Programming Highway Improvements in New Funding Environment

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Several issues have evolved in highway decision making that point to the necessity of establishing new processes and techniques for determining allocation of resources for system improvement and maintenance. These issues include the decline in highway revenues and inflation in construction cost, the uncertainty of federal highway programs and funding levels, changing public attitudes toward transportation investment costs and the probably reduced rate of investment in the future, energy efficiency, and more complex and stringent social and environmental concerns and public involvement. This paper describes the highway programming process and techniques developed in Illinois to respond to these issues and to further refine the setting of priorities and resource allocation methodologies needed to carry them out. Fundamental to the process is an inventory of transport service problems on the entire Illinois highway system. The process is essentially oriented to matching short-range priorities and solutions to existing service problems, but consideration is given to longer range goals as currently forecast fiscal resources allow. Included in the paper are discussions of deficiencies and problems of existing programming techniques, the philosophies behind the development of the Illinois process, and the development of the transportation improvement proposal information form, which provides the comprehensive information necessary for setting improvement priorities and project selection and control.

Several issues have evolved in highway program decision making that point to the need for establishing new processes and techniques to determine the allocation of resources to system improvement and maintenance. The most dramatic and severe issue confronting highway decision makers today is the cost-revenue squeeze, which has left highway organizations with fewer dollars available for improvements and maintenance. Concurrently, the purchasing power of these fewer improvement and maintenance dollars has been cut almost in half by inflated construction costs in the last 5 years.

In Illinois, for example, revenues based on the fixed-quantity tax on gasoline have leveled off to a 1 percent annual growth. Motor vehicle registration fees have also slowed in growth to about 3 percent annually. Although Illinois did not suffer an actual decrease like many states, the effect is substantially the same. Opposed to this reduction in revenues is the fact that highway construction costs ballooned 95 percent during the last 5 years.

The net result is that highway programs cannot achieve the goals and plans previously established and thought attainable. Based on the traditional concept of highway needs, the impact of this situation is amply illustrated by the fact that Illinois spent \$850 million from 1970 to 1974 to retire non-Interstate highway needs on its state-maintained system. The objective of this expenditure was to reduce the large backlog of needed improvements. But, during the same period, inflation escalated the cost of meeting this 1970 backlog by \$1.3 billion. Thus, the net result in 1975 was that after 5 years and the expenditure of \$850 million the backlog of remaining 1970 needs is \$450 million larger than when the program started out 5 years ago. To further compound it, new needs entered the picture each year because of continuing normal physical deterioration and obsolescence.

Unfortunately, the future appears to hold much of the same. At least no dramatic changes are foreseen by most economists. The situation has been temporarily eased in the short term since the formerly impounded federal highway trust funds were released. Also, some of the restrictions and rigidities attached to use of federal funds will apparently be eased. Proposals by the federal administration, various states, and AASHTO all lead in this direction. In addition, recent reports indicate that construction costs have leveled or in some instances are decreasing slightly.

None of these, however welcome in the short run, will resolve the long-run transportation funding problems. Explicit in future highway resource allocation is the dominant condition that many improvements, however desirable or productive, will not be made. In the past we could develop plans and undertake programs that would substantially meet all major highway needs. To attempt to reach those goals today means continually falling farther and farther behind in highway improvements and no hope of realizing our objectives.

Other issues, no less important, have also evolved to affect highway program decision making. These issues include more complex and stringent environmental concerns; changing public attitudes toward transportation

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investment costs and the probable reduced rate of investment in the future; increased demands for public involvement in transportation planning and programming; energy shortages, energy cost increases, and increased emphasis on efficient use of energy; multiple and sometimes conflicting goals and policies of the different modes; the frequent mismatch of planning goals, time frames, and constraints versus the goals, time frames, constraints, and priorities of the programming function; and the increasing uncertainty of federal programs and funding.

THE NEED TO REASSESS PROGRAMMING PROCESSES

The inescapable conclusion is that statewide highway programming as it has been typically practiced must be redirected if it is to effectively address the new problems that will compose the programming environment in the future. The inadequacies of current programming procedures are similar in most states. Although not all-inclusive, the following list gives major pitfalls:

1. Deficiencies and needs versus problems and solutions,
2. Separation of plans, programs, and financial resources,
3. Funding categories versus highway problems,
4. Establishing priorities and measuring success, and
5. Dealing with uncertainty.

Deficiencies and Needs Versus Problems and Solutions

Needs studies and sufficiency rating studies have been the backbone of highway programming for the last decade. They have been a fundamental tool for assessing the need for statewide highway system improvements, estimating the costs associated with these needs, apportioning funds to districts or areas, and making a case to legislators for securing adequate tax revenues. Given desired facility design or service level standards, their logic cannot be faulted. We must assess not only what the backlog of highway needs is but also what the need will be in the future.

A serious question, however, is whether the outputs of needs studies are of much value in securing solid information on the type and amount of transportation service deficiencies on existing highway systems or in formulating alternative programming solutions and recommending allocations of resources. They also typically offer limited assistance in evaluating proposed improvements. The reason for these shortcomings is twofold: They are based on (a) anticipated traffic use over the next 20 years or similar long-range time frames and (b) bringing deficient facilities up to arbitrarily established design standards irrespective of specific transport service problems.

Sufficiency rating studies are usually built around a composite of rating points for various roadway elements such as pavement width, sight distance, grades, and accident levels. Sufficiency ratings or other numerical rating indexes are used to determine the priority of a proposed highway improvement and to schedule it for construction. Again, assigning priorities to an array of candidate highway improvements in a systematic and technically sound manner is fundamental to developing a good program. An approach such as this that accomplishes the best solutions to the entire scope of highway system problems cannot be faulted.

The key to whether a sufficiency rating accomplishes this objective is in identifying the correct roadway and bridge elements to be rated and the relative importance attached to each in the rating scheme. But, regardless of how sufficiency ratings are constructed, their validity in establishing needs can be questioned in the same light as needs studies. Their contribution to effective improvement programming may well be limited to establishing priorities only after transportation service deficiencies have been identified and measured and allocations of resources to service problems have been decided. When these decisions have been made, sufficiency ratings can be applied for establishing improvement priorities and for scheduling construction.

In the new programming environment the need is not to determine an index of road deficiencies or projected needs but rather to state how the existing highway system is currently operating and to express these conditions in basic operating and geometric terms. Limited available revenues will often preclude improvements to full-design standards for a 20-year time frame, especially where it is primarily a facility deficiency and not necessarily a transportation service deficiency. Likewise, even the use of modified standards may not be the appropriate solution for some types of traffic service problems. Therefore, it is important that the identification of existing operating conditions be retained throughout the analysis and not lost in an index or rating number or in a dollar need.

Separation of Plans, Programs, and Financial Resources

In a simplified sense, planning deals with where to go, with what, and when, in the future. Programming deals with what is wrong, the funds available to fix it, and how much funds go where, currently. The problem is often that planning aims at a fixed target and programming at a moving target that is constantly reacting to changing conditions. Programming will work without planning, but it works much more wisely with it.

In the current funding environment, system plans may have little impact on what is actually programmed unless sights are lowered to fit the available money. Contingency plans are seldom available. Programming decisions in this case are driven more by funding sources, constraints, and making do with interim planning guidance until revised comprehensive plans are developed.

Funding Categories Versus Highway Problems

The categorical funding constraints imposed by federal legislation have in the past been the driving force in improvement programming. Although not ideal, this method did accomplish the goal of developing statewide systems of the various levels of highways—secondary, primary, and Interstate—and did attack specific categories of problems, e.g., safety and bridges.

Most states adopted, for convenience, a similar method of allocating moneys, usually to the point of making categorical allocations to geographic areas of highway districts. The result was that funds became the tail that wagged the highway problem dog. In more financially stable times, the method worked. In today's environment it will not work satisfactorily. Clearly, transportation service problems have to be the fundamental base on which programming solutions are built.

Establishing Priorities and Measuring Success

Establishing priorities of transportation improvement proposals is a constantly changing process. The citizen and legislative wants and decision criteria of yesterday are usually not applicable today. Evidence the effect of requirements for intensive environmental analyses of highway program makeup and construction scheduling in the last few years. Today, the same types of decision factors come in the consideration of energy factors. These are positive influences and are welcomed; programming as a dynamic process should be responsive and responsible to these concerns of users and society.

The principal problem in setting priorities that respond to these concerns is the increasing complexity of transportation goals and evaluation factors. The additional factors in all modes were essentially engineering oriented and quantifiable, tempered with administrative considerations and geographic and population equities. Setting priorities today means all of these factors plus a host of others including the roles and influences of the political executive, the legislature, the transportation administrator, the planner, and the citizen. Consideration must be given to energy efficiency and social and environmental consequences: Differences must be resolved in goals, values, and priorities within communities and metropolitan areas, as well as between local and state governments. Federal guidelines, regulations, and restrictions can also limit programming options.

Setting priorities and measuring programming success are a cyclical process, one feeding the other. Both involve efficiency, safety, cost effectiveness, user benefits, social benefits, achievement of long-range plans, adequate levels of service, balancing and integration of modal systems, serving minority and disadvantaged needs, and environmental safeguards. Clearly, no structured programming process exists to fully incorporate all of these requirements. Just as clearly, such setting of priorities and evaluation must be done in the emerging multimodal trade-off context in which resources are also scarce and many desirable improvements are being postponed.

Dealing With Uncertainty

The overriding inadequacy, however, in typical programming procedures today is the inability to deal with uncertainty. Traditional programming processes have not been designed to operate in this framework. Planning inputs have tended to be somewhat rigid long-range goals that set precise levels of facilities and offered few options. Funding and programming have tended to prescribe improvements based on developing networks or systems to design standards rather than on transportation service solution options. The current programming environment will not allow either of these concepts. Continuing them can only be detrimental to developing effective and responsive highway transportation problem solutions. Flexibility to change emphasis, to increase or decrease program scopes as conditions require, and to focus on solutions versus needs is mandatory.

DESIRABLE ATTRIBUTES OF A PROGRAMMING PROCESS

The Illinois Department of Transportation responded to this situation not by reviewing and revising then current plans and programs but by asking, What are desirable attributes of a process for producing highway improvement programs in this new environment and which process attributes are suitable to Illinois? It was decided that fundamental to the process should be analyzing existing system service and facility problems, developing alternative solution-impact-cost options, and then matching the problems and alternative solutions to fiscal resources and policy guidelines. The process should be essentially oriented toward short-range solutions to existing service problems, with an eye to longer range goals and plans as fiscal resources allow. It should provide flexibility to meet changing conditions, be responsive to local community and user wants, and be measurable against service accomplishment goals.

Major attributes of a process that would meet the above criteria are given below.

Funding-Solution Categories

An essential feature of the process was that funding sources should never lead the analysis of deficiencies or proposed solutions, nor should deficiencies or proposed solutions lead the funding allocations. Both are part of the framework within which a systematic analysis of problems is performed. Both are components of the process.

Programming Parameters

One of the most important steps in the process is establishing programming parameters. This sets the framework of limits and constraints for evaluating each mix of system deficiencies, alternative solutions, and financial allocations. Programming parameters were established. Fundamental objectives are to

1. Maintain the existing system to prevent further service deterioration,
2. Improve the existing system to increase safety and efficiency, and
3. Add to the existing system where there is a current, demonstrated need to upgrade the level of service.

The fundamental policies are to

1. Provide a minimum level of service to everyone in the state and
2. Do the most important improvements first, for these may be all that can be done with the limited available funds.

Program Structure

Another important step is the program development structure, which forms the basic strategy for analyzing problems and making statewide resource allocations. The program structure adopted and the philosophies behind each strategy are itemized below.

1. Adopt transportation service as the basic framework for preparing highway improvement programs. To put it simply, we first determine what is wrong with the service provided to the highway user. Then we ask what is wrong with the physical highway facility that is not providing the necessary service. The goal is to strictly match facilities to actual travel demands at a satisfactory level of service. Three levels of improvement are considered: (a) preservation where physical deterioration is the problem, (b) improvement where capacity or safety of the existing facility is inadequate, and (c) expansion where upgrading the existing facility is not so cost effective as constructing a new facility. The point is that, because service is the focus, facilities are not to be improved beyond their short-range match to service problems. This means that some narrow pavements will remain narrow and only be resurfaced and that some bridges will be rehabilitated to safe limits rather than replaced to modern design standards.
2. Shift from a project-by-project orientation to a

statewide system orientation aimed at producing an adequate level of service over the entire principal state highway system. The project-by-project approach was a feasible approach when it looked like funds would be available to reach the goals we had set. The revenue-cost situation no longer permits this approach or these goals. Specific projects, however desirable when they are standing alone, must now fit into the overall service goals and funding limitations for the entire statewide system.

3. Separate programs for the existing highway system and those for proposed new systems. The concept must be to get the most out of the existing system before investing large sums in new facilities. Expensive new facilities must be proved to be the most cost effective solution before money will be expended for them.

4. Separate programs for the urban highway system and those for the intercity-rural highway system. This distinction is important because the use and problems on these systems are fundamentally different as are the solutions and programs.

5. Expand the use of modified design standards in which important service improvements are obtained quicker at less cost but nonessential features are omitted. The trade-offs here are crucial. The fundamental fact today is that more solutions must be gained for the dollars invested.

6. Develop and adopt annual improvement programs within the framework of a continually updated multiyear improvement program. Revenue uncertainty demands the flexibility to shift the types and staging of projects as conditions require within the framework of a set multiyear program.

7. Identify a precise set of statewide improvement objectives, priorities, and criteria. Program objectives, priorities, and criteria must specifically set out the types of improvements that will be made and in what order and, conversely, what work cannot be undertaken, either because the proposed improvements did not solve or match the essential problems or, more probably, the money just is not going to be there.

Program Accomplishment Priorities

From the programming parameters and program structure, the following improvement priorities have been set:

1. Correct high-accident spot locations,
2. Maintain pavements to adequate surface conditions for the volume and type of traffic carried,
3. Replace or rehabilitate critically deficient bridges,
4. Widen narrow pavements, in conjunction with pavement maintenance, for the type and volume of traffic carried,
5. Improve intersections, short roadway segments, and other bottlenecks that seriously impede the flow of traffic, and
6. Construct freeways or other high types of facilities in corridors where there is a current demonstrated need.

PROGRAM DEVELOPMENT PROCESS

The Illinois process embodying these programming attributes can be generalized in seven steps. These are outlined in some detail below:

1. Start with a definitive statement of how the highway system is operating today in terms of service to users in basic operating and geometric terms and not in needs or sufficiency ratings that have standards built in. Categorize these service problems into analysis categories, e.g., narrow-rough roads, posted (or about to be posted) bridges, high-accident locations, and capacity and bottleneck problems.

2. Develop alternative solutions and associated costs and an evaluation of solution impacts (through either a subjective or objective process) for each problem category. Solutions and impact evaluation categories are listed below:

Solution	Impact Evaluation Category
Existing system	Urban, intercity, rural
Resurfacing	Functional class
Widening and resurfacing	Average daily travel
Safety	Full design (performance)
Increased capacity and efficiency	Standards and modified standards
Bridge	
New construction	Preservation, improvement, or expansion
New systems	
Interstate	
Supplemental	

3. Develop a complete picture of existing highway improvement revenues and expenditures, and perform analysis of funding options for producing additional highway revenues to develop alternative funding levels that appear feasible. Financial resources include revenues, operating expenses, diversion expenses, and net program funds. Funding options include increasing revenues through new sources or increased tax rates; or decreasing expenses by reducing operating costs or programs. These should be evaluated by funding category, whether fixed or optional, limitations, long- and short-term trends, and possible or probable short-term changes.

4. Based on the array of service problems and alternative solutions, impacts, and costs, establish programming parameters, strategies, and priorities. This includes the fundamental objectives of preservation, improvement, or expansion; the program structure; and program priorities.

5. Build alternative programs allocating resources in varying mixes of alternative solution and impact accomplishments under different levels of funding, all within overall departmental policy guidelines and fiscal restraints. Alternative solutions should be arrayed versus financial resources.

Alternative Solutions	Financial Resources
Existing or new system	Funding category
Urban, intercity, or rural	Fixed or optional
Functional class	Limitations
Average daily travel	Long- and short-term trends
Full standards or modified standards	
Preservation, improvement, and expansion	Possible or probable short-term changes

The funding options are to increase revenues and decrease expenses. Alternative programs are as follows: (a) cover minimum holding-level needs, (b) construct additional improvement concentrations, and (c) exercise funding options.

Assessment of alternative program trade-offs should include performance levels, short-term and long-term impacts, needs not addressed, funding utilization, and cost effectiveness.

6. Determine funding level, and select the desirable program. This includes satisfying objectives and accomplishment priorities and determining the investment payoff, fiscal feasibility, and political feasibility.

7. Follow through with specific project selection guidelines and an assembly process that is dedicated to the idea of accomplishments. Project selection guide-

Figure 1. Standardized transportation improvement proposal form.

LOCATION MAP

Fiscal Year/s FY 77/78
Program Category Rural Widen & Resurf.
Category Priority 2
Highway District 3
Legislative District/s 38
Congressional District/s 15
County/s Livingston
Urban Area/s
Marked Route/s Ill. 23
Key Route/s FAP 24
Functional Class Major
Location 5 miles W. of Cornell to N & W RR in Cornell
Miles 5.26
Bridge Number/s 053-0079; 053-0080; 053-0071

Improvement
Widen 18 ft. pavement to 24 ft. and 3 in. of bituminous resurfacing. Replace 1 concrete bridge and widen 1 bridge.

Number of Supplemental Sheets 9

STATEMENT

Government officials and business and service groups from the area have been extremely critical and have strongly advocated improvements on this section. This improvement will complete the upgrading of Illinois 23 to Major Highway standards between Ottawa and Pontiac. In addition, both bridges are narrow and one is a contributing factor to a high-accident location. The entire stretch of road has a high-accident rate.

ESTIMATED COST ($000)

	Prior Yrs.	FY 77	FY 78	FY 79	FY 80	FY 81
Land Acq.		150				
Structures		350				
Roadway			1,130			
Detour						
Total		500	1,130			

Total Cost 1,630

	Funding Source	Federal	State	Local	Total
Land Acq.	STATE		150		150
Construction	FAP	1,036	444		1,480
	Total	1,036	594		1,630

OPERATING CONDITIONS

Roadway	Existing	Proposed
ADT/Percent Trucks	1850 / 8	2300 / 8
Surface Condition/Type	3.8 / 19 74 / Bit.	
Pavement Width	N 24 / 18 / 24E	24
R-O-W/Roadway Width	66 / 34	100+ / 44
Number of Lanes	2	2
Level of Service	C	B
Horizontal Alignment	0.18	--
Vertical Alignment	None	--
Access Control	None	None

Structure		
Bridge Number	053-0071 1/	
Fed. SBRP Priority/Year	/	
Oper./Inv. Ratings	/ Tons	Tons
Posting Recommendation		
Width/Length	/	/

High-Accident Locations
Number of Spots Red -- Green -- Yellow 1
Mileage of Sections Red -- Green 1.38 Yellow --

RAILROAD CROSSING

Crossing 1 of 2
RR Name ICG RR
No. Tracks
Main 1 Passg. -- Ind. 1
Maximum Speeds
Passr. -- Frt. 40 Mixed --
No. Trains Daily
Passr. -- Frt. 4 Mixed --
Protection in Place
Cross bucks
Protection Proposed
Flashers

DATA BANK TIE Livingston
FAP 24 / 8.10 to 13.36

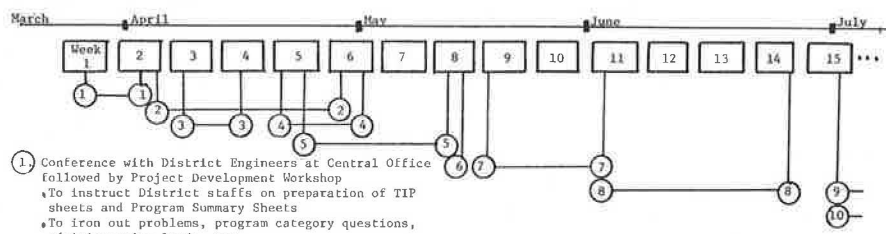
STATUS

State Job No. C-93-173-75
State Const. Sect. No. 101; 102BR; 102 B-1
Bridge Sect. No.
Standards Used Policy
Agreements
Type City - State
Status 12-15-72
Other --
Design Approval Date
FHWA 5-3-73 State --
Land Acq. Clear Date 1-1-77
Airport-Hwy Coord. Date N.A.
Letting Quarter FY 78
1st [X] 2nd [ ] 3rd [ ] 4th [ ]

COMMENTS/REVISIONS

1/ This steel I-beam structure over Vermilion River built in 1960 will remain narrow (28' wide).

Figure 2. Preparation schedule for multiyear program and fiscal year 1976 annual program.



(1.) Conference with District Engineers at Central Office followed by Project Development Workshop
- To instruct District staffs on preparation of TIP sheets and Program Summary Sheets
- To iron out problems, program category questions, administrative loads, etc.
- To give the Districts an opportunity early in the process to raise questions after District Engineer confers with his staff

(2.) District Selection of Candidate Projects and assemble candidate program and prepare TIP sheets.

(3.) Visits to each District by Programming Staff to offer assistance and clarification

(4.) District presents candidate Multi-Year Program and projects to Central Office for oral review--one day each district. Provides D.E. the opportunity to present his proposed programs in person.

(5.) Analyze and assemble Preliminary Multi-Year Program and extract out FY 76 Annual Program, incorporating adjustments worked out with District Engineer.
- Review final fiscal projections with Administration
- Final decisions on Interstate and Supplemental Freeways

(6.) Present Preliminary FY 76 Annual Program to the Secretary for review and presentation to the Governor.

(7.) Assemble Final FY 76 Annual Program.
- Make adjustments for carry-over projects
- Make adjustments considering Administrative review
- Final FY 76 Annual Program to typesetter
- Preliminary copy assembled for D.E. and Legislators

(8.) Continue analysis and assembly of Preliminary Multi-Year Program. Send to D.E. for review.

(9.) Districts review Preliminary Multi-Year Program and propose adjustments to Central Office.

(10.) Assemble Final Multi-Year Program, incorporating accepted District Engineer adjustments.

Table 1. Anticipated highway program accomplishments for fiscal years 1976 to 1980.

Program Category	Area	Project	Accomplishment	Cost ($)	Funds
Preservation	Intercity	Pavement widening and resurfacing	1840 km	185 000 000	State, FAP
		Bridge replacement or rehabilitation	296 bridges	170 000 000	State, FAP, SBRP
	Rural	Pavement widening and resurfacing	120 km	20 000 000	State, FAP, FAU
		Bridge replacement or rehabilitation	50 bridges	100 000 000	State, FAP, SBRP, FAU
Improvement	Rural	Safety improvements	550 projects	30 000 000	State, FAP, Safety
	Urban	Safety and traffic improvements	600 projects	235 000 000	State, FAP, FAU, Safety
	Intercity, rural, urban	New construction		65 000 000	State, FAP
Expansion	Intercity	Interstate highways		390 000 000	FAI
	Urban	Supplemental freeways		800 000 000	Bonds, private primage

Note: 1 km = 0.62 mile.

lines include (a) objectives, (b) criteria, (c) priorities, and (d) scheduling. Program assembly procedures are documentation, paperwork processing, and assignments and schedules.

PROGRAM IMPLEMENTATION AND MANAGEMENT TOOLS

The primary tool to implement a problem-solution programming process was the development of communication devices for use with the department's nine district engineers who are accountable for highway programming activities in this respective area.

Data given in Table 1 have been condensed from guidelines prepared for the district's use in development of the multiyear highway program. The table represents a statement of anticipated program accomplishments for fiscal year 1976 through fiscal year 1980. Specific project selection guidelines were developed for each category by the central office programming staff and accompanied Table 1. The project selection criteria included limiting values for ADT, pavement condition ratings, pavement widths, and bridge condition ratings. Highway district planning and programming personnel then selected and scheduled, by year, projects for the multiyear program.

To facilitate evaluation and assembly of a multiyear highway program, a standardized transportation improvement proposal (TIP) form was developed (Figure 1). The form was designed to accomplish several objectives:

1. To accurately portray the problem underlying a proposed transportation improvement, the type of improvement proposed, and its cost and processing status;
2. To provide a single, consolidated, concise, and common reference document within all divisions, offices, bureaus, and district offices in the department for each improvement proposed or under way; and
3. To provide a compact and readily accessible common communication tool that may be distributed to those concerned with or affected by transportation improvements.

For the district engineer, the TIP sheet provided the medium for (a) comprehensively and persuasively presenting the case for undertaking an improvement project, (b) having all central office bureaus and others referencing the same document in project communications, and (c) having at hand an immediately accessible one-page communication device for his constituency.

The front page describes the need and scope of the proposed improvement, with additional information on cost, funding source, a map, and the year(s) in which the improvement is scheduled. The statement section offers an opportunity for the district engineer to present all supplementary factors that amplify the need and benefits of the project apart from the technical justifications. Such information is of interest to the engineer and citizen alike. Thus, the front page can be used for multiple purposes, including legislative liaison and citizen information, and can serve as the basic departmental project reference document. The back page contains technical data concerning the details of the proposed improvement.

Projects were submitted to the central office on TIP sheets in district-by-district conference presentations in which the district's improvement program was presented and discussed.

Figure 2 shows the step-by-step process for submitting, adjusting, and finalizing the multiyear and immediate annual program. It illustrates again the roles of the central office and the district. The central office programming staff reviews and analyzes statewide problems, alternative solutions, and fiscal conditions and develops statewide accomplishment priorities for each program category. Working within the statewide accomplishment framework, each district proposes all appropriate projects fitting the programming category and the project selection guidelines. Each project is ranked individually in the district by priority within program category. Based on these proposals, the multiyear highway program is developed in cooperation with each district office.

It is important to note the amount of interaction, face-to-face and by TIP sheet, between the district and central offices. The process is neither centralized nor performed solely by the district. Each does the part best suited to it. The central office is closest to fiscal resources and the other statewide problems; while the district is closest to the specific problems and the appropriate priority of projects.

SUMMARY AND CONCLUSIONS

The statewide programming process described here is still under development and will continue to evolve as the department's multimodal programming process is developed and implemented. The process has proved to be a highly effective tool to date (after one annual iteration) in achieving the goals originally set out for it. The process has several important attributes:

1. Inventory of service problems on the entire system, unencumbered by arbitrary geographic allocation formulas, funding category restrictions, or fixed design standards;
2. Programming separation of existing and proposed highway systems to facilitate the cost-effective analysis of investment in new facilities;
3. Programming separation of urban and intercity-rural network problems and solutions;
4. Decision process governed by neither funding sources nor service problems but by both interacting equally;
5. Alternative solutions and funding allocations to provide flexibility to respond to changing conditions; and
6. Executive input and decisions at several stages to build a strong and decisively directed program.

The programming process as it currently operates does not have the benefit of an updated statewide plan. Such a plan is now being developed. When the plan is available, it is expected that an integrated highway planning-programming process will evolve, as a component of the department's multimodal programming process. As a closing point, it is likely that all of these planning-programming processes will possess one common attribute. They will be thinkable and workable on a human scale. Set formulas and mechanistic decision-making systems will be at a minimum. Decision-making accountability cannot be assigned to a computer.

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