Rebuilding Rural Roads and Bridges

Half of the rural low-volume roads in four Midwestern States need major repair. A fifth of them should be reconstructed. Townships are responsible for maintaining those roads, and financing such large-scale repairs is beyond the capabilities of most small governments. Selective maintenance may be the only way to keep all the roads open. Based on a survey of 6,000 townships in Illinois, Minnesota, Ohio, and Wisconsin.

The overall condition of rural roads and bridges is not good, according to our survey of township officials in four Midwestern States. The cost of improving local township roads and bridges to acceptable condition in Illinois, Minnesota, Ohio, and Wisconsin is estimated to exceed $2.5 billion. Farmers rely on low-volume roads and bridges, not only for basic transportation services to get to markets and to move inputs to farms, but to get to communities for services and to off-farm jobs. Others living in rural areas also rely on these roads.

The weak farm economy and more generally the lagging rural economy makes the low-volume rural road situation more troublesome. Most township officials must address the need for roadway maintenance and improvements in the face of a weakened property tax base and the loss of Federal General Revenue Sharing. Here is a description of the situation and some possible ways of dealing with it.

The responsibility for low-volume rural roads and bridges varies across States. Township governments have responsibility for over 218,000 miles of low-volume rural roads and about 30,000 connecting bridges in Illinois, Minnesota, Ohio, and Wisconsin. In these four States, both township and county governments are involved in financing and maintaining rural roads and bridges. These States are typical of those with two tiers of governmental responsibility for low-volume roads, where townships maintain local routes and counties have responsibility for maintaining arteries and connector roads. In several States (Iowa, Washington, and most Southern and Western States), county governments maintain all rural low-volume roads. In others (Virginia, West Virginia) State government provides rural road services. Some States (Kansas, Nebraska, and Missouri) have a mixed system where some county governments divide rural road responsibilities with townships, and other county governments maintain and finance all low-volume rural roads.

A comprehensive study of the township rural road systems in Illinois, Minnesota, Ohio, and Wisconsin was undertaken in 1983 and 1984 with support from the Agricultural Marketing Service and the Office of Transportation, USDA. Among other things, a mail survey of the 6,000 townships in the four States was undertaken. Information was also collected from the users of the rural roads in these States. We surveyed a random sample of farmers in each State and the Illinois agribusiness community by mall. From township road officials we collected information on road mileage, surface types, finances, management practices, conditions of roads and bridges, estimates of upgrading costs, and opinions on alternatives to improve services. Farmers and agribusinesses were asked about their business and personal use of rural township roads, as indications of service demands, and for information on the quality of road services and the most preferred revenue-raising and cutback management options to improve the fiscal and service performance of rural township roads. The survey data were matched with the 1982 Census of Governments providing an extensive rural road data set on Midwest townships in four States.
must be maintained to accommodate traffic safely and to meet agricultural transport demands are not reflected in traffic volume. For example, the weight of transported products and the configuration of farm machinery are major determinants of service demands not reflected in simple counts of the vehicles using the roads.

The Condition of the Roads—Half and Half

Township officials we surveyed indicated that about half the routes they have responsibility for would continue to meet demands and provide adequate service with only normal maintenance (fig. 2). Thus, half the rural road mileage will continue to be serviceable if current repair practices and schedules continue uninterrupted.

The rest of the roads need more attention and will require expenditures above current levels to make improvements necessary to achieve an acceptable level of service. About 30 percent of the rural township mileage was designated by local road officials as needing minor repairs above normal maintenance activities. These roads have experienced either changes in service demands or disinvestment requiring more than normal maintenance outlays for improvements. However, about 20 percent of rural township roads were identified as needing major repairs or total reconstruction. This represents approximately 44,000 miles in the four States. Roughly extrapolated to the entire Nation and all rural roads, that would represent over 400,000 miles of road that should be reconstructed or renovated.

The officials also provided information on the condition of rural bridges, with results similar to those for roads: about half the bridges need only regular maintenance, and 14 percent need some minor repairs plus normal maintenance to provide an acceptable level of service. However, one in three bridges requires complete renovation or replacement, amounting to close to 10,000 rural bridges in the four States. The study of the township rural road system in the four States also included the evaluation of roads by farmers, among the primary users of the system. Rating of road maintenance by farmers was similar to that of local road officials. Farmers indicated that 17 percent of the roads needed to be reconstructed and 23 percent needed minor repairs, in addition to normal maintenance.

The present condition of the rural road infrastructure results from the combination of normal physical aging of roads and bridges, inadequate maintenance, and heavier use from new, bigger farm machines and farm families going to off-farm jobs.

Most local rural roads were built before about 1920; most bridges, built before 1935, were designed for a 50-year life. Service demands now exceed the design capacity of a system based on conditions of the 1940’s, at best. Inflation and tax policies during the 1970’s and early
1980's eroded the real resources available to township road officials. The need for new capital investment in rural road infrastructure comes at a time when the farm sector and rural economies are going through a major restructuring.

Cost of Improvements Too Much for Most Local Governments

In response to variation in service demand, low-volume rural roads have been constructed and are maintained at different levels. Gravel surfaces on single-lane roads are most common but low- and high-grade bituminous surfaces are used in higher traffic areas. The tendency is for State highway engineers to adopt national service standards based on engineering criteria and promulgated by professional engineering associations. Local officials frequently dismiss these standards as unnecessary given the type of demand on their roads and as impractical given their budgets. The costs of bringing roads and bridges to "acceptable" condition (whether local rural roads are improved to meet engineering standards or the performance standards of local officials) are well beyond the current fiscal capacity of most rural townships.

The more than 3,000 township highway officials responding to the survey indicated that bringing all roads in the system to an acceptable performance level would cost $7,946 per mile, over six times the average spending per mile by townships. An acceptable level in the eyes of these officials is probably below the performance standards of professional engineering criteria, so the estimates in table 1 are likely less than the cost of bringing rural roads into compliance with common engineering criteria. Extending that estimate to all rural low-volume township roads in the four States yields a total estimate of $1.7 billion (in 1984 dollars). Furthermore, that money would pay only for the two-thirds of the total rural road system maintained by townships in Illinois, Minnesota, Ohio, and Wisconsin. Officials estimated that bridge renovation would cost $27,060 per bridge for a total of $800 million. Combined, rural low-volume township roads and bridges in just those four States need an estimated investment of $2.5 billion to bring all routes and structures to an acceptable condition, according to township road officials. Such an investment, or anything close to it, is way beyond the fiscal capacity of responsible rural townships.

Who Pays?

Finance systems providing revenues for rural roads vary from one State to another, but all systems follow the tradition of incorporating user-based taxes and general taxation in a pay-as-you-go manner. Debt financing is very uncommon because local road spending has been domi-

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**Table 1—$2.5 billion needed to upgrade township roads and bridges in four Midwest States**

<table>
<thead>
<tr>
<th></th>
<th>Road costs</th>
<th>Bridge costs</th>
</tr>
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<tbody>
<tr>
<td>Costs per mile</td>
<td>$7,946</td>
<td>$27,060</td>
</tr>
<tr>
<td>Number of miles</td>
<td>x217,938</td>
<td>x29,940</td>
</tr>
<tr>
<td>Total</td>
<td>$1,731,735,348</td>
<td>$810,176,400</td>
</tr>
<tr>
<td></td>
<td>$2,541,911,748</td>
<td></td>
</tr>
</tbody>
</table>

Estimated average in 1984 dollars for Illinois, Minnesota, Ohio, and Wisconsin.

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Optional Wheel Tax Available to Wisconsin Towns

Motor fuels taxes and vehicle registration fees are user-based levies most frequently collected by State governments to fund road and highway programs. Some of the receipts from these taxes are shared with local governments. Typically, the major source of local revenues available to local governments for roads and bridges is the property tax. One approach to broadening the local revenue base for roads and bridges is for States to authorize a local option motor vehicle registration fee or wheel tax. Wisconsin townships (or towns as they are more commonly called in Wisconsin), villages, and cities have had statutory authority to enact a wheel tax since 1967. Authority for a county wheel tax was added in 1980.

The wheel tax is piggybacked on the State registration fee and taxpayers pay both the local and State fee to the State. A service charge is imposed by the Wisconsin Department of Transportation to cover costs of collecting the tax and returning the receipts. As authorized, the Wisconsin wheel tax is a flat annual fee imposed by local ordinance. The amount of the tax is determined locally and is applied to all automobiles, station wagons, and smaller trucks (with gross weight of 8,000 pounds or less). Major exemptions are motorcycles, trucks over 8,000 pounds gross weight, and all trucks registered as farm vehicles. Since jurisdictions overlap, it is possible that annual town (or village) and county wheel taxes must be paid as well as the State registration fee. Owners must disclose the county and local jurisdiction where a vehicle is customarily kept when licensing their cars and trucks. This establishes liability for local wheel taxes.

Each jurisdiction enacting the wheel tax determines how the funds will be used. Wisconsin statutes do not require that funds be used only to finance road spending. Local governments are given discretion in this regard. The revenue potential of the wheel tax for any Wisconsin town depends on the number of taxable vehicles and the tax rate established. For a town with 1,000 people, a $10 tax would likely generate between $6,000 and $7,000. In 1982 the average Wisconsin township spent over $1,600 per mile on roads and maintained an average of 49 miles of rural low-volume roads. The weak revenue potential at reasonable rates may be one reason no rural Wisconsin town or county has adopted a local wheel tax. Only two medium-sized cities use the local wheel tax option, but it is available to local officials as one option to broaden the revenue base of rural Wisconsin towns and counties.
nated by outlays for maintenance. State governments typically provide a share of State motor fuels tax receipts or general State assistance to local governments with road responsibilities. General State assistance may be budgeted for roads by recipient governments. The shared motor fuels taxes are typically restricted to spending on roads. Miles of road, vehicle registrations, population, and past expenditures are common factors used in formulas to share motor fuels taxes with townships and other local governments responsible for roads. Other nonlocal sources that have supported local road budgets include Federal General Revenue Sharing, Federal bridge replacement funds, and, in some States, State bridge replacement monies. The elimination of General Revenue Sharing in 1987 will increase the reliance of townships on their own revenues to maintain road services.

An often forgotten source of major support for local rural roads in most States is the property tax. This is the major source of revenue generated locally for townships and county governments in most States and frequently gets overlooked as an important source of finance for road and highway services. Analyses of highway finance typically focus on State and Federal motor fuels taxes.

In the four Midwestern States we surveyed, local road budgets of townships and counties depend on local sources for an average of 46 percent of their receipts (fig. 3). While most of these funds come from property taxes, general State aid budgeted to roads from a local government's general fund is sometimes designated as a local source. Also because of accounting and reporting procedures, Federal revenue-sharing receipts may have also been classed as a local source. About half the road receipts of counties and townships are from State governments with about 67 percent of the State aid being shared motor fuels taxes. Shared State motor fuel taxes account for about a third of the total road and bridge receipts of township and county governments in Illinois, Minnesota, Ohio, and Wisconsin. Direct Federal assistance is less than 4 percent.

Because rural roads are public services, farmers and other road users typically press for roads that will serve their individual needs but are financed by a large broad tax base. In this way, they will maximize their individual net benefits from rural road services. The variation in rural road finance systems among States reflects, in part, this incentive. For example, virtually all the State aid to rural roads in Illinois and Ohio is shared motor fuels taxes. In Wisconsin and Minnesota, an important part of State aid supporting local rural roads is general local government aid allocated to roads by townships. Property taxes finance about half of all rural road spending in Illinois but only about 3 percent in Ohio.

Variation in finance systems makes it hard to generalize about the fiscal health of local rural road systems. But the more townships depend on property taxes for road funds, the more fiscal pressure will be felt as the poor farm economy weakens the farm property tax base. Elimination of Federal General Revenue Sharing adds to the fiscal pressure. These financial circumstances will make it virtually impossible for townships to finance from existing sources a program to maintain current spending on rural low-volume roads and allocate additional resources to improve all roads and bridges to an acceptable level.

Federal General Revenue Sharing was an important source of revenue for local rural roads, although it does not show up as direct Federal assistance because of reporting procedures. For the four survey States, townships spent an average of 85 percent of their grant on rural roads (table 2), about $133 per mile (in 1982 dollars). The Federal revenue sharing grant spent on roads averaged 20 percent of per mile expenditures. Townships will have to raise property taxes by up to 23 percent to replace the revenue sharing grant if spending on rural roads is to be maintained (an average of $1,125 was spent per mile in 1982). In rural areas with a struggling farm economy and a weakening property tax base, such an increase is not likely. Those areas can expect continued decline of road and bridge quality.

Some Alternatives

The primary concern of State and local officials is to provide rural road services considered affordable. The stress in the rural economy and the weakened property tax bases make it especially difficult to raise additional revenues from local sources. At the same time, continued deterioration in the transportation

Table 2—General Revenue Sharing (GRS) support of rural roads in four Midwest States

<table>
<thead>
<tr>
<th>State</th>
<th>GRS spent on roads</th>
<th>Percent of total GRS grant spent on roads</th>
<th>Average spending</th>
<th>GRS as percent of road spending</th>
<th>Road mileage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dol/mile</td>
<td>Percent</td>
<td>Dol/mile</td>
<td>Percent</td>
<td>Miles/township</td>
</tr>
<tr>
<td>Illinois</td>
<td>165</td>
<td>70</td>
<td>1,529</td>
<td>13</td>
<td>49</td>
</tr>
<tr>
<td>Minnesota</td>
<td>93</td>
<td>91</td>
<td>671</td>
<td>27</td>
<td>31</td>
</tr>
<tr>
<td>Ohio</td>
<td>256</td>
<td>79</td>
<td>1,801</td>
<td>22</td>
<td>30</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>132</td>
<td>92</td>
<td>1,662</td>
<td>19</td>
<td>49</td>
</tr>
<tr>
<td>4-State avg.</td>
<td>133</td>
<td>85</td>
<td>1,254</td>
<td>20</td>
<td>39</td>
</tr>
</tbody>
</table>

Mean responses from townships.
infrastructure will increase costs for industry and may inhibit the ability of farmers and others to reach jobs.

The loss of Federal General Revenue Sharing compounds the difficulties facing townships in financing rural roads and bridges. The choices facing State and local policymakers are not easy, but to take no initiative is to cause further declines in road and bridge quality with higher costs. What are some options?

More Revenues. The first alternative considered in policy discussions is usually to increase revenues. The poor financial condition of agriculture suggests property tax increases to finance higher local road spending, which usually must be approved by voters, would be burdensome. In some areas, tax rates will have to increase to offset declining farm property assessments and to replace Federal revenue sharing monies just to maintain spending at current levels.

However, if landowners could be assured that revenue from higher taxes would be spent only on improving roads, support possibly could be generated. When asked, farmers in the four Midwest States said they would be willing to pay higher taxes to improve rural roads and bridges. Respondents farming 150-299 acres indicated a willingness to pay, on average, as much as $8.62 more per month while those farming 1,000 acres or more would be willing to pay $18.20 more per month in taxes.

An increase in property taxes was, however, the least favored of all increases. Farmers preferred a higher tax on all users of State and local roads and highways. This response presumably means an increase in State motor fuels taxes with additional receipts shared with local governments. Because most States increased motor fuels tax rates in the past few years, an additional increase just for rural roads is unlikely. Allocating more of the current receipts for rural roads would meet with resistance because there would then be less money for State highways and urban streets.

States could authorize an optional local road users' tax, such as a wheel tax as a way of increasing road funds available to townships (see box). The tax could be piggybacked on State vehicle registrations with allocations back to townships. The revenue potential of a local wheel tax at reasonable rates is rather limited because of the low populations in most rural townships. For example, a $10 passenger vehicle wheel tax would raise an estimated $6,300 in a township with 1,000 people. For an average Midwest township, that represents $126 per mile, about 1.6 percent of the estimated cost of improving the average road to an acceptable level. The potential marginal revenue increase may not outweigh political resistance.

Another strategy may be for local governments to provide basic service levels with optional upgrades financed by individual landowners or through special service districts approved by voters. Since road services provide benefits that directly affect property values, there is some incentive for landowners to favor improvements. Volunteer programs could also be formed where farmers and adjoining landowners contribute services and assist in maintaining the roads serving their property. Most of the rural roads in the Midwest were constructed, improved, and maintained earlier in the century in just this manner. But liability problems associated with injuries of volunteers while working and lia-

Minimum Maintenance Programs

A cost containment or cost-reducing alternative to bringing revenues in line with service demands is to reduce road mileage. Short of closing roads, one option is to systematically reduce the level at which selected infrequently used roads are maintained. Four States that have authorized minimum maintenance programs for local governments are Iowa, Nebraska, Kansas, and Washington. In Iowa, the service level is designated as "B" and can be implemented through county government ordinance. In 1986, 43 of Iowa's 99 counties had adopted a "B" service program covering 2,534 miles of rural road (about 2.8 percent of the county rural road mileage and an average of 59 miles per county). An additional 35 counties are considering such a program.

The exact level of maintenance on service "B" roads is determined by the County Board of Supervisors in consultation with the County Engineer. Following official signing procedures, signs have to be installed at all access points to roads in a service "B" system from other public roads to warn travelers they are entering a section of road which has a lesser level of maintenance effort than other public rural low-volume roads. The sign posts in Iowa carry two signs: CAUTION MINIMUM MAINTENANCE ROAD and LEVEL "B" SERVICE ENTER AT YOUR OWN RISK.

The maintenance activities for a "B" service area typically exclude snow removal, sanding, and ice removal; regular blading, dragging, and surface repair; and mowing, weed spraying, and brush cutting. Bridges and culverts are not maintained to carry legal loads, a uniform width on the traveled portion of roads is not maintained, and no regular road and bridge inspections are conducted.

Liability is a critical issue on public roads maintained at lower levels. In Iowa, the service "B" program statute specifically exempts local governments and local officials from any liability for injury to persons or damage to vehicles or equipment, which occurs proximately as the result of the lower level of road maintenance on service "B" roads. Without the liability exemption, minimum maintenance programs would not be adopted by local jurisdictions even if authorized by the State. The ability to establish service levels reflecting demand is one additional option that should be available to local governments charged with providing rural road services. Local minimum maintenance program authority is one approach to establishing this option.

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abilities for vehicle accidents on roads maintained partially by volunteers may limit this option now.

A realignment of local school financing which would free property taxes to support services like rural roads is another possibility. Since States and the Nation are major beneficiaries of an educated population, one can argue that they, not local jurisdictions, should bear more of the burden of educational expenditures. Some shifting of financing for schools from the property tax to States would free property taxes to finance road systems, where benefits are more localized. However, by relying more on State income and sales taxes, local school districts would lose some autonomy and become more dependent on unstable revenue subject to business cycles.

Lower Costs. Without more resources, road maintenance costs will have to be contained or reduced. That can be done, but not without change. Some strategies include management and organizational changes, reducing the number of roads and bridges, and differentiating maintenance levels. All of these focus on lowering the costs of road maintenance. If resources remain constant and costs are reduced, selective reconstruction and reconditioning can be undertaken.

An often cited solution to address fiscal problems of small governments is for them to merge into larger jurisdictions presumably to capture economies of scale and reduce unit costs. With the average township in the Midwest having only 40 miles of road, this alternative certainly deserves consideration. But nearly 63 percent of the farmers surveyed thought township governments were efficient providers of rural road services. They showed relatively strong support for managing the system via the current decentralized structure.

More cooperation between townships and counties is an alternative to consolidation. Cooperative purchases of gravel and other materials, sharing of specialized equipment, and cooperation on large projects are examples of the kinds of efforts that can be considered. In addition, organized training programs for part-time local township road officials on maintenance techniques, financial management, and purchasing practices complement intergovernmental cooperation in providing road services efficiently and in keeping costs down.

Closing some roads is another option to reduce costs. Changes in agricultural technology and shifts in population may have rendered the section line mile road grids obsolete in many areas. The farmers we surveyed supported closing roads and bridges as a cost-cutting device. The respondents reported an average 8.7 miles of low-volume roads and two bridges could be closed without causing serious hardship. This represents about 20 percent of the mileage in the typical rural township.

While reducing the number of roads or bridges seems logical, State aid systems that allocate revenues on miles of road discourage this option. Also, landowners who would be directly affected by a closure and would not experience any reduction in property taxes for road services would certainly resist.

Short of closing roads completely, a program of limited or minimum maintenance on infrequently used roads is another option, sometimes referred to as a “primitive roads” program. The farmers we surveyed supported this approach. Several States (Iowa, Kansas, Nebraska, Arizona, and Washington) have made this option available to local governments.

To implement a minimum maintenance program, the liability of local jurisdictions and local road officials for accidents on roads maintained at a lower level of service has to be limited. Travelers need to be informed, with road signs, they travel these routes at their own risk. With reduced expenditures on these roads, resources can be shifted to improve other roads with greater traffic demands.

Like the road-closing option, limited service programs will be resisted by nearby landowners. Properties will receive lower transportation services, but property taxes will not be adjusted accordingly. Because roads are kept open, however, there would be no reduction in State aid based on miles of roads.

Outlook

Many local rural governments face fiscal pressures with respect to financing rural roads and bridges and can maintain current spending only with difficulty. In addition to a depressed farm economy and weakened property tax bases, townships face major adjustments from the loss of Federal General Revenue Sharing. Thus, the money available in the future will drop significantly in certain areas under current financing arrangements. This comes at a time when many rural roads are physically aging, not suited to today’s transport demands and, as a result, in need of rebuilding. Past increases in State motor fuel taxes rate limits the potential for additional increases just to target funds to rural roads.

Local rural government officials and their constituents will have to work with State governments to improve the position of rural road funding as well as find more cost-effective methods and organizational structures to meet service demands. Options depend on local economic conditions, State statutes, local government organization, and the preferences of residents for taxes and services. The challenge will be to maintain a sound investment and an adequately performing rural transportation infrastructure that is vital to agriculture, rural economies, and the country.

For Additional Reading...


Peter Korschning and Judith Gilder, eds., Interdependencies of Agriculture and Rural Communities in the 21st Century, Ames, Iowa State University Press, 1986 (chapter 8 is especially good).