TIME-STAGED STRATEGY IN THE TRANSPORTATION PLANNING PROCESS

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Transportation planning projects are often the subject of controversy. This can be avoided or reduced by improving the planning process. The public has become sensitive to how a project is planned in addition to what is proposed. One of the components of the planning process is plan staging. It is recommended that the process be improved through use of an approach called a time-staged strategy. A strategy is a series of actions designed to achieve certain system states in a given time sequence. The choice of actions conforms to an overall strategy that, in turn, is an interpretation of planning goals and objectives and their relative priorities (determined by community participation programs). A series of alternative single-purpose strategies is initially designated and converted in representative physical plans. This involves an evaluation of how well the elements of the recommended long-range plan comply with a given strategy. These single-purpose strategy plans are merged into a composite plan to identify those elements serving multiple strategies. These results are further evaluated by considering the ranking of the alternative strategies in order to determine what plan elements are most important in a staging sequence. The composite strategy plan and the top four strategies represent an overall strategy. With this as a guide, a series of activities can be devised that will improve the system achieving the goals and objectives valued most highly and that will achieve certain system states at given times. Coordination of actions must be flexible to respond to technical uncertainties. By using a time-staged concept, overall control of action can be achieved.

•ACROSS THE COUNTRY, transportation projects are involved in heated controversy, with many groups arguing either side of the question. The most clamorous, however, usually seem to be those challenging the need for a given project.

Although this paper does not address the causes of these situations, factors that seem to create controversy include the following:

1. Mobility or the ability to travel is a major facet of our life-style; therefore, projects that affect it are of significant personal interest.
2. As a land use, transportation facilities can have harsh impacts on contiguous land uses by altering the existing environment. Often, the people who bear some of the costs receive none of the benefits.
3. Transportation is sometimes viewed as a negative environmental force that can have effects considered too severe by our ecology-sensitive value judgments.
4. As urban areas grow more complex, the interrelationships among population groups, their activities, and facilities become more difficult to understand; the one aspect that appears certain is that, as individuals, we are more dependent on one another.

The inherent conflict is that we need and demand transportation service; however, many times this conflicts with environmental objectives. Such conflicts usually arise

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with only segments of the population, for the negative impacts tend to have a localized character. This gives rise to many proponents and opponents of a transportation project.

These factors were noted to establish a framework for the considerations discussed in this paper. If the goal of professionals is to plan and guide the implementation of needed transportation services and facilities, these factors need to be addressed.

The difficulties are a challenge for the transportation planner. However, development of more innovative and imaginative solutions is not enough. Resolution of the conflicts and provision of needed facilities must begin with improvements in the planning process.

This call for a significant improvement in the planning process is based on a need to increase sensitivity to the transportation planning issues described. The success or failure of a given planning project will rest on how the project is done in addition to which project is recommended. This concern has already been reflected in major legislation—the National Environmental Protection Act. The preparation of environmental impact statements (EISs) should be the outgrowth of an improved planning process. The EIS should be a summary of a planning process that has been environmentally sensitive throughout its course. The game is changing, and we planning professionals need to change our game plan.

PLANNING PROCESS

Generally, the planning process is the series of activities related to the planning and designing of a transportation project, from recognition of a need (existing or future) to an acceptable implementation plan. As shown in Figure 1, the planning process has several standard components, each of which could be improved relative to technical methodology, interpretation of results, and so on. One component, the staging plan, which is the subject of this paper, should receive particular attention. It is central to the issues noted previously and can have significant bearing on improving the process.

Why Improve Staging?

Staging deals with the translation of general or long-range plans and concepts into a sequence illustrating desired system states at given time periods. Staging converts the planning process from the more abstract network plans into physical systems. It addresses the basic question of what should be done first. This is particularly important because initial steps may establish a commitment to a given system or may even be the only ones implemented and, hence, the only means to achieve desired benefits.

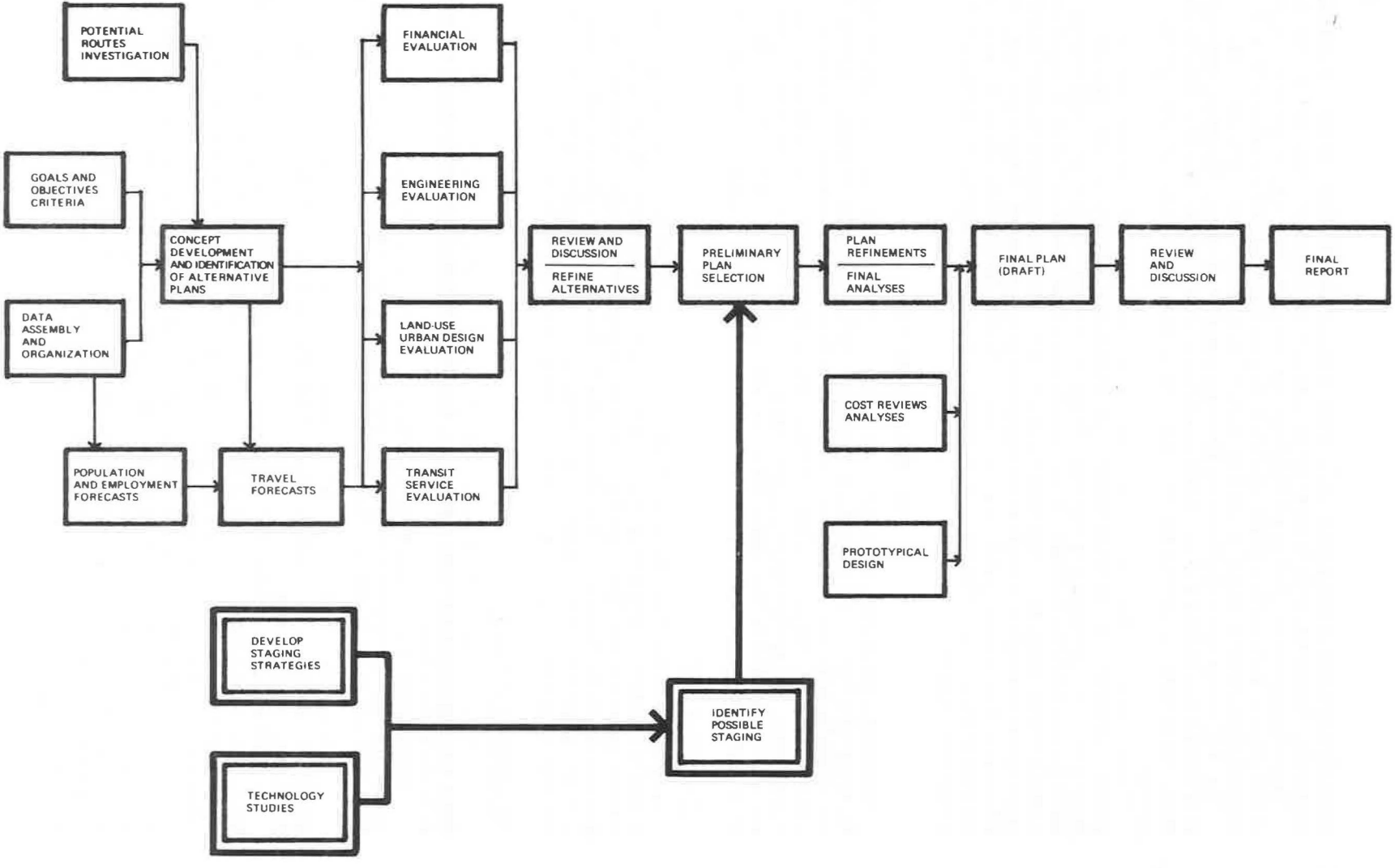
An Approach to Staging

The argument that improvement in staging of the planning process presumes that there are improvements to be made—i.e., that the traditional approach leaves something to be desired—is true.

Traditionally, staging has dealt in purely physical terms. It has segmented a long-range plan into manageable components in a sequence that satisfied a logical pattern. This approach is not totally invalid, but it has become inadequate for several reasons.

1. It has not had a strong or explicit goals orientation. Goals and objectives were part of the abstract or conceptual phase of the study and too often were not explicitly expressed in action plans.
2. Plan staging has normally reflected geographical rather than population considerations; i.e., plan elements are selected to serve a particular part of the area or to implement route A first, rather than being selected to serve, for example, the dependent labor force first or to provide service to all major medical centers.
3. As citizen participation increases, the role of the professional planner changes. Rather than provide a final recommendation for a transportation improvement program or facilities, the professional may be asked only to evaluate alternatives and their consequences; then the community makes the final recommendation. This affects the staging plan in a similar way. Staging needs to be developed in a manner such that a public decision-making process can be employed. That is, if the staging plan is to be de-

Figure 1. Study work sequence.



veloped as suggested in item 2, community values and priorities must be identified and utilized.

4. As urban areas become increasingly complex, the ability to predict transportation needs becomes more precarious. Coupling this with the fact that the scope and cost of most transportation systems have become very high indicates the high risk of overcommitment to the wrong solution. Such a situation should be reflected in alterations to the traditional staging process to provide a more flexible process that maintains options for future decisions.

5. Increased urban complexity also means that there is a need to forecast more conditions or relationships. This becomes difficult for long-range planning and suggests the needed capability of developing plans and stages into functional entities that can be evaluated separately as well as in whole systems. By this means, the planner can ensure that the incremental value of stages is in balance with the cost required to achieve them.

This review of the traditional staging process provides an approach to improve techniques. It should have a goals orientation, reflect priorities, achieve identifiable functions and services, and be flexible.

BASIS FOR STAGING

The plan-staging process described in this paper was developed in relation to the public transportation (transit) planning process. The basic approach, however, is applicable to other planning projects. The essential change represented by this approach is use of staging in a time-staged strategy.

Why a Strategy

The word staging implies "the state or condition" of a system at a given time. A strategy, on the other hand, is a series of actions taken over a given time span in a specific sequence to achieve certain objectives or end states (stages). This concept has a significant characteristic, i.e., choice. The advantages of a strategy approach are as follows:

1. It has a goals orientation; hence, objectives are explicitly stated in terms of action.
2. It creates a framework for staging that allows flexibility in selecting activities so that more than one set of actions might be used to achieve a desired end state.
3. The approach emphasizes the dynamic path to a plan that is action oriented rather than a static end state; it provides a mechanism for relating "end-state" planning to "means-state" planning.
4. Because a strategy relates decisions to a shorter time frame, it is more relevant to community participation and plan-staging actions can be evaluated in relation to community values and priorities.

The general organization of this strategy approach is shown in Figure 2. The process contains several steps that yield two end products, i.e., a selected overall strategy and a series of actions aimed at achieving certain system stages.

Method

The time-staged strategy process uses the following steps (Fig. 2):

1. Develop alternative strategies,
2. Prepare single-purpose strategy plans,
3. Select a strategy (combination), and
4. Develop action program.

These steps are based on three important products of the planning process that would normally precede the staging activity: the statement of goals and objectives for the planned transportation system, the relative priority of these statements, and the preliminary conception of the long-range (overall) plan.

The four steps in the staging process are described as follows:

1. Alternative strategies—This is a conceptual step in which goals and objectives are used to identify the widest reasonable range of possible strategies. Goals suggest the various services or impacts to be achieved by the plan. These can be equated to a strategy. For example, a potential strategy could be a plan that seeks to serve transit-dependent areas as the primary objective. All action included in such a strategy would be focused in this single purpose.
2. Single-purpose strategy plan—This step is an evaluation of how well the elements in the long-range or overall plan achieve each of the potential strategies. That is, it is necessary to determine what elements would be effective if any of the strategies were selected as the single purpose of the system. This assumes nearly perfect performance of each plan element.
3. Selection of a strategy—The stated goals and priorities can be used to rank alternative strategies by their functional importance, i.e., priority ranking. However, because the strategies are developed relative to single purposes, it is unlikely that only one would be desired to guide the staging process. A series or combination of strategies would allow the entire set of planning goals and objectives to be achieved to some extent. Hence, a combination strategy would be developed by building a composite strategy plan based on step 2.
4. Action program—With a selected combination strategy, a series of specific actions can be developed that would maximize the system benefits compatible with community priorities. Activity selection also requires an integration of other factors such as operational objectives, physical constraints, and general financial conditions. Because the result may be somewhat complex, the actions are organized into a time-staged decision or management network.

Nature of the Process

Besides an understanding of the basic methodology for the time-staged strategy process, other aspects need to be discussed to completely present the concept. These aspects generally deal with the nature of the process in terms of content, elements of choice, and strategy objectives.

Content—As noted earlier, staging plans have traditionally dealt with the configuration of the plan, i.e., the various routes, lines, or links that make up the total system. This aspect is valid for a strategy, except that there are added aspects. A strategy for a transit plan must consider service (operations) and transportation technology. The former is an aspect relating to both plan configuration and vehicles, whereas the latter is concerned with vehicle systems and their change over time.

Configuration—To develop the strategy relative to plan configuration requires that uncertainty be considered. This may be present in the following ways:

1. Estimation of transit demand—This is probably more uncertain than would be the case for the forecasting of highway traffic volumes. It deals with new or expanded transit systems and significantly altered levels of service. However, because the analytical models are based on existing conditions and relationships, there is no assurance of how accurately these relationships can predict public response to new service or systems. Similar technical questions can be raised about land use and activity forecasts on which future trip estimation is based. Questions of feasibility and system capacity should, therefore, be subject to continuing examination as implementation of the plan proceeds.
2. System availability—This aspect pertains to the ability of the local government to implement the system as needed. Because the plan includes new routes and facilities, its implementation will involve community interaction and proper programming of financial resources. How can future public acceptance be forecast, and what assurance is there that sufficient funds will be available? Will new rights-of-way be available?
3. Community priorities—This is related to item 2. The funds may be technically available, but the community may have different priorities causing a reallocation of the funds. Will the public continue to accept a major commitment to transit and, possibly, reduce highway expenditures after initial plan approval? Much has been said about the

need for transit, but will the community support a significantly different priority? Do social planning objectives that increase the need for transit have significant priority?

4. Public policy—There are certain public policies that have a major impact on public transportation but that the public has no clear position on. Potential policy matters of this type are (a) citywide land use or development policy, (b) use of direct public action to implement development policy, (c) proof of financial feasibility of a transit plan, (d) attitude toward transit as an alternative to the automobile (rather than the attitude of "letting someone else use transit so that I can use the freeway"), and (e) acceptable order of magnitude of transit improvement costs.

Because of these uncertainties, a strategy needs to be flexible. Good strategies retain as many options as possible.

Technology—In a similar way, transportation technology needs to be considered so that it can be staged in an overall strategy. Because the use of technology involves many decisions, a general approach to it—its role and what hardware to select—is an important part of a strategy. There are three principal aspects to such an approach.

1. Goals. Among the goals are use of public transportation as an effective alternative to the private automobile, to affect land development patterns, and to increase mobility for all segments of the population. In terms of technology, these goals raise issues relative to the "automobile" character of transit, i.e., convenience, security, comfort, the need for permanence relative to development patterns, and the need for ubiquitous service capability. Each of these achievements is specific, but they all pertain to practical and important features of a public transportation system.

2. Timing. The implementation of transit may be considered in the context of short- or long-range needs, and long-range needs are at the heart of the problem for technology selection. That is, how can technology systems be selected so that they can serve short-term and long-term goals? It would appear that technology selection for short-term needs is an easier task. It is necessary to determine what is available or could be available to satisfy short-term transit needs. For comparison, long-term needs are complicated by many questions and issues that are difficult to answer. Technology selection is thus based on less solid ground and becomes quite uncertain. Because of these uncertainties, a technology approach must be flexible.

3. Environment. A final aspect for consideration in a technology approach concerns the long-term environment. That is, beyond the three goals discussed, the ultimate goal of a public transportation program is to support and stimulate the creation of a new urban living environment. That is, in the long-range future, a "new world" ought to be created that is substantially better than today's world. Transportation of the future should not be troubled by the same problems we experience today, e.g., intolerable congestion, pollution, lack of mobility. Thus, with an optimistic view of the distant future, the potentially large investments in a new public transportation system should support the development of a better environment. This is a challenge to be innovative, to have an ultimate view about the desired future environment, and to devise a plan that maximizes benefits for a long duration rather than being guided only by short-range problems.

Elements of Choice—The second major aspect of the strategy process is the elements of choice. Given a transit plan, there are various components that can be changed or manipulated within the context of a strategy. These are the matters that should receive maximum analytical attention by the professional planner and community. For a transit plan, the choice elements are as follows:

1. Level of service is perhaps the primary element of choice. The variations are many and include (a) feeder service having a dial-a-bus concept and a CBD distributor system (minimum walking distance and transfers), (b) corridor express service with feeder transit on each end, (c) park-and-ride service with express transit, (d) free fare in special districts, (e) varying headways depending on function, and (f) bus priority operations on streets and freeways.

2. The location of transit corridors is described in the plan. However, there are choices in total network location in terms of (a) timing, (b) extent (extension in a corridor),

(c) pace of station development, (d) facilities at station, and (e) creation of route structure to achieve particular service.

3. Technology or transit hardware can be varied by corridor or within major activity centers. The choice elements in technology selection include the following features: (a) vehicle type and character, (b) vehicle size, (c) guideway type, (d) control system and operating mode, and (e) accessibility of service.

Strategy Objectives—The final aspect of the strategy process pertains to a set of objectives needed to guide strategy development. These objectives are somewhat abstract. They apply to a public transportation plan. Possibly, for a specific planning area, some items would not be applicable or others would need to be added. In any event, a list of this type is needed as a basis for developing a specific strategy. The creation of this list is very similar to the task of converting planning goals and objectives into a set of criteria. The latter are end-state oriented, whereas strategy objectives tend to be means-oriented. However, they still represent an interpretation of the planning goals and objectives.

1. Showcase a new level of service as soon as possible;
2. Serve transportation needs that are created by new or desired land use development and that cannot be met by increased highway supply;
3. Tap markets not using the existing bus system;
4. Place transit in existing land use corridors in which highway capacity shortage is evident and there is no possibility to upgrade highway service;
5. Preserve or save right-of-way opportunities;
6. Demonstrate compatibility with environment;
7. Provide a means to gather information about travel response to new service;
8. Ensure immediate availability of financial resources (i.e., take advantage of grants, other special funds, etc.);
9. Preserve flexibility in the long-range system;
10. Increase transportation service relative to social objectives and their order of priority, i.e., service to particular social, ethnic, or other groups;
11. Generate the most logical route structure; and
12. Disperse transit benefits to various geographical districts.

STRATEGY DEVELOPMENT

The Dallas Public Transportation Study can serve as a case study for a time-staged strategy.

The Dallas study, completed in 1973, sought to develop a long-range transit plan with three basic goals:

1. Develop an alternative to an automobile-only transportation system,
2. Use public transportation as a land use and development-shaping force, and
3. Increase the mobility of all members of population.

The study site (Fig. 3) was the Dallas subregion, an area equivalent to Dallas County. The population was 1,327,000 in 1970 and is forecast to be 2,316,000 by 1990. Similarly, employment is forecast to grow from 647,000 in 1970 to 1,161,000 in 1990.

Dallas has enjoyed a development boom in recent years. This now is being spurred by the Dallas/Ft. Worth Airport. Based on this growth, the community concluded that there may be a need for a vastly expanded public transportation system. This attitude is based on the recognition of several issues:

1. The Dallas/Ft. Worth Airport opened in 1973. Within 10 to 15 years, traffic generated by the airport may exceed available highway capacity.
2. Building construction in the Dallas CBD is continuing, but access freeways are approaching capacity.
3. Concern for the environment, community preservation, and citizen involvement is becoming more significant. The latter especially includes a stronger voice for minority groups.
4. The new airport, in addition to normal economic pressures, will generate sub-

stantial growth in the midcities subregion, western Dallas and eastern Tarrant Counties. These patterns could be affected by the provision of increased accessibility at desirable locations.

Alternative Strategies

The strategy approach attempts to translate the components of the basic plan into a priority description in which each component is evaluated by its ability to achieve a certain strategy. Once so identified, components can be combined to maximize the achievement of those strategies deemed most important. Such combination would, of course, be also tested in terms of physical and operational logic.

For Dallas, a major goal was to closely coordinate the land use or development concept with that for public transportation. Figures 4 and 5 illustrate the recommended development concept and long-range transit plan.

The development concept reflects a compromise between a trends plan and satellite cities concept. Significant outlying multipurpose activity centers and high accessibility corridors are envisioned. The Dallas CBD would continue to be a dominant center. The transit plan parallels the concept. Strong CBD access is provided, but various cross-town routes are added to give the network a grid-like character.

These plans and the strategy objectives were used to formulate a set of alternative strategies. Each has a single major purpose; however, the strategies are not mutually exclusive. A certain amount of duplication exists indicating support between various strategy objectives. This approach to alternative strategies is used so that a wide range of possibilities is considered.

Strategy 1. Access to High Activity Centers—This focuses access on specific development nodes, the Dallas CBD and the airport. Access to these centers is provided for major travel groups, i.e., air travelers, CBD shoppers, and CBD employees.

Strategy 2. Modal Split—This strategy attempts to achieve automobile trip diversion. Transit is needed in corridors in which travel is primarily by commuters, freeways are at or near capacity, or constraints have been placed on further highway expansion.

Strategy 3. Showcase—This focuses on attempts to use transit in innovative ways to show potential and to reflect Dallas' reputation as a progressive urban area. Service is provided to unique high-accessibility corridors, new technology is used for distribution, the multiple land use concept is implemented, and right-of-way opportunities are conserved.

Strategy 4. Social Objectives—This focuses on providing transit service to transit dependents with specific service to black and Mexican-American areas. Transportation access is created between employment and residential areas.

Strategy 5. Technology Evolution—This strategy attempts to apply new technology at an early time. It employs a demonstration project approach and seeks to establish orderly evolution of transit hardware and other facilities. This also means that future options, in terms of vehicles and guideway, would be preserved as new systems become available.

Strategy 6. Land Use Concept—This strategy seeks to support a subregional development concept through variations in accessibility. The strategy attempts to complement the multipurpose centers concept, the complete communities concept, and the use of transit to encourage balanced growth patterns.

Strategy 7. Political Support—The strategy focuses on approval of implementation by the primary political decision-makers. Transit service may have to be widely distributed so that benefits are proportional to political influence. This also considers regional versus local interests.

Strategy 8. Environmental Protection—Transit might be viewed as a means to reduce negative environmental impacts because of reduced right-of-way needs (compared to freeways) and air pollution by redirecting urban development trends away from sensitive open space areas.

Strategy 9. Industrial Growth—The focus of this strategy is on the provision of transit access to existing and emerging industrial districts as a means to enhance economic growth. Particular emphasis is given to new districts or those proposed in the development concept.

Figure 2. Time-staged strategy of development process.

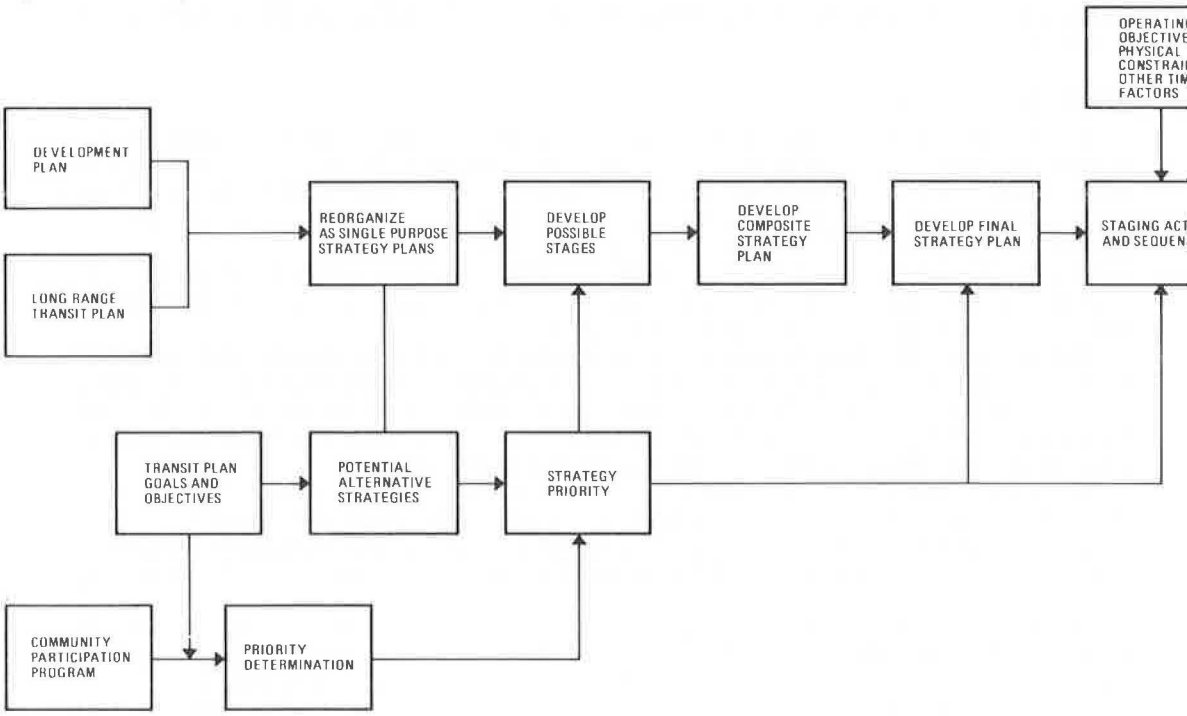


Figure 3. Dallas study area.

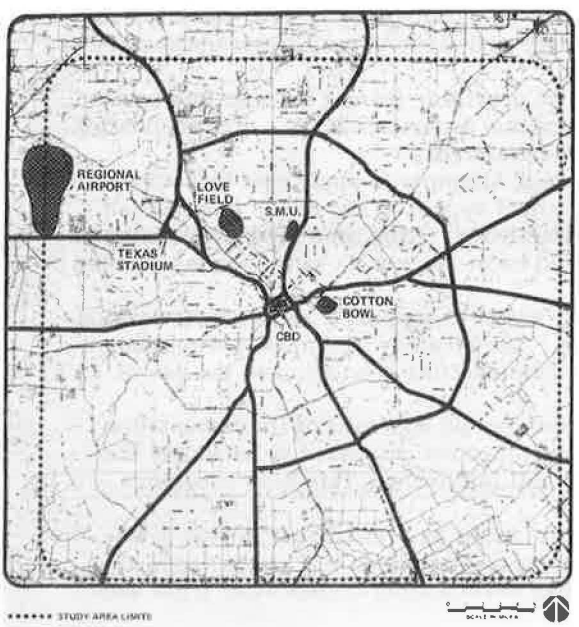
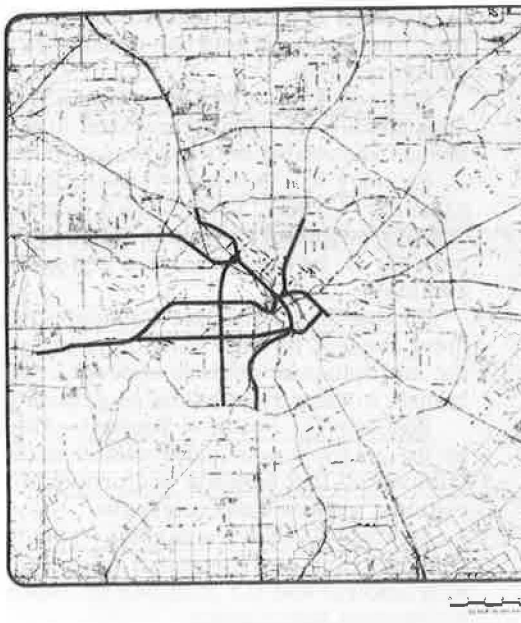


Figure 4. Dallas development concept.



Strategy 10. Facilitate Implementation of Current Plans—This strategy provides transit to support current proposals including the North Central Busway, urban tracked-air-cushioned vehicles to the airport, and the CBD transportation center plan.

Strategy 11. Economic—Under this strategy, realistic consideration is given to the availability of economic resources. The proposed transportation improvements need to be balanced with resources in terms of total amount and pace of availability.

Application of Alternative Strategies

Each alternative strategy represents a means concept; each creates a focus for continuing planning and implementation activities. The first step in translating the strategy into a specific action plan involves the conversion of the strategy into physical terms. This is accomplished by evaluating each element of the overall long-range plan in terms of its functional role to achieve the objective of each strategy. Combining various elements that achieve a given function yields a new plan. Each "strategy plan" represents a special version of the long-range plan wherein only certain portions are used. Each one is further evaluated relative to plan goals, objectives, and priorities to identify potential first and second stages for each strategy plan.

For Dallas, a series of alternative strategy plans was developed. A portion of these plans is shown in Figures 6, 7, and 8. The following brief notes attempt to describe the rationale for each:

1. Strategy 1—Social objectives (a) provide transit service to link labor force with employment from residential areas in the south, southwest, and west sections to the CBD, Stemmons Freeway commercial district, Redbird industrial district, and Grand Prairie industrial area; and (b) provide access to social service and medical institution areas (University of Texas Medical Center, Baylor University Medical Center).
2. Strategy 2—Technology evolution (a) uses North Central Expressway as a location for a busway; (b) uses Texas-183 as a route for special airport transit service; (c) uses Love Expressway for freeway flyer service; (d) provides dial-a-ride service for north Dallas; and (e) develops park-and-ride facilities at intercepting locations along three freeways serving the CBD.
3. Strategy 9—Industrial growth (a) provides high level of transportation access to Redbird, midcities, North Stemmons Freeway, and Fair Park industrial areas; and (b) uses freeway corridors extended toward the Flower Mound and Plano development areas as locations for new industry.

STRATEGY SELECTION

The preceding steps of the time-staged strategy will yield alternative strategy plans that incorporate elements of the long-range plan in a manner to achieve the planning of goals and objectives. These alternatives must be evaluated to produce one time-staged strategy as a basis for staging the long-range plan. This is strategy selection.

The selection step is composed of two parts. First, each single-purpose strategy plan is compared to determine which element of the plan is common to several strategy plans. This allows the assessment of the role each plan element could play in achieving several planning goals and objectives. The second part involves combining those plan elements that achieve high-ranking goals and objectives, i.e., achievement of strategies in proportion to ranking. The result is a time-staged strategy for the plan.

Composite Strategy Plans

A plan overlay technique is used to compare the alternative strategy plans to identify common elements. The result is a composite strategy plan, as shown in Figure 9.

For Dallas, the composite plan was mapped to show potential first stage elements of each strategy plan. The result identifies plan elements that would show a significant performance in achieving multiple goals and objectives. Plotting potential first stage elements attempts to focus attention on those that should be candidates for the first stage.

Figure 5. Dallas transit plan.

Figure 6. Strategy 1: social objectives.

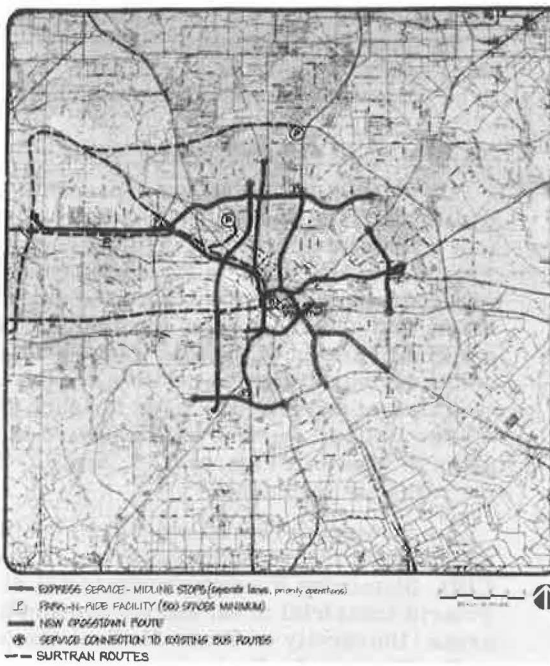


Figure 7. Strategy 2: technology evolution.

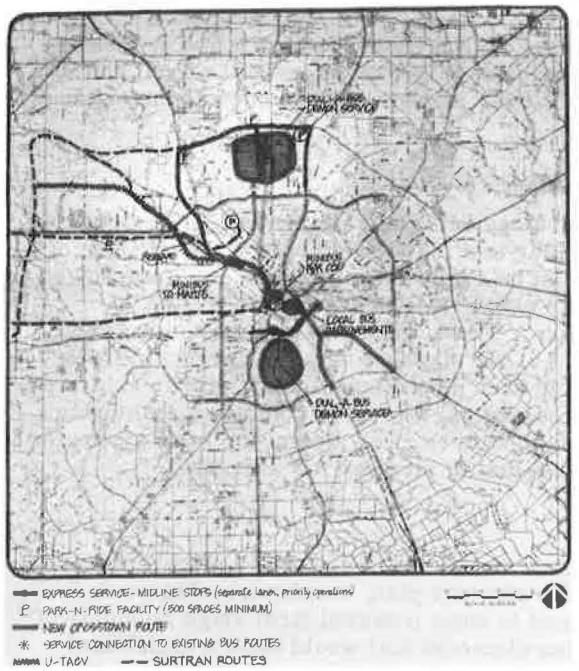
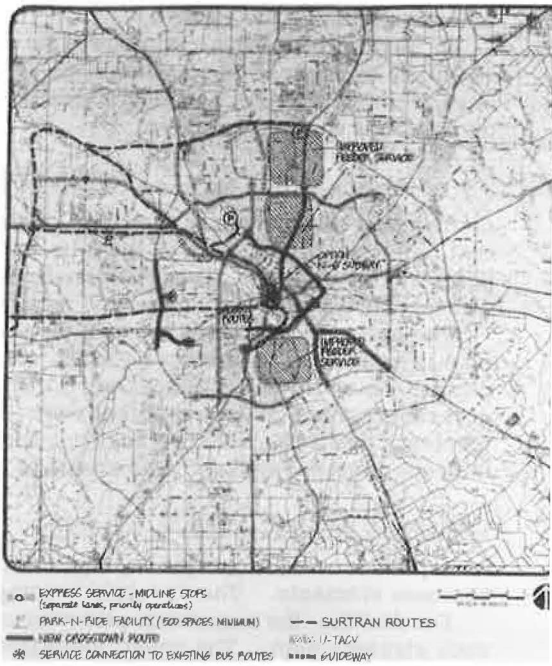


Figure 8. Strategy 9: industrial growth.



A Time-Staged Strategy

If all strategies have equal importance, the composite strategy plan can be used directly as the final strategy. However, this equality is not normally present because of priority ranking. This rank is determined by community values and judgments developed in the community participation process. When this aspect is introduced, the composite plan can be evaluated by weighting the importance of plan elements according to the ranking of strategies. The result is representative of a final strategy.

Recommended Strategy and Staging Plan—For the Dallas project, the attitudes expressed by local planning officials and citizens concerning the relative priority of planning objectives indicated that strategies 1 and 4, high activity center access and social objectives, had the highest priority. Strategies 2 and 5, modal split and technology evolution, had second highest priority.

With this finding and the composite plan analyses results, the relative value of each element of the plan was assessed; i.e., each one was described in a priority listing for consideration in successive plan stages. On this basis, preliminary staging for the Dallas subregional transit plan was devised. This is shown in Figures 10, 11, 12, and 13.

The overall concept for the recommended staging plan is that major improvements would begin in the central parts of the city and move outward by corridor according to apparent trends in urban growth. The provision of increasing transit service levels employs a pattern of establishing transit service first with buses, then with the more expensive guideway. This attempts to reduce the uncertainty and risk in major investments. The general sequence of staging can be summarized as follows:

1. Stage 1: Upgrade level of transit service by using buses on freeways, provide improved CBD access including initial phases of a transit mall, introduce satellite parking concept, provide new crosstown bus routes for access to Stemmons Freeway district and medical center and from north Dallas to Texas 183 corridor, and introduce special bus service to new regional airport.
2. Stage 2: Extended freeway express bus service to include all corridors within I-635, add more crosstown bus service, develop and implement demonstration dial-a-ride bus in different socioeconomic areas, introduce secondary transit service in CBD and Stemmons Freeway corridor, and implement urban tracked-air-cushioned vehicle (demonstration project) between CBD and regional airport.
3. Stage 3: Develop first sections of guideway system along North Central Expressway and south into Oak Cliff including first CBD subway along east-west corridor, add more crosstown service, develop permanent collector system in north and south corridors based on dial-a-ride results, and improve secondary transit in the CBD.
4. Stage 4: Develop north-south subregion in CBD and extend east and west subway to Fair Park, Baylor, and West Dallas areas; add stations on urban tracked-air-cushioned vehicle route; expand collector systems; and extend transit coverage in outer areas of region.

Time-Staged Decisions—The recommended plan stages and the individual projects included represent the general state of the transit service system at various points in time. These states can be achieved by undertaking a series of actions. These represent the final part of the time-staged strategy. The selection of actions would be guided by the strategy or combination strategy and would be aimed at the physical or operational performance illustrated by the plan stages. The actions are the means, and plan stages are the ends.

Further, the recommended plan stages are an outgrowth of the best knowledge available at the time. However, as observed earlier, there is a significant degree of uncertainty in both technical and public policy matters. Therefore, the staging plan and the implementation actions must be viewed as flexible products of the planning process.

Flexibility or a propensity to change plan recommendations could produce confusion and disorder in the implementation period that could destroy any chances to achieve the desired goals and objectives. Flexibility needs to be controlled in an orderly way. The selected strategy creates an overall framework for such control. This is supplemented by a management process that guides and coordinates the various actions undertaken during each plan stage.

Figure 9. Composite strategy plan.

Figure 10. Preliminary Dallas transit plan—first stage.

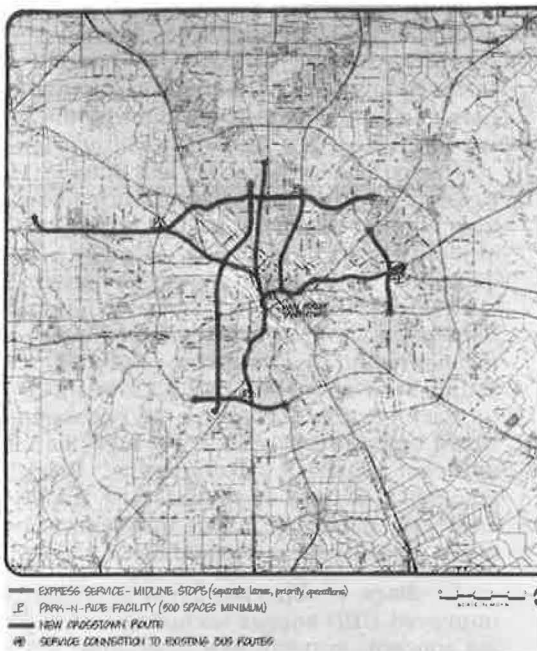


Figure 11. Preliminary Dallas transit plan—second stage.

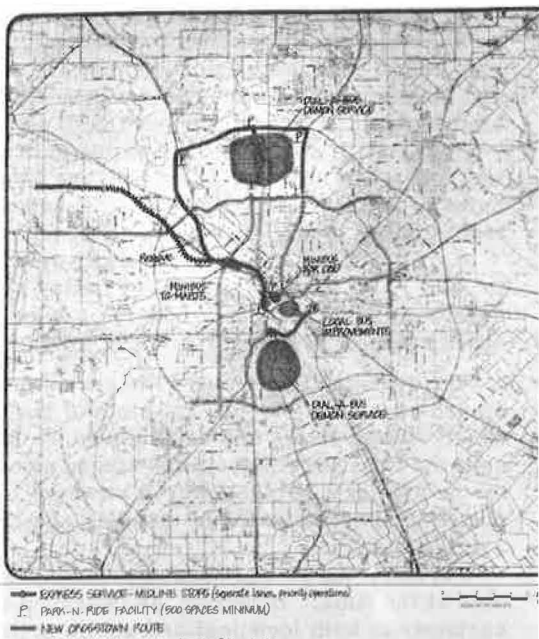


Figure 12. Preminary Dallas transit plan—third stage.

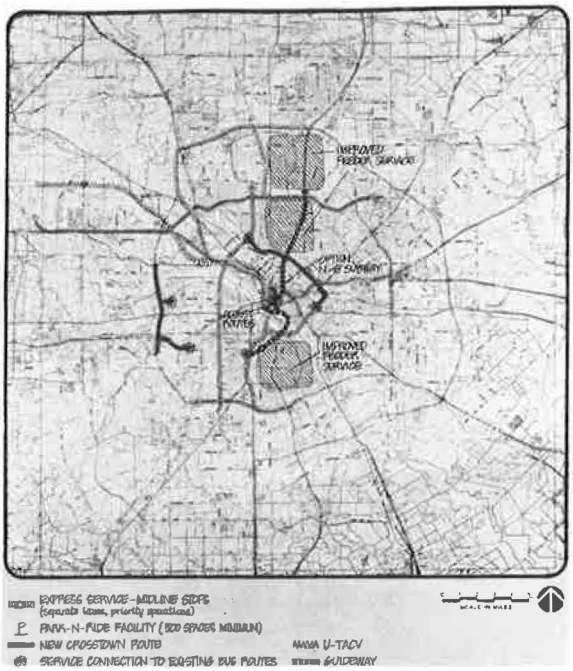
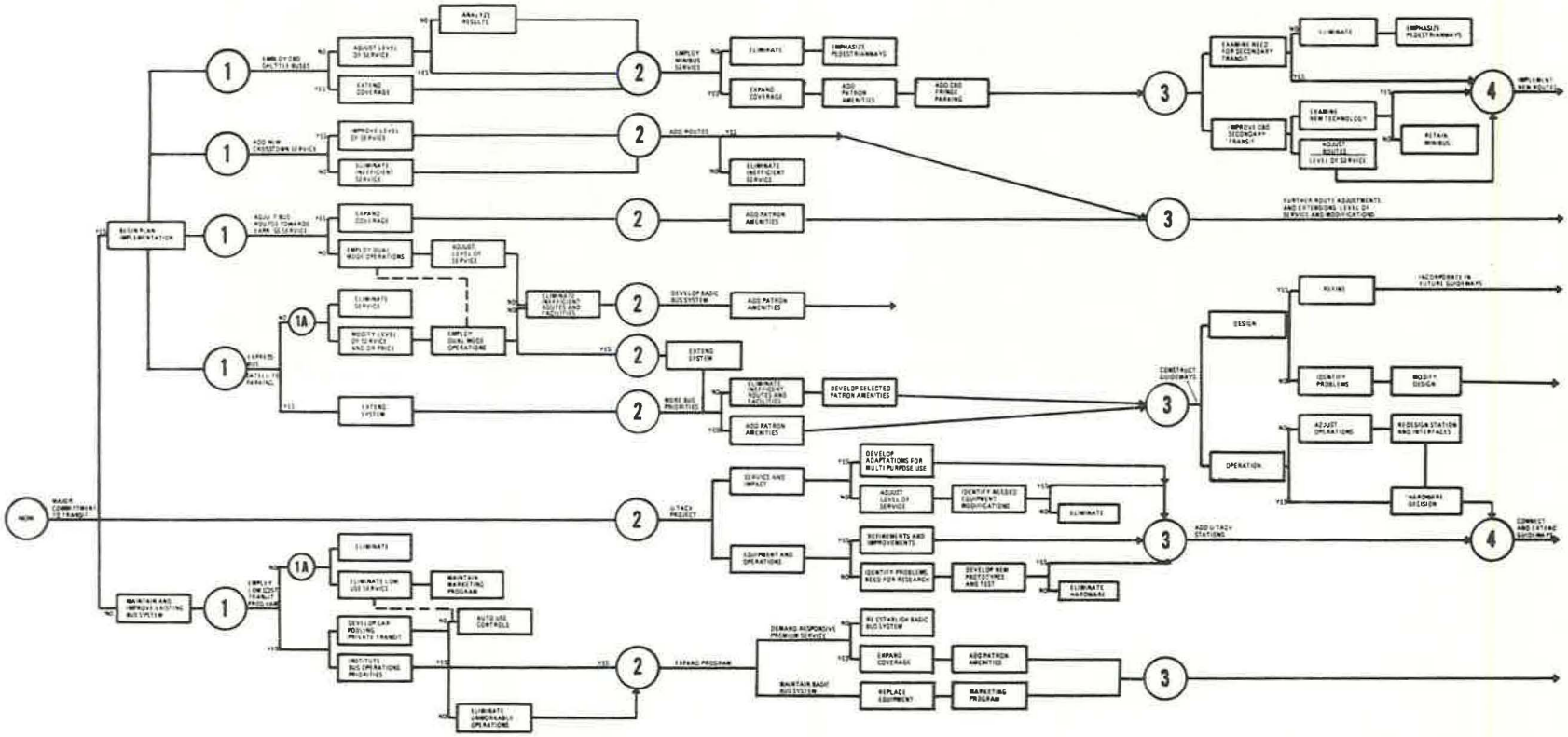


Figure 13. Preliminary Dallas transit plan—fourth stage.

Figure 14. Time-staged decisions.



The management device suggested is a time-staged decision system. A general outline of this system is shown in Figure 14. The time-staged decision concept provides for a logical sequence of detailed activities occurring in each stage.

As suggested by the figure, the action program for each stage is segregated into various sets. Each one is organized according to a major functional subsystem of the transportation plan. For Dallas, these were the guideway system, crosstown service, collector-distributor service, urban tracked-air-cushioned vehicle demonstration project, and a low capital investment bus system (as an alternative to the high investment program).

With each action set, there are identifiable sequences of activities. They attempt to deal with the various technical uncertainties and the continuing influence of a community participation program. The decision concept is derived from the multiple-decision points in this management system. There are several go/no-go points or decisions relative to a general course of action. Whatever the actions or decisions in this network, they would be guided by the time-staged strategy selected for the planning program. Hence, flexibility is provided but with consistent direction.

Because community priorities can significantly change over time, the selected strategy needs to be tested or evaluated on a regular basis. Within the decision system, this would be done at or near the completion or beginning of any stage, before commitment was made to a high investment project.

CONCLUSIONS

The time-staged strategy approach offers a means to improve the planning process. It provides a means to maximize the effect of preselected goals, objectives, and community participation on implementation action. The actions selected for the staging program are then a more explicit interpretation of citizens' desires for their community.

The use of strategy creates an overall framework that guides the selection of actions. The accent on actions reflects the emphasis on implementation. Stages are merely system states during the implementation process. This orientation gives emphasis to achievement of goals and objectives. Further, by creating a framework, the process has flexibility. Specific actions can be modified as values change or as new data become available.

These attributes are needed in the planning process. Urban problems are difficult; in many cases, it is very difficult to develop confidence in long-range plans. Such plans should be developed to guide short-range actions. However, if long-range plans are questionable, short-range action still cannot be forestalled because of the pressing need for transportation service. The strategy approach is workable in this context and allows the planning-implementation process to move forward.