

THE RESEARCH PROGRAM OF COUNTY ROAD MANAGEMENT

HOWARD BUSSARD

Executive Secretary, Management Research Program
National Association of County Engineers

My coming here today to discuss the subject of county road management, I am sure, results from an interest in this subject and its application to Kentucky counties. My discussion will be centered upon a research project being conducted to explain and demonstrate what county road management is and how it works.



Finally, I shall suggest a plan to utilize and apply the results in your state.

In introducing the topic of county road management it may be helpful to trace briefly its development. Before the days of the automobile, counties were responsible for what little rural road building was done. Initially, counties were divided into small road districts, managed by elected officials. With the automobile, trips became longer, crossing district and county lines. As more and longer trips became the rule, highway leaders in some counties saw that road districts were too small and responsibilities too divided to meet new travel demands. They felt that county roads could be better planned and improved if standards of policy and construction were applied on a

countywide basis. Also they recognized that counties needed engineering aid in implementing road activities.

Highway leaders envisioned an engineer-board plan of management as an ideal solution. This plan would serve a two-fold purpose: to preserve local authority; yet provide maximum efficiency in road affairs.

Under the engineer-board plan of management the county board makes policy and a professional engineer sees that it is carried out. The board has available the advice and counsel of an engineer when needed on policy matters. The county engineer-board road management plan gained in popularity after the Congress required states to have road management plans to qualify for Federal aid for highways. To be eligible for Federal aid, the states were required to organize highway departments staffed with engineers. This requirement indicated to counties that in addition to money and good management, specialized engineering skills also were needed to produce adequate roads.

In establishing county engineer-board management plans some states required or permitted the appointment of engineers by county boards. In other states, the adopted plan provided for experienced road superintendents, rather than engineers. Still other states made no changes, leaving road management under elected road officials who lacked specialized road knowledge. This situation still exists in many counties.

But the board-engineer plan has met with measurable success. Over the years many counties have gradually improved and expanded their management operations. By experience and advancement, although slow in many cases, they have determined the necessary actions of management first; then they have worked out good methods of doing them.

The board-engineer type of management is a team effort. Areas of conflict have been narrowed and a harmonious atmosphere of mutual respect is present. The engineer-board relationship is founded on the understanding of how both must work together to get things done effectively.

However, on a nationwide scale there is still no uniform pattern for county road management. Road management methods produce different results, some good, others poor. Generally, those counties that have followed the original concept of the engineer-board road management plan have produced the best results.

Yet there is still this problem: even among counties described as well-managed and under an engineer-board plan, there are notable differences in results.

Why is this so?

The answer is plain: the basic and uniform practices necessary to build and maintain a county road system properly are not being carried out correctly. New board members and engineers for example, are inclined to perpetuate existing practices—both good and poor. It is desirable, of course to have uniform management practices in every county, but where does one find the guide to these practices? What are the commandments of good management? What device can be used to appraise management actions?

The National Association of County Engineers in response to the need for sound practices in road management, has developed a plan that is adaptable to counties of all sizes and locations. Through its Central Research Committee and a Special Committee on Relationship of County Board and Engineer, this organization is now gathering, selecting and publishing the best road management practices in the nation.

The NACE Plan is being published in three parts—Relations, Actions, and Methods of Management.

A series of manuals relates the use of sound management practices and describes the board-engineer relationship necessary to apply these practices.

The Automotive Safety Foundation and the U.S. Bureau of Public Roads have provided research funds to carry out this program.

In the final analysis, the goal of efficient county road management is building and maintaining a system of county roads.

The NACE Plan will help achieve this goal regardless of the size or location of a county. Its practices can be adapted to various road department needs.

The NACE Road Management Plan begins by listing these basic Actions under 10 functional titles:

Office	Construction
Personnel	Relations
Information	Research
Programs	Maintenance
Plans	Suburban Development

Under each of these functional titles is listed the detailed activities which take place—to greater or lesser extent—in a county road office.

Office

The county road office is the seat of management. It provides housing for records and the space to carry out its activities. The staff size and work load will vary with the size and road responsibility of each county.

A few of the principal duties carried under office functions are:

Organization	Budget
Direction	Purchasing
Accounting	

Personnel

Daily activities of construction and maintenance on a county road system require many types of road equipment and employment of persons with many skills.

These activities include:

Selection	Direction
Compensation	Separation
Training	

Information

Because roads concern all citizens, each county should provide accurate information to acquaint its employees and the public with road policies, needs programs and benefits.

Information activities include:

To each other (between Board & Engineer)	To public
To employees	To groups

Advance Road Programs

Improvement programs are the advance determination of road needs and the orderly scheduling of necessary work over a period of years. A long range program generally extends for 10 or more years. Short range programs of one to five years are prepared from the long range plans.

Plans

Once specific projects have been scheduled for improvement, plans and detailed cost estimates are necessary.

Under plans these activities are included:

Surveys	Right of Way
Design	Construction Plans

Construction

Construction is building the road as detailed by the plans. Included are:

Specifications	Supervision
Contracts	Payment
Material control	

Intergovernmental Relations

Within a state, there are many governmental agencies with jurisdiction over roads and streets. However, these agencies—state, county and municipal—are engaged in building an efficient transportation system. In this endeavour all agencies must coordinate their efforts—that is a working intergovernmental relationship.

Necessary relations include those:

To Highway Department	To Municipality
To Bureau of Public Roads	To Association

Research

Research is the investigation and determination of better methods to build and maintain roads. County road management presents problems which, generally, differ from those of the state or municipalities.

Research should be directed to the problems found in these three basic areas:

Existing	Application
Needed	

Maintenance

Maintenance is the work performed to perpetuate a road or structure in good condition and keep traffic moving. The everyday tasks such as mowing grass, and smoothing or repairing road surfaces, are called routine maintenance. Reconstruction or improvement of existing roads is called improvements or special

maintenance. The division of maintenance into routine and special, allows cost to be segregated, gives the necessary facts for planning and control of operations.

The five principal maintenance activities are:

Standards	Operations
Cost Records	Results
Reporting	

Suburban Development

The increasing urbanization in counties is of real concern to boards and engineers. Road transportation plans affect other aspects of development such as land use patterns and public works. Many county engineers, in addition to road duties, have responsibility for public works, approval of subdivisions and trash disposal. They should be aware that solutions depend on a comprehensive, not piecemeal approach.

These basic activities are necessary for a comprehensive approach:

- Population Growth Estimates
- Land Use Plan
- Road Plan and Zoning Plan
- Subdivision Control
- Other Services

Actions of Management Chart

Here the Actions of Management are listed under their functional titles. This arrangement provides a practical basis to separate the broad subject into small components. This reduces road management to simple, familiar terms we all can understand.

A by-product of this chart is that it points up, both to the engineer and the board, the responsibilities of each.

This chart was also used to develop a plan by which members of the National Association of County Engineers could work together on the details of the various actions. At the same time, by using this plan, work was coordinated and *guided* to its final goal.

The Organization Plan

The Executive Committee of the Association appointed a Central Research Committee to carry out the study program. Advisors to aid this committee were also selected. The Central Committee formed subcommittees, each having definite responsibilities keyed to the basic actions chart.

Cover of County Road Management Guide (A step by step plan for improvement)

The plan described in this booklet can be termed the long range work plan of the organization. Actually, it was a research project to determine the necessary management actions.

Each committee began work by first listing activities considered necessary, and then writing descriptions of these activities.

The County Engineer and his Relationship to the County Board

The introduction described the evolution of county engineer-board road management, and defined this alliance as a team effort. Each member contributes individual skills and training.

The board, representing its citizens, is vested with legal authority and responsibility for the County Road System. The skill of board members is best employed in making decisions affecting roads.

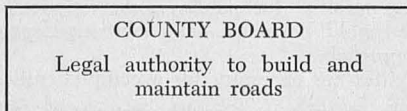
The engineer uses his training and experience to aid the board in arriving at decisions. His job is to carry out decisions.

One popular statement that sums up this division of duties is "The board determines policy and the engineer directs that policy." Although this statement is

generally correct, the team relationship is considered to have more profound implications. In actual practice, board decisions often depend on factual information that can only be provided by the engineer. In order to direct policy decisions successfully the engineer must fully understand them.

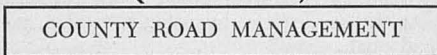
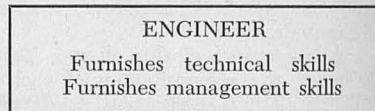
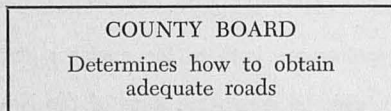
If we are to understand the desirable relations that produce an efficient road management team, we must know the specific duties of the team, some examples of how board policy is determined, and the engineer's role in working with his board.

These examples are designed to guide the management team into productive relations. A logical beginning point is the relative importance of a county board in road management.



The legislative purpose in giving road responsibility to the county board is to place these roads under local control. The board's responsibility is to build and maintain an adequate road system. This must be accomplished within the legal framework and with the approval of the county's citizens.

In the board-engineer management plan, legislative direction requires or permits the employment of an engineer to aid the board in its road responsibility. This creates a road management partnership—a management team.



The management team has these responsibilities: the board within a legal framework, is to provide an adequate road system. The engineer is to use his skill to aid in bringing this about.

The board functions as the County Road Authority by making decisions. It legislates on the many specific actions entailed in road building and maintenance. The engineer, in addition to providing factual information, carries out these decisions, by directing road activities.

The final product of this joint effort is county road management.

For a successful partnership between the board and engineer each must understand their inter-relationships in phases of road management. A joint committee of county engineers and commissioners was assigned the task of listing these relationships.

Cover of Relations Guide

This is the published report of this committee.

The report first reviews the broad general responsibilities of the board and engineers.

Engineer—Gathers and prepares factual road data; explains data to board

Board—Uses facts to make decisions (policy) on road management actions

Engineer—Consults with board to attain full understanding of their decisions (policy)

Board—Refers decisions (policy) to engineers to direct and carry out

The engineer provides the board with road information. He explains the data to the board and they use it in making decisions.

As these decisions become policy, the engineer should know the reasons behind policies so that he is better able to direct road operations.

Engineer—Uses technical skill and knowledge to build and maintain roads within the board's decisions. (policy)

Board—Sees that engineer carries out their decisions. (policy)

Board—Appraises results

Engineer—Appraises results

Road policies of the board are translated by the engineer into the operations of building and maintaining roads. It is the board's duty to see that its policy is carried out by the engineer.

These broad general principles apply to all functions of management and some of the individual actions. Several functions are used to demonstrate this.

Office Operations Function

Engineer—Directs activities, submits records method; prepares—presents annual budget; directs total operation within budget; directs purchases under procedure

County Board—Establishes office and records method; adjusts and approves annual budget; provides funds for budget; establishes purchasing procedure

Person Function

The performance of daily road tasks requires employees with skill and experience. Their efforts must be organized and directed toward specific tasks. Better results are obtained if employees are selected for specific skills, provided with proper equipment, and are trained in its application.

Engineer—Provides information on employees
Methods of reporting
Methods of training

County Board—Decides a method of selection
Establishes pay schedules
Provides a method of payment

Information Function

The task of county road management is made easier if the road department has the confidence and support of the public and its personnel. The key to confidence and support is the proper exercise of the information functions. This calls for a systematic information plan.

County Board—Informs public of road problems
Knows public reaction to policies
Knows public reaction to policies
Decides how to release road information

Engineer—Informs board of road problems
Informs employees of road plans
Arranges news material about roads

Program Planning Function

Improvement programs are advance decisions of the necessary road needs and the orderly scheduling of those needs. Programs provide a basis for fiscal planning and give an orderly sequence to improvements. Programming activities include road inventory, classification, and the translation of road needs and their arrangement into long or short range programs.

- Engineer*—Suggests classification plan
 - Determines improvement needs
 - Prepares long-range improvement plan
 - Prepares short-range improvement plan
- County Board*—Approves and adopts classification plan
 - Studies improvement needs appraisal
 - Adopts a long-range improvement plan
 - Adopts a short-range improvement plan

Plans Function

The first step in preparing construction plans is the accumulation of field data that records measurements and conditions. From this data is projected the desired facility designed to serve present and future traffic.

County Board—Authorizes survey and plans; approves plans; determines method to obtain rights of way

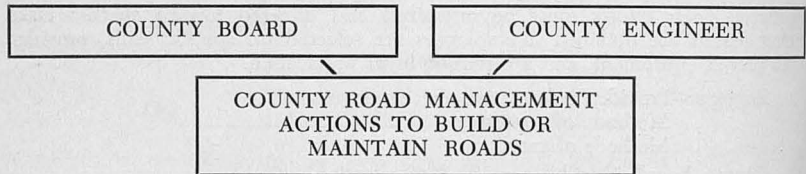
Engineer—Makes authorized survey; prepares plans including rights of way needed; estimates costs of improvement

Construction Function

For a specific improvement project, completed plans are essential to carry out the many details of construction including supervision and approval of completed work.

Engineer—Explains construction details

County Board—Decides how to do work
Awards contract
Approves completed work



The coloring in this slide, representing the management team, shows how their separate efforts finally merge together and bring about board-engineer road management. Good relations are basic to good management.

While it is essential to enumerate the necessary actions and describe each for uniform understanding there is one more needed element. What is the best method that can be employed to carry out each action?

The final objective of the county management program is geared to providing this answer. The six committees and nine sub-committees, formed to date, have devoted their attention to writing Methods Manuals for each of the management actions.

The first completed manual, Advance Road Programming was distributed recently.

Cover of Advance Road Programs

This manual, the product of Committee II, contains the details of program development. This is the cover of the Introduction which summarizes the procedure.

Actions Chart—with Programming coloured

Advance programming is one of the important functions of county road management. It should be a continuous activity. The engineers task is to gather and analyze facts and to prepare and recommend construction and maintenance

programs. The county board has final responsibility to activate the program. The manual explains the necessary steps.

Sequence of Programming

Shown are the various steps as they are discussed in the respective chapters in the manual.

This manual is a detailed work guide complete with sample work forms and examples. Its purpose is to bring to all counties a firm proven procedure.

Cover of Road Experience Records

Also completed and distributed is our accounting manual. Included are definitions and procedures similar to the A.A.S.H.O. accounting manual.

The importance of accurate records and how their use enables counties to perform their road duties more effectively is emphasized.

Cover of Introduction Information Public Relations

Every county road agency must give information about its activities. Recently distributed is our Public Relations manual explaining why it is necessary to provide road information and also describing methods to give this information. Examples of press and radio releases are provided.

Chart of Public Relations Process

This chart outlines how the county road management team can provide an information program.

Organization	Purchasing
Personnel	Comprehensive Planning

Committee work on these four manuals have been completed. After final review by the Central Research Committee editorial work, publication and distribution will follow.

Work is under way by active committee in preparation of these manuals:

Intergovernmental Relations	Zoning Control
Design Standards	Roads and Streets
Maintenance Standards	Drainage and Sanitation
Definitions	Location of Utilities

Conclusion

After this review of county road management the pertinent question is—how can such a plan be helpful in this state? I believe the answer lies with you people—the state department, the University and the county officials. It would seem your combined efforts could furnish the leadership to make this determination. Certainly a first step would be an evaluation of your present practices. The example I have described should be useful for this step.

Several years ago under a report entitled "A Highway Program for Kentucky" the Automotive Safety Foundation made specific recommendations for improving county road organizations. I believe these recommendations are still valid and can be used as a basic starting point for an action program.

Briefly these recommendations were:

1. Using the commission principle as a road agency in all counties either by a commission or the establishment of a 3 member road board within the fiscal court.
2. Counties with low income or small road mileage should form road districts with other counties. Suggestions for these combinations and their administration were also included.
3. Each road unit should appoint a road superintendent or engineer who would be given responsibility to carry out the policy of the road board on a countywide basis. The qualifications for superintendents and en-

gineers would be established. They would be required to meet these qualifications before being approved by the state.

4. When these conditions were met, counties or road districts would receive financial aid rather than direct expenditure by the state. Also, they would receive a yearly amount to aid in the cost of providing for the engineer or superintendent.

Control of road expenditures would be required by records and reports along with approval of improvement programs and construction plans.

It seems a starting place for action would be in those counties with a road commission. Basically a good management pattern exists in these counties and needed refinements could be more quickly made.

Once some counties were organized and working out their own salvation other counties would be more receptive to making changes.

The reward for the counties would be freedom, within the legal and administrative requirements, to work out local road affairs themselves. For the state it would mean a changed role to supervising an aid program rather than carrying it out directly. The net result would be to build up counties to meet their road responsibility and allow the state department to concentrate its effort on its own system.

should
arrive
I

this con
equipme
We
and mec
jobs that
maintena

I fee
neglect.
abuse wo
of course
drained, a
to the pr
or overtax
only going
greatest in

A tru
safety fact
more than
are all des
ary require
a maximum
exceed the
for hauling
than in the