CRITIQUE AND CONCLUSIONS

After researching available matrices and strategic approaches and finding them unsatisfactory for the transit industry, NJ Transit developed its own approach based on the MacMillan and AT&T processes. NJ Transit used the overall matrix concept developed by MacMillan. Many of MacMillan's criteria, for assessing both the market attractiveness and the competitive position of a service, were appropriate because they acknowledge the importance of political support and quality of service to a nonprofit agency. Nevertheless, some of the criteria were revised to make the process more appropriate for transit.

NJ Transit's approach evaluates the attractiveness of serving a market and the performance of its services relative to those of other providers. Management first analyzed its services collectively and considered which services to maintain or surrender to achieve the desired portfolio. Then the agency formulated specific strategies to capitalize on its strengths and avoid or eliminate its weaknesses. The process inherently encourages a cost-effective distribution of public resources.

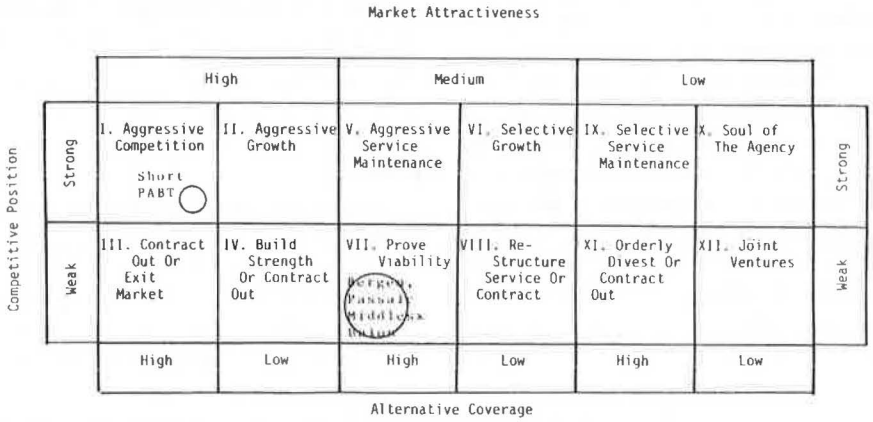

FIGURE 5 Completed NJ Transit matrix.

Other agencies should be aware, however, of several aspects of the process that may hinder its completion. First of all, this process takes a strong commitment of time and energy from the general managers and other top management. In addition, a thorough evaluation of services requires accurate and detailed data. NJ Transit is fortunate to possess some of these data; however, in the future the agency will be supplementing them with more sophisticated market research information. Finally, the process described in this paper is only a part of the strategic planning process. To complete the process, the strategies developed must be reconciled with the available financial resources. The next step is to place financial and political constraints on the process to force choices among the various strategies.

Despite these difficulties, NJ Transit found the process invaluable because it provided a formal structure within which to analyze both the markets and the attractiveness of the available travel options. For the first time, NJ Transit management was able to systematically assess the performance of its own bus and rail operations compared with that of the competition in specific markets. As a result of determining its current and desired service mix, the agency is allocating resources to maintain or improve services in all markets where it is a strong competitor. If it is determined that NJ Transit cannot become a strong competitor in other markets, some services will be contracted out to private operators or eliminated altogether.

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