

Michigan DOT

Efficiencies and Innovations

MDOT continues to undertake numerous efforts to operate more efficiently and find every available dollar in its budget for transportation infrastructure. The Department is also undertaking innovative cost-saving measures to reduce operating costs, extend the life of projects, and maximize energy efficiency. The following tables provide a summary of recent efficiency and innovation efforts.

MDOT will continue to take relentless, positive action to maximize its resources by finding efficiencies and incorporating them into its business practices to support the MDOT mission: **“Providing the highest quality integrated transportation services for economic benefit and improved quality of life.”**

Meeting Today's Challenges

**Better
Faster
Cheaper
Safer
Smarter**



**Michigan Department of Transportation
Efficiencies and Innovations**

EFFICIENCY	EST. SAVINGS PER YEAR
E-SIGN - MDOT's Chief Operations Officer, Bureau of Field Services, Transportation Service Centers, Design, and Aeronautics have used digital electronic signatures (e-sign) for construction documentation on more than 40 documents, saving up to three weeks of processing time per document and eliminating 7.4 million sheets of paper. Future savings will be significantly greater as more processes move to electronic signatures, and as other MDOT divisions and bureaus begin full implementation of e-sign. MDOT is only in the beginning stages of e-sign, and has already saved over \$2 million in the first six months with more savings anticipated the rest of the year.	\$4,000,000
RESTRUCTURE STF - MDOT restructured the State Trunkline Fund (STF) refunding bond deal to obtain a lower interest rate on debt; the new rate saved over 16% or \$9.4 million. The debt service savings was front loaded in FY 13 at \$2.6 million and just over \$810,000 debt service savings from FY14 through FY22.	\$2,600,000
ZILWAUKEE BRIDGE - MDOT is using new technology and products for Zilwaukee Bridge repairs which will result in significant cost savings. MDOT is using previously built beams, previously built scaffolding, and the thinnest bearings possible. These products allow the Department to complete the necessary repairs without making major modifications to the existing structure.	\$2,450,000
BICYCLE MAPS - MDOT has reduced the number of bicycle maps it produced from 96 county and city maps to 11 regional maps. The savings in printing costs alone have been approximately \$838,000. Savings have also been realized in reduced storage costs and decreased mailing expenses.	\$838,000
REST AREAS - The North Region has contracted the operations activities of six rest areas and two roadside parks. Private contractors perform services such as cleaning, mowing, and staffing on holiday weekends, which has reduced operating costs at those locations by two thirds. The contractors are also required to supply all the materials needed for the facility. Two more rest areas will be contracted out in spring 2013.	\$660,000
SALT PURCHASES - Bay Region developed a projection module spreadsheet that gives predictions of salt usage based on the current year's usage trend and on the five year usage average. This allows MDOT to keep the amount of salt purchases to a minimum.	\$470,000
ASSET MANAGEMENT CONTRACTS - The Asset Management Division reduced annual contract costs by using a qualifications-based low-bid vendor selection process for pavement surface data collection projects. This includes changing the scoping process to require a new sampling technique for surface condition assessments. MDOT is able to save money by reducing the sample size of pavement data collection to 30%.	\$380,000
MAINTENANCE STRATEGY - As part of a proactive maintenance strategy, Oakland County TSC has been performing heavy surface repair to minimize maintenance costs, minimize damage claims against the Department, and improve mobility. This strategy has resulted in considerable cost savings, 19 fewer damage claims, and 93 fewer closures since 2011.	\$327,000
CARPPOOL LOT PARTNERSHIP - MDOT continued its partnership with Meijer Corporation to add a 15 th store to the carpool lot agreement. The store, located in Wyoming Michigan, will provide parking for up to 50 commuters and save the Department approximately \$300,000 in construction and real estate costs. This partnership model has also been used in the Upper Peninsula; MDOT has agreements with four local businesses that provide parking capacity for commuters. Since 2008, this partnership has saved approximately \$4.5 million in real estate and construction costs.	\$300,000
ENTERPRISE ASSET MANAGEMENT - The Asset Management Division implemented the early stages of the Enterprise Asset Management program for non-pavement and non-bridge features. In addition to a lane mile inventory, this included loading over 135 asset classes to a central ArcGIS Server database that supports various business areas across the Department. By making this resource available via free software (ArcGIS Explorer), the Department was able to replace the fee-based Google Earth and Transportation Asset Mapping System (TRAMS) II programs.	\$250,000
STRINGLESS PAVING - Stringless paving is a new construction method that uses digital technology to accurately direct the paving equipment onsite, reducing the amount of preparation work and on-site surveying. By using this new technology, crews can more quickly and accurately establish the correct alignment and profile for the pavements. This new technology was tested in 2012 on a project in Bay County; it enabled MDOT to complete a two-year project in one year, with savings of \$210,000. This project also decreased user delay due to the expedited schedule.	\$210,000
BASCULE BRIDGES - The Bay Region contracted the operation and custodial services of two bascule bridges in Bay City. These bridges are M-13/M-84 (Lafayette Bridge) and M-25 (Veteran's Memorial Bridge), both are over the Saginaw River. The contractor will be required to operate these bridges as necessary and as required by law, and to provide custodial services at the bridges.	\$200,000

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WEED CONTROL - New weed control techniques are being used in the Grand Region area to inhibit the growth of roadside vegetation. This has reduced the amount of mowing by up to 50% in one growing season. There is potential for this technique to be used statewide.	\$192,000
IMPACT ATTENUATORS - The Oakland County TSC has been replacing damaged impact attenuators (impact cushions on fixed structures) with self-restoring reusable attenuators which have reduced repair and maintenance costs.	\$160,000
GUARDRAIL - The Oakland County TSC manages a contract with several private businesses to complete repairs of damaged guardrail. This work was previously conducted by the Road Commission of Oakland County. Since 2007 the private contracts have saved approximately \$600,000.	\$155,000
WOUNDED VETERANS PROGRAM - MDOT and FHWA recently joined forces to recruit and hire skilled wounded veterans for temporary positions -- at no cost to the state. Qualified wounded veterans are hired for positions in MDOT that best use their skills and training, and FHWA pays their salary for up to 6 months. Currently, MDOT plans to employ as many as 10 wounded veterans at a potential savings to the department of \$150,000 over six months.	\$150,000
SNOWPLOW SPEED - Southwest Region snowplow trucks drive 25 mph, down from 35-45 mph. The slower speed is expected to reduce the amount of salt used by 30-40%, saving money and creating safer road conditions. This technique can also be applied to other Regions.	\$100,000
BRIDGE JOINTS - New tools and technologies are being used for the bridge joint installation process that has reduced costs by 40%, reduced construction time by 50%, and provides a better surface condition after construction. The savings are based on eight projects conducted in the Grand Region during the 2012 construction season. This technique could be applied statewide.	\$78,000
EMPLOYEE RESOURCES - The North Region shared employee resources between offices for a major project in West Branch which reduced the need for consultants, saving time and expenses. The project utilized incentive-disincentive and user delay provisions that reduced motorist delay and business impacts.	\$60,000
COORDINATED WORK - MDOT and other road agencies coordinate their work, when possible, so multiple agencies can work in an area that is already closed to traffic. This method eliminates the cost of closing an area more than necessary. Combining different types of work within a construction closure area saves time, money, and improves safety by reducing employee's exposure to traffic. Cost saving is estimated using projects from the Grand Region. This process could be applied statewide.	\$48,000
EPOKE SPREADER - A new machine for salt spreading, called an EPOKE spreader, is being used for winter maintenance on the Zilwaukee Bridge. This allows the crews to spread both the solid material and a non-corrosive liquid with a single truck, as opposed to the two vehicles that were required with previous operations. In addition to reducing the number of fleet units and drivers required for winter maintenance, it has shown approximately \$30,000 in material savings per year due to the efficiency of the spreader.	\$30,000
LED LIGHTING - The Oakland County TSC replaced 350 existing lights with LED luminaires along the median of I-696 between I-75 and Lasher Rd. As of the 2nd quarter of 2012 the new lights have reduce energy consumption and saved approximately \$28,000.	\$28,000
AUXILIARY POWER UNITS - Auxiliary power units, or batteries, were installed in two MDOT vehicles that provides a power source to operate laptops, printers, etc. This device cuts idle time on vehicles with high engine hours and low mileage, thereby reducing the amount of fuel that needs to be purchased. Two additional units will be purchased by the end of the year.	\$15,000
SPRAY EQUIPMENT - A one-time purchase of new spray equipment from an auction site saved money. This equipment has been shared between the regions.	\$10,000
AUTOMATED DATA COLLECTION - Several automated processes have been developed for entering Air-Carrier Airport data, Inter-city bus passenger data, and Amtrak data in the Intermodal Management database. These processes improve accuracy and reduce staff time dedicated to data entry, which is used to monitor travel trends for modes other than highways.	\$5,000
USER SAVINGS	
COORDINATED GOALS - Coordinated lane-closure standards, winter maintenance goals, and traffic incident management in Metro Region, Southwest Region, University Region, and Operation Field Services were developed which has decreased user-delay costs for travelers on I-94 from the Indiana border to Port Huron.	\$2,000,000
STRINGLESS PAVING - The stringless paving pilot project in the Bay Region reduced construction time in half, from two years to one year, and reduced motorists delay.	\$600,000
Total Efficiency Savings:	
\$16,316,000	

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Listed below are efforts which produce cost savings for the Department or users that are difficult to quantify.

INNOVATIONS

CARBON FIBER - MDOT has used carbon fiber as a replacement for steel componenets in numerous bridges across the state. This technology will greatly expand the life of a bridge because the material is more resistant to corrosion than steel.

OVERDUE FINAL BILLINGS - The Metro Region established a goal to reduce the number of overdue final billings for projects between contractors and the Department by 50% before the end of the calendar year. The Region has already surpassed this goal and is working to continue to lower the number so contractors have a quick return of money they are owed and relief of their bonding debts.

ADOPT-A-WELCOME CENTER - The "Adopt-a-Welcome Center" program provides enhanced visitor service without increasing operational costs to MDOT. Tourism-related groups can adopt a welcome center and help staff the facility. Adoption activities include providing bags for visitors, maintaining flower beds, providing local expertise, and supplementing the current Welcome Center staffing levels. E-comment cards for Welcome Centers are being implemented which allows guests to provide feedback on our operations electronically, minimizing the need to print and store paper comment cards and reducing postage costs.

MI-COMMUTE WEBSITE - The MiCommute website became available to the public in spring of 2011 and provides tips and tools to help commuters find alternate ways to travel and save money in the process. The web site explores bicycling, public transportation, and other modes of travel that may help commuters save money on gas and vehicle repair costs.

REST AREAS - In the Grand Region energy efficient lighting was installed in five rest areas and automatic soap dispensers and faucets were installed in seven rest areas; reducing energy use, materials, and water waste.

SIGN FABRICATION - The use of Michigan State Industries (MSI), a division of the Department of Corrections, to fabricate signs in large volumes to aid in upgrades and new installations as in Emergency Routing Detours.

ENERGY SAVINGS - Set and follow general energy savings practices for building and employees such as programmable thermostats, limited use of lighting, closing overhead doors in cold weather, turning off computers; all of which have cut down considerably on electric and gas usage.

STAFFING - Reduced the permanent staff and seasonal employees at MDOT maintenance garages. The number of maintenance workers in the summer was reduced to match current funding availability, but retained seasonal positions to fully provide winter maintenance on the state highways.

STAFFING - Consolidated various technician classifications into one transportation technician classification to employ techs in the area of current need. For example, a tech could perform construction administration in the summer and design-related work in the winter.

PRECAST BRIDGES - Precast bridge elements were used for the first time on the M-115 Highways for Life project. This technology was used on the two bridges along this corridor. As a result of the use of the pre-cast elements the bridge reconstruction process was reduced by approximately 50%. In 2011, the M-25 Bridge over the White River in Huron County also made use of precast bridge elements. The time savings is estimated to be 2-3 weeks faster, with better time savings realized through more use and greater familiarity with the technology.

BRIDGE MAINTENANCE CREWS - Used an innovative staffing plan to employ six bridge maintenance crews between MDOT and several local road commissions. Joining forces allowed for three additional crews that were able to complete more preventative maintenance and minor bridge repairs, which will help reduce future costs by keeping bridges in better condition. By conducting more preventative maintenance now the Department will see a long-term benefit in lower repair costs in the future.