

SUMMARY OF PAPERS ON ORGANIZATIONAL STRUCTURE AND TRAINING

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●WHEN PREPARATIONS were made for the first Highway Maintenance Management Workshop held at the Ohio State University in 1968, it was thought that the principal value of the conference would lie in the pointing up of areas of research and development in which work is needed. In this second Workshop, this purpose has been well carried out under the topic of "Organizational Structure and Training." Five excellent papers were presented on this topic, and an attempt will be made to list the highlights presented.

The organization for highway maintenance in most states has more or less just grown up without much formal planning. A look at the history of highway usage makes the reasons for this clear. Early roads in the horse and buggy era were built purely for local travel. Roads were mostly only graded and drained earth with possibly some stabilization of surfaces with gravel or crushed rock. A very common practice was to require that each land owner spend a certain number of days per year working on maintenance of the road in front of his property or furnish a team of horses and wagon for a certain number of days.

As the "tin lizzie" appeared and travel increased in both volume and speed more work was required for maintenance. The farmers then logically asked the local unit of government, usually the township, to hire men to do the maintenance work, and the land owners paid taxes to cover these costs. This probably was the beginning of the patronage system of road maintenance wherein the maintenance workers were appointed by politically elected officials.

As traffic continued to increase in volume and in speed, an ever smaller percentage of the traffic passing any one point was of local origin, and maintenance became ever more logically a governmental responsibility. The building of better roads and the development of better maintenance equipment also brought about many changes. Trucks replaced horses and wagons, and then with the development of steam, gasoline, and diesel power came the development of more sophisticated and expensive equipment, but equipment which could do a better job of maintenance. This modern equipment can be used efficiently, however, only if there is a sufficient volume of work assigned to each piece of equipment, and if it is handled by skilled operators. Power mowers, patching equipment, stone spreaders, guard post drivers, and many other machines have a capacity for maintaining far more miles of road than exist in any one township, and even more work than exists in some counties.

In many states however, highway maintenance is still being done with personnel who are politically appointed. The only solution to problems created by this situation is to educate and train the employees. In his paper, Charles E. Diehl made an important observation as follows:

Team play requires two way communication—instruction and response. If instructions are poor or wrong, the coach has to accept responsibility. Maintenance communication should be no different. It must instruct and it must recognize a response. Too often, communication has been one way. We establish cost control reporting up the line. No information is ever fed back to the field to encourage change. We send down work methods from headquarters and never check up on the efficiency of the method with the man in the field. If communication is not looped through feedback, it is not a true communication; it is just information.

F. E. Crawford and G. L. Ray reported on findings from a study that has been conducted for the Louisiana Department of Highways by Roy Jorgensen Associates. This report included some rather significant findings, particularly that the number of maintenance employees could be reduced while at the same time the quality of maintenance could be improved. The net result to the state highway department would be better maintenance at lower cost. One interesting aspect of the report was the fact that reduction of the number of men on highway maintenance payrolls was being made through the normal process of attrition.

W. J. Buglass took a new look at maintenance as it must be applied to a whole transportation system rather than just to a network of highways. He believes that it is necessary to reorganize into comprehensive, unified departments of transportation for the following reasons:

1. We need increased operating efficiency to handle greater work loads without proportionate increases in staff.
2. We must make government as understandable and responsive to citizens as possible.
3. We face a growing complexity of problems which more frequently involve several agencies.
4. In order to aid and abet the new efficiency required in the entire industry, government needs to perform in new areas and in a coordinated fashion.

Another pertinent observation brought out by Buglass was that on all governmental levels it is increasingly recognized today that our transportation policy cannot remain segmented. The day is past when each transportation mode could successfully be treated in isolation, without reference to the total transport system of which it is a part. It is no longer valid, if it ever was, to plan and construct highway, air, rail, or water facilities, without reference to the transportation regulatory climate or knowledge of the interplay of transport investment, economic growth, and social change. Over the years this nation has seen rapid technological change in all fields of endeavor and the simultaneous development of a vast and complicated transport network. As the complexities of our transportation system and its interrelationships with all aspects of our interdependent society are increasingly recognized, we are forced to develop new public policy approaches to transportation and more sophisticated methods of analysis. Much study is needed.

Papers presented by Edward J. Kehl and by Louis G. O'Brien dealt with problems of doing the best job possible under the present system of patronage-appointed maintenance personnel in their states. In each paper the central thought was that in order to take advantage of available machines and know-how we need to reorganize maintenance forces so that men are responsible for larger units of work.

From the five papers presented it can be concluded that research is needed in several areas. Studies are needed of ways and means of reorganizing state maintenance systems so as to get away from the patronage employee. Such studies need to consider the size of political subdivision used as a basis of maintenance. Certainly the township is too small, and many counties are too small. Studies are needed of organization for maintenance. Studies are especially needed on ways and means of educating and training persons who will be responsible for maintenance work. These include inspectors who determine what maintenance work is needed to correct any particular situation, machine operators, maintenance supervisors, and so forth. Ways must be found not only to employ competent people but to improve the skills of all employees. Studies need to be made of the qualifications of persons responsible for making decisions on what maintenance work is to be done. Such a person must understand the engineering principles involved, and must be able to determine what has caused a maintenance failure in order to determine properly what corrective measures need to be taken.

The studies made by Jorgensen in Louisiana and Tallamy and Associates in Illinois both reported that currently too many men were employed on much maintenance work.

Studies are needed of lines of communication in maintenance work—both communication down, scheduling the items of work to be done, and communication up, feedback to the maintenance engineer on the accomplishments of maintenance, and the performance of repaired highway structures and pavements.

To accomplish good maintenance, formal training programs will be essential. In Louisiana much progress has been made in this effort including the production of canned instruction, i. e., a series of slides and an accompanying tape. There is some question on the effectiveness of this type of teaching. The tape itself cannot answer questions and the teaching will be effective only if the teacher can make sure that the listener has correctly gotten the message intended. Research and development are needed on teaching techniques for maintenance personnel.