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**Rural Roads And Bridges In The Midwest:  
The Growing Crisis  
And Recommendations To Deal With It**

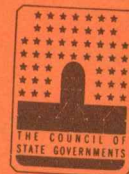
1982 FINAL REPORT

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AGRICULTURAL TRANSPORTATION TASK FORCE



**MIDWESTERN CONFERENCE**  
of the  
**COUNCIL OF STATE GOVERNMENTS**  
203 N. Wabash Avenue Suite 1200 Chicago, IL 60601



JANUARY 1983



Council of State HE149  
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RURAL ROADS AND BRIDGES IN  
THE MIDWEST: THE GROWING  
CRISIS & RECOMMENDATIONS...

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## FORWARD

Over the last few months the media has been full of discussions about the breakdown of the nation's infrastructure. Since the Midwest is the agricultural heartland of the nation, a strong transportation system is vital to bring that agricultural product to market. Unfortunately, to those of us representing agricultural states, it has become all too painfully clear that the road and bridge network in our rural communities is increasingly incapable of carrying out this important task.

It was the responsibility of the Midwestern Conference Agricultural Transportation Task Force to examine the extent of the breakdown of the region's roads and bridges, the causes for that breakdown and the possible solutions that states and local governments can use to deal with the problem. It became apparent that no single solution would be applicable to all the states within the region. Instead we have offered a variety of approaches and hope that these suggestions will be considered when policies are being made.

On behalf of the members of the Task Force, I want to extend our appreciation for the staff assistance provided by the Midwestern Office of the Council of State Governments, particularly Mr. James H. Bowhay, the Regional Director, and Mr. Jack Binkley, Field Representative.

Representative Walter J. Roorda  
Indiana House of Representatives  
Chairperson







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## EXECUTIVE SUMMARY

The Midwestern Conference Agricultural Transportation Task Force, Chaired by Representative Walter J. Roorda of Indiana, has completed its final report, "Rural Roads and Bridges in the Midwest: The Growing Crisis and Recommendations to Deal with It". The report discusses the increasing deterioration of the rural transportation infrastructure and the burden that will fall upon the state and local governments attempting to reverse this situation. The report is divided into four parts: (1) the important role of rural roads and bridges, (2) the extent of the deterioration of the infrastructure, (3) the causes for that deterioration, and (4) possible solutions.

With the abandonment of numerous rail lines, truck transportation has assumed a greater role in transporting farm produce to markets. Without usable roads and bridges those trucks would be unable to perform their vital tasks. But the essential role of trucks and the roads and bridges they travel upon would exist in large part even without line abandonment, because trucks are the initial mode of transportation, moving products off the farm to the elevators, the processing plants, the railroad terminals, etc.

Unfortunately, the rural road network, which makes up 3.3 million of the 3.9 million miles of the nation's roadways, appears increasingly incapable of performing that task. The report noted that the U.S. Department of Transportation estimates that during the time frame 1982-1995 between \$110 and \$175 billion dollars will be needed to maintain the national federal-aid highway system to the condition that existed in 1978. If all the deficiencies on the federal-aid system were eliminated, the amount needed would increase to over \$250 billion. How much of this would be required to be paid by the states would depend on the matching ratio used.

Of even greater expense to state and local governments is maintaining the off-federal-aid system. The Task Force estimates that during the same 1982-1995 time



frame, the bill to the Midwest alone could run in excess of \$100 billion. The situation becomes even more difficult when one realizes that approximately 1/3 of the nation's on-system deficient bridges and 44% of the nation's off-system deficient bridges are located in this region. The cost of eliminating this problem could be as much as \$18 billion.

After determining the extent of the deterioration of the rural transportation infrastructure and the potential burden that could fall on state and local governments, the report addressed the causes for that deterioration. The Task Force identified five basic causes for the deterioration: (1) increased weight of vehicles, (2) increased building and maintenance costs, (3) declining revenues from gasoline taxes, (4) the age of the system, and (5) the lack of a system-wide approach to planning. None of these problems are the total cause in any specific state and the proportion of the deterioration attributable to each cause will vary from state to state. Each of these causes must be considered by the policy planner as the search for solutions occurs.

Since the Task Force realized that the situation will be different within each state, it made no attempt to find a single recommendation. Instead it offered a variety of possible ideas that should be considered by the decision maker. These recommendations fell generally under four headings: financial, technological, public policy, and inter-governmental. Among the financial recommendations the Task Force looked at were increased state and federal funding, local user fees, special taxes on food with the revenues earmarked for rural roads, and allocating road funds upon the economic value of the products using the roads. The Task Force strongly believed that any increases in gasoline tax monies should be targeted for roads only, with a substantial portion guaranteed for maintenance as opposed to new construction. The Task Force also pointed out that the farmer exists in a competitive environment and has little ability to pass on cost to the consumer. Thus many of the special taxes discussed would ultimately cut into the farmers' profits. Under the technological recommendations, a number of possibilities were pointed out such as low-water bridges and standardized bridges.

In the public policy area the Task Force discussed such options as enforcing size limits on vehicles, reducing the size of the road system, reducing the standards on roads and bridges and developing more effective planning. The reduction of standards was of particular importance to the Task Force because of the tort liability that may be imposed on state and local governments. The Task Force also believed that centralized planning was necessary in order to make decisions such as reducing the size of the road network or the standards.

Under the final heading of intergovernmental relations, the Task Force suggested federal and state block grants to counties for local roads and turning a portion of the local system over to the state or federal government.





## INTRODUCTION

Within the last few years there has been a growing realization that America's agricultural strength and capability is only as strong as the transportation system that allows its produce to get to market. This is especially important when one considers that the agricultural sector supplies not only the essential foodstuffs for the nation, but also accounts for about 1/5 of the nation's export value. Increasingly, the ability of that transportation system to function effectively has been brought into question. It was for this reason that in 1978 Congress directed the administration to establish a Rural Transportation Advisory Task Force to develop recommendations in regard to a national agricultural transportation policy. The Task Force's report, published in 1980, noted that:

Transportation is not a final product, but a facilitative service. It is the life blood of commerce. In agriculture it is vital, both because of the geographic dispersion of farming, and because export of agricultural products has become essential to the nation's balance of international payments.<sup>1</sup>

This concern for the systemic well-being of the nation's transportation infrastructure has been concentrated recently on the problems associated with the deregulation of the railroad industry and the resulting reduction in access. As important as railroad abandonment is, it unfortunately has overshadowed a problem that may have far greater impact on the agricultural sector and may be far more complex to deal with. That problem is the growing deterioration of the nation's rural roads and bridges.

The problem is that this system of rural roads and bridges was, for the most part, built and designed to meet the needs and the technology of a half-century ago. Since that time, rural social and economic patterns have fundamentally changed the nature of farming, and altered the patterns of traffic on those transportation systems. Furthermore, technological innovations in farm vehicles, as well as their increasing size, have

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<sup>1</sup> Rural Transportation Advisory Task Force, Final Report, Agricultural Transportation Services: Needs, Problems, Opportunities, (Washington: January 11, 1980).



resulted in physical abuse and stress that the system was not designed for, nor can it absorb. These changing conditions have created what one might characterize as a problem of crisis proportion, especially as state governments encounter financial difficulties reducing their ability to address the problem.

### THE IMPORTANT ROLE OF THE RURAL ROADS AND BRIDGES

Without some form of rural road and bridge network the nation's agricultural economy would grind to a halt, and without a readily available supply of food our highly-centralized urban/industrialized society would simply disappear. The reason is that the rural transportation network supplies the essential link in bringing the farmers' produce to market. This essentiality was noted in a recent GAO study on grain transportation:

The farmer-owned and often operated motor vehicle initiates the movement of grain. Not only do trucks provide the initial movement of grain from farms to county elevators, they also transport significant amounts of grain to terminal markets and transfer points for transshipment by rail or barge.<sup>2</sup>

The actual impact and importance of truck transportation over those rural roads and bridges is more effectively realized when one translates the term "significant amounts" into percentages that reflect the reality of the farm-to-market traffic pattern. Nationwide, trucks accounted for the following percentages of grain movement to export ports: 12.6% wheat, 11.2% corn, 36% oats and 23.3% soybeans. Within this twelve-state region the role of truck transportation is even more pronounced. The percentage of grains arriving at Great Lakes ports by truck is as follows: 40% wheat, 73% corn, 52% oats, and 79% soybeans. In terms of regional intrastate shipments, 45% of all wheat and 75% of all corn moves by truck.<sup>3</sup>

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<sup>2</sup> U.S. General Accounting Office, U.S. Grain Transportation Network Needs System Perspective to Meet Future World Needs, CED-81-59 (Washington: General Accounting Office, April 8, 1981), 31.

<sup>3</sup> The data on grain movement was taken from a series of studies written by Mack N. Leath, Lowell D. Hill, and Stephen W. Fuller on interregional flow patterns and transportation requirements in 1977, published by the Agricultural Experiment Station, University of Illinois, January 1981.



As impressive as these figures are, they fail to reflect several important facts. First, as the GAO study noted, trucks are the first mode of transportation for all farm produce. It is the mode of transportation that the farmer uses to bring produce from the field and off the farm to the initial deposit point -- whether that is a grain elevator, a port demarcation, or the market destination itself. Second, since the advent of rail deregulation with its concomitant track abandonment, in many cases farm produce will have to be trucked greater distances to reach the initial deposit point. As a result, an increasing number of elevators within the region have had to totally restructure their method of operation, becoming "more of a storage-type operation, trucking their corn and soybeans to nearby markets that have rail service".<sup>4</sup> In fact, some new elevators are being built predicated solely on the basis of truck transportation. While this may increase the transportation cost per bushel, it does allow the elevator to continue to serve the nearby farmer. The problem is that the increased transportation costs as well as the accrued costs from storing in the local elevator cut into the farmers' profit. In an effort to avoid this loss, Professor Philip Baumel notes, "farmers will increasingly seek to reduce marketing costs by attempting to go direct to the processor, river loading elevator or to a train loading elevator."<sup>5</sup> Naturally the means the farmer will employ will be trucks. Finally, trucks are the primary means by which seed, feed and fertilizer are brought onto the farm and transported around the farm. These essential roles for motor transportation would exist whether rail deregulation occurred or not, as Professor Baumel correctly pointed out:

Trucks and rural roads are substitutes for branch lines, but rail lines cannot replace trucks and rural roads. The principal reason why rural roads and bridges must be upgraded, regardless of what happens to branch lines, is that railroads cannot haul farm inputs to the farms -- such as feed to the

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<sup>4</sup> Paul Queck, "Can an Elevator Survive Without Rail Service", Wallaces Farmer, October 11, 1980.

<sup>5</sup> Upper Midwest Report, Vol. III, No. 1, page 9.



hogs -- or haul grain to the elevators, and other farm production to the first assembly plant.<sup>6</sup>

As important as motor transportation is to the agricultural sector, in terms of moving both inputs and outputs, that mode of transportation can only operate where the rural roads and bridges can support it. This relationship, as well as the increased perception that there is a problem associated with the rural networks, was pointed out by the Rural Transportation Advisory Task Force:

While the economic well-being of agriculture requires that all types of highways be properly maintained, the public hearings and other sources made it apparent to the Task Force that rural roads and bridges in many agricultural areas have become a special problem. This is particularly true in some areas where large trucks are necessary for efficient movement of farm supplies and commodities to farms and markets.<sup>7</sup>

The picture the Rural Transportation Advisory Task Force received from state officials was clearly negative. Many witnesses pointed out that some counties could not keep up with the maintenance on their transportation network, and even if federal money was available, some local jurisdictions could not meet matching requirements. This situation was exacerbated because local property taxes were insufficient and branch line abandonment put further strain on the road system.<sup>8</sup>

While state officials were beginning to grasp the vast deterioration of the rural road and bridge system, the farmers who regularly traverse those roads also realized the extent of the problem and agreed with the Advisory Task Force's assertion. In a survey conducted by Pioneer Hi-Bred International early in 1980, 34% of the farmers asked felt that county roads and bridges were already a problem with their particular state and 17% believed it likely would become a problem in the next three to five years. Since we are

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6 IBID.

7 Rural Transportation Advisory Task Force, Final Report, 38.

8 Rural Transportation Advisory Task Force, Summary of Public Hearings on Agricultural Transportation, (Washington: January 1980), 21.

rapidly approaching the lower threshold of this three- to five-year window, it seems reasonable to say that about half the farmers interviewed believe that county roads and bridges are a problem right now. Within this region this perception was even more pronounced. In six states, Missouri, Indiana, Illinois, Ohio, Kansas and Michigan, over 60% believed the road network was an immediate problem or likely to become a problem in the near future.<sup>9</sup> These are the same farmers that use those roads and bridges daily and realize their importance.

Thus, the rural road networks are the indispensable link in the farm-to-market pattern. Even if we exclude the value of the produce moved by truck beyond the first deposit point, we are still confronted with the reality that the county roads are the means of getting a farmer's outputs and inputs to and from the farm, and on the farm itself. As vital as this system is, there is a growing perception on the part of state and local officials, as well as the farmers themselves, that the system itself is disintegrating before their very eyes. We must now attempt to ascertain the real extent of the problem in the rural road network.

## THE EXTENT OF THE PROBLEM

### A. Roads

Approximately 3.3 million of the nation's 3.9 million miles of roadway are, by definition, within rural areas. This rural system is made up of roads under state and local jurisdictions, and consists of every type of road from multi-lane asphalt and concrete interstates to single-lane rock, gravel and dirt roads. Unfortunately, little work has been done examining the total system. Part of the problem is that most of the focus is naturally on the federal-aid system roads because they are used the most. A sense of the

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<sup>9</sup> Pioneer Hi-Bred International, Inc., Improving Grain Transportation: Options by the Advisory Panel, Pioneer Poll on Grain Transportation (Des Moines, September 1980), 4.



depth of the problem, though, may be gauged from a 1970 Department of Transportation study that found that the states themselves reported that 3/5 of the arterial and collector roads and 1/2 of the local roads were deficient.<sup>10</sup>

Although it is difficult to extrapolate from such generalized data, more recent studies have tended to reaffirm these earlier negative findings. The U. S. Department of Transportation's 1981 report on The Status of the Nation's Highways: Conditions and Performance pointed out a general decline in the quality of pavement conditions on both rural and urban roads. The report concluded that "the significance of this trend is that more pavement mileage fell into the fair category . . . and that substantial amounts will reach their design life about the same time."<sup>11</sup> In practice this decline means that by 1995, assuming a continuation of expenditures at current levels, 46% of the interstate, 62% of the primary and 73% of the secondary road systems will need replacement or resurfacing.

The real question is what this general decline in the quality of pavement means to state and local government finances. The federal government has estimated that it will cost between \$110 billion and \$175 billion for all units of government during the period 1982-1995 to maintain the 1978 conditions on the rural federal-aid highway functional systems (see Chart 1).<sup>12</sup> Approximately 1/5 of that system resides within the Midwest region (see Chart 2). These estimates are made in 1982 dollars, assuming a 7% inflation

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<sup>10</sup> U.S. General Accounting Office, U.S. Grain Transportation Network Needs, 39. The arterial system are those roads that primarily serve travel of statewide or interstate significance, the collector system generally serves more localized traffic. The local system links the collector and rural destinations (e.g., the farms). U.S. Department of Transportation, Report of the Secretary of Transportation to the United States Congress, The Status of the Nation's Highways: Conditions and Performance, 97 Cong., 1st Sess., 1981, 8-9, 103.

<sup>11</sup> U.S. Department of Transportation, Status of the Nation's Highways, 79.

<sup>12</sup> IBID, TABLE 4-14, page 155; the chart used in this study is an updated version, April 1982.



rate, and are dependent on the volume of motor traffic which uses the roads and the standards of road quality selected. While it is impossible to determine with complete accuracy the full extent of the state and local obligations due to possible changes in the matching ratios, the application of present ratios brings a burden in excess of \$65 billion. These figures represent merely the cost to maintain the roads in essentially the present condition. If one were to remove all the deficiencies identified by the federal government on those functional systems during the same time period, the costs would increase to between \$255 billion and \$280 billion. Naturally, depending on the ratios used, this would increase the state and local burden.<sup>13</sup>

As monumental as these figures are, it must be realized that these figures only apply to the arterial and collector systems, excluding the local road system. While the least used in terms of vehicle miles traveled, local roads account for approximately 2.2 million miles or 69% of all rural road miles.<sup>14</sup> Furthermore, it is these local roads that are the immediate link to and from the farm, and in many cases on the farm itself. Thus, while the miles traveled on local roads may be minimal, those that are traveled are essential. Unfortunately, there is no accurate data on the present condition or the costs of repairing those 2.2 million miles of rural local roads. The most recent data in this regard comes from the 1970 federal highway needs study which indicated that about 1/2 of the rural local roads were deficient and that it would cost \$109.6 billion to upgrade them.<sup>15</sup> If that figure is converted to 1982 dollars, the bill would be more than doubled. Since the present federal contribution to the off-system roads is comparatively small, nearly all of this burden will fall on state and local governments.

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<sup>13</sup> IBID, 149.

<sup>14</sup> IBID, 103.

<sup>15</sup> U.S. Congress, House, Public Works Committee, National Highway Needs Report, 91 Cong., 2nd Sess., 1970, IV-42.



At this juncture, it should be pointed out that there are fundamental weaknesses in regard to these figures. In the first place, the figures were based on removing all the alleged deficiencies on those local roads that were characterized as deficient. In many cases the upgrading of those roads is simply not warranted. In the second place, in many cases where upgrading is warranted, the federal standards may be far in excess of the needs of that road. What this caveat focuses on is a dilemma that numerous Midwestern highway planners have pointed out. It is difficult, if not impossible, to estimate the cost of upgrading the local systems until the road standards have been specified and a determination has been made as to what roads will be maintained within the systems. In most cases these are not technical or engineering assumptions, but public policy decisions which must be made by the state and local governments.

Although the figures discussed above deal with the local road problem from the macro-view, an analysis of the data from two states may serve as a microcosm of the region. The state of Iowa has approximately 115,000 miles of road, of which over 90,000 miles are local roads that are part of the rural county road system. Another 9,000 miles are rural arterial roads and expressways that are the responsibility of the Iowa Department of Transportation. According to the IDOT, the total rural road needs for the period 1978-1997 are about \$14 billion, of which \$8.5 billion go toward the local rural county roads. This represents a 17% increase over the state's 1974 needs study.<sup>16</sup> A report done for the Indiana Department of Transportation for its 1975-1995 needs indicated total rural expenditures at \$15.3 billion, with over \$8.6 billion going to county roads.<sup>17</sup> An extrapolation of the Iowa and Indiana figures indicates that within the whole twelve-

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<sup>16</sup> Iowa Department of Transportation, Quadrennial Need Study: Report on Highways, Roads and Streets, for Study Years 1978 thru 1997, July 1979.

<sup>17</sup> Clyde Williams & Associates, 1976-1995 Indiana Highway Needs Study, Summary Report, November 1976.



state region it might cost over \$100 billion to maintain those county roads almost all of which are off-system local roads. This would be in addition to the region's share of maintaining the federal-aid system.

#### B. Bridges

While the road network makes up the vast bulk of the rural system, the other key element of that system is the rural bridge. Recently, the federal government has attempted to make a national inventory as to the condition of those bridges that are on the federal-aid system and those that are off the federal-aid system. Charts 3 and 4 point out the number of structurally deficient and functionally obsolete<sup>18</sup> bridges in each system for the states within our region. Those figures indicate that approximately 1/3 of the deficient on-system bridges and 44% of the off-system bridges are located within this twelve-state region. Newest federal estimates (Chart 5) indicate that it will cost approximately \$8 billion to meet the needs of the region's on-system bridges and over \$10 billion for the off-system needs. It should be pointed out, that just as in the case of federal road standards, there was some questioning of the appropriateness of the federal categories of structurally deficient and functionally obsolete, and that the stringency of those criteria may actually overdramatize the true extent of the problem. This is not to say that the problem is being belittled, only that it is again a question of determining the appropriate standard. Another problem with the data base is that it considers only bridges with a 20-foot span or more, while many local bridges are less.

Whether this criticism is valid or not, there are a number of facts that are important to keep in mind. First, according to the GAO, about 3/4 of all bridges were built

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<sup>18</sup> "A structurally deficient bridge is one that has been restricted to light vehicles only, closed, or requires immediate rehabilitation to keep open. A functionally obsolete bridge is identified as one whose deck geometry, load-carrying capacity, clearance, or approach road-way alignment can no longer safely service the system of which it is an integral part." U.S. General Accounting Office, U.S. Grain Transportation Network Needs, 40.



prior to 1935, and most have a 50-year life expectancy.<sup>19</sup> According to the state of Kansas, the average age of bridges within the state was over 30 years old, with over 15% already exceeding their life expectancy. The net result of this kind of information seems to indicate that the vast majority of present bridges will have to be replaced before the end of the century. The second problem is that aside from age being an enemy of bridges, many simply were not built to carry the larger-sized vehicles that farmers are using. As farms became larger and productivity increased, more farmers have gone to larger and heavier equipment. The inability of roads and bridges to handle this out-sized equipment is not only one of the weaknesses of the system, but also one of the primary causes for its deterioration. The impact of this particular issue will be discussed in greater depth in the next section.

In the final analysis, the inextricable relationship between rural roads and bridges and the well-being of the rural society is axiomatic, as the 1981 Department of Transportation report noted:

The condition of local roads and bridges is of special concern in rural areas, where the density of highway facilities and, therefore, the choice of alternate system access routes, is much lower than in urban areas. The existence of an inferior road or bridge in these areas could effectively isolate rural residents and economic activities from the rest of the country. In some cases, school buses, service vehicles, and commercial trucks are rerouted to avoid inadequate structures, inconveniencing residents, jeopardizing the security of rural communities, and adding an element of cost to goods moved over the highway system.<sup>20</sup>

### CAUSES OF THE PROBLEM

In attempting to ascertain the causes for the deterioration of the rural road network, the Agricultural Transportation Task Force identified five in number. These are not indicated in any priority for the region, and their impact will vary from state to state. These five causes are: increased weight of vehicles, increased building and

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<sup>19</sup> IBID.

<sup>20</sup> U.S. Department of Transportation, Status of the Nation's Highways, 104.



maintenance costs, declining revenues from gasoline taxes, the increasing age of the system, and the lack of a system-wide approach to planning.

As mentioned earlier, as farms became larger and farming became big business, the size of farm vehicles has increased in order to maximize productivity and cost efficiency. These imperatives have resulted in the following analysis by the GAO:

Increased farm size and productivity have led to the use of larger, more efficient machinery. Present day disks and cultivators are up to 54 feet wide. Large combines and other equipment have difficulty crossing narrow bridges and it is not uncommon for farmers to cut railings down in order to get through. Feed, fertilizer, petroleum, grain, and bulk milk trucks have all become larger. For example, the typical farm truck used to carry 100-300 bushels. Today, the average truck hauls 250-500 bushels, larger trucks haul between 600 and 800 bushels, and semi-trucks can carry as many as 1,500 bushels. Single-axle trucks weigh about 30,000 pounds fully loaded and double-axle trucks weigh up to 50,000 pounds. The larger grain trucks can weigh from 54,000-70,000 pounds when loaded.<sup>21</sup>

This movement toward larger bulk cargo vehicles has been exacerbated by the necessity to move produce over longer distances in the face of increased branch line abandonment, the introduction of low-cost unit-grain trains, and the financial reality that costs per unit-mile actually decline as produce is moved over longer distances by road. Thus, farmers are buying the largest possible cargo vehicles, which at the present time include 2,000 bushel wagons that weigh approximately 140,000 pounds.

This trend toward the use of larger vehicles has been amply documented in recent studies over the last several years. According to the Federal Highway Administration, between 1970-1975 the frequency of heavy trucks (more than 40,000 pounds) or combines on rural main roads increased over 50%.<sup>22</sup> Given the general trend in farm equipment

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<sup>21</sup> U.S. General Accounting Office, U.S. Grain Transportation Network Needs, 34; also see "Local Rural Roads and Bridges: Current and Future Problems and Alternatives", by C. Phillip Baumel and Eldo Shornhorst, unpublished paper presented at the Sixty-first Annual Meeting of the Transportation Research Board, Washington, D.C., January 20, 1982.

<sup>22</sup> U.S. Department of Transportation, Federal Highway Administration, 1975 Natural Truck Characteristic Report, (Washington: G.P.O., 1978). Also see U.S. General Accounting Office, Excessive Truck Weight: An Expensive Burden We Can No Longer Support, CED-79-94A, (Washington: G.P.O., July 16, 1979).



and truck shipping, it is probably safe to say that the frequency of this heavy equipment has more than doubled. While it is impossible to determine with accuracy how many extremely heavy vehicles exist on farms, a disproportionate amount probably resides within the region because of the importance of agriculture to the Midwest. For example, out of the 26,831 self-propelled combines purchased in 1981, nearly 2/3 ended up in this twelve-state region.<sup>23</sup> While it is true that in many cases these larger-sized pieces of equipment never leave private land, in some cases they obviously do, and the trend among farmers is toward even larger bulk carriers for farm inputs and outputs. Furthermore, it is apparent that even slight increases in load capacity have a disproportionate impact on the road network. Studies have shown that on a standard all-weather nine-ton road, the increase of the load from 18,000 to 20,000 pounds on a single-axle, or from 32,000 to 34,000 pounds on a tandem-axle, increases the pavement damage 50% and 25% respectively. Also, it is generally accepted that one fully-loaded tractor-trailer causes as much damage as 9,600 automobiles.<sup>24</sup>

This problem of increased size of farm vehicles is exacerbated by the inability of rural bridges to carry the loads. Using the GAO's benchmark of a single-axle loaded truck weighing 15 tons, the following information is most illuminating. Out of 19,800 county bridges in the state of Kansas, 1,000 had a load capacity of zero, 1,640 a load capacity between zero and 3 tons, and 7,512 between 3 and 15 tons. The resulting figures indicate that 52% of Kansas' county bridges are rated less than 15 tons load capacity. Similar figures for Illinois and Ohio indicate that 28% and 27% were rated less than 15 tons. As farmers move more and more semi-trailer trucks and heavier equipment -- such

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<sup>23</sup> Information supplied from Farm and Industrial Equipment Institute.

<sup>24</sup> Jerry E. Fruin, "Issues in Rural Road Management", Roads of Rural America, ed. by Arvin R. Bunker and T.Q. Hutchinson, U.S. Department of Agriculture; Economics, Statistics and Cooperative Service, ESCS-74, December 1979. Also see "Deterioration of the Nation's Roads Accelerates, Sparking a Race in States to Increase Fuel Tax", Wall Street Journal, October 15, 1981, 48.



as 1,000 and 2,000 bushel wagons -- across those bridges, it is anticipated that the life expectancy of those bridges will be shortened.

The second and third major causes for the deterioration of the rural road network are really two aspects of the same financial problem. On the one hand, there have been insufficient monies to maintain the system as the costs of maintenance and replacement have gone up, while on the other hand, there have been declining revenues. As with the cost of everything else, the cost of building and maintaining the nation's highways has increased over the last decade. According to the U.S. Department of Transportation, the impact of inflation over the period 1967-1979 resulted in a decline in real capital investment from \$9.8 billion yearly to \$5 billion. During the same period the cost of maintenance and operation almost tripled.<sup>25</sup> In a 1979 GAO study on the burden of state highways due to heavy truck traffic, 2/3 of the states within this region indicated that the lack of funds was, either to a very great extent or to a substantial extent, the cause for the deterioration of the state road system. Among those eight states, five considered it the most important factor.<sup>26</sup>

While state and local governments are facing ever-increasing road overhead costs, their ability to pay those rising costs is diminishing. The reason is that most state highway funds are tied directly to the revenues from the state's motor fuels tax. Since the 1973 oil embargo, Americans have been practicing fuel conservation, as well as purchasing more fuel-efficient vehicles. It has been estimated that the consumption of gasoline during 1981 was 5% less than the previous year. The result is less trips to the gas station and less money coming into state highway funds. In 1981, at least 40 states faced construction and maintenance fund shortfalls. South Dakota, for example, has been faced with a 14% decline in gasoline consumption since 1978. Based upon its 12¢ per gallon

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<sup>25</sup> U.S. Department of Transportation, Status of the Nation's Highways, 16ff.

<sup>26</sup> U.S. General Accounting Office, Excessive Truck Weight, 12-13.



tax, it would take more than two years to fulfill fiscal 1981 obligations.<sup>27</sup> Even under the most optimistic scenario developed by the Ohio Department of Transportation, it still sees a decline in highway revenues, exacerbated by inflation and increased costs of maintenance, resulting in a crisis. As the ODOT pointed out, "the Department's primary source of revenue, a fixed rate of tax on motor fuel, no longer provides a stable base to construct, effectively maintain and operate the state highway system."<sup>28</sup> Iowa expects a revenue shortfall of almost 50% of a \$20.3 billion road requirement thru 1997, but at the county level the shortfall is worse. Out of an \$8.5 billion total need requirement for the county system, there is anticipated almost a \$5 billion deficit.<sup>29</sup> While the extent of this problem will vary from state to state, the whole region is confronting it. Similar problems have confronted the federal system and have prompted the U.S. Department of Transportation to recommend a hike in the federal motor fuels tax.<sup>30</sup>

The net result of the rising costs to maintain the road network and the declining revenues to support that work is that the job simply is not going to get done without change. Almost any solution that state governments develop in dealing with rural roads must take cognizance of the financial reality.

The fourth and fifth causes for the deterioration of the rural road network are also related. They are the present age of the system that makes replacement and repair almost a crisis situation, and the total lack of a system-wide planning approach to deal

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<sup>27</sup> Jennifer Stoffel and Charles Williams, "Rough Going for Road Funds", State Government News, March 1981, 6 ff. Also see, "Deterioration of the Nation's Roads", Wall Street Journal, October 15, 1981, 40.

<sup>28</sup> Ohio Department of Transportation, Ohio State Transportation Program, Highway Financing, March 1981, 1.

<sup>29</sup> Iowa Department of Transportation, Quadrennial Need Study, 19.

<sup>30</sup> U.S. Congress, Congressional Budget Office, The Interstate Highway System: Issues and Options, June 1982; also see Rochelle L. Stanfield, "The New Federalism is Reagan's Answer to Decaying Highways, Transit Systems", National Journal, June 12, 1982 (No. 24), 1040-44.



with the problem. That a large proportion of the pavement on the federal road system will reach the end of its useful life in the near future, and that a similar situation exists in respect to the bridges, has been discussed earlier. The fact that this situation has been allowed to occur is a direct result of the lack of system-wide rationale. The reality is that for the most part the region's rural road network was designed for a horse and buggy generation.<sup>31</sup> Roads were perceived almost as a national resource, and as such they were continuously expanded and used without consideration for the future impact. Furthermore, all too often the decisions related to local road networks were based on non-objective political inputs that at times were actually systemically dysfunctional. The necessity for state and local governments to examine the total transportation network, not just the roads and bridges, from a system perspective was emphasized by both the Rural Transportation Advisory Task Force<sup>32</sup> and the GAO:

Many officials at both the state and local levels emphasized a need for improved planning, while agreeing that, to date, nobody has taken a look at how increased grain trucking, railroad abandonments, the growth of subterminals, and related developments affect highways.<sup>33</sup>

#### POSSIBLE SOLUTIONS TO THE PROBLEM

After examining and discussing a number of possible solutions to the rural road problem, the Midwestern Conference Agricultural Transportation Task Force concluded that the following list held the greatest possible advantages. Each recommendation is followed by a brief discussion of the pros and cons and possible ramifications. Generally the solutions fall under four headings: financial, technological, public policy and inter-governmental. The financial solutions are focused on means of raising the monies available to maintain the system. The technological and public policy decisions focus on

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<sup>31</sup> Fruin, "Issues in Rural Road Management", 2.

<sup>32</sup> Rural Transportation Advisory Task Force, Final Report, 11.

<sup>33</sup> U.S. General Accounting Office, U.S. Grain Transportation Network Needs, 36.



means of minimizing and rationalizing expenditures. The intergovernmental solutions examine the possibility of rearranging the present state-federal relationship, and explore the feasibility of a new role for the federal government.

Since the nature of the rural road problem varies from state to state, it is impossible for the Task Force to prescribe a solution for a state. Instead, the list offered below was written from the perspective that a state government should pick and choose from it, applying those portions which may be applicable.

## A. Financial

### 1. Increased federal and state funding.

The Pioneer Hi-Bred study of farmer perceptions showed that over half those interviewed believed that increases in federal or state funding was the answer to the road and bridge problem.<sup>34</sup> There are a number of problems associated with this recommendation, aside from the obvious reality that increased funding will probably mean increased taxes, and the trend at both the state and federal level is to minimize the size of government and to cut taxes. Foremost among these is what taxes would be raised or retargeted.

At the federal level the obvious targets are the motor fuels taxes. At the present time they generate almost \$5 billion in revenues, with over \$4 billion coming from the gasoline tax on manufacturers, and the rest from user excise taxes.<sup>35</sup> Recent legislation increased the gas tax by 5¢ with the majority of money to be used for roads and bridges. Since 85% of a state's contribution would be guaranteed to be returned, presumably a substantial portion would be focused on rural systems.

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<sup>34</sup> Baumel and Shornhorst, 14. In line with this the National Conference of State Legislatures, at its 1982 Annual Meeting, passed a resolution calling for the creation of a National Bridge Task Force and for new funding sources to be generated.

<sup>35</sup> U.S. Department of Treasury, Internal Revenue Service, Commissioners' Report, 1981, 37.

How much would end up supporting the local rural roads depends to a great extent on the administrative relationship between state and local government in regard to the passage of federal funds. The legislation does require 15% of the bridge money to be used for off-system bridges.

This new legislation is vastly different from earlier proposals, in which half the increased monies were to be turned over to the states to help them handle the assumption of social programs under the New Federalism and the remaining monies toward the completion and maintenance of the interstates. No money was targeted for other federal highway programs. This proposal drew criticism from the Highway Users Federation, which pointed out that the new highway financing responsibilities have been shifted to the states without enough money to do the job, that a new formula for fund allocations to the states needs to be developed, and that reconsideration should be given to the proposal to divert Highway Trust Fund money.<sup>36</sup>

Clearly the federal motor fuels taxes represent a vast potential resource for dealing with the rural road problem. Every 1¢ devoted to rural roads could represent in excess of \$1 billion in revenues. In regard to this issue, the Task Force strongly believed that any increases should be earmarked for the rural roads. This is in line with the recommendation of the Rural Transportation Advisory Task Force to "make appropriate changes in highway user taxes to cover expanded federal involvement, but continue to limit use of the Highway Trust Fund to highway purposes only."<sup>37</sup> The Task Force members also believed that the monies should be focused on the con-

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<sup>36</sup> Highway Users Federation, Reporter, March 1982.

<sup>37</sup> Rural Transportation Advisory Task Force, Final Report, 35.



tinued maintenance of those roads. All too often increased funding focuses on new building and ignores maintaining what is in place. The new legislation does require that 40% of the money allocated for specific systems be used for maintenance work.

In regard to increasing revenues, a number of states have introduced variable rate gasoline taxes, which are based on a percentage of the average wholesale or retail price. The assumption being that as the price of gasoline goes up, the state's revenues go with it. This, unfortunately, does not deal with the phenomenon of less gas being used through conservation, which in turn results in deficits in road funds. Obviously, states are going to have to find new sources of revenue if some readjustment is not made at the federal level, or more burden is not shifted upon local government. During the hearings of the Rural Transportation Advisory Task Force, farm groups emphasized that they were opposed to elimination of the federal farm use fuel tax exemption (about \$570 million for 1981) to help pay for rural roads, but were willing to pay higher highway user fees if other drivers paid as well. This point was reiterated by the results of the Pioneer Hi-Bred study as well.<sup>38</sup>

## **2. The development of local option taxes and user fees.**

If the burden of road construction and maintenance is shifted to local governments, they must be prepared to finance them. This represents a difficulty for county officials who are also under tremendous pressures to minimize expenditures. As mentioned earlier, both the Rural Transportation Advisory Task Force and the GAO noted that many local governments cannot

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<sup>38</sup> Rural Transportation Advisory Task Force, Summary of Public Hearings, 22; also see Baumel and Shornhorst, 14.

meet their share of highway expenditures as it is.<sup>39</sup> A 1973 report by the Senate Committee on Agriculture and Forestry noted that a county solely dependent upon an agricultural economy could not raise enough taxes to maintain its road system. The property taxes on the farms would be simply too great a burden.<sup>40</sup> While the Midwestern Conference Agricultural Transportation Task Force did not attempt to ascertain the validity of this statement, various local option taxes -- such as wheel taxes, sales taxes or excise taxes -- offer a possible way for counties to shoulder their burden. In 1979, Indiana established such an optional county vehicle tax program. Unfortunately, the initial returns are not very encouraging. Only three counties -- Dubois, Perry and Rush -- out of 91 have passed it, and there is no assessment as to its success.<sup>41</sup>

Direct user fees are another possible option. Increasingly, a number of states including Wisconsin, South Carolina, Maine and Pennsylvania are considering the possibility of using tolls to supplement their fuel taxes. Unfortunately, it is against the law for any state to put a toll on its interstate highway unless it wants to repay the federal government for the money used to build it. Thus, a change in federal legislation is needed for the states to implement a toll system.<sup>42</sup> Other user fees mentioned included ton-mile

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<sup>39</sup> IBID, 21; also see U.S. General Accounting Office, U.S. Grain Transportation Network, 45.

<sup>40</sup> U.S. General Accounting Office, U.S. Grain Transportation Network, 44. According to Baumel and Shornhorst 68% of the counties in Iowa are already at their maximum levy, 7.

<sup>41</sup> The optional excise tax of 2%-10% and a wheel tax of \$5-\$40 is the basis of this program. If the county passes the tax it can then participate in an interest-free \$10 million Distressed Road Fund.

<sup>42</sup> "More States May Collect Tolls as Road Repair Needs Mount", Wall Street Journal, June 22, 1982, 33.



taxes on trucks and requiring registration fees on farm vehicles that are used on public roads. It was pointed out during the Task Force discussion that a road user fee on farmers would probably not be able to be passed along to the consumer, but would have to be absorbed by the farmer because of the way agricultural prices are set. Furthermore, the kinds of user fees discussed above are probably impractical when applied to a rural setting. The registration fee on farm vehicles, while not examined by the Task Force, seems to present a different situation.

**3. Special tax on food with the revenues earmarked for rural roads.**

The initial reaction to such a proposal by a number of the members of the Midwestern Conference Task Force is that since food is an essential requirement of society, the burden for getting that food to the consumer should be shouldered by the consumer and not the farmer. While the logic of this position might be correct, the Task Force members agreed that the economics of the situation undermine that approach. Such a tax would have to be uniformly assessed in order to avoid interstate commerce clause violations. In the final analysis, no matter how the tax is assessed, it will probably be the farmer that pays. If an individual state placed the tax on farm produce, then the farmer of that state would be at a competitive disadvantage vis-a-vis farmers in other states; if it is a national tax, then U.S. farm produce would be at a disadvantage in the international market. In either case, the farmer would probably have to accept a lower market price in order to maintain competitive equality.

**4. Allocate state road funds based on the economic value of the product.**

The theory behind this is that too often state funds are allocated based on factors such as population or road miles traveled. Under these criteria, lightly traveled rural roads, while indispensable to the agricultural economy

of the state, will receive less than the necessary funds. By focusing on the economic value of the products moved, such imbalances may be removed.

## **B. Technological**

### **1. Standardized bridges.**

At the present time the cost of replacing a bridge runs somewhere between \$48 and \$55 per square foot. If that figure could be substantially reduced, the total governmental expenditures would be correspondingly reduced. One possible means of reducing this cost is to move toward the use of prefabricated bridges. While experimented with in a number of states, Oklahoma has undertaken a major effort in this area:

The "Bridge Program for Rural Oklahoma" is built around the concept of a bridge designed to utilize local industry resources and skills having a standard bridge deck that can be factory produced, field assembled at the local level, by local personnel.

Under this program, experimentation has been conducted with the use of prestressed concrete decks and prefabricated steel decks. A total of ten bridges have been completed, eight concrete and two steel. The average cost so far has been \$25.47 per square foot for the concrete bridges, and \$44.38 for the steel ones. It is hoped that the price can be even further lowered by mass producing the bridges and placing them in centralized inventories. Aside from the economies of production there is the ease of emplacement. One county built a prefabricated bridge using county and CETA labor, with only one man with previous experience. In order to support the standardized bridge program, Oklahoma has committed \$54 million to the county bridge program.<sup>43</sup>

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<sup>43</sup> L.A. Maciula and James Shamblin, "History and Status of Rural Bridge Replacement for Oklahoma, a Concept for Increased Productivity Using Standard Production Techniques", Center for Local Government Technology, Oklahoma State



## 2. Low-water bridges.

The use of low-water bridges or culverts is being experimented with by a number of states, including Minnesota, Iowa and Kansas. They can be made from a number of substances such as concrete or gravel. Pipes are built into the system to allow normal water flow. In periods of extreme rains, the water level may cover the bridges, thus giving them their name -- low-water bridges. Minnesota has begun to prefabricate box-shaped culverts, thus gaining economies of scale similar to those derived from standardized bridges. Because of the substantial savings that can result (one Iowa county engineer reported they cost only 1/7 the price of a regular bridge), the GAO recommended using low-water bridges as a means of minimizing road costs.<sup>44</sup> The major drawback to their use is the liability the county or the state can incur if a vehicle is washed out. This liability issue has tended to impede the placement of low-water bridges in many states and counties. A detailed study on the "Liability and Traffic Considerations for Low Water Stream Crossings", conducted by the Iowa Highway Research Board, suggests:

...that a risk analysis generally will indicate that the potential for accidents and liability will be reduced rather than increased, when a LWSC is substituted for a bridge that is structurally deficient or functionally obsolete. However, it is incumbent upon the official responsible for the LWSC to provide adequate warning of the presence of the facility if the risk of accidents and liability resulting from its use is to be kept within acceptable limits.<sup>45</sup>

With the proper markings, the state's and county's liability can be sufficiently reduced. A further discussion on the liability issue is included under

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<sup>44</sup> U.S. General Accounting Office, U.S. Grain Transportation Network, 46.

<sup>45</sup> R.L. Carstens and Richard Yun-Hao Woo, Final Report, Liability and Traffic Control Considerations for Low Water Stream Crossings, Iowa Highway Research Board, HR-218, ISU-ERI-Ames-81204, Project 1470, April 1981, 23.

the public policy discussion. It was noted that when low-water bridges are used in conjunction with dirt roads, the roads themselves are impassible because of the heavy rain, thus making it practically impossible for anyone to use the low-water bridge during periods of danger.

### C. Public Policy

#### 1. Enforce weight and size limits on vehicles.

Since the increasing size of vehicles was noted as one of the major causes of the deterioration of the roads and bridges, reducing the size and weight of those vehicles would appear to be a viable alternative. This is especially true in light of the development of 2,000-bushel wagons and the absence of limits on even larger wagons. This was a GAO recommendation and an issue which a number of states have wrestled with over the last few years.<sup>46</sup> Unfortunately, as Professor Philip Baumel of Iowa State University notes, "although this would reduce maintenance costs, it would increase costs for agriculture and would be difficult to enforce."<sup>47</sup> Farmers have moved toward larger vehicles because of cost efficiency. Furthermore, farmers have gone to larger cargo vehicles, in the face of railroad abandonment and greater transportation distances to initial deposit points. Ultimately, the enforcement of size and weight rules will be a cost burden on the farmer because he has only limited ability to raise prices in a competitive environment. The Task Force also realized that the reality of the homogeneity of the farm community mitigates enforcement efforts.

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<sup>46</sup> U.S. General Accounting Office, U.S. Grain Transportation Network, 46.

<sup>47</sup> Philip Baumel, "Rural Roads, Bridges in Need of Repair", State Government News, May 1982, 22. Farmers themselves seem to be split on the issue, Baumel and Shornhorst, 14.



## 2. Reduce the size of the road system.

While a reduction in the size of the road system seems to be an obvious means of minimizing road costs, the problem facing the planner is to determine which roads are expendable. From the point of view of the user, it is doubtful that any roads would be considered thus. Pursuant to Iowa Senate File 456, the state of Iowa has proposed transferring 10,000 miles from the secondary system into a "local access" classification:

The local access classification would apply to roads with low traffic volumes that serve primarily as property access to a local landowner rather than part of a continuous system used by the public. The jurisdiction and control over such classified routes could be with abutting landowners.<sup>48</sup>

Such an approach demands extensive planning in order to rationalize the road cuts. The Task Force avoided establishing criteria for determining the status of a particular road, because of the numerous factors that must be considered. As an equity balance, the Iowa proposal called for no county to lose more than 150 miles of road or less than 50 miles. Such an approach could be operational in most states.

A corollary to cutting back the size of the road net is a proposal made by Professor Philip Baumel. His idea is predicated on the reality that Midwestern roads are designed in one-mile rectangles giving many large property owners four-way access from their property. Baumel suggests that the state should institute a one-way-out strategy, which would guarantee the farmer only a single access from his farm.<sup>49</sup>

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<sup>48</sup> Iowa Department of Transportation, A Study to Determine Alternative Primary and Secondary Road System Sizes, January 29, 1982, ii.

<sup>49</sup> Baumel, "Rural Roads". Also see Fruin, "Issues in Rural Road Management".

**3. Reduce the standards on roads and bridges and local jurisdiction liability.**

Reducing the standards on various parts of the road network includes building low-water bridges and increasing the number of gravel and dirt roads. While agreeing that this is a strategy that state and local government should examine, the Midwestern Conference Task Force did not feel it had the expertise to deal with all the possible variation on standards. But one of the problems the Task Force did note in this regard is the county's and state's liability for maintaining lower standards. This was an area of great concern to the Task Force members.

The importance of liability has vastly increased within the last few years. A survey conducted in 1978 by the National Association of County Engineers showed that the number of claims against county governments rose 149% while the dollar amounts of these claims rose 159% between 1973 and 1977.<sup>50</sup> A 1980 American Association of State Highway Transportation Officials study indicated that, between 1978 and 1980, the dollar amount of highway-related tort actions rose from \$2.4 billion to over \$3.3 billion.<sup>51</sup> One of the primary causes of the trend is the decline of sovereign immunity.<sup>52</sup> For a county, these types of increases present the unenviable dilemma of either having to pay ever-increasing insurance premiums or possibly pay a million dollar tort claim. Aside from the potential economic impact, there are other detrimental aspects to the liability issue:

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<sup>50</sup> Rural and Urban Roads, September 1978, 32.

<sup>51</sup> American Association of State Highway and Transportation Officials, Survey on the Status of Sovereign Immunity in the States, August 1980.

<sup>52</sup> IBID.



Unjustified concern about liability can affect safety decisions by directing attention to road treatments that are assumed to be helpful to litigation efforts but may have little safety benefit . . . . Engineers are sometimes reluctant to make safety improvements at an accident site for fear that the improvement will be taken as admission that conditions were unsafe at the time of the accident, thus damaging the authority's defense position in possible later litigation . . . . It can also encourage the engineer to refrain from making certain decisions and to pass them to a superior for approval, thus reducing authority efficiency. In general, concerns about personal or agency liability can perpetuate a decision-making process that emphasizes the mechanical application of existing guidelines instead of imaginative or innovative applications. Thus, ironically, legal considerations can actually reduce road safety.<sup>53</sup>

Since liability is such an important force and potential obstacle to solving the rural road and bridge problem, the Task Force felt it was a high priority among those items to be addressed by the states. As in any negligence action, the primary elements of the action are: (1) a duty, recognized by law, to conform to a certain standard in order to protect others against risk, (2) a breach of that duty, (3) that the breach was the proximate cause, resulting in (4) an injury.<sup>54</sup> The threshold question facing highway planners is what is the duty or standard of care for which they are accountable. Although it seems quite clear that "highway departments have a duty to design, construct, and maintain highways properly and to give adequate warning of hazards or dangerous conditions to the reasonably prudent driver",<sup>55</sup> the precise nature of that standard varies from jurisdiction to jurisdiction. Despite this confusion, courts definitely consider relevant whether "the highway is designed and constructed in accordance with gener-

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<sup>53</sup> David Baldwin, "Uses of Road Liability Law in Improving Road Safety Decision-Making", The H.S.R.I. Research Review, Jan.-Feb.1980, Vol. 10, No. 4, 3.

<sup>54</sup> William Prosser, Law of Torts, 4th Edition, (St. Paul: West Publishing, 1971), 143.

<sup>55</sup> Larry Thomas, "Legal Implications of Highway Department's Failure to Comply with Design, Safety or Maintenance Guidelines", Research Results Digest, #129, October 1981, 4.



ally recognized and approved standards, policies or guidelines."<sup>56</sup> While normally these standards are those adopted by the Federal Highway Administration, other generally accepted engineering standards may become the standard in a particular case, and arguably, any effectively rationalized standard may be submitted under various jurisdictional rules. But as David Oliver, Chief Counsel for the Federal Highway Administration pointed out, "such (nationally accepted) standards and practices are only the minimal specifications . . ." and that "an action not in conformity with these standards will almost certainly result in a finding of duty breached." Furthermore, since the standards are only minimal, in many cases it may be proven that something more was required to maintain reasonable safety.<sup>57</sup>

Despite the confusion on the nature of state and county liability, there seems to be several general defenses available. One of these is generally called the discretionary exception, which distinguishes between those discretionary planning and public policy decisions that are exempt from liability, and the non-discretionary operational ones.<sup>58</sup> Another defense traditionally used is that of lack of notice. While increasingly difficult to argue, the defendant must certainly show an effective inspection procedure to mitigate the court establishing constructive notice.<sup>59</sup> A third defense -- "economic

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<sup>56</sup> IBID.

<sup>57</sup> David Oliver, "Public Liability", paper presented at the 20th Annual Management and Research Conference, National Association of County Engineers, Orlando, Florida, February 29, 1980, 3.

<sup>58</sup> James J. Stapleton, "Tort Liability as a Safety Incentive", paper presented at the American Society of Civil Engineers' Conference on Implementing Highway Safety Improvements, March 14, 1980, San Diego, California, 9.

<sup>59</sup> Michael Fitas, "The President's Message", Ohio County Engineer, August 1980, 7.



feasibility" -- was rejected in a 1978 Montana case, Modrell vs. State.<sup>60</sup> If it becomes an accepted precedent, then the lack of funds to undertake repair or construction work will have no impact on the state's or county's liability. Given the declining funds available for road work, the Modrell decision may prove to have unfortunate consequences.

Given the real problem of state and county liability, the Task Force felt that state legislation should attempt to deal with the matter. The California and New Jersey design immunity statutes offer possible solutions.<sup>61</sup> Furthermore, it felt that federal standards need to be reevaluated.

#### **4. More effective planning at the state and county levels.**

The generation of quality needs assessments are the essential foundation for implementing any of the other possible solutions. More and more states are developing their own analytical system to determine effectively the priorities in repair work and down-sizing the system. Minnesota has been highly successful in establishing its priorities in regard to its bridge program. Iowa is embarking on the use of a new computerized program entitled "Estimating Long Range Highway Improvement Costs". It is designed to allow the planner to examine the system using different engineering standards. Previously this program had been only used in Idaho, and it was only applied to the interstate. In Iowa it will be applied to the whole road network.

The Task Force believes that such centralized planning is necessary, and for it to be optimized there must be effective coordination with local government.

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<sup>60</sup> 587 P.2nd 405 (1978).

<sup>61</sup> California Government Code, 830.6.; New Jersey Stat. Ann., Title 59, 4-6.

## **D. Intergovernmental**

### **1. Block grants to counties.**

In many of the aspects of the rural road and bridge problem, the Task Force felt that those closest to the scene were best able to establish priorities about implementing some of the technological and public policy recommendations discussed above. The problem facing the counties, as discussed earlier, was the inability to fund many of these programs. For this reason federal or state block grants to counties appealed as an attractive alternative. By using the block grant approach, the counties would not be confronted with the necessity to use federal standards (if the liability issue can be overcome), which many state and county planners feel are excessive. The Task Force did point out that if this approach was undertaken, it would necessitate effective county planning in order to mitigate local abuses. Furthermore, block grants would not be burdening the counties with the administrative aspects of direct funding for rural roads and bridges.<sup>62</sup>

### **2. Turning a portion of the local system over to the federal or state government.**

This particular recommendation was discussed only in general terms because of the almost unlimited forms it could take and the fact that a turn-back is a part of the administration's New Federalism proposal. It was one of the major recommendations of the GAO, which was similarly couched in general terms, "placing additional local mileage under state jurisdiction or on the federal aid system".<sup>63</sup> Ironically this was the reverse of the Rural Transportation Advisory Task Force's recommendations. Although that

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<sup>62</sup> Rural Transportation Advisory Task Force, Final Report, 35.

<sup>63</sup> U.S. General Accounting Office, U.S. Grain Transportation Network, 46.



group recommended expanding "the scope of federal involvement on interstate and other major highways to include maintenance", the Rural Transportation Advisory Task Force advocated reducing the number of miles "directly eligible for federal assistance". The assumption was that it would concentrate federal dollars, remove some state burdens and eliminate the burden of meeting federal standards by the counties.<sup>64</sup> While the mechanics of such a transfer of responsibility needs to be explored, there seems to be a broad consensus that some type of transfer will be beneficial in attempting to deal with the road and bridge problem.<sup>65</sup>

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<sup>64</sup> Rural Transportation Advisory Task Force, Final Report, 35.

<sup>65</sup> For a discussion of some of the options under consideration see Stanfield, "The New Federalism", and the Congressional Budget Office's study, The Interstate Highway System.

CHART #1

**1982-1995 Capital Investments to Maintain U.S. Highway Conditions as in  
1978 by Functional Class**  
(In billions of 1982 dollars)

**URBAN**

Functional System

<u>Minimum Condition Standards</u>	<u>VMT* Growth Per Year</u>	<u>Inter-state</u>	<u>Other Freeways and Expressways</u>	<u>Other Principal Arterials</u>	<u>Minor Arterials</u>	<u>Collectors</u>	<u>Total</u>
Current	1.2%	9.86	6.25	19.75	23.62	26.76	86.20
Current	2.8%	10.39	6.70	20.74	24.23	27.03	89.09
Relaxed Rural	1.2%	9.86	6.25	19.75	23.62	26.72	86.20
Relaxed Rural	2.8%	10.39	6.70	20.74	24.23	27.03	89.09

**RURAL**

Functional System

<u>Minimum Condition Standards</u>	<u>Inter-state</u>	<u>Other Principal Arterials</u>	<u>Minor Arterials</u>	<u>Major Collectors</u>	<u>Minor Collectors</u>	<u>Total</u>
Current	8.70	18.55	20.55	64.51	38.31	150.62
Current	12.46	23.90	30.03	68.92	39.55	174.86
Relaxed Rural	6.76	15.89	13.84	42.72	31.12	110.33
Relaxed Rural	7.82	17.81	20.86	46.36	32.48	125.33

\*Vehicle miles traveled.

**TOTAL URBAN AND RURAL**

<u>Minimum Condition Standards</u>	<u>VMT Growth Per Year</u>	<u>Urban</u>	<u>Rural</u>	<u>Total</u>	<u>Billion \$/Year</u>
Current	1.2%	86.2	150.6	236.8	18.2
Current	2.8%	89.1	174.9	264.0	20.3
Relaxed Rural	1.2%	86.2	110.3	196.5	15.1
Relaxed Rural	2.8%	89.1	125.3	214.4	16.5

**Source:** Federal Highway Administration



CHART #2

**Total Road and Street Mileage: 1980**  
Classified by Jurisdiction

	Rural mileage		
	Under state control	Under local control	Under federal control
Illinois* .....	14,192	92,053	304
Indiana* .....	9,854	63,752	1
Iowa.....	9,282	94,744	116
Kansas.....	10,439	116,961	21
Michigan.....	7,739	84,240	--
Minnesota*.....	12,072	103,913	1,689
Missouri* .....	31,328	72,568	738
Nebraska.....	10,092	81,937	113
North Dakota.....	6,993	76,789	635
Ohio*.....	16,218	65,554	27
South Dakota .....	8,925	61,148	1,651
Wisconsin .....	10,752	83,403	64
United States Total.....	701,846	2,269,770	262,010

**Source:** Book of the States 1982-83, Council of State Governments, page 471.

\* Incomplete 1980 data submitted, area data used for totals and available data from previous submittals included and factored to 1980 levels.

CHART #3

**NUMBER OF DEFICIENT BRIDGES BY MIDWESTERN STATE**  
(On Federal-Aid System)

	<u>Number Of Bridges In Inventory</u>	<u>Structurally Deficient</u>	<u>Functionally Obsolete</u>	<u>Number Of Deficient Bridges</u>
Illinois .....	10,051	1,133	952	2,085
Indiana .....	6,588	846	1,859	2,705
Iowa .....	6,575	715	1,426	2,141
Kansas .....	10,245	1,008	2,175	3,183
Michigan .....	5,550	614	343	957
Minnesota .....	5,002	470	601	1,071
Missouri .....	8,372	413	2,824	3,237
Nebraska .....	5,130	423	1,242	1,665
North Dakota .....	1,644	198	317	515
Ohio .....	12,023	852	316	1,168
South Dakota .....	2,797	167	221	388
Wisconsin .....	<u>6,025</u>	<u>1,474</u>	<u>793</u>	<u>2,267</u>
United States Total.....	259,950 =====	27,354 =====	40,342 =====	67,696 =====

CHART #4

**NUMBER OF DEFICIENT BRIDGES BY MIDWESTERN STATE**  
(Off Federal-Aid System)

	<u>Number Of Bridges In Inventory (96% Complete)</u>	<u>Structurally Deficient</u>	<u>Functionally Obsolete</u>	<u>Number Of Deficient Bridges</u>
Illinois .....	14,622	4,367	2,440	6,807
Indiana .....	10,937	3,689	4,320	8,009
Iowa .....	18,981	4,911	6,232	11,143
Kansas .....	14,377	5,561	5,820	11,381
Michigan .....	4,448	2,250	361	2,611
Minnesota .....	7,828	1,249	2,068	3,317
Missouri .....	15,150	2,557	10,740	13,297
Nebraska .....	11,547	5,016	4,247	9,263
North Dakota .....	3,809	1,402	1,421	2,823
Ohio .....	16,745	2,185	1,873	4,058
South Dakota .....	3,513	681	1,717	2,398
Wisconsin .....	<u>6,521</u>	<u>2,817</u>	<u>1,511</u>	<u>4,328</u>
United States Total.....	297,566 =====	99,301 =====	81,530 =====	180,831 =====

**Source:** Federal Highway Administration, Highway Bridge Replacement and Rehabilitation Program, July 1982.

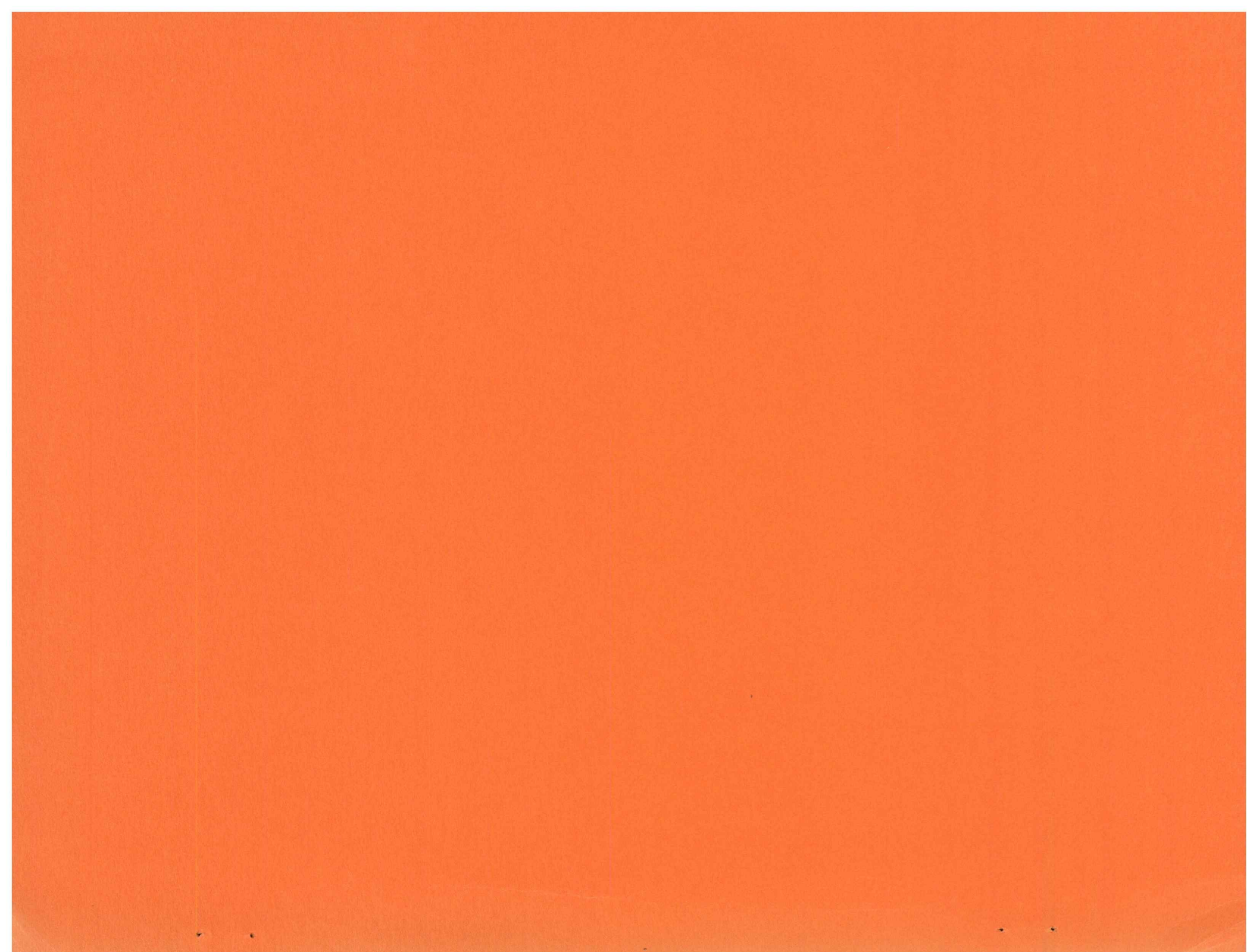


CHART #5

1981 BRIDGE REPLACEMENT COST ESTIMATES BY SYSTEM

<u>System</u>	<u>\$ Billions</u>	<u>Number of Bridges</u>
Interstate	\$ 1.7	3,144
Primary	9.9	19,957
Secondary	6.7	30,159
Urban	6.3	7,949
Off-system	<u>23.0</u>	<u>172,310</u>
Total	\$47.6	233,519
	=====	=====

**Source:** Federal Highway Administration, Highway Bridge Replacement and Rehabilitation Program.





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