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Field Notes

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The Prediction of Recreation Traffic Served by National Forests

Washington Office Division of Engineering News

FOREST SERVICE • U.S. DEPARTMENT OF AGRICULTURE

ENGINEERING FIELD NOTES

This publication is a monthly newsletter published to exchange engineering information and ideas of a technical or administrative nature among Forest Service personnel. The text in the publication represents the personal opinions of the respective author and must not be construed as recommended or approved procedures, mandatory instructions, or policy, except by FSM references.

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Coordinators should direct questions concerning format, editing, publishing dates, etc., to Fran Owsley, Editor, Division of Engineering, Forest Service, USDA, Washington, D. C. 20250.

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FIELD NOTES

THE PREDICTION OF RECREATION TRAFFIC SERVED BY NATIONAL FORESTS [1]

By Victor M. De Kalb, Director
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and

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This discussion presents the development and use of computerized recreation travel models by the U.S. Forest Service. Emphasis is placed on those aspects that relate to a transportation manager's concerns and not on in-depth technical analysis of the computer programs.

In 1968 the U.S. Forest Service established a small group in Berkeley with the assigned responsibility to "develop computerized procedures for analyzing transportation networks to provide information to enhance long-range and operational planning for management of National Forests."

The Forest Service transportation planning group then developed cooperative agreements with San Jose State University, Stanford University, and the Institute of Traffic and Transportation Engineering (ITTE) of the University of California.

The Institute of Transportation and Traffic Engineering was asked to develop an overall framework for the analysis work and standard models which could be used throughout the United States in Forest Service planning. An extended period of time at a moderate level of financing was allowed for this development work to assure that field validation could be accomplished often and that the techniques could and would be used by field units. This procedure is contrasted to a highly financed project of short duration which can often leave large gaps, inconsistencies, and lack of "fit" to the actual situation.

[1] *Presented by Victor M. De Kalb at the annual meeting of the Western Association of State Highway Officials (WASHO), Portland, Oregon, June 6, 1974.*

Early in the study, the cooperators found that a model which handled all traffic on National Forest roads was impractical. This was particularly true if the necessary input of the analyst and the decision maker was assured at the exact point in the evaluation when human experience, intuition, and choice were crucial. Man-machine interaction was considered indispensable and the models were designed to require this activity.

As a result, several models were developed which recognized both functional and spatial requirements. Since a majority of traffic on National Forest roads is generated by commodity (timber) and recreation use, the primary development focused on a commodity travel model (timber travel model) and two recreation travel models, for Regional travel and for travel within a smaller (National Forest) area.

Most of this paper will discuss the recreation travel models. These are behavioral models that generally relate travel demand to the characteristics of populations using National Forest recreation opportunities.

The following sections discuss the nature of the models and experience in Forest Service application.

MODEL CHARACTERISTICS

The U.S. Forest Service is a decentralized agency with considerable latitude given to the directors of Forest Service Regions and to National Forest Supervisors. A National Forest covers an area of about one million acres and each Region provides direction to about 16 National Forests. In view of this situation, and the wide diversity of use, climate, topography, and variety on National Forests, it is apparent that any useful, service-wide model should have the following characteristics:

- It must have the ability to be adjusted to fit local conditions.

- It must be manipulated through a variety of computer terminals including slow-speed conversational terminals.

- It should be operated and understood by analysts who do not necessarily know all of the mathematical attributes of the computer programs.

- Input and output must be in a form that a land use manager and his staff know and use.

- It must interact with resource management analysis being conducted for lands.

- Costs of data collection, customizing (calibrating), and using the model should be within the financial and manpower resources of a National Forest.

- The calibrated model must be technically (mathematically) correct in interrelationships within the model (such as traffic flow at intersections).

After intensive data collection on the Tahoe National Forest and an analysis of possible modeling technology as related to the Tahoe data, two models were developed which conform to the criteria listed above and which have the following additional attributes:

- Two separate models were developed so that the difference in detail between travel to many National Forests and travel within them could be reliably analyzed.

- Traffic which is attracted to the general National Forest recreation experience is analyzed. The models will respond to hunting, fishing, camping, swimming, and similar experiences. They will not include unique attractors such as a Disneyland or Mount Rushmore. These must be handled separately. There are additional qualifications to this characteristic that will be discussed under each model.

- The models are usually used to study one type of use at a time. They may analyze all summer traffic or, as a separate study, hunting traffic on a weekend or winter ski traffic. Care must be taken in establishing the objectives of an analysis.

- These are behavioral models and are calibrated from available demographic and use data, and usually from origin-destination surveys. Because of this characteristic, they should be checked and recalibrated whenever cultural values of people or preferences change.

- The models are calibrated for local conditions. Therefore, the calibrated formula used in a model which predicts traffic in the southern third of California cannot be used in a model to predict traffic in Colorado.

- The models are developed for situations where traffic is of low enough density that it is not constrained by other traffic. If many of the routes are so loaded with vehicles that a driver would choose alternate routes, then the more complex, urban-type traffic models should be used.

- The models use personal judgment, yet constrain such judgment so that it is mathematically correct.

- The calibrated model can be easily updated and corrected.

- The models fit the requirements of long-range planning through use of only a few variables. Consequently, they are most useful when variables are changed during successive runs to determine the sensitivity of predictions to various alternative network configurations or recreation policies.

- The computer cost of using the models is low. This encourages sensitivity analysis.

THE MACRO-MODEL

This model analyzes travel from population centers to large recreation areas, such as National Forests. It is designed for use within an extensive land area such as Appalachia. In this situation, it can be expected that the usual transportation routes investigated will be State and interstate highways. The variables considered are size of population, time needed for travel to the large recreation area (National Forest), attractiveness of the recreation area, and optional socioeconomic factors.

A statistical analysis of data collected on the Tahoe indicated that due to the homogeneity of the population centers using the National Forests in California, socioeconomic characteristics other than population size are not sufficiently strong to influence the model. In the Tahoe study, the difference in population of generation areas and their travel time to National Forests accounted for 95 percent of the observed variations, while differences in median income and median age contributed 3 percent and 2 percent respectively.[2] A further analysis of the Tahoe data indicated that very little predictive ability was lost by removing the attraction index from the equation.[3] Based on these studies and on analysis of the particular situation, the model formula includes the single socioeconomic factor for use if needed. The Tahoe work indicates that predictions are within ± 20 percent of correct figures and the largest discrepancy was in the lightly used areas.[4] In view of the many other variables, this is adequate for planning accuracy inherent in medium- and long-range prediction and the ability to apply sensitivity analysis.

Population and travel time can be obtained from census records and map measures. Current use at the recreation area and other behavioral data needed to calibrate the model are obtained through origin-destination interviews at the gates to the recreation area. Questions are developed based on the use to be investigated and later modeled. Travel studies include such items as day uses, overnight uses, period when travel is done, and kind of use, such as camping or fishing. Since costs of making a 100-percent interview are prohibitive, a statistical sample is taken based on the objectives for which the prediction is to be used.

Model calibration is an inexact procedure. It involves manipulating the travel data in a variety of ways in order to develop a mathematical formulation with trip estimation properties similar to the pattern actually observed. In the case of the Recreational Travel Macro-Model, the formulation may take one of several possible forms, as follows:

[2] *Gyamfi, P. **A Model for Allocating Recreational Travel Demand to Natural Forests.** Highway Research Record Number 408: Transportation Planning for Natural Resource and Recreation Development. Washington, D.C.: Highway Research Board, 1972.*

[3] *Kanafani, Adib and Okyere, Joseph. **A Demand Model for Recreational Travel.** Transportation Planning and Technology, Vol. 1, No. 2.*

[4] ***Transportation Analysis Procedures for National Forest Planning: Project Report.** Berkeley, California: University of California Institute of Transportation and Traffic Engineering, July 1971, 200 pp.*

$$T_{ij} = \alpha \; P_i \; E_i^{\beta} \; X_{ij}^{\gamma} \tag{1}$$

$$T_{ij} = \alpha \; P_i \; E_i^{\beta} \; e^{\gamma X_{ij}} \tag{2}$$

$$T_{ij} = \alpha \; P_i^{\beta} \; X_{ij}^{\gamma} \tag{3}$$

$$T_{ij} = \alpha \; P_i^{\beta} \; e^{\gamma X_{ij}} \tag{4}$$

where

T_{ij} = number of trips to forest j from origin i

P_i = population of zone i

E_i = second optional socioeconomic variable chosen to describe zone i (such as median income)

X_{ij} = travel time over the regional network between j and i

α, β, γ = parameters computed from the interview data

The model calibration process determines the unknown parameters and γ for one or another of these model forms. By trial, one sees which formulation reproduces the observed travel behavior best. The parameters must also meet certain rules for theoretical reasonableness and statistical significance.

The four alternative formulations are distinguished by different ways of handling travel time and by including or not including the extra socioeconomic variable that describes the population centers. The choice between the two treatments of travel time is largely pragmatic, neither form being theoretically better. To some extent, the power function in formulations 1 and 3 is easier to work with, because its similarity to Newton's Gravity Force formula helps in determining if a calibrated value of γ is reasonable. However, in some cases, a better fit may be obtained with the exponential function of formulations 2 and 4, which would recommend its use.

After calibration, predictions can be made. They will vary depending on the variables changed to reflect future conditions. Explanatory variables such as population can be manipulated and the effects of new routes or increasing the speed of existing routes can be investigated. Output shows travel demand on various links of the system as well as the number of trips to be expected at each forest gate.

More complete discussions of the theory involved in this prediction model are contained in the sources mentioned in footnotes 2, 3, 4, and 7. Also, refer to the user's guide that

allows use of the model by analysts who are not necessarily familiar with all of the mathematical theory embodied in the computer programs.[5]

Figure 1 and Table I compare the predicted with actual yearly attendance to National Forests in California. It should be noted that the predicted attendance was derived from traffic demand allocations developed by the model.

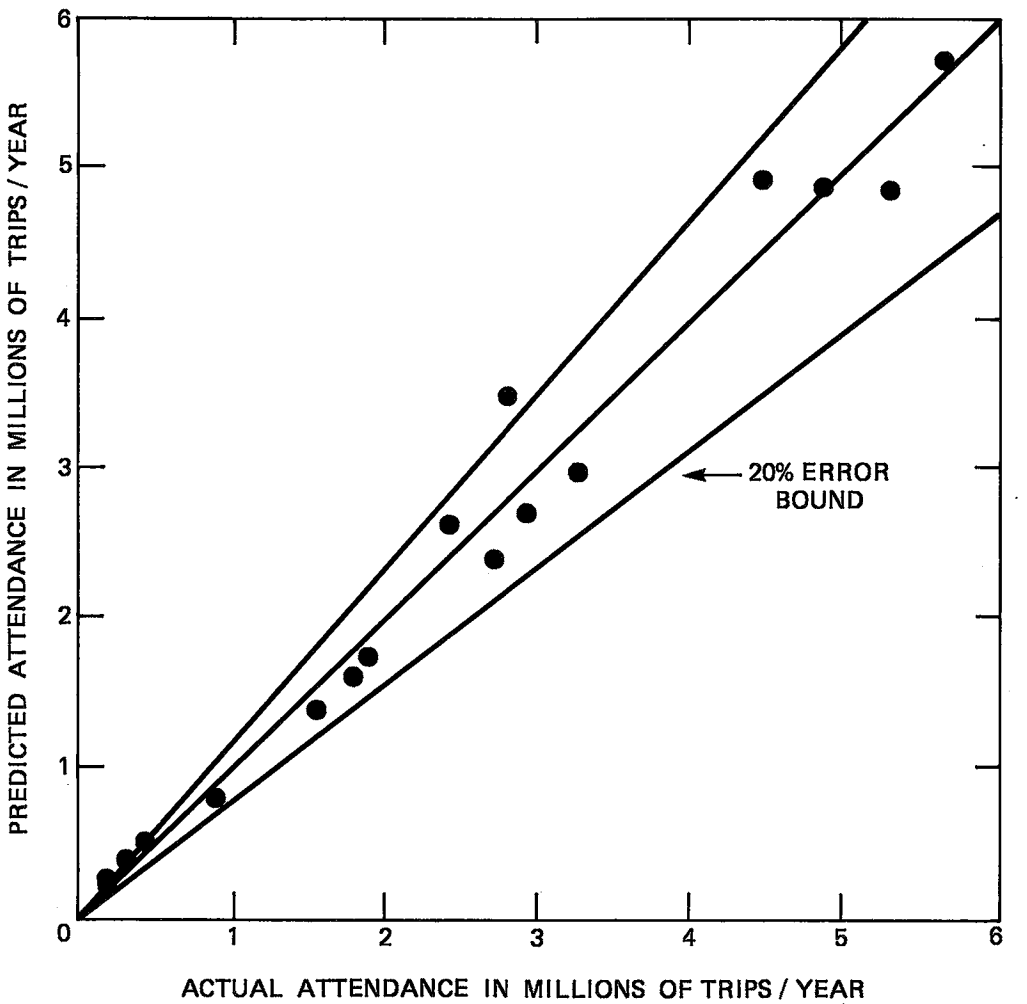

Figure 1. – Actual Attendance Versus Predicted Attendance for California National Forests from Tahoe Study

[5] ***A User's Guide for Network Analysis.*** *Berkeley, California: University of California Institute of Transportation and Traffic Engineering, July 1974.*

Table I. – Tahoe Study – Comparison Between Actual and Predicted Attendance

Forest	Actual Attendance (1000)	Predicted Attendance (1000)	Difference
A	5,633	6,253	+11.0
B	1,783	1,694	– 5.0
C	2,693	2,570	– 4.6
D	4,875	5,133	+ 5.3
E	424	461	+ 8.8
F	1,831	1,769	– 3.4
G	2,945	2,833	– 3.8
H	315	338	+ 7.3
I	236	246	+ 4.2
J	893	826	– 7.5
K	5,289	4,802	– 9.2
L	1,523	1,459	– 4.2
M & N	3,273	3,178	– 2.9
O	4,458	4,759	+ 6.7
P	236	251	+ 6.4
Q	2,411	2,554	+ 5.9
R	2,798	2,690	– 3.9

Macro-Model Use

During the last several years funds for recreation travel studies have been limited. Therefore, the model has been used operationally in only two cases, one of which is still under way. The locations are significantly different from Tahoe and include the Appalachia forests of the southeast and the Mogollon Rim forests in Arizona. The recently completed study covered National Forests from Atlanta, Georgia, along the backbone of the southern Appalachian Mountains to Maryland. The model considered seven National Forests and a detached unit in Kentucky. The attendance at these forests was related to 130 population centers in the eastern United States, including such cities as Atlanta, Asheville, Knoxville, New York, Washington, and Cincinnati.[6] Main highway networks are intense and recreation covers the total spectrum of outdoor use.

[6] ***A Report on Use of Forest Service Recreation Models on the Chattahoochee National Forest (Draft).*** *Report to be published by Region 8, U.S. Forest Service, Atlanta, Georgia.*

Since this was an operational exercise, only enough sampling data were taken to develop the model. Comparison of a few predicted versus actual data points showing attendance from various urban areas to the Georgia National Forest is shown in Figure 2. This chart indicates an accuracy very similar to the results found in the Tahoe Study.

It is interesting to note that the Tahoe Study used formulation 1 of the calibration formulas previously discussed, while the southern Appalachian model was calibrated most successfully using formulation 4.

The model was used to determine expected recreation travel entering each of the National Forests due to various published population assumptions for the year 2000.

In addition, an analysis was made of the effect of a proposed new major highway in the area.

The resulting data are being used by Forest Service planners for making land use recommendations and for the location and financing of recreation opportunities in the area.

The second area being studied is the Mogollon Rim recreation area in Arizona, a three-National-Forest playground of one major population center, Phoenix. Field data have been collected and the model is being calibrated.

An interesting opportunity to use this model concerns the Salt Lake City-Ogden population area. Surrounding this area are a number of large lakes which provide camping, fishing, boating, and water skiing opportunities. Historically, one or two of these lakes are closed periodically to poison trash fish and restock. Recently, closures have been made of certain kinds of use when a lake has become heavily polluted. We are considering the use of the model in this area to determine the most desirable schedule of lake closing for fish improvement. The model would also predict the additional impacts on the highway and lake system from other closing schedules.

It is felt that a model would reduce surprises now experienced when such impacts are ignored or predicted solely from judgment.

THE MICRO-MODEL

The Micro-Model is a more disaggregate technique for allocating traffic within a particular National Forest. The operational model is restricted to recreation uses associated with a well-defined destination. This currently precludes touring recreationists who have no specific destinations. Work is continuing to validate a different model for the touring activity.

The model considers both traffic entering a National Forest and that generated from campgrounds and small resorts or residences within the Forest. All of this generated traffic is allocated to various network routes based on behavior patterns observed in interview data. Such

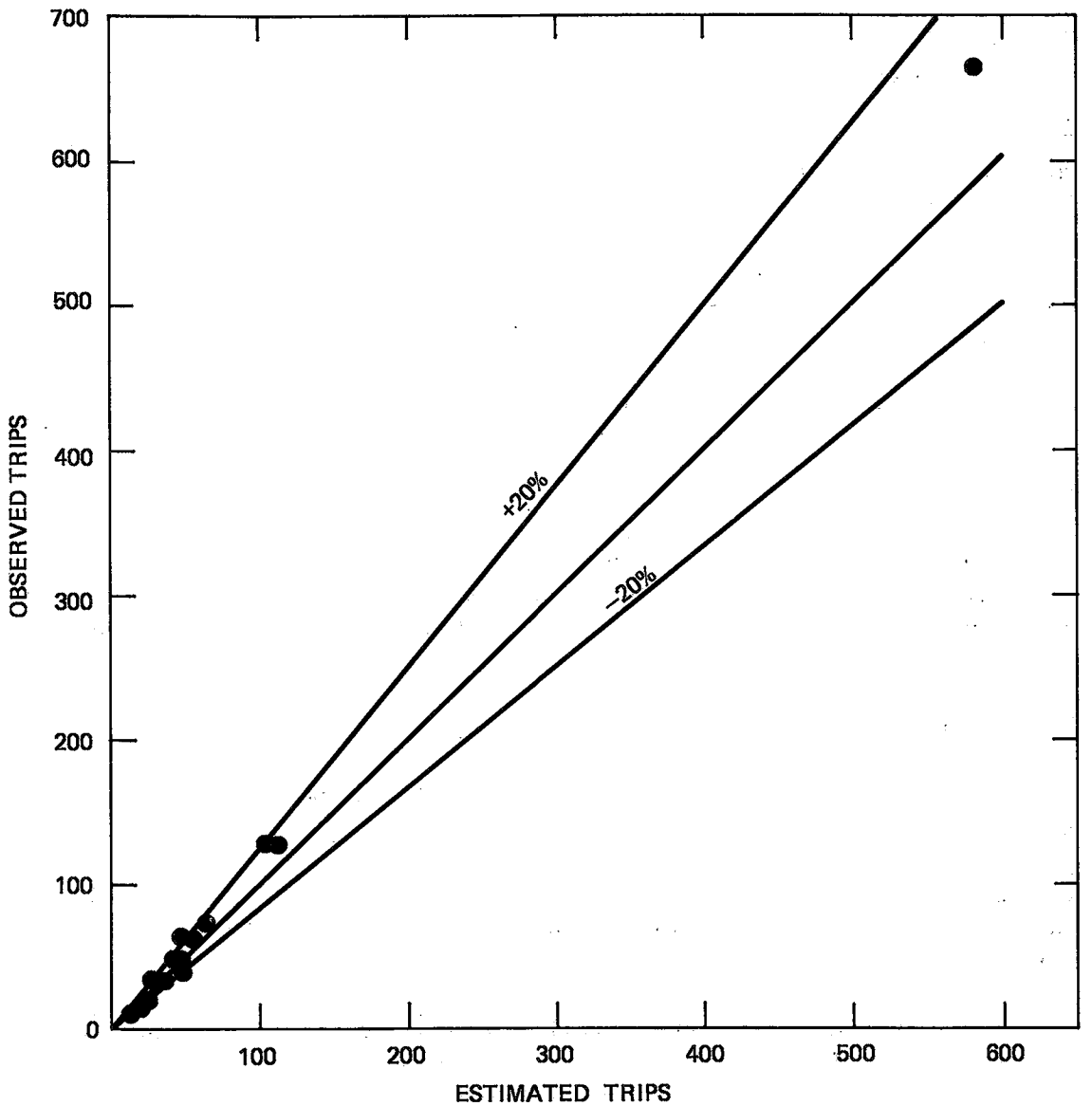

Figure 2. – Chattahoochee Study – Overnight Use from Major Urban Areas

allocations are usually done for separate user groups and for different times of day, days of week, and seasons when the travel takes place.

The road network includes all the roads needed to get from generator sites to the points of use. This usually includes State highways, county roads, and Forest Service roads. Consequently, the traffic allocated to a road by links from the Micro-Model must be increased by other traffic, such as travel, to obtain a total flow figure.

The model differs from most urban trip distribution models in that it simultaneously considers two principal location measures that influence choice of a use site. These are impedance along a route, expressed as travel time, and the density of destination opportunities. The traveler's reason for bypassing opportunities is a combination of the recreation site being insufficiently attractive and the distance to the next opportunity being acceptable.[7] In this model the attractiveness of the site is an important factor.

After data are collected through interviews and compilation of network and facility characteristics, the model is calibrated through procedures similar to those discussed for the Macro-Model.

Output of this model can show trips for each type of recreation use or aggregated trips. Such trips are output for each network link.

Prediction is done by varying the attractiveness of recreation sites, the transportation network, or the number of trips produced at generators. Because of the low cost of computer operation, the developers recommend that a large number of alternatives be run in order to detect factors to which the travel pattern is sensitive. This considerably affects the function of land use planners and allows testing of proposed land management policies before placing them into effect.

Micro-Model Use

Use of this model has coincided with use of the Macro-Model, and similarly was limited by low fund allocations since development.

In addition to the Tahoe Forest study, the model was developed and used on the Chattahoochee National Forest in north Georgia in conjunction with the south Appalachia Macro-Model previously discussed.

The primary use to date of this analysis has been to determine the pattern of recreational use of forest lands. Consequently, the major output of the model has been concerned with such questions as what percentages of users preferred what kinds of recreation.

[7] *Sullivan, Edward C.* ***Models for Recreation Traffic Estimation Within a National Forest.*** *Highway Research Record Number 408: Transportation Planning for Natural Resource and Recreation Development. Washington, D.C.: Highway Research Board, 1972.*

Sample trip reports produced in the analysis of existing use are shown in Tables II and III. Such reports are useful to determine when traffic and campground control or public contact would be most effective.

Table II. – Chattahoochee Study – Daily Distribution of Arrivals for Day Users

Time In	Sun	Mon	Tue	Wed	Thu	Fri	Sat
0– 6	0.1	1.2	0.	0.	0.	1.5	1.2
7– 9	5.4	5.1	6.3	13.4	4.7	9.8	10.3
10–12	45.7	50.3	42.0	51.3	54.2	45.4	49.4
13–15	37.7	40.8	39.1	23.3	31.0	29.5	29.4
16–18	10.6	1.8	11.6	7.9	9.7	13.8	9.2
19–22	0.6	0.9	1.0	1.0	0.4	0.1	0.5
22	0.	0.	0.	3.2	0.	0.	0.
Parties	(742)	(64)	(60)	(52)	(43)	(49)	(380)

Table III. – Chattahoochee Study – Daily Distribution of Arrivals for Overnight Users

Time In	Sun	Mon	Tue	Wed	Thu	Fri	Sat
0– 6	3.1	0.	4.8	2.7	0.1	1.4	1.9
7– 9	3.2	2.2	9.8	5.4	1.4	1.6	6.2
10–12	26.4	27.3	21.7	22.8	26.2	10.7	36.6
13–15	26.5	26.4	30.6	34.5	34.5	16.9	30.5
16–18	26.6	32.5	26.9	23.0	19.8	31.0	17.5
19–22	14.1	11.6	6.2	11.1	15.4	26.4	7.3
22	0.1	0.	0.	0.6	2.5	3.0	0.
Parties	(184)	(212)	(130)	(143)	(186)	(533)	(496)

A particular problem of transportation access was intensively studied. This concerned the Chattoga River along the east boundary of the forest, which has been designated a wild river. Planners were concerned whether additional canoe launching access should be provided and whether certain existing road crossings of the river should be eliminated. Several alternative transportation scenarios were run to predict traffic flow and concentration of use at road ends. These predictions were then used by planners for establishing the facility pattern along and across the Chattoga.

Much of the data and analysis used in this study is too voluminous to report; however, it is interesting to review the summary of results included in a recent report on the project.[6]

A similar study is being made on the Mogollon Rim area above Phoenix. Data have been collected but calibration has not been completed.

OTHER DEVELOPMENTS

A touring travel model is being validated by the University of California and the Transportation Analysis Group. This model would be operated independently from the two models discussed above and the results then added to the other recreation traffic estimates. This is necessary because the mathematical formulations are different.

This experience with modeling for recreation travel in rural areas has aroused interest for a current independent study at the University of California which is studying the possibility of modeling touring travel of several days' duration that would leave a population center and stop at historic sites, natural attractions, and similar recreational chances along a loop trip. This approach would provide the ability to explore the sensitivity of highway speeds and comparative attractiveness of recreation experiences of non-National Forest character as well as the National Forest experiences discussed in this paper.

CONCLUSION

This paper has reviewed the current level of recreation travel prediction in National Forest planning. Since previous publications have provided technical explanation of the models themselves, such material has been kept to a minimum in this paper. Readers interested in the exact formulations are encouraged to read the references cited.

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WASHINGTON OFFICE DIVISION OF ENGINEERING NEWS

OPERATIONS

Harold L. Strickland
Assistant Director

WORK GROUP APPOINTED

The Office of Management and Finance (OMF) of the Department of Agriculture is studying Departmental needs in aerial photography and other remote sensing, geodesy, and mapping. A work group has been appointed to discover and look into areas of common need.

The group is chaired by John Miranda of OMF and includes Jim Davis of ASCS, Jerry Gockowski of SCS, and Sky Chamard of Region 6 Division of Engineering. They are visiting various agency field offices, collecting data on agency programs, and familiarizing themselves with extra-Departmental activities in related fields. Information from the Federal Mapping Task Force study of two years ago has made the collection and correlation of Geometronics-type data much simpler this time.

The work group attended a conference at the USGS National Center on the National Cartographic Information Center (NCIC) before beginning their field office visits. Dick Swinnerton, our former Chief Geometronics Engineer, has been appointed Chief of NCIC. NCIC is trying to enlist the aid of other government agencies to establish a one-stop source capability for information about maps, charts, aerial photography, space imagery, geodetic control, and other related data and graphics.

The USDA group then visited the ASCS Western Photographic Laboratory in Salt Lake City. ASCS recently announced their intent to close their Eastern Laboratory in Asheville, North Carolina, next fiscal year and combine both labs in one facility in Salt Lake City. It was the coincidental intent to establish national centers in closely related fields by ASCS and the Forest Service that prompted the Department to undertake the study. Because the two agencies need to move quickly, the Department is treating the study with some urgency and has directed that the work group report their findings and recommendations, including official agency comments, no later than September 15, 1974.

Delegates to the 1974 Joint Fall Meeting of the American Society of Photogrammetry, the American Congress on Surveying and Mapping, and the concurrent XIV Congress of the International Federation of Surveyors will meet in the Rosslyn office on September 9, 1974.

Sky will probably be able to give a preview of the final group report at that time. Our new Chief of Geometronics, Don Loff, formerly Assistant Regional Engineer at Denver, will take the opportunity afforded by the meeting to renew acquaintance with those in attendance.

GIVE A HOOT FOR WOODSY OWSLEY

Our Editor, Fran Owsley, is taking the retirement trail after having helped us improve our writing and presentations for over 5 years. In addition to making many of us look good by correcting our mistakes, Fran has made it possible for all of us to have the benefit of our numerous engineering publications.

We would like to present Fran with a book of letters from all of us. So, how about taking a few minutes to send Fran an 8x10-1/2-inch letter with a 1-inch left margin. Al Colley, our Information Coordinator, will collect the letters and present them to Fran. Try to get your letter to us by October 1, 1974.

TECHNOLOGICAL IMPROVEMENTS

Heyward T. Taylor
Assistant Director

TIMBER CRIB INSTRUMENTATION STUDY

Under the terms of a cooperative agreement with the Forest Service, the University of Idaho has recently completed a study and analysis of an instrumented timber crib wall located on the Mount Hood National Forest in Region 6. The instrumentation was rather minimal. The main purpose of the study was to gain the experience, information, and techniques needed for a comprehensive instrumentation project on timber crib walls. Such instrumentation is needed to obtain a detailed check on the validity of existing bin pressure theories used in the design of timber crib walls.

Details regarding the design, construction, and instrumentation of the crib on the Mount Hood National Forest can be found in the final report for this study. Copies of the report, entitled *Timber Crib Instrumentation Study,* have been furnished to all Regional Information Coordinators. The report should be of interest and use to Forest Service engineers having job responsibilities in the design, construction, or materials aspects of timber crib walls. Although the findings and recommendations were based on a very limited instrumentation program, the following information highlights, extracted from the report, are deemed quite significant:

- Lack of accurate information on cribfill and backfill pressures hampers efficient design of timber crib walls. Crib walls are generally overdesigned or underdesigned. This results in a waste of money and materials for overdesign and failure for underdesign.

- Drainpipe placed in the cribfill at the base of a wall may not adequately drain the cribfill during periods of heavy precipitation. If effective weep holes are not provided in the plywood facing, there is a resulting buildup of water in the cribfill behind the facing, thereby decreasing the angle of internal friction and increasing the unit weight.

- Slope meter equipment should be routinely installed and used for observing postconstruction performance on all large timber crib walls.

- In this study, in all cases, the measured pressures were found to be greater than the pressures predicted by the existing applicable bin theories.

FY 75 ED&T PROGRAM

Instructions assigning the current year program to the Equipment Development Centers included the following:

> "Forest Service ED&T is planned to support FS program goals and objectives with priorities being set accordingly. Top priority for San Dimas is equipment for utilization of forest residues. Coordination with Forest Product and Engineering Research is essential. Equipment systems for treating TSI and other unusable residues is high priority in both the Missoula Fuel Treatment and the San Dimas TSI Slash Treatment projects. Increased emphasis is also to be placed on sound and safety projects to improve the work environment for personnel."

ED&T REPORTS FOR ENGINEERING

Two reports by San Dimas for Engineering are at the printers and will be reaching the field soon. They are:

- 7700-7 Functional Evaluation of the John Deere 570 Motor Grader

- 7700-8 Roadside Slope Revegetation Past and Current Practice on the National Forests

CONSULTATION AND STANDARDS

Charles R. Weller
Assistant Director

A ROAD IN THE FOREST

Many of you have commented on the new film-o-graph *A Road in the Forest* relative to its objective and the target audience. The objective of the program is primarily to develop a better understanding of multidiscipline team planning concepts as they relate to the landscape management aspects of transportation planning.

The film is intended for people who have transportation planning and development projects among their responsibilities, primarily the District Ranger and the Forest Supervisor. It should be helpful to the Unit Manager in his efforts to orient his technical people in these concepts. This does not mean that general audiences should be excluded, but that they should be aware of the film's primary purpose.

The film-o-graph was heartily endorsed by Chief McGuire. Even though many Regions are well along in the use of these concepts, there is room for improvement. Because of complacency or lack of knowledge, people are sometimes hesitant to apply new concepts. Hopefully, this program will stimulate them to apply these principles of team planning to their transportation projects.

A Road in the Forest is now available from the USDA Office of Communication, Motion Picture Division. The ordering number is P #12357. Please order directly from the Department. The price per print depends upon the number of copies ordered, as follows:

- 1 through 4 — $82.00
- 5 through 24 — $77.00
- 25 through 49 — $71.00
- 50 through 99 — $65.00
- 100 and over — $62.00

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