

1. Efficient management of scarce resources (energy, financial, social, community, and natural),
2. Preservation of the existing transportation system and maintenance of service improvement gains made so far,
3. Emphasis on possible rather than desirable standards and less emphasis on capital intensive improvements,
4. Focus on corridors to better analyze trade-offs between modes,
5. Better education of the public toward an energy conservation ethic,
6. Increased emphasis on land use control to protect highway utility (existing functional class and performance level),
7. Early and continued public involvement, and
8. Effective surveillance and evaluation through a clearly stated policy, a set of objectives that implement the policy statement, and criteria that can measure success of the policy.

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New Approaches in State Transportation Planning

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This paper provides a review of significant developments by various state agencies in two key areas of statewide transportation planning: (a) public involvement in plan and program development and (b) financially constrained state highway system plans. Brief synopses are presented of the statewide public involvement processes in Minnesota, Iowa, Arizona, and Louisiana and the plan development processes in Tennessee, South Dakota, California, and Texas. Some general similarities among the eight planning processes are discussed. The activities in these two areas reflect the realization that planning is an increasingly important resource. State transportation agency managers and state legislators are seeking public input on key elements of statewide planning, such as identification of issues, evaluation of policy options, and development of plans and programs. Also, managers and legislators are looking for

(a) planning options that satisfy travel desires but also recognize limited financial resources and (b) methods of controlling the planning, programming, and letting schedules. The desire for public involvement is a recognition of the need for public officials to respond to transportation problems identified by the public and an attempt to involve the public in some of the complexities of the transportation program.

A series of statewide highway planning seminars was held throughout the country during 1977 and 1978. They were sponsored by the Federal Highway Administration (FHWA) in cooperation with state departments of trans-

portation and state highway agency planners. The seminars focused on basic concepts, present procedures and problems, and significant new developments in state-wide highway planning. Although the focus was on highways, intermodal relations and interagency and citizen involvement in planning were also covered.

This paper concentrates on two subject areas covered by the seminars. We believe that these topics represent significant new planning emphases: (a) public involvement in plan and program development and (b) financially constrained highway system plans. The paper describes specific examples of what a few states are doing in each area. The criteria by which the examples were chosen were (a) the availability of a fairly specific level of documented information and (b) the ability to illustrate useful and important concepts and techniques.

PUBLIC INVOLVEMENT IN PLAN AND PROGRAM DEVELOPMENT

The large body of literature on citizen involvement is mainly in regard to urban and project-level issues. The need to bring out concepts and experiences pertinent to state-level system planning and programming was a specific concern of the seminars. The concern was timely. Several noteworthy efforts have been made to obtain public input to the development of state transportation plans and programs. This section describes methods used to develop public inputs to transportation plan development in Minnesota, Iowa, and Arizona and to develop inputs to capital improvement programs in Louisiana.

Minnesota

Minnesota's new department of transportation places a strong emphasis on early and continuous public involvement in the development of the state transportation plan. The plan development process was carried out in three distinct phases: (a) Phase 1 developed the problems, issues, and concerns that will be addressed by the plan; (b) phase 2 developed alternative ways of dealing with the issues; and (c) phase 3 developed a draft and final plan.

The public input for phase 1 was gained in three ways: (a) Letters were sent to legislators, elected representatives, interest groups, and citizens; (b) public meetings were held in each regional planning district and in the metropolitan area; and (c) a brochure was prepared that requested information from the general public on transportation issues. Over 600 letters and returned brochures were received. These and statements at the regional public meetings identified over 4000 issues. These were reviewed and grouped into the 13 basic categories listed below:

1. Energy;
2. Economic development;
3. Environment;
4. Land use concerns;
5. Safety, health, and recreation;
6. Problems of the elderly, handicapped, and other transportation-disadvantaged persons;
7. Funding or financial concerns;
8. Regulations;
9. Intermodal issues;
10. Goods movement;
11. Decision-making strategies;
12. Operations and maintenance; and
13. Specific transportation projects.

The specific transportation projects covered all

modes, not just highways. For example, there were specific recommendations about barge terminals, bus and commuter rail services, bikeways, and airport improvements. Recommendations were both positive and negative, and sometimes more complex than that. For instance, recommendations were made to improve route X as a four-lane expressway or as a two-lane facility, as well as some recommendations not to improve route X as a four-lane expressway.

Each of the 12 non-project-oriented areas listed above includes a wide range of specific issues. For example, in the financing and funding area, issues covered included modal or multimodal transportation funds, waterway-user charges, rail branch-line subsidies, and potential Amtrak competition with intercity buses. The details on the various areas and associated issues are covered in the published phase 1 report (1).

Phase 2 of Minnesota's process involved development and evaluation of alternative ways of handling the issues that had been identified in phase 1. Issue teams were established to develop background information and policy alternatives for each issue. These issue teams included planning staff from the Minnesota Department of Transportation as well as other interested persons.

Advisory task forces were established in each of the state's 13 planning regions to evaluate the policy alternatives developed by the issue teams and to indicate their preferred alternatives. They also identified transportation project needs and identified and ranked project selection criteria. They sponsored public meetings in each region to obtain additional inputs.

The published phase 2 report (2) documents the development of the issues. Discussion of each issue includes background data, a list of policy alternatives, the impacts of those alternatives, and a tabulation of the alternatives selected by the regional task forces. Policy alternatives selected by the regional task forces for the issue of alternative revenue sources are shown in Table 1.

The published phase 2 report did not cover all issues in detail. For those issues not covered in depth, the report provided a mailback postcard so that the reader could request the detailed material not included in the report. Phase 3 of Minnesota's plan development, now under way, is a draft and final plan. As with the earlier phases, this will provide for substantial outside involvement, including the regional task forces and a series of public meetings throughout the state.

Iowa

Iowa has 10 regional citizen advisory councils as one means for getting citizen input to transportation planning. When the state developed its first statewide transportation plan (Transplan 76), it established three statewide advisory councils, which represented private, government, and specific interest sectors. These original councils recommended establishment of regional councils to obtain more representative involvement and geographic coverage.

Membership in the councils is open to anyone interested in participation, and the latest reported membership was 950. Each council elects its own chairperson. Meetings are held bimonthly. Some examples of areas in which citizen advisory councils have provided input include the identification and ranking of critical transportation issues, review of a waterway-user charge proposal, review of various specific modal and terminal planning studies, and review of the five-year transportation improvement program.

One such review is worth mention. Comments from citizen advisory council members on a regulatory study

Table 1. Responses of the regional task forces to the question: What alternative sources of revenue (if any) should be used to fund transportation programs?

Region	Gasoline Sales Tax	General Funds	Increase Gasoline Fees	Increase Vehicle Fees	Dedicate Vehicle Sales Tax	Public Safety from General Funds	Increase Sales Tax
1	X			X	X	X	
2 ^a							
3	X	X		X	X	X ^b	X ^c
4	X				X		
5	X				X	X	
6E	X				X	X	
6W					X	X	
7E	X				X	X	
7W	X				X		
8 ^d			X		X	X	
9		X	X		X	X	
10	X		X	X	X	X	
11					X	X	

^aDid not consider issue.

^bThe recommendation of the region 3 task force was divided among a number of alternative revenue sources. Most agreed that revenue from the motor vehicle sales tax should be assigned to transportation and that the department of public safety should be funded from the general fund rather than from the state trunk highway fund.

^cThe region 8 task force agreed that sales tax money generated by the sales of motor vehicles should be dedicated to transportation purposes. Members suggested that 50 percent of these receipts go to the department of public safety and the other half to the highway trust fund. Additional funds for public safety would then come from the general fund. In addition, the task force suggested that 3 cents instead of 4 cents of the gasoline tax revenue go to the federal government and that 10 cents instead of 9 cents go to the state.

indicated significant difficulties in understanding the material. Subsequent detailed review of the material by council members and Iowa Department of Transportation staff helped to develop a report that the department of transportation believes will be easier for the public to comprehend.

Although Iowa makes intensive use of its citizen advisory councils, the councils are not a substitute for more general public involvement. The state also holds informal public meetings to obtain input from the general public on its plans and transportation programs and more formal public hearings for key planning products (e.g., state rail plan).

Arizona

In the early stages of development of its first multi-modal transportation plan, the Arizona Department of Transportation scheduled a series of public workshops throughout the state. The considerable preparation for these workshops began with the development of the Arizona Transportation Directions report (3), which provided background information on Arizona's transportation system and limited projections and indication of the wide range of possible future transportation directions.

To publicize the workshops, letters of invitation and copies of the Arizona Transportation Directions report (3) were mailed to government officials, interest groups, and citizens. Flyers were mailed to communities for posting in public locations, and about 1200 telephone calls were made to invite individuals to the meetings. Press releases sent to the media resulted in some 50 newspaper articles and spot announcements from about 25 radio stations. Each of the 18 communities throughout the state held workshops (Tucson held two). Altogether, about 800 people attended; average attendance at individual meetings ranged from 15 to 150.

At the start of each workshop, Arizona Department of Transportation personnel made a brief explanation of the workshop purpose, followed by a slide presentation based on the Arizona Transportation Directions report (3). Participants then broke up into small informal discussion groups of about 8-14 individuals. An Arizona Department of Transportation representative was in each group to encourage discussion on broad transportation questions. Discussions were taped, and a reporter was selected from the participants in each group. At

the conclusion of the group discussions, participants convened in one large group to hear the reporters summarize the results of the discussions. Individuals were then given the opportunity to make additional comments.

The results of these workshops are given in another report (4). This report includes a list of issue areas, analysis by issue, and a proposed action on each issue. An example of the analysis and action on the issue of coordination of public transit services follows:

Coordination of public transit services was a frequently mentioned issue. Problems cited include (a) schedule connections between intercity services; (b) schedule, facility, and lack of service connections between intercity and urban services; and (c) coordination among urban services. Some stated results of these problems were long (timewise) trips, which often include long layovers, inability or inconvenience in completing trips, and inefficient use of vehicles because of many single-purpose services (e.g., elderly, handicapped, and school bus services).

The action chosen is that the Arizona Department of Transportation will, as part of its public transit planning program, coordinate with transit operators, the Arizona Corporation Commission, and users to identify and seek solutions to specific service coordination problems.

Louisiana

Recent legislation in Louisiana (Act 334 of 1974) has defined specific roles for the Louisiana Department of Transportation and Development and for the legislature in the development of the state's highway construction program. By doing so, the law has also provided an explicit and open forum for public input.

The act requires the department to evaluate needs, establish priorities, and prepare a preliminary construction program. The legislature's role under the act is carried out through its Joint Committee on Transportation, Highway, and Public Works. This committee gives the department estimates of available program funding, conducts public hearings on the proposed program in each highway district, reviews comments, recommends changes to the department, reviews the final program, prepares implementing legislation, and monitors progress in program implementation.

Prior to the hearings, the department sends advance copies of the preliminary program to each highway

district; the public hearing notice advises that the document is available for public inspection. The joint legislative committee mails advance copies to each legislator. The legislative committee conducts the hearings; however, department staff are available to answer technical questions. Not only does the public have the opportunity to provide inputs, but the elected representatives also have the opportunity to appear in front of their constituents and plead their cases before the committee. An added benefit is that the committee has gained improved insights into the highway problems of the state.

FINANCIALLY CONSTRAINED HIGHWAY SYSTEM PLANS

The shortage of funds for capital improvements is one of the major realities of transportation planning today. This has led several states to appraise what they can do to improve transportation service and yet recognize the inescapable relationships among project costs, funding levels, and the size of the system for which they are responsible.

Four states have varying approaches for consideration of limited resources in their statewide plan developments. Tennessee uses a series of alternative needs studies that have variations in standards and improvement types to develop the state highway plan. The alternative plans and various financing packages provide the decision makers with planning options for their evaluation and consideration. South Dakota developed a comprehensive way, on a route basis, to appraise and report costs of alternatives in relation to funding resources. This method, although not conceptually unique, seems to have merit because of its ability to communicate, in a very understandable way, the realities of the relations among standards, length of road, and funding levels. California and Texas' financially constrained plan-development process, although reported in the literature (5, 6) is also reviewed briefly in this paper. Specific emphasis is given to the Texas management process that ties the system development policy to the program of improvement projects. Note that the material presented in the system plan development concept was used in the four states at one point in time. These approaches have been or probably will be modified in the future; however, we feel they have had tremendous influence on the development of the highway program in each state.

Tennessee

Tennessee, as a part of its state transportation planning effort, did a traditional needs study with one exception: They determined improvement costs based on three alternative 1995 systems in which scope of improvement program and standards were varied. The three alternatives were titled desirable, American Association of State Highway and Transportation Officials (AASHTO), and tolerable (7). The desirable system is based on the provision of a supplemental freeway system for the majority of the 2620 km (1625 miles) of principal arterials. The AASHTO system is based on the state's current highway design standards not supplemented by a freeway system. The tolerable system differs from the other two systems in that arterials would be improved only to the extent that they accommodate adequately an average highway speed of 88 km/h (55 mph) throughout the state. The total system costs in 1995 and the revenue deficiencies anticipated for all Tennessee highways and streets for the three alternative systems are given below.

System Alternative	Plan Cost (\$000 000s)	Revenue Deficiency (\$000 000s)
Desirable	13 347.0	8215.2
AASHTO	11 083.3	5951.5
Tolerable	8 906.3	3774.5

The following assumptions were made for the development of the revenue deficiencies:

1. Current highway revenue sources continue to be applied to the highway system,
2. Travel trends continue at present rate, and
3. New automobiles will achieve a 40 percent increase in fuel efficiency by 1985 over the efficiency of 1975 automobiles.

The traditional financial base for highways, fuel tax per liter, was examined for the funding packages. From an inflationary standpoint, this financial base was determined to be inadequate during periods of high inflation. A preferable tax base that is less vulnerable to inflationary pressure would be a tax on the percent of value of fuel sold.

Several funding packages were developed that are linked to the system alternative. Some sample funding proposals are illustrated below. These various alternative 1995 highway system plans and associated alternative funding packages provide options for the necessary action to address the highway program in the future (note: 1 cent/L = 3.8 cents/gal).

System Alternative	Fuel Tax Increase Only (¢/L)	Fuel Tax Increase Only (%)	Fuel Tax Plus Vehicle Registration (% + \$/vehicle)
Desirable	7.45	29.7	17.8 + 75.00
AASHTO	5.40	18.2	9.5 + 55.00
Tolerable	3.42	7.1	4.3 + 7.00

South Dakota

South Dakota faced increased construction and maintenance costs, increased backlog needs, and a predicted cash-flow deficit in 1980. The state decided that the financial and functional needs picture would require public and legislative exposure if an impending crisis was to be averted. So, the state had two major objectives for its needs identification process (8) and target year improvement plan: (a) The procedure must be capable of producing output in a short period of time and (b) the procedure and output must be understandable to the public. As a result, a route-by-route analysis process was developed. The route improvement plan provides the following information:

1. An approximation of the year the level of serviceability of each segment of highway regresses to the point that some improvement is required,
2. An analysis of the alternative level of improvement that might be applicable for each project (the alternative levels of improvement considered are spartan, moderate, ultimate, and "downscoped"; to determine these alternatives, the existing conditions, geometrics, and functional classification are analyzed and evaluated),
3. An estimate of the construction cost for each alternative level of improvement being considered,
4. A tabulation of the number of kilometers and the estimated construction cost for each of the alternative levels of improvement (the information is stratified by the year in which the serviceability is anticipated to regress to an intolerable level), and

5. A financial forecast of projected revenue anticipated for the route.

Definitions of the alternative levels of improvement follow. Spartan improvement is intended to maintain the status quo of the facility by extension of the service life of the surface 8-12 years without improvement to the general geometrics. This improvement would normally include a minimum leveling course plus a 3.5-cm (1³/₈-in) bituminous overlay. The cost of construction of the structures that are in poor condition and the structures that are narrower than the driving lanes will be included in this level.

Moderate improvement is intended to improve the load-carrying ability of the highway and extend the service life of the surface by 17-20 years without improvement to the general geometrics. This improvement would normally include a 2.5-cm (1-in) leveling course plus a bituminous overlay of sufficient depth and strength to allow the legal loads to be hauled year round. The cost for improving structures in poor condition will be included in this level. Also, costs will be included for widening structures that have widths less than the driving lanes on minor arterials or less than the driving lanes plus 1.22 m (4 ft) on principal arterials.

Ultimate improvement will improve the facility to current design standards. Downscoped improvement is based on designs that provide for more rolling grade lines, not surfacing the full shoulder width on previously graded projects, steepening the shoulder slopes from 6:1 to 4:1, constructing narrower shoulders on new projects, narrowing the right-of-way, and doing shoulder widening and resurfacing rather than complete reconstruction.

The US-14 sample (Figure 1) demonstrates some of the output of the planning process. The financial forecast of revenue for study purposes on the route was a proration of 1977 state revenues for the federal-aid primary highway system based on the ratio of length of US-14 to the total length of state highways. The graphic plot in Figure 1 shows the various alternative levels of improvement for US-14.

Since the gap between projected revenues and projected construction costs is wide, the state decided that highway designs must be downscoped if tolerable driving conditions are to be preserved on all state trunk highway systems. The state found that even a 0.514 cent/L (2 cents/gal increase in the gasoline tax every other year for the next 20 years will not permit enough capital to consider improvements at a level greater than the downscoped design alternative.

The route studies presented the state with a picture of total state highway needs based on alternative levels of improvements. This information and a series of revenue proposals, which considered various funding alternatives, were forwarded to the state legislature. Table 2 shows some of these proposals (9) and the anticipated shortfall of revenue in the year 2000.

California

In the late 1960s, problems developed in the very successful California highway program. Some of these problems suggested an approaching crisis:

1. Increases in vehicle travel and associated congestion problems;
2. Rising costs due to inflation;
3. Repeated upgrades of design standards and expanded project scope;
4. Leveling off of revenue, including reduction in federal dollars and an effective reduction of state money as the rate of travel growth was less than the rate of inflation; and
5. Growing public concern and questioning of the impact of the highway program on neighborhoods, community development goals and objectives, and quality of the environment.

Figure 1. South Dakota-US-14 route analysis.

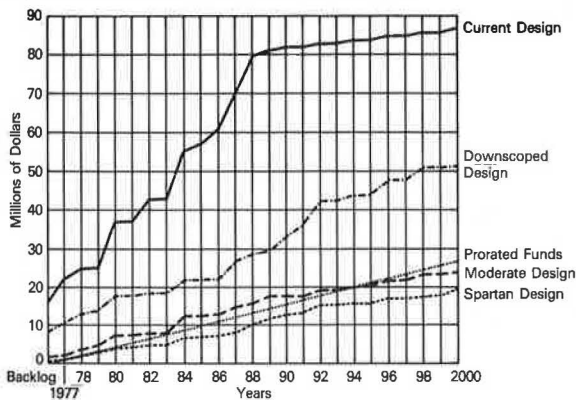


Table 2. South Dakota revenue proposals.

Funding Proposal	Revenue Shortfall (\$'000 000s)
Current funding	2611
Current funding + \$10 million/year	2070
Current funding + \$0.02 gasoline tax in 1978	2130
Current funding + \$0.01 gasoline tax in 1978, 1980, 1982	1990
Current funding + 4 percent tax + \$150 million bonding	1586
Current funding + 4 percent tax + \$300 million bonding	1397
Current funding + \$0.10 gasoline tax in 1978 + \$0.02 in 1990 + \$0.02 in 1995	+28*
Current funding + \$0.02 every other year	150
19 percent of consumer price of gasoline	355
16 percent of consumer price of gasoline	991
Current funding + 4 percent sales tax on gasoline	1773

*This proposal generates \$28 million in excess revenue.

This crisis became more apparent when the total program was evaluated. Despite capital improvement expenditure in excess of \$600 million/year, the highway needs were outstripping the rate of highway development. Backlog needs had increased from \$2.8 billion in 1960 to nearly \$10 billion in 1972 and were expected to reach \$20 billion in 1980.

This problem of increasing backlogged needs was, on analysis, revealed to be the result of the existing project-by-project planning process. This process consisted of (a) identifying deficiencies, (b) developing projects to respond to deficiencies, (c) adding projects to a needs inventory, (d) beginning project development on new and 10-year needs, and (e) scheduling projects for construction as funds became available. This project-by-project approach was highly effective in the early stages of the highway program and produced an excellent highway system in the 1950s and 1960s.

Some of the weaknesses uncovered in the project-by-project planning process were its deterministic design policies, which forced the designer to plan large, expensive improvements for a deficiency; its assumption of unlimited funding; and its lack of a system orientation. As a result, a system-planning approach was developed by a consultant for the California Department of Transportation (10). The objective of the system-planning approach was the establishment of a

balanced future highway system that could be funded and controlled.

A generalization of this new system approach is illustrated in Figure 2. It departs from the project approach by the addition of one step in the planning process—planning controls. The controls are basically: (a) forecasted funding limits or targets and (b) criteria for development and evaluation of project proposals to obtain a system-balanced level of service. Details of the system-planning approach, including guidelines for maximum system benefits and flow diagrams of the revenue forecasting and economic evaluation, are discussed in the literature (5, 10). However, worthy of note is that the system-planning approach provided at

Figure 2. California system-planning process.

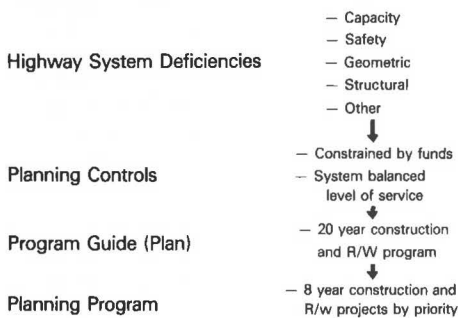


Table 3. Construction needs by program element.

Program Element	Cost (\$000 000s)	
	1974	1977
Land and building maintenance	-	30
Bridge reconstruction	22	161
Roadway reconstruction	53	315
Highway planting restoration	-	34
Safety roadside rest area restoration	-	2
Resurfacing	-	73
Protective betterments	6	43
Safety improvements	22	397
Noise attenuation	-	381
Highway planting	-	74
Roadside rests	5	45
Vista points and roadside enhancement	-	16
Traffic operational improvements	132	621
High-occupancy vehicle facilities	11	724
Bicycle facilities	-	24
New highway construction	8295	3698
Miscellaneous	2	9
Total	8548	3647

Table 4. Documents for controlling the highway program.

Variable	System Plan	Letting Plan	Advanced Letting Schedule
Key element	Identifies most desirable system improvement projects and their scope and concept in light of funding constraints and systemwide benefits	Defines high priority projects that should proceed to letting within the next 5-year period, given the known funding constraints	Identifies specific projects that are ready and planned to be let within the next year
Purpose	Provides for a reasonably complete, functioning network that maximizes benefits to the system within finite time period and funding outlook Provides a mechanism for recording decisions and communicating intentions of the department Limits work activities to projects that are likely to be financed	Focuses work efforts on the most critical projects so that they may proceed to letting as soon as practical Prevents diversion of scarce design and planning resources to projects that cannot be constructed for many years	Provides a vehicle for managing the control of letting functions
Project activity	Location surveys and determination of right-of-way data Project design, route, and environmental studies	Plans, specifications and estimates Preparation of right-of-way data	Submission of plans for final review and approval
Time horizon (years)	20	5	1
Frequency of update	Every 4 years	Annually	Quarterly

least 30 percent greater service than did the project approach. This is reflected in savings in operating, delay, accident, and maintenance costs.

California more recently applied the system-oriented approach to a legislatively required needs study (11). The comparison of needs by improvement type for the 1974 (project approach) report is summarized in Table 3.

There are two major differences between the two needs reports. In the 1974 report, deficiencies in the system were eliminated by construction of new facilities or reconstruction of existing facilities to full modern standards. The 1977 needs estimate contains more proposed improvements but fewer highways on new location. The 1974 estimate contained 1500 projects, compared to 6000 in the current estimate. However, the current estimate includes 480 highway proposals on new location whereas the 1500 projects in 1974 were almost all highways on new location. The 1974 needs were directed almost entirely at capacity problems. Underlying structural, safety, or operational problems added priority for highway improvements but were not usually problems for correction in themselves. The latest needs report was much more comprehensive and included various operational, environmental, and multimodal improvements.

Texas

The Texas statewide planning approach was similar to the California process, including development of revenue forecasts, identification of needs, development of design alternatives, assemblage of subsystem plans, evaluation of subsystem plans, development of the statewide highway plan, and control of the program. Public input to the subsystem plans is gathered through public hearings and meetings with local officials. Texas placed more emphasis than California did on a system to manage and control the short-range capital improvement program and increases in available revenue.

Three documents were developed to ensure that commitments, plans, and work efforts matched financial realities:

1. The system plan—a 20-year financially constrained long-term planning tool and basic control documents,
2. The letting plan—the short-range plan of projects that rank highest in priority and that can be constructed in the next 5 years, and
3. The advance letting schedule—the projects scheduled for construction in the next year.

Table 5. Application of preference criteria.

Preference Criteria	Set Department of Public Safety Budget at \$20 Million/Year, Not Taken from State Highway Funds	License Fees		Motor Fuel Taxes		Sales Taxes			
		Increase Fixed Rate on Weight Basis	Adjust Basis to Change in Vehicle Value	Increase Fixed Rate of Tax per Liter	Adjust Rate on Basis of Price	Transfer Motor Vehicle Sales Tax to State Highway Funds ^a	Transfer Parts Sales Tax to State Highway Funds ^b	Special Funds ^c	Refinery Tax
Tax highway users	X	X	X	X	X	X	X		
Provide inflation protection	X		X		X	X	X		
Minimize interaction with other agencies		X	X			X	X	X	
Minimize appearance of large, abrupt tax increase	X		X		X	X	X	X	
Provide vehicle to potentially take advantage of state surplus	X					X	X	X	

Note: X = satisfies criteria.

^aCurrently based on vehicle price.

^bCurrently based on price.

^cIncludes revenue sharing, general fund allocation, and grants.

The schedule for updating the system plan, letting plan, and schedule is 4 years, 1 year, and 3 months, respectively. These control documents and further description are reflected in Table 4 (5).

Two system plans were prepared for the 20-year plan. The first is based on the current funding outlook and the second assumes a modest increase in long-term revenue sources. Some revenue sources that were considered and preference criteria used are shown in Table 5 (5). Four revenue packages were developed that include various combinations of revenue sources. An essential feature of each package is inflation protection. Revenue recommendations were forwarded to the governor and the legislature. The funding approved in April 1977 guarantees that the department of highways will receive a fixed sum of money that includes an inflation adjustment factor based on the highway cost factor. The funding sources are a combination of dedicated highway user revenue and general funds.

SUMMARY

Several states have mounted a serious effort to get public input to transportation plans and programs. The inputs themselves have pointed to specific issues to be addressed by the plans as well as indicating specific projects and kinds of projects that the public does and does not want. Such inputs are likely to help guide planning along a more productive path.

Activities in the states discussed reflect the following:

1. Early consideration of future financial resources in the highway planning process and use of those forecasts in planning, programming, letting, and controlling of the highway improvement programs;
2. A willingness to depart from deterministic design standards and to consider a wider range of alternatives and project improvement types;
3. An attempt to give the legislature and the public information in a simplified format;
4. A desire to provide management and legislators with optional programs and funding packages for decision-making deliberations; and
5. An effort to seek revenue sources that provide inflation protection.

The eight state planning processes reviewed indicate some variation in approach, yet they also offer some consistency. The variation is not unexpected because each planning program is directed to respond to specific

conditions in the particular state. Threads of consistency are generally visible in each process. First is the focus toward the development of a short-range capital improvement program for improving transportation service. This program, which has an annual letting or budget, serves as the end product of the statewide transportation planning phase of the transportation improvement process. Next is the strong interest shown in financing—this interest is in either building a case for additional funds or in making maximum use of the financial resources currently available. Last, and probably most important, is the interaction of state legislators and the public regarding issues, policies, and programs.

In addition to those consistencies, each statewide planning program appears to follow a broad, overall planning process. The key sequential activities of these statewide transportation planning processes are as follows:

1. Policy development—problem and issue identification, issue analysis, alternative policy investigation, and policy selection and action; and
2. Plan and program development—transportation service deficiency identification, planning controls for deficiency analysis (guidelines for service improvements and financial constraints), target-year transportation plan, priority determination (including social, economic, and environmental analysis) and short-range program and contract letting schedule.

These steps were not always visible in the eight planning processes reviewed. Again, this depends on the state and the nature of the problem in the state. For example, those states that have new departments of transportation (Minnesota, Iowa, and Arizona), because of legislative or management emphasis, have concentrated efforts in the policy development areas. In some instances activities were conducted concurrently (e.g., in Minnesota issue identification and transportation service deficiency were discussed in the same regional meetings). Also, in general, the public involvement was greater in the policy and priority-program development activities and less in the technical areas of plan development.

CONCLUSION

As a result of emphasis on public involvement and limited financial resources, planning is becoming an important resource for management. In many states,

management actively seeks public input on key elements of statewide planning, such as identification of issues, evaluation of policy options, and the development of transportation plans and programs. Also, because securing public funds is increasingly difficult, long-range plans are being financially constrained, and improvements that maximize the use of the existing system are being developed. Management also has a keen interest that planning efforts be focused toward program development and that central documents be developed that firmly link together financial resources with plans, programs, and letting schedules.

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Resort Transportation Improvements: Case of Little Cottonwood Canyon, Utah

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The objective of this study was to adopt a practical methodology for short-range transportation improvements that are fully responsive to the typical problem of recreational resources near an urban area. The methodology was applied to alleviate the transportation and related problems of ski resorts of Little Cottonwood Canyon of Utah. Specific evaluation data related to the canyon; however, the breadth of the system considered, the parameters developed, and the decision-making process suggested were structured so that the concept could be adopted as a consistent planning tool to resolve problems in similar recreation resorts. Emphasis was placed on simplicity and practicality of the developed methodology as well as on maximum accessibility and minimum negative environmental impacts. A specific park-and-ride bus transit system has been recommended for the study resort on the basis of economic factors and community responses. Application of the suggested methodology stressed intangible factors as well as strictly monetary factors.

The demand for leisure activities has caused serious transportation and related environmental problems at many recreation resorts. Obviously, the traditional dependence in the United States on private vehicles for recreation access has been a major contributor to these problems. Due to the recent energy shortage and high road construction cost, we must concentrate on more than just improvements to the existing highway system. In order to maintain a high level of recreational participa-

tion and enjoyment and also attain broader local and national goals (energy conservation, environmental improvements, equity for transit dependents, and preservation of natural aesthetics), transportation and recreation planners must now investigate a wide range of innovative transit systems to improve the accessibility of recreational resources.

As an example, Little Cottonwood Canyon, southeast of Salt Lake City, Utah, is the setting for excellent skiing activities. Its proximity to the major transportation facilities of the Salt Lake Metropolitan Area (SLMA) affords this canyon an opportunity to be a major ski resort complex on a local and national basis. In recognition of this potential, private developers have independently undertaken the construction of major resort facilities at the canyon. However, development of ski resorts (Alta and Snowbird) in the canyon has progressed with little coordination or consideration of existing transportation facilities. The only access road to the canyon (UT-210) is a narrow, winding, two-lane highway, which traverses rather steep grades over most of its length. The yearly increase in the number of private automobiles that use the access road often exceeds the road design capacity, and thus restricts the road in ef-