

A photograph of a red and white dump truck in traffic on a road with potholes. The truck is in the center, moving towards the viewer. The road surface is heavily damaged with numerous potholes. Other cars are visible in the background, and trees line the street.

SUPPLEMENTAL REPORT NO. 3

**Additional Examples of
Efficiencies and Effectiveness Measures
Taken by Road Agencies in Michigan**

**"Those Not Aware of What Is Happening
May Assume Nothing Is Happening"**

Prepared for The Transportation Funding Task Force
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Table of Contents

Introduction	1
Part I. Agency Cooperation	2
A. Road Commissions: An early Example of Regionalism and Consolidation of Services	2
B. Asset Management	2
C. Purchasing Consortiums	3
1. MiDEAL	3
2. MITN	3
3. ICC	3
D. Cooperative Agreements to Maintain Traffic Signals	4
E. Inter-Agency Cooperation to Introduce Advanced Technology	4
F. Inter-Agency Cooperation on Individual Road Projects	5
G. Sharing the Services of Expert Consultants	7
H. MDOT Partnering with Meijer’s for Park-and-Ride Lots	7
I. Sharing Equipment and Labor and Working Together to Purchase Materials and Equipment	7
J. Regional Cooperation	9
1. Metropolitan Planning Organizations (MPOs)	9
2. Southeast Michigan Council of Governments (SEMCOG)	10
3. Pavement Management: Grand Valley Metro Council	10
K. Contracted Winter and Summer Road Maintenance	11
L. Adjacent Road Commissions Swapping Snow Routes	11
M. Cooperative Agreements with Industries that are Heavy Road Users	12
Part II. Operational Efficiencies	13
A. Flexible Work Hours	13
B. Altered Shift Timing	13
C. Utilization of Temporary Winter Workers	13
D. Shoulder Paving	13
E. Pothole Patching with an “Autopatching” Machine	14
F. Switching from Graders to Snowplows at the Beginning of Snowstorms	14
G. Additional Salt Storage Facilities	14

H. Liquid Salt Brine for Winter Maintenance	14
I. Use Pulverized Asphalt on Gravel Roads	14
J. Berm Removal on Gravel Roads	15
K. Cut Grooves in Tires to Eliminate the Need for Chains	15
L. Eliminated Secretarial Staff	15
M. Superintendents Plowing Snow When Needed	15
N. Chip-Seal Program	16
Part III. Equipment Efficiencies	17
A. Apply Thermoplastic Pre-Cut Pavement Markings by In-House Crews	17
B. Perform Own Asphalt Recycling	17
C. Extend Brine Sprayers on Trucks	17
D. Add Front-Mount Rollers	17
E. Switch to All-Wheel Drive Graders	18
Part IV. Technology	19
A. Using Technology to Enhance Road System Efficiency	19
B. Geographic Information Systems (GIS)	19
C. Global Positioning Systems (GPS)	20
D. Roadview	20
E. Wireless Traffic Signal Communications	20
F. Electronic Bridge Monitoring	20
G. Enterprise Software Systems	21
H. Equipping Trucks to “Multi-Task”	21
Summary	22

Introduction

Michigan's road agencies, from the Michigan Department of Transportation (MDOT), to the smallest county road commissions and village departments of public works, have been under-funded for decades. As a result, they have focused on effectiveness and efficiencies for a long time. However, as was noted in the Highway, Road and Bridge Subcommittee's *Supplemental Report No. 2*, **those who are not aware of what is happening, may assume nothing is happening** – and that has often been the case with regard to the efficiency and effectiveness achievements of Michigan's road agencies. How could legislators, the general public or, for that matter, most people outside of these agencies, know that these efforts were taking place? **The constant effort to improve efficiencies and effectiveness is not something most road agencies publicize – it's just a normal part of doing business.** However, because these agencies have been grossly under-funded and cannot accomplish all that is expected of them, it is assumed by many that they are inefficient. This report takes a more in-depth look at some of the steps already taken by these agencies, adding to the list of efficiency and effectiveness steps reported in *Supplemental Report No. 2*.

While the listings included in this report and the previous report of efficiencies and effectiveness measures already enacted are extensive, they do not represent an exhaustive listing. These are only the measures that could be identified in the brief time allowed for the compilation of this report or were considered representative of many other similar activities. Given that in Michigan there are more than 600 public agencies with road jurisdiction, many of which are so strapped for cash that they can barely keep the lights on (let alone spend time documenting past steps taken to improve efficiency and effectiveness), the collection of this data has been a daunting challenge.

Some of the examples cited have obviously had a profound impact on the operation of road agencies in the state. Others may appear to have relatively minimal impacts. However, the diversity and extent of the examples provided demonstrate that the agencies responsible for Michigan's roads are continually reviewing the way they do business in an effort to find ways to improve efficiency and enhance effectiveness.

For those not yet convinced that Michigan's road agencies are facing a dire situation, or that this situation is already have a dramatic impact on the private sector, consider the following. A recent edition of the television show, "Extreme Makeover, Home Edition," featured home-renovation work performed by a North Carolina contractor. During the program, it was revealed that the contractor's company previously had been based in Michigan but had been forced to relocate to North Carolina because of the poor economy in its home state. Sadly, the same thing is happening to Michigan road contractors. As was reported by a representative of one asphalt-paving company at the Oct. 13 meeting of the Transportation Funding Task Force (TF2), these contractors are losing employees to other states because there is no longer enough work in Michigan. Those skilled workers are not likely to come back to Michigan. Other companies are moving lock, stock and barrel to other states, having given up on the likelihood of Michigan ever dedicating the level of resources to its roads that others states, including North Carolina, have for years.

Part I

Agency Cooperation

The idea of governmental agencies joining forces to reduce costs and or improve the effectiveness of operations has been promoted by many Michigan leaders of late. It is not, however, a new concept. In fact, many transportation agencies in the state have joined forces to enhance efficiencies and effectiveness for many years. This section will document some examples of this.

A. Road Commissions: An Early Example of Regionalism and Consolidation of Services

Michigan's county road commissions are one of the earliest examples of governmental cooperation to create a regional approach to providing services.

In the early 20th century, just as the automobile was gaining popularity, there was a large push in Michigan to improve and expand the state's road system. At the time, the system was primarily unpaved.

One of the greatest challenges at the time was maintaining rural roads, a responsibility that fell to townships. Most of the townships were ill-equipped to handle the task. In an effort to take advantage of economies of scale, the townships came together to create countywide agencies to assume this responsibility. These agencies were known as county road commissions, and were even originally governed by boards made up of township supervisors.

While road commissions have evolved significantly over the decades, today they still provide the countywide economies of scale and consolidation of services for which they were created, providing services more efficiently and for a lesser cost than could individual townships.

B. Asset Management

While many of the benefits of Michigan's Asset Management program were discussed in *HRB Supplemental Report No. 2*, one aspect not covered was the degree of intergovernmental cooperation that was required by and resulted from the asset management effort.

In order to provide a uniform data set, collection methods, etc., which are required to have a credible asset management program, extensive cooperation was required between governments at all levels. In fact, this level of cooperation was historic in nature and unprecedented in recent times in Michigan. Never before have so many road agencies, municipalities, metropolitan planning organizations and MDOT worked so closely together for such an extended time to create a universally applicable system that is shared by all agencies with road jurisdiction in the state.

The Michigan Asset Management program is truly the greatest example of road-related intergovernmental cooperation in existence in the state.

C. Purchasing Consortia

One of the ways agencies with road responsibilities have worked to become more efficient is by forming purchasing consortia. This is done in order to use economies of scale to get reduced or quantity pricing. Three examples of this are MiDEAL, MITN and ICC.

1. MiDEAL

The Michigan Delivering Extended Agreements Locally (MiDEAL) partnership allows Michigan local units of government to benefit from the state's negotiating and purchasing power by permitting them to purchase through the state's contracts on the same terms and conditions and at the same prices as state government. Local governments benefit not only from the reduced costs of goods and services, but also from indirect savings related to writing specifications, researching industries, processing invitations to bid, recruiting a diverse pool of potential suppliers and awarding contracts.

MiDEAL is authorized by Michigan legislation and has been in existence since 1975. Membership is open to any city, village, county, township, school district, intermediate school district, nonprofit hospital, institution of higher learning or community or junior college in Michigan. Some of the most frequently used contracts include office supplies, janitorial products, carpet, pharmaceuticals, disposable paper, lawn and garden equipment, cell phone equipment and service, fuel oil, gasoline, tires, vehicles, hardware, tools, computers, furniture and road salt.

2. MITN

The Michigan Intergovernmental Trade Network (MITN) is a group of agencies that joined forces to create a regional system to notify companies of new bid opportunities. As of this writing, 42 governmental or quasi-governmental agencies are members with an additional nine agencies being surplus-auction-only members.

3. ICC

In a similar manner, 22 public agencies in Southeastern Michigan with road responsibilities joined together to form a consortium to purchase road salt. Called the Ice Control Cooperative (ICC), this public/private partnership was successful in receiving a substantial price reduction on road salt through volume purchases. The partnership was made up of the cities of Auburn Hills, Berkley, Clawson, Eastpointe, Farmington Hills, Lathrup Village, Livonia, Pontiac, Riverview, Rochester Hills, Romulus, Roseville, Royal Oak, Southfield, St. Clair Shores, Walled Lake, Warren and Westland as well as the

Huron Clinton Metroparks, the Road Commission of Macomb County, the Road Commission for Oakland County and Southfield Public schools.

D. Cooperative Agreements to Maintain Traffic Signals

Another example in which road agencies are working together to eliminate redundancy and create efficiencies is in the area of traffic signal management. Traffic signals require the highly specialized skills of engineers and electricians to ensure they operate optimally and correctly, and that repairs are made properly and in a timely manner.

Because there are often state (MDOT), county (road commission) and city or village signals in close proximity, in some cases it would be redundant for each of these agencies to have specialized staff and equipment (such as expensive “boom” trucks) dedicated to maintaining the signals. That’s why, in places like Kent and Oakland counties, the various agencies work together, so that only one agency provides this service.

In the case of Kent County, the City of Grand Rapids maintains all the city’s traffic signals as well as all the MDOT and Kent County Road Commission signals in the county, as well as some county and state signals in adjacent Ottawa County. In Oakland County, the Road Commission for Oakland County maintains not only all of its own signals, but all MDOT signals in the county and most of the signals owned by cities and villages in the county (all of the signals owned by 24 of the 29 municipalities that have signals).

In Eaton County, the county road commission contracts with the local electrical company, which already has the equipment required (boom trucks, etc.) to maintain its traffic signals.

In each of these examples, great economies of scale are achieved by allowing all the signal maintenance expertise and highly specialized equipment to reside with a single agency.

E. Inter-Agency Cooperation to Introduce Advanced Technology

As noted in the HRB *Supplemental Report No. 2*, there is a unique partnership in Southeast Michigan, in which the four largest local road agencies in the state, as well as the regional public transportation service, have joined forces to introduce cutting-edge winter road maintenance fleet-management technology. While *Supplemental Report No. 2* focused on the technological advances implemented by this partnership, the cooperative nature of the agreement is critical as well.

The partnership is known as the Southeastern Michigan Snow and Ice Management project (SEMSIM). It was the first project of its kind in the nation in which multiple agencies joined forces to collectively employ the latest technologies to

improve winter road maintenance operations and public safety. The SEMSIM partner agencies are: the Road Commission for Oakland County, the Wayne County Department of Public Services, the Road Commission of Macomb County, the City of Detroit Department of Public Works and the Southeast Michigan Authority for Regional Transportation (SMART).

One of the major factors that made this project so unique is the unprecedented inter-jurisdictional cooperation involved. These agencies had never before cooperated on this level, and the project has resulted in greatly improved communications between the partner agencies and led to many instances of additional cooperation unrelated to SEMSIM. The end result is that through SEMSIM, as well as the additional level of inter-agency cooperation, there is now improved effectiveness and efficiency in the delivery of winter maintenance service across all partner agencies.

F. Inter-Agency Cooperation on Individual Road Projects

In addition to the purchasing consortiums and the cooperation involved in asset management and in traffic signal maintenance in some counties, another of the most prominent ways road agencies work together is in the efforts to bring about countless individual road projects. Without this cooperation, it is doubtful that many of these projects could have been accomplished.

Here are just a few specific examples demonstrating how this coordination often works:

- Reconstruction of Main Street Bridge, Village of Dexter and Scio Township, Washtenaw County
The Village of Dexter partnered with the Washtenaw County Road Commission and Scio Township in the reconstruction of the Main Street Bridge in Scio and the removal of the Mill Creek Dam. Funding for this project was acquired through the Village of Dexter, Scio Township, the Washtenaw County Road Commission and the Michigan Critical Bridge Fund. Along with paying a share of the replacement cost of the bridge, the Village of Dexter covered the entire cost of removing the dam under the bridge to restore the natural flow of water on Mill Creek. The reconstruction of the Main Street Bridge and removal of the Mill Creek Dam was vital to regional transportation. The existing bridge was 100 years old and deteriorated to a point that the weight restriction was 7 tons. The dam was structurally connected to the bridge, so replacing the bridge without removing the dam would have been difficult.
- Glendale Road Repair, Redford Township, Wayne County
Through a \$2 million grant from the Michigan Transportation & Economic Development Fund (TEDF), Redford Township was able to partner with Wayne County to repair one mile of Glendale Road between Telegraph & Beech Daly roads. The repair was necessary due to the deterioration caused by the industrial traffic along the road. The TEDF grant covered the cost of

construction and inspection done by the county, while the township provided the design work.

- Rauch Road Repair, Monroe County
To cover the costs of repairing a two-mile stretch of road that separates the townships of Ida and Bedford, the two communities decided to collaborate and share the costs of repair. The Monroe County Road Commission is responsible for the actual task of repairing the road, but Bedford and Ida have decided to collaborate and split two thirds of the cost.
- Bridge Repair, Macomb County
Bonds issued by the county general government, along with funding from the Road Commission, some federal dollars and contributions from larger municipalities within the county have paid for a large-scale project to rebuild and enhance many bridges in the county. Many of the bridges were deteriorating and needed major improvements. These projects would have been impossible to undertake without the participation of all involved parties. Most of the projects have been completed, and the remaining bridges will be repaired in the near future.
- Inkster Road Right of Way, Southfield and Farmington Hills, Oakland County
Inkster Road between Eight Mile and Shiawassee roads is the border between Southfield and Farmington Hills. It was a two-lane road with gravel shoulders, open ditches and no sidewalks. The communities, both wishing to improve the road, each budgeted \$500,000 to resurface the road, add a center left-turn lane and improve drainage and road aesthetics. Neither community could have completed the project on its own.
- Walton Boulevard widening/bridge reconstruction, Oakland County
This project, that involved widening the two-lane road to a five-lane concrete road, also included the reconstruction of the Walton Boulevard bridge over I-75, replacing the existing two-lane bridge with a five-lane bridge. The project represented the first time ever that a bridge under MDOT's jurisdiction was replaced by a local agency as part of a local road project. Both MDOT and the Road Commission for Oakland County approached the project as a true partnership.

G. Sharing the Services of Expert Consultants

Another way that local road agencies and communities work together is through the sharing of experts' services. Here's an example:

Oak Park, Berkley, Huntington Woods and Ferndale, Oakland County

In 2008, Oak Park was involved in two major construction projects with other communities: Eleven Mile Road (Berkley and Huntington Woods) and Nine Mile Road (Ferndale). None of the three communities employs a full-time engineer. Each community paid for its portion of the project, but rather than contracting with a private consultant, the communities all used the Oak Park engineer. He was viewed as a project manager for both projects by all communities involved. Compensation for his oversight will be included in the cost of the construction project. This has reduced costs for all four communities.

H. MDOT Partnering with Meijer's for Park-and-Ride Lots

The Michigan Department of Transportation (MDOT) has taken the lead in one this aspect of creating public/private partnerships: In October of 2008, MDOT announced an agreement with the Meijer chain of stores, in which Meijer will allow MDOT to use sections of its parking lots at six stores as new, additional park-and-ride lots. The agreement allows MDOT to significantly expand its park and ride program at no cost to the agency. Expanding this program was identified as a major goal for increasing the opportunity for motorists to carpool, and thereby reduce the number of single-occupant vehicles on the roads.

Similar agreements could be reached with additional Meijer stores and other chains in coming months and years.

I. Sharing Equipment and Labor and Working Together to Purchase Materials and Equipment

As noted in *Supplemental Report No. 2*, the majority of road commissions and many cities and villages in Michigan share equipment with other agencies when needed or join forces with other agencies to purchase materials at better rates, to purchase equipment that the agencies individually could not afford or even to share the maintenance of equipment. In *Supplemental Report No. 2*, however, these cooperative efforts were simply alluded to. Because these cooperative efforts are so pervasive at Michigan road agencies, it was determined that a broad range of examples should be included in this report. Here are examples:

- Wexford and Missaukee county road commissions jointly purchase crack filler
The Wexford and Missaukee county road commissions joined forces in 2007 to jointly purchase a crack-filling machine, a piece of equipment that neither could have afforded on its own.

- Wexford County Road Commission joins cities within the county to collectively purchase materials
 The Wexford County Road Commission has joined with the cities of Cadillac, Mesick, Manton, Harrietta and Buckley to collectively purchase patching material, gravel, snowplow “blades” and salt. All parties are able to get a better price on the materials due to the economies of scale created.
- Lenawee and Washtenaw county road commissions work together on bridge
 The Lenawee County Road Commission recently provided a work crew, crane and crane operator to assist the Washtenaw County Road Commission in the construction of a timber bridge.
- Presque Isle, Alpena and Cheboygan road commissions share equipment and labor
 The Presque Isle, Alpena and Cheboygan county road commissions, over the past several years, have shared equipment and labor, including for projects such as seal coating of roads. This partnership has saved each agency money, and ensured that each is able to complete work that it could not do on its own.
- Presque Isle, Alpena, Alcona, Cheboygan, Emmet and Iosco county road commissions collectively purchase materials
 The road commissions in Presque Isle, Alpena, Alcona, Cheboygan, Emmet and Iosco counties have, for several years, been collectively purchasing asphalt emulsion. This allows the agencies to get “truck-load” pricing and split the shipping costs. The agencies have also worked together to collectively purchase other materials, such as culverts and sign posts.
- Osceola, Missaukee, Wexford, Lake and Manistee county road commissions trade equipment
 The road commissions of Osceola, Massaukee, Wexford, Lake and Manistee counties share equipment as needed to allow each agency to complete work. The agencies charge each other a set rate, depending on the piece of equipment shared. Shared equipment includes rollers, force-feed loaders and v-bottom trailers.
- Contracted Fleet Maintenance: Troy, Oakland County
 The City of Troy provides fleet maintenance services to outside entities. It provides all fleet maintenance for the cities of Birmingham and Clawson, and some for the city of Madison Heights and the Troy School District. This raises revenue for Troy, because it receives money from other entities, and saves money for the entities that pay for the services, because they are not providing their own mechanics, service facilities, etc.
- Sharing of Equipment and Personnel: Utica, Sterling Heights and Shelby Township, Macomb County
 The cities of Utica and Sterling Heights and Shelby Township share equipment, personnel, etc. from their departments of public works. This saves them all money by not having to rent or purchase equipment that they need to perform their duties. Each community benefits from this tradeoff because each loans to

the others and borrows from the others at no charge through an informal agreement.

- Joint Contract for Street Sweeping: Keego Harbor, Sylvan Lake, Orchard Lake Village, Oakland County
State law requires that the cities of Keego Harbor, Sylvan Lake and Orchard Lake Village must sweep their streets to protect the watershed. Because each of the municipalities would need to hire this service, it is economically efficient for them to contract jointly for the service.
- Baraga County Road Commission's broad equipment sharing agreements
The Baraga County Road Commission has equipment-sharing agreements with all adjacent county road commissions as well as all cities and villages in the county and with MDOT.
- Many road agencies join coordinate projects on roads that span the county lines
Many county road commission and cities and villages in Michigan work together to ensure that improvement projects on roads that span county or municipal boundaries are coordinated across the jurisdictional lines. Just one of countless examples is the Baraga County Road Commission and the Houghton County Road Commission teamed up to replace a large culvert on Alston Avenue in Houghton County

J. Regional Cooperation

1. Metropolitan Planning Organizations (MPOs)

Under federal law, every metropolitan area with a population greater than 50,000 is required to have a Metropolitan Planning Organization (MPO) to provide a forum for transportation decision making and coordinated approach to transportation improvements. MPOs, in cooperation with state and local transportation operators and interests, are responsible for developing a 20-year long range transportation plan (LRTP) and periodic development of a 4-year programming document for implementing projects called the Transportation Improvement Plan (TIP). The state of Michigan is divided into 14 planning regions to meet these requirements, along with the coordination of planning efforts among their member communities.

Additionally, Michigan's MPOs are actively involved in the Asset Management program. They have undertaken the task of coordinating and consolidating the acquisition of data as well as assisting member communities in data collection and reporting this information to MDOT and the Asset Management Council.

As noted above, along with the development of regional long-range transportation plans (LRTPs) and the shorter-range transportation improvement plans (TIPs), the MPOs are also involved in other efforts to improve the efficiency and effectiveness of transportation networks

throughout the state. These include: Assisting member communities in developing access-management plans, operating as a central repository for traffic data, creating regional mapping products, providing GIS product and technical assistance and serving as the review agencies for prioritizing the use of federal funds on transportation projects.

2. Southeast Michigan Council of Governments (SEMCOG)

An example of the cost savings resulting from MPOs working with road commissions and municipalities on transportation-related issues is the Southeast Michigan Council of Governments (SEMCOG) traffic volume data collection. SEMCOG now maintains a public database of traffic volume counts on nearly all roads in its region. At least one road commission in the region that used to maintain its own such database now simply provides its data to SEMCOG, saving the cost of maintaining a separate database, and making this information readily available to a much larger segment of the public.

3. Pavement Management: Grand Valley Metro Council

In a broader sense each of the 14 Metropolitan Planning Organizations (MPOs) in the state represents the cooperative efforts of its member communities in terms of a variety of transportation-related efforts. Additionally, there are other regional organizations in the state that further these cooperative goals.

A prime example is the cooperative pavement management effort undertaken by the Grand Valley Metropolitan Council that serves the counties of Allegan, Barry, Ionia, Kent, Montcalm and Ottawa. The members of the GVMC, through the council, collectively purchased a specialized pavement management vehicle in 2006. None of the member counties or communities could have purchased the vehicle on its own.

The specially equipped vehicle is a new, advanced-technology tool used to gather data on pavement conditions. This data helps local and state officials make better decisions about road repairs and reconstruction. The full-sized van is equipped with state-of-the-art electronic pavement scanners, high-resolution still cameras, Global Positioning System (GPS) components and computers. Operated by experienced transportation planners from GVMC's Transportation Department, the equipment is used throughout the GVMC area to ascertain pavement conditions and enable road agencies to better manage roads, bridges and other elements of the region's transportation network.

K. Contracted Winter and Summer Road Maintenance

Another example of intergovernmental cooperation that results in cost savings and improved effectiveness is the contracting of winter and summer road maintenance activities that occurs between some county road commissions and cities or villages. An example of this can be found in Oakland County, where the Road Commission for Oakland County contracts with several cities to provide either the winter or summer maintenance services on several county roads.

These arrangements benefit both parties. The road commission pays the community for the services provided on the subject roads and is then able to devote its staff and equipment to other areas, thus improving effectiveness on the rest of the system. For their parts, the cities, because of the proximity of the roads to their maintenance facilities and, in some cases, their willingness to augment the funding received from the road commission, can provide their residents with an enhanced level of service.

L. Adjacent Road Commissions Swapping Snow Routes

Some county road commissions apply a similar principal that also helps to make them more effective. In this case, the road commissions of adjacent counties swap “snow routes” (the assigned routes for snowplows) that are on or near the border between the two counties.

Often times, this will involve a snow route that, while inside of one county, is a long way from that county’s nearest maintenance garage, meaning the snowplow driver must waste a lot of time getting to and from the route. That route may actually be closer to a maintenance garage in the adjacent county, though the garage is across the county line.

In this day of tight budgets and declining revenue, agencies are interested in these types of cost-saving arrangements, and several have been implemented around the state. An example is Oscoda and Alcona counties, where the road commissions have established just such an arrangement. The Presque Isle, Alpena and Montmorency county road commissions also help each other out by plowing roads across a county line when needed.

M. Cooperative Agreements with Industries that are Heavy Road Users

In some counties, after years of watching certain industries take a heavy toll on their roads, the county road commissions have opted to partner with those industries for the mutual benefit of both parties. A prime example is Dickinson County, where the timber industry is a significant player in the economy.

In that county, when there is a timber sale generating a flood of timber trucks, the trucks typically tear up the roads. However, this county road commission has established a very positive relationship with the industry, that has resulted in the timber industry lending equipment to the road commission to help repair the roads, as well as actually helping out with the needed repairs.

Part II

Operational Efficiencies

Many agencies with road jurisdiction have taken steps to improve the efficiency or effectiveness of their operations in recent years. Some examples were included in HRB *Supplemental Report No. 2*. However, to further demonstrate the breadth and depth of these reforms, additional examples are provided here. Again, this list is not intended to be comprehensive, but simply to provide a broad cross-section of the types of reforms that have been, and continue to be undertaken frequently by those who maintain Michigan's road systems.

A. Flexible Work Hours

Some road agencies and municipalities across the state have implemented a flexible-work-hours program. For some, this was undertaken to expand business hours to better accommodate customers. For others, it was done to help reduce traffic congestion by allowing employees to arrive or leave before or after the traditional rush-hour periods. Still other agencies that have shifted to a "four/ten" work week. This arrangement has allowed work crews to get more work done, without interruption, than the traditional eight-hour shift, five-day work week.

B. Altered Shift Timing

Overtime wages are a significant budget issue for road agencies that must respond to winter weather whenever it happens, whether it is during normal work hours or not. One Michigan county road commission has been testing a somewhat novel approach to trying to reduce the financial impact of this. The agency has simply altered its shift timing in response to snow events in order to minimize overtime costs.

C. Utilization of Temporary Winter Workers

Some county road commissions, faced with the reality that, while they needed to have drivers available for snowplows/salt trucks during the winter, they did not have sufficient revenues to provide year-round employment for these workers. As a result, the agencies have turned to hiring temporary workers during winter months. While this certainly has some potential down sides, it has allowed these agencies to maintain at least a minimum level of winter road maintenance service.

D. Shoulder Paving

A Southeast Michigan road commission has concluded that paving road shoulders an additional two-to-three feet when roads are reconstructed or during resurfacing projects protects the gravel shoulder. This reduces shoulder deterioration and edge rutting which, in turn, reduces gravel shoulder maintenance costs. An additional

benefit is improving safety by reducing the potential for pavement edge drop-offs that can lead to errant drivers over-correcting and crossing the road centerline.

E. Pothole Patching with an “Autopatching” Machine

Some road agencies have found they can expand their ability to patch potholes by utilizing “autopatching” machines that eliminate the need for employees to manually shovel pothole patching material into the holes. Some agencies are still investigating whether these expensive machines can fulfill the promise of long-term cost savings.

F. Switching from Graders to Snowplows at the Beginning of Snowstorms

Some road agencies, primarily in northern counties used to frequent, heavy snowfalls, have changed some operational standards. In the past, some of these agencies immediately deployed their road graders as soon as the snow began, knowing that the snow would quickly accumulate to the point where the grader would be effective at pushing the snow off the road in some areas. However, after evaluating this practice, some agencies have concluded it would be more effective to reassign their grader drivers to snowplow trucks that can plow, salt and/or sand during the early phase of the storm.

G. Additional Salt Storage Facilities

Some road agencies have determined that they could operate more effectively if they constructed additional salt storage facilities to store more salt. So, on the occasions when they are rapidly using large quantities of salt, the agencies are less likely to be forced to wait for salt to be re-supplied. Of course, this can only be accomplished when the road agency has sufficient finances or bonding capacity to be able to construct the new facilities.

H. Liquid Salt Brine for Winter Maintenance

A number of Michigan road agencies have concluded that applying liquid salt brine prior to the onset of a snowstorm can extend the time before ice forms and reduce the need for salting in the early phase of the storm. In some cases, road agencies pump the brine from their own wells, making it virtually cost-free, while others purchase the brine that is produced as a bi-product of oil wells, which is also cost effective.

I. Use Pulverized Asphalt on Gravel Roads

Some road agencies have found that spreading pulverized asphalt on sections of gravel roads that are prone to washouts helps to stabilize the roads and reduce the likelihood of washouts. Although this does not produce a short-term cost savings, it

can be a very effective means of ensuring that gravel roads remain passable. Additionally, the argument can be made that the cost of applying the pulverized asphalt is cheaper than the ultimate reconstruction of a washed out road.

J. Berm Removal on Gravel Roads

The necessary grading of gravel roads can often produce an undesirable berm on the side of the road, caused by the grader pushing gravel and loose soil to the side of the road. These berms can prevent water on the roads from properly draining off the roads. When the water cannot drain, and remains pooled on the roads, it can quickly damage the road surface and make it unstable. Consequently, a number of road agencies have concluded that establishing programs to actively remove, or puncture, these berms actually extends the life of the road surface and reduces the amount of work required to maintain the roads. However, providing such a program can be costly, and some agencies have been forced to discontinue their gravel berm removal programs due to a lack of funds.

K. Cut Grooves in Tires to Eliminate the Need for Chains

In some northern counties, some road commissions which traditionally installed chains on the tires of their winter maintenance vehicles during the snow season, have found a better alternative that is less destructive to the road surface. These agencies opted to cut grooves into the vehicle tires, which provides better traction, just as the chains do.

L. Eliminated Secretarial Staff

Some smaller road agencies have saved money by eliminating their secretarial staff. The tasks previously performed by these staff members are then divided among remaining, primarily administrative staff members. Of course, there are bound to be some tasks that no longer can be performed by the remaining staff members.

M. Superintendents Plowing Snow When Needed

Traditionally, the maintenance fleets of road agencies are overseen by superintendents. Superintendents generally perform managerial functions, typically in the agency garages, to keep the fleets operating. However, in today's fiscal environment, some agencies have opted to put these managers in snowplows when no other drivers are available. The obvious benefit is that a snowplow is on the road that otherwise would not be. Of course, the downside is that during this time, the management function is not filled at these garages.

N. Chip-Seal Program

Some agencies have concluded that they could extend the useful life of their paved road surfaces by implementing pavement “chip-sealing” programs, that involve applying a thin layer of “chip seal” to the road surface. This approach is not ideal in all conditions, but does work well in some instances to delay the deterioration of the road surface. Of course, implementing such a program requires that the agency expend funds on the “chip-sealing” program.

Part III

Equipment Efficiencies

While the greatest efficiencies can typically be gained through shifts in the way agencies operate, many Michigan road agencies also have been able to squeeze additional efficiencies from their equipment by either making changes to the actual equipment, or changing the way the equipment is used. Some examples of the equipment efficiencies were included in *Supplemental Report No. 2*, and some additional examples are provided here.

A. Apply Thermoplastic Pre-Cut Pavement Markings by In-House Crews

Traditionally, road markings were created by painting the markings onto the road surface. However, in recent years, a new advancement, known as thermoplastic pre-cut pavement markings has become available. This is essentially a very durable form of plastic tape that can be quickly applied to the road surface. Some agencies have found that they can reduce the cost of installing or replacing pavement markings by ordering the pre-cut thermoplastic markings and having their own staff install them, rather than contracting with a private company to paint the markings.

B. Perform Own Asphalt Recycling

Some road agencies have found that they can save money by performing their own asphalt recycling, rather than contracting this activity to the private sector.

C. Extend Brine Sprayers on Trucks

Some road agencies have found that they can cut in half the number of passes required to spray brine on a gravel road by extending the brine sprayers on their trucks. Brine is used to control dust on gravel roads during the summer months. In the past, these trucks dispensed a one-lane-wide spray of brine. By extending the sprayers, the same trucks can now cover a two-lane gravel road in one pass.

D. Add Front-Mount Rollers

Some agencies, upon review of their road-maintenance activities, have concluded that they could eliminate the need for a separate roller vehicle and driver, by attaching front-mounted rollers to their dump trucks. That way, the dump trucks, used to carry the patching material, can also “roll” the road following patching activities.

E. Switch to All-Wheel Drive Graders

Many road agencies use road graders to plow snow off the roads, particularly following a heavy snow fall. However, traditional rear-wheel-drive graders have sometimes not been able to adequately push a plow through heavy snow. In order to ensure that the graders can operate as effectively as possible, some road agencies have switched to purchasing all-wheel drive graders that are better suited to pushing heavy snow. Of course, these graders are generally more expensive, so purchasing them, while enhancing agency effectiveness, requires additional funds.

Part IV Technology

A. Using Technology to Enhance Road System Efficiency

Several of Michigan's larger road agencies have turned to technology to improve the efficiency of some of the state's most congested roads. Examples include MDOT, the Road Commission for Oakland County and the Road Commission of Macomb County.

MDOT is a national leader in the field Intelligent Transportation Systems (ITS), a concept strongly supported by the Federal Highway Administration as one of the best ways to make road systems more efficient. MDOT's ITS system includes freeway changeable-message signs, electronic traffic monitors (cameras, traffic counters, etc.), "adaptive" traffic signals and much more. At the local level, the Road Commission for Oakland County has been a leader in transportation technology for nearly 20 years. Today, RCOE operates the second-largest system of adaptive traffic signals in the nation, as well as the largest system of video-imaging vehicle detection in the world. Across the border in Macomb County, the RCMC is rapidly expanding its system of adaptive traffic signals as well. The Federal Highway Administration, as well as countless experts in the field, report that adaptive traffic signal systems, which adjust signals based on the traffic flow and volumes present at any moment, are one of the most cost-effective ways to increase road capacity – sometimes accomplishing the same goals as road widening at a fraction of the cost.

B. Geographic Information Systems (GIS)

The Road Commission for Oakland County has also utilized Geographic Information Systems (GIS) to increase efficiencies. GIS allows geographic data and digital maps to be used in operational analysis at the user's computer. The database allows employees to view transportation-related data, such as the road centerline, right-of-way, aerial photos and topography, directly from their desk. To increase productivity, a Web-based mapping system has been deployed which allows access to the maps from any Internet-enabled location. This system allows staff to conduct preliminary site research at their desks without the need of making costly and time-consuming site visits.

Initial startup costs for a system of this stature are typically intensive. However, the road commission was able to mitigate these costs by partnering with the Oakland County Information Technology Department (OCIT), which already had vast infrastructure and data resources in place. An inter-agency agreement provides a two-way data-sharing agreement that lowers cost for data collection for both agencies through equipment sharing and technical training. Furthermore, the road commission uses OCIT staff to make updates to the system at a cost which is typically one-third of a private consultant.

Further agency cooperation takes place between the road commission's Department of Permits and Environmental Concerns and the Oakland County Drain Commission. The two departments cooperate in locating and mapping drainage outfalls throughout the county.

C. Global Positioning Systems (GPS)

An increasing number of Michigan road agencies are turning to Global Positioning Systems (GPS) to enhance operational efficiency. In some cases, GPS is used to track agency vehicles (as in the SEMSIM project described in item IV A above). In other cases, agencies have required some companies they contract with equip their vehicles with GPS, so the agencies can better monitor the work of the contractors. In both cases, this technological advancement is providing road agencies with significantly enhanced information that allows them to better manage their resources.

D. Roadview

Just as MDOT has employed a high-tech photo log to assist in monitoring its road system (described in *Supplemental Report No. 2*), some local road agencies are doing the same. In one instance, at the Road Commission for Oakland County, the system is known as "Roadview," and provides a searchable database of photos of every mile of road under the agency's jurisdiction. Using Roadview, agency staff can "drive" a particular road without ever leaving the office. This saves a considerable amount of time previously required to physically visit road locations.

E. Wireless Traffic Signal Communications

The Road Commission for Oakland County is also pursuing another cutting-edge technological effort that will save money and enhance the reliability of the agency's high-tech FAST-TRAC adaptive signal system. FAST-TRAC allows the agency to continually coordinate the traffic signals along a corridor, despite the ever-changing traffic volumes and traffic-flow patterns. It does this by enabling communication between the computers that operate each signal. Traditionally, this communication has occurred over telephone lines. However, this mode of communication is both expensive and unreliable. For these reasons, RCOC has created a wireless system of communications to link the signals, and is beginning to install the system around the county. When fully implemented, the system is expected to save the agency more than \$600,000 per year.

F. Electronic Bridge Monitoring

Several road agencies in Michigan have introduced electronic monitoring of road conditions on new bridges. This allows the agencies to remotely monitor whether or not the bridges are becoming icy in inclement weather. Additionally, these high-

tech bridges are also equipped with automated anti-icing systems. When the bridge monitor system detects ice forming on the bridge, the anti-icing system is automatically turned on, spraying liquid brine across the bridge surface and preventing the formation of ice. Because bridges typically ice-up before roads (because the bridge decks, suspended in air, tend to get colder sooner than road surfaces), they can be some of the most dangerous road segments as winter temperatures drop below freezing. These automated systems not only make the bridges much safer for drivers, but can save the road agencies the substantial cost of sending trucks to salt potentially remote bridges.

G. Enterprise Software Systems

Some Michigan road agencies (as have other governmental agencies in the state), have implemented “enterprise” software systems that combine many of the traditional bookkeeping functions of an agency into a single, largely automated system. Often, these systems allow agencies to replace often antiquated stand-alone software systems used for individual accounting functions. Additionally, these systems create significant electronic databases that make it much easier to track agency operations, expenditures, budgets, etc., and ultimately to identify additional means of streamlining operations.

H. Equipping Trucks to “Multi-Task”

In the past, some road agencies have purchased road maintenance trucks with very specific tasks in mind, such as snowplowing. In recent years, most agencies have opted to equip their trucks in such a way that they can be used for a wide variety of tasks, from road grading, to salting, to traditional plowing, to material hauling, etc. These versatile trucks eliminate the need to purchase separate vehicles for some of these tasks. Some of the additional pieces of equipment added to the trucks include things like computerized salt spreaders that allow the agencies to more closely control the amount of salt spread, and to readily adjust spread rates as conditions change.

Summary

As has been shown in this report, it is clear that for Michigan's road agencies, improving efficiency and enhancing effectiveness are top priorities. While this report is far from comprehensive, it provides a broad cross-section of the many and varied types of steps road agencies across the state are taking to improve their efficiency and effectiveness. Hopefully it will have also conveyed to those not familiar with the day-to-day operations of Michigan's road agencies, that the pursuit of efficiency and effectiveness has become an integral part of doing business. This has been even more the case in recent years, as every one of these agencies has struggled to attempt to maintain the level of service provided in years past despite declining revenues and skyrocketing operational costs.

However, **there comes a point at which a simple lack of funding becomes a deterrent to further savings.** Michigan is now at that point. Nearly all Michigan road agencies will confirm that, with an increase in funding, they could further improve their efficiency and effectiveness.