



## ENGINEERING FIELD NOTES

This publication is a monthly newsletter published to exchange Engineering information and ideas among Forest Service personnel.

The publication is not intended to be exclusive for engineers. However, because of the type of material in the publication, all engineers and engineering technicians should read each monthly issue.

The publication is distributed from the Washington Office directly to all Forest, Regional, Center, Station, Area, Laboratory, and Research Offices. Adequate copies are printed to provide all who wish a personal copy. If you are not now receiving a personal copy and would like one, ask your Office Manager or the Regional Information Coordinator to increase the number of copies sent to your office. Use form 7100-60 for this purpose. Copies of back issues are also available from the Washington Office and can be ordered on form 7100-60.

It is intended that the material in the Field Notes be primarily written and used by Forest Service Field Engineers; however, material from other publications may be used.

Field Note material should always be informative and cannot contain mandatory instructions or policy. The length of an article may vary from several sentences to several typewritten pages. Material need not be typed (neatly written or printed is acceptable), or edited before being submitted to the Washington Office. The Washington Office will edit and prepare the camera copy to accommodate our format and allowable space.

Each Region has an Information Coordinator to whom field personnel should submit both questions and material for publication. The Coordinators are:

R-1		R-6	Kjell Bakke
R-2	Alfred Buerger	R-8	Ernest Quinn
R-3	Dan Roper	R-9	Clifford Hill
R-4	Fleet Stanton	R-10	Gerald Coghlan
R-5	Chuck Paletti	WO	Stan Bean

Information contained in this report has been developed for the guidance of employees of the U.S. Department of Agriculture - Forest Service, its contractors and its cooperating Federal and State agencies. The Department of Agriculture assumes no responsibility for the interpretation or use of this information by other than its own employees.

The use of trade, firm, or corporation names is for the information and convenience of the reader. Such use does not constitute an official evaluation, conclusion, recommendation, endorsement, or approval of any product or service to the exclusion of others which may be suitable.

UNITED STATES DEPARTMENT OF AGRICULTURE  
FOREST SERVICE

WO

**REPLY TO:** 1360 Meetings  
(7100)

May 15, 1972

**SUBJECT:** WO and RO Divisions of Engineering Meeting  
September 27 – October 1, 1971



**TO:** Deputy Chief, Division Directors, Regional Foresters, Directors,  
Area Directors, Forest Supervisors and Participants of the Meeting

I wish to share with you the Proceedings of the Washington and Regional Office Divisions of Engineering Meeting which was held in Washington, D.C. during the week of September 27, 1971.

The primary purposes of this meeting were to share information among top management in the Forest Service and representatives of the Washington and Regional Divisions of Engineering, improve communication between Engineering in the Washington and Regional Offices, and to identify problem areas and related action plans that should result in a more responsive engineering organization.

I trust you will receive these Proceedings in order to gain a better insight to key problems facing our organization. Where action is suggested, your support is requested and appreciated.

M. R. HOWLETT  
Director of Engineering

Enclosure



UNITED STATES DEPARTMENT OF AGRICULTURE  
FOREST SERVICE

WO

**REPLY TO:** 1360 Meetings  
(7100)

May 22, 1972

**SUBJECT:** WO and RO Divisions of Engineering Meeting  
September 27 – October 1, 1971

**TO:** Participants and Proceedings Recipients



Ever increasing demands on our limited resources have established that quality programs and quality projects are essential to the Forest Service.

Some hard decisions lie ahead of us which will require the establishment of priority objectives while maintaining a sense of balance. We have to redeem our total public responsibilities and at the same time carry out key assignments relating to increased timber production and pollution abatement. To do this, our engineers with full support from their line officers must see that all engineered works are carried out with a minimum expenditure of personnel and financial resources and at the same time produce end products that will meet public needs and demands. This is no easy task; however, I am confident that the Forest Service will once again distinguish itself by meeting this challenge.

The meeting reported by the following proceedings was well timed and essential. I am deeply interested in the issues covered and look forward to their satisfactory resolution.

I suggest we devote the necessary time to review these proceedings and support Engineering's efforts to resolve the identified issues.

JOHN R. MCGUIRE  
Chief



# F I E L D N O T E S

## FOREWORD

From its modest beginning in the early 1900's, engineering in the Forest Service has become significantly more sophisticated and complex. In the 1970's, Forest Service engineering covers a multitude of widely diversified activities in support of the Service's objectives for the administration and development of the National Forests. As these engineering activities have become more diversified and more specialized, the need for more and better Service-wide communication among engineers has become apparent. This communication, the exchange of information upwards, downwards and sideways, has never been more vital than in these days of rapid technological changes.

In previous years, the annual meeting of the Western Association of State Highway Officials (WASHO) has been used as a forum whereby Washington Office and Regional engineers could communicate concerns and discuss problems regarding Forest Service engineering. It has become increasingly apparent that this forum or vehicle for communication is no longer adequate. Engineering talent, time, and budgets have been stretched exceedingly thin by on-going programs such as road construction, pollution abatement, special use permits, buildings, campground facilities and many others involving engineered facilities. At the same time, there has been a rightful and proper demand on the part of the public, Forest Service engineers, and land managers for more quality engineered facilities. These conditions have combined to create a growing concern and uneasiness about the engineering mission in the Forest Service. In an effort to better understand these concerns and problems, to improve communications and to explore avenues for problem solutions, a Service-wide meeting was called.

The Regions and the Washington Office identified certain areas of mutual concern. A group of detailers to the Washington Office structured these concerns and problems into a meeting agenda. The agenda was drawn up in such a way that selected concerns were assigned to panels for definitions of the problems and recommendations or action plans leading towards solutions of these problems. The meeting was held as planned. Concerns and problems were identified. Concise problem statements were prepared and action plans recommended.

It is intended that these proceedings record and document the concerns, problems, and recommendations expressed at this Washington Office – Regional Office Divisions of Engineering meeting. It is also intended that these proceedings record the post-meeting analysis and synthesis of the findings of the various panels and give the rationale for making specific commitments and decisions regarding the panels' recommendations.

Beyond all this, it is hoped that these proceedings will serve as a bridge and a vehicle for developing and improving communications so vitally needed in effectively accomplishing the engineering mission of the Forest Service.



## TABLE OF CONTENTS

	Page
Transmittal of Proceedings . . . . .	i
Memorandum from Chief . . . . .	iii
Foreword . . . . .	v
Table of Contents . . . . .	vii
List of Attendees . . . . .	ix
Agenda . . . . .	xi
Summary of Remarks by C.A. Shields (The Managerial Environment) . . . . .	1-4
Summary of Remarks by L.M. Whitfield (Impacts of Recent Legislation) . . . . .	5-10
Discussion . . . . .	11-12
Summary of Remarks by J.R. McGuire (Message from the Chief) . . . . .	13-14
Discussion . . . . .	15-22
Summary of Remarks by C.W. Rupp (Multiple-Use Planning) . . . . .	23-31
Discussion . . . . .	32-35
Summary of Remarks by M.R. Howlett (Direction for Engineering in Forest Service) . . . . .	37-42
Summary of Remarks by R.P. McRorey (Public Works Construction and Management) . . . . .	43-46
General Discussion, Monday, September 27 . . . . .	47-57

TABLE OF CONTENTS – Continued

	Page
Summary of Remarks by C.W. Rupp, T.B. Glazebrook, V.M. DeKalb, M.J. Hassell (Multidiscipline Planning Teams) . . . . .	59-89
Discussion . . . . .	90-94
Panel Reports –	
Panel 1, FR&T Programming . . . . .	95-96
Panel 2, Pollution Abatement . . . . .	97-98
Panel 3, Engineering Quality . . . . .	99-100
Panel 4, Geometronics & Technological Improvements . . . . .	101-102
Panel 5, Inspector Certification . . . . .	103
Panel 6, Equipment Development and Equipment Management . . . . .	105-106
Panel 7, Special Use Impacts . . . . .	107-108
Panel 8, Transportation System Operation . . . . .	109-111
Panel 9, Materials Engineering . . . . .	113-114
Panel 10, Training and Manpower Development . . . . .	115-116
Panel 11, Construction Impact of Pollution Abatement . . . . .	117-118
General Discussion, Thursday, September 30 . . . . .	119
Panel Reports – A Review and Discussion . . . . .	120-137
Panel Reports – Priorities, Decisions and Follow-up Action . . . . .	138-139

## LIST OF ATTENDEES

### A. Chief's Office

H.R. Bryant	Watershed Management
R. Carder	Legislative Affairs
C.C. Chandler	Administrative Management
J.W. Deinema	Associate Deputy Chief
T.B. Glazebrook	Watershed Management
M.J. Hassell	Legislative Affairs
S.P. Hughes	Watershed Management
G.M. Leonard	Timber Management
R.P. McRorey	Associate Deputy Chief
J.R. McGuire	Associate Chief
C.W. Rupp	National Forest System
C.A. Shields	Associate Deputy Chief
L.M. Whitfield	Legislative Affairs

### B. Division of Engineering – Washington Office

M.R. Howlett	Director, Division of Engineering
R.P. Allison	Geometronics Cartographer
O.D. Bockes	Systems Development, Geometronics
O.A. Broadway	Equipment Management Engineer
L.D. Bruesch	Chief Highway Structures Engineer
H.L. Cappleman	Water Resource Engineer
A.L. Colley	Management Engineer
H. Coorsh	Electrical Engineer
J.H. Daly	Engineer, Technical & Recruitment Development
J.F. Dixon	Geometronics Cartographer
C.F. Dwyer	Aerial Tramways
D.L. Hahn	Solid Waste Management Engineer
F.J. Hammond	Management Engineer
J.D. Hogan	Systems Development Engineer – Computers
D.L. Jones	Materials Engineer
R.O. Mahan	Geometronics Engineer
L.E. Matson	Equipment Management Engineer
E.C. Neumann	Highway Safety Engineer
T.R. Nielsen	Chief Highway Design
A. Pelzner	Chief Materials Engineer
B.Y. Richardson	Equipment Development Engineer
R.W. Rhodes	andscape Architect – Roadside Controls

LIST OF ATTENDEES – Continued

P.W. Simmons	Geometronics Engineer
J.M. Sirmon	Operations Engineer
D.L. Sirois	Mechanical Engineer
H.L. Strickland	Assistant Director of Engineering
J.R. Swinnerton	Chief Geometronics Engineer
H.T. Taylor	Assistant Director of Engineering
D.B. Trask	Chief Transportation Analysis Engineer
S.J. Wilcox	Chief Construction and Maintenance Engineer
C.R. Weller	Assistant Director of Engineering

C. Division of Engineering – Regional Office

Region 1 – C.A. Miller, Regional Engineer

F.M. Burbank	Equipment Development Center
R. Landman	
B. Meinders	
G.W. Roberts	

Region 2 – R.W. Wilke, Regional Engineer

L.A. Hepfl, Jr.

Region 3

C.E. Carnahan  
D. Logan  
D.F. Roper  
D. Jordon

Region 4 – J.M. Usher, Regional Engineer

R. Larse  
D. Loff

Region 5 – D.C. Turner, Regional Engineer

C. Howard	Equipment Development Center
J.D. Kennedy	
W.E. Furen	
W.R. Kinworthy	
L.J. Stern	
V.M. DeKalb	Transportation System Planning Project

Region 6 – W.W. Gano, Regional Engineer

R.R. Chamard  
B.B. Plath  
T.E. Utterback

LIST OF ATTENDEES – Continued

Region 8 – J.A. Adams, Regional Engineer  
J.W. Lamb  
F. Ferrarelli

Region 9 – F.E. Curfman  
G.R. Scherrer  
N.G. Sears

Region 10 – C.C. Ketcham, Regional Engineer

AGENDA

Regional and Washington Divisions of Engineering Meeting  
Washington, D.C.

September 27 - October 1, 1971

---

TOPIC	SPEAKER and/or DISCUSSION LEADER
<u>Monday, 9/27 – Conference Room, South Agriculture Building, Room 3840-46</u>	
Management Environment	Chet Shields, Associate Deputy Chief
Impacts of Recent Legislation	Larry Whitfield, Director of Legislative Affairs
Message from the Chief	John McGuire, Chief
Multiple Use Planning	Craig Rupp, NFS
Direction for Engineering in Forest Service	Myles R. Howlett, Director of Engineering
Public Works Construction & Management	Russel P. McRorey, Associate Deputy Chief
General Discussion	

AGENDA – Continued

TOPIC	SPEAKER and/or DISCUSSION LEADER
<u>Tuesday, 9/28 – Conference Room, South Agriculture Building, Room 3840-46</u>	
Multidiscipline Planning Teams	Craig Rupp, NFS Tom Glazebrook, Director, Watershed Management Vic DeKalb, Project Leader, TSPP M.J. Hassell, Programs & Legislation
Multidiscipline Planning Teams (continued)	
Panel Sessions (see panel session schedule for assignments and meeting room)	
<u>Wednesday, 9/29</u>	
Panel Sessions	
<u>Thursday, 9/30</u>	
Panel Sessions	
Panel Reports Room 813, Plaza C. Rosslyn	Harold Strickland, Assistant Director of Engineering
<u>Friday, 10/1</u>	
Panel Reports – A Review and Discussion	Harold Strickland, Assistant Director of Engineering

## SCHEDULE FOR PANEL SESSIONS

9/28, Tuesday 1:30–4:30

R & T Programing

R. Larse, Chairman, R-4  
F. Ferrarelli, R-8  
R. Chamard, R-6  
F. Hammond, WO  
Rm: 702–703 Rosslyn

Pollution Abatement

J. Kennedy, Chairman, R-5  
J. Lamb, R-8  
J. Meade, R-2  
H. Smallwood, WO  
D. Hahn, WO  
Rm: 704 Rosslyn

Quality of Results in Engineering

T. Utterback, Chairman, R-6  
G. Scherrer, R-9  
D. Jordon, R-3  
Timber Management Rep., WO  
T. Nielsen, WO  
Rm: 3840 So. Building

9/29, Wednesday 1:00–4:30

Special Use Impacts

B. Meinders, Chairman, R-1  
Recreation Rep., WO  
H. Cappleman, WO  
S. Hughes, WM, WO  
C. Dwyer, WO  
Rm: 813 Plaza C, Rosslyn

9/29, Wednesday 8:30–12:30

Geometronics & Technological Improvements

J. Hogan, Chairman, WO  
R. Swinnerton, WO  
O. Bockes, WO  
C. Chandler, Adm., WO  
Rm: 813 Plaza C, Rosslyn

Contracting and Inspector Certification  
Program

G. Roberts, Chairman, R-1  
D. Roper, R-3  
Admin. Services Rep., WO  
D. Jones, WO

Rm: 702–703 Rosslyn

Equipment Development and Equipment  
Management

C. Howard, Chairman, EDC, San Dimas  
F. Burbank, EDC, Missoula  
O. Broadway, WO

Rm: 704 Rosslyn

9/30, Thursday 8:30–12:00

Training & Manpower Development

D. Loff, Chairman, R-4  
E. Kinworthy, R-5  
N. Sears, R-9  
R. Landman, R-1  
J. Sirmon, WO  
Rm: 702, 703, 704, Rosslyn

SCHEDULE FOR PANEL SESSIONS – Continued

Transportation System Operation

D. Trask, Chairman, WO  
F. Ferrarelli, R-8  
E. Neumann, WO  
S. Wilcox, WO  
Rm: 702-703 Rosslyn

Construction Impact of Pollution  
Abatement

B. Plath, Chairman, R-6  
A. Colley, WO  
Admin. Services Rep., WO  
Recreation Rep., WO  
Rm: 813 Plaza C, Rosslyn

Materials Engineering

W. Furen, Chairman, R-5  
L. Stern, R-5  
A. Pelzner, WO  
D. Jones, WO  
Rm: 704 Rosslyn

## THE MANAGERIAL ENVIRONMENT



*C. A. Shields, Associate Deputy Chief for Administration — Washington Office and Regional Office Divisions of Engineering Meeting, September 27, 1971, Washington, D.C.*

I appreciate this opportunity to talk to you about the management climate we have today in the light of some of the concerns facing us. Many of our managerial systems, some in use only 10 years or so, are no longer adequate to solve the problems we face today and surely not adequate to plan solutions to tomorrow's problems.

The growing alarm about pollution, clear-cutting, roads, et cetera, may be well justified but alarm alone will not clean up the environment or find suitable alternatives to current unaccepted or unacceptable land management practices. Neither will setting up scapegoats, such as capitalism or technology or "The System," because we are all big polluters, here and in other countries.

Western man's ability to concentrate on a problem and persist until it is solved has contributed much in the way of material progress. But precisely this ability to concentrate has produced scientists and managers who ignore what is outside their focus, and government officials who do not care enough about problems outside their jurisdiction. The result contributes to the growing disunity and fragmentation of society. We are in the painful process of expanding our horizons to count the total costs of our inventions and systems. Increasingly we will need "integrators" who can consider problems in a broad context, and who will be able to give early warning of unintended harmful side effects of technological advances.

One of the big problems facing management in the Forest Service is that we are in "the house that shaped us." We cannot escape our earlier development and experiences; they continue to influence the way we see ourselves and the way we deal with one another. We have been successful in using an organization based on functional specialization which focuses attention on individual or groups of activities, but it is beginning to collide with the principle of unity. We have been allowing functions to pursue their own aims by their own lights.

One result is that today we find ourselves struggling to paint the correct picture of what is required to finance and operate our organization. Worse yet, we find it difficult to predict the impacts of one on the rest of the organization. I'm sure you see this happening, since your responsibilities and actions span the range of our functions, and you no doubt share some of our concerns in trying to provide management systems which will optimize our efforts.

Whether we like to admit it or not, professionalism and its use of technology is on trial. Your definition of a professional – the pursuit of a learned art in a spirit of public service – is a noble statement. It invites you to count the costs of your proposed actions and, since we are a group of many professions, it behooves us to work together in specifying goals, objectives, and criteria to determine the greatest good for the greatest number.

Management's job in the Forest Service is to put together the kinds of job combinations and systems which will enhance this teamwork. A current example is our experimentation with several organizational concepts to improve coordination and planning to the end that a less fragmented approach to land management will result. Even within your own engineering organizations you have the latitude to break out of inter-professional functionalism.

The solution to many of our problems is more, not less use of the specialist. Our path toward quality management calls for more specialization, and certainly our management must accept this fact and make the necessary organizational and communications arrangements to ensure that we make the best use of our specialists.

The McKinsey report, "Gearing the Organization to the Job Ahead," which was made in the late 1950's, was our first substantial recognition that the Forest Service must make better use of specialists. We made some organizational changes, have added thousands of specialists since then, and have gone a long way toward integrating their talents into the decision-making process, but we still have a long way to go. The recent organizational changes you made at your Regional level were a move to encourage a higher degree of expertise and technical leadership.

An organizational change is not enough in itself. It takes time to "change the house that shapes us" and grow or recruit the talent to provide the level of skill and leadership needed. In the meantime, work goes on – and we will no doubt make some mistakes in selecting people – but if our objectives are good and we keep them in focus, tomorrow's organization will be much better manned.

We can't stop the development process of our specialists when they reach the first plateau of technical leadership. We must provide them with opportunities to keep current – maybe a kind of senior engineer's update program at various intervals in their careers.

We must improve our system of identification of talent and selection for promotion so that we encourage and advance our best men. This can't be left to chance or totally controlled by the man's supervisor. We must have more effective feedback systems to adequately evaluate talent and not promote on the "who knows who system." Our system for accountability must be improved if our manpower development programs are to be meaningful.

Along these lines, we are currently investigating the kinds of technical information systems needed for all our professionals. One aspect of such a system would be a current awareness program. A task force was appointed by the Chief to develop recommendations on the kind of technical information system the Forest Service needs. This will be about a one-year study, and could constitute a major step forward in improving the quality of decisions.

Another challenge to management is the question of dealing with public involvement. When we say we want to listen to "the people," the phrase sounds a lot simpler than the realities. The challenge for management is to monitor all this flak, criticism, advice, et cetera; weigh it against fact and at the same time maintain order within the ranks so that we don't succumb to self-flagellation and develop a "can't do" attitude out of despair and frustration. This will take creativity and imagination on the part of management. We must develop expertise of the highest order to do this.

We have always been proud of our working relationships with our constituents and local communities on general and mutual concerns. This has been one of our strong points over the ages. This kind of closeness to the people was the hallmark of our Rangers for many years. The once home-owned sawmill is now a subsidiary of a "Boise-Cascade," operating on many Ranger Districts and managed by the best executive and legal talent in America. The "little old lady in tennis shoes" is now represented by full-time top talents who don't even know we have Rangers or Supervisors, but deal directly with the policymakers in the highest chambers of government.

Our earlier voluntary involvement of the public hasn't been adequate. Our current administrative requirements to involve others, such as environmental statements, aren't doing the job many desire. There are strong moves afoot to include the public in decision-making through legal processes.

We can't keep asking "What have we done to deserve this?" We must instead explore ways to operate within these new arrangements. It isn't going to be easy or painless to see much of our latitude for independent action taken away. Engineers will suffer as much or more frustration than any other profession in the Service as we adjust to these new influences.

Maybe you can also be our strongest leaders in adjusting to this change. You have always preached that our actions have pronounced impacts and influence on an economy bigger

than our immediate areas of operation. This same insight can also be applied to understanding the public's stand as they move into influencing the final outcome of our actions. Managing the Forest Service is not a responsibility of a select few, but is every employee's responsibility; and the Service needs your analytical skills, not only to be applied to technical matters, but also to matters concerning policy and administration. Forest Service management processes must allow meaningful input from all of us.

Environmental statements are a process to allow public involvement. We haven't learned to use them yet as we intended. We have a lot to learn concerning effective and timely public involvement.

Our (the USDA) responsibility in reviewing environmental statements on other agencies' or organizations' projects is this country's way of broadening the context by which the impacts of these projects are weighed. We are not asked to review a road job in Podunk, Iowa, because we have engineers; on the contrary, we are asked to review it because we have wildlife biologists, landscape architects, et cetera. We have skills in certain fields of interest which can advise the final decision-maker about side effects the project originator could not see. The challenge of management in the Forest Service is to facilitate this broader look-see at our works; in other words, get out of the "house that shapes us" and see our actions in a much broader context, both environmentally and economically.

More will be said about environmental statements later in your meeting, but I urge you to develop this philosophy and help to properly use this coordinating tool and not curse it in the name of red tape.

In closing, I would say the managerial environment is much like our social revolution. Managerial systems are on a whole no better than our social values and concerns. Man's products, his arts, his systems, et cetera, are but a reflection of himself. The same can be said for the way we arrange ourselves to get a job done. We are still in the evolutionary process and although a few may be more advanced than others, our overall progress and pace are determined by forces bigger than ourselves.

No one person in the Forest Service knows the solution to all our ills, nor can point to improved ways of managing ourselves in every area. We all seek a better product, procedure, or design. We are working hard to improve. Let's turn the energy we use in criticism to suggestions for improvements.

Most of your meeting is concerned with investigation of problem areas, hopefully resulting in recommendations for improvement. I know some concrete proposals will come out of your work groups, and I welcome any recommendations concerning ways to improve our management systems. The environment is ripe for suggestions.

## IMPACTS OF RECENT LEGISLATION



*L. M. Whitfield, Director, Division of Legislative Reporting and Liaison – Washington Office and Regional Office Divisions of Engineering Meeting, September 27, 1971, Washington, D.C.*

The title on your agenda for my talk is "Impacts of Recent Legislation." When we talk about the legislative area, I think it is important that we consider not only recent legislation, but also pending legislation. I think probably most of you are more directly affected today by recent legislation that has become law than you are possibly with what might become law. I would like to talk to you about both because I don't think you can separate them.

In talking about this, I want to talk about the legislative activity in the area that we are concerned about. We are concerned, of course, with things that deal with the environment; we are concerned with ecological questions; we are concerned with conservation; and we find in the public's mind that all of these are stirred in together in a kind of common pot. I think you can characterize the legislative activity in this area, now at least, as very active. The public is very concerned about their environment, very concerned about conservation and ecology, and, as I say, they have this all mixed up. Since they are concerned, I think Congress is very responsive to that concern, and that is represented and reflected by the many bills that become law and the many more that will be pending in times to come.

I think we should also have to say, generally, that this activity is going to be beneficial. It has opened up areas with which we are now concerned and areas which have held our concern for a number of years. It's beneficial to the extent that we can respond positively to it.

On the other side of the picture, interest appears to be way ahead of knowledge and a lot of people interested in environment, conservation, and ecology, really lack a basic knowledge of those areas. I would say that this is probably represented by the fact that most of the concern seems to express itself in terms of preservation rather than any effect it deals with in the real world of environment and conservation.

The consequences of all this legislation, both that which has become law and that which is pending, are pretty great, as many of you are well aware. I can cite for you several

consequences that have mixed blessings. Just a few might be this: much of the legislation tends to limit activity that takes place, for instance, on National Forest land; limits land use; classifies land. Another thing that you deal with every day – part of this legislation sets standards and increases standards, all the time recording and monitoring standards. Another thing that is becoming increasingly difficult to cope with is that it interjects other agencies into our business, and again I think probably in engineering you have had to cope with that as much as any other area of our work.

Some examples of that are very apparent to you in the National Environmental Policy Act of 1969 which requires that we combine many of our activities with environmental statements; that these statements have public involvement; and that they have comments from other Federal agencies, State agencies, and almost anyone else who might want to comment. Another example along the same line involving other agencies is the many air and water quality standards in which the Environmental Protection Agency has direct responsibility and, in some instances, an overlapping responsibility for enforcement with the Forest Service.

I would like to give you just one little example of a minor bill and how it affects some of this legislation. We have a bill – sometimes referred to as the Jackass Bill – in which the son of a Congressman from Maryland became concerned about the wild mustangs of the West. He was told or read that these mustangs were all descended from old Spanish stock and that they were a real part of early America and history of the West, and they were being harassed, abused, and killed. I guess he, as much as anyone, started the concern for this, which resulted in about 16 bills to protect these animals. I think the basic idea there was good, but you can see some of the problems. Most of these animals were not descendants from old mustangs – they may have been abused and killed – they do have some real historic value. But these bills, among other things, would establish a property interest in those animals so that we say that the United States in effect owns or at least has dominant control over them. It limits the action that private property owners could take with respect to these animals when they come on their property. This is quite contrary to the standards that the State would ordinarily set up.

Some of these bills provide that, where the animals get on private property in the United States, owners be responsible to gather them up to get them off their property. It sets up, in one instance, an almost quasi-judicial system of enforcing those acts primarily because the Bureau of Land Management doesn't have law enforcement responsibility.

This is an example of a minor bill that is so complicated and creates so many problems that it interjects other agencies, tends to limit the use of some of our land, and creates whole new interests in the United States. So while there are many values to this concern and the legislation that is being considered, there are some problems as well.

Current standards, as we say, often tend to increase, requiring more employees and financing, and in the face of efforts to cut the Federal budget, they don't seem to be coordinated, leading to a great deal of frustration.

Some recent legislation along these lines are the air and water quality standards and the enforcement of the Environmental Protection Agency, Environmental Policy Act of 1969 which created the Council on Environmental Quality. While they don't have any direct enforcement responsibilities, they certainly have an overriding function and get directly involved in a great deal of our business.

Some of the others that provide additional effort on our part are the Uniform Acquisition and Relocation Act (that is not its proper name, but it is as close as I can come today). Some of you may not be aware of that, but it deals with our acquisition of land; the fact that we must provide copies of our land appraisals to land owners with whom we cannot negotiate and that we must option fair market value. More importantly, we must provide certain reimbursement for relocation; we must pay for business and other activities that are taking place on the land.

You are all aware of the Wilderness Act of 1964 and the impact that it had on our work. More recently the impacts are felt through the introduction of the new bill which creates new wilderness, completely apart from those areas that are presently incorporated in the primitive areas. The impact there is simply that it diverts our work on the primitive areas, it fouls up the mineral examinations, and other work that must go on.

We have the Land Water Conservation Act of 1965 which increased our workload a great deal, not only in terms of acquiring land, but also in providing or trying to provide the recreation facilities that are needed on this land. This is the case where we have the money to acquire the land and yet that is not closely coordinated with the money to provide the facility.

We have the National Trails Act, and many of you are involved in that.

We have the Wild and Scenic Rivers Act and continuing efforts there to expand upon what we call the instant rivers or the study rivers that were created by the bill by adding new rivers. There are several bills in Congress now that would do that and we anticipate many more.

Then we have the recent Sisk Law Enforcement Act of 1971 that is now a law with which you will be directly involved, I suspect, in the matter of regulating road use and enforcement.

Those are just some of the highlights of recent legislation that has been passed and yet those are almost eclipsed by the many pending bills. I heard in the last hour some comment about such things as land-use — we have a whole host of land-use bills pending that cover a wide spectrum. Some of those deal with the implementation of the Public Land Law Review Commission report on land use. So far in the House we have H.R. 7211 by Mr. Aspinall and its counterpart in the Senate. They are pretty much alike. We have hearings on 7211 and we are about to have them on the Senate version. I don't know how familiar you are with those, but they again would have the same impacts of rigid control. For example, they give more explicit direction in land-use planning; they would generally implement rigid rules of rule-making; they would provide for dominant use theories; they would create a whole host of Boards and Commissions which we must confer with in doing our land-use planning in management activities; they would subject us in some cases to State and local zoning or State and local land-use plans; and almost anything else you can think of.

The Administration has the Land Use bill, H.F. 4332, in the House — that is an effort to provide State control over private land. It also has a provision that seems to make Federal land-use plans subject to State land-use plans if they follow the provisions of that act. That could possibly give us some trouble.

As I say, we have a whole host of land-use plans to cover a wide variety of circumstances. Most of these will never be heard, but I think it is apparent that in land-use planning and management you will have additional legislation.

Another area that is active is mining and mineral leasing. I don't know how many bills are pending now, but there are a number of bills which generally take the form of replacing the 1872 Location and Entry law and substituting some form of mineral leasing. Many of them deal also with the Mineral Leasing Act as well, and this is regarded by the Federal government largely through the efforts of the Secretary of the Interior who is reviewing the Mining and Mineral Leasing Act, and I am sure they will shortly have their own bill. We were to have had a hearing on one of these mining bills last week, but when the hearing was held, the Federal government did not testify in order to give them a chance to come forth with their own bill. We have been in on some of the consideration of what might be in the Administration bill, although we haven't seen the final product. That is a very active field and one we are all going to be involved in.

We have several bills that deal with Cooperative Forestry. These generally seek to make private land more productive, particularly small land parcels.

These generally seek to increase our activity in Forest management in providing assistance; providing the incentive to increase our participation in fire control; getting better and wider fire control to private lands; and this, of course, is complicated at this

point in time because of the conflict between the grant in aid program and the Administration's current effort to provide revenue sharing on a wider basis with less control by the Federal government.

We have the Indian and Native Claims Act. In Alaska the native claims are a major problem and it appears that undoubtedly the natives will probably get something in the neighborhood of 40 million acres in Alaska and a billion dollars in money.

These bills, along with native claims, also deal with many of the Indian tribes in the lower 48, including the Yakimas.

We have a host of bills dealing with special areas, again creating higher standards and limiting planned use. A few of these are the Seward NRA bill in Alaska; the Oregon Dunes NRA in Oregon; the Sawtooth in Idaho; the Snake River Moritorium bill in Regions 1, 4, and 6 which would create an NRA. We have a Hell's Canyon Moritorium bill that would preclude any development on that river, and we have several wilderness bills which I mentioned to you that give us some problems in that they interrupt and complicate our schedule for the provisions of the primitive areas and consideration of those in the wilderness.

We have revenue sharing, which I just mentioned to you, which is an effort to provide more responsibility to the State and local governments to grant Federal tax money, but with fewer strings attached. There is real concern there; for instance, whether the Administration can get that through and if they don't, how long will other bills – for instance, the Cooperative Forestry bill – be held up because they are contradictory to the provisions of revenue sharing.

Perhaps the real thing concerning reorganization is the tremendous amount of support among members of Congress, especially among soil conservation groups, and the general public.

We have a variety of timber supply acts – Mr. Hatfield's American Society Act, and others – which are generally directed at three things; to provide better forestry management, better production on private lands, and to give greater Congressional direction and guidance of management and timber resources on public land. Those will be debated at some length before we have anything out of that.

In considering all of these, I think we should understand that there are many bills introduced that have a great deal of impact on forestry which are never acted on. They either simply don't have enough interest or the sponsor doesn't have enough seniority to have it heard, or they are introduced simply to satisfy some individual or group of individuals. There are many others we have an interest in and on which the committees

ask us for a legislative report and that is the end of those bills. And then we have others on which we are asked to report because of our interest and we will have hearings and we will testify, and that will be the end of those bills. But throughout all of these processes, we will have many bills, I am sure, which we will be asked to report on, which we will have hearings on and which will become law. From what I see, the interest is still very strong and I am sure it is going to continue. There are going to be many bills and a great deal of legislative action that will have direct bearing on us and our work, and we can look forward to a great many laws that will be enacted that will affect us directly.

## DISCUSSION

### WHITFIELD

To start things off, maybe I could give you a brief idea of what happens when we get these bills. I know that in the projects we think are worthwhile there is some concern about why we can't move ahead in the direction we all might like. Briefly, when legislation is introduced and goes to a committee, if there is going to be any activity, they try to decide what agencies are interested, then request them to make a legislative report, and ask for witnesses. So we write a report and submit it back to the committee chairman through the Department who first clears it with OMB. Our position must be compatible with Administration's opinion.

There are many bills that we might report on and this is what becomes difficult – to know what to tell the public. You can't have an official position until the statement has cleared the Department. It's checked against positions of other Departments and it's not uncommon to report on a bill in connection with the Department of the Interior.

That isn't to say that we can't influence what the Administration's position is – we oftentimes can and do. We cannot clear a position ourselves unilaterally without going to OMB. Only occasionally will the Administration say they don't have any position.

### QUESTION

Have you detected any change in whether the conservationists are trying to get more bills into Congress?

### WHITFIELD

I am sure there is a great deal more legislative activity in this Congress. Obviously, the conservationist groups are looking to the courts more and more. The whole legal profession is trying in some respect to become the answer to these environmental problems. I don't sense that groups are going to lay off the legislative routes.

### HOWLETT

We will want to discuss what constraints are on people who testify because I think there is a lot of misunderstanding about it. I also think that as we look to the Forest Service as a strong professional organization, that we are going to have a lot of professional rather than political leadership at the top – we have got to be extremely sensitive to this element of the whole legislative process.

WHITFIELD

I know we have a great deal more flexibility in what we can do than a lot of other agencies — in our policy and in developing our own testimony. One of the reasons is because we have been pretty straight with the system. We have played the game square, professionally.

## MESSAGE FROM THE CHIEF



*J. R. McGuire, Chief, Forest Service – Washington, D.C., Divisions of Engineering Meeting, September 27, 1971, Washington, D.C.*

Gentlemen, welcome to the Washington Office. I am very happy to make comments for this first formal meeting of Regional engineers.

The record of accomplishments by engineers in the Forest Service is one to be proud of and I want each of you to know that I am appreciative of your efforts and achievements.

I could reminisce with you about the first bulldozer, some of our more spectacular road and bridge developments, or the equipment you have developed to fight fires or to plant trees. These and many more have produced benefits but I would rather call attention to the key role you have played in our overall Forest Service programs.

You have been involved in the expansion of our Forest Service programs from the beginning. The Accelerated Public Works Program of 1962 and 1963 was largely an engineering program. So was the Job Corps work. And I do not think of these as "Engineering Programs" as distinguished from Forestry Programs. I see engineering as a vital element that contributes to the management and direction of our National Forests.

I am confronted daily with controversies which require your input. Today's Joyce Kilmers, Sandia Crest, Minarets Highway, and the George Rogers Clarks will be replaced tomorrow by equally controversial projects. We need your best analytical and professional advice.

Demands for special uses on the National Forest by private industry and other agencies are on the increase. Annually, we accommodate hundreds of millions of dollars worth of construction and we need your best talents to minimize the impacts on our lands.

We are building over 7,000 miles of road annually, requiring proper supervision and inspection. I'm sure you realize this and I need your help in arriving at a balanced use of manpower so that we can put enough energy in places of need.

We have literally thousands of buildings and facilities which have outlived their economic and service life, yet, we seem unable to properly describe our plight to the point where this program is adequately funded. I need your help here.

The pollution abatement program presents a problem now with the manpower restraints, yet, we are told to meet the deadlines under Executive Order 11507. I need your help here.

I am glad to see that you are now pioneering in the development of transportation system planning to meet the demands now being placed on us for more timber and more recreation in a pollution-free environment. The land manager must increase his output by every means possible and this means modern machines, automation and better planning. You are involved and vitally needed in all of these.

Technology is giving us more tools today than we can possibly use. There are so many machines and complicated gadgets available to end pollution, transport garbage, and harvest trees that I would not begin to try to list, much less understand, all of them. And that's why we have you. You can rest assured we will rely on you more in the future. You must develop even better analytical tools than we now have to assist in reaching the best possible solution to management problems.

After all, society is giving you credit for creating most of the environmental and ecological problems we have today. I feel that this is an unfair indictment of the engineer and the technology he has developed. But what do we do for solutions? Which brings us back to you. You have the training, experience and expertise and you will be called on to apply it fully. You work on the Forests, with the Supervisors and Regional Foresters and know our problems better than anyone.

So I see you having an even more important role in the future by sorting out and evaluating technological developments, then applying them to achieve the goals we have established.

I could go on and on. I see you plan to struggle with many of these problems in your work groups and I hope you develop some concrete suggestions we can adopt and move forward with immediately.

You have my best wishes in this endeavor and I will be looking forward to the results.

## DISCUSSION

GANO

In the face of these constraints of real managerial challenges, are we expressing ourselves to whom we are reporting in the Administration as to what these constraints mean in carrying out the program within the quality standards as we understand them?

McGUIRE

We are getting quite a way down that road with our Secretary. We are having less progress with the OMB and perhaps with the White House. Our Secretary would go along with us if we were to say, if we don't get the money, we can't cut the timber. The White House people tend to look at things more in terms of efficiency. At the White House level, while we get quite a bit of sympathy, we invariably run into the problem that there are a lot of high priority things that must be done in this Nation and there isn't enough money – the question is what to do first? Maybe we could do a better job of expressing ourselves to outside groups. Sometimes it is more effective to have outsiders tell our story than to have it come from us.

The appropriations committee was quite impressed by the fact that in this last set of hearings, chaired by Mr. Powell, a group evenly balanced between the timber industry and conservationists went up as a body to support our request for additional appropriation. We need to encourage more of that kind of thing.

GANO

I appreciate your remark about the possibility of using outside groups to attempt to get a more forceful expression of these problem situations.

McGUIRE

I think we are competing with all the other needs of the Nation, and it is not enough to sell the Secretary of Agriculture on it. We have a large number of contacts. Some principal contacts here in Washington are the representatives of the associations – conservation and preservation – that kind of key men. Perhaps that is the problem here in Washington – to deal with key men. We have opportunities from day to day for contacts where in the field you have to keep working at it.

DEINEMA

Mike, I would like to make one point clear before we get on the next question. I am not so proud to see so many engineers in the group as I am to see the different kinds of

disciplines you have in here — that it isn't all engineers. The day has long passed where you have engineers talking to just engineers and foresters to foresters.

I think there is no doubt in anyone's mind that engineers are a mighty important segment of our team approach. I guess there is no doubt in anyone's mind that engineers have a career — it is no longer we or they — we work as a team.

FUREN

I wonder who's planting seeds now organizationally for the eventuality of having a Corps of Engineering. If we have a Department of Natural Resources "they" will be doing all the engineering work for the Forest Service. What are we doing now about the things that are going to be happening in the next 3 to 50 years?

DIENEMA

We have an outstanding expert in the Forest Service right here now — John McGuire — to tell us. He has been working with different committees that have been set up to study this whole problem.

McGUIRE

The two Houses of Congress have held hearings on the whole idea of reorganization, and now they are planning, probably next month, to hold hearings on individual departments. The first department to be taken up probably will be the Department of Community Development, which would be HUD, plus some other odds and ends. The Department of Natural Resources possibly will be taken up by the Senate this year. The prospect of anything happening this year doesn't look very good, although the Administration is still pushing it pretty hard. Next year, being an election year, is anyone's guess. There is quite a bit of overall support for reorganization, but when you get down to the specifics, there is quite a bit of opposition. For example, many Agriculture members are generally in favor of reorganization, but they don't want to do away with the Department of Agriculture. Whether they ever get together is a good question. One of the things we are concerned about is that if they go part way and move the Forest Service and Soil Conservation Service over to the Department of Natural Resources they never may get around to abolishing Agriculture. In the past we have always argued that we wanted to stay in Agriculture, but we can't argue that now if they want to do away with the Department. On this point of Corps of Engineers doing all the engineering, you will hear stories like this. The proposal is for five administrations in the new Department of Natural Resources. There will be one for Land and Recreation and one for Water Resources.

It's going to be difficult to coordinate those two administrations. Each will have under present plans its own research arm, but what other kind of coordination that might be done is not at all clear. Except in the case of Water, they would like to consolidate the planning functions. You see, the Corps is not going over lock, stock, and barrel, it is just the planning part of the Corps that is proposed to move to DNR. There are some substantial engineering elements in SCS and Bureau of Reclamation. I don't quite see how you can consolidate all the engineering work, but there could be a consolidation of planning.

On the land side, again there may be some centralization of planning but no consolidation of engineering functions. If this were to go through, a more imminent possibility would be a move to do away with bureaus as we know them – Forest Service, Soil Conservation Service – and have a regional administrator for each administration. Under this proposal, the Regional Office would report to the Regional Administrator, and the WO would become staff offices for the Administrator of the Land and Recreation Administration.

DEINEMA

I think what we should say here is that we are not going to let this pass by. We are actually participating, and attending all the committee meetings, and we have our hands pretty well into it.

McGUIRE

Yes, we have had an excellent opportunity to participate in all of these proposals. Of course, we couldn't oppose them or we wouldn't have been allowed to participate. But we have had a chance to lay out alternatives and point to pitfalls.

ADAMS

Could you give us a short rundown on the Sierra Club meeting last week? Are they after us in the timber business and the road business, or are we anonymous?

McGUIRE

No, we were not exactly anonymous. We caught our share of all the criticism. It's like going to a revival. It is an emotional thing. There was substantial criticism from the platform, but then I found when I talked to individuals that there are quite a few reasonable people in the two organizations. We even got some defense from the floor.

They talked a little bit about coming restrictions on wilderness use, rationing, and so forth. The press was interested in that prospect. We encountered a little difficulty

getting down to consider alternative ways of protecting primitive areas in the East. I told them bluntly that I didn't think there was much in the East that qualified for primitive areas and that was thrown back to me throughout most of the meeting that day. A lot of people don't agree with that.

I proposed we set up some way of discussing the problem. I think we are going to wind up doing this with the Sierra Club and the Wilderness Society.

They probably will appoint some people to meet with us, and we want to get some folks in from the two eastern Regions. Then we can talk about all the different angles. The thing that appeals to them about this is that if there is Eastern wilderness legislation, there might be an opportunity to remove some of the undesirable aspects of the Wilderness Act. They want to talk about it, but they think we are too pure in our interpretation of what's wilderness.

#### HOWLETT

I hope while we're on this subject of wilderness that everyone gets a chance to read the paper that Dick Costley wrote on wilderness. It was just sent to the Regions last week. It is a good thought-provoking discourse and should be a must for every engineer. It casts a lot of light on why we have the positions we have and what the wilderness really means to us as land managers. You don't have to agree with everything Dick said, but it will start you thinking. He did an excellent job of presenting his views.

I would like to go back a moment to reorganization. We have given this a lot of thought within the Division of Engineering. As you look at the agencies that are now Interior, we would be adding certain strengths. There is one particular reason why we like Agriculture. It has an environment that encourages professionalism among all the people in the Department. We have top professional people running the Department, from the Secretary, Assistant Secretary, et cetera. It has been very easy for us to maintain a good solid, sound professional organization based upon professional approach to land management.

The Forest Service has a high percentage of professional people. We would have almost half of the professional people in the new Department because other agencies haven't been organized along these professional lines.

Another thing we would have other than the great preponderance of the professional strength in such a Department is certain activities that are not presently common to Interior, such as our research organization. Our research organization is by far the strongest of any of the agencies proposed for consolidation. It would be just overwhelming in that Department. Also our State and private activities would mean that we would have the only organization with ongoing programs closely related to each and

every individual State. If you look at the effect of this on the new Department, you can see that it would be difficult on the Secretary to have an individual agency which overshadows the rest of the Department in so many important areas. We must concern ourselves now with maintaining our organizational integrity.

CURFMAN

Do I understand correctly that the Chief's Office is now going to develop a set of National priorities that will be helpful to the field in determining what one program priority is in relation to another one? This would place different emphasis in different Regions. Each Regional Forester would have the National priorities in which he would be working within each program instead of being directed to develop within a certain set of criteria where he is to put people and dollars. Is that the way you are headed at the Washington level?

McGUIRE

That's right. Our program planning process that we want to develop with the Regions is a balanced program for the decade ahead. We hope the Region in turn will do the same thing with the Forests. Each Regional Engineer and each Forest Engineer will know what's coming and what's agreed on in the way of priorities. It is fine to talk about balance when we want balance, but we must get down to brass tacks.

DEINEMA

What form this takes and how soon it comes about is not decided. However, I have a hunch it will be a major topic of discussion at the RF&D meeting. I don't see how we can take these reductions along with the pressure for increases. We are going to have to pick program priorities, try and fund those adequately, and do a quality job. Some things are going to have to go by the wayside.

McGUIRE

I sure agree.

LARSE

While we recognize these short-range restraints on our program and budget, what do you perceive for the long-range future? Do you see increasing levels of resource development programs for the Forest Service? In the field, we try to maintain a high degree of optimism for the future all the time. We note an increase in the amount of pessimism about what the future holds for increase in quality of work and resource development.

DEINEMA

Just let something happen to the Vietnam war — which is almost a cinch before the election — complemented with the programs to decrease unemployment and the programs for the environment and ecology. I think we are going to have some pretty bright days ahead of us. The Regions with the proper plans are going to get the increase in dollars. What I am trying to say is, don't give up on your planning efforts; we still lack funds, but we are going to have dollar increases in the future. My outlook is optimistic.

McGUIRE

Our tentative 10-year program calls for a doubling of expenditures over the next decade. Our expenditures now are running around \$700 million including payments to States, and I wouldn't be surprised if we came pretty close to doubling that within the next 10 years. There is a lot of popular support for what we are doing, and if we don't slip up too frequently in how we carry out our programs, we will maintain this popular support. I don't see why we won't get the funds to go ahead.

DEINEMA

Gloomy? Talking about reductions in people and reduction in dollars — although it does look gloomy temporarily, just look back over the last 5 years and see how far we have come. Every other year we have these periods of leveling off, or even a depression, but we bounce right back with more dollars and people than ever before. I am not trying to take the sting away or the degree of caution that is needed right now, but I also think the long-range future is optimistic.

WILKE

I believe we have been trying to meet an allowable timber sales quota regardless of the amount of road miles that go with it. Jack, you said you don't think we will be allowed to make a reduction in timber sales. Don't you think we should tell OMB we can't sell this much timber with this much money and still do a quality job on the ground?

DEINEMA

We didn't make allowable cuts last year. We didn't have the road funds. We had conservation constraints and other factors that leveled it out. We got some criticism, but we stood up and were counted on this. I think this is what we are going to have to do in the future, but not until we actually know what it is like on the ground. We just went up and testified that if we got 10 percent increase in our timber sales dollars and our FR&T increases, then we could do such and such. As quickly as we have specifications on why we can't do this, Region by Region or Forest by Forest, we will let it be known.

We should never sacrifice quality for quantitative goals. Any more of these poor sales or poor roads, and I think we are lost as an outfit. The only way we are going to save ourselves is by taking people out and showing them on the ground. It is not going to be TV ads, newspaper ads, fancy talks, or anything else. It is the kind of job that needs to be done right out there on the ground.

LARSE

Is there any anticipation at this time that in packaging your Phase 2 programs you may in the future make some inter-Regional shifts or targets?

McGUIRE

It's going to be a kind of negotiating process. After all, you have the information; we need your estimates. When we set a target, we are going to have to allocate it in some fashion so there's bound to be shifts. I think we are going to need to be flexible on this – not just in timber or roads, but in all the other functions as well.

WILKE

You asked the Region for the maximum program they can handle. This is always predicted on the historical financing on which the Regions have to build their present capability.

McGUIRE

That is right. I was trying to get both the supply and demand side recognized in our analyses. That is why we have set up this multifunctional planning team here in the WO to try to improve our techniques. It is also why we are committed to OMB to make a study of roads and their relation to resource use. We need new techniques and we have to take all the factors into account. We have been too loose in our approaches in many instances, and one of the reasons we have trouble with those who develop budget levels is that we haven't made a good case.

KREITLER

Are we using the input from "Environmental Program for the Future?" The Environmental Program for the Future went out in November or December of last year – about 10 months ago. Now, this was, in effect, a 10-year plan regarding what direction you wanted to go. The Environmental Program for the Future was the basis for our request to the Department for FY 1973, with minor changes. This was the first step – we took the basic information supplied by the Regions and told the Department that this is what we are interested in doing.

Now the second step came with the FY 1973 planning process. Around February, the Regions responded as to where they would like a 6 percent increase and where they would like a 15 percent increase. The Regional Forester has much more leeway in reallocating the resources and their priorities.

At that time the Department came back and said your Environmental Program for the Future is much too high—all we can give you is something much smaller. In fact, they asked what we would do if we didn't get an increase at all. We went back to the Regional responses on the 6 percent and used this as a basis in figuring out what total we want in the various programs. This was the fundamental information that was fed into it. It is not the exact information. Through the various negotiation processes within the Department, we continued to rely on the information supplied to us by the Regional Forester on what they wanted to do.

Now let me take this a step further. Budget and Finance is now in the process of coming up with initial allotments to the Regions, and their initial basis for doing this is the 6 percent level—in other words, feeding right back to the Regions the basic dollars they requested. There will be some changes. The Chief has priorities; things will balance out. In effect, we are going to use this as a beginning point with the allotment system. We are using the Regions' information. We intend to continue using it. It has a very significant input to this entire cycle. We use the information in our requests to the Department, and the Department will probably send it to OMB. Presumably they will be asking us additional questions and we once again will have to go back to what the Regional Foresters wanted in order to come up with new figures. When OMB comes up with the package, it will go to Congress in a message by the President, and Congress will finally come up with a final appropriation. I think the answer is yes, we are using it.

## MULTIPLE-USE PLANNING



*C. W. Rupp, Multiple Use Coordinator – Washington Office and Regional Office Divisions of Engineering Meeting, September 27, 1971, Washington, D.C.*

To begin, let me define the area of management I'm going to talk about and the integration with other management activities that is required. Since this particular meeting is focusing on NFS management, I will direct most of my thoughts in that direction.

As I see it, we are responding to quite a variety of laws, EO's and departmental directions that authorize and direct us to take appropriate actions to achieve a series of National goals. We have developed an organization to coordinate the efforts of ourselves and others and we have adopted means of accomplishing certain basic management functions. There are many ways to illustrate this and I think this is appropriate for the emphasis we have today.

Laws provided us with an NFS land base to work from. Laws guided our organizational functioning and had large impact on organizational structure. Presidential objectives (National goals) set priorities and targets. So what?! You already know all this! I would like to remind you of how our management actions must mesh.

One of the major and very basic purposes for organizing or creating an organization is to provide coordination towards synchronizing the efforts of people to achieve a common purpose or objective. Most of us, at one time or another, have said to ourselves, "By golly, I've just got to get organized," or "Get things organized," or words to that effect.

When I say that to myself, it's usually as a result of finding my efforts aren't achieving the desired result and most of my work seems wasted. So with organization, production is achieved as a result of many things, and volume and quality control and even the kind of commodity produced is influenced by how skillfully or well these management functions are carried out individually and how they are coordinated towards meeting the objectives.

The point is, as we focus on the management function of planning today, we must remember the direct and vital relationship of planning to the other functions of

organizing, directing, controlling and ensuring coordination throughout the organization. This understanding is basic to my discussion for multiple-use planning and is a part of a total management picture that must be viewed in its entire perspective in order to see the various dependent relationships between multiple-use planning and other management activities.

As I see it, the objective for multiple-use planning is to provide for the production of an optimum mix of goods, services and values from National Forest System lands in order to fulfill the Forest Service objectives identified in Framework for the Future and to help meet the National production targets. Okay, swell! Hasn't this been a major objective of multiple-use planning for more than 10 years? And a major objective of several other management actions as well? Yes, you're right, it is and has been, and that's just the point. Our objectives in relation to NFS land management planning haven't changed all that much, and the direct tie to other management actions and functions is even more visible.

If that's true, then the next question just has to be: Why the change? The way I see it the change that is taking place is more a shifting of gears than a total change of direction. We are not proposing, in any sense, that we "throw out" what we've done in multiple use planning over the past 10 years. That planning system, designed in the early 1960's and that level of planning intensity was fine for the complexities with which management was involved in those years. But the complexities are far greater today, the value lines sharper and more numerous, and a group of new laws are bringing their weight to bear. Speaking on this same subject, Thomas Jefferson once said, "I am not an advocate of frequent changes in laws and constitutions but laws and constitutions must go hand in hand with the progress of the human mind. As that becomes more developed, more enlightened, as new discoveries are made, new truths discovered and manners and opinions change, with the change of circumstances institutions must advance also to keep pace with the times. We might as well require a man to wear still the coat which fitted him when a boy as civilized society to remain forever under the regimen of their barbarous ancestors."

Well, now, I'm not suggesting that our recent ancestors were all that barbarous. I do know that change in society, in environment, and in everything we do is constant. We can count on it in the factors which influence our lives. As a matter of fact, many management consultants and specialists consider change as a matter-of-fact item. The key is acceleration of the rate of change. I'm suggesting to you that the pressures are rising and we must meet the challenge.

Understanding that we are not going to start all over again, but will build from where we now stand, let's look at what's different in the revision of our planning system.

For one thing, there is a more direct and visible tie between the Chief's statement of objectives and the accomplishment of projects at the Ranger District. There will be a more intensive and deliberately systematic look at management options. The system of multiple-use planning is designed to be dynamic. The concept of a completed multiple-use plan for most administrative units has never been applicable, and it never will be. A far more positive, public-interagency involvement is required. Now let's look at the multiple-use planning system, remembering that it exists as a part of a complete management system of interdependent modules.

Here, I'm going to take a look at a chart called "The Multiple Use Temple," if you will. We have a number of laws: The Environmental Policy Act of 1970, The Weeks Act of 1911, The Wilderness Act of 1964, the Assistance to States and Research Act of 1962 – these are all laws that have the basic input. We have the matter of coordinating them. We have planning, organizing, directing, and controlling – these are basic pillars of this temple and what we are going to talk about today is planning. The others are just as important, and if any one of them slipped, the temple is going to start to sag.

Multiple-use planning relates three basic elements to provide a comprehensive set of NFS land-oriented plans for action. The three basic elements considered are: resources, land capability, and people's demands. Of course, they can be reached in many ways, through such things as studies, judgment, or experience. It can be illustrated in this way – we have interdisciplinary teams, public involvement specialists – here in the center we have the plan – resource, demands and land – these all playing their roles in the rest of the feed-in to the plan.

Of course, this greatly oversimplifies the relationships and assumes many things that are spelled out in a detailed description of the system. So in order to more fully understand what is intended, let's walk through a hypothetical planning situation for an imagined area. Some compromise may be made in the system, but I'll try and describe an idealized situation.

A Forest Supervisor is confronted with a need to develop an action plan for management of a part of his National Forest. The plans he now has seem inadequate or inappropriate in relation to fulfilling his objectives for management. He decides, after consulting with his management team or staff and Rangers, that a more intensive planning job must be done before he can make rational decisions.

Assume he had:

- Area Planning Guides
- Basic Assumptions
- Forest Coordinating Requirements
- Planning Units Identified for his Forest
- Forest Situation Statement
- Required Skills Available (either in- or out-Service)

The Forest Supervisor might take this approach. To start: he assembles and appoints the appropriate planning team. He may include membership from the non-government area. He appoints a chairman, usually an individual who is assigned as the planning coordinator for his Forest. He establishes the priority of this planning project in relation to other work, and sets a target date for completing the job of preparing alternatives for his decision. Remember, we are talking about planning units. He establishes guides for the extent which he desires to participate in the planning process. He provides planning objective or sideboards that must be considered for the planning unit.

He provides the planning team with his best estimate of the critical decisions which may result from the planning process. This, coupled with on-going judgment of the planning team, determines the extent and intensity of inventory and data collection work.

What kind of people are on planning teams? I'm going to break a long-standing personal rule and make a negative statement. Planning teams are not made up of "available" people. People possessing the skills and areas of expertise identified by the officer as necessary must be made available to serve on the team. In some cases "available" people will be the right people for the team. The thing to avoid is assignment of individuals to a planning team job on the basis of operational expediency.

The planning team, then, has an organizational job to do. A flow chart is developed to establish the expected or desired sequence of events and to tie this sequence into the necessary time frame. An early list of contacts in-Service and out-Service is prepared and required meetings and hearings are tentatively set on the schedule.

A public meeting or series of meetings may be considered at this time. Meetings should be considered when specific objectives relating to the planning effort can be met. They should be documented and should not be held without specific, visible, and reasonable objectives to be met. At this same time, the desirability of holding an in-house briefing session should be considered. The availability and effectiveness of other communication tools is a judgment factor that will help decide whether an in-house briefing is advisable.

The planning team now needs to review its planning environment. Are the objectives clear? Are there implied objectives that need to be listed with the previously stated objectives? Based on the preliminary flow chart, can the job be done to the specified standards within the time limits established? The idea is to try and resolve administratively controllable conflicts and clear the decks for continued work. One of the basic planning premises is that we are to consider land capability, resources, and people's demands in order to formulate a series of management alternatives. Sources of information for the three major categories are determined early.

People's demands are provided or are available from several sources. Laws and the political process have provided a base for the formulation of agency objectives, Regional management direction, planning area guides, and Forest coordinating requirements. These objectives and their step-down through the Forest Service organization provide direction on the nature of various outputs of goods, services and values desired from the National Forests and, more specifically, the National Forest involved in this planning effort.

National targets for commodity goods and activities, distributed to Departments, Agencies, Regions, and National Forests tell us more precisely how much of what is desired or needed as a result of our management activities.

Budgets are not really a means of viewing people's demands, but may provide short-term insight on the relationship of priorities for programs within the agency and viewed as a whole may provide some perspective on the relationship of Forest Service programs to other programs of the Administration in the short range.

Viewed from the perspective of a full knowledge of the array of National demands, public involvement is another tool for assessing the relative hierarchy of values people place on commodity goods, opportunities for use, and environmental quality factors. Careful listening, weighing, and comparisons of the views expressed by people is an excellent way to develop mixes of uses and activities. These ideas will help fulfill National objectives and targets while providing a more desired range of attendant complementing outputs. Many aspects of actually executing programs on the ground can be varied and adjusted to meet multiple goals. Size and scope of activities, timing, administrative techniques, regulation of use, and design of physical features (roads, buildings, timber sale units) are all variables that may be controlled.

Another major category of information that is needed is data on land capability. There is some relationship in this area to the data collected on resources. The information is used in this step to identify the kind of land being dealt with and to provide a series of statements of what the land characteristics mean for management activities. At least four basic items are identified and related to each other: geology, land form, soil, and habitat type. Present cover type, fauna, hydrologic, climatic and other data may be added as necessary. The idea is to be able to predict, with some degree of reliability, the effects specific activities will cause on the land. It is easy to get busy collecting data, however, without regard for its usefulness. This should be avoided by collecting and inventorying data on the basis of need and expected use.

Data on land capability should be correlated by the interdisciplinary planning team. The results of their correlation should be a map showing significant land classifications and a write-up describing these land areas. The write-up will include statements indicating the meaning or implication of these areas and their characteristics to management.

The third broad area of information needed is a compilation of resource inventories. These inventories can be collected in field surveys or may be compiled from existing data. Data collected in this resource inventory process is most useful if it is both displayed graphically and statistically. Transparent overlays made on the same scale as the planning unit base map is the best way to display data graphically. These overlays, used in various combinations, help the planning team to visually relate the relationships of one resource to another. Conflicts between activities and opportunities to develop complementary patterns of management are more readily apparent. These overlays are also a good communication tool in working with other goods.

Recording and inventorying resources must be done objectively according to predetermined inventory standards developed for each resource category; Range, Recreation, Timber, Water, and so on. Field judgments on usability or value must be avoided in the interest of getting an unbiased and comparable count of the resources as they exist. It is the job of the planning team to make judgments on the way in which activities may be combined to produce the most advantageous mix of goods, services, and values from the planning area.

Inventories of the various resources are best collected by people who are specialists in working with that particular resource. It is more satisfactory to collect data by using a number of various specialists who focus their inventory skills on the same planning unit within a common time frame. Attempts to collect inventory data on a number of resources simultaneously with one individual have not been satisfactory. Planning team members may want to participate in some of the inventory work. This part of the job sharpens their individual and collective awareness of the features and relationships existing in and around the planning area.

All right then. We now have available to the planning team information on: land capability, resources on hand, and people's demands. The next step is to develop a series of alternative management plans for the planning unit. Each alternative plan should be designed to be responsive to one or several stated management objectives for the planning unit. The President's water resources council has published four National objectives for the management of public land. They are: to enhance regional development, to enhance the National economy, to enhance social well-being, and to enhance the quality of the environment.

As a start, an alternative management plan should be developed for each objective that deliberately favors that goal. This does not mean that an alternative plan must exclude consideration for the other objectives that are not being emphasized in the alternative. In some cases one alternative may satisfy several objectives simultaneously. After all reasonable alternatives have been developed, the planning team will identify and, where possible, describe and quantify the benefits, consequences, costs and impacts for each alternative plan.

Before we get too far now, let's talk about how the alternative plan development is done. The planning team is able to prescribe a pattern of uses, or activities, as well as certain values and constraints that will apply to the planning unit. It is necessary, however, to rely heavily on specialists from the various management divisions to help design the precise parts of the plan so that the desired management result is obtained. Timber, Range, Recreation, Watershed, Wildlife and other projects are molded into a program for management of the area. Timing of projects is specified. All of the constraints and actions needed are spelled out. Staffing to execute the program is anticipated and becomes a guide for personnel management activities. Critical points are identified and control items established.

Just as the specialists and experts from resource and management divisions are essential partners in this process, so too, the public represented to the best of our and their ability must be able to have a real and visible effect on the planning activity. Methods for achieving solid public input are many and varied. Conditions and circumstances will point the way to the most appropriate methods for each planning situation. Several things are clear. Public involvement is to be planned and structured to derive the greatest benefit from the public inputs. Public inputs will be considered fully and carefully. Our dealings with the public will be open and frank. When the line officer makes his choice and decides to implement a plan from the array of alternatives presented to him, he must be able to do so with a knowledge of all of the facts and opinions bearing on the planning unit. Local public involvement considered in light of National and Regional objectives and targets is one of the ways to understand National demands as they relate to the specific planning unit.

When the planning team begins the job of matching up uses to identify alternative plans for a planning unit, they must be sure to consider the widest possible range of choices and uses. The range of activities varies from consideration and proposal for wilderness to a pattern of management geared to very intensive management and use.

The Forest Service is familiar with the extremes of the management spectrum and with a great variety of mixes in the middle range of management. Recently, we have opened up a new concept of "back-country" management that helps fill heretofore unfulfilled need. The need is for areas of land that provide opportunities for experience similar to those found in wilderness in places that do not qualify as wilderness according to the specifications in the Wilderness Act.

In constructing alternative courses of action for an area, each alternative should respond to an organizational objective or set of objectives. In planning for National Forest

System lands, in every case, an alternative management plan will be developed that is responsive to the following set of objectives:

1. Enhancement of Regional Development
2. Enhancement of National Economics
3. Enhancement of Environmental Quality

This alternative will consider actions necessary to maximize this sawtimber and related wood fibre product outputs from the planning unit. The plan will itemize the expected benefits, consequences, costs, and environmental impacts. This information is to be displayed in such a manner as to facilitate comparison of this alternative for management against other alternatives. Basic multiple-use values and considerations must be retained, but the emphasis in this alternative is on timber production.

An alternative will be developed responsive to the objectives of enhancement of the environment and enhancement of social well-being. This alternative will consider the options for management of the planning unit in its entirety or in major part as wilderness or as back country if the land does not qualify as wilderness under the Wilderness Act.

Other alternatives should be developed as necessary to assure an exploration of the complete range of management possibilities.

In any case, the kinds of uses and activities envisioned for the planning unit will be delineated on a map of the planning unit. This helps the team and others to relate quickly to the special distribution of activities and to more clearly understand the relationships between activities, life systems, and values. Overlapping of activities can be expected. Critical relationships and acute conflicts may be emphasized if needed. A descriptive write-up should be prepared for each alternative. An explanation of the sequencing or timing of activities or events will add to understanding at this point.

The write-up of the alternative will need to itemize the expected or predicted costs, social, cultural and economic, of implementing the alternative. Benefits, consequences and risks involved also must be listed and discussed. Public opinion should be summarized if possible.

The objective, of course, is to provide a program of management in response to National and local demands. Public land managers must take into consideration the programs and activities of landowners and agencies affecting or being affected by their work. Forest Service managers and planning teams must make every effort to include the plans of others in their considerations. Members of the public or other agencies may be included on planning teams or utilized in a consultant capacity.

Before even considering making a decision an environmental analysis is made and an environmental statement is prepared and filed for the alternative plan that most nearly satisfies the objectives identified for the planning unit. The decision is made only after the entire process for environmental statements has been satisfied.

What happens, then, to our array of "functional" plans? The change here is slight. Over a period, or say, roughly 8-10 years, our functional plans will still resemble plans of today. The difference is that over that period they will have been repeatedly adjusted until they are an aggregate of the projects developed for planning units throughout the Forest.

## DISCUSSION

WILKE

Our present guides for environmental statements say that we make environmental statements for multiple-use plans and environmental statements for transportation system plans. It might make more sense to make environmental statements for combined multiple-use plans rather than for the individual transportation plan.

RUPP

If you are far enough down the road that those two are completely integrated, then your statement about making it for the multiple-use plan would be adequate. However, in the unit planning, we don't have a National Forest that has a multiple-use plan on that basis. Those that have done some work on it indicate that with present manpower and financing, it is going to take up to 10 years to get it. The thought here is just like individual timber sales, individual roads, or individual any project. We are going to have to make some environmental statements in the interim period until we have the units completed. Until then we will have to make it for individual projects.

The hardest hurdle to get over now is that when we get through with unit planning, we are going to have a mix of other types of planning which range from complete multiple-use plans under the old system to almost nothing. Some National Forests don't even have a multiple-use plan of any type. That is hard to believe in this day and age. If they get transportation planning down in advance or ahead of completion of the unit planning in multiple-use, they would make some environmental statements.

WILKE

Are you saying, we could make a transportation plan without having a unit planning done?

RUPP

It's been done. We have transportation plans on a lot of Forests that don't have multiple-use plans.

WILKE

My point is I don't think the thinking behind the directive is clear in that respect.

RUPP

We were talking about unit planning and transportation planning. Under the old system of multiple-use planning where we had zoning and management units rather than planning units, you could come up with a transportation plan that would not be the same as what we are talking about in unit planning. Then, if you make the environmental statement on the old system, it is almost meaningless when compared with what we are talking about under the new system. We are talking about making the environmental statement only on these units, not on the old type of multiple-use plans. You wouldn't make one for each transportation plan within the unit.

We are still going ahead with timber management plans, for example, even though the multiple-use plan is not complete, and I think that is going to continue.

ADAMS

Do we have any indication that CEQ and GAO will accept an environmental statement that will cover all these things?

RUPP

We are working with CEQ and GAO and they are very pleased with what we are talking about.

CURFMAN

What size package do you see in developing an environmental statement? A Ranger District? Group of sales? Forest Service sale?

RUPP

No. A planning unit and everything that's included in it. These units can be around 20,000 acres – some could be much larger; some much smaller.

CURFMAN

What happens if there is some reason to change a part in the unit plan once it has been made?

RUPP

If there is a change, then it takes a reanalysis of the entire unit because everything is integrated. If it is acceptable to go some other way, then another environmental statement is necessary. Any plan that can't be changed isn't worth much.

· GANO

Can you give any background in regard to the rationale behind the instructions for the 5,000 acre or more wilderness study area; my point being – is there some possibility that these undeveloped areas may be less than a proper management unit?

RUPP

Because of the concern of many people inside and outside the Forest Service as to how much wilderness we should have and where it should be, we had to take a look at what was available first. We had to make an inventory of what was available and we said that if we had 5,000 acres and if there were no roads and no obvious things that conflicted with the Wilderness Act, we should take a look at it. This doesn't say that they are selected for study, and then make a proposal for those that are to be studied. Some of them are obviously going to fall out in the first look, but we can't automatically say this doesn't fit or that doesn't fit until we take a look. First, we recognize where these all are. Then when we go to the President and say we propose that these areas be studied – not that they be made wilderness areas – we propose these areas be studied. If we don't go to the public with this, the first thing they are going to ask is, did you look at this area? Did you look at that area? The public also knows where these areas are.

GANO

I worry about the delineation of a planning unit being consistent with what might be drawn around a 5,000-acre site. I see some possibility of less than total consideration being given to a unit because we are only looking at a part of it.

RUPP

You are talking about the interrelationship of units. However, we are trying to get people to describe these units on the basis of land capability, needs and demands, and on the basis of the socio-economic situation. If they are within the potential wilderness area, whether they be 5,000 acres or not, we will use it. However, chances are the unit boundary will not be around 5,000 acres; it will be much larger.

WILKE

Something bothering me about this is that we established a wilderness area sometime ago in Colorado that goes right across the most logical and economical routes of the Interstate Highway system. It's costing the State a lot of money and it is going to cost every traveler of that road money. I am concerned that we don't recognize this in deciding whether these areas are eligible. I think we are going to have a little trouble keeping wilderness people from saying we don't have to build that road there. I see a real hazard here.



## DIRECTION FOR ENGINEERING IN

### FOREST SERVICE



*M. R. Howlett, Director of Engineering – Washington Office and Regional Office Divisions of Engineering Meeting, September 27, 1971, Washington, D.C.*

As you will notice on the agenda, I am going to talk to you about the direction of engineering. I asked for a lot of advice – some of the advice I got I don't think we need. Then I started looking back through some of the older material that we have. One thing that I think was very important was the report, "Use of Engineering Skills in the Forest Service." I hope that everyone occasionally picks this up and looks at it.

In the past, Engineering in the Forest Service has been a kind of haphazard, growing thing. At the time I came into the Forest Service, we were performing functional types of operations incidental to engineering service. The Forest Engineer, for the Forests that had engineers, and there weren't very many, was basically a construction and maintenance superintendent. Then the Forest Service recognized the need for multi-professional input into a changing and

complex role. Therefore, we had a sudden change in the late 1950's and early 1960's when we employed large numbers of engineers. However, we never truly organized to do this unique engineering task demanded of us. We still did our work very much as we had prior to the time when we had large numbers of professional engineers and before we had major engineering works to accomplish.

In this environment, we had a very difficult time bringing our overall engineering up to a professional level, offering our individual engineers opportunities for them to grow in their professional skills, and no particular organization for the use of high engineering skills to do engineering work. To a large extent, we still continue to do our work at a very low professional level. Most of our engineering work is done at a GS-7 or GS-9 sub-professional level. This is a matter of some concern to me, and I know it is to you. We have been attacking this problem for some time, and I think with some success.

I would be less than candid if I didn't say that I am not at all satisfied with the success we have had. We must develop a high degree of unique professional talent and organize in a manner in which we can apply this professional talent to specific jobs out on the ground.

This morning we have listened to speakers talk about people looking at us and the public becoming more critical. We are going to have to face these attacks. If we are going to make ourselves invulnerable to these attacks, we are going to have to increase our engineering skills, and we are going to have to ride in an organizational vehicle in which these skills can be applied to high priority specific jobs.

Some of you have learned, perhaps the hard way, that every available technique, special skill or device has to be brought to bear if the growing, complex engineering-oriented resource problems are to be solved and the needs of people are to be met. Not only technical skill but a keen understanding and awareness of social, cultural, political, and economic forces must be applied. All of you have the ability to know what you and your immediate staff can do and recognize when you need the help of others to solve a problem or make a crucial decision.

The purpose of engineering in the Forest Service is to provide its input, thus allowing a better job of land management. Only to the extent that we need engineering skills to advance the art of forestry (in its total context of managing land) do we need engineering skills in the Forest Service.

As I talk about professional engineering skills, I am not thinking in terms of the normal engineering skills such as civil engineers, mechanical engineers, or any other types of engineers that we hire. Rather, I am thinking in terms of forestry and how we as engineers, or we who are skilled in the various kinds of engineering, can advance the objectives of the Forest Service. This is what I am talking about and what I am suggesting we organize to do. I'm not talking about organizing to make a better engineer per se, or to make a better Division of Engineering per se – I am talking about actual contributions the art of engineering can make to meet and enhance the art of forestry in the broad context of land management.

Some time ago, each Region received a letter transmitting a study of "Engineering" with recommendations signed by Ed Schultz and Red Nelson. At the time, Ed was Deputy Chief for Administration and Red was Deputy Chief for NFS. The transmittal letter stated there is a need for: better designs of roads and critical public works, better supervision of construction, better program development and better control of programs, better management of road funds, and better management of our engineering force as a whole. These recommendations are just as valid today as they were three years ago!

The letter went on to state: "To meet these objectives – in order to bring adequate competence to bear on major and critical problems, the Forest Service must accept the concept that all levels of organization of engineering work of the Forest Service are complementary rather than separate entities. The full technical competence of the Regional or Washington Office should be applied, where needed, to the job on the ground.

"With the great expansion of engineering work in the past few years, the Forest Service has tended toward more decentralization without recognizing the weaknesses inherent in this type of organization. Young engineers can best grow professionally under the supervision of highly qualified engineering supervisors."

I would like to be more specific on this – a couple of weeks ago, Dick Wilke and I were out on the Forest and talked with a GS-12 Forest Engineer who had never been anywhere but on that Forest. He was obviously an intelligent engineer, and he had good formal academic training, but that young engineer, when we discussed with him engineering processes, had absolutely no idea whatsoever of what was involved in a truly professional approach to engineering. That was our fault – we hadn't trained him. In this highly scattered organization of ours, we hire perfectly competent people in the academic sense, but we don't continue to develop them in a truly professional engineer's approach to getting the job properly done in order to meet the goals of the Forest.

The letter continues: "Also, this has led to the use of a generalist rather than the team of experts needed to do a first-class job. Dispersal of engineering forces has also tended to fix the size of program at Forest level at the expense of Regional priorities. Our organization as such has the ability to do a job, to determine where we can do the work, and how much we can do at an acceptable level of competence. It has led to a multitude of small projects which require more supervision than we are equipped to handle properly.

"Looking at our greatly expanded engineering job, we are convinced that we must organize differently. We must make better use of our qualified and experienced engineers. This will require such action as the establishment of a technical center – or centers – to handle major projects or those specialized projects which occur infrequently on any one Forest."

Now when I talk about centers, I am talking about centers within your organization of technical skills to resolve difficult problems that do not occur on all of your Forests, or if they do occur at all, not with enough frequency to have the kind of expertise available at the Forest level. We are not talking about large numbers of people or even most of the work when we think of these centers. The major part of the work still has to be done at the District and Forest level. What I am saying is that there is a part of that work that

we cannot do there and we have got to organize at a higher level for this more complex professional work. This does not necessarily mean large numbers of people, but it is a skill contribution we have to be prepared to provide.

Such centers would be under the direction of the Regional Engineer. They would be fully staffed with specialists and equipped with modern equipment needed to do a quality job. Here again, one cannot, at the Forest level, have modern tools to fully evaluate many of the problems that will be encountered. We are going to have to consolidate parts of the engineering design work load. This proposed organization includes three Assistant Regional Engineers. Administrative units, such as branches or sections, should be eliminated. Instead, specialized skills would be organized under staff engineers, architects, or other specialists. These top staff specialists should be of GS-13 caliber.

Our purpose is not to run an engineering program as such, but to provide professional expertise. When looking to fill these spots, we still have a tendency not to think in terms of a top GS-13 technical engineer in the Region but rather of a program manager. We have got to be far more critical of the man's particular special skills to do the "engineering" job. You are not going to get a GS-12 or GS-13 Forest Engineer to ask for help at the Regional Office when he feels that the man in there is no better qualified than he is. In too many instances, we have not been looking for the right kind of talent in the GS-13 specialist at the Regional Office.

The transmittal letter also stated: "I know many of you are wondering what this new concept will do to the Forest Engineer's job – and in particular, the technical centers."

The establishment of technical centers would not detract from the importance of the job of Forest Engineer. In addition to serving as a member of the Supervisor's staff the Forest Engineer will participate in multiple-use planning and will lead in the development of transportation planning. He, the Forest Engineer, will direct other engineering-related activities on the Forest, such activities to be determined by use of guidelines contained in Appendix C of the report, "Use of Engineering Skills in the Forest Service" (and to which I certainly hope to hear you referring occasionally). Formulation of long- and short-range plans and annual plans of work; reconnaissance for roads and other improvements; design of minor roads or major roads where terrain is not complex; supervision of construction of all but the most complex projects; engineering investigations relating to proposed construction of improvements by others on National Forest lands; checking such engineering structures for safety; and maintenance of roads, bridges, and other improvements are some of the activities which logically would remain at Forest level. Where work is done at the Regional level, the Forest Engineer acts in a similar capacity as the owner's engineer in private business. He develops a prospectus for needed work; reviews plans for compliance with stated needs; makes on-the-ground,

plan-in-hand review of plans; and supervises construction. In case of a fluctuating program, the technical center may supervise construction, but the Forest Engineer will check periodically to ensure that Forest needs are met.

The engineering organization at Forest and Regional levels should complement each other. Where higher-level or specialized skills can only be provided at Regional level, the Forest Engineer should call for assistance when needed. This is a mark of a professional engineer; that is, knowing when his own resources should be supplemented and taking action to obtain that support.

The importance of the Forest Engineer position dictates that he be well trained. In the future, plans should be made for identifying promising engineers at the GS-11 level and giving them broad training including assignments at Regional Offices or technical centers. They should also be well-trained in multiple-use philosophy and in basic resource management technology. They should also be trained to take part in the fire control organization in those areas where their engineering background can be of specific advantage to our organization.

The Forest Engineer must be contemporary with modern forestry. He will continue to have one of the toughest jobs in the Forest Service. He must begin his career as a specialist to show him how his specialty (engineering) fits into the whole scheme of things. It will train him to take direction and enable him to see that in order to advise the manager, his grasp of things must be broader than his specialty. Our concept of what is right or wrong should be greater than the concept of a good technical engineering job.

He must be a communicator. Special training in reading, listening, writing, and speaking are the vital daily tools of his job. Communicative skills will play a key role in his being selected for responsible engineering jobs and continue to be a factor in whether or not he can perform it properly.

He will soon learn that his undergraduate days at college are only the beginning. He must have that built-in urge for self-improvement, an intellectual curiosity; if not, he will stagnate the moment he leaves college. He must continue to learn, to be aware of priorities and social and political trends around him.

He will supply the input of practical knowledge. He must take the initiative to broaden himself between his level of doing and the areas where he calls for assistance. He must associate with professional societies to stay "plugged in" to discussions on contemporary issues. There is no substitute for personal experience and face-to-face communication.

This is our challenge. I think that we have been giving challenges for sometime for our engineering organization. It started several years ago when we suggested reorganizing the Divisions of Engineering, first at the WO level and more recently at the RO level. However, we must not stop. I think we can be proud of what we have done, but we have a long way to go in order to more effectively use the people we have. I am not talking about the people we might get – but the people we have.

## PUBLIC WORKS CONSTRUCTION AND MANAGEMENT



*R. P. McRorey, Associate Deputy Chief – Washington Office and Regional Office Divisions of Engineering Meeting, September 27, 1971, Washington, D.C.*

The topics which you have outlined for discussion this week are both timely and urgent in the context of our present activities of belt tightening, self-appraisal, and a constant need to improve, modify, or change the ways of doing business. I appreciate the opportunity to speak to you in detail on one of the major areas of concern – public works construction and management. It is an area which provides opportunities for major steps forward toward better ways.

It has already been pointed out several times this morning that you, as Engineers in association with the other disciplines, are involved directly and/or indirectly in about every activity in the Forest Service. You are, however, more deeply involved in “construction” activities than any of the other disciplines. You, as a group, are therefore in a position to better define some of the

problem areas where improvements or changes can and must be made if we, the Forest Service, are going to adequately manage the “public works” aspect of our Program.

What are some of the specific, significant legislative actions and changes in the National Forest Program areas which affect our work? Four, in particular, come to mind.

1. Major increases in the Forest Development Road and Trail Program from \$49 million in 1961 to \$173 million in 1972. This still has not caught up with our needs, but is a substantial growth in 12 years.
2. The Timber Sale Credit allowances for road construction increasing from \$44 million to an estimated \$110 million per year in the same 12 years.
3. Legislative action in the FY 1971 appropriation process creating our new construction and land acquisition line item financing. This sets our structural improvements funding out as a multi-year fund similar to the Road and Trail Program.

4. The Environmental Policy Act of 1969, along with clean air and clean water legislation, has placed environmental quality out in front of many other considerations in the public eye in many individual cases. Along with this, we have Executive Order 11507 concerning pollution abatement at existing Federal facilities.

There are others, but these four alone add up to a major impact on the Forest Service as a whole and on engineering and architectural services in particular.

As I am sure you are well aware, engineers and architects, both structural and landscape, must be involved from concept through all stages of translating the land management plans into reality. By acting as the service group responsible for making that road, bridge, or building function, you may be thought of seldom if it does, and often if it does not, regardless of the reason why or why not. Because of the involvement in the "public works" developments carried out by the Forest Service, you have, both as a group and as individuals, more direct personal interest in this Forest Service activity than any other group, or at least you should have.

A moment ago I mentioned some specific program levels. The items of construction and maintenance set out in the final FY 1972 budget, when combined with the timber sale credit allowances for road construction and maintenance, totaled \$324 million. That is a sizable investment in new, reconstructed, and maintained facilities. When you realize that at any given time we are working with at least two or three Fiscal Year Programs, then this is a major impact on the organization and its ability to efficiently "manage." The budget line items alone make us, according to Engineering news record, the sixth largest civilian public works agency in Federal government. With timber credits added, we would be fourth largest.

These investments are solving many problems in terms of our ability to better manage specific aspects of the Forest Service Programs. At this same time they are creating new, or adding to existing problems of adequately constructing, maintaining, and operating the facility in an "environmentally" acceptable manner.

We sense that these programs may be creating a deep frustration in the field people. They see large amounts of monies going into new facilities, many times on a functional basis, and a lack of funding of related functional activities to make the total facility fully functional. They cannot confidently look ahead to fully financed operation and maintenance programs. They cannot always obtain the full funding of other related functional programs. You all probably know of specific instances of this within the Region or Forest you were on. In many cases it is an outside influence such as a Corps of Engineers or Bureau of Reclamation project which sets the stage for the coordinated funding needs and problems.

In any case your help as staff is needed, throughout the process of implementation of land management plans, to identify to the Line Officer the alternatives of development, and the consequence of the first, and long-term costs of systems and facilities, and assist him in his decisions to commit existing and future funds to a constructed facility.

We talk about "public works" and "facilities," but what do we really mean by these terms and what is meant by "management?" There is more to this than the line item in the budget. If, for instance we consider "facilities" as Webster defines the word, then almost anything contributing to getting a specific job done is included. If however, we limit facilities to the physical plant or capital investment in constructed items, we can then categorize them into transport facilities for man, goods, and equipment, and structural facilities for housing of man, equipment and storing and conserving goods and resources. If we further break down transport facilities, it would include roads, trails, airfields, heliports, tramways, waterways and related items, pipelines, conveyors and even possibly the equipment used on or in the particular system or systems. Structural facilities would include buildings, dams, retaining walls, stream control structures, erosion control structures, major communications, power and water systems networks, et cetera.

These facilities may or may not come fully under our authority for funding or control, but they still involve engineers and architects in the total management needs and effort. The term "management" has many connotations depending on the context within which it is used. We use it in terms of very specific functions, such as fleet management, as well as the broad sense of management of the National Forest. In the Management Environment presentation you heard the word used in its broadest term of organizational concepts.

The pollution abatement program has probably done more in the last year to focus attention on the wide range of "management" problems, real and imagined, in "public works." We have managed the reports, funding, facilities, sites, et cetera.

For the purposes of this presentation and as food for thought, I suggest that "management" should mean the coordination of identified need for, and service criteria of a facility with:

- Planning and programming.
- Design and specifications.
- Construction work.
- Operation of the completed facility at or below design capacity.
- Maintenance to assure performance at level of service initially identified.
- Similar actions on related but different functionally controlled facilities.

You have all seen facilities designed and constructed for one purpose, operated for an entirely different purpose, maintained to some questionable standard, and you were probably called when everything failed because of "inadequate design." This is the concern to which we and your Regional Foresters must address ourselves.

A rapidly expanded capital investment plus increased complexities of facilities, systems, and uses, and a finite life of facility requires a sophisticated systems approach. The problem is big. Functionalism has caused fragmentation. How do we manage such a problem? In total? In parts? Or in accumulation of parts?

How do we show the total cost of all elements of a complex development such as recreation around a reservoir, when funding is separated into several sub-items in the budget process?

Is a system of planning, programming, design, construction, operation, maintenance, expansion, and replacement, cycled over a time period of 10, 20, or 30 years feasible? Do we provide for accelerated amortization as intensity of use increases? Can we make it a system responsive to the field people's total budget needs?

How do we reduce the present complexities of initiating and coordinating the multi-facility programs in a complex situation such as a major recreation development which results in a Ranger District or Forest expansion program?

Should all "public works" programs come under one authority for execution and management?

Later this week in your problem-solving sessions you will be addressing yourselves to some detailed problems of management such as personnel, programming, quality, new tools and new methods. I suggest you keep the total Public Works Program in mind. It should serve to broaden the scope of your discussions. I hope that some specific items are identified which might provide the handle we need to set objectives for you in the Regions and us in the WO. We must work toward an early solution to these growing problems and opportunities for change, innovation, and improvement. It may only be the clarification of the problem and its scope, but that would be a good start.

## GENERAL DISCUSSION

MONDAY, SEPTEMBER 27



*J. W. Deinema, Associate Deputy Chief – National Forest Systems, Washington Office and Regional Office Divisions of Engineering Meeting, September 27, 1971, Washington, D.C.*

### DEINEMA

My presentation was going to be just brief opening remarks to tell you about the challenges facing us today in the multidisciplinary approach and, after listening to Chet, I think he has covered it all pretty well. What I would really like to do is get the feedback from you fellows. I would like to have a good, frank discussion where you pin us down; where you ask the kind of questions that are bothering you. Give us the kind of advice you feel is necessary.

### HOWLETT

I thought maybe one way to get this stimulated is for a discussion on what a 2.9 percent reduction in Forest Service personnel means.

### DEINEMA

This is the type of challenge that is hitting us, the reduction in dollars, personnel, and ceilings. Management is demanding more and more, and giving less and less to do it with. How do we get out of this spot? I think this is the type of thing we can discuss.

### SHIELDS

Our final FY 1972 budget estimates include the additional funds that Congress added to the Administration's call for a permanent full-time staffing of 22,539 positions. The additional funds call for an increase of 1,024 positions over our end of FY 1971 staffing. Now then, the ceiling given us under this proposal is the staffing we had as of August, which was 21,526. That is a figure 2.9 percent below the 22,539, so it is something like 1,700 positions below our calculated needs for the size of the program. Our expected attrition, based on experience, during that time will be only 967. We must come down some 600 positions.

## QUESTION

What other alternatives do we have in terms of other types of appointments? Where you quote permanent full time, what are they doing with other types of appointments?

SHIELDS

The Office of Management and Budget (OMB) hasn't dropped the other shoe yet. We will probably get a ceiling on "others." We do have the constraints on full-time ceilings and we also cannot turn to contract for the work that a certain amount of personnel could do. We are going to impound the dollars.

DEINEMA

What we have to do is see where we have major increases, for instance in pollution control – we need more men to go with it. We can't get the men; therefore, we can't reach these program goals.

SHIELDS

At this point in time, the objective is to determine how we can do the job within the guidelines and give the Department and OMB the picture. If we can't do the job within the prescribed guidelines we must describe the consequences and see what they do about it.

## QUESTION

How are they going to control contracting?

SHIELDS

I would doubt that anybody in OMB has checked out the details as to how to do this. The way they arrive at these things is a top-level arbitrary decision. They then leave it to the Indians to figure out the details. I am not being cynical or negative here. I am just describing the management process that takes place nationally.

## QUESTION

I guess I didn't get the significance of that limitation on contracting, Chet. Could you run that by again?

SHIELDS

Let me read the exact statement: "Careful planning and ingenuity will be necessary in effecting the required employment reductions to assure maintenance of program priorities as established by the President. Contracts with private firms or individuals will not be increased or used as a way to circumvent the required reductions in employment. Unavoidable increases in work loads must be absorbed." That is the sum total of the guidelines. We are in the process of trying to figure out what it means and how we apply it.

#### QUESTION

Jack, do we have any feedback from that statement on the Administration's programs, such as cutting timber and pollution abatement? Do we have any real feedback yet as to what may happen to these programs? That we might be directed to carry out these programs to something else?

DEINEMA

Realistically, there is no doubt that we are going to have to continue with our pollution abatement program. Also, OMB will not let us slack off on our timber sales program. Eventually, OMB is still going to demand output goals as they have before. How do we meet them? I think contracting is one of our real hopes, especially in the engineering and timber fields. Timber stand improvements and planting programs increased \$11 million this year. We will not be let off the hook by turning the money back, especially after all the fights to get this program going. Our proposal this morning is to give the \$11 million back, but they are not going to let us live with it, politically. And when I say "they," it is kind of an outside gray world someplace – but "they" are the Office of Management and Budget; the Congressmen on the Hill; and the preservationists along with the timber industry. This is one of the things we wear the white hat for – to carry out the stand improvements program in addition to the harvesting program. We are also proposing to reduce our harvesting program with these cutbacks. This Administration, however, is not about to let us back off of these things. Now, whether this approach is going to give us more people, and whether the reductions will be as severe are unanswered questions. The President tells us to do this and that, and at the same time takes away our resources to do the job. In the past we have reached a compromise. We have given up part of the people, but we haven't given up all the people proposed to be given up. However, we have never been let off the hook as to meeting our commitments.

USHER

It comes to a point of realism where there is so much work to be accomplished by so many people. Now, if we absorb a 2.9 percent reduction in personnel and go ahead and make the goals that were set for 2.9 percent more people than we have, then we were wrong and "they" were right. If we have that much slack, that we are doing a lousy job of management, and if you take away the money as well as the people, then the opportunity to work our own people overtime 6 days a week is taken away. Now, where does dreaming go out the window and realism set in? Somebody has to draw a line someplace.

DEINEMA

I see your point, and I agree with you 100 percent. I think we are down to the hard muscle. I don't feel we have any fat left in the field, and any more paring means we will just have to give up something in our programs. I think we are going to have to make hard decisions on what programs we have to give up. But I don't think the choices are going to be made entirely within the Forest Service; they are going to be made in the Administration, in the White House, and OMB as well.

QUESTION

This will bring us back to some of the things we have seen before in our programs where we had GS-7 and -9's doing equivalent GS-13 work. To me, this is wrong. I don't see how we can live with that.

DEINEMA

You people in the field know it a lot better than I do. I have to rely on your judgment.

SHIELDS

Well, there is no question that these pull-backs in average grade and ceilings are working at opposite purposes. The OMB is looking pretty hard at this. I would expect something to give, and I think it is more likely to give on the average grades than on the ceiling. That is just my opinion.

DEINEMA

One thing I would like to stress is that if we ever take the easy route out and lower quality, letting GS-7's supervise GS-13 work and we end up with sloppy roads put in the wrong locations and sale layouts that are too large for clear cut blocks, we are lost as an

Agency. I think the Chief has reiterated this time after time, that we will not sacrifice quality for quantitative goals. I think we had better stress that, and I think John McGuire would stress it. We just have to get a quality job done. We are under the gun as we have never been before. The things we may have done in the past and gotten by with are no longer acceptable in this day and age. There are too many outfits that would like to whittle us up and spit us out. We are not going to survive unless we really stress quality. I know it's easy to stand up here and glibly talk about quality when you are getting pinched for dollars and people. I just don't feel we can do anything else.

#### QUESTION

As I see the week developing here and with your talk about giving National priorities I would like to know whether the field has been directed as to which is a higher priority program than others? This is direction that has been badly lacking in the past. No one has really put their name on the line and said this is a higher priority or this is a lower priority. If we really want some candid feedback, then towards the end of the meeting would be a good time to meet and say, OK, here is the direction, here is the start. Can we achieve it, and where are we going?

DEINEMA

Excellent suggestion. I will make myself available.

#### QUESTION

I would like to talk about something relatively simple. Chet said we are a product of the house we live in and this house has gone through personnel and budget constraints many times. Every time we took almost the same approach – an extremely conservative approach – we followed these constraints to the letter. What I would like to suggest is that maybe it's time we stop playing hero and stick our noses outside this house for a minute and look at what happens to the people who didn't play hero. I think maybe we lost when the final score was tallied. I don't know of a case in the past – maybe you do – where somebody has been over a little bit and then lined against the wall and shot. Perhaps we should take a more liberal approach, a more liberal interpretation – and not honor these constraints so conscientiously.

DEINEMA

I think we do have to gamble up to a certain point. However, if we gamble too far, and get in the hole on some of these things, we could really be racked.

One thing along this line really shocked me. Sitting in the field as I have for most of my career, then coming to the Washington Office really opened my eyes. When we testified

at the appropriations hearing I sat there day after day and listened to the legislators ask us if we didn't want more money in FR&T, Recreation, Watershed, and other places where we desperately needed it. Yet we said no — this is all we can handle. I finally realized that we have to play on the Administration team — that we have these budget limits set for us.

#### QUESTION

I would just like to point out that when we talk about quality we should also talk about credibility. If there is anything we need, it is credibility, not only between the Forest Service and the public, but within the Forest Service. I would like to suggest that we ought to talk about credibility as long as we are talking about quality in the rest of the meeting program.

#### DEINEMA

I think we do have a credibility gap. We also need better communication, especially with those in the field.

#### HOWLETT

One thing happened that specifically affected this group last year. We gave all the field extra ceilings for the pollution abatement program but the Forest Service as a whole never got a new ceiling. We just felt that this was a risk we were going to take. We were already so over-committed on ceilings at the time that we gave these extra ceilings for pollution abatement. We were just told by the Chief to go ahead and to do it. He had no authority to do it over and above the ceilings he was allotted.

#### SHIELDS

I think the point of being over conservative is well taken — I think we need to seek better ways of meeting goals in terms of both output and personnel. I think we needn't beat ourselves over the head too much because if we examine Forest Service success over the years in terms of obtaining manpower and dollars, it is a pretty good story. A current example is in our own agency taking a 2.9 percent cut when government-wide it is 5 percent or better. Agriculture is even taking 5 percent. When you consider that we get add-ons totaling \$38 million over the Administration's budget, I would say the way we play the game has resulted in some degree of success.

#### WILKE

One of the problems of engineering in the Forest Service is that we design projects that we think we are going to build, then we have to design the project we actually build. We

waste a lot of engineering-effort this way because of change in management planning. Part of this is in-house; part is out-of-house. Public involvement plays a part in this. We never get the public really involved in planning decisions. They don't get involved until they find out the road is going by their door or opening up their favorite hunting area. I think somehow we should figure out a way to get the public involved in planning and design decisions so we don't have changes after the project is designed.

DEINEMA

I am far from an expert, but you are right – we always have a plan which we try to hammer down the public's throat one way or another. We can take multiple-use plans to these hearings – get the people present, especially if there is some sort of controversy. On the other hand I know many areas won't give a darn. You won't get anybody to your meetings unless there is going to be a road past their front door.

WILKE

That's the problem – these people don't come.

CURFMAN

In reference to quality engineering jobs, many of the things that the Engineering Skills Study defined more than 10 years ago are still with us. It seems to me that in many areas the requirements for a quality job are increasing faster than our ability to perform the quality jobs on the ground.

McROREY

I think we are doing a quality job. However, I think we have the capability to do a better quality job. I am not satisfied with the job and one of the reasons is that we are continually faced with crisis situations where we have to use our people to meet initial demands on us.

LUPIEN

Regarding the topic of quality jobs and manpower ceilings, I would like to direct my question to Russ, primarily in the vein of personnel. My question is, why can't we have a dynamic and effective personnel section? It takes forever and a day to fill positions. Once we establish a ceiling, we should maintain an optimum personnel backlog within the Forest Service instead of waiting x number of days to fill a position. If we know a position is going to be vacant, we should advertise it prior to the man's departure instead of losing a quarter of a man-year to deliver a new person to that job. We lose a lot of

time dragging our feet. Why can't we make better use of the vast resources from the aerospace industry? Can't we have an active recruitment campaign on campuses, not just in the springtime, but an ongoing program of recruitment?

McROREY

This is a tremendous area in which improvements can and should be made. We are continually probing within the confines of the Civil Service Commission to see what can be done. I think we are making some headway. Some actions are pretty tightly tied in with the constraints we have from the Department and from the Civil Service Commission.

With respect to the aerospace industry, we have been asked to see what we can do about employing former aerospace employees. I think all of your points are excellent. There must be a better way to do it.

LUPIEN

If we decrease our work force, it becomes imperative that we keep maximum employment otherwise we are going to do a poorer job in making up interdisciplinary teams. If you take one link out of that chain, you break it. It takes time to weld it back together.

WILKE

What about designating GS-13 engineering jobs to the Regions?

McROREY

I am not aware at this time of any decision. There has been considerable discussion but no decision. One of the considerations goes back to your point – the need to have competent people available throughout the area in highly specialized fields.

LOFF

I have something on personnel I want to follow up on. Some time ago, time and energy were spent on personnel programs and systems review. It was set up as a kind of model in the Government. I haven't seen that we have implemented the recommendations or any follow-up action other than one example sent to Regions about six months after the report came out.

SIRMON

There was some follow-up. Each unit had to develop their own plan for implementing recommendations that came out of the study. We have taken two approaches, one of which has been with personnel within our Division. We have reorganization, restructuring of jobs, we brought in an Administrative Officer in terms of the recommendation dealing with better use of people. We are trying to relieve staff engineers of routine office management function. We have followed in terms of cleaning up our own Division.

LARSE

Would you comment on the new direction that we might be taking in the programming and budgeting process in the Forest Service?

SHIELDS

The Department and OMB are going to "building blocks." In the budget review in OMB in FY 1973 they are going to look at programs from all resource agencies, apparently in anticipation of the new Department of Natural Resources. I don't know how they are going to do that in any meaningful way because of the interrelationships of any one program with other resource activities. For example, considering timber, how do you consider roads along with it when you look across several agencies' lines?

I really think the budget examiners are going to have some frustrations. I think it will create a tendency to look at more than just regional or functional lines. I don't see anything happening in Congress in terms of moving to a uniform approach. They are not staffed to handle it. If you people really want to get an insight into the process, an excellent book, "Power and the Purse" by Pennell, describes the budget and committee process.

CHAMARD

Could you tell the group where we stand on computers right now?

SHIELDS

We have completed our analyses of what our needs are. The Department of Agriculture has done the same. Their proposition is that there should be a centralized computer within the Department. There was a task force working for some time on determining how to go about acquiring a system of hardware for the entire Department based on the proposition of five major computer centers across the country — each run by a different

agency of Agriculture. One in the Rocky Mountain area would be mostly run by the Forest Service. It appears the Department may be shifting its attitude a little bit as to how to go about this, but they have yet to specify any details.

I made a trip to Region 6 with Assistant Secretary Elliott and a member of his staff. We attempted to relate to them the critical importance of computer programs in our Forest Service programs and organization. The result was we got approval to further define our situation and propose how our needs would be met. It was made very clear that this does not constitute approval for deviation. All I can say is that at this point in time they have a lot of sympathy for our needs, but we don't have a thing nailed down.

HEPFL

What about Department approval for use of outside equipment? Is that still mandatory?

SHIELDS

Right. I think we have some of the delegation up to certain levels. We get rather prompt approval from the Department. I really don't expect any problem on that.

HOWLETT

This morning and this afternoon, over and over again, we have heard about frustrations from all our field people about ceilings, the budget process, allocation process, et cetera. Jack and John mentioned that when we go into our budgeting process, these are defined in the light of National priorities in particular areas. Some things are popular at the moment in the Administration and some are not. In this whole process, we have to be mostly concerned with the priorities of the Administration.

After receiving our initial dollar estimates from the Regions, we put together a budget for submission to the Department. What we win or lose there goes to OMB. What we win or lose with OMB becomes the budget we request from Congress. This is an extremely important concept — this is the only budget we can publicly argue for. Some people say this isn't very professional and that we should argue for what is needed. You have to be a member of the team; if you are not, you don't play on the team; and if you don't play on the team, they can always get someone who will. We are going to play on the team.

When these appropriated funds come back down from Congress through the Department, back to the Forest Service, they come back for specific purposes. These specified purposes may not be related to what was cast up as alternatives. I have just finished making an inspection in Region 2. They have a tremendous amount of work to do in areas for which they are not adequately funded. This is causing not only

distortions in funding, but also distortions in manpower allocations, particularly in the process by which we are giving manpower allocations. Manpower is not furnished in proportion to the funds authorized. Dollars do not relate to specific projects the Regions were financed to accomplish.

The requests from the field on what needs to be done may not be what Congress is going to send back to us to do. They are going to be modified in the overall light of National priority. We would like to be as responsive as we can to the managers of the land, however, we must be totally responsive to the Administration.

We are talking about balanced financing for the programs we cast up, opportunities that exist in the National Forests for certain services to the American public. These opportunities do not necessarily fit into a total National priority. We must take our opportunities in light of National priorities, and it will never be balanced. The opportunities we cast up will never fit precisely into National priority goals.

Don't let me discourage you from casting up these opportunities. We must. It is the only way we will have a viable program, the only way we can be responsive managers of the land. We must cast up opportunities for the benefit of the total American public. But never think that we are going to get them all back.



## MULTIDISCIPLINE PLANNING TEAMS



*C. W. Rupp, Multiple Use Coordinator – Washington Office and Regional Office Divisions of Engineering Meeting, September 27, 1971, Washington, D.C.*

We talked some yesterday about planning with the use of multiple discipline teams. Let me give a status report on what's taking place as we know it from the National level. Most of the multiple discipline team training that is being done today is more or less on an on-the-job basis. A few teams have been trained in the West to do intensive coordinative functional planning such as the logging systems team training. This basically was Region 6, however, Regions 1, 4 and 5 are also involved to some degree. As far as the type of teams I spoke of yesterday doing unit planning, Region 1 is doing some. Region 8 has a Regional planning team. Region 9 has a planning team that has been set up on individual Forests. Our evaluation so far using the multiple discipline teams is that it produces a superior plan of action as compared to plans produced by a single man or a single discipline. I think that's to be expected. We have instructions that are

going to tie this together for the entire Nation. They are coming out in an Emergency Directive, hopefully in the next few weeks. We have, off the press today, enough copies to send to each of the multiple-use coordinators in the Regions and for some review in here. Obviously, teams can't operate without substantial formalized training. Their skills will grow with experience. Formal training can help many people, but we can operate from our present knowledge base. The Ranger's job, as you know, has been a mixture of doer and planner. It is a matter of facing facts . . . often meeting requirements of implementing and administering projects left him with little or no time for working on the planning part of his job. Recognizing this fact, we are removing the multiple-use planning responsibilities to the forest level. That is what this new directive will do. Thus, the Rangers will be free to concentrate more on execution of the plans. As far as the role of staff is concerned, I would have to start by trying to relate to jobs done by multiple discipline staff teams and multiple discipline planning teams. Establishing priorities must be done by the Forest Supervisor. The staff man with his knowledge and expertise may be called upon to serve on or lead a multiple discipline team. I spoke in detail yesterday on what's expected; others may have something to say about this subject.



## THE RESOURCE CAPABILITY SYSTEM



*T. B. Glazebrook, Director of Watershed Management – Washington Office and Regional Office Divisions of Engineering Meeting, September 27, 1971, Washington, D.C.*

I've been asked to discuss, as part of this panel presentation, RCS or the Resource Capability System. I'm pleased to do so, as I truly feel that it's time to capitalize on our considerable investment. I do not expect to go into much detail unless pressed to do so. In case I get into water too deep for my comprehension, I have a secret weapon to spring on you – I'll reveal "it" at the opportune time.

You may be interested to know why we got into the RCS business. We set out in the beginning "to evaluate the component and composite contributions a nation-wide program for management of the soil, water, and mineral resources can make to the total social and economic productivity of the National Forest System." This sounds legitimate. To do a job of this complexity required a team effort. Subject matter specialists in watershed management,

programs and policy analysis, selected Regional soil and water scientists, and the Watershed Systems Development Unit at Berkely, California, have all been involved. Invaluable assistance has been received from Forest Service Research, other Divisions, and the Economic Research Service.

The Unit is still in existence, though it is now attached to Region 5 Division of Watershed Management. The methods, tools, and analytical procedures resulting from this effort have been collectively called the Resource Capability System, or RCS. Specific purposes of the RCS component development have been:

1. Utilizing existing research, develop operational management tools which can be used to assist in evaluating the capabilities and limitations of the basic soil, water, and climatic resources;
2. Using these tools, develop methods for simulating and quantitatively evaluating the basic resources' response to functional program alternatives;

3. Combining this capability with quantitative data from the various disciplines and functions of resource management, plus selected management objectives and constraints, develop analytical tools to utilize it in an interdisciplinary analysis of resource allocation alternatives, with major emphasis on the objectives of optimizing water yield and minimizing sediment yield, water quality and soil productivity in a balanced multiple-use mix situation;
4. Training Regional and Forest soil scientists and hydrologists in the use of these tools and methods.

Developments during the past four years have been:

1. New methods for analyzing the capabilities and limitations of the soil, water, and climatic resources;
2. Analytical methods and tools permitting the simulation of these resources' response to program alternatives;
3. New tools permitting interdisciplinary analysis and evaluation of program alternatives, including the physical and economic impacts of the roads and facilities required;
4. A model for the evaluation of the "On-National Forest" and downstream value of water quantity and quality.

Approximately 50 computer programs have been developed during the past four years in connection with this work. Most have been provided to the Regions for their use in scientific support and analysis. Some are simple and others are quite sophisticated. Weaknesses and gaps are being remedied as manpower permits. A field manual and user's guide for both the analytical systems and economics inputs have been developed. Both are now being revised, and will be available early this fall.

The Chief's Program of Work for FY 1972 includes the training of one man in each remaining Region to the operational level in the use of the individual components and the entire RCS analysis. It also includes the training of one man on each of the Forests approved for implementing new trial organization concepts. In addition, Region 5 has requested training and implementation on the Six Rivers National Forest for use by their multidiscipline planning team. Region 9, which has a man trained, is implementing these concepts on the Monongahela National Forest.

I'm sure you will say this is all very well, but first I'm more interested in what goes on from here than in what went on in the past, and second, just what is RCS and what good is it for me as an engineer? First, what is RCS? It's a kit of analytical tools (interrelated models) usable in whole or in part, depending on the problem to be solved. Some of the elements in the decision-making process which are handled by parts of RCS are:

- Physical characterization
- Response simulation
- Resource allocation
- Development planning
- Project design
- Performance monitoring

RCS might also be called a "logic pattern" for problem-solving in the resource field. It is structured so that we soil, geology, and watershed scientists can be responsive in an analytical context to the problems of resource management at whatever level of intensity the problem is structured.

I proposed in my 1970 "Multiple-Use Action Planning" paper (which some of you may have seen) the use of three levels of planning as points from which to discuss the NF planning effort. I used the letters A, B, and C. They related to:

- Level A: Forest M.U. planning which I called resource allocation;
- Level B: 5- and 10-year short term resource and development planning;
- Level C: Individual project planning.

If you glance at the list of elements handled by RCS you will note planning levels A, B, and C by other names.

If you think a bit about it, and recall our original definition of RCS, you will discover that the "intensity" of planning varies from level A to B to C. Sometimes we do not act as though this fundamental is true, such as those times when we opt for a standardized "inventory" for all time and all uses.

In using any analytical tool, it is of course necessary to make a problem statement first; i.e., we must know what our goal is. For example, if I want to analyze an individual project plan or do resource allocation, I have two different levels of intensity. These levels of intensity help me design my inputs. For economy of inventory dollars, I should collect no more data than are usable at the intensity I wish to analyze. This may sound terribly fundamental, and it is – but I certainly wish we would act as though we understood it. An understanding of this fundamental led to the restructuring of soil resource inventories. For all practical purposes, they are structured to relate to planning levels A, B, and C.

RCS can handle these varying intensities of analysis; however, the inputs, i.e., the physical characterization, is varied according to the intensity. RCS is a controlled resource analytical system which works with the physical characteristics of the resource base; i.e., the soil, water, climate interaction.

RCS is controlled by the response simulation capability. This is contrasted with uncontrolled systems, which depend on previously known or previously developed and accepted management alternatives.

If you think it important, we can go into this in a bit more depth, but right now I'm moving on to some other observations of where we go from here. Frankly, I began to wonder a week ago after going down to Houston to NASA, where the Forest Service was headed in systems development. I'm sure Jean Hassel has wrestled with this same question in the last month. I began to wonder, principally because we seemed to be thinking in terms of sophisticated tools to perform processes which either I could not see the need for or where our current mode of operation fills the bill pretty well.

Let me illustrate. I'm beginning to believe the bulk of our analytical work – or that which will have top priority in the short run – will be concerned with “already-made” resource allocations. Put another way – our MDT teams will be illustrating the effects of a given resource allocation. That is, we (the line officers) have already decided to cut timber and build roads. The question is not trade-offs, but the balanced or tolerable impact on other resources of the National Forest. Thus, our biggest job right now – again in the short run – is to give line officers insight into the effect their proposed actions have on the physical, environmental, or ecological complex.

After I discerned this, I began to take heart and believe we have some way of discriminating between our short term needs and our needs for long term resource allocation. Actually, I wonder if we have any other role to play in the use of analytical tools in addition to that of illustrating results or searching for the optimum balanced solution.

I genuinely feel that the resource allocation process will be made much as in the past – by statute, management direction, physical limitations, public pressures or constraints. True, there may be some problems of roading versus no roading, but I believe the allocation or solution will be provided in most cases; i.e., you will get the job of roading an area to move timber or recreationists and you will be asked to optimize the resulting road. I believe that the dimensions of the job on hand must be understood. Jean Hassel must have thought of some of these trends.

RCS is fully adaptable to this direction if it proves to be the way it works out. However, we may need the full package. More and more engineers are being asked to look at total

costs of transportation facilities and not just the investment costs of a facility. A brief consideration of this big order makes it clear that analytical tools and reasoning or logic systems like or similar to RCS – at least a system which goes to the point of providing options to the land manager – will be appropriate.

We have not worked at the Regional Office level very much so far, except with outside hydrologists and soils scientists in helping them use individual parts of RCS and in being responsive to functional management services, such as telling engineers the sedimentation or change in water regime due to a road alternative. Where Forests have made specific requests to acquire capability beyond the individual watershed related elements, we have tried to provide such capability.

So far, we are using RCS “in total” at five trial watersheds – some 500,000 acres – which characterize 42 million acres of the Pacific Southwest. In addition we have the Six Rivers National Forest multidiscipline team, the Monongahela National Forest planning team, and every Region (except 10) has the “ingredients” of most of the tool kit, and can use them on specified problems. We are trying to get the Forest Soil Scientist and the Forest Hydrologist trained to use RCS to expose the physical responses and constraints of a given piece of real estate – in other words, to meet the priority needs as we see them in this environmental decade.

One final thought I want to leave with you is, though there has been a lot done, there is much more to do. The chart for the RCS family of software and other models is much too “pat” looking. A lot of hard work is still involved as outputs from one level are not automatically useable in the next level. In other words, the chart for the RCS family of software and other models is too “comfortable.” A lot of strengthening and gap-filling is still needed.

In closing, I will summarize a bit. I believe you will find the RCS family of software models useful in examining the effects of proposed road construction on soil and water. You will find that hydrologists or teams of hydrologists and soil scientists are ready to provide services along these lines within a year – two years at the outside.

This whole area of use of computers to perform analysis suffers, I believe, from a lack of attention both by line officers and program managers such as you Regional Engineers. I am as guilty as anyone of not disciplining myself enough to get a firm grip on the direction to such programs. I suggest a change is indicated unless you want to abdicate to computer technologists or systems people.

These are all only tools. They do not supplant the necessity for management decisions; they only facilitate them. As program managers, you must make decisions relating to intensity of inventories to use in analysis. There is no universal inventory. Each must be tailored in intensity to the questions to be answered.

Another serious question – to whom shall training in computer technology be given? Are you going to build an elite corps or by training will you make this technology part of the kit of tools of all your transportation planning engineers? Finally, planning, like a woman's work, is never done. It's dynamic and will always be thus.

I have enjoyed visiting with you.

# THE FOREST SERVICE TRANSPORTATION SYSTEM PLANNING PROJECT

A PROGRESS REPORT  
1968 to September 1971

## INTRODUCTION

This discussion is primarily focused on status of specific techniques for field application. Brief discussions on "background" and the planning process are presented to provide a basis for relating techniques to their application.

## BACKGROUND

The Service-wide Forest Service Transportation Planning Project (TSPP) was initiated by the Chief in 1966 to:

1. Develop new methods for planning access to Forest resources.
2. Train a nucleus of Forest Service personnel in applying new methods.

New methods were and are needed to allow planners to quickly analyze various alternatives under changing resource values. Not

only were new methods needed but they are available through technological developments in computer use, probability, systems analysis, network analysis, simulation and similar concepts.

The TSPP project was established in Berkeley with one Forest Service employee who managed cooperative agreements with three universities with specialities used as follows:

- University of California – Building models of key relationships among users, travel, natural resource uses, and management policies. (Descriptive models that clarify the interrelationships and predictive models for predicting future consequences.)



*V. M. DeKalb, Project Leader, Servicewide Transportation System Planning Project – Washington Office and Regional Office Divisions of Engineering Meeting, September 27, 1971, Washington, D.C.*

- Stanford — Developing procedures for analyzing and choosing among alternatives.
- San Jose State — Developing tools for use in estimating travel volumes.

The project was established in Berkeley because of the availability of experienced universities and the presence of other Forest Service resource analysis projects for coordination. It also allowed the project leader to be close to employees in training at the University.

At the present time the project has three Forest Service employees working full-time on the project and four Forest Service engineering trainees enrolled in the training program. It has developed several techniques which will soon be implemented, and its effort is changing from development to implementation.

Two areas will continue to receive extensive development effort. They are Information Management and Evaluation Techniques. Most other techniques require such activities as verification, handbook writing, and user training.

The project should operate about 3 years more in order to complete and implement a total analysis and implementation package. At that time, the project will be reviewed by the Washington Office and the field to determine whether it should be employed in revision and development of newer techniques in line with new technology.

## IMPLEMENTATION

A discussion of this phase of the project is necessary to emphasize the training and orientation necessary to assure competent and effective use of tools developed.

About 15 years ago the Forest Service tried application of photogrammetry to road design. Many early applications were incorrectly used and consequently, costly errors turned many Forest Service engineering personnel away from this new technique. It has taken 12 or more years to overcome this reluctance to use photogrammetry. We don't want this to happen with transportation analysis and evaluation techniques, therefore, careful implementation is necessary.

It is expected that all techniques that are developed will be carefully studied by training specialists who will develop specific implementation procedures, such as audio-visual, programmed training, seminar type training, and others. In some cases, TSPP or universities will train teachers, in other cases processes will be developed to train users. Of special importance will be programs to orient management and resource specialists.

One of the implementation approaches to be initiated next summer is a trial operation on two National Forests where both the techniques of network analysis and training will be tested. After the trials, handbooks and training programs will be rewritten as necessary for Service-wide use. We are working with the Division of Watershed Management and others to combine TSPP techniques with RCS processes on the same trial Forest.

#### ACADEMIC TRAINING

In preparation for implementation, the Forest Service has been sending two engineers each year to a two-year training program under the guidance of the TSPP Project Leader. The two-year training program consists of one year full-time graduate work in transportation planning at either the University of California at Berkeley or Stanford, and one year on-the-job training on the project. Graduates of this program have gone to Regional Offices as Transportation Planners. This program has been a success. It is producing better graduates every year because of the continuously improving development environment. By June of 1972, there will be a graduate of this project in each of seven Regions and one in the Washington Office.

It is now appropriate to look seriously at the training program for the future. A graduate of the present program has the following experience.

1. He is exposed to new techniques of probability theory, system analysis, network analysis, linear programming, and decision analysis.
2. He is exposed to the evaluation of facilities to serve natural resources through new techniques for measurement analysis and for presentation to the decision-maker. He learns that the facility must serve the public and minimize damage to resources.
3. He has been operating in an environment which encourages learning and research, so he takes time to learn and evaluate. "Production" does not get in his way as he learns.
4. He learns under a project leader who has had a variety of experiences in the Forest Service including tours of duty as a Fire Control Officer, Timber Cruiser and Appraiser, Watershed Management Officer, Forest Engineer, Assistant Regional Engineer in Planning, and Regional Chief of Roads and Trails. The experience includes assignments in the exposed public arena of the Southern California Forests.

5. Forest Service Management feels that the project leader has a special ability to train these young engineers. In capitalizing on this characteristic, he has been encouraged to devote at least half his time to their development. Learning in a production atmosphere does not allow for this kind of attention.

There are other aspects of the two-year formal training program which should make it valuable for continued support. The things learned during the two-year program are exactly those attributes which management says are needed by engineers in all phases of technical work in the Forest Service. These attributes, understanding of resource relationships, exposure to public involvement, the ability to weigh and make decisions, and a broad understanding of Forest operations, are invaluable in preparing a person to be a future Forest Engineer. With the above considerations in mind, we can expect that the seven graduates of this program will not long remain in transportation planning. Forests are continuing to set up assistant engineers in charge of transportation planning, operation and maintenance. At least 15 percent of the National Forests now have multidisciplinary planning teams, and we strongly recommend that graduates of this program spend several years on National Forests.

From the above discussion, it would appear that because of attrition and the expanded need at the Forest level for trained personnel, a program of two engineers a year for a number of years is necessary. Consequently, no change in format or training objective is recommended. It is also suggested that the Washington Office and Regions consider including Foresters as candidates for this program. An announcement for candidates will be out early this Fall. Regional Engineers responsible for encouraging applicants should consider the above discussion before deciding that "the Region can do it better" or "we don't need any more."

## PLANNING PROCESS

In order to discuss the tools available, there is a need to relate them to a resource planning process. The thin "Process Overview" report published by the University of California shows a simplified process which is illustrated in modified form as follows:

### THE RESOURCE MANAGEMENT PLANNING PROCESS

#### STRUCTURE THE PROBLEM

#### DEFINITION OF GOALS AND OBJECTIVES

## DETERMINATION OF THE INFORMATION REQUIRED AND SELECTION OF ANALYTICAL TECHNIQUES

DEFINITION OF ALTERNATE PLANS

COLLECTION, MANIPULATION, AND  
PRELIMINARY ANALYSIS OF DATA

ANALYSIS OF ALTERNATIVES

EVALUATION OF ALTERNATIVES

PLAN SELECTION

Note: All have feed-back loops to all others.

Based on the illustrated flow chart of any planning or decision-making process, the techniques discussed below fall into the data collection phase and the analysis of an alternative phase. Very little has been done by TSPP, or any other unit in the Forest Service, about systemizing the evaluation phase.

### TECHNIQUE DEVELOPMENT PROCESS

There has been much concern about the slow process of TSPP. This has occurred because of a relatively low level of financing and the processes involved in systems development. The level of financing was planned to employ in any one project not less than three nor more than eight development engineers with supporting services. This ensured that development went slowly enough so that all facets of the complex problem could be understood and accounted for. At the time of formation of the TSPP, several agencies in government had purchased system programs on a one-year development schedule and costing over a million dollars. In most cases, the techniques could not be used. TSPP experience over the last three years indicates that this slower, deliberate effort is producing better products.

In developing a computer system for field-use, the following phases are followed:

#### Formulate the Technique

1. Conceptualize and formulate
2. Validate

#### Pre-Implementation

3. Final operating system programming
4. Writing user and training guides
5. Trial implementation

#### Implementation

6. Apply on a Service-wide basis

These phases will not be further explained because of lack of time. However, it is important to note that many techniques require field investigation in phase two and phase five. In this situation a minimum of two summers is usually needed before the technique is ready. If the cooperator is short-handed, additional time is needed. This requires an average lead-time of 4 years from conceptualization to Service-wide implementation. "Implementation" usually requires several training sessions and intensive handbook study, so a unit would usually find it difficult to put a technique immediately to work upon receipt.

In developing techniques, TSPP has pursued the following policies:

1. Techniques are for use at Forest levels, although model manipulation may have to be done on Regional Office computers.
2. The Forest Service will have access to computers of all levels of sophistication when the techniques are ready for use. (In many cases, standard Forest Service computers are not big enough to handle complex models.)
3. Techniques will complement (not duplicate) other resource analysis systems being developed. TSPP personnel work closely with other development units to assure that this occurs.
4. Techniques needed first by most Forests will be developed first. TSPP needs continuous field interaction to be sure of meeting this policy. The early publication of low priority techniques may occur because of difficulty of development of high priority techniques.

TRANSPORTATION SYSTEM ANALYSIS TECHNIQUES  
AVAILABLE FOR USE WITHIN TWO YEARS

Note: Data available for trial use means that any unit can use techniques with help from competent instructors and at a certain risk.

Name of Technique	Process and Remarks	Date ready for trial use.	Date ready for Service-wide use.
<p><u>TRAVEL DEMAND MODELS</u></p> <p>Macro-Allocation Model</p>	<p>Determines the amount of recreation traffic which can be expected to enter a large planning area (Forest) at designated "gates" from surrounding population centers.</p> <p>By changing inputs such as population, study area attractiveness, and difficulty of travel, a variety of alternative future states can be investigated.</p> <p>Also useful in recreation planning. Usually used in combination with the micro-model. Not applicable to areas where there are no population centers.</p> <p>Developed for use on CDC 6400 and probably Univac 1108 computers.</p> <p>University of California development.</p>	<p>Spring 1972</p>	<p>Summer 1973</p>

TRANSPORTATION SYSTEM ANALYSIS TECHNIQUES  
AVAILABLE FOR USE WITHIN TWO YEARS – Continued

Name of Technique	Process and Remarks	Date ready for trial use.	Date ready for Service-wide use.
<p style="text-align: center;">Micro-Allocation Model</p>	<p>Allocates to each link in a network the amount of recreation traffic (usually daily traffic). Also allocates the amount of trips to various recreation areas.</p> <p>Generation is measured from traffic entering “gates” of area. This is derived from the macro-model of other sources.</p> <p>This model has sub-models measuring (1) traffic generated by travel to various recreation units which “compete” in attractiveness and (2) traffic generated by touring desires (this can also be used for trials).</p> <p>By varying inputs, including road characteristics and/or recreation area characteristics, alternative future states (plans) can be investigated. This is applicable in planning, operation, and maintenance in planning.</p> <p>The model is designed to be custom-tailored for each Forest.</p> <p>Data collected through interviews, traffic counting, network measurements, and recreation unit evaluation.</p>	<p style="text-align: center;">Spring 1972</p>	<p style="text-align: center;">Summer 1973</p>

TRANSPORTATION SYSTEM ANALYSIS TECHNIQUES  
AVAILABLE FOR USE WITHIN TWO YEARS – Continued

Name of Technique	Process and Remarks	Date ready for trial use.	Date ready for Service-wide use.
	Developed for use on CDC 6400 and probably Univac 1108 computers. University of California development.		
Timber Allocation Model	<p>Allocates timber harvest travel to various links of a network. Through probability applications can estimate where logging traffic will go. Requires considerable input from timber management people on various timber harvest alternatives.</p> <p>From manipulation of harvest alternatives, road standards, and network alternatives, various future states (plans) can be investigated.</p> <p>Includes timber transport model (listed below) as a sub-model.</p> <p>Useful for planning, operation and maintenance analysis.</p> <p>University of California development.</p> <p>Uses Univac 1108.</p>	Spring 1972	Spring 1973
<u>NETWORK ANALYSIS MODELS</u>			
Timber Transport Model	May be published as a timber network analysis model.	February 1972	February 1972

TRANSPORTATION SYSTEM ANALYSIS TECHNIQUES  
AVAILABLE FOR USE WITHIN TWO YEARS – Continued

Name of Technique	Process and Remarks	Date ready for trial use.	Date ready for Service-wide use.
	<p>Analyzes a transportation network to determine most efficient haul route for logging trucks from a given sale and through a mill to a market (railhead, etc.). Analysis can be made of shortest time, shortest distance, lowest cost. Determines route efficiency measures for all three criteria.</p> <p>In addition to timber appraisal this has been used for estimating effects of various locations of a wilderness boundary and for analyzing which section of an unimproved road to rebuild first.</p> <p>University of California and TSPP effort use a Univac 1108 or CDC 3100 computer.</p>		
Network Scheduling Model	(Administrative Travel) Provides a computer program for scheduling most efficient travel routes for crews required to work at various locations in the network. For example, garbage haul, campground clean-up.	February 1972	February 1972

TRANSPORTATION SYSTEM ANALYSIS TECHNIQUES  
AVAILABLE FOR USE WITHIN TWO YEARS – Continued

Name of Technique	Process and Remarks	Date ready for trial use.	Date ready for Service-wide use.
	<p>Coordinated University of California, TSPP and Forest Service Management Sciences Staff effort.</p> <p>Uses a Univac 1108.</p>		
<p>Fire Control Transport Model</p>	<p>A fire control transport model.</p> <p>Not fully conceptualized in cooperation with the University of California and the Forest Service Riverside Fire Lab.</p>	<p>Spring 1974</p>	<p>Spring 1974</p>
<p><u>SINGLE LINK ANALYSIS PROGRAMS</u></p> <p>One-Lane Road Simulator</p>	<p>Simulates flow of traffic on one-lane road. Measuring truck (one kind) and light vehicle (one kind) travel speeds under various conditions such as: amount of vehicles going each way, per cent of each classification in each direction, spacing of turnouts and length of turnouts. Program is costly to run so a designer's guide will be issued for typical situation analyses used for establishing design criteria in planning and design.</p>	<p>August 1972</p>	<p>August 1972</p>

TRANSPORTATION SYSTEM ANALYSIS TECHNIQUES  
AVAILABLE FOR USE WITHIN TWO YEARS – Continued

Name of Technique	Process and Remarks	Date ready for trial use.	Date ready for Service-wide use.
	<p>Can also be used to check a design.</p> <p>Stanford, TSPP, and Region 6.</p>		
<p>The Effects of Horizontal Alignment on Vehicle Running Costs</p>	<p>A handbook with nomographs for determining running costs difference between different sizes of curves. Can be used in determining alignment for planned roads or in designing single curves. Appendix D has an excellent discussion on Economic, Political and Financial factors in analysis.</p>	<p>Now</p>	<p>Now</p>
<p>A Cost Model for Design Criteria</p>	<p>Will evaluate costs on total system basis of a proposed road development project. Analyzes cost of construction, operation and maintenance under various alternatives including stage construction situations.</p> <p>(Cooperator under consideration.)</p> <p>May be handled by M.I.T. or University of California.</p>		<p>Fall 1973</p>
<p><u>SUPPORT FUNCTIONS</u></p> <p>Decision-Making Primer</p>	<p>A handbook with specific samples for applying decision theory to investigation problems. How much traffic counting, foundation site testing, and sampling should be done? Very simple write-up for easy understanding.</p>	<p>February 1972</p>	<p>February 1972</p>

TRANSPORTATION SYSTEM ANALYSIS TECHNIQUES  
AVAILABLE FOR USE WITHIN TWO YEARS – Continued

Name of Technique	Process and Remarks	Date ready for trial use.	Date ready for Service-wide use.
<p>Traffic Surveillance Handbook</p>	<p>Covers all facets of traffic surveillance for Forest Service roads, including specific direction on traffic sampling and interview procedures.</p> <p>Will also include computer programs for Regional use in volume and classification data manipulation and summarizing.</p> <p>Will be rewritten after one year of use to clarify obscurities.</p> <p>Programs operate on Univac 1108 and CDC 3100.</p> <p>Coordination between TSPP, San Jose State and Region 4.</p>	<p>Rough draft to all Forests February 1972</p>	<p>June 1972</p>
<p>Data Management</p>	<p>Specifically – revision and update of road inventory forms to make a more manageable computer program; include inventory data for network analysis and incorporate accomplishment reports.</p> <p>Use INFORM if possible. Work will start aggressively January 1, 1972 and include a questionnaire to all Forests on needs.</p> <p>Cooperative TSPP and University of California.</p>	<p>January 1973</p>	<p>January 1974</p>

TRANSPORTATION SYSTEM ANALYSIS TECHNIQUES  
AVAILABLE FOR USE WITHIN TWO YEARS – Continued

Name of Technique	Process and Remarks	Date ready for trial use.	Date ready for Service-wide use.
<p><u>WORK BY OTHER UNITS OR IN FUTURE</u></p> <p>Traffic Counter Evaluation</p>	<p>Missoula Equipment Development Center is working on traffic counter evaluation, best methods for installing counting devices (loops), a data compiler, and investigating devices for mechanical classification.</p>		<p>Handbooks will be issued as work proceeds.</p>
<p>Running Costs Analysis</p>	<p>There are few studies on running costs for (a) logging trucks (b) any vehicle on dirt or gravel roads.</p> <p>The San Dimas Equipment Development Center is beginning studies in this area. TSPP will arrange to re-write the Byrnes, Googins, Nelson Study (Logging Road Handbook) when cost data become available.</p>	<p>Date Unknown. Say 1973.</p>	

THE TOTAL PLANNING PROCESS

While a total planning process (including a transportation system analysis and evaluation process) has not been formally developed, it has been investigated by TSPP. From studies during the last three years, the Forest Service and its cooperators have issued three reports in this area.

Through careful reading and underlining of sections relevant to a particular planning project, a transportation planner or a multidisciplinary planning team can obtain considerable guidance in "the process" from the following reports.

1. Forest Service Engineering Technical Report No. ETR-7700-4a TRANSPORTATION PLANNING FOR FOREST RESOURCE MANAGEMENT: INTRODUCTION TO THE TRANSPORTATION SYSTEM PLANNING PROJECT—A CONCEPT
2. Forest Service Engineering Technical Report No. ETR-7700-4b TRANSPORTATION SYSTEM PLANNING FOR FOREST RESOURCE MANAGEMENT: SOME ASPECTS OF RESOURCE AND TRANSPORTATION ANALYSIS
3. Forest Service Engineering Technical Report No. ETR-7700-4c TRANSPORTATION SYSTEM PLANNING FOR FOREST RESOURCE MANAGEMENT: ANALYSIS PROCEDURES — A PROCESS REVIEW

In addition, one of the best planning guides available today is found in Cooperative Highway Research Board Report No. 96.

#### STRATEGIES FOR THE EVALUATION OF ALTERNATIVE TRANSPORTATION PLANS

A prototype "total resource planning process" will be developed this fall and winter by the Washington Office Division of Planning and Policy Review. It will include sections on transportation analysis. After this publication is completed, TSPP will supplement any transportation analysis areas needing further explanation.

#### EVALUATION

Techniques developed or under development by TSPP are useful for transportation system analysis and can also be used in planning, operation, and maintenance. These techniques produce results which must be measured against effect upon resources. Most of them involve the consideration of effects which cannot be measured by dollars. During the next few months, TSPP will be working very closely with resource analysis and systems development units in order to assure coordinated evaluation.

Several techniques are available which appear to have promise in evaluating and presenting irreducible data to the decision-maker. Some of these techniques will be developed by TSPP or its cooperators. From the development of evaluation techniques, new approaches to the allocation of the FR&T dollar should be forthcoming, and "programming" can then recognize cost-effectiveness concepts not now considered. FR&T programming will be difficult to analyze and readjust until further work is done in the "evaluation" area. At that time, say in 12 to 18 months, a better programming process can be evaluated.

## OBSERVATIONS

From the preceding brief overview of planning and transportation system analysis techniques, several observations come to mind. The question has been asked – What significant changes in the way we plan at Forest level should occur as a result of TSPP findings? In answer to this it should be pointed out that culture, not TSPP, is causing a change in Forest Service planning approaches. Observations made here are discussed and recommended by many units of the Service as well as outsiders.

Highlights of imminent changes in planning procedures in the Forest Service include:

1. Planning will be systemized – we will approach the process in terms of a macro-system, with careful consideration of all components and their interactions.
2. Planning will be based on analysis, using probability concepts and with the understanding by management that plans must continually change.
3. The biggest change or innovation will be in the method of presenting alternative plans and their consequence, so that the decision-maker can understand what is being presented. (This includes presentations to the public.)
4. Based on the above observations, it is apparent that most National Forests will need one or more (usually three) specialists skilled in one or more historical functions (like timber or engineering) and in new techniques of system analysis, probability, computer techniques, and similar planning skills. Few production people can competently fill these positions without intensive retraining.
5. Because of the above changes, computer terminals (access to computers) will be necessary items on Forests.
6. This additional analysis work will take much more lead-time dollars, and commitment to planning by Forest managers than seen today.
7. The systemized planning procedures will extend into operation and maintenance of activities and facilities on a National Forest. Plans and their application will become self-adaptive systems which adjust to external changes quickly and easily, like the human body. This requires a greater effort in continuous information collection and its use in analyzing the development and operation of the system.

8. As a public agency gets better at recognizing and serving public needs and desires, the public's aspirations rise, and people demand more amenities. In addition, television has created a situation where "instant" demands by large sectors of the public are heard. This has never occurred before in world history. This unique environment operates to meet reasonable changes in public preferences.

The planning changes listed above, as well as adjustment in planning processes based on new technology, will not take place all at once. Forests under great public pressure and in the right management environment are already changing. Many of us in "planning technique development" groups are learning from such units. On the other hand, the handbook for transportation analysis which is coordinated with total resource planning, to be completed within two years, may not be applied by certain units for some time. Carrying the ball is up to the field.

New techniques are considered by two types of users; the risk-taker and risk-adverse individual. Most managers are risk-adverse and want a guarantee that the technique will work before they use it. The innovator with time will take the technique and develop applications never thought of by the developer. One approach, to support effective implementation, is to allow enough time to a Regional office engineer for study and manipulation of a new technique and then for him to work with Forests in its application.

TSPP was developed to support transportation analysis at the Forest level. Priorities of work were established from the best knowledge of Forest needs. There may be additional techniques needed in transportation system analysis which are not being recognized by TSPP. Please advise us of such needs so that the trained skills of our specialists can be applied where they do the most good.



## INTRODUCTION



*M. J. Hassell, Staff Assistant in Division of Legislative Affairs – Washington Office and Regional Office Divisions of Engineering Meeting, September 27, 1971, Washington, D.C.*

I appreciate the opportunity to present to you an account (my version) of the events leading to the establishment of the Multi-functional Program Planning Process Development Team (MPT), and the assignment given to it by the Chief. I have also been asked by Mike Howlett to predict what the Team will accomplish. Though it could be considered foolish to predict this early in my new assignment, I will try to do so.

## DEVELOPMENT

In trying to describe the series of events which caused the Chief to establish the MPT, I first attempted to follow the evolution of program and land planning in the Forest Service up to a point where I could say that this is where it happened. This seemed superficial to me because planning is a difficult and expensive process which requires strong forces to start it or to cause it

to change once it is established. Plans do not evolve in and of themselves. The forces at work which demand changes in our planning and programming approach, I believe, are as follows:

Population growth coupled with expectation for higher and higher standards of living in all of its many facets is having great impacts on the Nation's Forest and Range lands. Questions and challenges are being raised nationwide at all levels as to the extent and priority of use for these lands and resources. Internal and external pressures are being exerted to influence program emphasis and mix. On a National level, the Environmental Policy Act has required detailed analysis and public consultation and participation for actions which would significantly affect the human environment. The Act has provided those who do not agree with a proposed action a strong way to challenge agencies. Polarized extremes have developed, leaving many people searching for leadership which will provide correct, supportable, and understandable answers to their concerns about the management and use of their forest and range lands. They seek leadership which will include their participation as an input into plans for use of the land and its resources. Traditionally, this has been a leadership opportunity for the Forest Service.

The Forest Service does not have sole responsibility for planning nor are we isolated from the plans and problems of other Federal, State and private agencies. Laws, regulations, policy and public demand require that plans and programs be coordinated and made mutually complementary to the extent possible. Forest Service plans and programs must take into account rural and urban social and economic problems.

The Forest Service and its problems, challenges, and opportunities are not present in a vacuum. A host of National, Regional and local problems confront those assigned the responsibility of allocating limited funds and manpower. At the National level the Executive Branch continues to require improvements in program planning and evaluation. The President established the Office of Management and Budget to better meet these requirements. The Secretary of Agriculture continues to strengthen his drive for stronger program planning and evaluation. It is the responsibility of all agencies to prepare fully supported programs complete with alternatives, benefits, costs and consequences, and to communicate them clearly. Because money and manpower are limited, their use must be efficient, and this efficiency must be demonstrated and clearly communicated. The responsibility to compete for money and manpower is not limited to the Agency itself, but is extended to sub-units within the Agency. Competition between problem areas is real and it will always be present. Those who sit back and await their turn will not receive adequate recognition.

This means that traditional "one function at a time" planning and programming (long or short term) by themselves no longer meet the present challenges. Plans and programs must reflect the inter-relationships among resource uses which are present in the real world. This means that analysis, decisions and justification must be based on firmer foundation than intuition or trial and error. Those responsible for planning and programming must be able to call on the tools, talent, and data which will permit them to understand interrelationships and capabilities and mold these into alternative courses of action, complete with appraisals of the consequences of each. There must be an effective two-way channel of communication open from the highest organizational level to the ground level. Agency leadership must be able to define and justify National objectives, policies, and programs which are consistent with realistic estimates of forest and range land capabilities, prospective demands and operational programs. Conversely, field units must be able to keep land area plans and unit programs responsive to National and Regional goals, as well as local needs.

Considerable action is underway in the shift toward multifunctional or interdisciplinary planning and programming. Efforts have been made to strengthen multiple-use planning through the use of interdisciplinary teams qualified to prepare land management plans. Several Regions have progressed rapidly in this direction. These efforts have resulted in a variety of land-use planning procedures that are evolving to fit the needs of each Region, and in some cases Forests, as they see them. The Forest Service Environmental Program

for the Future has continued to develop in recognition of the interrelationships between the rising level of resource-use activities, and capabilities. Much has been done in the development of techniques for planning analysis. These efforts are in various stages of development. Several are at the point where they are ready for implementation. How do we know whether efforts by all concerned can be united into an effective planning system? Which efforts are the best for which purpose? What are the time and cost factors involved? What should we say to those who have developed analysis tools and now want to implement them? What should we do about new proposals to develop planning and analysis procedures? Can any of the tools developed or under development be used by S&PF? I believe this properly describes the setting which led the Chief to establish MPT under the leadership of the Deputy for Programs and Legislation.

### OBJECTIVES

It also brings me to the point where objectives must be discussed. The overall objective is to develop an on-going multifunctional program planning and evaluation process. The process must link the Field to the Washington Office through a single unified program-planning package. The program package will provide analysis of inputs and outputs based upon a process which includes:

1. Physical capability of land
2. Expected use and consumption of resources, goods, and services
3. Value of resources, goods, and services
4. Constraints – esthetic, pollution – air, water and other environmental requirements
5. Multifunctional approach to planning
6. Public involvement

As I see it, full achievement of this objective will require something like the following:

1. Chief's Office – A computerized process which would permit the Chief and his staff to examine, on a broad base, National priorities and demands. Further, it should permit examination and display of alternative program mixes and levels of intensity complete with costs, consequences, and benefits. It should permit examination of the proper balance between NFS and S&PF, and between Regions in accordance with their capability to

produce goods and services. Finally, it should serve as a basis for assignment of tentative production and tentative funding targets to Areas and Regions.

2. Regional Offices (and Area Offices to the extent that this would fit) -- A computerized process for distributing WO tentative output targets and funds to Forests and for analyzing Forests replies. Finally, for responding to the Chief on the basis of: a) The Chief's tentative targets, program balance, and funding; b) Alternative proposals; c) Costs, consequences, trade-offs and benefits of all alternatives presented.
3. National Forests -- A procedure to: a) Identify specific units of land; b) Determine resources therein; c) Determine capability to produce goods and services; d) Work up and analyze program alternatives; e) Display several reasonable alternative forest programs with clear presentation of the outputs, costs, and consequences for each (this step should be the basis for one important output of public involvement); f) Compare tentative output targets given by the Regional Forester to resource capability, proposed funding, environmental quality constraints and local needs; g) Respond to the Regional Forester's tentative program proposals and present alternatives.
4. A procedure for negotiating between the Chief's Office, Regional Office and the Forests concerning program levels, mixes, and counterproposals until a selection is made. This same procedure should be used to periodically update the program at all levels in order to reflect changing values and priorities.

In spite of all of the effort and accomplishment to date, we are a long way from this overall process. It is true that multifunctional planning on NFS lands is now underway and that National direction to guide this effort will soon be a reality. It is true that new analysis techniques have been developed and others are under development. It is true, also that new opportunities present themselves almost daily for finding better ways to conduct management of the National Forests. The reason we find ourselves still far from the process we need is because there has not been a baseline for all efforts to tie into. This brings me to predicting, at least for the short-term, what MPT will accomplish.

1. Develop a framework or outline of the overall process. This must be done soon so that we can relate what has, and is, being done to the overall system. Lack of this outline is holding up refinement and use of subsystems already developed.

2. Using the process as a baseline, analyze the various new procedures and computerized techniques for planning analysis which are developed or are under development. The analysis will serve as the basis for recommending how these techniques might be employed in the planning system.
3. Pinpoint gaps in the overall process where new techniques and more knowledge are needed. Get action underway to plug the gaps. (One obvious gap is the National planning process.)
4. MPT's assignment has given them an opportunity to serve as liaison and coordinator between various individuals and groups concerned with different dimensions of the planning effort. This should speed up some phases of development work and eliminate confusion through better communication.
5. In the interest of improving communication in the planning and management effort, a glossary of terms will be developed. (This effort is underway. A group has been assembled with representatives from Research, S&PF, NFS, including MU Coordinator, Administration, I&E, and one member of MPT. Their initial effort will be to produce a suggested glossary which will be widely circulated for comment prior to finalization.)
6. Get a group together to standardize data collection units to ease future (and present) problems of system interfacing and useability.
7. Participate in efforts presently underway by the Chief's direction to classify land on the basis of ecosystems for management purposes.
8. Search for successful innovations in planning and public involvement, and incorporate into Forest Service effort where appropriate.
9. Last, I predict that before this overall process is fully developed and operational, several years will have gone by.

## DISCUSSION

### WELLER

I'm interested in the project in Region 3, the Beaver Creek watershed study. It has taken considerable effort in the Region, but they have managed to keep it afloat. I wonder what kind of linkup or coordination Glazebrook's efforts have had on the Beaver Creek watershed.

### GLAZEBROOK

At the present time, we are in the process of deliberating on what we observed at Flagstaff. We are going to ask for a technical review of the proposed plans that are going in for the next 10 years, and a technical review against the background of present activities to see how much priority can be placed. It is not a question of the contribution that Beaver Creek can make. It is a question of how much priority and funding can be put into that particular project over the next 10 years. At the present time some of the techniques and some of the individual software systems that are in RCS are known to the members of the technical organization in Flagstaff.

We don't need to be overwhelmed by what we are beginning to find out here. These systems were built for specific purposes. We should realize that RCS was built to illustrate the effects of a soil-water program on water-yield in the PSW. This was its reason for being and it had to be a total package, but its components are highly salvageable and useable in other contexts. Beaver Creek was built around the same thing – water-yield improvements.

How do we salvage, utilize, or interface all this material that we paid for over the last 4 or 5 years and make it available on the firing line at the Forest level for interdisciplinary teams or others to use? This is the problem program managers have to sell. Are we going to have all people on the Forests and all people in engineering have the capabilities to use these kinds of tools? Or, are we going to develop a number of specialists and some coordinators who can communicate with those specialists?

Some of these decisions will be made without you if you don't get in there and pitch for it. With TSPP, we are trying to furnish these various components for use with the computer systems at the Forest level, and to those who ask for them. I think this is about the way things will go in the future.

### TURNER

I was pretty interested in your remarks as to how the soil scientists are going to handle that aspect of the job that needs to be done. I haven't really observed this in action. What sort of scheme do you have going on the reorienting of these fellows?

## GLAZEBROOK

We were asked by GAO as to what kind of progress we are making in acquiring the inventory information which we need to do our job. We totaled up the Regions as to where they stand in soil survey inventory-reconnaissance-type soil surveys to serve planning at the various intensity levels. There are two Regions that have a long way to go. Region 10 is one and Region 5 is the other. Some way or another, the philosophy which I enunciated this morning did not take hold in Region 5. We have tried to trace the genesis of it. We only have about five years or so to cover the whole Region. For instance, with soil resource inventory usable in these planning processes, Region 4 has attained even less than that – maybe four years at our current level of effort. Region 3 is in very good shape. Region 8 is in particularly good shape. T.C. Green in Region 8 had the idea of tailoring the inputs to the kind of outputs that were expected. I think Region 5 is reoriented, but they have a larger backlog than anyone else.

## USHER

I have heard some concern expressed that our systems are outstripping available data. I begin to feel that way myself. We have pretty fine systems for taking data to develop consequences, but the basic data is suspect. I wonder what your general feeling is about that. Maybe we are going to wind up with a lot of sophisticated models which are much more sophisticated than the relationships of the data that goes into them.

## GLAZEBROOK

We are at a point here where one of the major problems is to get these two things in balance. The Forest Service has a severe data gap in providing information for the sophisticated software and hardware. Timber Management realized this. They are at that point where they are trying to determine what kinds of inputs will be needed. Their inputs, heretofore, have been tailored for two purposes: one, to determine allowable cuts, and two, to lay out timber sales.

We are going to have to broaden the usefulness of timber inventory data for range purposes and hydrological analysis. We had quite a job to get this thing structured in such a way that it can be used by this new computer technology. This again is a job that can't be done by any individual. If a manager is trying to manage timber, he may want different kinds of ecological communities delineated on a map. These may be important to him as far as species and as far as brush competition is concerned. The range manager wants an entirely different delineation.

At the present time we do not have our input structured to facilitate every use. INFORM is not keeping up with other capabilities. The current idea in INFORM is to display information for use in computer technology. Suppose you do not want to

display it, but want to put it into another level of computer technology. You want to use it all along the line. These are two different jobs. To print it out and give it to you to look at is one thing, but for one computer to talk to another one or one program to talk to another one or to use the effects of various software models to bring them to bear on a linear program model, you need a different kind of INFORM – conceptual arrangements. We don't have it yet. We have made some progress, but we still have a long way to go. It's going to take years.

RUPP

I think we have to recognize that our inventories in the past – let's take timber for example – have not been statistically sound. We have done work on several bases and immediately have tried to apply it on a block basis or even to an individual sale, and it just was not statistically sound. It was never designed, never intended to be used for an individual sale or even on a block. Then we complicated the whole thing further when we started trying to have input into these systems by wrapping planning in with the inventory. People go out to take a timber inventory. However, it may be that we are not going to cut that area because of esthetics or we are not going to harvest as much in that area because we are going to lengthen the rotation because it is a roadside zone. This is a planning phase. This is something an interdisciplinary team can do. It is not an inventory job.

The same thing can be said about Range, because we have done some of this same type of inventory in Range Management. Why? Because here is a gap – we try to fill that gap, but it leads us down some roads that have gotten us into some deep trouble because they weren't coordinated in the first place, and they weren't statistically sound. So what we are proposing in this "new system" is that this inventory be statistically sound by planning units – not over entire National Forests, but by planning units. I think this will make some difference.

It is going to take a reorientation of inventory methods, and priorities are going to be set by Forests on the basis of what is planned. It's a job that is going to have to be done.

USHER

Craig, from that standpoint and the information in the field, who in the Chief's office sees that his inventory level comes along with the software programs so that they progress to a point where one is interdependent on the other, and the other is available?

RUPP

Right now, no one.

USHER

That is a point that bothers us in the field.

RUPP

This subject of coordination of programs is what Jean Hassell is talking about today. He is going to have to pull this together. A lot of people are concerned about what this is going to do to their function. It makes it necessary for them to have very competent people to do what needs to be done, and to get it done in a manner which provides the services that the unit out there on the ground needs. It is not going to do away with any inventory system or any planning from the functional standpoint. In fact, it's going to make it mandatory that we do a better job than we have in the past.

USHER

Agreed. The concern is that the computer or software models get farther ahead than the basic inventory material. Therefore, needs of the computer system may dictate the requirements for the resource inventory. The inventory people are not sure this is proper for the management of the resource. We have this banging back and forth and someone has to put it together.

HASSELL

I think you actually understated the problem. I think it's a little deeper than just getting a balance between software and available data. I think we don't know what data is. We don't know what to do with it when we get it. We don't know how to use the data we have. I think we don't at all understand the concept of trying to match data needs to the job at hand. It seems like a feast or famine situation to me. We approach any planning job as if we have to know everything there is to know about everything. It is too expensive and too difficult to do. I think we have to learn to try to do a little bit of thinking before we start this planning effort and really figure out what it is we want to know and at what level of accuracy we need to know it. I think that just to approach data – to have to know everything – is really what is getting us into trouble. I also think that by doing this, we automatically rule out a lot of data that we already have that we don't use. I think the problem is that serious.

DeKALB

We found multidiscipline planning teams in Region 6 had three months to plan a 20,000 acre area; they spent two and a half months of that time collecting data. This was because that is all they really knew how to do. They spent the last week analyzing, and

it wasn't a very good job. If they had collected less data and spent more time analyzing it, they would probably have had a pretty good plan.

BRYANT

You folks as managers have a real obligation. Get involved enough so that you can determine to what extent tools like this will help you in what you are doing now. Find out what it will cost to use them, because nine times out of ten you will find that there is a fantastic investment but very little increase in the reliability of your answer unless you start way back in the process. You owe it to yourself and to your people to get personally involved so that you can communicate with the people who are doing the job. That is the toughest thing for a manager to do – to get qualified enough to know the limitations and accuracies of the answers he is being supplied with.

USHER

I don't care how reliable poor data is. If it's wrong, its degree of reliability and sophistication are not very helpful to the decision-making.

HOWLETT

We have to run sensitivity analyses on the kind of data we are using to see how sensitive they are to the final decision.

HASSELL

From my point of view, this whole approach to planning and programming is quite a task and it's kind of amazing to me how we could spend so much effort and money and still be so far from where we want to go. Yet, I don't see any other way we could have gotten into so many things without the approach we are taking. It is time now to put something together. I think we can all see the conflicts and the problems. I would say we have a lot to learn and if anyone has any suggestions – we can use the help.

HOWLETT

Thank you, Jean. This was discussed last year at the RF&D meeting – all these planning processes, the material, and the programs were discussed. We had to learn something about the processes before we could begin to develop methodology that would be useful in planning. It is an extremely complex field and we are not going to settle it just by saying this is a program and we are going to use it. It won't work that way. I don't think we have been spinning our wheels. I think all this has been very useful. All of our field people, including the Regional Foresters, need to be told this.

PANEL 1

FR&T PROGRAM PLANNING AND MANAGEMENT

R. Larse, Chairman  
R. Chamard  
F. Ferrarelli  
F. Hammond



*R. W. Larse, R-4  
Chairman*

PROBLEM STATEMENT

The Forest Service does not have an FR&T programming system in which decision-makers and program managers have confidence.

BACKGROUND

The search for a programming process that provides both some certainty of future program direction and continuity as well as flexibility to meet changing demands is a challenge and somewhat of a paradox for the program manager and decision-maker.

There are many indicators that direct us to the conclusion that the present system is in need of overhaul. Some are as follows:

1. The GAO has directed the Forest Service to establish and implement both Service-wide and Regional program management systems consistent with management objectives on a priority basis.
2. There is a lack of resemblance between tentative and final programs and accomplishment.
3. Resource program goals appear out-of-step with our capability to match with FR&T funds.
4. Present "basis" for apportionment of funds to Regions and Forests is resulting in much dissatisfaction and inhibits objective commitment to our Administration's goals.

5. The demand to do more and more with less money for development work is creating deep frustrations in all field people. They cannot confidently look ahead to better days.

These and other indicators offer challenges and demand that we develop and refine our program management methods to better satisfy the resource manager's needs of today and in the future. Our position today is one of reaction rather than planning and programming to meet recurrent and new demands.

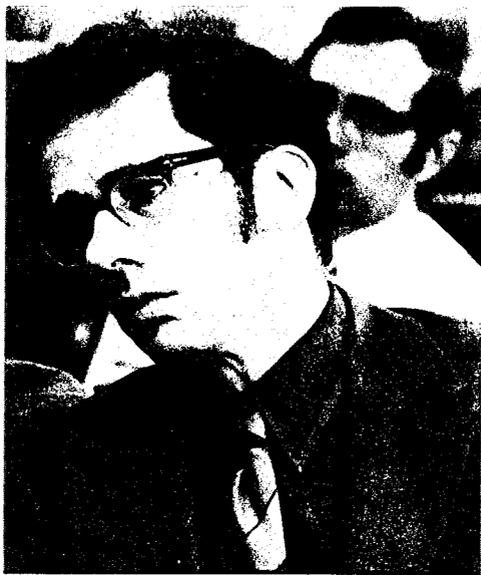
## RECOMMENDATIONS

1. Further define National goals and objectives in relation to recurrent multiple-use program needs and Regions.
2. Better identify and fund the basic workload of Regions for recurrent FR&T related activities and program support.
3. Provide Regions with more specific forecasts of future program funding levels – a minimum of 3 years in advance of the budget year is recommended.
4. Develop program management techniques and processes to better manage and evaluate effectiveness. The system should be designed to improve the program as follows:
  - a. Certainty, so that planned accomplishment results from budgets.
  - b. Flexibility, to ensure continuity and effectiveness—in spite of changing levels and emphasis.
  - c. Stability, in recurrent program activities to support the broad range of multiple-use demands, regardless of shifts in National Administration goals.
5. Design program management techniques for measuring transportation facility benefits in order to better guide and improve quality of program decisions. Project "Worthiness Evaluation."
6. Review adequacy of present program system and its effectiveness relative to the intent, purpose, and goals of the Federal Highway Act of 1958.

## PANEL 2

### POLLUTION ABATEMENT

J. Kennedy, Chairman  
R. Hahn  
J. Lamb  
J. Mead



*J.D. Kennedy, R-5  
Chairman*

#### PROBLEM STATEMENT

Considerable concern continues to be expressed about the lack of accomplishment to date in the Water Pollution Abatement Program. With the established deadlines for compliance, the Regions seem to be behind schedule.

#### BACKGROUND

The program for water pollution abatement on National Forest lands is not a new program. Executive Order 11288 — Prevention, Control, and Abatement of Water Pollution by Federal Activities — was issued in July 1966 and directed each agency to provide leadership in the nationwide effort to improve water quality.

Due to lack of response to this Executive Order and subsequent legislation and to gather the various directions under one Order, President Nixon issued E.O. 11507 on February 4, 1970. This Order directed each agency to abate water and air pollution at existing Federal facilities and established deadlines for accomplishing this program. The current Water Pollution Abatement Program is in direct response to this Executive Order.

Since the issuance of E.O. 11507, the Forest Service program has risen to over 1,600 individual projects, with estimated costs rising to over \$130 million as of June 30, 1971. More projects have been identified and placed in a deferred status. The Chief has expressed strong concern about the growth of this program and of our capability to handle increased numbers of projects within the established deadlines.

Differences in interpretation of project eligibility between Regions and between Forests within Regions led to confusion in project identification. Policies relating to inclusion of FS permittees and private land developments in joint systems were not well understood. Management decisions relating to continuing use of high-cost, low-use facilities were not timely. Solid waste management programs, also in response to this same E.O. 11507, have received varying degrees of response.

There was much confusion in various Regions on the program implementation. However, in recent months, much of the past confusion and apparent lack of consistency has been recognized at all organizational levels. The program is now receiving the attention of management and is approaching an even keel. Time lag factors from planned actions to accomplishment reporting, cause a distorted view of a program that is moving rapidly.

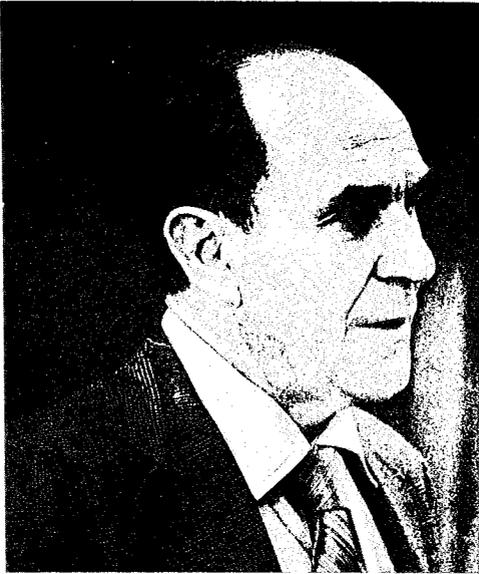
## RECOMMENDATIONS

1. It is recommended that this time lag factor be recognized and, with the complementary nature of the organization, that the Chief's office reaffirm its confidence in the Regions in accomplishing the task at hand.
2. It is recommended that the WO meet with EPA to clarify our respective roles in dealing with the States for approval of sewage treatment plans. Different Regions of EPA exercise their role of FS representation to the States in different ways, ranging from support to message carrying. The latter causes problems if or when EPA gives its tentative approval and then will not support the decision.
3. It is recommended that all water pollution abatement data be documented and retained for use in subsequent management and land-use planning. As the Water Pollution Abatement Program has developed, many projects have been identified, included in the program, and then subsequently dropped as non-qualifiers for this program. The data accumulated on these projects and sites are valuable input for management decisions on operations of Federal facilities and should not be lost, even if the projects are not included in the Pollution Abatement Program.
4. It is recommended that the WO develop criteria for use of additives in concentrated sewage wastes. In the technical area of the Pollution Abatement Program, the problem of disposal of concentrated wastes from vaults, camp trailer units, and portable toilets is significant. Community systems are becoming increasingly unavailable for treatment of concentrated sewage wastes from National Forest facilities. One of the problems is related to the varying controls on additives to such wastes, many of which are incompatible with treatment processes.

## PANEL 3

### ENGINEERING QUALITY

T. Utterback, Chairman  
D. Logan  
G. Leonard  
T. Nielsen  
G. Scherrer



*T.E. Utterback, R-6  
Chairman*

#### PROBLEM STATEMENT

How can uniform compliance to standards be obtained for all road construction on National Forests?

#### BACKGROUND

One of the land management objectives of the Forest Service is to maintain the allowable cut of timber. As pointed out in "Environment for the 70's" quality timber harvest and use of land resources depend on proper road construction for good management. New road specifications and contract requirements recently implemented to improve the quality of our timber access roads and minimize their adverse impacts will require more, not less manpower.

Lacking are guidelines to the field to assist in scheduling limited engineering people and skills toward upcoming action programs. Obviously, energy pointed in a direction other than that of subsequent programs cannot be tolerated, particularly when an engineering service can barely be supplied at best. The field Forest Engineers have experienced fluctuations of financing in the past; they are convinced that it will happen in the future.

The WO naturally influences and is most knowledgeable of directions apt to be taken. The "accelerated road program" is a prime example of committed FR&T financing without adequate engineering lead-time. People responsible for engineering schedules would have been most appreciative of even a few months' notice on a "possibility" basis.

Studies conducted to date indicate that even with the best organization and technique, the presently projected workload cannot be carried out to a satisfactory level of quality.

#### RECOMMENDATIONS

1. Establish at WO level the "rules of the game" for assigning priority objectives to be carried out with insufficient manpower. This statement should include activities which may be abandoned before quality suffers on other activities. Create priority ranking for commitment of engineering effort.
2. Select a joint timber management-engineering task force to investigate the merits of a Service audit system to evaluate conformance with quality standards.

## PANEL 4

### GEOMETRONICS AND TECHNOLOGICAL IMPROVEMENTS

J. Hogan, Chairman  
O. Bockes  
C. Chandler  
R. Swinnerton



*J.D. Hogan, WO  
Chairman*

#### PROBLEM STATEMENT

1. We do not have adequate work and administrative maps to meet today's Forest Service needs. We cannot afford to keep up with the demand with present methods and organization (production rather than developmental work).

#### BACKGROUND

Each panel member presented a brief discussion describing his place in the organization and the problems he saw. These problems ranged from interagency liaison on remote sensing from space to implementing new engineering ADP systems, to providing Rangers with up-to-date work maps. The interest of the attendees centered primarily on the operational mapping problems and a concern for Regional involvement in Technological Improvements projects. They want to be involved in priority setting in the Technological Improvements area.

#### RECOMMENDATION

Define the production mapping program needs for the next 5 years (short range) and develop alternative action plans to accomplish the program.

#### ACTION

Hold a workshop with representatives from all Regions in order to develop a framework for implementing the recommendations. All AREs responsible for geometronics were asked to attend – scheduled for Denver, October 27–29, 1971.

## PROBLEM STATEMENT

2. There is a lack of direction in the development and implementation of engineering computer applications and geometronics.

## RECOMMENDATION

Establish a steering committee or advisory group composed of Regional and Washington Office personnel which will:

- (1) Promote communications between the "user" and the "developer" so that the wants or problems of the user are defined and so that advances by engineering computer oriented technology and geometronics are made known.
- (2) Prepare a program to satisfy or solve the immediate wants and problems of the user.
- (3) Prepare and update a program to explore advances in engineering computer oriented technology and geometronics for applicability to Forest Service problems.

## ACTION

Swinnerton, Bockes, and Hogan (WO) to develop proposals for implementing the "advisory groups."

PANEL 5

INSPECTOR CERTIFICATION

G. Roberts, Chairman  
B. Bowen  
D. Roper  
D. Jones  
D. Williamson



*G.W. Roberts, R-1  
Chairman*

PROBLEM STATEMENT

How do we insure adequate inspection on both formal contract and timber operator construction?

BACKGROUND

In the past, timber purchaser road construction has not received inspection comparable to formal contract construction. The question is, how do we get an adequate job done on timber purchaser roads? There is more progress in some Regions than in others. What is needed is a uniform program for certification to be administered by the Regions.

RECOMMENDATIONS

It is recommended that the Forest Service develop a Service-wide construction inspector certification program by taking the following steps:

1. Director of the Division of Engineering should designate an individual with the specific responsibility to develop the program.
2. Chief's office should issue a policy that a certified inspector shall be required on all jobs after July 1, 1974.
3. Training material to initiate the program must be available to the Regions by September 1972.



## PANEL 6

### EQUIPMENT DEVELOPMENT AND EQUIPMENT MANAGEMENT

C.W. Howard, Chairman  
F. Burbank  
O. Broadway



*C.W. Howard, EDC, San Dimas  
Chairman*

#### PROBLEM STATEMENT

The Equipment Development and Test Program does not relate with the Regions as well as it should. Equipment Development personnel do not have a clear picture of the functional needs and requirements of all the Regions, nor do field foresters or managers fully realize the extent of the Equipment Development and Test services available to them.

#### BACKGROUND

In the past, new projects were instigated through the recommendations of a loose-knit Regional equipment committee. The trend has been for these committee meetings

to become a rehash of functional equipment objectives. The equipment advisory board and the Regional committees are not covering the whole field. On a nationwide basis, only fragments are coming in. The centers are working to regenerate some life back into these committees. However, they have not been too successful.

#### RECOMMENDATIONS

1. Provide Regions with copies or synopses of new project proposals for their review, comment, and priorities as they relate to their Regions.
2. Regional Equipment Advisory Boards should represent the interests of management, the user, and those who must maintain and repair equipment.
3. Place more emphasis on informing the Regions of actions taken on project proposals submitted by them—that they were accepted in whole or in part

as new proposals, included in other approved projects, or that they were deferred or rejected, and reasons why.

4. Coordinate activities of various committees and groups working on common equipment development programs.
5. Provide Equipment Development staff personnel opportunity to attend Regional Equipment Advisory Board meetings as needed, but restricting their activities to providing information and advice.

PANEL 7

SPECIAL USE IMPACTS

B. Meinders, Chairman  
H. Cappleman  
C. Dwyer  
S. Hughes  
M. Loverage



*B.E. Meinders, R-1  
Chairman*

PROBLEM STATEMENT

Financed programs must be reduced and qualified manpower shifted to do work connected with unfinanced Special Use Permits.

BACKGROUND

There are numerous construction projects on our Forests that are not part of the FR&T program. These projects include FHWA highway construction, FPC construction, and construction by other agencies such as the Corps of Engineers and the Bureau of Reclamation. There are also many requests for special use permits from private sources. Although we cannot completely prevent or

control these construction efforts on National Forest land, we must recognize that their impacts are so great that we cannot ignore them.

In the past we have neither given them proper recognition nor have we ignored them. However, the impact is increasing to the point that we must properly review and supervise their design and construction. In order to properly review and supervise these outside generated projects, we are forced to take money away from existing financed programs and manpower and shift our efforts to cover programs over which we have no planning control.

We are responsible for protecting our resources and ecology. The Forest Service is responsible for the safety of the public on National Forest lands. The work of other engineers must be reviewed to determine if safety and ecology are adequately

protected. However, with the reduction in manpower and our inability to get additional funds, the alternative seems to be to discontinue allowance of permittee construction on the National Forests. It is recognized that this is an impractical solution.

#### POSSIBLE SOLUTIONS

1. Realistically recognize the increased workload and increase ceilings to provide financing and qualified manpower.
2. Sharply define legal requirements of the job and do no more than legally required.
3. Require the permittee to finance Forest Service support services.

#### RECOMMENDATIONS

1. Washington Office define legal responsibility.
2. Regions assess manpower requirements in connection with Special Use Permits.
3. Washington Office develop policy and procedures for furnishing adequate funding and manpower.

## PANEL 8

### TRANSPORTATION SYSTEM OPERATION

D. Trask, Chairman  
F. Ferrarelli  
E. Neumann  
S. Wilcox



*D.B. Trask, WO  
Chairman*

Three topics were discussed by the panel; Maintenance, Use Regulations, and The Third Road System. Each topic will be considered separately.

#### 1. MAINTENANCE

##### PROBLEM STATEMENT

A uniform definition of maintenance does not exist. Practices on condition surveys vary in each Region.

##### BACKGROUND

Some Regions would like to put system roads to bed in a positive manner to avoid maintenance expense during periods of non-use. The occasional user or hunter could be given access through some other means. It was apparent that the group did not feel that maintenance funds were adequate to cover the 6,000 to 7,000 miles of additional roads that are being added to the road system each year. Further discussion revealed a lack of understanding and distinction between maintenance and reconstruction. Uniform definitions do not exist. Practices on condition surveys and maintenance vary in accordance with the number of Regions and probably with the number of Forests. It was clear that no Region has a definitive system for assessing maintenance needs and funds in accordance with these needs on a systematic priority basis.

There was some discussion on the effects of recent legislation on our maintenance obligations both from an environmental standpoint (Clean Air Act, et cetera) and the probabilities of tort claims where adequate maintenance is not performed. There was additional discussion on use of network analysis leading to total cost consideration before deciding to build new roads.

## RECOMMENDATIONS

- (1) The Washington Office should redefine maintenance standards since the present definition is out of date.
- (2) There is a need for the Washington Office to develop new methods of determining priorities for investments in maintenance and reconstruction use and control.
- (3) The Forest Service engineers should do a better job of analyzing road maintenance as it relates to total road costs and furnish the land managers with better advice on alternatives to be used in decision-making.

## 2. USE REGULATION

### PROBLEM STATEMENT

It is very difficult to designate and enforce special service road use by commercial haulers. There needs to be a more uniform understanding and use of P.L. 92-82.

### BACKGROUND

It was called to the group's attention that Forest Service roads now fall under 23 CFR Chap. 11 – Safety Order No. 13 of the Highway Safety Act. This requires compliance with uniform traffic control devices, but the Washington Office is working on modifications with the Department of Transportation. The Forest Service should be able to comply with the modified requirements.

Road use regulations were discussed and Special Service designation was given special attention. There was expressed interest in the need for tighter road management or operations to direct and control the use of our roads. Law enforcement will become a problem as traffic increases on system roads and the need for law or traffic regulation enforcement will become imperative. Since our objective is that State traffic laws be applicable to Forest Service roads, it is appropriate that the State or counties be asked to enforce these laws. Public Law 92-82, recently enacted, will facilitate law enforcement on all types of land under Forest Service jurisdiction and will allow the Forest Service to reimburse Police authorities for some of this enforcement. The group was interested in a Washington Office interpretation and guidance under P.L. 92-82 (Sisk-Johnson Act).

## RECOMMENDATIONS

1. The Washington Office Division of Engineering should seek modification of 36 CFR 212.7 to permit notification of commercial haulers by mail, in order to minimize Special Service Road signing so as to avoid sign pollution.
2. The Washington Office should write additional manual material concerning the proper use and interpretation of the various regulations to control and direct road use closures for accomplishing resource objectives.
3. The Washington Office publishes manual material on operations under P.L. 92-82.

## 3. THIRD ROAD SYSTEM

### PROBLEM STATEMENT

The number of roads abandoned by the counties are increasing. The counties are placing impossible restrictions which require the Forest Service to maintain these roads.

### BACKGROUND

These are roads on both the county or State and Forest Service System or those roads on the county systems approaching the National Forest boundary. In many cases, the counties are either too poor to maintain these roads, or are occasionally abandoning them. The Forest program in the area is frequently dependent upon these roads and yet the road is often a public road. In some cases the county may put impractical restrictions on the roads, making Forest Service activities very difficult to accomplish. The extent of the problem was not known, therefore the group made the following recommendations:

### RECOMMENDATIONS

1. The Washington Office should gather data on the magnitude and nature of this problem and contact the National Association of County Officials to discuss possible solutions. The Regions should begin making local contacts and attempt to solve these problems within the various States.
2. The Washington Office should provide guides for determining jurisdiction and maintenance responsibilities between the Forest Service and county authorities.



## PANEL 9

### MATERIALS ENGINEERING

W. Furen, Chairman

D. Jones

A. Pelzner

L. Stern



*W.E. Furen, R-5  
Chairman*

#### PROBLEM STATEMENT

Over \$300 million are being spent annually on engineered works in the Forest Service. The vast majority of these dollars are spent on the Forest Service Transportation System. That this transportation system and other engineered works have a significant and often detrimental impact on the Forest environment is unquestioned. This impact is expressed in excessive dust, sediment and unsightly failures. This in turn has resulted in inordinate construction, maintenance and repair costs. Forest Service engineered works are built on, in, and from earth materials. In general, these earth materials are not receiving adequate engineering attention in planning, design, construction and maintenance. This inadequate attention is resulting

in unsatisfactory performance of many of our engineered works and degradation of the Forest environment. This in turn has resulted in very basic and serious problems for efficient and effective management and development of the National Forests.

#### BACKGROUND

There are many indications that the earth materials used in engineered works in the Forest Service are not receiving adequate attention. Some of these are:

1. Using wrong skills to try to solve geotechnic problems
2. Poor results – failures
3. Lack of knowledge of skills in “earth science” fields

4. Inadequate or untimely response to Forest needs
5. Imbalances of materials engineering organizations across the Service
6. Trial and error design techniques – inordinate costs
7. \$10 million/year storm damage to transportation system
8. Dusty roads and unstabilized surfaces
9. Slope failures
10. Forest road safety deficiencies
11. Excessive maintenance costs
12. Insufficient road life
13. GFI reports
14. Line decisions by Regional Foresters:
  - a. No slip, no slide (Region 6)
  - b. Stabilized surfaces (Region 5)

#### RECOMMENDATIONS

Since engineered works are built on, in, and from earth materials, and since these earth materials are basic to National Forest management, it is recommended:

1. That a high level fact finding group, such as the group enlisted in the Timber Harvesting Review Committee, examine Forest Service practices in the handling of these earth resources.
2. That this group develop specific, detailed and comprehensive recommendations to the Chief for the proper and appropriate engineering attention to be given to these earth resources.

## PANEL 10

### TRAINING AND MANPOWER DEVELOPMENT

D. Loff, Chairman  
W. Kinworthy  
R. Landman  
N. Sears  
J. Sirmon



*D.D. Loff, R-4  
Chairman*

#### PROBLEM STATEMENT

Due to the heavy workload, supervising engineers are reluctant to release engineers for training. The Regional Forester and his staff do not understand the role of the Division of Engineering training position.

#### BACKGROUND

It is obvious if we are to do a "quality" job with the people we have, we must do a better job of training the engineers and of informing staff members of the Forest Supervisor of the problems. The panel believes that we must develop a system and the skills to identify deficiencies in our people. If the deficiencies can be corrected

by training, we must be able to provide quality training to improve the competence of the people we have.

To do this, each Region must have an engineering training coordinator to work with Personnel Management. He should be one who has or can acquire skills to identify deficiencies and has the knowledge to correct them.

We also need to explore, develop, and make known training opportunities – specifically, out-Service opportunities.

#### RECOMMENDATIONS

1. Get understanding and commitment from the Regional Engineers regarding the need for the engineering training and development position.

2. A paper is being developed (by Jeff Sirmon, due February 1972) which will assist Regional Engineers in informing the Regional Forester and staff to gain an understanding of the role of this position.
3. Reaffirm the original commitment to develop an action plan to examine obvious Service-wide technical engineering training needs and deficiencies.
  - a. Determine how these can be corrected utilizing either in-Service or out-Service capabilities.
  - b. WO take the leadership, with Regional engineering training and development coordinators doing the staff work, and report to the Regions on progress by July 1972.
4. Analyze the amount of time other similar professions spend on self-development and relate this to the needs of Forest Service engineering personnel.

## PANEL 11

### CONSTRUCTION IMPACT OF POLLUTION ABATEMENT

B. Plath, Chairman

B. Bradley

A. Colley

R. Feuchter



*B.B. Plath, R-6  
Chairman*

#### PROBLEM STATEMENT

We are now constructing over 500 sewage treatment plants that will require licensed operators. We have neither the ceilings nor the trained manpower to operate these plants. It will be difficult to contract for this service as we are already behind in our operation and maintenance funds for existing facilities and cannot take on additional unfunded work in this area.

#### BACKGROUND

The panel held that construction in itself posed no major problem. Personnel for contract administration and construction supervision should be available within the ranks of those who carried out the planning and design for these projects.

The major impact is the operation and maintenance of the pollution abatement systems after construction. Recognizing that decisions made today concerning the system designs would have a decisive impact on the amount of operations and maintenance required in the future and our ability to finance it, the panel developed the following statement:

“Line and Staff have not given adequate attention to the operation and maintenance aspects of pollution abatement systems.”

Full implementation of E.O. #11507 requires that we have all water pollution abatement projects and all solid waste disposal systems operational by the end of FY 1974. As a

conservative estimate, \$20 million per year will be required to operate and maintain these systems.

Approximately 500 sewage treatment plants will require licensed operators. Action should begin immediately to explore alternatives for securing this trained manpower. Where we cannot contract for this service, we must develop in-house capabilities and have our operators on board during the construction of their respective plants.

To ensure that all actions leading up to the operational phase of these systems are fully recognized, funded, and carried out on a timely basis, this panel recommends that each Region and the WO develop critical paths for the water pollution abatement and solid waste disposal programs.

## RECOMMENDATIONS

In carrying out the above, the following should be identified and appropriate actions taken:

1. Forest Engineers and Supervisors must consider O&M costs in the selection of a pollution abatement process. This requires an examination of alternate methods for carrying out the required O&M.
2. Regional Offices must identify O&M personnel needs and their qualification requirements. This is critical where a State license is required.
3. The Washington Office Divisions of Administrative Management and Recreation will need to develop a system for identifying and funding O&M costs. Currently, funds for the operation of administrative facilities are financed through general assessments. This may present a problem for contributing functions if their budgets are not increased to cover the amount required for pollution abatement at administrative facilities.

GENERAL DISCUSSION  
THURSDAY, SEPTEMBER, 30

TURNER

As I see it, National priorities have been set; we are going to have to use all our people on the timber program and pollution abatement program. Many other areas of concern are going to have to suffer.

GANO

Someone suggested we are doing a poor job of telling the Chief we aren't performing the kind of job that he's after. We have a study underway that is attempting to establish what we understand our quality standards to be and we are attempting to conduct an audit to qualify goals. We are considering attitudes, motivations, practical arrangement, et cetera; we are looking at tools, adequacy of use of skills available to use; we are recognizing that training in itself may be one of our real problems, that we haven't built into our people the skills that are required. There are a whole host of things here that cause deep concern, and it's not necessarily manpower — not necessarily money. We have to admit that we are uneasy. I suggest that perhaps we should indicate our uneasiness to the Chief.

KETCHAM

In the Chief's Program for the 1970's, the first statement concerns a quality job. The Chief needs to know what we need in the way of facilities to do a quality job.

WILKE

I think there has been quite a bit of discussion on establishing priorities. We should stop spending time reviewing design plans made by others. There hasn't been anything suggested as far as changing priorities or direction — just an exercise in semantics. I think we are going to have to change our emphasis and cut out something. I believe we are trying to do business as usual without changing anything.

## PANEL REPORTS – A REVIEW AND DISCUSSION

HOWLETT

We have Jack Deinema, Russ McRorey and Paul Neff with us today. I would like to bring them up to date with respect to our panel reports and recommendations. Yesterday we had a report from each chairman. We would like to review these reports today.

DEINEMA

How do you intend to follow up? Are you going to put this into written form?

HOWLETT

Everything will be put in final written form – into a proceedings volume. Before we finalize what we put down as recommendations, we would like some guidance and input from you. We are not asking for answers – we just want to make sure that the recommendations we make are not too far off.

UTTERBACK

I was on the panel for quality engineering. It was rather apparent to us that quality engineering applies to everything we do in engineering. We felt we had to zero in on just a small part of quality engineering. An obvious minimum in quality engineering is that we are a support effort to assist land managers in meeting land management objectives; however, there are further considerations from an engineering standpoint. These must relate to a total overlook of the various alternatives which could provide that required service. Considering adverse impacts, such as loss of resources and cost factors unique to each of these alternatives, an economic analysis should be run to find the best alternative for the lowest cost. Legislative and executive direction has been pointed at a comprehensive study of alternatives of land management, particularly related to irreplaceable or irrevocable actions. Most engineering projects result in an irrevocable action. A project cannot be considered as adequately engineered until all alternatives have been considered.

USHER

I think we engineers need priority definitions as far as programming is concerned. We can't do everything. Nevertheless, we want to be part of the solution, not part of the problem. With our present constraints we feel uneasy about the projects for which we

are accountable. The Regional Engineer is responsible for giving advice to the Regional Forester on engineering aspects related to management objectives. We are just a little bit uncomfortable about the real direction in which we are going. I just want to be able to advise the RF's properly.

TURNER

I feel uncomfortable with the present situation. It seems National priorities are being called to our attention. We are financed to produce our timber cut. We are also financed to take care of pollution abatement. I really don't see much choice but to get these things done. This will mean that we have to lessen our efforts in other areas and consequently do less than a quality job in other fields. I am not confident that RF's will accept or support that. I feel I am in a trap. I must do the priority things and, consequently, less than what we ought to do in other areas. I don't see a way out. We are not talking about more money or more people.

MILLER

This business of quality engineering has been bothering me all week – I think one of our problems is in trying to satisfy the land manager. We have to go beyond that idea – we have to satisfy the people we are really working for, the public. We have responsibility to reach beyond just what a "land manager" might be happy with.

WILKE

We ought to recognize that quality engineering is a relative thing. What we are faced with today is that in the past we have been furnishing the kind of quality that has been demanded of us. Now people are saying that this is not the level of quality they are asking for. It is just not as simple as saying that we can redirect some of our efforts from preconstruction to construction engineering, or some other juggling of our efforts. We don't have in Region 2, in total, the number of engineers that other road building agencies would have put in the construction engineering phase of just our road building program. We have been talking all week about priorities; what things to emphasize and what things to de-emphasize. We have yet to agree on one single phase of our total engineering job that we would be willing to forego in terms of getting something else accomplished. You can only do so much with so many people, no matter how efficient you are at it and how well directed. I don't think we are at a point of doing with the people we have, the kind of quality job on roads that people are now telling us they want. In Region 2, we have 1 man per 10 of what any other road agency would be using on just this one aspect of our job.

HOWLETT

We do have to make some shifts; however, any shifts in manpower are very limited. The majority of our manpower is already directed toward the road program. Our second largest number of people is in pollution abatement. One help to this was suggested in the panel on programming. One of the problems is that we just don't know where we are going far enough in advance so that we can organize more efficiently to meet those jobs that become priority in the future. Bob Larse's panel had some recommendations on this.

LARSE

One of the problems we discussed in our panel with respect to programming was the constraints we have today in manpower and funds and the apparent need to shift people to meet changing job demands. We need longer range forecasts of what our program is going to be 2, 3, and 4 years from today. At the present time it is very difficult for Regions to forecast what new program direction there might be 3 years from now. I think we are going to have to work on the flexibility of our manpower and skills. This may involve changes in organizational concepts.

HOWLETT

We do not have the flexibility to accomplish the movement of people to do priority jobs. We are not talking in terms of just the engineering organization. It's much larger than just engineering. We are talking about whole Forests. We sometimes bolster the Forest organization with manpower and put project funds there for projects that just aren't going to happen. There is a strong constraint organizationally against doing anything about this. We feel that we have reached a point where we are going to have to make some hard decisions or we are not going to meet our goals without increasing our numbers of people.

DEINEMA

Will this reorganization effort that we are going through of two Forests per Region be of some help? It is going to give more flexibility Forest by Forest, isn't it?

HOWLETT

We have been discouraged almost to the point of frustration in the way some of these studies are made and the total lack of relationship of what we are going to be financed to do and what we are going to put out there to do it. No one will get down to the basic

fact that you have got to look at what you are proposing and then organize to do it. We organize around a fixed concept rather than around what we have to do on the ground?

DEINEMA

These trial reorganizations on the Forests have more flexibility. They can organize to do the job much more easily. It's just a trial so far, but isn't that a step in the right direction?

HOWLETT

What happens, Jack, is that we have some basic legislation such as the Multiple-Use Act that describes what we are going to manage, but then we get funded and required to do specific things. We are organized to do the first and we never organize to do the second. This is making it extremely difficult to carry out an effective program particularly under the adverse conditions we are facing.

CURFMAN

We have four forests that are being studied. There were two constraints that were given to each one of the forests: (1) you can't have additional people and (2) you can't have additional money. It was assumed from the beginning that we had enough people there and we had enough dollars. It was just the improper mix. So we are trying to achieve something without a foundation to work from.

HOWLETT

There is also a serious problem in every Region regarding unfinanced jobs. It was brought out in panel discussion that on, say, ski lifts, we do about 7 times the number of man-years of work than we are financed to do. We have other large impacts such as the interstate highway program, water projects, etc. These are tremendous users of our engineering time and effort — to review plans, work with particular problems that develop during the course of construction — taking our highest level and most talented engineers to divert their efforts to these fields. We feel that these can't be abandoned. Many times these impacts are far more important to the management of the lands than those projects we are financed to undertake. We have many Forests that have large impacts on the lands. They have a tremendous job of managing these other programs for which they are not funded. This is not recognized, either in job loads or in the types of people we put in the field to do these jobs.

DEINEMA

One point on this, I have been in here a year and one month. I am a lot wiser. I used to make many recommendations similar to this. It was too easy to put the finger on the WO when I was in the Regional Office and on the Regional Office when I was on the Forest. Then I came in here and I began to see some of the facts of life. I just don't have a solution for this kind of thing. This need concerning special use impacts is well recognized. We went after about \$2.5 million additional this year for this purpose. It got to the Department and there it got slashed back. We'll probably get a little more restored through arguing with the Department, but then it will go to the Office of Management and Budget, and over there it is really wiped out. Then when it goes to Congress, and you people in the field are making your needs known, Congress restores some of it. So we end up with a slight increase, but not anywhere near what is necessary on the ground.

Now, how do we overcome that? It is going to take all the thought and help you fellows can give us. The only way we are going to get the job done is to somehow convince the Office of Management and Budget. I think you people have done your job of selling us in the WO that the work on special use impacts is needed. We are able to convince the Department, but we are not even scratching the surface with OMB. There's where the big ax falls and our funds really get cut back.

HOWLETT

Jack, we want you to know what has been reiterated over and over during this meeting. We don't want to become part of the problem; however, we do want to point out the handicaps we will have in doing our job. We want some general recognition and some internal help in solving some of these difficult problems.

TURNER

This is exactly what I meant when I said I was uncomfortable in trying to shift the efforts of our people toward financed priority programs. We were very hopeful this fall that we were going to be able, with your help and understanding, to show OMB some of these problems. The schedule we had set up for your trip was largely aimed at showing these tremendous outside impacts we were not financed to handle. I hope the trip will be rescheduled; but, if it is not, we will try to do our part in getting OMB to understand the problems that we face.

DEINEMA

That's probably what it's going to take -- to get OMB people in the field. I don't see any relief in sight. The same pressures and the same binds are going to stay with us. I think our only salvation is to look to contracting.

WILKE

That's one of the most discouraging things I have heard this whole week. Chet Shields said that we are not going to be allowed to increase our contracting efforts in order to accomplish our objectives.

DEINEMA

I think there will be some relief in contracting. I don't feel there is going to be any relief on adding more people to our rolls. There may be a need to add more engineers, but it's going to have to be cut back someplace else. I would feel bad trying to offer any hope or salvation on these personnel ceilings. I think we have hope for contracting.

McROREY

What Chet was talking about was that the written material we have to date carried a paragraph directing us not to use contracting to get around hiring people. But nevertheless, when the President puts great emphasis on pollution abatement and we are held responsible for doing something about it, something is going to have to give. I certainly agree with Jack — there is some negotiating room there with OMB. I think we will be able to go further in contracting.

I think, Don, when you initially spoke of the quality engineering job, you said that we are going to have to establish priorities at the highest level of funding and that is what the President is saying — the President gave us additional money for pollution abatement. I don't see any way out — if we only have so many men and so many dollars, we are going to have to channel those into the highest priorities which are coming down from the highest source—the President.

TURNER

Then what happens when an FPC project comes along and it's going to affect the Forest a lot more than pollution abatement — what do I tell my Regional Forester then?

DEINEMA

Concerning Don Turner's point on convincing his Regional Forester about these different priorities, I'd be willing to bet my last dollar that when you stand up and tell your Regional Forester what is good quality, he will back you up in your common desire to achieve quality. I think all the way through the Service it has been made perfectly clear that we are not going to sacrifice quality for quantity — this is in the Timber Manual, it's in the Chief's statement, it's every place else. If you fellows are

under pressure to make an allowable cut on the National Forest or a Ranger District, and to get that allowable cut you have to build a road that's going to slide down the hillside, be esthetically displeasing, or that you cannot professionally stand up and defend, I think you would really be remiss if you didn't take that to your boss, challenge him and almost refuse to build that road. Every Regional Forester would back you up. You are not going to get your hand slapped for not making an allowable cut if you've got reasons like that behind you. But where you don't have the reasons, where it's an easy out, where you've got a lot of excuses why you can't make an allowable cut – then you are on shaky ground. What is quality – I'm darned if I know – I know I'd have to depend on you fellows to tell me what is quality in a road, trail, or anything else. I feel you would really be falling down on your job if you didn't stand up and be counted. If you stand up and state the fact that a proposed project does not meet professional practices, you are defensible. If you accept that we have to meet the allowable cut and everything else goes by the wayside, then this would be morally indefensible.

#### NEFF

Of course Jack is correct – the statement can't be disputed. In many respects we are being pushed along and sometimes very much impeded by public opinion and by people who have special interests, et cetera, so it isn't surprising that a quality job might not look the same to everyone.

When we go to OMB and to Congress for money to finance our job, they immediately insist that we attach goals. You know that when we ask for timber money or FR&T money, going right along with it are the goals we are supposed to accomplish. No one, particularly the Chief, is willing to go to OMB or Congress and say, "You give us the money, but we won't be able to meet the goals."

Where we get into a dilemma on allowable cut is that if we fail to offer timber in a particular area, it immediately goes into the political arena. Foresters and Forest Supervisors become embroiled in public hearings or in Congressional hearings as to why they didn't offer their allowable cut.

As a matter of policy, I think we have to say that we are going to do our best to accomplish the goals that have been agreed to by the Chief and OMB. I agree we can't do this at the expense of the resource. I think the whole problem is ascertaining the time and place at which we say, "No, we are not going to meet these goals because of these reasons." There are all degrees of quality. We have a hard time getting to the point where we say, "We aren't going beyond this point." That is the difficult part of it; however, when we get to a point where we can stand up and defend our position with our critics and be

successful, that is the time we should say, "No, we are not going to sell the timber, because if we sell the timber we will damage the resource — and that is just not acceptable."

In the meantime, the Chief, Jack, and I suppose everybody else is going to have to put emphasis on accomplishment of goals — I don't see how we can do otherwise.

At our panel session the other day, we said we don't have enough engineers to do quality work. Okay, when we get to the point that we know the work we are going to do will be damaging to the resource and we can demonstrate it, then we should say, "We don't have enough engineers to do this job properly; therefore, don't give us the money." I think that is one of the first things we have to say. If we continue to take the money to accomplish the goals, I think that Congress and OMB have a right to say, "Why do you take the money and spend it, but not accomplish the goals you said you could accomplish with the money."

I think the Regional Forester is going to have to say, "Don't give us more money, because I don't have the people to do the job." I don't see how we can keep taking the dollars, spending them, and then say we just couldn't accomplish the goals.

WILKE

Jack, I agree with your example about the poor road but the way we have to state the case to the Regional Forester is not that we are going to lose the whole road. What I have to tell him is that we don't compact the fills adequately and, therefore, we are getting erosion all along the way; we don't have the people at the site during construction to design additional drainage and therefore we don't have enough culverts.

So it's not black and white — it's a shade of grey and where do you draw the line? We are getting land damage in the form of erosion because we are not assuring ourselves that we are getting proper drainage and compaction along these roads. To assure ourselves that we do, we would have to have 10 times the people in that job that we now have, and the Chief can't buy that. So it is really not this black and white. What I have to tell him is that we can only build one-tenth of the miles of road.

We have some good jobs not because of policy or engineering, but because we depended on contractors or a timber purchaser to give us a good job. Some of them do; however, some don't. In order to make sure that all of them do, we have to have the people on the project to enforce the specifications.

DEINEMA

You put your finger right on it and it has always bothered me in the field – what is acceptable erosion? We can't have a complete, finished product everywhere all the time and that's just where it has to take good judgment. It is going to have to depend upon the situation.

KREITLER

In FY 1972 the Chief made an agreement with Congress that there would be goals. Can you give us any indication as to what the Chief is thinking about for FY 1973?

DEINEMA

In generalities. When we had our preliminary budget session as to what we were going after for 1973, we had a Chief and staff meeting. We were interested in meeting our allowable sale and cut goals. We did not want any increases in our allowable cut until we felt we had the money to do a quality job and we earned the right to make increases in the cut through thinning and seeding.

Following that, the Chief wanted increases in recreation improvements, getting dust-free roads into the campgrounds and a good recreation base out there. He felt we were really low in watershed. Special uses came up for a lot of discussion – that is when we decided to add the \$2.5 million for special use administration. Progress on water-related development is poor. We are not getting the boat ramps in – we are not really keeping our heads above water. There is a desire for an increase in timber, but there is not a desire for increases in all other activities to try to bring about a closer balance.

I think that our request to the Department will show you what we thought was quality. There was a request for an increase of 48 percent in dollars, but no increase in goals and production, especially as far as timber is concerned.

The Chief is really standing up and being counted. I don't think that is being recognized in the field. He is fighting just as hard as he can to get this balance and quality point across.

HOWLETT

There's one subject that we talked about yesterday and I think it would be well if we bring it out again and that is Transportation System Operation.

## TRASK

We are getting hurt in many ways. Perhaps we tend to overlook the road system we have already built. We have just under 200,000 miles of roads in existence — we have about 100,000 miles of trails; we are spending \$28 million at the present time just to maintain the system. We are seeing increased use of that system and experiencing growing pressure on that system. We find dissatisfaction with dust; we find there are some things we can do differently.

For example, our old definition of maintenance — we looked at maintenance as that activity which would keep the facility in the condition under which it was constructed. Maybe we need a new definition. Maybe we need a definition that ties that condition to a level of use. One of the first things that our panel agreed on was to redefine maintenance under today's climate.

We think that with a budget of \$28 million it should be managed better. Maybe we could look at a system and ask how could we control its use and could we maintain it so that we get a good investment in that system. Maybe when we look at a new project, we should realize that back down the line it means more maintenance. Maybe we should look at the whole thing—maintenance, development, reconstruction, control — all as a package.

The second area that we spent some time with was the use of regulations. We feel a growing concern that we are experiencing a lot of pressure on resources. Perhaps we could use our regulations to control that use. Let's build some flexibility into our use of the system by use of regulations.

Another area that our panel dealt with was the third road system. This is that system that lies between the forest development system and the county system. Jurisdiction is unclear; maintenance responsibilities are unclear. Oftentimes our resource plans are thwarted because of lack of county maintenance. The panel identified this area as one on which perhaps the WO should provide some kind of guidance and direction.

## HOWLETT

Following right along in that same line relating to operations was the panel on the impact of our pollution abatement program.

## PLATH

It became clear in the panel discussion that our big impact was going to be in maintenance and operation of our treatment systems. In rough estimates we have a

program that will cost about \$4.3 million a year to maintain. Over and above that we haven't even considered the dollars to pay salaries for operators. We didn't have everything built into the program.

We decided we had to coordinate this and suggested that Administrative Management and Recreation should get together and coordinate efforts. We need to have a total picture of what is needed in the future to maintain and operate these facilities. How many people are involved? What type of skills are required? We need a critical path to get people reassigned, recruited, retrained, and licensed. We are starting this pollution abatement construction and we are going to build tremendous operational problems during the next 2 years.

We need a completely coordinated effort.

DEINEMA

Where does the fault lie? Why isn't this coordination being done now – is Recreation failing to participate?

PLATH

Recreation has been concerned about it. The engineers were doing the basic design or planning and have been plugging in their figures. We haven't pulled it all together yet – recreation has been working over here and we have been working over there – we haven't been together. I don't think the time is too late to get together, but we must recognize this now and get going.

HOWLETT

Of the new treatment plants that we are building, there are some 650 of sufficient sophistication that will need qualified plant operators. Most States are going to require licensing to comply with State laws. We should go ahead and at least make sure that our people are qualified to the level that they can be licensed by the State. In addition to the 650 plants that we are going to build, there are many already constructed.

We need and we are looking toward a development program. We have got to determine how soon the operators have got to be on board. We have got to start a training program to get qualified people in place. We also have to recognize in this highly skilled area that we are going to have a lot of attrition. We will probably be training for the local community plants.

FUREN

I am not sure that we are getting the full impact of this. We are talking about treatment plants but the operation and maintenance of the solid waste systems are probably going to be quite a bit more. Everybody is concerned right now because pollution abatement has been dealing principally with the treatment plants. I just want to make sure that the group is keeping in the back of their minds that the day-to-day operations in solid waste are going to have a tremendous impact.

COLLEY

I would like to make a point concerning the \$4.3 million annual maintenance cost for water pollution. We have no firm estimates for Operation and Maintenance of land fills and current costs are hidden. It will probably take around \$15 million per year, and we can state unequivocally that the cost is going to be 3 to 4 times the cost of maintaining and operating water pollution abatement system.

PLATH

Don't you think that the balance will probably be more dollars required in the solid waste disposal than people, and with water pollution abatement we will need more personnel to go along with the dollars? That is the way that I look at the broad picture there.

COLLEY

It's a good bet that we have people on the ground today engaged in collection and hauling of solid waste, but not to the extent that will be required to handle the new solid waste systems. Maybe 500 operators have to be trained for major water pollution abatement projects. We probably won't have to bring that many people on for the solid waste. However, staffing for these jobs is a big problem and we need to get with it.

STERN

In the water pollution abatement program, the field is very much concerned about the required operation maintenance dollars. They are so concerned, that they really lack confidence that they will get these dollars; concerned to the point that it is swaying their judgment in selecting alternatives in the initial construction phase. In other words, they are going to select an alternative that is relatively maintenance-free, but this may not be the best solution.

## HOWLETT

This problem of operating pollution abatement facilities is very difficult but we must come to grips with it.

The next panel on Materials Engineering was also concerned with a difficult problem — one that we have Service-wide.

## FUREN

Our panel tried to define materials engineering and while it involves lots of things, basically materials engineering in the Forest Service is concerned with the use of earth and earth materials. This use of earth materials is quite basic and fundamental to the total mission of National Forest management.

We were struck by the magnitude of the job when we talked about the use of earth materials in the Forest Service. I think it's impressive that over \$300 million are being spent annually for engineered works — this is a tremendous figure. One sidelight is that about \$10 million per year are being spent for the repair of flood damage, primarily to repair damage to the earth materials we build from.

How much soil is lost in slides; how much in erosion? How much is tolerable? We just simply don't know.

So I think really the spirit of our recommendation is that we don't have a means to measure what we are actually doing — or even what we should be doing. We have no quality standards for the use of these earth resources in engineered works. This, for something as basic to Forest Service management as soils, is tremendously significant. We need to enlist a high level group to study our engineered works and our use — and perhaps abuse — of earth resources. The dollar figure for our engineered works, constructed in, on and from earth materials is tremendously impressive. We have heard all week long that all of us are uneasy as to the kind of quality job we are doing. I am suggesting that the Service somehow needs to develop a system for us to measure what we are doing to the National Forests, and just as important, to identify and develop meaningful and practical standards — something we don't have now. We feel the best way to do this is to have a high-level unbiased group take a long hard look at our present practices.

## DEINEMA

Would it be held to the construction and what's planned in the long-range future of the land?

## FUREN

I guess what I am saying is that we are all trying to do a better job. We have not taken a look at what our posture is right now — a base from which to improve. We can't define quality and until we do, for something as basic as these earth resources, we will never get on top of the problem. We need somehow to measure our present practices and establish acceptable practical quality standards for these earth resources.

## GANO

Just in supplement, I am afraid that the degree of effort that we are able to put on materials engineering is an after-the-fact type of situation. Most of our effort in materials engineering is applied after we have experienced a damaging situation. A more adequate level of materials engineering should have been applied in the beginning and then we would have avoided some of these costly problems.

## HOWLETT

There is one thing the panel mentioned which I think is quite significant. In materials engineering there is probably a greater variation between Regions and between Forests than in any other engineering activity we undertake. It varies from sophisticated preconstruction and predesign investigations to none at all; from good quality control in contacts to none at all — tremendous Service-wide variation. Obviously there is a lot of difference of opinion about the value of a complete materials engineering job. You can always accept some failures as a cost of not doing complete engineering. How realistic are we — what is quality? Materials engineering is an aspect of quality engineering again. What are the consequences of doing a complete materials engineering job or not doing it at all — or something in the middle? I think we need to look at this very carefully. Certainly we need to look at the variations of materials engineering between Regions and between Forests very carefully. I think that we are probably making a lot more mistakes than we can afford. In some places we are, I am sure, reaching the point where there is no particular financial or political advantage of being more careful in our preliminary investigations and our present way of checking plans and specs.

Our next panel was on Training and Manpower Development and Don Loff was the chairman of that panel.

## LOFF

It is obvious from what I heard this morning, that if we are going to do a better job with the people we have, we have to do a better job of training our people. We have to do a better job of improving their confidence. We must develop a system which identifies the

skills and the deficiencies in the people we have. If these deficiencies can be corrected by training then it is obvious we will have to provide appropriate training to fill the voids. Our panel suggested that we develop an engineering training coordinator in each Region (some Regions already have one) – a man who has the skills or who can acquire the skills to identify people's deficiencies and the knowledge and authority to do something about it. We need to develop and make known the training opportunities for our people, specifically out-Service training opportunities. Too many of our in-Service courses lack the needed quality.

#### HOWLETT

Jeff, I think it would be well if you would discuss for a minute some of the ways in which we have been pointing out the need for this type of work in the Regions.

#### SIRMON

This whole field of manpower development hasn't been defined very well and we have a lot of people working in different areas.

There are people operating in manpower planning and they think in terms of numbers, ceilings, span of control, and this sort of thing. We have other people who operate in deployment or employment of people – placement and this sort of thing – and this is also called manpower development. We have people involved in recruitment – getting people on board.

The whole manpower program has never been drawn together and one of our panel recommendations has to do with this type of synthesis. We hope to develop a paper that speaks to the question of how a technical division redeems its responsibility in manpower development. A technical division is concerned with bringing a man on with the type of skills that are needed. We want to identify the type of development needed, et cetera. Eventually, we want a man in a job doing a job and making a maximum contribution to the organization.

This whole field of manpower development from the standpoint of a person being responsible for getting the job done has never been put into a clear focus. One of the recommendations deals with that.

Another thrust of our panel is that with this emphasis on cutting back and/or better use of people, we should be using instructors who are qualified to teach the subject matter – professional teachers. We need to take a real look at outside sources of training and consolidate training needs. We have a recommendation dealing with consolidating these kinds of needs to the point that we can get adequate training and improve the level of instruction.

DEINEMA

I think Engineering has always been outstanding and a leader in the whole Forest Service in manpower training, placement, and the whole field of personnel management.

HOWLETT

Are there any more discussion points?

NEFF

I don't know how rapidly we are going to be able to improve our quality of work, but I do know we are going to improve it much more rapidly if we work as a team. So I only want to say to you, Mike, and to all of you fellows, that we in Timber Management are going to work with Engineering at the Washington Office level as a team. I hope we continue to improve this at the Regional levels. I would like to make the offer that any time you call on Timber Management we will work with you to get things clarified. We have the same objectives and we want the same accomplishments.

HOWLETT

I want to say that Timber Management and Engineering have never been any closer together than they are now. We have been very fortunate in the people we have had running Timber Management in the Washington Office. I have also noticed this at the Regional level. In every Region that I have been in the last 3 years, there hasn't been a single inspection that Timber Management people haven't gone out with us. There is a feeling of cooperation; I think it is one of the real strengths we can build on to make it possible to meet some of the challenges facing us.

CURFMAN

On the first day, I brought out credibility; I would like to talk again on credibility and also bring in quantity.

Credibility – I think everyone on this room realizes the tight-rope that you people in the WO are walking – that there are certain rules.

John McGuire did a pretty good job in saying that the Washington Office can't be too outspoken about this or that issue, or that they won't participate in the decisions affecting the Forest Service.

Now from the standpoint of quantity, I would just like to tell a true story about quantity. I am going back to a situation that started a long time ago and I have never been removed from it. We started in with a new work planning program back in the late 1950's which was supposed to cure the problems we are talking about here and have been talking about all week. The supervisor was the type of individual who, when he talked to his staff and Ranger, was very emphatic. "Now every one of you has your job planned out and I am going to personally hold each one of you accountable for that." We had a recreation staff man who was getting close to retirement and when the Supervisor would ask him how he was coming on a special project, the staff man would always respond that he hadn't got to it, but he expected to get to it next week. Finally, the Supervisor said, "This is going to take about 3 or 4 weeks and I want you to do it for me." I said, "This is very good experience for me." I also said, "Now which one of the jobs is it that you would like me to drop in order to do this extra job?" He said, "The thing I like about Ranger so-and-so is that when I give him an extra job, he doesn't ask me what to drop, he just sees that they all get done."

Basically, the jobs that aren't getting much attention are really the problems. We have the third system of roads and also a fourth system—temporary roads. There is little or no engineering going into the fourth system of roads which is disturbing more soil than anything else we are doing. This is getting no engineering attention. We feel that if a guy wins a race and he stays ahead of the bulldozer while he flags the road he is doing the job. We are satisfied that he won the race — that he didn't get run over. I think it has been demonstrated here all week that if we are going to go ahead without normal quantity, we are going to be pretty much in the same situation. If anyone is looking for a utopia as far as priorities are concerned, they aren't going to get it.

#### DEINEMA

One of the toughest jobs I ever had was to tell an Assistant Regional Forester I was going to have to take something out of his work program; I felt that I just had to do it. But it gets tougher at the Washington level. The jobs are broader and ill-defined and you don't know how to put the parameters on them.

I think we will have to say what we are going to cut out. I think John McGuire emphasized that on Monday. I just feel it is going to be imperative that we, as the staff, are going to have to establish where the priorities lie. This is especially true with these personnel and grade reduction constraints — more so than in dollars. I don't know what form it is going to take. I will promise you that I will do what I can to get these priorities laid out. I hope you will record my commitment to this loud and clear. I feel that the Chief will help us set priorities — that he is solidly behind us.

One other thing on this credibility — I don't look at it as credibility as much as I do communication. Somehow we are not getting the story of what's happening told to the

field. My contacts with Rangers this summer shocked me nearly half to death when I discovered how little they knew about what was going on at the National and Regional levels. I would hope that Engineering, being as bright as they are, can come up with a system of closed television in our staff meeting and somehow get the supervisors tied into a system like that. I don't want more paperwork, but it wouldn't hurt to have Chief and staff minutes put out to all the Regions so you in the field know what's happening in here. I think it is just something we have to work at all the time. I have no ready solutions for it.

#### CURFMAN

I think this would be very helpful, Jack. I think this organization culture to decentralize is good.

#### DEINEMA

One other point in closing – I sure feel engineers have come into their own and are working as a team and I don't think we have ever seen brighter days in dollars and people, than in the long-range outlook now.

We are working together – I think Mike mentioned that it goes throughout the Service. I feel that real strides have been made in getting away from the “we” and “they.” It is not Foresters making the decisions – it is line officers. Engineers are in key spots – we have made some real breakthroughs and real progress to opening up all career avenues for the different disciplines. I think you fellows have earned that. I am personally very proud of what your profession has done and how the Service has responded to it.

## PANEL REPORTS – PRIORITIES, DECISIONS, AND FOLLOW-UP ACTION<sup>1/</sup>

The discussions at this meeting covered the major concerns of engineering in the Forest Service today. The recommendations reflect this and reflect also the breadth and depth of these concerns. To think we can meet, discuss, recommend, and, “presto,” the problem is solved isn’t realistic. Solutions may come slow and hard. In view of demands on our time and the constraints we are experiencing, we have identified the following areas where a substantial contribution can be made with the forces available.

1. FR&T Programming – We have already made some progress in this area. Efforts will continue to better identify objectives and then weigh programs against these objectives. We have efforts underway with MASS to better describe an output-oriented approach in conjunction with the stated objectives to arrive at a “worthiness evaluation” – hence, a rational approach to priority setting.
2. Pollution Abatement – The first order of business is to get a Sanitary Engineer on the WO staff. One of his first assignments will be to develop criteria for use of additives in concentrated sewage wastes.
3. Engineering Quality – Jeff Sirmon and Sterling Wilcox will follow the Region 6 audit system and develop an approach for Service-wide adoption, due FY 1973.
4. Geometronics and Technological Improvements – The Workshop held in Denver as a result of recommendation 1 of Panel 4 concluded with a plan to implement a multi-layer map series. This proposal was presented to Chief and staff in January and to Regional Foresters and staff in all Regions in February and March. A task force consisting of Jeff Sirmon, Terry Gossard, and Bill Stephens will make a detailed analysis of how to best implement this new approach. Their report is due in early summer.

Efforts to establish a steering committee are underway (see recommendation 2).

---

<sup>1/</sup>Jeff M. Sirmon, Administrative Management and Data Retrieval, Washington Office and Regional Office Divisions of Engineering Meeting, September 27, 1971, Washington, D.C.

5. Inspector Certification Program – Dave Jones has been assigned the job of developing a Service-wide program. He is to develop a flow chart soon to outline how the July 1, 1974 target date can be met. Consideration will be given to policy development, program description, subject matter, training, testing, and trainee population.
6. Special Use Impacts (Panel 7) – Charles Dwyer will develop a paper concerning legal responsibilities associated with special uses involving winter sports. The paper will include recommendations for steps to be taken to redeem the engineer's responsibilities. Due Fall 1972.

Rich Weller will coordinate efforts to assess manpower requirements in connection with special use permits. He will consider needs in the planning, construction, and operation phases. To be included in the activities studies are dam, highway, power lines, railroads, mining, et cetera.

7. Transportation System Operation – Sterling Wilcox will take the lead in implementing recommendations 1, 2, and 3 dealing with maintenance. Some work has already started with MASS in determining maintenance investment alternatives. Due February 1973.

Dave Trask and Ed Neumann will handle recommendations 1, 2, and 3 dealing with road operations.

8. Material Engineering – Adrian Pelzner will develop a problem statement and pose a fact-finding group composed of skills necessary to meet the objectives as per his statement.
9. Training and Manpower Development – Jeff Sirmon will develop a paper on manpower development by early Spring.
10. Construction Impact of Pollution Abatement – Frank Hammond will develop guidelines on how to define and display O&M cost, both in the initial planning and in the subsequent annual operating plan.

Jeff Sirmon will work with EPA and other agencies to explore a training program for O&M personnel. One aspect of the program will be preparation for State examinations. Funds have been earmarked in the FY 1973 budget to define our needs and develop a training program. Due March 1973.



ENGINEERING MEETINGS — SEPTEMBER 27 — OCTOBER 1, 1971

N O T E S





