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THE CHARACTERISTICS OF EFFECTIVE STRATEGIC PLANNING IN PUBLIC TRANSIT SYSTEMS

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ABSTRACT

The purpose of this paper is to identify the characteristics of strategic planning systems of transit agencies that enhance these agencies' ability to respond effectively to federal legislative requirements and mandates. Analysis of data from 54 transit agencies, using structural equations, revealed that strategic planning enhances a transit agency's ability to respond effectively to federal legislative requirements and demands of host communities. This is particularly so when it is designed to consolidate the various unit action-plans into a system-wide strategic plan. Additionally, for strategic planning to be effective, it should receive more than a lip service from top and unit or division level managers, it requires the involvement and commitment of top and division or unit managers, and it should be designed to have an external orientation. That is, it should focus on an organization's responsiveness to the demands of its customers and it should identify and exploit future growth opportunities. Furthermore, effective strategic planning requires involvement of employees, particularly those who will be responsible for the implementation of the resulting plan, and it must fit the management and decision making styles of the top and unit or division level managers. These characteristics are intended to provide guidelines to agencies intending to use strategic planning as a tool of effective strategic management.

INTRODUCTION

The success of strategic planning in some private sector firms as well as interests of governments looking to tie their budgets to performance measures have spurred its use in public sector organizations as a tool of strategic management. An example of this interest is the Government Performance and Results Act (GPRA) of 1993, which mandates strategic planning for federal agencies. However, mixed evidence about the relationship between strategic planning and organizational performance makes the debate about its effectiveness as a tool of strategic management an ongoing one. Mintzberg (1991), for example, argued that in a turbulent environment strategic planning is a constraint on the flexibility of an organization to adapt to its rapidly changing and uncertain environment. Roney (2003) and Akhter (2003) have argued that it is environmental uncertainty that makes strategic planning an imperative for organizations that operate in turbulent and uncertain environments. Agreeing with the latter argument, Backoff, Wechsler and Crew (1993), and Vinzant and Vinzant (1996) argue that local government agencies are prime candidates for strategic planning because they, too, face turbulent, ever-changing and politically charged environments, and highly publicized resource allocation problems. Additionally, as Poister and Van Slyke (2002) note, transportation departments (including transit agencies) have experiences with planning, data gathering and analysis, and "using this information to allocate resources and manage programs", thus making them good candidates for strategic planning.

These arguments notwithstanding, many researchers seem to agree that strategic planning is an effective tool of strategic management. Miller and Cardinal (1994) found positive

relationships between strategic planning and organizational effectiveness and performance and argued that methodological problems could explain the inconsistencies in past research results. Hussey (1974) pointed to design and process flaws as possible explanations of failure of strategic planning in many cases. He argued that, the fact that an organization practices strategic planning does not mean that it is done well. The question therefore, is what characteristics of strategic planning are related to its effectiveness. According to Ramanujam, Venkatraman and Camillus (1986), these characteristics are the organizational environment in which strategic planning is applied (contextual), and how strategic planning is designed and implemented. Ugboro (1985, 1991) adds top management leadership involvement in and commitment to strategic planning, and the strategic planning process itself to the characteristics of effective strategic planning.

The objective of this paper is to identify the characteristics of strategic planning systems that enhance a public transit agency's ability to respond effectively to federal legislative requirements, and still have positive impacts on their communities. This requires determining the relationships between strategic planning characteristics and strategic planning effectiveness. To do so, this paper develops measures of internal organizational success of strategic planning, federal legislative requirements, community impacts of strategic planning, and strategic planning characteristics. These characteristics are measured by the organizational contextual, design, process, top-management leadership involvement and commitment dimensions of strategic planning systems of public transit agencies and are treated as variables. Then, using structural and measurement equations, the paper develops relationships between the measures, strategic planning characteristics, and internal organizational success of strategic planning, federal legislative requirements and community impacts. Those measures with positive coefficients are used as the characteristics of effective strategic planning.

The rest of the paper is divided into six parts. Section 2 presents a survey of the relevant literature on strategic planning and strategic management particularly in the public sector. It is followed in section 3 and 4 by hypothesis and methodology respectively and in section 5 by tests of hypothesis. Sections 6 and 7, deal with the characteristics of effective strategic planning and conclusion respectively.

LITERATURE REVIEW

Strategic planning is defined as the process of diagnosing an organization's external and internal environments, deciding on a vision and mission, developing overall goals, creating and selecting general strategies to be pursued, and allocating resources to achieve the organization's goals (Hellriegel, Jackson and Slocum, 2005). The objective of strategic planning is to align an organization's activities with its environment, thereby providing for its continuing survival and effectiveness. It requires an organization to monitor its internal and external environments constantly for changes that may require modifying existing strategic and tactical plans or developing different ones altogether.

At the federal level, the GPRA requires agencies to prepare three strategic planning documents. The first is a strategic plan covering a period of five years and reviewed every three years. As required by the act, this plan must have a comprehensive mission statement, goals and objectives, how the goals and objectives are to be achieved, identification of external factors that could affect the achievement of the goals and objectives, and a description of program evaluations to be used to revise the goals and objectives. The second document is an annual performance plan for each program activity. It requires agencies to establish quantifiable and

measurable performance goals, provide a description of the resources needed to meet the goals, and performance indicators. The third document is a program performance report that compares the performance indicators established by each agency with its actual performance to assess strategic planning's failures and successes. Other federal legislations, for example, require transportation planning to be continuous, comprehensive and cooperative, and to be consistent with the Americans with Disabilities Act, provisions of the Clean Air Act and its amendments among others.

Following the GPRA, many states passed legislations or issued Executive Orders (e.g. Arizona, New Jersey, Texas, Wyoming, Delaware, Hawaii, Florida) to require similar results oriented measures on their agencies (Berry & Wechsler 1995, Broom 1995; Melkers & Wiloughby, 1998; Aristigueta, 1999). Berry and Wechsler (1995) surveyed state agencies to determine the extent of their use of strategic planning. They found that 60 percent of the agencies responding, i.e., 255, used some form of strategic planning and attributed the large percentage of use to possible overrepresentation of adopters of strategic planning in their sample and less experience with strategic planning. In their view, more experience with strategic planning could possibly increase the proportion of agencies that have discontinued its use. Although this view suggests some apprehension about the use of strategic planning, these authors conclude that strategic planning has produced "very little disillusionment among those who have used it" (Berry and Wechsler 1995: 165). Complementing these results, Poister and Streib (2005) found in their national survey of public sector agencies that 44% of the 512 public agencies responding used some form of strategic planning. They compared this result to their work ten years earlier (i.e., Poister & Streib 1994), and concluded that strategic planning's use was spreading, i.e., 6% increase over 10 years. Backoff, Wechsler and Crew (1993) explain this slow adoption rate by the difficulty in designing and implementing strategic planning in government settings. On the other hand, Vinzant and Vinzant (1996b) conclude that public organizations are not good candidates for strategic planning because it is difficult to develop performance measures for them.

Although some public agencies adopt strategic planning because of government initiatives, others adopt it for several reasons including the need and desire to set policy and define program direction, emulate good business practices, respond to constituents' demands and pressures to reduce expenditures, and as a symbol of personal leadership (Berry & Wechsler, 1995). Others adopt it because of their need to resolve competing agency resource allocation priorities and tie performance to resource allocation (Long & Franklin, 2004). Still others adopt it to increase job satisfaction since past research shows positive and statistically significant relationships between employee participation in strategic planning processes and job satisfaction among employees of local government agencies (Kim 2002).

Despite these reasons, the usefulness of strategic planning continues to be debated in the strategic management literature. While we do not contribute to this debate, we note that advocates of strategic planning include Berry and Wechsler (1995), Gerbing, Hamilton and Freeman (1994) and Armstrong (1982). Gerbing et al (1994), argue for strategic planning touting its positive relationships with organizational performance (i.e., improved financial performance), organizational processes, morale, and employee commitment to organizations. Furthermore, they argue that strategic planning is positively related to effective organizational mission definition, competitive advantage, and organization-environment alignment critical to creating and sustaining a superior competitive advantage. Pearce, Freeman and Robinson (1987) argued similarly and found a strong positive correlation between strategic planning and profitability

even in firms facing and competing in turbulent environments. Advocates of strategic planning also point to its resurgence in recent years in the private sector as evidence of its rebirth.

On the opposite aisle are Miller and Cardinal (1994), and Mintzberg (1991). Mintzberg (1993), a vocal critic, offered a requiem for strategic planning in the private sector arguing that it has not been successful because in an uncertain environment, it inhibits an organization's ability to engage in creative thinking critical to innovative ideas necessary to deal with environmental surprises. In his view, strategic planning gives tunneled vision and does not allow management to take note of other possible approaches to problems. Despite these arguments recent increases in the adoption of strategic planning in the public sector at a time when the private sector seems to reduce its use makes its study in public transit agencies ever more important.

HYPOTHESIS

To assess strategic planning in public transit systems involves developing measures of its effectiveness. Changes in firms' managerial decision-making processes from adopting strategic planning are sometimes used to measure strategic planning effectiveness (Lorange, 1980), as are the effectiveness of the strategies produced by a strategic planning system. This is because "effective strategy process can influence organizational effectiveness" (Gerbing, Hamilton and Freeman 1994) and the processes involved in decision-making affect the effectiveness of the resulting decisions (Dean and Sharfman 1995). In the private sector, the measures of the effectiveness of competitive strategies include their contributions to organizational performance in terms of returns on investment and owner's equity and assets, earnings per share growth rate, market share growth, and improvements in and stabilization of a firm's profits over an extended period.

In the public sector, a multi-dimensional conceptualization of strategic planning effectiveness (i.e., its internal organizational success) that is focused on its capabilities, objectives or intent is often used. This is because public agencies are not-for-profit organizations and their performance and effectiveness cannot be measured by the traditional financial measures of private sector organizations. The measures of strategic planning effectiveness based upon this conceptualization include strategic planning's ability to help organizations develop their missions, foresee major future transportation opportunities and threats, properly appraise strengths and weaknesses, clarify priorities and develop long range useful plans (Ugboro 1991). Others are strategic planning's ability to help anticipate future needs of customers, respond to customer demand, anticipate future capital needs, design appropriate technologies, and its use in resource allocation decisions.

Using this conceptualization Ugboro (1991) identified top management leadership role as an important aspect of strategic planning effectiveness because it is positively related to strategic planning effectiveness, i.e., internal organizational success. Earlier, Ramanujam and Venkatraman (1987) used this approach and identified strategic planning process as an essential dimension of strategic planning effectiveness, while according to Steiner (1979) the dimensions are organizational contextual, strategic planning design, strategic planning process and top management involvement. The contextual dimension, according to Steiner (1999), deals with organizational environmental factors that affect strategic planning effectiveness including availability of adequate resources, managerial support, commitment and attitude of managers towards strategic planning. The design dimension is the degree of external and internal orientation of a strategic planning system, extent of its functional coverage, coordination,

quantitative, and qualitative emphases. The process dimension deals with communication and coordination of planning efforts, especially the roles of dedicated planning staff, guidance and direction provided by general management. Finally, top management role dimension is the involvement and commitment of top management to strategic planning efforts, including the amount of time spent on the strategic planning process, the amount of resources allocated to strategic planning, acceptance of strategic planning as a direct and personal responsibility, and creation of an organizational environment that supports and promotes strategic planning. Together, these dimensions define the characteristics of strategic planning.

A positive relationship between internal organizational success of strategic planning and these characteristics, however, may only show partially the overall effectiveness of strategic planning in public transit agencies. For, the resulting strategic plans from the strategic planning processes in these agencies may have external impacts on the communities where the agencies are located in terms of quality of life, mobility, accessibility, air quality and congestion. If a strategic planning characteristic is positively related to community impacts it could show strategic planning is effective, and this relationship would have to be weighed against other impacts, positive or negative, that strategic planning may have on internal organizational success. Similarly, if strategic planning characteristics are positively related to how responsive transit agencies are to federal legislative requirements, they too could indicate strategic planning effectiveness.

An example of a federal legislative requirement in public transit systems and transportation planning agencies is the 1990 Americans with Disabilities Act, which requires retrofitting transit vehicles to make them accessible to people with disabilities. Others are the clean air standards in the Clean Air Act of 1970 and its amendments, and provisions in the Federal-Aid Highway Act of 1962 requiring transportation planning to be continuous, comprehensive and cooperative. A survey of strategic planning use in state agencies shows that some adopted it because they interpreted the Older Americans Act¹ and the Intermodal Surface Transportation Efficiency Act² as requiring strategic planning (Berry & Wechsler 1995). When strategic planning processes in transit agencies conform to federal legislative requirements, they ensure that the projects in the ensuing plans would qualify for federal funding. Although there are many federal legislative requirements that possibly could affect strategic planning, we limit our discussion mostly to the provisions of the Federal-Aid Highway Act of 1962. This is because this act defines important aspects of transportation planning processes in the U.S. even today and its requirements are internalized by transit agencies. Hence, we expect strategic planning in transit agencies to be continuous, comprehensive and cooperative as well.

The characteristics of strategic planning and even the internal organizational measures of strategic planning's success, certainly could affect strategic planning's impacts on federal legislative requirements and have positive community impacts.³ Additionally, strategic planning's ability to help meet federal legislative requirements and have positive community impacts could depend upon its characteristics. And strategic planning's ability to meet federal legislative requirements and have positive community impacts could depend upon its internal organizational success such as allowing organizations the ability to anticipate their human capital needs, and properly appraise their strengths and weaknesses. Thus:

Hypothesis: *Strategic planning characteristics and internal organizational success of strategic planning are positively related to meeting federal legislative requirements and strategic planning's community impacts.*

This is the main hypothesis of this paper, and to test it involves establishing relationships between strategic planning characteristics, internal organizational success of strategic planning, federal legislative requirements, and community impacts of strategic planning effectiveness.

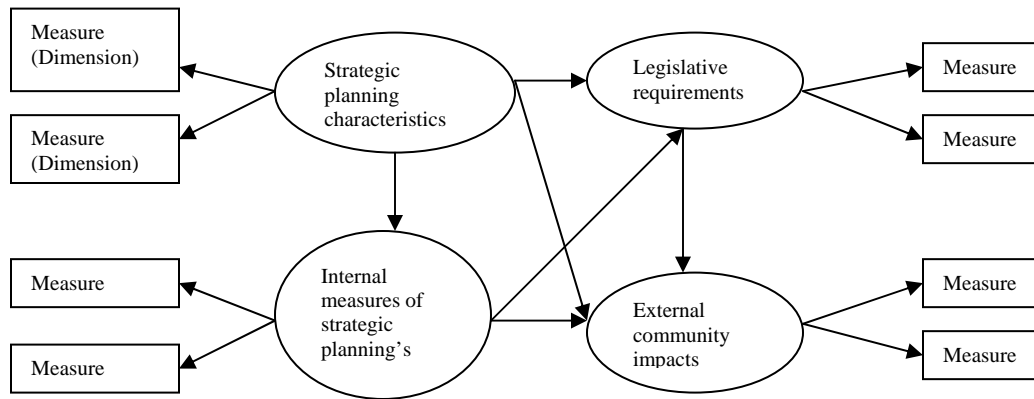


Figure 1: Hypothesized Relationships

Figure 1 summarizes the hypothesized relationships. The boxes are the measures of the latent variables denoted by ellipses. These latent variables are strategic planning characteristics, internal organizational success of strategic planning, federal legislative requirements, and community impacts, which are by themselves unobservable. An arrow leading from an ellipse to a box shows a measurement equation. On the other hand, an arrow leading to an ellipse shows a structural relationship, i.e., a relationship between latent variables. From the structural equations, strategic planning characteristics are hypothesized to affect the internal organizational success of strategic planning directly, federal legislative requirements directly and indirectly, and community impacts directly and indirectly. Internal organizational success of strategic planning is also hypothesized to affect community impacts directly and indirectly, and to affect federal legislative requirements directly. Finally, figure 1 shows a hypothesized direct effect of federal legislative requirements on community impacts. From this diagram, the total effects of strategic planning characteristics and internal organizational success of strategic planning on federal legislative requirements and community impacts depend upon their direct and indirect impacts.

METHODOLOGY

Measurement Scales

In developing scales for internal organizational success and dimensions of strategic planning, we used item statements from Steiner (1979), Wood and Laforge (1981), Ugboro (1991) and Ramanujam, Venkatraman and Camillus (1986). Strategic planning effectiveness is measured by a sixteen-item scale, while strategic planning design, top management role and strategic planning process are measured by seven, five, and fourteen item scales respectively. The contextual

dimension of strategic planning is measured by a seven-item scale. Because there are no existing scales for community impacts and legislative requirements, we designed scales to measure them. While five, four and four-item scales respectively assess if strategic planning is comprehensive, continuous and cooperative, we use a seven-item scale to measure community impacts. Respondents were to show their agreements and disagreements to the item statements in all the scales using the five-point Likert scale: 0- Not Applicable, 1- Strongly Disagree, 2- Disagree, 3- Agree and 4- Strongly Agree.

Data

Data collection started with identifying transit agencies involved in strategic planning to participate in the study. We used the Internet to obtain the names and addresses of public transit agencies in the United States. From these names, we randomly selected 150 geographically dispersed transit agencies, contacted them by phone to explain the purpose of the study and asked if they had employees in charge of strategic planning or had strategic planning departments. For each transit system, if the answer was a yes, we asked to speak to that person and requested his or her participation in the study. Transit agencies that did not have strategic planning departments or were not involved in strategic planning were removed from the sample. From these telephone calls, a list of potential participants was developed. Questionnaires with pre-paid return postage were sent to those on the list to complete and return to us. Two weeks later, reminder postcards were sent requesting study participants to complete and return the questionnaire if they had not already done so. Following the postcards, we made telephone calls to those who still had not responded and asked if they could do so. Fifty-four transit agencies completed and returned their questionnaires (i.e., a 36% participation rate) in usable form. Table 1 provides descriptive statistics about the participating transit agencies and the positions of the respondents in these agencies. It shows that the study participants worked for various transit agencies and held different management positions in their agencies. Most, 95.24%, were directly involved in strategic planning.

Table 1: Characteristics of transit agencies and respondents

Variable	Mean	Std Dev.
% Operating buses	100.0000	0.0000
% Operating light rail	26.1900	0.4450
% Operating rapid	16.6700	0.3772
% Operating demand responsive	80.9500	0.3974
% Operating commuter	14.2900	0.3542
Years involved in strategic planning	6.1548	2.9826
Direct involvement in strategic planning	0.9524	0.2155
Strategic planning responsibilities	0.8333	0.3772
Average modes operated	2.2381	0.6555
% General manager/CEO	21.9500	
% Directors	39.0300	
% Divisional managers	19.5100	
% Planners	19.5100	

Table 2: Summary of factor analysis results

	Factors	HO:	χ^2	P > χ^2	TLI
ACHIEVEMENTS AND PERFORMANCE (INTERNAL SUCCESS)	. Respond to customer demand	4 factors sufficient	77.2583	0.0917	0.9324
	. Appraise strengths and weaknesses				
	. Foresee areas of future growth				
	. Anticipate human capital needs				
CHARACTERISTICS					
Strategic planning process	. Strategic planners, unit managers and top management work well together	2 factors sufficient	15.1130	0.0870	0.8841
	. Detailed actions plans developed by each unit and combined into a system-wide plan				
Role of top management	. Prepares formal statement about types of services to be provided	1 factor sufficient	8.2363	0.1437	0.8955
Strategic planning process	. Too much attention to putting numbers in boxes, mechanistic process	4 factors sufficient	43.2624	0.3750	0.9850
	. Strategic planning process well understood throughout organization				
	. Constraints put on unit managers by top managers				
	. Strategic planning given more than a lip service				
Contextual	. Strategic planning fits top management style, decision making process	1 factor sufficient	18.4572	0.1867	0.9165
COMMUNITY IMPACTS	. Accessibility to facilities and businesses	2 factors sufficient	8.4357	0.3921	0.9957
	. Encourages businesses to relocate to area				
LEGISLATIVE IMPACTS					
a. Continuous	. Periodic review of strategic planning	1 factor	1.5176	0.4682	1.0000
b. Cooperative	. Includes projects from other agencies	1 factor sufficient	0.4539	0.7970	1.0000
c. Comprehensive	. Considers land use/regional impacts	2 factors sufficient	2.3527	0.1251	0.9109
	. Considers impacts on stakeholders				

*TLI = Tucker and Lewis' reliability index, HO: Null hypothesis

Analytical Techniques

Factor analysis: We used confirmatory maximum likelihood factor analysis method with orthogonal rotation to determine the number of measures underlying each characteristic of strategic planning, internal organizational success, federal legislative requirements, and community impacts. This method permits tests of hypotheses regarding the correct number of factors and ensures that the factors are uncorrelated. Table 2 shows a summary of the factor analysis results including fit statistics and Appendix Tables A.1 to A.7 show detailed results. These results strongly support four measures of internal organizational success of strategic planning whose fit statistics are a Chi-square value of 77.2583, probability of 0.0917, and a Tucker and Lewis' reliability coefficient of 0.9324. The four measures are responding to customer demand, proper appraisal of strengths and weaknesses, ability to foresee future opportunities, and ability to anticipate human capital needs. We also found two distinct measures of strategic planning design (Chi-squared = 15.1130, probability = 0.0870, Tucker and Lewis' reliability coefficient = 0.8881). They are the abilities of strategic planners to work well with top management and unit managers, developing detailed action plans to support each service and consolidating them into a system-wide action plan.

Table 3 – Structural equations results

Measurement equations	Latent variables	Estimate	Standard error	t-value	R ²
Contextual, i.e., fit of strategic planning to top management style (e4)	Strategic planning characteristics	0.7331*	0.1088	6.7408	0.5368
Consolidate action plans into a system-wide plan (e5)	Strategic planning characteristics	0.7572*	0.1143	6.6225	0.5728
Employees' understanding of established procedures for strategic planning (e1)	Strategic planning characteristics	0.7105*	0.1243	5.7182	0.4949
Restriction put on unit managers by top management (e2)	Strategic planning characteristics	0.4192*	0.1386	3.0254	0.1755
Strategic planning is more than a lip service (e3)	Strategic planning characteristics	0.3408*	0.1473	2.3142	0.1101
Top management involvement and commitment (e6)	Strategic planning characteristics	0.6687*	0.1156	5.7840	0.4467
Responsive to customer demands (e7)	Internal measures of strategic planning success	1.1086*	0.2246	4.9363	0.2347
Foresee opportunities for future growth (e8)	Internal measures of strategic planning success	0.9831*	0.2514	3.9098	0.1846
Continuous (e9)	Legislative requirements	0.8126*	0.0944	8.6046	0.7826
Comprehensive - economic and land use impacts (e10)	Legislative requirements	0.4697*	0.1189	3.9506	0.2614
Comprehensive - stakeholder impacts (e11)	Legislative requirements	0.6069*	0.1093	5.5504	0.4365
Cooperative (e12)	Legislative requirements	0.6392*	0.1025	6.2355	0.4843
Mobility and accessibility impacts of strategic plan (e13)	Community impacts	1.5255*	0.2857	5.3403	0.8180
Structural equations					
Internal measure of strategic planning success	Strategic planning characteristics	0.4373*	0.0770	5.6820	1.0000
Meeting federal legislative requirements	Strategic planning characteristics	0.8704*	0.0910	9.5646	0.8206
Community impacts	Internal performance	0.2661*	0.0398	6.6868	1.0000
	Internal performance	0.4373*	0.0770	5.6820	
	Meeting federal legislative requirements	1.1966*	0.1608	7.4399	
	Strategic planning characteristics	-1.1550*	0.2614	-4.4183	
Covariance among exogenous variables					
Cov(e1,e2)		-0.2760*	0.0839	-3.2900	
Cov(e1,e3)		-0.4054*	0.1064	-3.8100	
Cov(e3,e4)		0.2778*	0.1061	2.6200	
Cov(e1,e5)		0.0149	0.0641	0.2300	
Cov(e3,e6)		0.1472	0.1023	1.4400	
Cov(e4,e6)		0.1719*	0.0872	1.9700	
Cov(e7,e8)		-0.1928	0.1153	-1.6700	
Cov(e10,e11)		-0.2795*	0.1002	-2.7900	
Model fit statistics					
Goodness of fit index (GFI)	0.8519				
Adjusted GFI	0.7305				
Root mean square residual	0.0707				
Chi-square	62.1295				
Probability > Chi square	0.1168				

Probability < 0.05

Regarding top management involvement in and commitment to strategic planning, we found that its item statements define a unique measure (Chi square = 8.2363, probability = 0.1437, Tucker and Lewis' reliability coefficient = 0.8955). This factor is most closely associated with top management developing an organizational climate supporting strategic planning and a formal statement about the types of services to be provided to customers. On the other hand, we found four factors underlie strategic planning processes (Chi square = 43.2624, probability = 0.3750, Tucker and Lewis' reliability coefficient = 0.9850). The first factor is organization-wide understanding of established procedures for strategic planning. The second is the mechanistic nature of strategic planning in some transit agencies, the third is the constraint put on unit managers by top management that prevents unit managers from doing their work well

enough for strategic planning to be effective, and the fourth factor is strategic planning being more than just a lip service.

The seven item statements of contextual characteristics support a one-factor solution (Chi-square = 18.4572, probability = 0.1867, Tucker and Lewis' reliability coefficient = 0.9165). This factor is the fit between strategic planning and management style. Similarly, the factor analysis supports a one-factor solution for continuous strategic planning (Chi square = 1.5176, probability = 0.4682, Tucker and Lewis' reliability coefficient = 1.0000). This factor is the existence of a formal periodic review of strategic planning. On the other hand, two factors underlie comprehensive strategic planning (Chi-Square = 2.3527, probability = 0.1251, Tucker and Lewis' reliability coefficient = 0.9109). The first is land use, economic, and environmental impacts of strategic planning, and the second is stakeholder impacts of strategic planning. Finally, one factor underlies cooperative strategic planning (Chi-Square = 0.4539, probability = 0.7970, Tucker and Lewis' reliability coefficient = 1.00) and it is the inclusion of other agencies' projects in the strategic plan. Regarding community impacts, we identified two underlying factors from the factor analysis (Chi-squared = 8.4357, probability = 0.3921, Tucker and Lewis' reliability index = 0.9957). They are improvements in quality of life in terms of mobility and accessibility and the aesthetics and business relocation or attraction impacts of strategic planning.

Structural equations: We use structural equations to test the hypothesis and identify the characteristics of effective strategic planning systems. Using the factors from the factor analysis results as measures, we estimated the measurement and structural equations hypothesized in Figure 1 simultaneously using the covariance analysis of linear structural equations (CALIS) program in SAS/STAT (SAS Institute 1990).⁴ The fit statistics are the Goodness of Fit Index (GFI), the Adjusted Goodness of Fit Index (AGFI), Root Mean-squared Residual (RMR), Chi-Square and its associated probability and the method of estimation is maximum likelihood with the covariance matrix as input. Using the modification indices in the SAS output, we eliminated those measurement equations with extremely low coefficients of determination from the analysis and allowed pairs of some measures to be correlated.⁵ We also estimated the error variances in all the measurement and structural equations except those in the structural equations for internal organizational success and the community impacts of strategic planning.

Table 3 shows the estimated results and the fit statistics for the model including the coefficients of determination and t-statistics for the coefficients.⁶ The results show a good fit of the model particularly a GFI index close to its acceptable value of 0.9, a quite low RMR of 0.0707, a Chi-square probability of 0.1166, and coefficients that are positive and statistically significant at probability levels of less than 0.05. Additionally, the coefficients of determination are relatively high for some of the equations. Figure 2 is a path diagram using these results and provides a clearer picture of the impacts of strategic planning systems in transit agencies.

TESTS OF HYPOTHESES

The estimated coefficients show that strategic planning characteristics are positively related to internal organizational success of strategic planning, and to transit agencies' abilities to meet federal legislative requirements. Here, the coefficients of the direct and indirect paths of strategic planning characteristics are positive and statistically significant showing that the total effect is positive. In terms of the effects of strategic planning characteristics on community impacts, our results show that although the direct effect is negative and statistically significant, the total effect

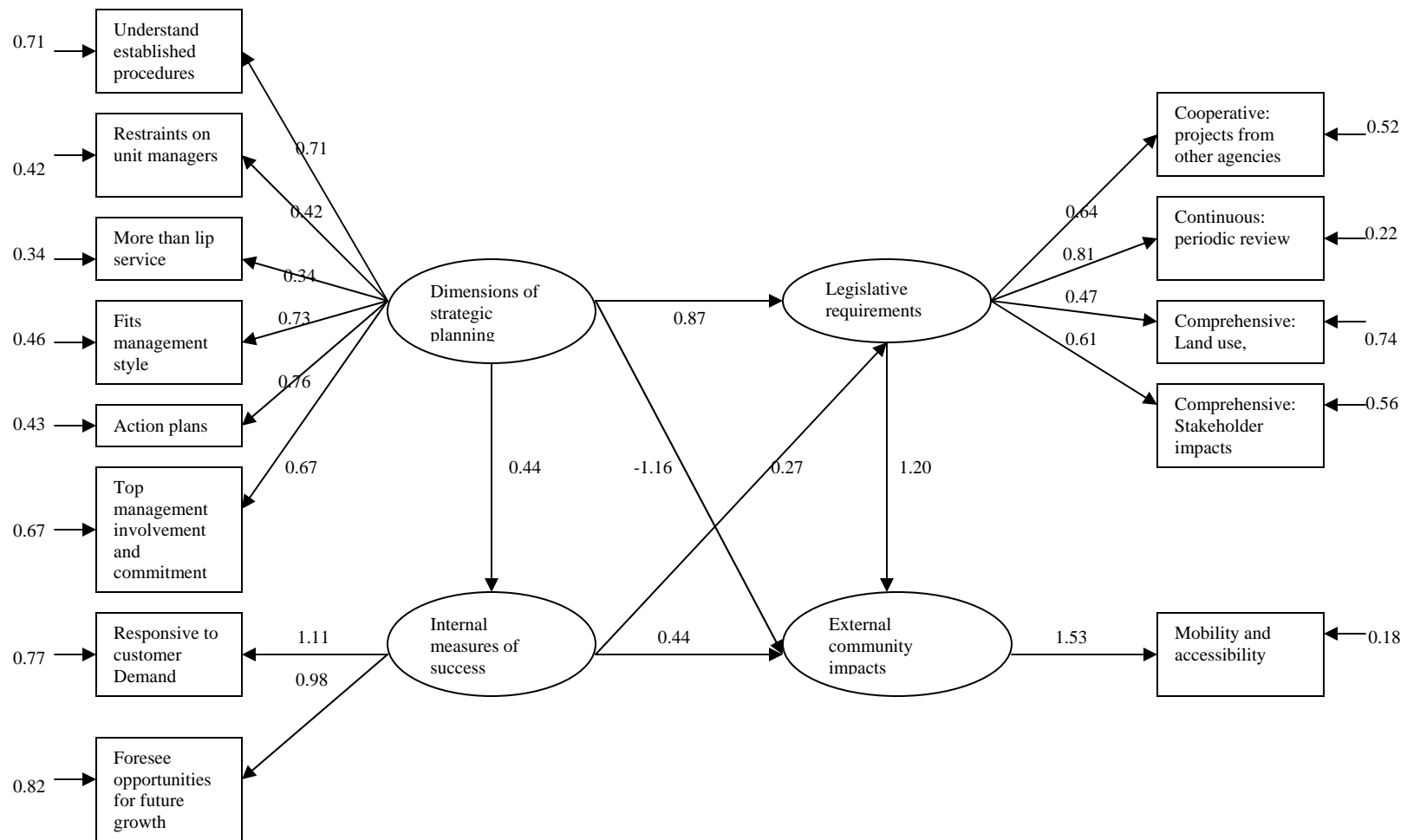


Figure 2 – Estimated Structural Model
 (GFI = 0.8519, AGFI = 0.7305, RMR = 0.0707, Chi-square = 62.13, P > Chi-square = 0.1166)
 Note: Covariances are not shown.

is positive and provides support for the hypothesis. Specifically, the total effect of strategic planning characteristics on community impacts is 0.2169 compared to its direct effect of -1.1550, and indirect effect of 1.3719. It follows that the positive indirect effects of strategic planning characteristics on community impacts compensate for their negative direct effect, thus making the overall effect of strategic planning characteristics on community impacts positive and providing further support for the hypothesis. The hypothesis is supported also by the positive and statistically significant paths from meeting federal legislative requirements to community impacts, and the total effect of 0.9867 of strategic planning characteristics on federal legislative requirements. In short, the results overwhelmingly support the hypothesis.

CHARACTERISTICS OF EFFECTIVE STRATEGIC PLANNING

Federal legislation requires transportation planning to be continuous, comprehensive and cooperative. Therefore, we ask if there are positive relationships between these requirements and strategic planning characteristics. The characteristics of strategic planning that we identified as positively related to these requirements and supporting the hypothesis are, understanding established procedures for strategic planning, constraints on unit managers, the fit of strategic planning to management style of top management, and strategic planning being more than a lip service. Others are consolidating unit action plans into a system-wide action plan and top management involvement in and commitment to strategic planning. These characteristics also have positive relationships with mobility and accessibility. Additionally, strategic planning's abilities to make transit agencies responsive to customer demands and foresee areas of major future transportation opportunities have positive relationships with meeting federal legislative requirements and improving mobility and accessibility as we found. Together, these characteristics are principles of effective strategic planning and are considered important in establishing strategic planning in public transit agencies. These principles are discussed below.

Understanding established procedures for strategic planning: From our results, a characteristic of effective strategic planning systems in public transit agencies is that employees must understand and know the established procedures in place for strategic planning. This is especially the case of those with strategic planning implementation responsibilities. This understanding may be accomplished through employee training or proper documentation of established procedures for strategic planning and sharing it with all employees. Such documentation could increase employee awareness of what is expected of those involved in strategic planning.

Strategic planning must be more than a lip service: If strategic planning procedures are distributed to employees, it makes them realize that it is an agency-wide effort supported by top management. From the results, for strategic planning to be effective in transit agencies it must be more than a "lip service" for employees to know its importance. Thus, it must be evident through top management actions, and top management must lead in emphasizing its importance to employees. In addition, there must be agency-wide commitment to strategic planning and the implementation of its plans. This commitment could involve creating a strategic planning department adequately staffed to facilitate and coordinate strategic planning activities throughout the public transit agency. It could also involve the CEO and other senior-level line and staff managers devoting adequate amounts of time to strategic planning activities, instituting agency-wide reward systems tied to individual and group commitment and contributions to strategic

planning, and tying management performance to credible and responsive strategic plans developed for their units.

Strategic planning must fit management style: Yet, another characteristic of effective strategic planning found in this study is that it must fit the management style of the top executive team and the reality of a transit agency's decision-making process. This ensures that the resulting strategic plan would be implemented and it would receive the support of top management. To ensure this fit indeed occurs, top management must be involved in the development of the plan. Additionally, there must continuous consultations between strategic planners and top management to ensure that the provisions of the plan are consistent with the vision of top management.

Top management must be involved and committed to strategic planning: Besides championing strategic planning throughout the agency, providing strategic direction and ensuring that strategic planning fits top management style, we found that top management of transit agencies must be involved and committed to strategic planning to make it effective. This involvement and commitment could take the form of formal statements about what types of services to provide, helping set goals and priorities, and developing a climate supportive of strategic planning and its initiatives in the transit agency. When top management is actively involved and committed to strategic planning, it could increase the flow of resources to strategic planning initiatives, it could make employees perceive strategic planning as participative, and it could create a feeling among employees of ownership of the strategic planning goals, objectives, and outcome measures they helped develop. It could also make employees be held accountable for strategic planning performance, and provide directions to strategic planners in terms of where to focus the agency's limited resources.

Consolidate unit action plans into a system-wide plan: Another characteristic of an effective strategic planning we identified in transit agencies is that each unit within an agency must develop its own action plan. Then, the action plans must be combined into a system-wide strategic plan for the agency. This is a bottom-up approach instead of a top-down approach and makes the various units take responsibilities for their plans. Moreover, this approach allows employees to be involved and participate in the development of the strategic plan. This finding is consistent with previous research (Hendrick 2000, Poister and Van Slyke 2002) that showed the bottom-up approach is used by organizations with major divisions. The system-wide plan becomes a reference document that drives decisions throughout the organization whereas the action plans drive decisions in various units. The action plans may be developed by creating strategic planning teams in the various units (or divisions) and charging each with the responsibility of developing an action plan for its unit. An organization-wide strategic planning staff may also be created to coordinate and integrate the action plans into a strategic plan for the entire organization.

Top management constraints on unit managers: Quite surprisingly, we found that a characteristic of effective strategic planning in transit agencies is that top management imposes some constraints on unit managers. We had expected otherwise because we thought these constraints could limit the flexibility required in developing and implementing strategic planning. That we obtained our result, however, could show that top management is active in strategic planning in transit agencies by specifying the parameters within which it must be done. It may also show that top management purposefully imposes the constraints to ensure that the resulting strategic plan aligns with the overall strategic direction of the organization and conforms to legislative and other requirements. Thus, the constraints may not be intended to

affect plan implementation at the unit level or to intentionally limit resources to strategic planning initiatives. Unit managers are still responsible for making strategic choices for their units and aligning their unit plans with the strategic direction and priorities of their transit agencies.

Responsive to customer demands: Another characteristic of effective strategic planning systems in transit agencies that we found is that they use their abilities to meet customer demand as an internal measure of strategic planning success. This finding is not a surprise since public transit agencies provide services to transit users. Meeting customer demand allows these agencies to provide responsive services and to satisfy federal legislative requirements for transportation planning as well in terms of being comprehensive and having positive impacts on the community. Both community impacts and comprehensiveness, as our results show, can be measured by mobility and accessibility, and adequate consideration of stakeholder impacts respectively. Moreover, since public transit agencies depend upon their customers for portions of their revenues and for their support, this characteristic encourages transit agencies to focus their limited resources on those services their customers want the most.

Ability to foresee areas of major future transportation opportunities: The final characteristic of effective strategic planning in transit agencies is its ability to foresee opportunities for future growth. This environmental scanning could involve cooperation between agencies and jurisdictions, thus satisfying one of the federal legislative requirements examined in this paper. It could also involve introducing new technologies and services to meet new and ever changing customer demand.

CONCLUSION

The purpose of this paper is to study strategic planning in public transit agencies and identify its characteristics that make the agencies that use it effective in responding to some federal legislative requirements, and have positive community impacts. We limited the federal legislative requirements mostly to those of the Federal-Aid Highway Act of 1962, which are for transportation planning to be continuous, comprehensive and cooperative because it specifies how transportation planning is to be done. From the results, we conclude that strategic planning is an important strategic management tool that allows public transit agencies to meet customer demands primarily in terms of mobility and accessibility, and federal legislative requirements. The characteristics of effective strategic planning in public transit agencies we found are:

- Unit action plans must be consolidated into a system-wide action plan
- Strategic planning must be more than a lip service
- Employees must understand established procedures for strategic planning
- Strategic planning must fit the management style of top management
- Top management must be involved and committed to strategic planning
- Strategic planning allows transit agencies to foresee future opportunities for growth
- Strategic planning must be responsive to customer demand

These findings are limited by the federal legislative requirements considered and the data used. Future research that uses a larger sample and considers other legislative requirements would certainly add to our results.

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APPENDIX

Table A.1: Achievements and performance

Achievements and performance (coefficient alpha = 0.9500)	Mean	Std. dev.	Factor 1	Factor 2	Factor 3	Factor 4
1. Strategic planning efforts help us develop a clear mission statement for our organization	2.8781	0.9538	0.4855	0.34851	0.1913	0.2090
2. Strategic planning efforts help us foresee areas of major future transportation opportunities	2.9268	0.9053	0.1859	0.22921	0.9286	0.2249
3. Strategic planning process helps us foresee major future threats.	2.7805	0.8807	0.4665	0.41104	0.5095	0.2070
4. Strategic planning efforts enable us to properly appraise our strengths.	2.9024	0.7683	0.2262	0.89804	0.2798	0.2531
5. Strategic planning process helps us to properly appraise our weaknesses.	2.7561	0.7675	0.4396	0.73171	0.1087	0.2453
6. Strategic planning efforts help us clarify our priorities.	3.2195	0.7910	0.5313	0.47976	0.2584	0.2807
7. Strategic planning activities help us to develop useful long-range objectives.	3.0976	0.8604	0.5576	0.42047	0.3209	0.2537
8. Strategic planning helps us develop useful long-range transportation program strategies.	3.0976	0.9167	0.4292	0.42471	0.2779	0.3817
9. Strategic planning efforts help us to develop and implement credible medium and long-term transportation goals.	3.0488	0.8931	0.5155	0.37138	0.2377	0.4343
10. Strategic planning efforts help us to prevent and avoid unpleasant surprises.	2.4390	0.7762	0.5553	0.37903	0.3748	0.1889
11. Strategic planning efforts help us to anticipate the future transportation needs of our customers.	2.7561	0.9160	0.5003	0.14439	0.6919	0.1038
12. Strategic planning efforts help us to adequately respond to our customers' demand.	2.7805	0.8220	0.8085	0.24049	0.4442	0.1420
13. Our strategic planning effort helps us to anticipate the future human capital needs of our organization.	2.5610	1.0607	0.0935	0.27780	0.1041	0.9270
14. Our strategic plan includes a plan to adequately meet our future human capital needs.	2.4146	1.0482	0.2016	0.10527	0.2085	0.7684
15. Strategic planning efforts help us to design appropriate technologies into our transportation system and services.	2.7561	0.9690	0.4882	0.26385	0.0865	0.5252
16. Strategic plan serves as the basis for resource allocation and decision-making.	2.9024	0.8002	0.4085	0.52817	0.4622	0.2402

Scale: 0 = not applicable, 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree

Table A.2: Strategic planning system design

Item statements	Mean	s.d.	Factor 1*	Factor 2*
1. Our strategic planners are located close to the to management team of our transit system.	2.7619	1.3400	0.7083	0.1814
2. Our strategic planners work well with our unit managers.	2.5952	1.1699	0.7907	0.2763
3. Our strategic planners work well with our top managers.	2.7143	1.2550	0.9602	0.2335
4. Our strategic planning committee or teams structure is just right for us.	2.4048	0.9892	0.2831	0.4692
5. Each functional unit is expected to do its own strategic planning with minimal system-wide direction or coordination.	1.7857	1.1161	0.3008	0.3871
6. Detailed action plans are developed to support each major transportation delivery strategy.	2.3571	1.1438	0.1695	0.8635
7. The various strategic planning activities are consolidated into a written system-wide plan.	2.4048	1.2506	0.1571	0.8602

* Rotated factor pattern shown. Scale: 0 = not applicable, 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree

Table A.3: Role of top management

Item statement	Mean	Std. dev	Factor pattern
1. The top management of our organization has developed a climate in the organization that supports our strategic planning efforts.	2.9524	0.8821	0.7506
2. The top management team of our organization has developed a formal statement of what type of services we want to provide our customers.	3.0952	0.7590	0.8409
3. Our top management team has established clearly defined and quantified goals for our transit system.	2.7619	0.9055	0.6081
4. Attempts are made to use the results of our strategic plans to judge managerial performance.	2.2857	1.0426	0.3580
5. Unit managers fully participate in the strategic planning process in our organization.	2.5952	0.9892	0.5816

Scale: 0 = not applicable, 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree

Table A.4: Strategic planning process

Item statements	Mean	Std. dev	Factor 1	Factor 2	Factor 3	Factor 4
1. Top management spends an appropriate amount of time on strategic planning	2.6226	0.6571	0.5435	0.2843	0.0720	0.3982
2. Strategic planning in our organization is given more than a lip service.	2.8113	0.6521	0.2368	-0.0421	0.0081	0.9706
3. Many managers in our organization do not really accept or believe in strategic planning	2.1887	0.8100	0.0155	0.3900	0.1400	0.0077
4. Our strategic planning system proceeds on the bases of an acceptable set of procedures.	2.3585	0.8791	0.5315	0.1584	0.1542	0.3454
5. Our strategic planning procedures are well understood throughout our transit systems.	2.2453	0.9386	0.9881	0.0459	0.0516	-0.0006
6. Our strategic planning process pays too much attention to just putting numbers in boxes.	1.8302	0.7528	0.2006	0.9684	0.1414	0.0444
7. Our strategic planning process is too mechanical, too routine, and too rigid.	1.7925	0.7431	0.2173	0.8350	0.2940	0.1003
8. New ideas are generally welcomed during our strategic planning process.	3.0000	0.6794	0.3762	0.1361	0.2546	0.4487
9. Many unit managers are not willing to accept our weaknesses when devising our strategic plans.	2.1308	0.8779	0.0626	0.2939	0.5783	0.1076
10. Unit managers get sufficient guidance from top management for effective strategic planning.	2.3774	0.9850	0.4561	0.0287	0.5750	0.3717
11. Unit managers are too restrained by top management for effective strategic planning	1.9057	0.9254	0.1565	0.3464	0.7725	-0.0606
12. The ability of unit managers to do effective strategic planning is taken into consideration when they are evaluated annually for overall job performance.	2.1887	1.0752	0.4235	0.1817	0.4260	0.0956
13. Clear strategic planning assumptions are formulated for unit managers who have formal responsibility for strategic planning.	2.3208	0.9359	0.5665	0.1860	0.3270	0.2635
14. Our strategic planning process is such that the final plans and objectives are accepted by those responsible for their implementation and attainment.	2.5094	0.9927	0.7588	0.1012	0.2317	0.3406

Scale: 0 = not applicable, 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree

Table A.5: Contextual dimension

Item statement	Mean	Std. dev	Factor pattern
1. Top management has accepted the idea that strategic planning is its major responsibility.	3.0189	0.8433	0.4314
2. Our strategic planning fits the management style of our transit system.	2.8491	0.7441	0.8879
3. Our strategic planning system fits the reality of our decision-making process.	2.6981	0.6957	0.7202
4. Top management spends appropriate amount of time on strategic planning.	2.6226	0.6571	0.7324
5. There is too much foot-dragging about strategic planning in our organization.	2.3774	0.6571	-0.2468
6. Unit managers generally spend an appropriate amount of time with other unit managers and/or staff in developing our strategic plans.	2.1698	0.9754	0.4829
7. The work requirement to complete our strategic plans is acceptable to our unit managers and staff.	2.3585	1.0936	0.3624

Scale: 0 = not applicable, 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree

Table A.6: Community impacts

	Mean	Std. Dev.	Factor 1	Factor 2
1. Our strategic plans are designed to improve quality of life.	2.9811	0.7719	0.8687	0.3210
2. Our strategic plans improve the aesthetic character of the community.	2.6792	0.9151	0.5181	0.7013
3. Our strategic plans encourage businesses to relocate to our area.	2.4717	1.0671	0.2562	0.8747
4. Our strategic plans improve the mobility of the non-driving public.	3.0755	0.8514	0.7479	0.4070
5. Our strategic plan improves accessibility to community facilities and businesses.	2.9254	0.7808	0.8516	0.3773
6. Our strategic plan alleviates congestion on transportation facilities (airports, railroads, roads etc).	2.5283	1.0489	0.4433	0.5460
7. Our strategic plan makes provisions for people with special needs.	3.0777	0.8540	0.7563	0.3435

Scale: 0 = not applicable, 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree

Table A.7: Meeting legislative requirements

Continuous				
Item statement	Mean	Std. dev	Factor 1	
1. Our strategic plan is reviewed periodically.	2.6981	1.0300	0.7985	
2. Our strategic plan covers multi-year programs.	2.8679	1.0007	0.8125	
3. The priorities in our strategic plan change every year.	2.3208	0.7538	0.3898	
4. There is a formal process to periodically review our strategic plan.	2.3585	1.0208	0.8840	
Comprehensive				
Item statement	Mean	Std. dev	Factor 1	Factor 2
1. The impact of our strategic plan on the environment is always considered.	2.3774	1.0602	0.6956	0.4751
2. The impact of our strategic plan on the economy of the region is always considered.	2.5472	1.0664	0.8432	0.3229
3. The impact of our strategic plan on land use is always considered.	2.6226	1.0233	0.9137	0.2891
4. The impact of our strategic plan on various stakeholder groups is always considered.	2.7170	1.0072	0.2970	0.9549
5. Our strategic planning process considers all modes of transportation in our area.	2.5849	0.9494	0.3497	0.3709
Cooperative				
Item statement	Mean	Std. dev	Factor 1	
1. The process of developing our strategic plan involves working with the MPO for the region.	2.6792	0.9956	0.6556	
2. Our strategic plan includes projects from other agencies outside of our area.	2.4340	0.9096	0.9055	
3. The CEOs of transit systems in our area meet regularly to discuss the various strategic plans.	2.0377	1.0913	0.4643	
4. Government officials in our area are involved in developing our strategic plan.	2.4340	0.9905	0.8037	

Scale: 0 = not applicable, 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree

END NOTES

¹ This act requires statewide coordination of services for the elderly.

² An important aspect of this act is that it provided flexible funding for transportation.

³ As noted already these characteristics are the contextual, top management involvement, strategic planning design, and strategic planning process dimensions.

⁴ Each measure is the sum of the weighted responses to the item statements that define it, where the weights are the factor scores.

⁵ The equations removed are those for strategic planning being mechanical, appraisal of strengths and weaknesses, assessment of human capital need, strategic planners and top management working well together, and business relocation impacts of strategic planning.

⁶ The fit statistics are GFI = 0.8519, AGFI = 0.7305, RMR = 0.0707, Chi-square = 62.1295, probability = 0.1166.