Area Service B Classification: A Legal Approach to Setting Road Maintenance Levels for Infrequently Used Low-Volume Roads

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The problem of maintaining low-volume roads is discussed in this paper. Specifically, the paper is a summary of the status of a new secondary road classification, "minimum maintenance road," as it is used in the five states of Washington, Kansas, Nebraska, Minnesota, and Iowa. The new classification is used for very low-volume roads and provides for a lower level of maintenance for these roads than for the balance of the secondary road system. The legislation that was passed by each state is analyzed and the similarities and differences between them are noted. Information is also provided on how the concept has worked in each state, especially as it relates to tort claims. Iowa's experience is explored in detail, based on the results of a survey of all the county engineers in the state. The paper concludes that, even though the courts have yet to test the concept of the minimum maintenance road classification, it should be considered successful.

When Iowa's road network was created over 100 years ago, the size of the average farm was about 90 acres (36 ha). The road network basically formed a grid pattern, with roads generally at 1 mi (1.6 km) intervals both north-south and east-west. These roads effectively subdivided the land into sections of land of about 640 acres (259 ha) in size. The pattern was interrupted only by natural barriers, such as rivers and lakes.

The extensive road network was a key to land development because it provided access from the land, through the farmstead, to markets for the farm's products. (For the purposes of this paper, a farmstead is defined as the farm home and accessory buildings normally associated with a farming operation.) At this time, most of the state's population lived on farms and the rural road network was also used for social interaction and as an access to necessary goods and services.

Since then, the size of the average farm has increased considerably. Improved technology has greatly increased the productivity of the individual farmer, which has caused mass migration from farms to cities and towns. Average farm size increased to 158 acres (64 ha) in 1930, to 267 acres (108 ha) in 1976, and to a current estimated 303 acres (122 ha). Iowa's rural population was 1,528,000 in 1920, but dropped to 1,318,000 in 1960 and to 1,097,000 in 1980. Farm population dropped from 662,000 in 1960 to 512,000 in 1970, and from 421,000 in 1980 to an estimated 393,000 in 1985. (The recent farm financial crisis in the midwestern states has further accelerated migration from farms to urban areas.)

During the early years of Iowa's road network development, each mi (1.6 km) of road provided access for three to four farms. The consolidation of small farms into larger ones has reduced that number to between one and two per mi in terms of access to farmsteads. In many instances, farmsteads are concentrated on the more heavily travelled roads, which leaves some roads open to use only as access to farmland.

Traffic needs have also changed. Farm mechanization has greatly increased the size and weight of the farm machinery that occasionally uses the road network (1). Vehicles that carry farm products to market are bigger and carry heavier loads. These same improvements in technology have changed farmers' travel needs, ranging from the regular delivery of goods and services to the farm, to the regular use of goods and services by travelling to nearby communities. These traffic needs require that the roads be equipped with an all-weather surface and an improved geometric design.

RESULTING ROAD NETWORK

County governments have reacted to these needs by expending large amounts of available funds on their roads. Most secondary roads were graded to the acceptable geometric standards of their time and most have received an all-weather surface (2). A hierarchical structure has been developed for functional classification of the secondary roads; some have been designated as trunk or trunk collector roads and the remainder as local service roads. As adequate financial resources were made available, many of these trunk and trunk collector roads were paved to accommodate heavier traffic volumes.

A number of factors have contributed to the change of road use patterns.

1. Some improvements, especially the addition of pavement to principal roads, caused a shift of much traffic to those roads.
2. Mechanization has caused major changes in the character and location of centers of activity, on the land as well as in nearby communities.
3. The migration of people from the farm to urban areas has drastically changed the number of people using the roads.

These changes are likely to continue as the effect of the current farm financial crisis causes further enlargement of farms.
Although road use patterns have changed, the road network has changed little. Attempts have been made to close some of the lightly travelled roads, but these efforts generally have met strong opposition (3). As a result, few miles of roads have been removed from the secondary road system.

Tight budgets have forced county governments to make priority decisions on expenditures. One of the options chosen by many counties has been to reduce maintenance on lightly travelled roads. Little construction or reconstruction money is spent on these roads; many have never been surfaced with all-weather material and some will rarely have the material renewed. The road’s surface is being bladed less often and, in some instances, snow is never plowed from the road.

Because these maintenance and operations practices on lightly travelled roads have become an unwritten policy, county engineers and boards of supervisors have become concerned about the possibility of accidents occurring on these roads and the threat of tort claims being filed against the county for alleged road defects (4). (In 1965, the Iowa legislature passed the Tort Claims Act. It waived governmental immunity for negligent acts on the part of any public body.)

This concern appears valid, because recent judgments in tort liability cases have often resulted in large awards, and public agencies have been particularly hard-hit. The local jurisdictions responsible for secondary road maintenance are especially vulnerable to tort claims, because maintenance of many of these lightly travelled roads has failed to meet the standards of "generally accepted practice."

WHAT IS THE SOLUTION?

Several states have moved toward one solution to the problem by classifying some of the lightly used roads separately. Though the term used to describe these roads will vary from state to state, they can best be described as a portion of the group of secondary roads generally referred to as "local roads" or "area service roads" that will receive significantly less maintenance than that required by applicable statutes. (Nebraska uses the term "minimum maintenance roads" and Washington describes them as "primitive" roads.)

In general, state legislation is enacted that provides for the reclassification of roads into this new category, describes (at least briefly) the intent to lower levels of maintenance, and supplies the means to develop and promulgate standards for the level of maintenance. The legislation also provides for the posting of appropriate warning signs on these roads.

Each state approaches the problem differently. A brief description of the policies and experiences of five states follows.

Washington

Washington is the first state known to have provided a separate road classification for minimum maintenance secondary roads. Its legislation, passed in 1980, described these roads as primitive roads. In general, primitive roads are not classified as part of the counties’ primary road system; have either a gravel or earth driving surface; and carry 100 or less vehicles per day (based on average annual daily traffic).

The legislation provides for placement of road signs at all places where the primitive road portion begins or connects with a highway other than another primitive road. The signs are to be marked to indicate that “it is a primitive road, as provided in the manual of uniform traffic control devices.”

No specific criteria were suggested for these roads in the legislation. Instead, the legislation included the statement that “no design or signing (other than warning sign requirement) or maintenance standards or requirement apply to primitive roads.” Counties set their own policies regarding maintenance criteria.

There are about 41,000 miles (66,000 km) of roads in the county systems within Washington, including approximately 12,000 miles (19,000 km) of roads that are classified as arterial. As many as 4,000 miles (6,400 km) of these roads have been classified as primitive roads. (A statewide inventory of these roads is scheduled for 1987.) Although the counties are not required to use the primitive road designation, 20 of the 39 counties do.

Tort liability experience to date is good, although there is a lawsuit pending as a result of an accident that occurred on a primitive road. It will be the first court test of the legislation.

Nebraska

In 1983, the Nebraska legislature revised earlier statutes to include provisions for a new functional classification: “minimum maintenance” roads. The Act described the new road classification as consisting of:

“(a) roads used occasionally by a limited number of people as alternate access roads for areas served primarily by local, collector, or arterial roads, or (b) roads which are the principal access roads to agricultural lands for farm machinery and which are not primarily used by passenger or commercial vehicles.”

The legislature carefully phrased the revised statute so as not to change the incidence for liability in the event of the filing of a tort claim for “personal injury or loss of life, or damage to his or her property” due to insufficiency or want of repair. The legislation also provided for the following:

1. Development of specific criteria for the new road classification by the Board of Public Roads Classification and Standards. Standard Board procedures include provisions for public hearings and formal publication of the criteria.
2. Installation and maintenance of appropriate signs at entry points to adequately warn the public of a lower level of maintenance than that of other public roads.

These criteria have been developed and published in a procedures manual for county use. In addition, a sign has been designed especially for the minimum maintenance roads and is described in the same procedures manual.

The revised statute also provided the following guidelines to the Board regarding the standards to be developed:

1. The level of maintenance shall be adequate to serve farm machinery and occasional or intermittent use by passenger or commercial vehicles.
2. Structures (bridges and culverts) on the road may be removed by the county (to protect public safety) and need not be replaced unless the county chooses to do so.
 Counties are not required to use the classification, but by mid-1986, 30 of the state's 93 counties had chosen to use it. About 2,100 mi (3,380 km) of the state's 78,600 mi (126,494 km) have been classified as minimum maintenance roads, which is slightly more than 2.5 percent of the total. However, that figure represents nearly 10 percent of the miles of the system of those counties using the classification.

Tort liability experience has been favorable thus far. There have been no suits filed and none are pending that relate specifically to a minimum maintenance road.

Kansas

Kansas passed legislation that permitted the designation of minimum maintenance roads in 1981. This provided the basis for "declaration of minimum maintenance roads" and established procedures for adopting the resolution, providing for official notice, and holding public hearings.

The Act grants the power to the board of county commissioners of each county to make the declaration. The following two conditions must be met to declare a given road a minimum maintenance road:

1. If, in the opinion of the board, the road (in the county or on the county line) is used only occasionally or is used only by a few individuals, then the board may commence proceedings, provided
2. The road has not been constructed with federal aid.

The Act also provides for official notice to the board of commissioners of an adjoining county if the road is on or partly on a county line. However, it does not prohibit a unilateral adoption of the declaration for the portion of the road under consideration that falls within the given county's jurisdiction.

The Act does not provide for any standards of maintenance, but most of the counties have adopted their own. Posting of signs stating "Minimum maintenance, travel at your own risk" is required. The signs are to display black letters on a yellow background, and the letters must be at least 2 in high. The State Department of Transportation (Bureau of Rural and Urban Development) of Kansas has designed a sign (30 in × 30 in, or 76 cm × 76 cm) that can be used by the counties.

It has been estimated that between 15 and 20 percent of the counties have adopted a minimum maintenance resolution, but no accurate figures are currently available. However, the counties' tort liability experience so far is favorable; no known cases are pending or have been filed.

Iowa

Iowa's legislation, which provides the legal basis for a lesser level of maintenance, is fairly brief. Also passed in 1981, it created two different classes of roads from existing area service roads called "area service A classification" and "area service B classification." Roads classified as area service A are to be maintained as before, in accordance with applicable statutes. Roads designated as area service B may have a lesser level of maintenance, which is to be specified by the county board of supervisors.

Like all other legislation encountered, the Iowa law calls for the use of appropriate signs to warn drivers of the lower level of maintenance. The signs, made of reflective material with black print on a yellow background, are to be posted at all access points to these roads from other public roads. Samples of the sign designed by the Iowa Department of Transportation are shown in Figure 1.

Counts are not required to use the new road classification, but they are encouraged to do so. A sample resolution was prepared in 1981 by the Iowa DOT and a committee of county engineers and supervisors, and has been made available to the counties. Most of the counties that adopted the area service B classification have used the sample resolution. Some have not used it in its entirety but have adopted it as a guideline that varies slightly in content.

The most important part of the sample resolution was the description of what constituted "minimum maintenance." The sample resolution suggested that the following elements be included:

- **Blading.** Blading or dragging will not be performed on a regular basis.
- **Snow Removal.** Snow will not be removed.
- **Signing.** Except for posting load limits on bridges, signing will not be continued or provided. (This does not include the required warning signs for service B classification.)
- **Weeds and Brush.** Mowing or spraying weeds and brush cutting will not be performed.
- **Structures.** Bridges and culverts may not be maintained to carry legal loads. Upon failure or loss of bridges and culverts, the replacement structure will be appropriate for the traffic thereon.

It should be noted that Iowa has conducted some research into low-water crossings. Some low-water crossings have already been installed where deemed appropriate to replace existing bridges. More are expected to be used.

Counties began to adopt the road classification slowly. After the first full year, no counties adopted it, although four were actively considering it for some of their roads. Three years later, only 20 counties had adopted the service B classification.
However, in the next 2 years, there was a rapid increase in the number of counties adopting the classification. By mid-1986, 44 counties classified roads as service B and another 36 were seriously considering it. Nineteen of these 36 expected to have adopted service B classification by the end of the 1986 calendar year. (There are 99 counties in Iowa.)

Most of the counties that adopted the service B classification used the sample resolution in its suggested form. However, some counties have used the form with minor differences, mostly in the description of minimum maintenance. Some of these variations are as follows:

- The allowance for the possibility of some snow removal;
- The statement that "no surfacing materials" will be applied to these roads;
- Comments to the effect that there will be no attempt to maintain the road's cross-section (crown, ditch, shoulders, or uniform width); and
- No regular inspections will be performed.

A survey of all county engineers regarding the use of the service B classification was completed in early 1986. Part of the questionnaire addressed the issue of the county's position on the use of service B classification. These results, reported earlier, indicate that over 80 percent of Iowa's counties already use service B or will be likely to use it by the end of 1987.

The following table is a summary of data that relate to the use of the service B classification in Iowa:

<table>
<thead>
<tr>
<th>Number of counties that adopted</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>the classification up to 7/1/86</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Total miles of roads in those counties</td>
<td>39,787</td>
<td></td>
</tr>
<tr>
<td>Total miles of service B roads</td>
<td>2,666</td>
<td></td>
</tr>
<tr>
<td>Miles of unsurfaced roads (service B classification)</td>
<td>2,230</td>
<td></td>
</tr>
<tr>
<td>Roads yet to be classified service B (estimated)</td>
<td>864-897</td>
<td></td>
</tr>
</tbody>
</table>

A number of reservations about service B classification were listed by the remaining 19 counties and are summarized as follows:

- Some boards of supervisors believe that it is not a good idea, politically.
- A few counties believe that the required signing is too elaborate and expensive.
- Several believe that it was of little value to them because they have few roads that they would classify as service B.
- A few counties either believe that the law does not provide any protection from tort liability or they are waiting to see the law tested in court.

Although one county has not adopted the service B classification, it has officially adopted the suggested set of standards for maintenance of the unsurfaced (dirt) roads in that county in the form of "Instructional Memoranda." No signing is indicated by the document.

Counties that have used the service B classification have, for the most part, been happy with its use so far, although some are still expressing doubt as to its effect on lessening tort claims. County engineers have received few complaints, although some citizens had expressed some concern that the new classification could lead to road closure or to lack of access, inconvenience, or increased private costs. Some engineers stated that the classification has been well received. However, a few county engineers believed that complaints would increase when landowners discover that granular surfaces will not be renewed on the service B roads.

For the most part, public hearings were not controversial, especially after the engineers pointed out that reclassification would not mean any significant changes in the way the roads would be maintained; most roads received little attention anyway. Some complaints were registered from rural mail carriers and school bus operators because they are instructed not to use service B roads on their routes, even in good weather. They complained of the apprehension evoked by the "ENTER AT YOUR OWN RISK" statement on the sign. As a result of these complaints, some roads have been changed back to the service A classification.

There have also been some differences in the way the law has been interpreted. Some engineers (and county boards of supervisors) believe that the classification applies primarily to unsurfaced roads, whereas others believe that it should apply to any infrequently used road.

Tort liability claim experience to date has been excellent. No claims have been filed and no tort liability actions are pending relating to the reclassification of any roads to service B or the standards of maintenance applied to the classification. One interesting related case has been adjudicated that involved a county that did not, at that time, use the service B classification. The judge said that the county "ought to have a service B classification and the road posted." Within a short time, the county had passed the appropriate resolution and posted the road.

The other subject addressed in the survey was the matter of cost savings. At the outset, counties adopting the service B classification did not expect any significant savings in maintenance costs. Those counties mostly formalized what had already been a practice of providing little maintenance on those roads. However, significant cost savings will occur when smaller bridges require replacement. Many will be replaced with low-water crossings, which will satisfy the anticipated use of the road. There should also be savings from the reduction in tort claims that might have been filed, assuming that any future court tests prove to be favorable.

**Minnesota**

Minnesota is the most recent state (1985) to pass minimum maintenance legislation. Minnesota's version granted a road authority (other than the state commissioner) the right to designate by resolution a road under its jurisdiction a minimum maintenance road. (The road authority could be either a county or township.) All that is required is to determine that the road segment is used only occasionally or intermittently for passenger and commercial travel. However, the designated road must not be a trunk highway and its reclassification must not result in a loss of federal aid.

Designation of minimum maintenance in Minnesota becomes effective when the proper signs are erected. The signs must conform to the commissioner's manual of uniform control devices and are to be posted at entry points to and at regular intervals along the minimum maintenance road. The design for the sign to be used on the reclassified roads in Minnesota is shown in Figure 2.

No specific maintenance standards are stated except that the minimum maintenance road may be maintained at:
"a level less than the minimum maintenance standards required for state-aid highways, roads and streets, but must be maintained at a level required to serve the occasional or intermittent traffic."

Unless changes are made to the legislation, local county and township jurisdictions will be expected to develop their own standards.

Local jurisdictions have been slow to adopt minimum maintenance resolutions, although several counties express interest. It is likely that, in Minnesota, like in Iowa, interest will develop slowly. However, favorable tort claim experience should cause interest to increase.

**SUMMARY AND CONCLUSION**

Most managers of secondary road systems are facing the same problem: costs of maintaining a relatively fixed sized network of roads are escalating and are further constrained by a slow growth rate of revenues. Managers in the five states of Washington, Kansas, Iowa, Nebraska, and Minnesota sought to minimize that problem by reducing the maintenance efforts on some of their lightly travelled roads. [This is not to suggest that secondary road managers in other states have not reduced road maintenance, only that it is now possible in these five states to make the arrangement part of public policy (5).] Later, concern for the possibility of serious accidents and the threat of tort claims caused the legislatures of these five states to create a new road classification and make reduced maintenance on these roads a standard practice.

The State of Washington pioneered these efforts by enacting legislation in 1980 that created the new primitive roads classification. Although the idea was new and had not yet been tested in the courts, legislatures in Iowa, Kansas, and Nebraska passed similar legislation over the next 3 years. Minnesota is a relative newcomer, it enacted similar legislation in 1985.

A comparison of the legislation passed by each state reveals some differences, although the laws are similar. The following table is a summary of some key differences between each state's legislation.

<table>
<thead>
<tr>
<th>Elements Compared</th>
<th>WA</th>
<th>IA</th>
<th>KS</th>
<th>NE</th>
<th>MN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special signs required?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Counties required to use signs?</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Statewide maintenance standards?</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

None of the five states requires local jurisdictions to use the classification. However, all five states require that any roads classified as such must be posted with appropriate warning or advisory signs. Other comparisons are difficult to make. Although all five states use roughly the same description for the new road classification, both the length and amount of detail in the laws vary somewhat. Only one of the five states has set standards by legislation; the rest rely on local jurisdictions to set their own.

All the legislation must be considered successful, if success is determined by a reduction in tort claims. No tort liability claims have reached the courts in any of the states. The reasons for the lack of tort claims are unclear, although adequate notice of lowered road maintenance may in itself discourage tort claims from being filed. It is also possible that the posting of signs discourages use of these roads for other than land access, which may in turn reduce the number and severity of accidents. However, much more complete research is required to prove this.

An additional note must be made regarding the signs. The signs used among the five states are dissimilar; some do not conform to the standards for warning signs provided in the Manual for Uniform Traffic Control Devices. If more widespread interest in this concept develops, a new standard should be adopted.

One major concern of most local road system managers is public reaction and acceptance. County engineers who use the service B classification in Iowa report generally favorable citizen reaction, with a few complaints, once the resolution was passed and signs were in place. It is possible that, as the practice becomes more widespread, road users will view the designation as a regular part of the road network and acceptance will increase.

Those local jurisdictions that are waiting for the concept to be tested in the courts before they enact similar legislation may have to wait a while. One cannot be totally sure of the status of such laws without the benefit of court judgments, and these do not seem to be forthcoming, at least not soon. Perhaps this should be considered good news.

It does appear that, at least in these five states, as much as 10 percent of the miles of secondary roads could eventually be reclassified as minimum maintenance roads. Savings in maintenance costs are not likely to be substantial, because most of the reclassified roads had probably not received much attention in recent years anyway. However, significant savings are possible if bridges on these roads are either not replaced or replaced with less expensive structures, such as low-water crossings.

It does appear that, in each of the five states studied, the legislation is working as expected.

**REFERENCES**

The Practical Application of Computer Highway Costing Programs

D. C. CARLSON

Highway departments sometimes use computer highway costing programs that are designed to help managers evaluate maintenance programs, establish priorities, and select construction programs. The highway costing program discussed in this paper was written for an IBM mainframe computer; supplementary programs were written for an IBM-PC. The highway costing program consists of four modules: highway maintenance costing, equipment costing, inventory, and construction activities. The use of the modules and their relation to one another are discussed to show how the development of a historical data base can help forecast trends in road and equipment maintenance; break down labor, equipment, and material costs; keep inventory; and generally help managers and workers make informed decisions and minimize administrative time. The highway costing program met the goals and objectives it was designed to meet. Although it did not significantly decrease the workload, it increased the level of responsiveness to problems. The availability of data also increased productivity and efficiency.

PROGRAM PURPOSE AND HARDWARE USED

The computer highway costing programs described in this paper are designed to meet the management needs of highway departments in evaluating maintenance programs, establishing priorities, and selecting construction programs. The primary highway costing program was written for an IBM System 34 or 36 mainframe computer. Supplementary programs were written using a dBase program on an IBM-PC.

PLANNING AND DEVELOPMENT

The initial program was developed to assist management in extracting critical and meaningful data from large data bases. The program had to be flexible enough to meet the needs of both small highway departments, with four or five managers, and larger highway departments. It also had to accommodate and interface with a variety of diverse accounting systems and it had to be compatible with state requirements of mandated reporting items.

It was also important that the information be reported at several levels of detail to meet the needs of several levels of management.

IMPLEMENTATION

The system includes 10 major reporting categories, or programs, and about 50 sub-categories, or activities, that are reported on daily time cards by field personnel. A short training session is needed to acquaint field personnel with forms and the importance of accurate reporting. Office personnel should also receive orientation on the system to ensure that they record and input information into the system accurately.

It may also be advantageous to spend some time orienting the different levels of managers on how to effectively use the reports that are available.

HIGHWAY COSTING SYSTEM DETAILS

The highway costing system is composed of the following four modules:

1. Highway maintenance costing,
2. Equipment costing,
3. Inventory, and
4. Construction activities.

HIGHWAY MAINTENANCE COSTING MODULE

The highway maintenance costing module is probably the most beneficial because it has the most data and is the most difficult...