



## Economies, Efficiencies & Innovations

Reported Savings: 2010 to 2017

Michigan Department of Transportation

Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
Cumulative 2010 to Present	\$675,342,570	\$27,217,088
2010	\$87,057,957	Not counted
2011	\$71,357,957	Not counted
2012	\$86,726,290	Not counted
2013	\$80,520,920	\$13,294,988
2014	\$166,974,066	\$10,698,988
2015	\$108,433,877	\$1,865,702
2016	\$53,984,392	\$1,328,710
2017	\$20,287,111	\$28,700
2018		
2019		
2020		

*Data last updated February, 2018*

The *Economies, Efficiencies & Innovations Report* is produced from data managed through MDOT's *Innovation Central* application.

*Innovation Central* is an MDOT tool developed to enable employees to self-report their innovation ideas in a shared database, to be implemented with approval by management, eliminating unnecessary bureaucracy, saving time and money, and improving customer service. This allows MDOT management to promote a culture of innovation and engage employees in the organization's success. The new process shifts the focus of the report from simply calculating cost saving innovations to also include innovations that improve quality or service without calculable cost savings.

This report reflects implemented actions since CY2010. To prevent overstating budgetary savings, actions for which good estimates of dollar savings can be generated will reflect those savings. Other actions, which generate improvement, but where accurate dollar savings either cannot be calculated or where the savings result in a redirection of the resources, will not show a dollar value. Summary figures for previous years may change as more accurate data become available.

Initial Year of Savings represents the first calendar year in which benefits accrued from the innovation. Savings Expiration Year represents the final calendar year in which benefits accrued from the innovation, or the point in time where the change became ingrained in MDOT's business processes and was no longer deemed innovative.

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Geographic Information System (GIS) Right-of-Way (ROW) Permit Mapping</b> - The Statewide ROW Permits Unit is preparing to implement a GIS mapping tool that will facilitate all MDOT, especially region permit staff, in identifying permitted and unpermitted work activity. The map will show items such as proposed and approved permitted activities, unknown situations such as water break and excavation for utility repairs, etc. All this information can be accessed using mobile and office computer devices. Staff will be able to view the map and identify where activities are occurring which minimize the time spent going and coming to review, inspect and monitor work activities. The map will also include layers for seeing endangered species areas, archeological areas, environmental site closures and monitor wells. The largest contribution is MDOT staff will be able to document and locate closely the location of proposed, constructed and maintained activities.</p>	Bureau of Development	Real Estate	2017	2022	\$740,000	
<p><b>Entera/NXTera Software Cancellation</b> - It was determined that the software Entera/NXTera was no longer being utilized by MDOT staff. In response to this revelation, Cory Johnson deemed the software unnecessary and saved the department over \$30,000 annually.</p>	Bureau of Planning	GIS & Mapping	2017	2020	\$30,000	
<p><b>High Definition (HD) Video-Conferencing</b> - An effective way to remotely participate in meetings throughout the state. Minimizes the number of face-to-face meetings by allowing participants to see each other in real time, and allows all meeting participants to present materials to each other in real time for discussion.</p>	Superior Region	Administration & Personnel	2017	2022	\$ 30,000	

## 2017 Economies, Efficiencies & Innovations

### Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Metro Underdrain Video Equipment</b> - Provide video equipment to MDOT project staff to videotape underdrain (6 inch plastic pipe underneath roadway) on MDOT projects. MDOT inspectors can ensure the pipes are videotaped prior to paving over them, eliminating the possibility of crushed/plugged underdrain being paved over, which would result in costly repairs and delays later on. Total savings per year: \$9000 in employee labor and travel, \$3000 in pavt repair costs. This also saves potentially 3 days of delay for \$300,000 of user delay costs.</p>	Metro Region	Highway Construction	2017	2021	\$ 12,000	\$ 300,000
<p><b>Mapping As-Built Information in ArcGIS</b> - The As-built plans within <i>ProjectWise</i> and the Oakland TSC hanging files are a great source of information. However, searching those plans to find out which ones are relevant to the roadway location being researched can be a very time consuming process as there are many plan sets in each control section. To reduce the amount of time required to search for location specific as-built information, Oakland TSC has mapped in ArcGIS every as-built and as-let plan contained within the Oakland as-built and as-let folders in ProjectWise as well as the locations for the hard file as-builts at the TSC. Now, by simply clicking on a specific location in ArcGIS a listing of the relevant as-built plans can be obtained. This will allow the research of only the desired as-builts versus reviewing every possible file under that control section. This will save a measureable amount of time every time somebody researches as-built information.</p>	Metro Region	Highway Design	2017	2021	\$6,300	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>TAMC E-Gov Delivery</b> - Staff supporting the Transportation Asset Management Council (TAMC) shifted their routine communication with hundreds of local stakeholders to the E-Gov delivery system, savings some 20 hours of staff time per year and improving the efficiency of communications.	Bureau of Planning	Administration	2017	2022	\$ 5,000	
<b>Surface Pro Cradle</b> - Secure way to hold the surface pro in a vehicle or anyplace besides a flat surface. Made out of wood and secured with Velcro to existing laptop holder. Can be made out of old signs.	Grand Region	Other	2017	2020	\$1,000	
<b>Use Printers to save printing to Avery sticky labels</b> - Using a suitable printer to print addresses directly onto any size envelopes. The process is quicker and eliminates the need to buy sticky labels for all but the largest sized envelopes.	Grand Region	Administration & Personnel	2017	2020	\$1,000	
<b>Push Rod</b> - MDOT Maintenance Forces were able to fabricate Push Rods used to find buried culverts, end sections, and buried pipes at a cheaper cost than buying them from a manufacture. Cost for 4 manufactured Push Rods was \$200, where as cost of MDOT Maintenance fabricating was \$23 in supplies and \$82 in wages/fringes for a total of \$105. This saved MDOT \$95.	North Region	Highway Maintenance	2017	2017	\$95	

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Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Dilemma Zone Signal Technology</b> - Cars approaching an intersection on a green light have no assurances the light will remain green as they travel down the road. A "dilemma zone" is created when the intersection signal changes from green to yellow and the driver arriving at the intersection must decide whether to stop quickly or run through the light. Wavetronix Advance continuously tracks the vehicle's speed and distance from the intersection, communicating with the traffic controller to keep the light green for drivers as they approach. At the same time, the Smart Sensor Advance looks for safe gaps in traffic and tells the traffic controller when there are no longer vehicles caught in the dilemma zone, and it is safe to change the traffic light from green to yellow.</p>	Bay Region	Highway Safety	2017	2030		

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Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>ArcGIS Permits Map</b> - ArcGIS Permits Map</p> <p>The ArcGIS Permits map was developed to track ongoing permits and advance notices that are either being processed or approved in CPS. Individual points are loaded for each permit/advance notice at its specific location. At each point, MDOT can input information pertaining to it. This includes location, description of work, dates when work will take place, contractor contact information, etc. In addition, users can also upload photos, inspection reports, plans, and application documents onto each point. The ArcGIS map also provides information on ongoing construction projects near the site and environmental information. This information can be viewed from any computer in the office or mobile device in the field. This information is very useful in the field and saves MDOT a lot of time. All that is needed is a mobile device with network connection. All info and documents needed for a specific permit or advance notice is at the users' fingertips. If the user needs more information, they are also linked to CPS. Therefore, they will not need to waste time traveling back and forth from the office to retrieve the necessary information.</p>	Metro Region	GIS & Mapping	2017	2017		

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Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>County Maintenance LCAR Form</b> - This spreadsheet was developed by working together with Road Commission of Oakland County (RCOC) and the Oakland TSC to develop a spreadsheet that meets our needs to enter lane closure data into LCAR for daily maintenance activities performed by the county on MDOT trunk line. The excel spreadsheet is filled out by each of the county garages in the morning detailing the work being performed and emails it to the TSC staff so it can be entered in LCAR. We also have them fill out the same form for weekend work and submit it by Wednesday COB so it is entered in LCAR by Thursday and included in the weekend construction report which is sent out by Region communications to the media on Thursdays.</p>	Metro Region	Highway Maintenance	2017	2020		
<p><b>Contracts Template Spreadsheet</b> - The Contracts Template Spreadsheet is an "Excel" spreadsheet which the Macomb TSC Maintenance Engineer created to help him to monitor his budget and track expenditures for various maintenance activities.</p>	Metro Region	Administration & Personnel	2017	2021		
<p><b>Field Headphone Communication System</b> - The Maintenance staff has recently purchased headphones that allow them to communicate in high noise volume situations such as air compressors, Vac Trucks, pump stations, etc.. The system mutes the noise to a level that clear communication is obtained which is very helpful. Staff no longer has to rely on hand signals when they can easily talk now.</p>	Metro Region	Highway Construction	2017	2021		
<p><b>Safety Chain for Wing Plow Spring</b> - The design of the wing plow results in lost parts when release-pin is sheared as there is no fail-safe. Our office designed a retainment system by welding an eyelet and attached a chain to prevent loss of parts. This results in savings of time (downtime ordering parts, etc) and dollars.</p>	Metro Region	Highway Maintenance	2017	2021		

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<p><b>Short Videos for Permit Applicants and their Contractors</b> - To improve permits compliance, reduce time of MDOT staff needed to explain &amp; clarify guidelines, Metro Region created informational videos to explain permitting processes, greatly assisting customers.</p>	Metro Region	Administration & Personnel	2017	2017		
<p><b>Single Joystick Control for Tow Plow</b> - Install a single joystick scraper/plow control where it can be up to four controls. The use of one control makes it safer for both the driver, and public as there is a high degree of danger with the driver not being able to maneuver the controls quickly enough to pickup and stow the scraper and plows in an emergency. This control is now being considered as a statewide standard.</p>	Metro Region	Highway Maintenance	2017	2021		
<p><b>Streamlined Project Wise For Ipads</b> - Projectwise Edge Mobile greatly enhances the search capability, making this process much easier than the previous. The Taylor office is leveraging this tool to enhance construction productivity.</p>	Metro Region	Highway Construction	2017	2021		
<p><b>Switchboard Operations</b> - Keep a log of all questions, comments and concerns from customers who call or walk in. Overtime, we'll be able to see the different times of the year we get more questions, comments or concerns about different subjects by using a graph to give people a visual. With this information we'll be able to reorganize resources at the front desk, and also have the correct websites bookmarked, that way everything is easy to answer for those who cover the switchboard.</p>	Metro Region	Administration & Personnel	2017	2021		

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Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Track Pavement Cuts</b> - SHORT TERM: To minimize costs to MDOT by avoiding the costs to fix poor restorations.</p> <p>INTERMEDIATE TERM: To keep the agency that performed the work accountable for the pavement cut restoration performance, to understand what type of restoration works the best, to provide quality pavement replacement on pavement cuts, to decrease traffic delays and damage to vehicles.</p> <p>LONG TERM: To increase customer's satisfaction by providing better quality pavement cut restorations/improving quality of ride.</p>	Metro Region	Highway Maintenance	2017	2021		
<p><b>Traffic Management during construction (Acyclica)</b> - At the Macomb TSC for our upcoming M-59 reconstruction project, we are partnering with Macomb County to use Acyclica, which is a traffic management equipment that allows the county to monitor the traffic flow in real time and adjust the signal timing as needed to help with the bottlenecks. We will have more information on this once the 2017 portion of the project is and how effective it was in the flow of traffic.</p>	Metro Region	Highway Operations	2017	2018		
<p><b>Using OneNote for Improved Task Management</b> - e-Travel Logs - storage and workflows using ProjectWise for travel logs.</p>	Metro Region	Administration & Personnel	2017	2021		

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Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Update and Expand Michigan Aviation System Plan (MASP)</b> - Update the MASP in accordance with MDOT's current vision, mission, and goals. Expand document to include Economic Impact Studies/Community Benefit Assessments for various airports statewide and evaluate effects of the governor's Regional Prosperity Initiative. Community Benefit Assessments will provide valuable economic information to local governmental officials regarding the positive financial impacts their particular airport generates for the local community.</p>	Office of Aeronautics	Aviation & Airports	2017	2030		

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Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Online Payment System</b> - The Office of Passenger Transportation, Regulatory Unit has developed an on-line computer system accessible by Michigan's "for-hire" passenger carriers that moves many of OPT's current manual and time consuming processes to the "live" system. Carriers now have the capability to add or delete a vehicle, pay fees, and register vehicles on-line and in real time versus submitting paper forms and waiting. Processes have been streamlined for on-line customers resulting in faster processing times, improved quality due to the reduction in the multiple handling of paperwork and entering of data. Customers are able to instantly view the status of their request and changes. The on-line system went live at the end of 2016 to a limited number of carriers for testing purposes and is now available to all for the 2017 annual renewal process. OPT is anticipating limited usage by carriers for the 2017 annual renewal process due to the newness of the program and recent changes in the commercial for-hire passenger vehicles laws that will remove many of the carriers that would have used it from MDOT regulation. MDOT will work through 2017 to train carriers. The office will continue to track use of the new on-line capacity in order to measure success and are hoping that at least 40% of all carriers to renew on-line in the 2018 cycle.</p>	Passenger Transportation	Passenger Bus & Rail	2017	2020		

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<p><b>PTMS milestone</b> - Another example of a successful innovation is the creation of the PTMS milestone module. This module allows transit agencies to electronically submit their milestones to their project manager and supervisor for review and approval. Also, with the development of the PTMS universe for business objects, we are now able to pull the milestone reports from PTMS, sorted by grant, which allows the program managers a more efficient way to enter the milestones into the Federal Transit Administration grant system.</p>	Passenger Transportation	Passenger Bus & Rail	2017	2017		
<p><b>Develop and Implement E-Invoicing Process.</b> - Using ProjectWise, have airports submit their invoices for approved work electronically to AERO Project Managers and Accounts Payable staff to speed process of contractor and consultant payments. Using ProjectWise and electronic approvals will eliminate wait time for mail delivery and reduce lost paperwork delays. This will save staff time and reduce errors.</p>	Office of Aeronautics	Aviation and Airports	2016	2030	\$16,000	\$24,000
<p><b>Update Aircraft Scheduling Software with Web-Based Program</b> - Replace outdated server-based flight scheduling software with a Web-based program. Staff will have the ability to provide quotes, view and adjust the flight schedule remotely. This will reduce staff time, passenger's time waiting for a response on their inquiry, and improve the overall efficiency of the Air Transport Unit.</p>	Office of Aeronautics	Aviation and Airports	2016	2030	\$14,000	
<p><b>Travel Logs in ProjectWise</b> - e-Travel Logs - storage and workflows using <i>ProjectWise</i> for travel logs.</p>	Metro Region	Highway Design	2016	2021	\$369	
<p><b>Double Sided Print Default</b> - Set up, by default, all office printers to use both sides of the paper. Users can select single sided on case by case basis.</p>	Grand Region	Administration & Personnel	2016	2020		

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<b>Downspot Inlet Installation</b> - The inlet slides into a cut section of pipe, there are no bands to tighten and gap to seal. This installation eliminates the slower installation of downspouts.	Grand Region	Highway Construction	2016	2020		
<b>e-OnCamera Interview</b> - Soundbite was emailed via iPhone to news outlet out of state.	Grand Region	Highway Construction	2016	2020		
<b>Add Permit as Builts to ProjectWise</b> - Provide a more complete history of work completed on MDOT roadways; currently scanning old permits.	Grand Region	Highway Design	2016	2020		
<b>"T" Nuts for Bridge Guardrail Retro Fits</b> - Quicker/safer shorter time frame along side of road to install guardrail.	Grand Region	Highway Maintenance	2016	2020		
<b>Chemical Containment Area Inside Specials Crews Building</b> - Allows for spray trucks to be safe and secure and protected from the weather.	Grand Region	Highway Maintenance	2016	2020		
<b>Generator Storage Under Truck Bed</b> - Generator stored under truck and can be pulled out to use and pushed back for transport and storage. Saves on lifting out of back of truck due to exhaust build during useage.	Grand Region	Highway Maintenance	2016	2020		
<b>Guardrail Installation Bolt Clamp</b> - Clamps guardrail sections together to ensure bolts line up. Easier installation, Savestime. Safety due to less time in traffic.	Grand Region	Highway Maintenance	2016	2020		
<b>Guardrail Wind Row (Berm) Removal Attachment</b> - Attachment added to a bobcat bucket to blade wind row (berm) under guardrail to improve drainage.	Grand Region	Highway Maintenance	2016	2020		
<b>I-Pads for Spray Trucks and Sign Trucks</b> - Use with GIS/GPS. More Efficient and Less Error in the reporting process. Also some excluded areas are now on GIS.	Grand Region	Highway Maintenance	2016	2020		
<b>Maintenance of Traffic (MOT) Sign and barrel Trailer</b> - Trailer that holds all necessary Maintenance of Traffic (MOT) signs and barrels for a maintenance lane closure.	Grand Region	Highway Maintenance	2016	2020		

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<b>Sand Blaster Mounted on the Air Compressor Trailer Either Front or Back</b> - Frees up space on the truck bed and is easier to access.	Grand Region	Highway Maintenance	2016	2020		
<b>Shop Manufactured Hopper Loops/Fork Support for Lifting</b> - Modifications to fit lift equipment at facility to move salt hoppers/sand pots .	Grand Region	Highway Maintenance	2016	2020		
<b>Spray Equipment Modifications</b> - Different nozzle modifications to catch both sides of the roadside guardrail.	Grand Region	Highway Maintenance	2016	2020		
<b>Tape Applicator During Construction for New Strip Seal Bridge Joints</b> - Duct Tape is applied standing up with enough pressure for the tape to adhere to joint surface. Reduces back stress and allows for a better seal so that wet concrete during construction doesn't leak in the joint.	Grand Region	Highway Maintenance	2016	2020		
<b>Vacuum Lift Installed in Sign Shop</b> - Allows for a safe way for one person to lift a full sheet of Plywood during fabrication.	Grand Region	Highway Maintenance	2016	2020		
<b>Water Tank Trucks Used for Remote Water Supply for Spray Applications</b> - Mobile and allows more efficient and effective spray program.	Grand Region	Highway Maintenance	2016	2020		
<b>Double Sided Print Default</b> - Set up, by default, all office printers to use both sides of the paper. Users can select single sided on case by case basis.	Grand Region	Highway Operations	2016	2020		
<b>Expedited Towing</b> - The City of Grand Rapids 911 dispatch center will immediately send a towing company to all crashes on the freeway, even before confirmation from on-scene responders .	Grand Region	Highway Operations	2016	2020		

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Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Improve Switchboard Efficiencies</b> - We have struggled with the best way to try to be efficient and still be customer oriented. We have had a phone installed inside the vestibule - visitors or those delivering items, can dial "0" to get someone to let them in or dial someone else's extension for assistance. A cell phone that was made available to Barb or to another administrative support person who is in the building giving greater flexibility for the person covering the front.</p>	Grand Region	Highway Operations	2016	2020		
<p><b>Metro Region Spray Gun Modification</b> - John Ladensack from the Auburn Hills Maintenance Special Crews, and Robert McDaniel from the Detroit Maintenance Garage teamed up on a spray innovation that resulted in increasing the daily production over 50%. They replaced the spray gun to a higher volume gun, and they increased the hose size from 1/2" to 3/4". This increased the volume tremendously. Prior to this innovation they were spraying 500 gallons a day, and they increased it to over 1200 gallons a day.</p>	Metro Region	Highway Maintenance	2016	2020	\$10,000	
<p><b>Dual Monitors</b> - Office of Economic Development (OED) staff are transitioning to dual monitors, which promotes cost savings by reducing the amount of paper printed and also reduces paper waste. It is no longer necessary to print a document in order to compare it with information on a single monitor, as one of the monitors can serve as the paper copy in order to work in multiple programs, often spreadsheets, simultaneously.</p>	Economic Development	Finance & Contracts	2016	2018		

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Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Tablets in the Field</b> - Two grant coordinators are piloting use of tablets in the field including Michigan Grant System (MGS), forms, photos, and other functions. Staff will be saving time by removing the need to scan paper files into MGS and by enabling users to directly type meeting notes into the form on the tablet. This eliminates the need for paper notes and time typing those notes to share electronically.</p>	Economic Development	Finance & Contracts	2016	2018		
<p><b>In House Cardio Pulmonary Resuscitation CPR and First Aid Training Certification and Recertification</b> - MDOT Employees become American Heart Association AHA CPR and First Aid Instructors to teach other MDOT employees. Money and time savings.</p>	Superior Region	Administration & Personnel	2016	2018	\$3,000	
<p><b>Add Adopt-a-Highway Forms to MDOT Website</b> - This will allow administrative staff to assist customers with routine calls or requests (i.e. form for safety video and clean-up sheets). This will improve customer service and free up time for Adopt-a-Highway coordinator.</p>	Superior Region	Administration & Personnel	2016	2018		
<p><b>Create a digital Sign Out Board for Superior Region</b> - "No matter where you are, as long as you have access to the internet, you can see at a glance if the person you need is on sick leave, annual leave, or where they are working on a particular day.</p>	Superior Region	Administration & Personnel	2016	2018		
<p><b>Create a Region Mailbox for Administrative Support Staff to Receive E-Mailed Invoices</b> - This would be a shared mailbox used by vendors that now prefer to send electronic invoices rather than mailing hard copies. This process is used by some offices for shared responsibilities, and this would offer good backup. Advantages: Less costly for vendor; quicker receipt time by MDOT; eliminates e-mailed invoices being sent to a specific person. This recently occurred and the person was on an extended leave. Therefore no one was receiving the invoices.</p>	Superior Region	Administration & Personnel	2016	2018		

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<b>Create a Region Wide Communication Protocol for Internal or External Customers</b> - "Creates consistency throughout the region in how MDOT staff interacts with customers.	Superior Region	Administration & Personnel	2016	2018		
<b>Customer Service Business Card</b> - Customers that come to the office get a business card with phone numbers of Transportation Service Centers.	Superior Region	Administration & Personnel	2016	2018		
<b>Informational Flyer/Poster for Contract Item Procurement</b> - Simple informational flyer/poster with pictures that list contract items and how to procure them, OfficeMax, MSC Industrial Supply, etc.	Superior Region	Administration & Personnel	2016	2018		
<b>Custom-Made Nuclear Gauge Transport Box for 2015 GMC Trucks</b> - Stacy Sutela, Brian Johnson, and Kenneth Crawford were responsible for the following innovation: a problem with mounting the standard nuclear density gauge transport box was encountered when attempting to install it in the 2015 GMC 1500 half-ton Extended cab pickups: it would not fit on the front passenger floor, which was the only approved location for the box. Kenneth Crawford, St Ignace garage, fabricated a steel bracket to mount a 'donut' in the rear passenger compartment. Subsequently, Construction Field Services staff verified the safety of the new installation by taking radiation output readings with the gauge in the new location, and the readings indicated that exposure readings were the same, or better than, the front-passenger location. The 2015 GMC trucks can now safely transport nuclear gauges to job sites.	Superior Region	Highway Construction	2016	2018		

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<b>Temporary Sign Quantity Calculator in Excel</b> - For design - Calculates and documents the quantity of temporary signs used on a project. It helps eliminate double counting of signs used in multiple maintaining traffic sequences (e.g., a shoulder closure and lane closure called for on the project but not at the same time, but can use signs from one sequence in the other, thus only need one set of Road Work Ahead signs for the project) and documents how the quantity of signage was achieved.	Superior Region	Highway Construction	2016	2018		
<b>Making Utility Coordination Requests Electronic</b> - We no longer send hardcopies of anything in the mail. Our utility Coordination Engineer is using e-mail notifications which gets a more timely response. We are using the MDOT file transfer protocol (FTP) site to get large plan files to folks outside MDOT. Quicker service, paperless, less labor.	Superior Region	Highway Design	2016	2018		
<b>Sign Request Tracking Spreadsheet</b> - Tracking Spreadsheet for all sign requests from the initial call to installation. Provides a way to follow the status of a sign request and to ensure it gets installed, if approved.	Superior Region	Highway Operations	2016	2018		
<b>Longitudinal Joint Distress Preventative Treatment Using Mastic &amp; Modified Microsurfacing</b> - Mastic and modified microsurfacing application for repair of longitudinal joints on composite pavements.	Metro Region	Highway Maintenance	2016	2017	\$2,000,000	
<b>Work Zone Deficiency Report</b> - Use of PowerPoint to provide a brief reminder of the three most frequent work zone deficiencies identified in the previous month.	Metro Region	Highway Operations	2016	2017		
<b>Salt Adjustment Spreadsheet</b> - Utilizing a salt adjustment spreadsheet to improve accuracy and elimination of human error. Spreadsheet calculates excessive moisture and sieve analysis and determines final dollar adjustment and adjusted unit price.	Bay Region	Administration & Personnel	2016	2016		

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<p><b>ArcGIS Online</b> - Annette has been using ArcGIS Online for mapping projects and road condition for ridearounds and project selection for quite some time. She now has been working with Dan Sokolnicki and the Pavement Management Group to use ArcGIS Online for the annual Remaining Service Life (RSL) review. This year, there will be some pilot projects with Annette and North Region to see how it works.</p>	Bay Region	Geographic Information Systems & Mapping	2016	2016		
<p><b>Temporary Ramps for Emergency Access Points</b> - Temporary ramps for emergency access points on I-75 construction project at Baker, King and Hess in Saginaw County. Quicker response time for direct access for emergency responders to access I-75 with temporary lane configurations for the reconstruction project. No cost savings.</p>	Bay Region	Highway Construction	2016	2016		
<p><b>Airless Tires on Skid Steer</b> - Airless tires on skid steer and overall the unit has functioned better than expected and provided more stability when maneuvering within a work zone while giving the operator just as smooth of a ride as a pneumatic tire. Bay Region operators reported that the Tweel tire has met all operational needs and has a major advantage over a pneumatic tire. The region approved this item for special applications such as skid steers for bridge work. provide greater stability, traction, durability, and not requiring maintenance due to air loss.</p>	Bay Region	Highway Maintenance	2016	2016		
<p><b>Boost Tanks</b> - Boost Tanks installed at West Side Garage this winter. The West Side Garage purchase of larger tanks, which eliminated the need to do partial or split loads, which was an additional \$500 per filling. By placing the new tanks in an area that is more accessible will save loading time for the Transportation Maintenance Workers. \$1,000/year in trucking cost savings and \$135.60/year in labor costs (varies depending on season).</p>	Bay Region	Highway Maintenance	2016	2016	\$1,135	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Combined Maintenance Forces</b> - Mt. Pleasant direct work force did preparatory work and City of Midland contract forces completed the work. This allowed for each work group to concentrate on the work they are most efficient at, timeliness and utilizing available equipment.	Bay Region	Highway Maintenance	2016	2016	\$3,200	
<b>Laser Distance Measuring Device</b> - The Laser Distance Measuring device measures separations, but could also be used to measure salt, crack in culverts, right of way fence, etc. (the device figures volume).	Bay Region	Highway Maintenance	2016	2016	\$800	
<b>Living Wind Break &amp; Installation</b> - Living wind break and installation. Bay Region is receiving 5,000 seedlings from the Michigan Department of Natural Resources to plant in Bay Region right-of-way (ROW) as wind breaks. Tree planting in the ROW can be very expensive, so we are partnering with local Conservation Districts to get them planted.	Bay Region	Highway Maintenance	2016	2016		
<b>Mile Marker Sign Innovation</b> - Installation of mile marker signs using square tube and breakaway foundation or 3 # post versus traditional slip mate. Installed along US-127 Clare area. Material Cost Savings (\$60 vs. \$600) and easier and faster for crews to install and repair.	Bay Region	Highway Maintenance	2016	2016	\$600	
<b>Salt Inventory System</b> - Approximately eight years ago, Mike Metiva developed a salt inventory system for use by direct and contract forces that is evaluated and improved each year. This has helped the Bay Region go from an average usage of 72,000 tons to about 49,000 tons per year. Though previously always off, our inventory has been perfect for the last eight years. In addition, we are the only region where salt usage reports, stores inventory, and local area programs salt usage reporting match every year. Salt cost savings per year = \$1,380,000 (assuming average salt cost of \$60/ton).	Bay Region	Highway Maintenance	2016	2016	\$1,380,000	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Winter Operations Workshop</b> - Holding a winter operations workshop for sharing of innovations. (tow plow, Road Weather Information System, Global Positioning System/Automatic Vehicle Location, Maintenance Decision Support System (MDSS), salt inventory, etc.	Bay Region	Highway Maintenance	2016	2016		
<b>Real Time Help for Transportation Technicians in High Crime Areas</b> - Pilot program issued 800 megahertz radios to two techs in each of six Transportation Service Centers that service Detroit, Taylor, Macomb, Oakland, Bay and Davison. These radios are the same as the Michigan State Police (MSP) and have the capacity to connect the Techs to the MSP with the click of one panic button. The call goes directly to the MSP or to one of our Michigan Intelligent Transportation Systems Centers in Detroit or Lansing where MSP are also located. The radio gives a Global Positioning System location of the Tech. The roll out and training for these radio's is 8/16/16. The program will be tracked with quarterly surveys to the users as to the effectiveness and cost/time analysis. If successful, it will spread to other locations and other departments such as the Michigan Departments of Environmental Quality and Natural Resources, etc.	Bay Region	Highway Safety	2016	2016		
<b>iPad Service</b> - Removed lines associated with iPads and making them Wi-Fi only format in order to save monthly fee on each active iPad.	Bay Region	Other	2016	2016	\$2,400	
<b>iPhone Wi-Fi Hotspot</b> - Utilize iPhone Wi-Fi hotspot and removed service on multiple MiFi units for certain staff and adding the Wi-Fi hotspot option on their cellphones.	Bay Region	Other	2016	2016	\$1,600	
<b>Local Agency Workshop</b> - Holding a Local Agency workshop for face to face recognition of local agency personnel.	Bay Region	Other	2016	2016		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Long Distance Phone Service</b> - As part of Port Huron office closure and bills being transferred, Desira has followed up on numerous things and is deciding: Do we need this anymore? Can we cancel? What is this even for? Macomb had been paying monthly bills to Sprint for long distance. They were only about \$20+ per month. We (Huron) already had three of the four telephone lines disconnected, since building is now vacant. Kept one line for the security system. Do not need long distance on lines that have been disconnected. Suggested moving long distance coverage to phone service retained for security line (AT&amp;T, Frontier?) versus paying a separate bill. Thought there might also be a cost reduction from reducing bills from two to one simply based on processing costs. Following up with Tammy Walderzak. If cost savings identified, will follow up with other Bay Region Transportation Service Centers and with Keith Belonga to see if more savings are potential region/state-wide.</p>	Bay Region	Other	2016	2016		
<p><b>Mobile Office</b> - Since Huron Transportation Service Center (TSC) is literally a virtual office, Bob Otremba has developed a mobile office in his truck. He can do his job(s) from "virtually anywhere". Laptop, two monitors, cell phone with hotspot, portable printer, ProjectWise, Construction Permit System (CPS), and a tank of gas. For security reasons, he pulls most of this out of his truck on a daily basis. He also has standard tools (shovel, wheel, buckets) in the back of his truck. His job is untraditional, Huron TSC has small number of staff and largest number of lane miles in the state. Bob does permits, materials, construction, traffic, maintenance, design, warranties, and responds to customer's inquiries. Benefits MDOT, can do what he needs wherever he is. Saves time and cost.</p>	Bay Region	Other	2016	2016		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Polycom Use with iPhone</b> - Utilizing a plug that goes from an iPhone to Polycom so we can reduce the number of phone lines in most region office conference rooms. In addition, figured out we could combine multiple dialers on same phone line (sump pump alarm is combined with elevator and fire alarm will be combined with fax line).	Bay Region	Other	2016	2016	\$2,940	
<b>Streamline Business Team Meetings</b> - Streamline the Business Team Meetings by conference call for Traffic Safety Operations Business Team Meeting. Bay Region wide. Call was 13 minutes for updates. Saved two hours of commute time for Davison and Mt. Pleasant staff.	Bay Region	Other	2016	2016		
<b>Virtual Office</b> - No facility costs and employee drive times with a virtual office.	Bay Region	Other	2016	2016		
<b>Virtual Safety Meetings</b> - Since Huron Transportation Service Center employees are virtual (spread across area), most of our meetings/ communications are conference calls. To ensure we are sharing safety topics, we are going to have secretary e-mail safety topics to employees. After reading the topics, they will electronically sign the Attendance Form 0037 in ProjectWise.	Bay Region	Other	2016	2016		
<b>See Conference Room Screen</b> - The 2nd floor North Central conference room has two lights that are mounted directly above the projection screen. The effect is that the image projected onto the screen is washed out. I'm having difficulty seeing anything that is projected onto the screen. I'm not the only one that has expressed this concern. I don't know if this is an Americans With Disabilities Act issue. Regardless, I'm asking to have the two lights removed or disabled.	Bureau of Development	Other	2016	2016	\$10	\$10

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Bridge Core Element Calculations</b> - Bridge Core Element Calculations - A spreadsheet used to determine quantities and element codes for MiBridge program	Metro Region	Highway Maintenance	2016	2016	\$70,000	
<b>SRT Guardrail Collection</b> - The team utilized GIS technology to locate and identify SRT guardrail endings and monitor corrective actions.	Metro Region	Highway Maintenance	2016	2016		
<b>State Trunkline Funds (STF) Bond Refinancing</b> - Refinanced \$64.5 million in State Trunkline Funds bonds to achieve savings of \$14.8 million over remaining life of the bonds based on present day value.	Statewide	Finance & Contracts	2016	2016	\$14,765,709	
<b>Lansing Transportation Service Center (TSC) General E-Mail Account</b> - Lansing Transportation Service Center (TSC) e-mail account. Centralized communication with vendor, centralized record of communication (electronic records that do not disappear if an employee leaves). All online vendor accounts to be registered with Lansing TSC e-mail not employee e-mail. Helps with coverage. Centralized storage of contact information and correspondence with external clients/business partners. New way for the public to communicate with the Lansing TSC.	University Region	Administration & Personnel	2016	2016		
<b>P-Card Checklist</b> - P-Card Checklist Development & Revision of P-Card Reference Binder. P-Card holders will be able to process P-Cards with zero or minimal procedural errors by using the checklist. Conciseness, brevity without sacrificing quality. There are many requirements to comply with and details needing follow-up. To achieve completed checklists and use them as a resource when historical information is needed.	University Region	Administration & Personnel	2016	2016		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Vendor Comparisons</b> - Huron TSC saved \$31.00 monthly to switch to CenturyLink from AT&T on the long distance bill for the St. Clair Lift Bridge phone. Checking vendor rates could result in savings to MDOT.	Bay Region	Bridges & Structures	2016	2010	\$372	\$372
<b>Plantings Located on Plans</b> - Planting locations of trees and shrubs will be detailed on the project plans. This will alleviate some of the last minute work required by construction.	Bay Region	Highway Design	2016	2010		
<b>Soil Rig Borrowing</b> - When blow counts are required for soil analysis, consider borrowing other region's equipment prior to consulting out.	Bay Region	Other	2016	2010		
<b>Salt Reporting</b> - Began using a salt reporting schedule created by a Maintenance Superintendent. By tracking salt usage monthly, how much salt was used per winter storm event can be known. This helps track remaining stored salt levels. This system also makes it possible to determine the rate of salt being applied so adjustments can be made to stay in alignment with required/recommended usage.	Bay Region	Highway Maintenance	2015	2020	\$1,000,000	
<b>Average Annualized Daily Traffic (AADT) Map Process</b> - Average annualized daily traffic (AADT) volume maps have been provided in .PDF format. Staff substituted an interactive Geographic Information System (GIS) application and reduced staff time to provide the information by 90% from 400 hours to 40 hours.	Bureau of Planning	Asset Mgt. & Planning	2015	2020	\$12,000	
<b>Geographic Information System (GIS) Map Service</b> - Staff implemented a State of Michigan Geographic Information System (GIS) Map Service allowing public access to multiple years of traffic volume estimates, improving access and reducing staff time spent on data requests.	Bureau of Planning	Asset Mgt. & Planning	2015	2020	\$5,000	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Combine Aggregate Test Reporting</b> - Combined two MDOT forms, form 1901 Aggregate Gradation Test and form 1900 Gradation Test Summary, into one self linking fillable form. Benefits include a typed test report, reduced calculation errors, reduced sample and testing, a PDF is stored for the project file (no scanning), and a yearly summary is retained of how each aggregate classification for each pit is performing providing a historical record. Reduced testing is allowable based on a two year quality history and not possible without a historical record.	Grand Region	Highway Construction	2015	2020		
<b>Consultant Full Construction Engineering Checklist</b> - Consultant Full Construction oversight checklist was developed for MDOT Transportation Service Center to document inspections conducted by MDOT staff.	Grand Region	Highway Construction	2015	2020		
<b>Cross Over Staffing</b> - Construction staff is part of the workload discussion with Permit and Traffic & Safety (T&S) staff. Construction staff has been able to assist with the work in Construction Permit System (CPS) when there is a Permit/T&S workload overload.	Grand Region	Highway Construction	2015	2020		
<b>Department Specific E-Mail Addresses</b> - Creating general department e-mail addresses improves and expedites the submittal process via ProjectWise. Example would be Office Tech Inbox.	Grand Region	Highway Construction	2015	2020		
<b>Door to Door Public Outreach</b> - For larger projects, detours, significant traffic changes. The public appreciates the personal connection. This minimizes the pushback from the public prior to start of construction. Brochure was developed with project staff contact information.	Grand Region	Highway Construction	2015	2020		
<b>Field Builder Shadow File Development</b> - Consistent process for developing Field Manager for Construction Manager General Contractor contracts.	Grand Region	Highway Construction	2015	2020		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>ProjectWise Shortcuts for eConstruction</b> - Shortcuts that reduce the number of screens to sign and change the state of a document.	Grand Region	Highway Construction	2015	2020		
<b>Ride Quality Spreadsheet</b> - Spreadsheet allows for Ride Quality raw data to be input, analyzed and sorted.	Grand Region	Highway Construction	2015	2020		
<b>Assist/Share Gov Subscriptions with Rest Area Janitorial Supervisors</b> - Expedite distribution of flag lowering details.	Grand Region	Highway Maintenance	2015	2020		
<b>Density Gauge Mounts</b> - Newer trucks have aluminum floors and can't be modified as compared to older steel floors.	Grand Region	Highway Maintenance	2015	2020		
<b>Kent County/Grand Rapids Transportation Service Center Maintenance/Private Partnership</b> - Lighting fixtures provided by Kent County/MDOT Maintenance and the electrical service provided by the Grand Rapids Rapid. This was done as part of an on going homeless area safety program.	Grand Region	Highway Maintenance	2015	2020		
<b>Laminated Driver Cheat Sheets</b> - Fueling instructions, Non-Fuel with fuel card, Preventative maintenance guidance.	Grand Region	Highway Maintenance	2015	2020		
<b>Snow Removal Guidelines</b> - Posting in the Rest Areas for Janitorial Staff	Grand Region	Highway Maintenance	2015	2020		
<b>Vehicle Dashboard Stickers</b> - Fueling Instructions	Grand Region	Highway Maintenance	2015	2020		
<b>Invasive Species/Harmful Roadside Plants Training Program</b> - Training program for invasive species and harmful roadside plants. Used document in spring 2015 as training tool and conducted training for construction staff and youth corps. Made hard copies and distributed to youth corps, co-ops and interested MDOT construction staff.	Grand Region	Highway Operations	2015	2020		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Non-Motorized Focus for Work Zone Reviews</b> - Created Bicycle-specific checklist to look at for work zones. Note: Kent county/MDOT perform 1120 acceptance reviews for non motorized path projects on bike.	Grand Region	Highway Operations	2015	2020		
<b>Tree Mitigation Guidance Document</b> - Assist MDOT staff when it has been established MDOT is to be compensated with a tree planting due to removal of vegetation in the right-of-way (ROW) (billboard vegetation permits, ROW construction permits and illegal cut in the ROW). This will be used statewide.	Grand Region	Highway Operations	2015	2020		
<b>West Michigan Traffic Operations Center Outreach Video</b> - Creating a short video of what the Traffic Operations Center does to promote to incident management partners who don't come in for a tour. This will be useful to introduce TOC services to our new Counties as well.	Grand Region	Highway Operations	2015	2020		
<b>Zipper Merge Signs</b> - Graphic of the Zipper Merge to educate motorists.	Grand Region	Highway Safety	2015	2020		
<b>Rapid Chloride Test Kit</b> - Field analysis of chloride in reinforced concrete is a five minute test with accuracy comparable to the AASHTO T260 laboratory test. Quick determination of chloride content allows quick assessment of issues related to reinforcement corrosion. Typically samples sent to lab cost \$100 each with a two week turnaround. This method has a unit cost of \$10. Ten to 15 samples are typically taken for a chloride distribution map for each structure investigated. At least three structural investigations per year are anticipated for 2016-2020. (2015 savings: 3 structures x 10 samples x \$90 = \$2700)	Statewide	Bridges & Structures	2015	2020	\$2,700	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Extend Project Limits to Close Gap on Pavement Markings</b> - One possible best practice/innovation is related to the US-2/US-141 reconstruct that will take place next year. US-141 is 1.24 miles long from the Wisconsin border to US-2. North portion of US 141 has recessed markings from the 2011 reconstruct and south portion has waterborne markings. South portion is susceptible to being missed from the yearly paint contract and has been missed in the past. We tried to set up recessed markings on the south portion of US-141 as part of the region wide paint contract but Lansing will not allow recessed markings on the region wide paint contract. As a result, we are extending the intersection project south to the Wisconsin border so we can place recessed markings on the southerly section of US-141 as part of the construction project. We will work through the environmental process and change the job limits in Michigan Architectural Project Information System (MPINS). We have approvals to do this. When the project is complete, all of US-141 will have recessed markings and we will no longer have to set up the short section down by the border bridge for waterborne each year.</p>	Superior Region	Highway Design	2015	2020		
<p><b>Storm Water Filtering System for Discharge Into Environmentally Sensitive Watersheds</b> - Developed for Moon Lake storm water: A filtering system comprised of 6A (3/4 inch to 1 inch) stone, sand, and sumps in structures. It will both filter and meter water until it becomes full and then the sumps will be the only retaining device. Plans and photos are available.</p>	Superior Region	Highway Design	2015	2020		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Dilemma Zone Detection System at US-2/41/M-35 and South Hill Drive in Gladstone</b> - Added a Dilemma Zone Detection System traffic signal at the intersection of US-2/41/M-35 and South Hill Drive in Gladstone. This system detects vehicles approaching the signal too fast on US-2/41/M-35 and extends the all-red phase of the signal. Safety benefit by allowing vehicles traveling too fast on US-2/41/M-35 to travel thru the intersection while keeping side street traffic from entering intersection by extending the all-red phase of the signal.</p>	Superior Region	Highway Safety	2015	2020		
<p><b>Portable Video Equipment to Collect Vehicle Counts</b> - A dash cam can provide data that would otherwise take two people to collect in work zone inspections, operations at intersections or projects with new geometry, driver perspective data for signing and pavement markings. Reduces employee exposure to traffic/amount of time spent in traffic.</p>	Southwest Region	Highway Operations	2015	2018		\$2,700
<p><b>Add Link to Region SharePoint Page for Latest State of Michigan Office Max Catalog</b> - <a href="http://inside.michigan.gov/mdot/payments-purchasing/Procurement%20Cards/Pages/default.aspx">http://inside.michigan.gov/mdot/payments-purchasing/Procurement%20Cards/Pages/default.aspx</a> The above link is to the latest State of Michigan OfficeMax catalog. Dawn Gustafson suggested posting the catalog or link on the region SharePoint page. Is it possible to add names, e-mail addresses and phone numbers of those people who can place orders?</p>	Superior Region	Administration & Personnel	2015	2017		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Paving Spreadsheet/Book</b> - Developed by Larry Biekkola and Stacy Sutela, the paving book was generated to help track paving operations without paper forms. The paving book requires the inspector to input stations for individual sublots and random numbers for loose mix sample and cores. Once the sublot tonnage is reached and station is input into the book the core locations, transverse and longitudinal locations will automatically be calculated resulting in less time needed to cut cores. The paving book allows paving information to be transferred between inspectors without having to actually be on site so paving information will be consistent and up to date for each inspector. This paving book will generate a summary sheet that can be inserted into the project file allowing tracking of paving operations without paper forms. This paving book could save an estimated 10 hours of inspection on a 2 week paving project.</p>	Superior Region	Highway Construction	2015	2017		
<p><b>Project Submittal Spreadsheet</b> - Used for the Ironwood project, the Project Submittal Spreadsheet is an innovation/best practice that our construction staff developed to help both the contractor and Transportation Service Center (TSC) track contractor submittals. This is the third year we have been using it and we have one for every project. These are project specific and are reviewed at the progress meetings. This is especially helpful when we are working with a new contractor.</p>	Superior Region	Highway Construction	2015	2017		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Monitor Statewide Warranty Administration Database (SWAD)</b> - Monitor Statewide Warranty Administration Database (SWAD) weekly/daily to ensure Transportation Service Centers (TSCs) are completing interim inspections on time and final inspection before the warranty expires. When an inspection date or warranty acceptance date have not been entered into the SWAD database, I am contacting the TSC SWAD users to make sure inspections are done and information has been entered into the database.</p>	Superior Region	Highway Design	2015	2017		
<p><b>Multiple Views in Microstation/Gopal for Plan Sheet Creation</b> - Alignment, removal, construction, drainage sheets are all created from one file with one border cell. This innovation is used in conjunction with the newly renovated Titleblock macro and use of container files for level controls. The use of multiple views allows for cutting of sheets within the same clip limits to be completed at one time. Shared labels are only placed once. Any changes, errors, or omissions only need to occur one time. Consistency between sheets of a similar station range is automatic since they are the same file.</p>	Superior Region	Highway Design	2015	2017		
<p><b>Extending Oil Changes Intervals on 2004 Winter Maintenance Trucks</b> - Extending intervals between oil changes on 2004 and potentially other Winter Maintenance Trucks at the St Ignace Maintenance Garage only.</p>	Superior Region	Highway Maintenance	2015	2017	\$1,822	
<p><b>Digitizing 1992-2006 Capital Preventive Maintenance (CPM) Proposals and storing in ProjectWise</b> - Digitized 1992-2006 Capital Preventive Maintenance (CPM) Proposals and stored them in ProjectWise for quicker access to CPM project information.</p>	Bureau of Field Services	Asset Mgt. & Planning	2015	2016	\$750	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Freeway Lighting Public-Private Partnership</b> - A public-private partnership contract (15 years) for upgrading and maintaining freeway lighting in the Detroit tri-county area was finalized. The lighting/fixture upgrade portion of the contract will result in an overall savings to MDOT of approximately \$13 million. The freeway lighting system will be improved over a 2 year period. Operations and maintenance responsibility will remain with the contractor and commence after improvements are complete and continue for the remaining 13 years.</p>	Executive Office	Finance & Contracts	2015	2016	\$13,000,000	
<p><b>Geotechnical Investigations for Signal &amp; Strain Pole Foundations</b> - Soil conditions vary by site, but experienced soils crews know and understand site conditions better than anyone. By giving soils crews latitude in varying the depth of soil exploration on-site, sufficient information can be gathered, while improving productivity and minimizing data to quality assurance, store and manage while providing safe facilities for the driving public. Savings were realized over a several month period where many test hole depths were reduced.</p>	Metro Region	Highway Design	2015	2016	\$15,000	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Belle Isle Snow Removals</b> - Snow removal services are performed by a private contractor on Belle Isle. This performance based contract involves the contractor handling all snow removal operations without the need for MDOT to call the contractor to provide services. The contractor is made aware of the weather conditions that require them to come out to provide services at the start of the contract. After that they are required monitor weather conditions on the island and remove snow when needed. MDOT will track when the Contractor is on the island using the Collector App. Collector is connected to ArcGIS online and uses GPS positioning to track the location and time the Contractor was removing snow. For future reference, MDOT can go back to any day and time to see if the Contractor was on Belle Isle. This performance based contract saves time and money for MDOT since we will not be required to continuously monitor the island and comes at a cheaper cost.</p>	Metro Region	Other	2015	2016		
<p><b>Waterless Device for Men's Room</b> - Waterless device in Men's bathroom</p>	University Region	Administration & Personnel	2015	2016	\$100	
<p><b>Secretary Share</b> - Efficient use of staff. Transportation Service Center secretary also serves as customer service at the Clare Welcome Center.</p>	Bay Region	Administration & Personnel	2015	2015	\$15,000	
<p><b>Bridge Approach Downspout</b> - Bridge approach downspout with integral curb and gutter for less erodible design and easier on snow plows. The downspout is constructed at an angle to the roadway to minimize any flow getting past it. Also taper the approach side to allow the snowblades to blade across it easier.</p>	Bay Region	Bridges & Structures	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Bridge Unit Scoping With Current Construction Work</b> - Bridge Unit scoping of I-75 bridges during overnight closures with current construction work for safer lane closures.	Bay Region	Bridges & Structures	2015	2015	\$8,000	
<b>Utilize ArcGIS Programs in the Office &amp; on the Road</b> - For fast, easy access to historic project information, condition data, and future projects. Electronic map helps staff quickly find past projects, provide convenient access to information for project selection reviews and correlate location with condition and project information.	Bay Region	Geographic Information Systems & Mapping	2015	2015	\$1,800	
<b>Best Practice of Approved Concrete Mix Designs</b> - To re-utilize best practices established regarding potential reuse of approved concrete mix designs amongst various projects by supplier. Estimated 50 percent savings on reviews. Saving time and money in concrete mix approvals. Win-Win for MDOT and Contractors.	Bay Region	Highway Construction	2015	2015	\$5,000	
<b>Use of Temporary Light Emitting Diode (LED) Pavement Markings</b> - Temporary LED pavement markings placed in the lane shift transitions. This includes a small solar chip that is utilized to energize the LEDs in the dark. Increases safety to motorists while traveling through work zones at night and helps avoid traffic incidents in work zones	Bay Region	Highway Construction	2015	2015		
<b>Utilize PowerGEOPAK SS3 for Multi-Lane Roundabout Design</b> - Utilize PowerGEOPak SS3 to design and model a multi-lane roundabout. In addition to the plan set and 3D data for construction, 3D pdfs are being used to easily convey the design to stakeholders.	Bay Region	Highway Design	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Road Watch Sensor Mount</b> - Location installation took less time, protected by being tucked in behind the mirror and easy to fabricate. Mounting simple: Pop off rubber panel in the cowl, remove one bolt from the hood hinge and attach bracket using existing bolt. No need to drill or alter any of the vehicles body panels.</p>	Bay Region	Highway Maintenance	2015	2015	\$20,000	
<p><b>Use of Hot Mix Asphalt for Winter Pothole Patching</b> - Using Hot Mix Asphalt (HMA) for patching potholes over the winter. Use of HMA is significantly less expensive and last longer than cold patch. East and West Side Garage's will order together to further reduce cost. Working with Yeager Asphalt for supply.</p>	Bay Region	Highway Maintenance	2015	2015	\$4,000	
<p><b>Using Liquid Emulsion for Chip Sealing</b> - Saginaw West Side Garage is using liquid emulsion from Michigan Paving &amp; Materials Company. Saves time and money when chip sealing for cracks and potholes with our Rosco machine. AMS Seal SP is purchased in cardboard totes that contain 320 gallons of emulsion and weigh approx. 2,700 pounds. As long as the temperatures remain above freezing, the totes can be stored at the garage. The totes stay warm for approximately four days and are usable for months after purchasing. This product allows the Transportation Maintenance workers to fill our Rosco machine at the garage by lifting the tote with a loader, attaching a fill line and draining the product into the top of the Rosco machine. We typically purchase two to four totes at a time, depending on work load. By storing on site, we experienced decreased travel time to obtain products and increased the productivity of Transportation Maintenance workers and equipment. The West Side Garage also stores H1 blue stone at the garage.</p>	Bay Region	Highway Maintenance	2015	2015	\$628	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Guardrail Long Span Special Provision</b> - Approval of the guardrail long span special provision allows spanning of culverts with guardrail up to 25 feet. The current use of W-Beam Backed Guardrail (Standard Plan R-72) allows spanning up to 18.75 feet. The use of Guardrail over Low-Fill or Slab Culverts (Standard Plan R-73) requires drilling anchor bolts into or through the culvert. The Guardrail Long Span was successfully crash tested and approved for use in other states. Thomas Anderson and Erik Tamlyn from Davison Transportation Service Center worked with Carlos Torres to develop the special provision detail for use in Michigan.</p>	Bay Region	Highway Safety	2015	2015		
<p><b>Light Emitting Diode (LED) Pavement Markings In Crossovers/Lane Shifts</b> - Light Emitting Diode (LED) pavement markings are being used in crossovers/lane shifts on I-75. They are temporary, raised pavement markings that use a solar square. Better visibility for driver due to angle on Michigan left turn. Contact Brian Ulman for additional information.</p>	Bay Region	Highway Safety	2015	2015		
<p><b>Maintenance of Traffic (MOT) Taper</b> - Maintenance of Traffic taper on US127, when going from a single lane ramp exit to a double lane section. Takes only one lane by shifting traffic to the left to avoid driver confusion. In a Two lane ramp location with required maintenance, only open one lane to traffic, thereby eliminating driver confusion and merging.</p>	Bay Region	Highway Safety	2015	2015		
<p><b>Shoulder Closure for Ramps</b> - Shoulder closure for ramps. Safety for workers and public.</p>	Bay Region	Highway Safety	2015	2015		
<p><b>Stop Signs Angle at Michigan Left Turns</b> - Angle on stop signs at Leaton Road Blvd. Better visibility for driver due to angle on Michigan left turn.</p>	Bay Region	Highway Safety	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Guest Speaker at Design-Build Team (DBT) Meeting</b> - Have a guest speaker at monthly DBT Information and Idea generating meeting.	Bay Region	Other	2015	2015		
<b>Huron Service Area</b> - Developing the first virtual MDOT office. Border adjustments of the Regional Prosperity Initiative provide the opportunity to implement a new way of providing customer service. Transportation services normally done by residents visiting a brick and mortar office will now see MDOT go to the customer, local governments and field location on the road or bridge to solve issues. This will expand MDOT use of mobile information technology tools in the field, keeping staff connected to databases and web links in other locations. High performing field staff responsible for multiple transportation services in a geographic area, working independently is the new operational model. Working out of a vehicle, alternative office or home can be a way to provide transportation services more efficiently than a conventional direct office supervision model.	Bay Region	Other	2015	2015		
<b>Paperless Meetings for Development Business Team</b> - All information is placed in a ProjectWise folder and put on screen during the meeting. Save time and expense of printing individual copies.	Bay Region	Other	2015	2015	\$250	
<b>Using Facebook</b> - Using <i>Facebook</i> to connect with people when looking for owners in the Real Estate Process. Fast and easy way to connect with people.	Bay Region	Real Estate	2015	2015		
<b>Utilize Company Websites</b> - Utilize company Websites to conduct business. Some real estate title companies are online and their Website can be utilized. Correspondence, title work, and information available to see saving time and phone calls.	Bay Region	Real Estate	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Add Sufficiency Data to Pavement Historical Database (PHD)</b> - Added Sufficiency data to Pavement Historical Database (PHD) to improve efficiency of data access.	Bureau of Field Services	Asset Mgt. & Planning	2015	2015		
<b>Annual Friction Data</b> - Annual Friction data was reported to regions in a graphical format for ease of use.	Bureau of Field Services	Asset Mgt. & Planning	2015	2015		
<b>Digitizing 1991-2005 Pavement Management System Video Tapes</b> - Digitizing 1991-2005 PMS Video Tapes internally instead of contractor/consultant.	Bureau of Field Services	Asset Mgt. & Planning	2015	2015	\$95,000	
<b>Laser Based Pavement Texture Measuring Device</b> - Laser based pavement texture measuring device	Bureau of Field Services	Asset Mgt. & Planning	2015	2015		
<b>Pavement Historical Database (PHD)</b> - Add mapping functions to Pavement Historical Database (PHD).	Bureau of Field Services	Asset Mgt. & Planning	2015	2015	\$500	
<b>Pavement Historical Database (PHD)</b> - Creation of spreadsheet form assisting users with data entry into the Pavement Historical Database (PHD).	Bureau of Field Services	Asset Mgt. & Planning	2015	2015	\$2,000	
<b>Field Implementation of Magnetic Imaging Tomography (MIT) Scan</b> - Field implementation of Magnetic Imaging Tomography (MIT) scan T2 pavement thickness measurement device on the I-75 Monroe County reconstruction project.	Bureau of Field Services	Finance & Contracts	2015	2015		
<b>Digital Temperature Data Loggers</b> - Provides digital temperature data loggers to University, North and Superior Regions materials quality assurance labs for use in concrete test cylinder storage tanks.	Bureau of Field Services	Highway Construction	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Established Requirements for Portable Plants</b> - Using reclaimed asphalt pavement (RAP) with no established RAP stockpile.	Bureau of Field Services	Highway Construction	2015	2015		
<b>Hot Mix Asphalt (HMA) Paving Operations Certification</b> - Changed from perpetual to a five year certification to ensure up to date training on hot mix asphalt (HMA) practices for those involved with HMA products.	Bureau of Field Services	Highway Construction	2015	2015		
<b>Implementation of New Local Agency Acceptance Specification on National Highway System Routes</b> - Improves quality by strengthening testing and sampling requirements for hot mix asphalt and by revising tolerance limits and penalty structure.	Bureau of Field Services	Highway Construction	2015	2015		
<b>Modified Pavement Milling Specification</b> - New specification allows maintaining traffic on a milled surface and reduces user delay costs.	Bureau of Field Services	Highway Construction	2015	2015		
<b>Regressed Air Voids</b> - Regressed air voids to 3% in field for all mixes results in more asphalt in mixes, reduces surface cracking and increases pavement performance.	Bureau of Field Services	Highway Construction	2015	2015		
<b>Super Air Meter</b> - Participation in a national round-robin correlation study to de/refine operating procedures/specifications for measuring the quality of entrained air-void system in fresh concrete.	Bureau of Field Services	Highway Construction	2015	2015		
<b>Surface Resistivity Meter</b> - Participation in a national round-robin correlation study to de/refine operating procedures/specifications for measuring the quality of entrained air-void system in fresh concrete.	Bureau of Field Services	Highway Construction	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Thermal Imaging Camera</b> - Thermal imaging camera technology for inspection during bridge construction used to ensure grouted ribs for the Bridge in a Backpack were fully filled. Without this device, risk of underfilling the grouted ribs increases, jeopardizing load carrying integrity of structure.	Bureau of Field Services	Highway Construction	2015	2015		
<b>Warranty Improvement Team</b> - Statewide team reviews warranty audit findings and develops improvements to warranty program. These include form letters and timelines to insure timely completion of corrective action, revising the Statewide Warranty Administration Database user guide to be more comprehensive.	Bureau of Field Services	Highway Construction	2015	2015		
<b>Implementation of Mechanistic-Empirical Pavement Design</b> - Implementation of Mechanistic-Empirical (ME) Pavement Design for reconstruct designs. ME is the latest generation of pavement design methodologies. It utilizes the theories of mechanics of materials to predict a pavement's response to load. This is then correlated into accumulated damage over the design life and results in predicted distresses over time. Climatic conditions are taken into account through the material properties of constituent pavement layers. Finally, the models used to predict distresses are calibrated using observed distress amounts (the empirical portion of the name).	Bureau of Field Services	Highway Design	2015	2015	\$290,000	
<b>Digitizing Aggregate Files</b> - Scanning historical aggregate file records to enhance efficiency and better service future data searches.	Bureau of Field Services	Other	2015	2015		
<b>Ground Penetrating Radar &amp; Falling Weight Deflectometer</b> - Ground Penetrating Radar and Falling Weight Deflectometer equipment used to assist detection of voids under pavement.	Bureau of Field Services	Other	2015	2015	\$1,000	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Ground Penetrating Radar and Falling Weight Deflectometer Vehicle</b> - First year of using Ground Penetrating Radar and Falling Weight Deflectometer combined into one unit.	Bureau of Field Services	Other	2015	2015	\$2,500	
<b>Robotic Linear Traverse</b> - 3D printed parts and open source software to replace Linear Traverse machine used to conduct Hardened Air Testing on concrete.	Bureau of Field Services	Other	2015	2015	\$17,000	
<b>Screening Tool for Vibration Sensitive Soils</b> - Vibrations from pile driving operations can damage underground utilities or cause settlement in foundations of nearby structures. In MDOT research project OR10-046, researchers developed a simpler and more accurate method for estimating vibration dissipation as distance from pile driving increases and predicting where ground settlement will occur. A software tool was developed to identify troublesome sites and avoid damage to nearby structures.	Bureau of Field Services	Other	2015	2015		
<b>Video Conferencing for Geotechnical Best Practice Meeting</b> - Implemented Skype for Business for semiannual meetings with region soils engineers. Ability to share slides and allow presenters from remote locations adds value to information exchange.	Bureau of Field Services	Other	2015	2015		
<b>ArcSpatial Database Engine (SDE) Security</b> - Created new user groups for the Arc Spatial Database Engine (SDE) to increase security of enterprise data.	Bureau of Planning	Asset Mgt. & Planning	2015	2015		
<b>Climate Vulnerability Geographic Information System Map Service</b> - Staff implemented an MDOT Geographic Information System (GIS) Map service, allowing staff easy access to Climate Vulnerability data for 2050 and 2100 as it relates to bridges, culverts and pavement under extreme heat and precipitation events.	Bureau of Planning	Asset Mgt. & Planning	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Interactive Americans with Disabilities Act (ADA) Curb Ramp Transition Plan</b> - Creation of an interactive Americans with Disabilities Act (ADA) Curb Ramp Transition Plan using Geographic Information System technology met FHWA and Attorney General requirements for providing data on future intersection enhancements based on the Five Year Transportation Program.	Bureau of Planning	Asset Mgt. & Planning	2015	2015		
<b>Lane Mile Inventory (LMI) to Road Asset Inventory (RAI)</b> - Lane Mile Inventory converted to Road Asset Inventory to add additional attributes from the retiring Sufficiency data collection.	Bureau of Planning	Asset Mgt. & Planning	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Pavement Data Collection Unit</b> - Designed &amp; developed automated receipt/logic-checking of sensor data. Implemented <i>PaveMaPP</i> functions for Divided Route, Latest Job Number and Latest Job Work Type to generate annual Pavement Condition File/Remaining Service Life (RSL) report. Designed/implemented segment-length-check warning for Quality Assurance (QA) Officer within <i>PaveMaPP</i> Collection Review module. Prepared scope to consolidate <i>Highway Performance Management System</i> (HPMS) required pavement surface condition measurement for non-trunkline segments within our contract. Leveraged <i>Pavement Surface Evaluation &amp; Rating</i> (PASER) data collected on trunkline ramps to support draft 2015 RSL estimates.</p> <p>Redesigned/Improved user-interface for <i>PaveMaPP</i> Latest and Historical Condition Data reports for easier multiple-location inputs. Initiated development of app to retrieve latest surface condition data for segments in the field.</p> <p>Recommended timely leveraging of <i>Transportation Asset Management System</i> (TAMS) straight-line diagram functionality for display/access of various pavement data/imagery. Developed concepts for leveraging database-query capabilities in <i>PaveMaPP</i> to enhance distress survey data QA process by scanning/checking incoming data as a whole dataset per each distress type and by total-quantity comparisons to prior survey data.</p>	Bureau of Planning	Asset Mgt. & Planning	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Solar Power Continuous Count Stations (CCS) Pilot</b> - Equipped seven Continuous Count Stations (CCS) locations with solar panels, batteries and controllers to power internet protocol modems and monitoring equipment. Testing adaptability of equipment for locations throughout state. Saves on traditional power contracts, administrative costs, power drops, services calls during weather events and provides long term sustainability.	Bureau of Planning	Asset Mgt. & Planning	2015	2015		
<b>Michigan Maintenance Rating System</b> - Provided access to system data through a mobile Geographic Information System application. Staff are able to update segment performance data in the field that directly populates the database. Eliminates paper collection and manual input.	Bureau of Planning	Highway Maintenance	2015	2015		
<b>Bike Map e-Store</b> - Per order savings due to switch from contracted map mailing service to e-store on almost 900 individual map requests contract costs. Processing time was also cut from six weeks to a two to four day turnaround.	Bureau of Planning	Non-Motorized	2015	2015	\$4,500	
<b>Video Conferencing Technology</b> - Used video conferencing technology at meetings in Upper Peninsula to minimize travel for non-MDOT participants.	Bureau of Planning	Non-Motorized	2015	2015	\$0	\$30,000
<b>Complete Streets Advisory Council</b> - Eliminated unnecessary Complete Streets Advisory Council meetings with concurrence of the committee and chair.	Bureau of Planning	Other	2015	2015	\$17,000	\$6,000

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Design Plan and Proposal Boilerplate</b> - Pilot initiative stores common information from plans/proposals as boilerplate for reference instead of publishing/storing it in every contract. If implemented will generate cumulative savings in server storage costs as the retention period is indefinite. The outcome also realizes increased efficiency in contract development and mitigates error, omission and inconsistency in contract language. First test letting of 24 project occurred in November 2015, saving \$112 (100 gigabytes at \$1.12/gig) of storage space in first month. Cumulative savings over 30 years for this single letting would be \$40,320 assuming no change in the cost of storage.</p>	Executive Office	Finance & Contracts	2015	2015		
<p><b>Electronic Consultant Invoicing</b> - Consultant invoices are now submitted, reviewed and routed (using workflows) in ProjectWise for approval and initiation of payment. Savings realized by system document management resulting in more efficient payment processing.</p>	Executive Office	Finance & Contracts	2015	2015		
<p><b>Combined Signage/Delineation Installation</b> - Combine installation of enhanced roadside delineation with programmed/scheduled freeway signing upgrade project. Savings would be in maintenance of traffic, mobilization and bid letting cost. Per pilot in Southwest Region, will become statewide in FY2017. Savings will accrue from one letting instead of two, maintenance of traffic and mobilization.</p>	Executive Office	Highway Design	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Consultant ProjectWise Document File Submittal and Management</b> - Consultants previously submitted documents/deliverables to MDOT by File Transfer Protocol (FTP), mail, e-mail or in person. Consultants can now submit deliverables directly into ProjectWise and participate in electronic milestone reviews and file sharing. All parties now use/reference the same file(s), eliminating the risk of contention, error or omission from multiple documents. This generates savings to MDOT and consultants, as well as improving efficiency, effectiveness and project collaboration.</p>	Executive Office	Highway Design	2015	2015		
<p><b>Development Guide Wiki</b> - Ongoing effort to convert design procedures, standards, and guidance to Wiki content rich environment to allow linking between documents and provision of real time documentation of changes without additional effort. Users receive notification of changes through watch/list.</p>	Executive Office	Highway Design	2015	2015		
<p><b>Digital Pen</b> - Digital Pen is a device to convert handwritten input into digital data. MDOT is using the digital pen for milestone reviews to capture comments from parties involved on a single set of documents. This ensures all review comments and notes are maintained in a single electronic file versus multiple files manually compiled by the project designer/manager. MDOT also mandated all comments must be received prior to the milestone meeting ensuring focus on major issues and resulting in shorter review meetings.</p>	Executive Office	Highway Design	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Diverging Diamond Interchange Guide</b> - Diverging Diamond Interchange Guide will assist in design and operations of this new interchange type with fewer conflict points, better sight distance, improved driver understanding/operating through interchange and near impossibility to enter a ramp the wrong way. When this interchange type is viable for the circumstances, it has a direct cost benefit as well as a safety cost benefit.</p>	Executive Office	Highway Design	2015	2015		
<p><b>Geospatial Underground Infrastructure Data Exchange (GUIDE)</b> - MDOT used a 2015 \$100,000 FHWA State Transportation Innovation Council (STIC) grant for Phase 2 of the Geospatial Underground Infrastructure Data Exchange (GUIDE) initiative. Phase 2 will better define attributes to collect for underground utilities and how to manage data through geographic information systems. Studies have shown that for every dollar invested on location of underground utilities \$4 are saved in future design and construction activities.</p>	Executive Office	Highway Design	2015	2015		
<p><b>Reference Information Documents (RID)</b> - Reference Information Documents (RID) are digital design data required for final plans that include 3D models from design to construction. RID are reviewed/updated at milestones of a project. Data is for informational purposes only. RID mitigates construction risk by more detailed investigation during design. RID allow contractors to produce digital data for Automated Machine Guidance (AMG) for stringless paving, grading, excavation and staking with less effort. Additional cost savings accrue from data transfers and more efficient construction techniques. Industry studies show 30% savings in construction of projects with earthwork.</p>	Executive Office	Highway Design	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Enhanced Delineation Special Provisions</b> - Special provisions have been modified to define specific application for statewide uniformity of enhanced delineation to address run off roadway crashes. The Special Provision update provides options for selection of delineation type. Social and economic savings realized through reduced number of crashes.</p>	Executive Office	Highway Safety	2015	2015		
<p><b>Road Safety Audits (RSA)</b> - Statewide guidance developed to expand use of Road Safety Audits (RSA) beyond safety projects. An RSA is a formal safety performance examination of existing/future road or bridge project by an independent, multi-disciplinary team. RSA contribute to road safety by providing a fresh, unbiased assessment of the road feature to identify potential safety issues and solutions in support of the Toward Zero Deaths initiative. Cost savings are realized through early identification of problems during project design rather during or after construction. Additional savings realized through reduced serious injuries and fatalities and their social and economic impact.</p>	Executive Office	Highway Safety	2015	2015		
<p><b>Toward Zero Deaths (TZD) Champions</b> - Toward Zero Deaths (TZD) Champions have been identified in each region and are a standing item on the Traffic Safety Statewide Alignment Team agenda. Effort fosters opportunity for sharing successes/issues in order to promulgate TZD efforts. Cost savings will be realized through sharing of best practices, evaluating/updating traffic safety guidance/standards and reducing the social and economic impact of crashes.</p>	Executive Office	Highway Safety	2015	2015		
<p><b>I-96 Over Sand Creek</b> - Articulated concrete block (ACB) scour mitigation placed on four scour critical interstate bridges.</p>	Grand Region	Bridges & Structures	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>US-131 Muskegon River Bridge Rehabilitation Project</b> - Pier modifications, flat jack installation and harped external post-tensioning were used to strengthen the bridge and extend service life. Flat jacks and harped post-tensioning were first use by MDOT.	Grand Region	Bridges & Structures	2015	2015	\$35,000,000	
<b>Bridge Approach Projects for Design Unit Single Sheet Bridge Approach Projects</b> - When plan sets are put together there are usually many sheets generated. Make plan sheets, removal sheets, profile sheets and various details to provide contractor with enough information to construct the project. Combine everything into one sheet. The information provided is exactly the same except everything is now in one location.	Grand Region	Highway Design	2015	2015		
<b>Cable Barrier Maintenance Gap</b> - With a Maintenance Gap cable section, a shorter run of cable barrier is anchored between an entire bridge as a stand-alone section. For inspections, the short run of cable can be lowered to perform the work.	Grand Region	Highway Maintenance	2015	2015		
<b>Cured-in-Place Culvert Linings</b> - Long-term repairs being completed on four 8 foot diameter corrugated metal pipes with very little impact to traffic and mobility; Both culvert structures currently rated in serious condition and will improve to good condition after project completion.	Grand Region	Highway Maintenance	2015	2015		
<b>Fix Price Variable Scope Bidding</b> - Used Fix Price Variable Scope bidding on our hot mix asphalt crack treatment and concrete joint reseal projects.	Grand Region	Highway Maintenance	2015	2015		
<b>Freeway Lighting Data</b> - Provided contractor access to MDOT freeway lighting data through a mobile Geographic Information System application. Provided quick field reference for contractors to gather data on supplies and equipment needed for replacement without direct inspection of each individual light.	Grand Region	Highway Maintenance	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Light Emitting Diode (LED) Fixtures for High Mast Tower Lights</b> - Installed Light Emitting Diode fixtures on high mast tower lights at interchange. Monitoring light levels and cost impact to determine wider application.	Grand Region	Highway Maintenance	2015	2015		
<b>Light Emitting Diode (LED) Freeway Lighting</b> - Installed light emitting diode lighting along US-131.	Grand Region	Highway Maintenance	2015	2015		
<b>M-44 Driveway Assist Device</b> - A driveway assist device was used instead of a direction detour for reconstruction portion of the project. Allowed provision of two-way access through work zone.	Grand Region	Highway Maintenance	2015	2015		
<b>Mapping Capabilities</b> - Developing/Piloting enhancements in both Construction Permitting System and Adopt-A-Highway software for mapping and tracking.	Grand Region	Highway Maintenance	2015	2015		
<b>Rest Area Light Emitting Diode Replacement Parking Lot Lighting</b> - Significant annual energy savings from use of Light Emitting Diodes for rest area replacement parking lot lighting.	Grand Region	Highway Maintenance	2015	2015		
<b>US-131 External Post Tensioning</b> - US-131 external post tensioning used on US-131 over the Muskegon River.	Grand Region	Highway Maintenance	2015	2015		
<b>Add Texting Option for Traffic Incident Notifications Subscribers</b> - Added a texting option for Traffic Incident Notifications subscribers to supplement the previously available e-mail notification option.	Grand Region	Highway Operations	2015	2015		
<b>I-96 Cascade Divergent Diamond interchange</b> - First MDOT divergent diamond interchange one in design, second one in operation, first in West Michigan.	Grand Region	Highway Operations	2015	2015		
<b>M-11 Roundabout</b> - Partnership with City of Walker to reduce speed and improve safety and level of service.	Grand Region	Highway Operations	2015	2015		
<b>Speed Limit Assessment</b> - Enhanced data collection and auto fill decision cells, coordinated with North and Southwest Regions.	Grand Region	Highway Safety	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>North Country Trail</b> - Partnered with the MDNR to provide construction engineering and inspection for their North Country Trail project between Hart and Montague.	Grand Region	Non-Motorized	2015	2015		
<b>Installation of Type A Nuclear Density Gauge Storage Box</b> - Installation of Type A Nuclear Density Gauge storage box for F-150 Super Cab trucks.	Grand Region	Other	2015	2015		
<b>Freeway Lighting Panel and Energy Invoice Inventory</b> - Use of ArcGIS to determine MDOT Freeway lighting inventory.	Metro Region	Asset Mgt. & Planning	2015	2015	\$1,560	
<b>I-94/I-69 Interchange</b> - After reviewing actual site conditions, it was determined that one retaining wall could be redesigned from a 40 foot tall, pile supported wall to a shorter spread footing supported slope wall.	Metro Region	Highway Construction	2015	2015	\$2,000,000	
<b>Concrete Patch Geolocation</b> - M-14 and I-275: Concrete patch repairs were recorded using Global Positioning System equipment, prior to placing a hot mix asphalt overlay on M-14 lanes and ramps, to assist in identifying these locations when pavement warranty work is required. Restricting ramp and road rehabilitation to nights and weekends lessened the overall impact to the public as all of this work was completed during non-peak traffic hours.	Metro Region	Highway Design	2015	2015		
<b>Field Data Collection of Environmental Assets</b> - Wetlands are delineated to determine project impacts using field data collection instruments, with the data manipulated into a computer assisted design (CAD) format and stored for future use. Utilizing in-house personnel provides for better consistency, controllable workflows saving the department both design time and dollars.	Metro Region	Highway Design	2015	2015	\$22,000	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>I-94/I-69 Interchange Wall Redesign</b> - Innovations included: Use of Expanded Polystyrene (EPS) blocks and Low Density Cellular Concrete as engineered fills at the bridge abutments; Use of Carbon Fiber Post Tensioning Cables for the I-94 bridges over Lapeer. The carbon fiber cables are stronger than the traditional steel cables allowing for increased post tensioning force thereby reducing the potential for transverse cracking in the bridge deck. Also by using a non-corrosive material like Carbon Fiber, post tensioning ducts do not need to be filled with grout which allows the cable to be re-tensioned as needed; After the project was let, MDOT construction team continued to look for improved ways to build the project. After reviewing actual site conditions, it was determined that one of the planned retaining walls could be redesigned from a 40 foot tall, pile supported wall to a shorter spread footing supported slope wall. This redesign resulted in a cost savings of approximately \$2,000,000.00.</p>	Metro Region	Highway Design	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Low Profile Barrier Curb - M-1 (Woodward Ave.) Light Rail Project:</b> To enhance pedestrian safety, used low profile barrier curb to add median sections in center left-turn lane at pedestrian crossings. Used Light Detection &amp; Ranging (LIDAR)/photogrammetric survey in utility structures and 3D mapping of facilities during design that is updated with potholing and construction information to mitigate risk of subsurface conflicts and coordinate third party utility relocations. Utility relocations are staged with road/rail work when practical. M-1 RAIL board represent major stakeholders along the corridor, so most communications are performed by M-1 Rail team. This has been efficient and effective as they have provided additional resources and are in tune with local businesses/neighborhoods. New signals will be connected with fiber and controllers have Intelligent Transportation System (ITS) capabilities for future ITS expansion. These will tie into the backbone at I-75 and I-94. Oversight by both the Federal Transit (FTA) and Federal Highway (FHWA) Administrations for federal funds resulted in a One DOT agreement between the federal agencies. The contract is structured to address different requirements for the streetcar and MDOT scopes of work. Due to the unique funding structure and impacts of the streetcar facilities, M-1 Rail is the lead contracting agency for the overall project with strong MDOT participation and oversight.</p>	Metro Region	Highway Design	2015	2015		

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Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Specialized Sound Wall Paint Treatment</b> - I-94 and US-24 (Telegraph Road) Soundwall: Due to the limited right-of-way and access behind the sound walls and the delicate nature of removing the deteriorated concrete on the top posts, the contractor built special access baskets that hang from the panels for access; This project is also one of the first jobs which recoats previously painted concrete surface coating. MDOT staff has been working with Sherwin Williams representatives to create an optimal method of applying the coating, which includes the addition of a conditioner to the previously painted surface prior to the applications of the paint to ensure long lasting results. Further, collaboration with the contractor lead to additional savings by the creation of templates for wall repair, saving time and money.</p>	Metro Region	Highway Design	2015	2015		
<p><b>Use of Microstation Container Files For Design</b> - Used Container Files and Multiple View plan sheets on I-275 Inlay saving an estimated 10 percent preliminary engineering cost for Metro Region Design Squad.</p>	Metro Region	Highway Design	2015	2015	\$46,500	
<p><b>Alternative Culvert Repairs</b> - Snap-Tite Culvert Lining - An alternative innovative lining for corrugated metal pipe (CMP) was researched and considered due to the fact that field condition did not allow utilizing conventional cured-in-placed felt liner. Snap-Tite lining restored the structural integrity of severely deteriorated CMP and eliminate costly removal and replacement.</p>	Metro Region	Highway Maintenance	2015	2015	\$14,857	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Concrete Patch Geolocation</b> - Mapping and documenting the location and condition of concrete patch repair project with Global Positioning System device. GPS unit was utilized to identify location and fix type. GPS information was provided to all bidders as part of bid document. Low bidder was 9.25 percent below engineer estimate and indicated that GPS information was very useful for estimating the cost and Maintenance of Traffic and was a contributing factor to the low bid.</p>	Metro Region	Highway Maintenance	2015	2015	\$117,000	
<p><b>Detailed Bridge Inspection for High Load Hit</b> - Innovation consists of measuring deformation of the damaged beams (out of plane bending, flange bending and under clearance) using a Light Detection And Ranging (LIDAR) located on the freeway shoulder in lieu of the hand measurements and associated lane closures.</p>	Metro Region	Highway Maintenance	2015	2015	\$7,200	
<p><b>Graffiti Maintenance Contract</b> - Provided Taylor Transportation Service Center with a Geographic Information System (GIS) map/database for their performance based Graffiti Maintenance contract. MDOT staff and contractors use a GIS collection application to collect tagged locations and record cleaning jobs. GIS dashboard allows staff to track contractor performance as data is collected.</p>	Metro Region	Highway Maintenance	2015	2015		
<p><b>Interchange Swath Mowing</b> - An alternative mowing method was piloted for mixing bowl on M-10/I-696/Telegraph interchange in Metro Region/Oakland County to limit mowing to 15 feet swath mowing. This was to promote green structure and habitats for pollinators, improve erosion control and reduce mowing cost.</p>	Metro Region	Highway Maintenance	2015	2015	\$8,800	

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Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Longitudinal Joint Repairs</b> - Longitudinal Joint Repairs - Various innovative longitudinal joint repairs have been researched and utilized in order to improve ride quality and minimize impacts to the driving public. Significant cost saving is reported in comparison with conventional repair method of mill and fill. The cost saving does not include saving in user delay cost.</p>	Metro Region	Highway Maintenance	2015	2015	\$44,761	
<p><b>M-14 &amp; I-275 Pavement Warranty</b> - To assist in identifying locations for pavement warranty work, concrete patch repairs were recorded using Global Positioning System equipment prior to hot mix asphalt overlay on M-14 lanes and ramps. Restricting ramp/road rehabilitation to nights and weekends reduced overall impact to the public.</p>	Metro Region	Highway Maintenance	2015	2015		
<p><b>Tagged Overhead Sign Cleaning &amp; Replacement Project</b> - Tagged Overhead Sign Cleaning and Replacement Project</p>	Metro Region	Highway Maintenance	2015	2015	\$12,500	
<p><b>Weekly Construction Report</b> - Previously the Region Communications Representative would retype word for word lane closure entries in the Lane Closure &amp; Restrictions (LCAR)/MiDrive for the weekly construction notice provided to media. Also the Southeast Michigan Traffic Operations Center (SEMTOC) construction coordinator would also retype this same information for developing the dynamic message sign message plan. Marji Zabel worked with SEMTOC staff to instead pull this information directly from the LCAR database, in a format that works for both users. This saved communications approximately two hours per week and SEMTOC between four and eight hours per week.</p>	Metro Region	Highway Operations	2015	2015	\$7,010	

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<b>Detroit Project and Master of Community Development (MCD) Fellowship</b> - Public/Private Partnership (P3) vacant land blight removal and workforce development project in Detroit.	Metro Region	Other	2015	2015		\$31,000
<b>Real Estate Consent Pilot Forms Reduction</b> - Metro Region Real Estate utilizes many forms to support projects, requiring time for data entry, processing and communication. Recently an effort was made to combine forms to in order to save processing time.	Metro Region	Real Estate	2015	2015	\$20,000	
<b>E-Construction File Naming Convention</b> - This naming convention was evolved to help the Alpena Transportation Service Center with their e-Construction files. This innovation will make it much easier to file documents and be able to locate them once they are filed away. This has been given to the statewide e-Construction team and they are looking at using it on a statewide basis.	North Region	Highway Construction	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Fine Tooth Milling to Eliminate Rutting Prior to Placing Chipseal in Lieu of Microsurface -</b></p> <p>* Microsurfacing is often placed to correct ruts. Use of fine tooth milling to eliminate rutting is significantly cost effective and allows more flexibility in surface repairs such as use of a chipseal instead.</p> <p>* Chipseals are often more desirable than microsurfaces because of their ability to seal cracks – Microsurfaces address ruts but can be brittle, leading to delamination. North Region has placed a chipseal over a fine tooth milled section with minimal complications.</p> <p>* Micro-milling cost approximately \$0.75/sq. yd.. Multicourse microsurfacing would cost approximately \$3.00/sq. yd. but also requires new corrugations – Micromilling then chipsealing can gap the corrugations. Single chipseals cost approximately \$2.40/sq. yd.. A single chipseal with fine toothed milling would address rutting while providing a more desired surface for sealing cracks at the same price as a multi-course microsurface.</p>	North Region	Highway Construction	2015	2015		
<p><b>Links to Soil Borings in Construction Plans -</b> With the switch to all digital plan sets, it is more difficult to switch quickly between a construction sheet in the plans and the soil boring pages. If the soil boring locations on the plan sheets provided a link directly to the soil boring sheet, this would provide efficiencies to staff in the field.</p>	North Region	Highway Construction	2015	2015		

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Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Links to Standard Plans in E-Construction .PDF Files -</b> While answering a contractor query about constructing a specific concrete spillway, it became apparent that the current .PDF system could be further streamlined by having links on plan sheets to navigate directly to pertinent information regarding an item or special detail. Other examples:</p> <ul style="list-style-type: none"> <li>* Special details for specific driveways could have a link on the construction sheets directing the inspector back to the special details (Convenient and more likely to get recognized).</li> <li>* Intersections on the construction sheets with associated detail grades could have a link directly to the detail grade sheet.</li> <li>* Attachments to special provisions.</li> <li>* A table of contents with quick links to specific sections such as construction plans, sewer plans, special details, detail grades, etc.</li> <li>* Other job specific items outside normal construction work.</li> </ul> <p>As this would create extra work for design, find an iPad compatible application to add links/shortcuts/ attachments/notes to the Adobe copy of the project plans, thus creating an easily accessed custom set of plans.</p>	North Region	Highway Construction	2015	2015		
<p><b>Longitudinal Joint Density Spreadsheet -</b> Alpena Transportation Service Center was able to create a spreadsheet that will calculate the payment and compare our results against the contractors for the longitudinal joint given MDOT's and the Contractors lab tested joint density results. We should see a significant time saving over calculating it by hand with the use of this spreadsheet which calculates the Quality Assurance Longitudinal Joint Density Incentive.</p>	North Region	Highway Construction	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Longitudinal Joint Density Spreadsheet</b> - Alpena TSC created a spreadsheet to calculate the payment and compare MDOT and contractor results for the longitudinal joint given their lab tested joint density results. Significant time savings over calculation by hand.</p>	North Region	Highway Construction	2015	2015		
<p><b>Performing Full Construction Engineering (CE) on Projects Outside TSC/Regional Boundaries</b> - In July and August 2015, North Region's Cadillac Transportation Service Center (TSC) provided full construction management (engineering, inspection, testing) on a project on M-115 in the City of Clare (Mt. Pleasant TSC, Bay Region). Through collaborative effort and flexibility, minimal contractual or bureaucratic issues arose. While TSCs have covered projects in the same region in the past, this appears to be the first project managed by an office from another region. This successful collaborative small project proves existing contractual and bureaucratic framework allows cross-regional project management to take place, opening up other collaborative possibilities:</p> <ul style="list-style-type: none"> <li>* Rather than consulting full construction engineering on projects overloading certain offices, the best fit adjoining office, even outside the region, can take projects over.</li> <li>* Corridor projects (like sign upgrades) can continue into other regions to capitalize on economy of scale if doing so makes a logistical and contractual sense.</li> </ul> <p>Potential savings could result in saving so millions of dollars every season.</p>	North Region	Highway Construction	2015	2015	\$30,000	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Training &amp; Certification</b> - I would consider all employees and trainer at the same hourly rate. And consider travel/class time being the same. Just to compare hotel and meal expenses alone, for five employees from North Region to travel to a Monday-Thursday training class in Lansing would be three nights for a hotel and meals (maybe four depending on class times). Assuming \$115 per day per employee, grand total would be \$1725. If the trainer traveled to Gaylord the same three nights would cost \$345. I know this could be broken down in detail for hours, overtime, gas, where the employee is traveling from, etc., but it just makes since to me to have one person travel rather than five. I'm sure someone can break everything down to figure out how many employees you need in a class before it is a cost savings but I just wanted to bring this up as a potential cost savings.</p>	North Region	Highway Construction	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Urban Chipsealing</b> - Disappointed by reflective transverse cracking following standard Hot Mix Asphalt (HMA) mill and resurfacing Capital Preventive Maintenance (CPM) projects in curb sections, crack treatment with chipseal, used successfully in rural areas, was considered for curb sections. Piloted on US-31 in the Village of Bear Lake, processes for chipsealing were modified for use in an urban area.</p> <ul style="list-style-type: none"> <li>* Traffic constantly maintained using traffic regulators.</li> <li>* Traffic diverted from new surface until fog seal placed to avoid flying aggregate damage to adjacent facilities.</li> <li>* Contractor required to do both chipseal courses and fog seal by end of week.</li> <li>* Use of a vacuum-truck (or similar device) was required to minimize flying debris from standard sweeping.</li> <li>* Structure inlets were protected.</li> </ul> <p>With these restrictions, the project was built uneventfully and has held up well through its first winter. If chipseals were considered in all low volume curb sections where traditionally HMA mill &amp; fills have been performed and half were appropriate for chipseals, 25% more small urban pavement CPM could take place, resulting in the equivalent of millions of dollars of additional surfacing yearly. Single Course Chipseal with fog seal = \$3 per sq. yd. 1½" HMA resurfacing with milling = \$6 per sq. yd.</p>	North Region	Highway Construction	2015	2015		
<p><b>Construction Engineering (CE) &amp; Preliminary Engineering (PE) Estimating Tool</b> - North Region has developed a new spreadsheet tool to assist project managers with estimating costs for both Preliminary and Construction engineering.</p>	North Region	Highway Design	2015	2015		

## 2017 Economies, Efficiencies & Innovations

### Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Posting Maintenance Activities to Local Social Media Accounts</b> - Traverse City Transportation Service Center worked with counties and cities to have them post trunkline maintenance activities to their local Facebook and Twitter accounts.</p>	North Region	Highway Maintenance	2015	2015		
<p><b>Corrugated Metal Pipe (CMP) Culvert Band Socket Extender</b> - Frank Oliver's crew (Dan Radziejewski, Roxsann Prell, Dennis Rhode) took a 5/8" diameter socket and cut it in half, and welded a 12" long metal pipe extension between the two halves to make a culvert band socket extender. The problem before was that a standard socket is only 3-4" long and the 10" long culvert band bolt would bottom out at the treads before it tighten up. This would require hand tightening with a wrench. The new culvert band socket extender allows for the bolt to go through the hollow pipe extension and allows an impact drill to tighten up the bolts, speeding up the process of putting culvert bands together.</p>	North Region	Highway Operations	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Dilemma Zone Detection</b> - MDOT was approached by a vendor to pilot a new type of vehicle detection for traffic signals called Dilemma Zone Detection. The specific unit, Iteris Vector Vantage, is a 2 in 1 detection system. A video camera detects the presence of vehicles at the stop bar (traditional detection) and a radar unit detects the presence and speed of vehicles approaching the stop bar from up to 600 feet away. The detector enables programming the traffic signal controller to hold the yellow phase by a couple seconds when a vehicle is at a distance in advance of the intersection where the decision to go or stop on a yellow is a dilemma for the driver; the dilemma zone. The detector also tracks vehicle speeds as they approach the intersection, enabling the controller to hold the all-red phase if an approaching vehicle's speed is such that they are unlikely to stop for the red. Both features are designed to reduce crashes related to red light running. The new detectors were installed by region electricians Kevin Tomich and Owen Werth at the intersection of M-33 and M-55 in Ogemaw County in February 2015. The intersection was on the most recent high crash list due to a pattern of severe angle crashes resulting from red light running. Since installation, there have been no recorded angle crashes. This success pilot will likely lead to a Special Provision for dilemma zone detection.</p>	North Region	Highway Operations	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Enhanced Freeway Delineators</b> - Rob Hall approached Garrett and Jason about the delineators along I-75, concerned that they were not durable and didn't provide much reflectivity. He asked if something better could be piloted, so Jason and Garrett came up with a 3"x12" aluminum panel with Type IX sheeting. Dan Townsend made some samples and the new delineators were placed on existing delineator posts near Gaylord as a pilot. It was evident right away that the new delineator panels were more durable and provided much better reflectivity than the plastic buttons, so Youth Development and Mentoring Program funding and employees were utilized to replace all of the plastic buttons on I-75 and US-127 within the Gaylord Transportation Service Center area in 2015. This project has gotten some statewide attention. A new Special Provision has been developed for the delineator panels, and MDOT is considering moving entirely to that design (in varying sizes) for all delineators installed on rigid posts. A picture of the delineator panel is attached.</p>	North Region	Highway Operations	2015	2015		
<p><b>Non-Routine Uses of Youth Development and Mentoring Program (YDMP) Staff</b> - The YDMP program has been utilized to perform activities not conforming to any other maintenance activity including: Plant and water up to 15,000 trees for windbreaks in a season; Scrape growth and seal downspouts. For the tree planting and watering, savings of over \$25,000 in North Region could be anticipated by having YDMP perform this work over having the same work performed by Transportation Maintenance Workers or county forces based on weekly waterings and hourly rates.</p>	North Region	Highway Operations	2015	2015	\$25,000	

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Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Posting Maintenance Activities to Local Social Media Accounts</b> - Traverse City Transportation Service Center works with local counties and cities to have them post maintenance activities that are occurring on the trunkline to their local Facebook or Twitter accounts.</p>	North Region	Highway Operations	2015	2015		
<p><b>Quick Response (QR) Codes</b> - Field access to signal information was time consuming and difficult with data located in several locations through ProjectWise and SafeStat. Limitations with Computer Aided Design licensing required electricians in the field to contact office staff for printouts. Updates to paper copies kept in signal cabinets must be manually replaced. It was determined that Quick Response (QR) Codes linking the user to a single location on ProjectWise, providing a centralized location for signal information, would improve efficiency and assure access to the current version. Currently, Gaylord TSC has several folders in ProjectWise for each signal location which are linked to the user via QR Codes. These folders contain signal plans, timing permits, cost agreements, Transportation Work Authorization &amp; Internal Work Authorizations, Activity Log, Image of the signal, and any other relevant data. This system allows field staff instant access via tablet or laptop, cutting the information accessing time to roughly 90 seconds. Since Transportation Service Center (TSC) Traffic &amp; Safety staff review updated copies of all signal files when changes are made, it is their responsibility to upload these files when changes are made (time to do this is minimal). Gaylord TSC is currently the only office using this innovation. However, the Operations Engineer is making plans for region and perhaps statewide implementation.</p>	North Region	Highway Operations	2015	2015		

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Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Rural Intersection Collision Avoidance System (RICAS) Combined with Rural Intersection Warning System (RIWS)</b>                      - Severe and fatal crashes have at the intersection of US-131 and Intertown Road have placed it continually on the High Crash List. Due to limited sight distance caused by vertical curves, this section should be flattened and reconstructed at a cost of roughly \$4 million. This is not feasible due to limited funding. As part of the Toward Zero Deaths efforts several types of warning devices were considered and it was decided this location would be a good candidate for the RICAS combined with the RIWS. While these technologies have been used individually around the country with impressive results, combining them is a relatively new concept with few resources on which to draw. While there are currently three RIWS locations in use in Michigan, it will be the first RICAS location in the state and is believed to be amongst one of the first places in the U.S. where both are installed together. The price tag for such a fix is roughly \$50,000. This system is currently being installed and has a planned completion for late Fall, 2015. The Signals Unit and Gaylord TSC Traffic and Safety staff will be monitoring its operations and effects on crashes for possible consideration on other Michigan roadways with similar geometrics and crash patterns.</p>	North Region	Highway Operations	2015	2015		

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<p><b>Shoulder Gravel Spreader</b> - Crew rigged a plastic corrugated pipe to be used as a shoulder gravel spreader to help get the gravel material out of the dump truck and onto the shoulder ribbon where it was needed. The crew used a short section of 30" diameter plastic pipe and attached it to a current truck. The truck is currently set up to spread salt on the centerline of the roadway, so the innovation helped transfer the shoulder gravel where it was needed behind the hot mix asphalt shoulder.</p>	North Region	Highway Operations	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Stationing Youth Development and Mentoring Program (YDMP) Remotely in County Road Commission Garages -</b>            Currently North Region stations YDMP staff remotely. Stationing YDMP staff remotely versus centrally helps MDOT, counties, and staff by:</p> <ul style="list-style-type: none"> <li>* Limiting the drive for the youth, making recruitment of local, economically disadvantaged youth more feasible.</li> <li>* Providing accountability by having youth in constant contact with the maintenance agency staff on the same trunklines.</li> <li>* The maintenance agency is better equipped to notice, prioritize and have the youth address work items.</li> <li>* Providing more availability to the county for use of youth on their own county primary routes when work on trunklines has been addressed.</li> <li>* Keeps youth from straying when travelling from a central location to a remote county.</li> <li>* Keeps work groups to a manageable size, thus allowing more participation.</li> </ul> <p>A savings of approximately \$2,000 per youth is realized throughout a season; approximately \$140,000 in North Region based on 70 youth at \$8 per hour and average 2 hours daily drive time over 4 days per week from a central location plus vehicle mileage. While North Region has been doing this for quite a while, it is innovative because other Regions are not.</p>	North Region	Highway Operations	2015	2015	\$140,000	

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<p><b>Toward Zero Deaths Implementation Plan</b> - MDOT adopted Toward Zero Deaths , a national strategy on highway safety, in 2010 and has since been working to increase awareness of safety issues amongst the motoring public and its own employees. North Region has embraced TZD by creating an implementation plan that specifically addresses crash types and or social issues that contribute the most to traffic deaths in the region. The TZD plan has four focus areas: Lane Departure crashes, 75% of fatal crashes in the North Region, Angle crashes at stop-controlled intersections, Local Roads and Public Education. The North Region TZD Implementation Plan represents a shift in focus from addressing locations that exhibit high crash frequencies to addressing crash types that contribute the most to traffic fatalities. It also represents an enhanced focus on safety in all the work we do, whether it be during project development, construction or operations and maintenance. The TZD Plan is attached to this posting.</p>	North Region	Highway Operations	2015	2015		
<p><b>Winter Maintenance Truck (WMT) Auger Cover</b> - This was an equipment modification request from Lisa Lutke, and was designed and fabricated by Ken Brown at the Kalkaska Facility. This change from the solid auger cover on the side delivery system allows operators to view that the augers are working correctly and that the material is being applied as needed.</p>	North Region	Highway Operations	2015	2015		
<p><b>M-33/M-55 Traffic Signal Dilemma Zone Project</b> - Gaylord Transportation Service Center used a low-cost enhanced signal detection system designed to reduce angle crashes from drivers running red light. Location on high crash list for severe angle crashes; Since installation in February 2015, no angle crashes recorded.</p>	North Region	Highway Safety	2015	2015		

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<b>Co-Op Committee</b> - Team to help improve/enhance the experience of Co-Op students. Developed a one week training period with all students together to receive all required training. Also set up educational field trips for students. Departure surveys sent to students and supervisors to improve the program.	North Region	Other	2015	2015		
<b>Innovation Web Site</b> - Created an internal Web page where staff are encouraged to submit their innovations.	North Region	Other	2015	2015		
<b>Culvert Inventory</b> - Provided access to culvert data through a collection application. Inspections use this Geographic Information System app instead of paper collection and manual entry.	Southwest Region	Asset Mgt. & Planning	2015	2015		
<b>Map Billboard Applications</b> - Billboard applications are geographically located so inspectors can review all applications while in the area. 8 person hours/week savings.	Southwest Region	Asset Mgt. & Planning	2015	2015		
<b>Map Wetland &amp; Environmental Reviews</b> - Wetland and Environmental reviews are mapped and completed jointly with Billboard applications. 8 person hours/week savings.	Southwest Region	Asset Mgt. & Planning	2015	2015		
<b>Service Area Remaining Service Life (RSL) vs 5 year Program Map</b> - Map showing Remaining Service Life (RSL) of all state roadways overlaid with the 5 year program to identify areas with no programmed projects.	Southwest Region	Asset Mgt. & Planning	2015	2015		
<b>Bridge Maintenance Innovations</b> - Telemetric stream gauge to monitor flow depth during high flow events. Improved Scour Monitoring. Developed a Bridge Emergency Guidance Document, Improved emergency response for bridge hits.	Southwest Region	Bridges & Structures	2015	2015		

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<b>Construction Innovations</b> - Used traffic detection system for total closure on freeway project to increase safety and reduce traffic delays. 100% of construction projects completed with E-Construction. Precast bridge elements on all bridge projects for 2015 to reduce construction schedule and Increase quality. Utilized Dispute Review Board Process for two projects to reduce construction claims. Design-Build for I-94 BL Exit 92 interchange project and bridge/Ramp rental specification reduced construction time by 51 calendar days.	Southwest Region	Highway Construction	2015	2015		
<b>Pavement Markings</b> - Requiring layout of the pavement markings in intersections (turn skips on radius) using Global Positioning System coordinates and not laying them out by hand or tape measures.	Southwest Region	Highway Construction	2015	2015		
<b>Plan Quantity Spreadsheet</b> - A live link between plan sheets and WebTrnsport reducing errors and saving one hour of Southwest Region staff time on each plan sheet with quantities.	Southwest Region	Highway Construction	2015	2015	\$250,000	
<b>Approach Area Calculation Spreadsheet</b> - Approximation method for measuring approach quantities. 100 person hour savings at Marshall TSG.	Southwest Region	Highway Design	2015	2015		
<b>Improved Drainage Structure Adjustment</b> - Using core drill to remove hot mix asphalt and replace with concrete. Savings to utility companies \$500/Structure.	Southwest Region	Highway Maintenance	2015	2015		\$500
<b>Maintenance &amp; Operations</b> - Pilot showing snow plows locations on MiDrive. Region Fleet Team working to develop new y-chute/zero velocity salt distribution system to save time/money. Joined Western Michigan University to install/study temporary pedestrian signing in roadbed to Increase pedestrian safety.	Southwest Region	Highway Maintenance	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Combined Signage/Delineation Installation</b> - Combine installation of enhanced roadside delineation with programmed/scheduled freeway signing upgrade project. Savings would be in maintenance of traffic, mobilization and bid letting cost.	Southwest Region	Highway Operations	2015	2015		
<b>Region Wide Maintenance Garage Maps</b> - Responsibility maps showing intersecting roads, townships, freeway mile markers and emergency routes for each garage.	Southwest Region	Highway Operations	2015	2015		
<b>Volunteer Workers</b> - Volunteer Southwest Michigan provides court-ordered community service volunteers. Volunteers who assist full time equivalent laborers with cleaning and outdoor projects save the department man-hours equal to a 720 hour State Worker position.	Southwest Region	Highway Operations	2015	2015	\$7,200	
<b>Road Safety Audit (RSA)</b> - Instead of contracting the Road Safety Audit (RSA) out, performed by Traffic & Safety staff, not necessarily from the local office. Savings of \$20,000/each RSA.	Southwest Region	Highway Safety	2015	2015		
<b>Electronic Processing &amp; Signatures</b> - Processing all mileage or travel logs for MDOT trucks electronically, with electronic signatures.	Southwest Region	Other	2015	2015		
<b>Magnetic Garage Door Switch</b> - Magnetic garage door switch automatically turns furnace off when garage doors are open.	Southwest Region	Other	2015	2015	\$65,520	
<b>Organization</b> - Created flags by cutting manila folders. When giving paperwork to Kalamazoo Transportation Service Center staff, flag includes date materials given on. Flag is placed upright in file box to tag materials pending return.	Southwest Region	Other	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Reduce Printing, Various Tasks &amp; Meetings</b> - For large reports/plan reviews, print one copy and share with all staff for commenting. See comments of others speeds review. Saves money on printing costs.	Southwest Region	Other	2015	2015		
<b>Task Prioritization</b> - Created a color coded and prominently labeled folder system to aid staff in prioritizing different tasks.	Southwest Region	Other	2015	2015		
<b>Video Conferencing Technology</b> - Staff meetings held simultaneously for both offices.	Southwest Region	Other	2015	2015	\$1,200	
<b>Mio-Vision Technology</b> - Asset Mgt. Div. Data Collection & Analysis Section used Mio-Vision units to record vehicle classification and intersection turning movement data using a camera sensor. Data is transmitted back to Mio-Vision which processes and returns a formatted file. Units allow one person to perform seven class counts for same cost as the one traditional class count.	Statewide	Asset Mgt. & Planning	2015	2015	\$170,000	
<b>Non-Trunkline Federal-Aid (NTFA) Program Network</b> - The Non-Trunkline Federal-Aid (NTFA) program annual road network maintenance minimizing the number of studies/type of equipment needed to meet the federal requirement. Approximately 100 locations annually. Data Inventory & Integration Division saved MDOT \$15,000.	Statewide	Asset Mgt. & Planning	2015	2015	\$15,000	
<b>Pavement Marking Data Logging System</b> - Third party device for waterborne markings installed on pavement marking vehicles to record Global Positioning System, pavement and environmental data along with user input on project. Grand Region is piloting the same device for spray thermo markings. Cost savings realized through more efficient data collection, enhanced accuracy of warehoused data and expected outcome of improved bid prices.	Statewide	Asset Mgt. & Planning	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Public Access to ArcGIS Online Page</b> - Select datasets can be viewed, mapped and overlaid to support decision making in an intuitive web browser environment.	Statewide	Asset Mgt. & Planning	2015	2015		
<b>Public Open Data Portal</b> - Created to allow the public to download MDOT Geographic Information System data in several formats. Released in conjunction with Center for Shared Solutions and Michigan Department of Natural Resources.	Statewide	Asset Mgt. & Planning	2015	2015		
<b>Material Tagging Procedures</b> - Reduce loss of tagging and resampling as well as E-metals Lab testing procedures to eliminate form work and duplication of efforts. Expedites sample turn around time.	Statewide	Bridges & Structures	2015	2015		
<b>Remote Witness of Cylinder Breaks</b> - Use of Skype at out-of-state fabrication facilities saves time and travel expenses.	Statewide	Bridges & Structures	2015	2015	\$20,000	
<b>Request for Action (RFA) Process</b> - To prioritize/coordinate bridge repairs, Request for Action (RFA) allows consistent evaluation and decision making to efficiently dedicate resources such as Statewide Bridge Repair Crew, Emergency Temporary Support Budget and Special Needs Contract.	Statewide	Bridges & Structures	2015	2015		
<b>Comprehensive Transportation Fund (CTF) Bond Refinancing</b> - Refinanced \$32.8 million of Comprehensive Transportation Fund bonds to achieve savings of \$4.7 million based on present day value over remaining life of bonds.	Statewide	Finance & Contracts	2015	2015	\$4,711,020	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Grant Application Completeness Verification -</b> Implemented validations in MDOT Grant System to require certain document types be added before allowing application submission. Time of MDOT grant coordinator, Metropolitan Planning Organization and Michigan Fitness Foundation Grant Coordinator is saved in verifying all requirements are met so further applicant contact is not required.</p>	Statewide	Finance & Contracts	2015	2015	\$5,280	\$1,980
<p><b>Paperless Transportation Economic Development Fund Categories A &amp; F Grants and Applications -</b> Replacement of Transportation Economic Development Fund Categories A (TEDA) and F (TEDF) grants and applications paper files with data stored in MDOT Grant System and eventually ProjectWise.</p>	Statewide	Finance & Contracts	2015	2015	\$3,630	
<p><b>Tracking Transportation Economic Development Fund Categories A pre-1200 Direct Grant Status in Michigan Grant System (MGS) -</b> Tracking all grants in MDOT Grant System (MGS) eliminates maintenance of separate spreadsheets as all data on outstanding grants will be obtained from a Business Objects Report. It also saves staff time researching the status of direct grants each time a question arises. Using MGS, all staff have access to the status and tracking will be consistent for all direct grants.</p>	Statewide	Finance & Contracts	2015	2015	\$1,980	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Transportation Economic Development Fund Categories A &amp; F Use of Michigan Grant System</b> - Use of MDOT Grant System (MGS) Direct Grant Worksheet to communicate Non-Direct Grants to Local Agency Programs (LAP) skips creation of an Excel spreadsheet. Formalizing coordination meeting process creates uniformity from Grant Coordinators in dealing with local agencies to ensure relevant and consistent information is provided. Using MGS to LAP saves creating a separate document to transmit information and ensures LAP has the most current information.	Statewide	Finance & Contracts	2015	2015	\$954	
<b>Flexible Non-Cementitious Hot Applied Resin Joint</b> - Flexible Non-Cementitious Hot Applied Resin Joint repair material for partial-depth repair of concrete pavements.	Statewide	Highway Construction	2015	2015		
<b>High Performance Concrete</b> - Use of Grade DM concrete.	Statewide	Highway Construction	2015	2015		
<b>Hot-Applied Mastic</b> - Hot-Applied Mastic for repair of longitudinal joints in asphalt pavements with wider joint openings.	Statewide	Highway Construction	2015	2015		
<b>J Band</b> - Hot-applied 18 inch wide membrane treatment for longitudinal joints installed between leveling and top course. Absorbs into the matrix of the top course, increasing the density of the asphalt mixture against moisture intrusion.	Statewide	Highway Construction	2015	2015		
<b>Low Tracking Bond Coat Specification</b> - Low tracking bond coat sets faster and tracks less resulting in more efficient operations and less unsightly tracking of tack off the project site.	Statewide	Highway Construction	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Microsurfacing Repair</b> - Microsurfacing repair of longitudinal joints in asphalt pavements.	Statewide	Highway Construction	2015	2015		
<b>On-Line Access to American Society for Testing and Materials Procedures</b> - Provided department wide access to American Society for Testing and Materials Procedures guidance materials and search engine.	Statewide	Highway Construction	2015	2015		
<b>Penetrating Surface Sealers</b> - Use of penetrating surface sealers for joint treatment of concrete pavements. Technology was demonstrated via capital preventive maintenance project.	Statewide	Highway Construction	2015	2015		
<b>Rapid 1</b> - Durable concrete which opens to traffic within eight hours.	Statewide	Highway Construction	2015	2015		
<b>Thermal Bond</b> - Hot-in-place rehabilitation of longitudinal joints in asphalt pavements.	Statewide	Highway Construction	2015	2015		
<b>Use of LCPTracker</b> - Decrease payroll oversight time	Statewide	Highway Construction	2015	2015	\$210,934	\$155,034
<b>Waterproofing Structural Concrete Surfaces</b> - A spray applied elastomeric membrane protocol was specified for the I-696 plaza bridge deck repair and rehabilitation project.	Statewide	Highway Construction	2015	2015		
<b>Freeway Lighting</b> - Other Efficiencies - New methods of converting to light emitting diode (LED) freeway fixtures while reusing poles and towers. Reuse of poles and towers is a significant cost savings and results from advances in performance and lighting patterns of LED fixtures.	Statewide	Highway Design	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Pavement Marking Special Provisions</b> - Special Provisions have been modified to provide specific pay items for turning guide lines, recessing markings, roundabout arrows and specific material types to ensure uniformity. Cost savings through improved bid prices and reduced number of contract modifications during construction phase.</p>	Statewide	Highway Design	2015	2015		
<p><b>Steel Reinforcement Calculations/Plan Sheet</b> - Historically steel reinforcement calculations were manually tabulated and entered into Microstation. Utilizing Visual Basic for Applications, calculations are now entered directly into Excel, checked with a validation tool and transferred to the final plan sheet. This also automates the change management process. Savings are realized by mitigating risk of error or omission to be addressed as a contract modification during construction.</p>	Statewide	Highway Design	2015	2015		
<p><b>Automatic Vehicle Location (AVL) &amp; Maintenance Decision Support System (MDSS)</b> - Maintenance Decision Support System (MDSS) tools allow improved maintenance decision making for MDOT direct garages and plow truck operators. Sharing AVL salt speed compliance reports yields increased salting efficiency of about 5% from start of FY2015 winter through the year for direct force garages. Non-quantified savings include ability to more accurately plan for or reduce overtime based on MDSS forecasts.</p>	Statewide	Highway Maintenance	2015	2015	\$375,000	
<p><b>Carpool Lot Partnership</b> - MDOT partnered with Meijer Corp. to add additional lots to the carpool lot agreement. Each store will provide parking for up to 50 commuters and save the department approximately \$300,000 in construction and real estate costs.</p>	Statewide	Highway Operations	2015	2015	\$900,000	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>I-94 Corridor Evaluation</b> - Multi-agency team reviewed the I-94 corridor from Indiana State Line to US-127 in response to the 193 vehicle crash on January 9, 2015. The review identified statewide and regional safety and operational efforts to address concerns and minimize the recurrence of such crashes. Savings realized through reduction of social and economic impacts of crashes.	Statewide	Highway Safety	2015	2015		
<b>Personal Protective Equipment (PPE) Pack for Visitors/Occasional Use</b> - A drawstring bag containing hard hat, clear and tinted safety glasses, Class 2 economy safety vest and ear plugs. Personal Protective Equipment (PPE) pack costs \$10 less per pack than using customized MDOT PPE, is ready for use/distribution and a convenient way to transport/store PPE. Regions & Business areas (12) x estimated visitors/limited field contact (30 ea.) x \$10 savings = \$3,600 [Safety & Security Administration]	Statewide	Highway Safety	2015	2015	\$3,600	
<b>Toward Zero Deaths (TZD) Dynamic Message Sign (DMS) Enhancement</b> - In response to customer requests, beginning in February the weekly Toward Zero Deaths (TZD) Dynamic Message Sign (DMS) message will inform motorists how current traffic fatalities compare to last year's total. Publishing driving statistics changes driver behavior and savings will be realized by reducing the social and economic impact of crashes.	Statewide	Highway Safety	2015	2015		
<b>Cracking Index Method</b> - An installed grid system to measure expansion due to alkali-silica reactivity and other mechanisms in structures and pavements. Designed to allow regions to schedule repairs where most needed and monitor expansion.	Statewide	Other	2015	2015		
<b>Review/Evaluate Verizon Services &amp; Equipment</b> - Discontinued use of data card and/or implemented other options. [Safety & Security Administration]	Statewide	Other	2015	2015	\$720	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>I-75 &amp; 3 Mile Rd. Carpool Lot, Sault Ste. Marie</b> - Public Private Partnership with Meijer. Elimination of an existing facility. Will provide more spaces. MDOT Cost to relocate = \$30,000.	Superior Region	Asset Mgt. & Planning	2015	2015		
<b>Epoxy Injection M-95 Over Menominee River</b> - MDOT crew epoxy injected existing delaminated areas on bridge deck in lieu of concrete deck overlay. Per IowaDOT, epoxy injection structurally bonds concrete areas. Projected to defer need for a deck overlay or deck replacement for 5 to 10 years. Bridge was opened to traffic earlier due to elimination of cure times for a concrete overlay.	Superior Region	Bridges & Structures	2015	2015	\$200,000	
<b>Consider All Contractor Value Added/Savings Requests Contractors Provide During Project Construction</b> - For 2015 we have so far, Investigated and implemented elimination of sheet piling on a temp culvert installation at Baltimore River, saved \$27,000. Currently investigated and implemented utilization of squared up ends at Warner Creek crossing M-35, savings of \$90,000. Investigated and implemented contractor proposed changes in electrical modification work on the portage lake lift bridge \$167,000	Superior Region	Highway Construction	2015	2015	\$284,000	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Construction Personnel Provide Cost Savings Suggestions During Scoping &amp; Design Project Review Phase of Projects Through Quality Assurance Reviews of Plans</b> - One suggestion was to mill and fill an existing roadway which had been previously crushed and shaped, instead of crushing and shaping again, which was the fix that had been selected, estimated savings over \$150,000 plus 4 weeks of time savings to the project). Suggested utilizing part width construction and temp widening on a box culvert installation in lieu of full run around and temp culvert that was designed at the plan review stage, estimated \$200,000 savings. Suggested elimination of Mechanically Stabilized Earth wall and change to cast in place barrier and slope utilization on Front Street in Hancock during the plan review stage, estimated savings of \$150,000.</p>	Superior Region	Highway Design	2015	2015	\$500,000	
<p><b>Infrared (IR) Illuminators on Environmental Sensor Station (ESS) Towers</b> - Use Infrared (IR) illuminators on Environmental Sensor Station (ESS) towers in lieu of 500 W lights for night imagery. IR illuminators were installed on ESS towers constructed in 2013, and ESS towers to be installed in 2016 will also be equipped with IR illuminators. This saves energy, addresses complaints about lights bothering nearby residents and eliminates a source of distraction to drivers.</p>	Superior Region	Highway Design	2015	2015		
<p><b>Road Weather Information System (RWIS)</b> - Relocating Road Weather Information System (RWIS) sub-probes from lane to shoulder on all new installations is anticipated to reduce number of new sensors needed due to mill and resurface projects.</p>	Superior Region	Highway Design	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Use Log Projects on Design Where Possible</b> - Saves in design costs. In looking at two projects just now designed with log jobs we expended 20 percent of the budget that was set up. Plan jobs would have likely expended entire budget. Estimated savings on these two projects is \$650,000. JN 120178 and JN 125863	Superior Region	Highway Design	2015	2015	\$650,000	
<b>Use of Multiple Views for Generating Plan Sheets</b> - Work done and displayed in one container file generates plan information for up to four, with potential expansion to eight, sheets. Saves time on sheet creation/labeling and reduces errors from redundant tasks.	Superior Region	Highway Design	2015	2015		
<b>Extending Oil Change Intervals on Newer Fleet Vehicles</b> - Extending oil change intervals on newer fleet vehicles was piloted at St. Ignace garage but not yet approved for widespread implementation by Fleet Team in Lansing.	Superior Region	Highway Maintenance	2015	2015	\$3,400	
<b>Extending Oil Change Intervals on Newer Fleet Vehicles</b> - Piloted at St. Ignace garage. Not yet approved for widespread implementation by Lansing Fleet Team. Projected annual material savings at St. Ignace garage = \$1822, labor savings = \$1581.	Superior Region	Highway Maintenance	2015	2015		
<b>Herbicide Applications</b> - Use ArcGIS Live Maps and global positioning equipment to avoid previously mapped no spray areas and reduce errors in spraying. Use of iPads to forecast wind direction and plan daily routes.	Superior Region	Highway Maintenance	2015	2015		
<b>High Speed Salting</b> - MDOT staff prototyping department designed equipment in-house, Piloted process during winter 2014-2015. Accurately places salt in travel lane at high speeds; Approximately 30% salt savings or \$50,000 during pilot period (labor, salt).	Superior Region	Highway Maintenance	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>I-75 Maintenance Decision Support System (MDSS) Salt Application Analysis</b> - Analyses to compare Maintenance Decision Support System (MDSS) recommended applications to actual are still being evaluated.	Superior Region	Highway Maintenance	2015	2015		
<b>Mobile Advanced Road Weather Information System (MARWIS)</b> - Used the Mobile Advanced Road Weather Information System (MARWIS) for collecting road and temperature data to predict when to apply salt. Savings to be determined.	Superior Region	Highway Maintenance	2015	2015		
<b>Tow Plow</b> - Being used on I-75 and sections of US-2 in Mackinac County. Fully implemented during Winter 2014 with cost savings of approximately 25% per year.	Superior Region	Highway Maintenance	2015	2015		
<b>Wing Plow</b> - Use of wing plow in active lane of traffic. Placed additional Superior Stick lighting on wing at \$200 per installation. Will free up one plow truck for other routes. Allows plow trucks to include passing lanes and truck climbing lanes with one pass. Approximate average savings of 30% per route (saves one operator, truck and a full-route-run per winter event).	Superior Region	Highway Maintenance	2015	2015		
<b>AURORA Project Seasonal Weight Restrictions Demonstration</b> - Collection of Road Weather Information System (RWIS) data. Utilization of various models to determine reliable prediction of frost depth. Freight Movement savings to be determined.	Superior Region	Highway Operations	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Couple Safety Messages with Statistics on Dynamic Messaging Signs (DMS)</b> - Regarding posting of total fatalities statewide on the DMS once a month, I suggest we cycle between two messages. "440 Traffic Deaths in MI this year"/"Please Don't Text and Drive". The next month a different safety message is displayed. We are missing an opportunity to drive home a safety message. "Don't text and drive"; "Don't drink and drive"; "Wear your safety belt"; "Pay attention". We can pilot the two message cycle to see if it is viable.	Superior Region	Highway Safety	2015	2015		
<b>Installation of Motion Sensors for Lighting at 24-7 Welcome Center Bathrooms</b> - Installed motion sensors for lighting at 24-7 Welcome Center bathrooms. Savings to be determined.	Superior Region	Other	2015	2015		
<b>SharePoint Page Upgrades</b> - Includes links to innovation pages and other resources, Region dashboard; employee engagement tracking; Wildly Important Goals (WIG) and Sub-WIG information; Redesigned, user friendly, one-stop-shop.	Superior Region	Other	2015	2015		
<b>Telecommuting and Video Conference</b> - Proactive use of Lync, GoToMeeting, Skype and Adobe Connect for in/external attendee and remote meetings between Lansing, contractors and MDOT facilities allowed travel time and wage savings.	Superior Region	Other	2015	2015	\$309,106	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Phone Consolidation to Cell Phones</b> - Consolidation of phone lines to cellular service for majority of Transportation Service Center (TSC) staff. In 2013 Jackson TSC was faced with a decision regarding land line phone service. To restore quality of service for all lines, AT&T needed to upgrade and was going to charge MDOT over \$10,000. Through communication, most employees with cellular service decided to forego their land lines and consolidate to one state phone number. This avoided the upgrade and reduced TSC monthly bill by over \$300.	University Region	Administration & Personnel	2015	2015	\$3,600	
<b>Hot Mixed Asphalt Tracking Spreadsheet</b> - A spreadsheet to assist in tracking and reducing potential errors involved in new requirements for longitudinal joint cores in Hot Mixed Asphalt paving. Benefits include an easily transferable template for technicians to use in layout and tracking of core locations. The spreadsheet also has an auto-calculating feature for incentive payment based on the core density.	University Region	Highway Construction	2015	2015		
<b>Plan Quantity Spreadsheet</b> - A live link between plan sheets and WebTransport reducing errors and saving one hour of University Region staff time on each plan sheet with quantities.	University Region	Highway Construction	2015	2015	\$250,000	
<b>Asset Management Lite</b> - An iPad application was downloaded to store location data and photos of tree removal sites. From this, a spreadsheet or other format can be provided to direct users to locational information.	University Region	Highway Maintenance	2015	2015	\$50,000	
<b>Deployed 2 Modified Superior Region Style Salt Spreaders</b> - Deployed 2 Modified Superior Region Style Salt Spreaders	University Region	Highway Maintenance	2015	2015	\$10,000	
<b>Deployed 5 Dual Wing Winter Maintenance Trucks</b> - Deployed 5 Dual Wing Winter Maintenance Trucks	University Region	Highway Maintenance	2015	2015	\$25,000	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Deployed 6 Tow Plows</b> - Deployed 6 Tow Plows	University Region	Highway Maintenance	2015	2015	\$90,000	
<b>Deployed 8 Zero Velocity Salt Spreaders</b> - Deployed 8 Zero Velocity Salt Spreaders	University Region	Highway Maintenance	2015	2015	\$39,000	
<b>Dual-Wing Plow Truck</b> - Dual-Wing plow truck proposed by Lansing Transportation Service Center area garages, implemented at Mason Garage. One driver/truck can clear both shoulders of a road in two passes or a ramp in one pass. Provides more efficient operation.	University Region	Highway Maintenance	2015	2015		
<b>Mobile Mechanic</b> - Adrian and Brighton	University Region	Highway Maintenance	2015	2015	\$59,000	
<b>Plow Truck Easy Button</b> - Easy button in plow trucks developed by staff in Mason Garage allows driver to quickly retract wings or tow plow with the push of a button, without needing to take his or her hands off the steering wheel. Allows for safer operation of plow trucks.	University Region	Highway Maintenance	2015	2015		
<b>Salt Calibration Team</b> - University Region has begun putting together a Salt Calibration team to ensure all winter maintenance trucks (WMT) are properly applying salt at specified amounts. Six employees have been trained and can now at the very minimum easily test the WMTs to confirm calibration is correct. The team has been shown a very straight forward procedure that requires no special tools, software or added salt controller knowledge. The goal is to also train night shift employees so during good weather they could test and calibrate as needed, travel from garage to garage as well.	University Region	Highway Maintenance	2015	2015		
<b>Superior Plus</b> - The Superior Plus can use the spinner function to help spread salt.	University Region	Highway Maintenance	2015	2015		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Track Zero-V</b> - Track Zero-V. The advantage of this design versus the typical paddle wheel design is that the only time ours has plugged is when they've allowed it to jam up when unloading the truck in the salt shed. Can get a kit for around \$1,400, after purchasing the additional parts total cost is under \$2,000.	University Region	Highway Maintenance	2015	2015		
<b>Drain Design Checklist</b> - It creates a standard for pipe size and discharge rate which helps avoid overtaxing our system and makes the requirements clear for the property owners. We followed similar requirements that the City of Lansing uses.	University Region	Highway Operations	2015	2015		
<b>Federal Emergency Management Agency (FEMA) Homeland Security Grant Program Urban Area Security Initiative</b> - Grant instead of state funds used to purchase portable generator to maintain pump house operations during power outages. [Safety & Security Administration]	University Region	Highway Safety	2015	2015	\$80,000	
<b>Federal Emergency Management Agency (FEMA) Homeland Security Grant Program Urban Area Security Initiative</b> - Grant instead of state funds used to purchase traffic signal modules to coordinate signal timing during emergencies. [Safety & Security Administration]	University Region	Highway Safety	2015	2015	\$48,490	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Reduction of Lane Departure Crashes</b> - Change of mindset designing Capital Preventive Maintenance (CPM) projects. All Jackson Transportation Service Center resurfacing CPM projects will include: -5 Year General Safety Review. - Mapped out crash locations with Roadsoft and/or ArcMap. - Corridor will be reviewed for tree removals. - All warning signs will be reviewed for compliance to Michigan Manual on Uniform Traffic Control Devices and possibly be upsized based on crash analysis. - All warning sign posts will have yellow reflectorized panels installed. - All stop signs (mainline &amp; cross road) will have red reflectorized panels installed.</p>	University Region	Highway Safety	2015	2015		
<p><b>Bridge Repairs</b> - Fabricated a float to allow riprap installation in scour areas of culverts or small bridges. Riprap prevents debris from falling into the water and can be loaded into the float on the road, put into the river with a crane truck and floated into the culvert/bridge. When the float is above the scoured location, a ripcord can be pulled that drops the riprap into place.</p>	Bay Region	Bridges & Structures	2014	2020	\$900,000	
<p><b>Bay Region Communications</b> - Using smart phones for e-mail, text, camera and internet provide faster maintenance response.</p>	Bay Region	Highway Maintenance	2014	2020	\$12,000	
<p><b>Energy Savings</b> - Installed Light Emitting Diode (LED) lights in many facilities and all signals to reduce overall energy usage and costs. Additionally, LED lights require re-lamping approximately every seven or eight years instead of annually.</p>	Bay Region	Highway Maintenance	2014	2020	\$500	
<p><b>E-Poke system for Winter Maintenance on Zilwaukee Bridge</b> - Formerly the Zilwaukee Bridge had only one truck available for de-icing. Now a second truck equipped to apply material allows for a spare truck if one goes down or use of both to complete the application in half the time.</p>	Bay Region	Highway Maintenance	2014	2020	\$50,000	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Mobile Office Technician</b> - Doing Office Tech from the field using mobile devices allows more time on site with inspectors, giving guidance and being familiar with the projects being reported.	Bay Region	Highway Maintenance	2014	2020	\$6,000	
<b>Building Utility Usage</b> - From May 2013, graphs were displayed showing utility usage at multiple facilities to readily track all utility usage and alert staff to spikes in usage.	Bay Region	Other	2014	2020	\$1,200	
<b>Utility Usage</b> - Bay Region disconnected one phone and one fax line in 2014.	Bay Region	Other	2014	2020	\$1,613	
<b>Inter-Agency Catch Basin Crews</b> - During Summer 2014, maintenance coordinators at Transportation Service Centers partnered with staff from county road commissions and municipalities for catch basin cleanout. Compared to prior years with private vendors, the new method was more cost effective and provided a higher quality outcome.	North Region	Highway Maintenance	2014	2020	\$15,000	
<b>Performance Based Rest Area Contract</b> - Developed a performance-based rest area maintenance contract for Topinabee and Hebron rest areas which pays the contractor a fixed amount to maintain the facilities, then measures their performance against set condition standards. If standards are not met, the contractor is penalized. Savings were over 15%.	North Region	Highway Maintenance	2014	2020	\$18,000	
<b>Restructure State Trunkline Fund (STF)</b> - 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.	Statewide	Finance & Contracts	2014	2020	\$90,000	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Concrete "Take-Off" Calculator</b> - A spreadsheet was developed to convert concrete pay items from a proposal into concrete volumes for different mixes. Concrete volumes are useful in planning lot size and testing quantities. Conversion from individual pay quantities requires reference of different standard plans and special details, hand calculating each pay item in turn. Approximately \$2,500 will be saved in meeting preparation during a construction season.	Statewide	Highway Design	2014	2020	\$2,500	
<b>Concrete Patch Drilling</b> - Concrete pin drill with three drills instead of just one cuts drilling time in half, allowing maintenance crews to complete work sooner and reducing the cost of repairs.	Statewide	Highway Maintenance	2014	2020	\$12,000	
<b>E-Mail Pre-Production Meetings</b> - Pre-production meetings for small quantity jobs are held using e-mail to contact interested parties and solicit comments. Comments are then synthesized into final minutes and distributed. The method saves time and transportation costs to MDOT, contractors and suppliers.	Statewide	Highway Maintenance	2014	2020	\$2,300	
<b>Pothole Patching Mix</b> - Purchased asphalt recycler to recycle broken asphalt during winter months when asphalt plant is closed. Allows maintenance crews to apply a hot mix during the cold weather months and spend less time fixing pot holes.	Statewide	Highway Maintenance	2014	2020	\$4,000	
<b>Premixing Salt</b> - Premixing salt with boost allows salt to work faster, reducing the time it takes to clean up winter storm events. Prewetting salt also reduces the amount of salt needed and helps keep salt from scattering out of lanes.	Statewide	Highway Maintenance	2014	2020	\$36,500	
<b>Bike Map e-Store</b> - Over 600 map requests at \$5 each generated annual savings from not contracting map mailing services. Additionally, processing time has been cut from 6 weeks to less than 1 week (2-4 day turnaround).	Statewide	Non-Motorized	2014	2020	\$18,000	

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<b>Online Utility and Right of Way Permitting Using the Construction Permit System</b> - MDOT transitioned from permitting via paper/postal to permitting exclusively online. Monetary savings are mostly related to time processing via paper and preparing mail related to permits.	Statewide	Other	2014	2020	\$3,000	
<b>Reorganization</b> - Lease savings from closure of eight facilities in 2011.	Statewide	Other	2014	2020	\$547,963	
<b>Global Positioning System (GPS) Unit</b> - Purchased a GPS unit to facilitate wetland delineation, locate new tree plantings and evaluate noxious weed spraying.	Bay Region	Environmental	2014	2018	\$8,000	
<b>Smart Phone Apps</b> - Using a smart phone application to collect locations of invasive species into a Geographic Information System file. The spray crew will use this inventory to seek the most effective way of treating invasive plants. This also allows spray crews to monitor the effects of treatment and find the most effective treatments for each species.	Bay Region	Environmental	2014	2018	\$2,500	
<b>Skype</b> - Used Skype and Facetime for out of state candidate interviews. This worked much better than standard phone interviews as a face could be placed with the answers.	Bay Region	Other	2014	2018		\$2,000
<b>Tracking Spreadsheet</b> - An <i>Excel</i> spreadsheet to monitor planned and actual milestone dates for all projects requiring right of way. Used at status meetings to give a visual aid when discussing projects.	Bay Region	Real Estate	2014	2018	\$12,000	
<b>Adopt-A-Highway</b> - Seven landfills are currently serving MDOT Southwest Region's Adopt-A-Highway program at no cost. The overall savings of this practice is estimated at \$14,145 each year (which varies from season to season).	Southwest Region	Highway Maintenance	2014	2016	\$14,145	

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<p><b>Weekly Construction Issues Call-In Meeting</b> - This is a 15 minute call-in meeting that can be done from the field. This is used for coordination of upcoming weekly tasks, keeping staff current on issues and making them aware of issues that are new or ongoing. I have seen improvement on employee engagement and how aware they are of all the issues in the office and region. It is hard to quantify time savings but it definitely saves time on coordination with each individual when they are all on the phone at the same time and are all hearing the same information. I have been using this for just over a year.</p>	Superior Region	Highway Construction	2014	2016		
<p><b>Salt Boxes with Auger</b> - Using salt boxes in trucks with an auger rather than flight chain for more accurate salting. Increases ability to place appropriate amount of salt in needed areas.</p>	Bay Region	Highway Maintenance	2014	2015	\$100,000	
<p><b>Accelerated Innovation Deployment Demonstrations</b> - Used Accelerated Innovation Deployment (AID) grant funding for a bridge slide and diverging diamond interchange. FHWA AID demonstration funding is an incentive for eligible entities to accelerate implementation and adoption of innovation in highway transportation. MDOT received \$1,000,000 in both 2014 and 2015.</p>	Executive Office	Finance & Contracts	2014	2015	\$1,000,000	
<p><b>Tungsten Underbody Blades instead of Steel Blades</b> - Four truck were retrofitted with tungsten underbody blades that last three times longer and only need to be replaced every 3 years, unlike the 9' steel wing blades, which require replacement approximately 3 times per year. Other variants include recycling and reusing center blade plows from trucks as wing-blade spares for other snowplows.</p>	Southwest Region	Other	2014	2015	\$3,948	

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Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Aircraft Registration Payment Website</b> - Implementation of the Office of Aeronautics online aircraft registration payment website allows aircraft owners to renew registration. Minimizing mail or phone payments annually saves approximately 80 hours of staff time. Lock box fees have been eliminated and mailing costs reduced. Customers save with reduced costs of mailing checks.	Statewide	Aviation & Airports	2014	2015	\$4,000	\$1,500
<b>e-Construction/Tablets</b> - More than 600 managers, inspectors, materials staff and others using e-construction techniques and tablet computers have reduced costs, materials and time.	Statewide	Highway Maintenance	2014	2015	\$21,430,000	
<b>Pothole Patching</b> - Use of asphalt instead of cold patch when asphalt plant is open. Hot mix lasts longer than cold patch and is about half the price. This reduces number of times crews are on the roadway applying material in traffic and frees them for other duties.	Statewide	Highway Maintenance	2014	2015	\$4,000	
<b>Americans with Disabilities Act (ADA) Ramp Design Tool</b> - Developed a spreadsheet to perform the repetitive calculations of grades and slopes when designing an Americans with Disabilities Act (ADA) ramp. The spreadsheet provides a quick calculation and visual output that allows the designer to see where the design does not meet current specifications.	Statewide	Non-Motorized	2014	2015	\$100,000	\$100,000
<b>High Speed Salting</b> - Staff currently prototyping MDOT designed equipment in-house. Piloted process during winter of 2014/2015. Accurately places salt in travel lane at high speeds. Approximately 30% salt savings.	Superior Region	Highway Maintenance	2014	2015	\$50,000	

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Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Single Set of Plans for Alternate Pavement Bid Projects</b> - Standard procedure for Alternate Pavement Bid (APB) projects creates two sets of plans, one for each pavement type. A single set of plans was created for the US-127 reconstruction project north of Jackson. Saved development time and resulted in a smaller, more concise set of plans.	University Region	Highway Design	2014	2015	\$50,000	
<b>Thermal Integrity Profiler (TIP)</b> - Both caisson Thermal Integrity Profiler (TIP) and Crosshole Sonic Log (CSL) testing on Vassar bridge used to determine best practices and future uses to eliminate air pockets in the caisson foundations.	Bay Region	Bridges & Structures	2014	2014		
<b>Digital Pen</b> - US-10 at Nine Mile Rd. bridge replacement included using Digital Pen for Plan Reviews during the design phase, consolidating/reducing forms needed for submittal, pilot for new ProjectWise folder structure and workflows and right of way plan submittal. Based on the success of this project, many of these changes will become standard.	Bay Region	Finance & Contracts	2014	2014		
<b>Dispute Resolution Board</b> - Piloted Dispute Resolution Board during the 2014-15 I-69, M-54 to Center Rd, reconstruction to replace the traditional claim process. Also included new right of way plan submittal process.	Bay Region	Finance & Contracts	2014	2014		
<b>Prompt Payment</b> - Implemented prompt pay check process to insure contractors on MDOT and local agency projects are paid promptly. Process includes spot checks on pay items to make sure payments are timely. This has created improvements.	Bay Region	Finance & Contracts	2014	2014		
<b>Light Detection And Ranging (LIDAR) Surveying</b> - The US-10BR (Eastman Ave.) reconstruction in Midland design build project made use of LIDAR to expedite surveying by two months.	Bay Region	Highway Construction	2014	2014	\$85,000	

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<b>Time Sequence Cameras</b> - Time sequence cameras installed on the M-20 roundabout safety project in Midland take periodic photos showing construction over time. Currently working through a software issue with the graphics area. Completed time lapse movie to be rolled out at High Impact presentation.	Bay Region	Highway Construction	2014	2014		
<b>Computer-Aided Design &amp; Drafting (CADD) Development Team</b> - Susan Phillips is co-chair of a new statewide Computer-Aided Design & Drafting (CADD) development team to improve the design development process.	Bay Region	Highway Design	2014	2014		
<b>Computer-Aided Design &amp; Drafting (CADD) File Management</b> - Design is investigating a new Computer-Aided Design & Drafting (CADD) file management technique that simplifies the level control of reference files.	Bay Region	Highway Design	2014	2014	\$25,000	
<b>Alternative Technical Concept</b> - Used Alternative Technical Concept (ATC) for Maintenance of Traffic (MOT) on freeways. Approach allows contractors to develop alternatives for maintaining traffic via an approval process while minimizing costs and maximizing construction efficiency.	Bay Region	Highway Maintenance	2014	2014		\$3,000,000
<b>Epoxy Injection</b> - Assisted on construction M-90 Bridge over Black River project. Crews epoxy injected existing deck delamination in lieu of chipping and patching. This is a new process, shared from Iowa DOT. that structurally bonds concrete areas. Saved contractor and MDOT the 30 day cure time of chipping and patching prior to placing an epoxy overlay wearing surface on the bridge. Contractor will not need to patch the existing deck next season and will not have to wait the cure time before placing an epoxy overlay wearing surface.	Bay Region	Highway Maintenance	2014	2014	\$17,000	

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Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Fluorescent Barrels</b> - I-69, M-54 to Center Road, reconstruction project piloted use of fluorescent barrels. Traditional barrels used westbound looked dirty compared to fluorescent barrels on eastbound. Contractors and inspectors stated they felt safer with fluorescent barrels. It was also said that they are more visible in rainy/wet conditions.</p>	Bay Region	Highway Maintenance	2014	2014		
<p><b>Geotextile &amp; Hydrophilic Expanding Polyurethane Products</b> - Embankment material was getting drawn in between separated pipe joints leading to a settlement problem with an 84" concrete culvert on M-47 just north of M-46. Region and Bridge Field Service staff added geotextile in joint separations, used hydraulic cement to seal the joint and injected hydrophilic expanding polyurethane into soil surrounding the pipe, sealing the joint. This was done without disturbing traffic and/or open cutting to replace pipe.</p>	Bay Region	Highway Maintenance	2014	2014	\$500,000	
<p><b>I-75 Reconstruction from Dixie to Hess</b> - For the I-75 Reconstruction from Dixie to Hess, piloted a Dispute Review Board, fluorescent barrels in tapers, median barrier wall mounted temporary sign and movable concrete barrier wall.</p>	Bay Region	Highway Maintenance	2014	2014	\$6,000,000	
<p><b>Tow Plows on I-75</b> - Do same amount of snow removal and salting as another truck would do. Storm event response time on I-75 is quicker and more efficient as only one operator is needed to remove snow and/or apply product to two lanes of roadway.</p>	Bay Region	Highway Maintenance	2014	2014	\$170,000	
<p><b>Monitoring Traffic</b> - I-75 pavement rehabilitation project in Genesee County used the Slow Stopped System to monitor active traffic speeds. When traffic was slowed or backed up, dynamic message signing was activated to suggest alternate routes.</p>	Bay Region	Highway Operations	2014	2014	\$20,000	

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Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Pavement Marking Shields</b> - I-75 in Genesee County pavement rehabilitation project included installation of pavement markings of freeway medallions within lanes to assist drivers in lane selection prior to the I-75/US-23 split in the freeway.	Bay Region	Highway Operations	2014	2014		
<b>M-20 Boulevard Safety Project</b> - Project to eliminate all left turns at Leaton Road. Intersection leads directly to Soaring Eagle Casino and is very busy during events and certain times of the week. Saginaw Chippewa Indian Tribe was interested in continuing the boulevard west for their own benefit and traffic control, and contributed \$1.6 Million. Due to added safety, MDOT supported this. Both projects coordinated with local Indian tribe and Bureau of Indian Affairs. This was the first coordinated project by MDOT and BIA.	Bay Region	Highway Safety	2014	2014	\$1,302,300	
<b>Safety Improvements</b> - Given approximately 30 presentations on Toward Zero Deaths to raise awareness and change driver behavior. Presentations have been given to MDOT staff, AASHTO, MSP, County 911, local officials and service groups.	Bay Region	Highway Safety	2014	2014		
<b>Safety Improvements</b> - Partnered with Thomas Township, MSP and Saginaw County Sherriff to invest in safety improvements on M-46 in Saginaw County. Part of this initiative was creation of a safety coalition and a Stay Safe Drive Smart campaign aimed at red light enforcement, seatbelt usage and speeding along the corridor.	Bay Region	Highway Safety	2014	2014		

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<p><b>Communication E-Mail Updates</b> - Operations initiated an e-mail list by county to forward updates to participants. Participants were added at their request following inquiry of interest. Participants include local agency partners, emergency responders, schools, media partners, residents and businesses. Communiqués often create further responses and follow up.</p>	Bay Region	Other	2014	2014		
<p><b>Fleet Reduction</b> - Developed a fleet assignment chart to determine vehicle assignments by position/duties. Utilization is monitored annually to right size light fleet.</p>	Bay Region	Other	2014	2014	\$216,000	
<p><b>Aggregate and Hot Mix Asphalt (HMA) Patch</b> - Concrete patch repairs on US-10 were completed using ½ depth of aggregate and ½ depth Hot Mix Asphalt (HMA) to allow same day opening to traffic. Greatly increases public mobility versus closing road for three days of curing.</p>	Bureau of Field Services	Highway Maintenance	2014	2014		
<p><b>Utility Pavement Cuts</b> - MDOT wants pavement cuts replaced with like materials to minimize impacts of future rehabilitation/maintenance activities. Utility pavement cuts in composite pavement during Winter cause the need for repeated patching efforts until the permanent fix can be made in Spring. Past practice was to bring concrete up to adjacent concrete pavement grade, let it cure and cover with cold patch material until Spring when Hot Mix Asphalt (HMA) is available. At that time the cold patch is removed and replaced with HMA. City of Coldwater used a two inch temporary concrete layer over a plastic separator in place of cold patch. Top layer of concrete will be removed and replaced with HMA in Spring. A two inch layer of cold patch typically requires multiple repairs during the same period. As of late January the temporary patch still looks great.</p>	Bureau of Field Services	Highway Maintenance	2014	2014		

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<b>Wing Plows</b> - Installed wing plows on winter maintenance trucks, allows operators to clear a lane and shoulder or a ramp with one pass instead of two. Reducing passes reduces time taken to clean up a winter storm event.	Bureau of Field Services	Highway Maintenance	2014	2014		
<b>Winter Performance Monitoring</b> - In an effort to reduce material consumption during Winter, using performance metrics and processing data in new ways to find outliers in MDOT operations. Developed a storm severity index so comparisons of salt usage with respect to levels of Winter across the region can be made. Information is updated weekly instead so adjustments can be made during the season. Using specific storm characteristics, each event has a 1-10 intensity measure and a number of hours. This severity value is correlated with salt placed per lane mile to provide a basic comparison between areas on salting practices. Though there is no target value, the approach does define trends between areas. This report also provides a dashboard glance of how garages are following the salting speed advisory. The perspective of each garage on one report also allows corrections as necessary.	Bureau of Field Services	Highway Maintenance	2014	2014		
<b>Remote Sensing</b> - Aerial Light Detection And Ranging (LIDAR) photos used to identify an abandoned coal mine in Jackson. Point clouds from commercially available LIDAR photos were filtered to remove unwanted vegetation reflection to reveal a depression and tailings pile.	Bureau of Field Services	Other	2014	2014		
<b>Hard Shoulders</b> - Bureau of Transportation Planning staff participated in analysis of using hard shoulder running on I-96 in Oakland County and US-23 in Livingston and Washtenaw Counties as a way of managing peak hour traffic congestion to improve traffic flow and safety along the corridor.	Bureau of Planning	Highway Operations	2014	2014		

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<p><b>Teleconferencing Pre-Production Meetings</b> - Telephone conferencing technology offers contractors/supplier representatives the option of saving time by calling into pre-production meetings. Since these meetings are short duration, travel time is often a major part of the cost of attendance.</p>	Construction Field Services	Highway Construction	2014	2014		
<p><b>Bridge Slide</b> - Deployment of accelerated bridge construction techniques in the form of 3 bridge slides in Grand Region. User delay costs reduced by \$3 million on M-50 over I-96 and \$2.9 million for both US-131 bridges over 3 Mile Road.</p>	Grand Region	Bridges & Structures	2014	2014		\$5,900,000
<p><b>Diverging Diamond Interchange (DDI)</b> - Design of Diverging Diamond Interchange (DDI) at Cascade Road and I-96 to obtain operational and safety benefits. Requires teamwork between MDOT, county, local and FHWA partners.</p>	Grand Region	Highway Design	2014	2014		
<p><b>Dynamic Traffic Assignment (DTA) Modeling</b> - The I-96 design team made use of Dynamic Traffic Assignment (DTA) modeling to develop and evaluate the different maintaining traffic alternatives for this project. By using the DynusT software, a model was created that provided methods to predict/estimate how drivers may shift to other routes or adjust their departure time in response to the construction project. This also provided a better understanding of how individual travel decisions impact congestion for the entire metro region. The model was one of the tools used to assist the design team to develop user costs for each alternative, as well as create a visualization video which showed where congestion would occur and assist in determining the impacts on the other roadways within the region.</p>	Metro Region	Highway Design	2014	2014		

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<b>M1 Rail Partnerships</b> - Rail project complements/enhances redevelopment already occurring throughout Downtown and Midtown Detroit. Made possible through a unique partnership between private, philanthropic, local, state and federal agencies.	Metro Region	Local Public Transit	2014	2014		
<b>Local Agency Contact Information</b> - Created and monitored contact information of local agency employees in a shared database, updateable by Transportation Service Center and Region personnel. Contact list is shared in Outlook and is available on iPhone devices. Outlook contact list is always current and updates with no user effort. Contact list is electronic and no paper is used, saving time and simplifying work. This method will be suggested to other Region contact lists also.	Office of Human Resources	Other	2014	2014		
<b>Truck Parking Intelligent Transportation System (ITS)</b> - MDOT deployed truck parking Intelligent Transportation System (ITS) signs to provide valuable parking availability data to truck drivers, ensuring optimum, on-time freight movement.	Southwest Region	Highway Operations	2014	2014		
<b>User Delay Cost Limiting Wildly Important Goal (WIG)</b> - Set a Wildly Important Goal (WIG) to limit user delay cost for travelers on I-94, I-196, I-69 and US-131 by reducing/eliminating delays caused by incidents, work zones and winter weather. Daily, employees focused efforts on three lead measures involving quickly clearing traffic incidents, optimizing work zone maintenance of traffic schemes and regaining traffic speeds in morning rush hours during snow events.	Southwest Region	Highway Operations	2014	2014		

## 2017 Economies, Efficiencies & Innovations

### Quantified Savings & Unquantified Efficiencies



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<b>Welcome Center Intelligent Transportation System (ITS)</b> - New Buffalo Welcome Center installed an Intelligent Transportation System (ITS) to inform truck drivers how many parking spots are available at any given time. Effort is aimed at reducing driver fatigue and, hence, crashes.	Southwest Region	Highway Operations	2014	2014		
<b>Work Group E-Mail Profiles</b> - E-mail profile MDOT-SW-Materials@michigan.gov was created for transfer of materials related documents. A similar profile is planned for the region's hot mix asphalt group.	Southwest Region	Other	2014	2014		
<b>Enterprise Asset Management Solution</b> - Developed a request for proposals to outline functionality and requirements of a department wide asset management system. By managing assets across the department, MDOT can improve utilization and performance, reduce capital costs, reduce asset-related operating costs, extend asset life and subsequently improve MDOT's return on assets.	Statewide	Asset Mgt. & Planning	2014	2014		
<b>Mio-Vision Technology</b> - Data Collection & Analysis Section have been using Mio-Vision units which record vehicle classification and intersection turning movement data using a camera sensor. Data is transmitted back to Mio-Vision which processes the data and returns a formatted file to MDOT. Units can allow one person to perform seven classification counts for same cost as the one person performing one class count.	Statewide	Asset Mgt. & Planning	2014	2014	\$230,000	
<b>Non-Trunkline Federal-Aid (NTFA) Program</b> - The Non-Trunkline Federal-Aid (NTFA) road network has combined road segments, minimizing the number of traffic counts needed to meet the federal requirement.	Statewide	Asset Mgt. & Planning	2014	2014	\$133,950	

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<b>Michigan Airport Directory Mobile Application (MiAirports)</b> - Office of Aeronautics collaborated with MDOT/DTMB staff to develop the Michigan Airport Directory Mobile Application (MiAirports) to supplement printed and online versions of the Michigan Airport Directory. Application has the potential to replace paper directory saving approximately \$25,000 a year in printing costs and saving staff editing and approval time.	Statewide	Aviation & Airports	2014	2014	\$25,000	
<b>Geosynthetic Reinforced Soil (GRS) Integrated Bridge System</b> - In partnership with FHWA and Ionia County, Bridge Development Section showcased a promising new bridge substructure that allows MDOT and local agency bridge owners to build small to medium span bridges quickly with reduced cost.	Statewide	Bridges & Structures	2014	2014		
<b>Call For Projects Capital Preventive Maintenance (CPM) ProjectWise</b> - Modified Call For Projects process to have all submittals, correspondence and acceptance of each Capital Preventive Maintenance (CPM) project done in ProjectWise. Reduced approval time and centralized all correspondence documentation.	Statewide	Finance & Contracts	2014	2014		
<b>Comprehensive Transportation Fund Bond Refinancing</b> - Refinanced \$10.7M of Comprehensive Transportation Fund (CTF) bonds for interest savings of \$917,040 over remaining life of bonds. The benefit of these savings are 2/3 to Aeronautics and 1/3 to CTF.	Statewide	Finance & Contracts	2014	2014	\$798,519	
<b>Construction Project Average Age Reduction</b> - Bureau of Finance & Administration Wildly Important Goal is to reduce average age of completed construction projects awaiting closure from 1.8 years to 1.0 year.	Statewide	Finance & Contracts	2014	2014		

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<p><b>Fixed Price Variable Scope (FPVS)</b> - Many regions used this innovative contracting concept within the Capital Preventive Maintenance (CPM) program as a method to gain maximum improvement with available funds. A North Region Fixed Price Variable Scope (FPVS) project is planned for late in the fiscal year to utilize any funds remaining from favorable bids in the program. This also results in more efficient use of employee resources in existing planned projects rather than developing a new, separate project. Bay Region had five FPVS projects on bridges, crack seals and chip seal projects. University Region is considering FPVS for I-69 in Eaton County. This approach also maximizes performance in the region strategy by increasing the lane miles of work applied.</p>	Statewide	Finance & Contracts	2014	2014		
<p><b>Mid-Term Incentives</b> - Special Provisions award/penalize contractors if certain mid-term open to traffic dates are met or not.</p>	Statewide	Finance & Contracts	2014	2014		
<p><b>State Trunkline Funds (STF) Bond Refinancing</b> - Refinanced \$265 million in State Trunkline Funds (STF) bonds to achieve interest savings of nearly \$23 million based on present day value.</p>	Statewide	Finance & Contracts	2014	2014	\$22,974,744	
<p><b>Construction Staffing</b> - Developed construction workforce planning tool now used to staff appropriately for upcoming construction season. Determines staff necessary for the upcoming construction program and can be used as a decision making tool for hiring co-ops, consultants or moving staff between offices to handle construction oversight.</p>	Statewide	Highway Construction	2014	2014		
<p><b>Cross-Working in Permit &amp; Construction</b> - Staff took on role of inspector for construction projects saving need to hire consultants.</p>	Statewide	Highway Construction	2014	2014	\$120,078	

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<b>Electrician Staffing</b> - Using an asset based approach, developed electrician workforce planning tool which determined permanent staffing for electricians statewide necessary to maintain our electrical devices.	Statewide	Highway Construction	2014	2014		
<b>Hot Mix Asphalt (HMA) Specification Modifications</b> - Modified mix design requiring fine graded surface course mixtures. Requirement to field regress air voids to 3% which will require additional Asphalt Cement in the Hot Mix Asphalt (HMA). This will reduce surface cracking and increase pavement performance. Modified asphalt cement grade for Capital Preventive Maintenance Projects which will reduce cracking resulting in longer lasting pavement treatments.	Statewide	Highway Construction	2014	2014		
<b>Optional Precast Concrete Substructure</b> - A change to standard job practices was made to allow contractor to decide if precast substructure units are a cost effective alternative to cast in place of concrete.	Statewide	Highway Construction	2014	2014		
<b>Portadam™ Cofferdam Water Diversion System</b> - Projects requiring water diversion typically use concrete barriers and sheet piling. Contractor on Project 118262A opted to try portable cofferdam equipment, which consists of a series of interconnected metal frames supporting a laced/interlocked tarp. Water from the river was 100% diverted from the work area, though some pumping to discharge ground water was required. Cofferdam increased safety because the work area was visible and fewer water pumps were needed resulting in fewer electrical cords and discharge pipes. A smaller volume of discharge from the work area increased contractor's production.	Statewide	Highway Construction	2014	2014		

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<b>Stringless Concrete Paving</b> - Used stringless concrete paving on I-75, including Light Detection And Ranging (LIDAR) for quantity determinations at intermittent layers of construction. This included scanning existing pavement, subbase and aggregate base, hot mix asphalt interlayer and final concrete construction. Method is being used for very precise measurements of quantities and tolerances. Project also made use of the Alternate Technical Concepts (ATC) process for contractors to submit their concepts for maintaining traffic within guidelines for safety and mobility.	Statewide	Highway Construction	2014	2014	\$1,000,000	
<b>PowerGEOPAK SS3</b> - Design Services Section developed tools/resources to implement PowerGEOPAK SS3 for enhanced automated mapping, parametric roadway and drainage design. Effort will further enable the development of three dimensional engineered models and electronic engineered data for delivery to construction and beyond.	Statewide	Highway Design	2014	2014		
<b>Federal Emergency Management Agency (FEMA) Homeland Security Grant Program Urban Area Security Initiative</b> - Grant funds, instead of state funds, were used to purchase traffic signal modules and emergency route signs.	Statewide	Highway Maintenance	2014	2014	\$61,750	
<b>Freeway Lighting System</b> - MDOT continued to upgrade lighting to energy efficient light emitting diode luminaries, including high profile project areas such as I-96 from I-275 to US-24, the Zilwaukee Bridge and High Mast light towers at I-75 and US-2.	Statewide	Highway Maintenance	2014	2014		
<b>Laser Scanning</b> - Use of a survey grade static laser scanner for precise vertical clearance between the bottom of a bridge and the top of a railhead does not require physical presence on the railroad. This increases safety for the surveyor and, because a railroad company spotter is not required, saves time and money.	Statewide	Highway Maintenance	2014	2014		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Maintenance Decision Support Systems (MDSS) -</b> Automatic Vehicle Location on trucks and Maintenance Decision Support Systems (MDSS) management tools improve maintenance decision making. Meridian state-of-the-science MDSS provides detailed and accurate information on each route. This enables effective maintenance on roads while optimizing resource use and reducing cost.	Statewide	Highway Maintenance	2014	2014		
<b>Maintenance Staffing -</b> Using an asset based approach, developed maintenance/sign workforce planning tool to determine permanent maintenance staffing statewide. Tool is used to determine necessary maintenance workers staffing for sign maintenance.	Statewide	Highway Maintenance	2014	2014		
<b>Safety Lights for Wing Blades -</b> Light emitting diode safety light mounted on wing blade of plow truck to increase visibility when plowing large amounts of snow allows driver to see outside edge of blade, reducing obstructions strikes.	Statewide	Highway Maintenance	2014	2014		
<b>Sign Covers Required During Construction -</b> Using three standard sign covers on ground mounted speed limit signs eliminates cost and time associated with designing and fabricating Type 1 sign covers. 3 standard sign covers = \$60; 1 Type 1 Sign Cover = \$1500	Statewide	Highway Maintenance	2014	2014	\$54,720	
<b>Intelligent Transportation -</b> Message boards on I-75 notify public on crashes or roads/ lanes closures. This allows the motorist ample time to move out of a closed lane, seek an alternate route or slow down coming up to a lane closure. This reduces the number of secondary incidents.	Statewide	Highway Operations	2014	2014		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Adobe Connect Webinars</b> - Intermodal Policy Division ensures good communication while reducing travel costs and time for staff and participants by meeting through Adobe Connect. Four Tribal government planning meetings were conducted, resulting in substantial cost savings, particularly for the Keweenaw Bay Indian Community, whose Baraga offices are a 900 mile round trip from Lansing. Staff time/travel also saved by the MDOT Ishpeming Transportation Service Center and Marquette DNR.	Statewide	Other	2014	2014	\$9,500	\$500
<b>e-Pub Accident Prevention Plan</b> - Reduced cost of publishing Accident Prevention Plan by having e-Pub version available to employees.	Statewide	Other	2014	2014	\$2,000	
<b>Increase Minority/Women Teachers/Interns in Transportation and Civil Engineering (TRAC) Program</b> - Created a statewide list of teachers and interns participating in the Transportation and Civil Engineering (TRAC) Program with contact information, place of employment, gender, and whether s/he considers themselves a minority. Data directed the focus of the outreach program to encourage TRAC program goal of more participation from minority and/or female teachers and interns.	Statewide	Other	2014	2014		
<b>Reduction of First Aid Injuries</b> - Reduced number of visits to medical clinics for minor first aid and/or poison ivy.	Statewide	Other	2014	2014	\$5,000	
<b>Public Private Partnership</b> - Pursued a public-private partnership for managing timber in portions of MDOT right-of-ways.	Superior Region	Highway Maintenance	2014	2014		
<b>I-96/US-23 Interchange Layout</b> - Using Alternate Technical Concepts to maximize performance/maintenance of traffic, created new interchange layout with contracting methods used on I-75 project in Monroe County.	University Region	Finance & Contracts	2014	2014		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Reconfiguring I-96/US-23 Interchange</b> - Reconfigured I-96/US-23 Interchange to eliminate merging traffic on mainline I-96. A new four lane I-96 freeway section will be constructed in the middle of the existing I-96 roadway with the existing roadway becoming a collector distributor road. This operational approach also improves safety with less cost and disruption to the traffic and residents than the complete reconstruction and reconfiguration to a full cloverleaf alternative of a previous study.	University Region	Highway Construction	2014	2014	\$80,000,000	
<b>Intelligent Transportation Systems (ITS) Device Asset Management Database</b> - Intelligent Transportation Systems assets (19,000+) were added to a central database used for project planning, work order creation and tracking, device inventory and device maintenance. The database can be accessed by Traffic Operations Center staff, maintenance personnel, and MDOT. Annual savings estimates are based on decreased time creating work orders, faster response time to work orders, and decreased time creating system reports.	Statewide	Asset Mgt. & Planning	2013	2020	\$120,000	
<b>Maintenance Decision Support System (MDSS)</b> - Maintenance Decision Support System (MDSS) enables better informed decisions before and during winter weather. The combination of sensors mounted on winter maintenance vehicles relay information to a software program that gives employees accurate data about road conditions in real time, increasing efficiency of salting and plowing.	Statewide	Highway Maintenance	2013	2020	\$100,000	
<b>Recycling Scrap Metal</b> - The scrap metal salvage program has saved \$343,000 in five years.	Statewide	Highway Maintenance	2013	2020	\$86,000	
<b>Tow Plows</b> - New snow removal equipment and technique in which an additional plow is attached to the side of a plow truck to almost double cleared area per pass. This saves trucks, staffing and fuel.	Statewide	Highway Maintenance	2013	2020	\$200,000	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Adobe Connect</b> - Used <i>Adobe Connect</i> for Web meetings, training and webinars to reduce travel expenses.	Statewide	Other	2013	2020	\$818,510	
<b>MDOT Construction Manual</b> - Hardcopy of MDOT's Construction Manual last updated in 2003. Consists of 350 pages and weighs about five pounds. In 2012, there were 766 addendums to the manual, which required printing and manually updating thousands of pages. The Wiki format online construction manual and elimination of hundreds of printed amendments will have ongoing efficiencies for faster information distribution and always up to date information in one location.	Statewide	Other	2013	2020	\$365,000	
<b>Carbon Reinforced Polymer Strands</b> - M-102 Over Plum Creek - In 2013, the Michigan Department of Transportation replaced an existing earth-filled arch culvert on M-1 02 (8 Mile Road) with a CFRP pre-stressed spread box beam structure. M-102 is a major urban route into the city of Detroit, with four lanes of traffic in each direction. Working on this route presents a major impact to regional mobility, so the decision to use durable, non-corrosive materials was deliberately made to ensure that life cycle rehabilitation actions can be delayed for as long as possible. The spread box beams are pre-stressed with CFRP strands and contain CFRP shear stirrups and mild reinforcement. The bridge deck is also reinforced with CFRP mild reinforcement. Each bridge consists of a single 70' span, with eight 33" deep by 48" wide, pre-stressed spread box beams. Note that the beams contain no steel materials!	Metro Region	Bridges & Structures	2013	2016		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Loader/Grader</b> - A loader outfitted with a plow and wing to determine if this equipment combination can push open closed roadways and bench snow during intense snow events. If proven effective, when no longer repairable MDOT's fleet of grader's with plows and 12' blades can be turned in for salvage/sale and be replaced with this equipment.</p>	Southwest Region	Other	2013	2016	\$100,000	
<p><b>Property Damage Reclamation Process (PDRP)</b> - Created in 2007, the Property Damage Reclamation Process (PDRP) enables MDOT to search the Michigan State Police <font size="3">&lt;em&gt;Traffic Crash Reporting System&lt;/em&gt;&lt;/font&gt;&lt;font size="3"&gt; (TCRS) for crashes on state trunklines with potential damage. At the time TCRS was accessible only to MDOT. In 2012 a Web based program enabled MDOT and Contract Local Agencies to work within the system. Operation Field Services (OFS) hired a second Coordinator to increase processing claims. By 2013, PDRP was the focus of lost potential reimbursement, leading to an increase of damage costs returned and submitted to Finance. Performance measures and training for MDOT Regions and Local Agencies has provided better understanding of the importance of PDRP and increased reimbursement returns.&lt;/font&gt;</font></p>	Statewide	Asset Mgt. & Planning	2013	2016	\$5,115,192	\$1,300,000

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Transportation Alternatives Program (TAP) Coordination with Southeast Michigan Council of Governments -</b> Shared services between MDOT and Southeast Michigan Council of Governments (SEMCOG) regarding Transportation Alternatives Program (TAP) pre-application meetings and phone calls, educational sessions, application review and project selection. Collaboration eliminates the possibility of two separate TAP funding programs serving Southeast Michigan causing inefficiencies amongst local agencies applying to both sources for TAP funds. MDOT and SEMCOG also occasionally co-fund TAP projects allowing each agency to more widely distribute their TAP funds and the community to the maximize federal funding.</p>	Metro Region	Finance & Contracts	2013	2015	\$2,808	\$35,008
<p><b>Rural Freeway Mowing -</b> Implemented a three-year mowing/spraying method for the I-75 corridor for low and high-growth areas leading to a \$40,000 annual reduction.</p>	North Region	Highway Maintenance	2013	2015	\$40,000	
<p><b>Metropolitan Planning Organizations (MPO) Use of the Michigan Grant System (MGS) -</b> Metropolitan Planning Organizations (MPO) used the MDOT Grant System (MGS) for their Transportation Alternatives Program (TAP) application and review process. This eliminated development of a separate application or system for TAP applications and tracking of key fields required for federal reporting. Use of one application also saves applicants from filling out separate MDOT and MPO applications for TAP funds. Also allows for MDOT technical reviewers to comment on constructability factors for MPO TAP applications. Having TAP data in one location makes federal reporting more efficient.</p>	Statewide	Finance & Contracts	2013	2015	\$3,300	\$980

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Paperless Communication of Grant Awards to Applicants</b> - E-mail templates were developed in MDOT Grant System (MGS) to eliminate grant awards being sent via U.S. Mail. The templates pull key data from the grant in MGS to reduce errors and help ensure consistent communication.	Statewide	Finance & Contracts	2013	2015	\$11,019	
<b>Transportation Alternatives Program (TAP) Grant Status Meetings</b> - Bi-monthly meetings held with the grant coordinators, MDOT Local Agency Programs Unit (LAP), and Metropolitan Planning Organization (MPO) to review status of all unobligated grants. This addition to the Transportation Alternatives Program (TAP) grant process has improved the TAP obligation/ reimbursement rate for Michigan. Result is Michigan communities see positive safety and mobility impacts of investments sooner. MDOT Grant Coordinator and MPOs get updates on project status all at once rather than at different times for each project. It also fosters group awareness of issues local agencies may encounter during design and provides a venue for problem solving and barrier busting, thus improving customer service.	Statewide	Finance & Contracts	2013	2015	\$7,135	\$900
<b>Interactive Communication &amp; Meetings</b> - Using applications like Google Earth during meetings improves speed, accuracy and communications during meetings. Also saves on paper costs and reduces field time.	Statewide	Other	2013	2015	\$660,000	
<b>Office Space Consolidation</b> - Cancellation of two leases in the Lansing area. (Lansing Transportation Service Center \$242,847, Photo Lab \$486,667)	University Region	Other	2013	2015	\$729,514	
<b>Zilwaukee Bridge Project</b> - Savings on Z-bridge project using Construction Manager/ General Contractor (CM/GC) process.	Bay Region	Highway Maintenance	2013	2014	\$575,000	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Electronic State Transportation Improvement Program (e-STIP)</b> - The Electronic State Transportation Improvement Program (e-STIP) allows Metropolitan Planning Organizations (MPO) to enter project information via a Web-based application. Between \$11,000 and \$14,000 saved by removing duplication of effort and allowing MPOs to enter data for local projects.	Statewide	Asset Mgt. & Planning	2013	2014	\$14,000	
<b>MiBridge</b> - Combining the Michigan Bridge Reporting System (MBRS) and Michigan Bridge Inspection System (MBIS) software platforms into MiBridge helps the Department better manage/schedule bridge inspections and notify local agency owners of deficiencies. This contributes to National Bridge Inspection Standards (NBIS) compliance.	Statewide	Bridges & Structures	2013	2014	\$80,000	
<b>e-Construction</b> - First agency in country to pilot paperless construction projects. Requires contractors to submit all construction documents electronically to MDOT's document management system. Mandated use of digitally encrypted electronic signatures. In addition to cost savings from pilot project involving an interchange and estimated 170,000 pieces of paper and 150,000 days of mail time were eliminated.	Statewide	Finance & Contracts	2013	2014	\$100,000	\$85,000
<b>E-Sign</b> - Savings were greater than anticipated from this 2012 innovation. An additional \$2.6 million in savings was realized over the \$4 million reported for 2012.	Statewide	Finance & Contracts	2013	2014	\$2,600,000	
<b>ProjectWise</b> - Used ProjectWise to transfer agreements and send large documents and save printing and mailing costs.	Statewide	Finance & Contracts	2013	2014	\$20,000	
<b>Supplier E-Mail Summaries</b> - Instead of mailing, aggregate suppliers e-mail their weekly summaries. Saves on manual printing, filing and tracking expenses.	Statewide	Finance & Contracts	2013	2014	\$15,000	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Epoxy Injections</b> - A new procedure was used on some bridges with deteriorated surfaces. Instead of resurfacing a bridge deck, epoxy was injected to re-establish the bond between deck and overlay concrete.	Statewide	Highway Maintenance	2013	2014	\$100,000	
<b>Inspection Flow Charts</b> - Inspection flow charts are being used to streamline inspection process for structural steel and precast concrete.	Statewide	Highway Maintenance	2013	2014	\$15,000	
<b>Sign Recycling</b> - Cuts cost of signs by approximately 50%. Program is a collaboration between MDOT and MSI, our primary sign supplier.	Statewide	Highway Maintenance	2013	2014	\$57,000	
<b>Signals</b> - Completely switched the dynamic message signs to light emitting diodes.	Statewide	Highway Operations	2013	2014	\$64,000	
<b>Wounded Veterans Program</b> - MDOT employs eight wounded veterans whose salary is paid by FHWA for up to two years.	Statewide	Other	2013	2014	\$200,000	
<b>Upper Peninsula Shuttle</b> - Operating Upper Peninsula air shuttle saved 2,000 hours of lost productivity.	Superior Region	Other	2013	2014		\$75,000
<b>International Bridge</b> - International Bridge maintenance crews completed work in-house for 40% less than contractor estimate.	Bay Region	Highway Maintenance	2013	2013	\$153,584	
<b>Precast Concrete</b> - Using precast concrete, lane closures were reduced during a project on I-94 reducing user delay cost. Precast concrete is also expected to last three times longer than standard concrete repairs.	Southwest Region	Bridges & Structures	2013	2013		\$11,600,000
<b>Restructure State Trunkline Fund (STF)</b> - 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.	Statewide	Finance & Contracts	2013	2013	\$2,600,000	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Mobile Light Detection and Ranging (LIDAR)</b> - Surveying projects using Mobile LIDAR reduced costs by 40%. A project in the Bay Region used this new technology to survey a seven mile stretch of rural freeway for an upcoming project. The technology reduced on-site crew hours and in-office processing work and saved approximately \$43,000.	Statewide	Highway Construction	2013	2013	\$43,000	
<b>Maintenance Contracts</b> - Reducing maintenance contracts for street sweeping and hot mix asphalt overlays on freeway ramps.	Statewide	Highway Maintenance	2013	2013	\$900,000	
<b>Freeway Lighting Rebates</b> - MDOT participates in utility plans that provide incentive rebates for reducing energy costs on lighting replacement projects. Rebates are based on the difference costs between existing lighting and light emitting diodes (LED). LED bulbs also last much longer than the existing light fixtures.	Statewide	Highway Design	2012	2020	\$13,333	
<b>Snowplow Speed</b> - MDOT is revising snowplow speed guidelines to improve snow removal and de-icing, which is expected to save \$13 million annually.	Statewide	Highway Maintenance	2012	2020	\$13,000,000	
<b>Oakland County Heavy Surface Repair</b> - Maintenance Strategy - As part of a proactive maintenance strategy, Oakland County Transportation Service Center 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.	Metro Region	Highway Maintenance	2012	2015	\$327,000	
<b>Private Contracting of Guardrail Repair - Guardrail</b> - 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.	Metro Region	Highway Maintenance	2012	2015	\$155,000	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Private Contracting of Guardrail Repair</b> - 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.	Metro Region	Highway Maintenance	2012	2015	\$155,000	
<b>Self-Restoring Reusable Attenuators</b> - Impact Attenuators - The Oakland County Transportation Service Center has been replacing damaged impact attenuators, impact cushions on fixed structures, with self-restoring reusable attenuators which have reduced repair and maintenance costs.	Metro Region	Highway Maintenance	2012	2015	\$160,000	
<b>Self-Restoring Reusable Attenuators</b> - Impact Attenuators - The Oakland County Transportation Service Center has been replacing damaged impact attenuators, impact cushions on fixed structures, with self-restoring reusable attenuators which have reduced repair and maintenance costs.	Metro Region	Highway Maintenance	2012	2015	\$160,000	
<b>Bascule Bridges</b> - Contracted operation and custodial services of two bascule bridges in Bay City; M-13/M-84 (Lafayette) and M-25 (Veteran's Memorial), both over the Saginaw River. Contractor is required to operate bridges as necessary and required by law and to provide custodial services.	Bay Region	Highway Maintenance	2012	2014	\$200,000	
<b>Salt Purchases</b> - Developed a projection module spreadsheet that predicts salt usage based on current year's usage trend and the five year usage average. This allows MDOT to keep salt purchases to a minimum.	Bay Region	Highway Maintenance	2012	2014	\$470,000	
<b>Weed Control</b> - Weed control techniques being used to inhibit growth of roadside vegetation. This has reduced mowing by up to 50% in one growing season. Technique could be used statewide.	Grand Region	Highway Maintenance	2012	2014	\$192,000	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Impact Attenuators</b> - Oakland County Transportation Service Center replaces damaged impact attenuators (impact cushions on fixed structures) with self-restoring reusable attenuators which have reduced repair and maintenance costs.	Metro Region	Highway Maintenance	2012	2014	\$160,000	
<b>Rest Areas</b> - Contracted operations of six rest areas and two roadside parks. Private contractors perform cleaning, mowing and staffing on holiday weekends, which has reduced operating costs at those locations by two thirds. Contractors are also required to supply all materials needed for the facility. Two more rest areas will be contracted out in spring 2013.	North Region	Highway Maintenance	2012	2014	\$660,000	
<b>Enterprise Asset Management</b> - Asset Management Division implemented early stages of Enterprise Asset Management for non-pavement and non-bridge features. In addition to lane mile inventory, this includes loading over 135 asset classes to a central ArcGIS database that supports business areas across the department. By making this resource available via free ArcGIS Explorer, MDOT was able to replace the fee-based Google Earth and Transportation Asset Mapping System (TRAMS) II programs.	Statewide	Asset Mgt. & Planning	2012	2014	\$250,000	
<b>Asset Management Contracts</b> - Asset Management Division reduced annual contract costs using a qualifications-based low-bid vendor selection process for pavement surface data collection projects. This included 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%.	Statewide	Finance & Contracts	2012	2014	\$380,000	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Stringless Paving</b> - A new construction method using digital technology to accurately direct paving equipment on-site, reducing preparation work and on-site surveying. With this new technology, crews can more quickly and accurately establish correct alignment and profile for pavements. Tested in 2012 on a project in Bay County; it enabled MDOT to complete a two-year project in one year. This project also decreased user delay due to the expedited schedule.	Bay Region	Highway Construction	2012	2012	\$210,000	
<b>Zilwaukee Bridge</b> - Cost savings from use of previously built beams, previously built scaffolding and thinnest bearings possible to allow completion of necessary repairs without major modifications to the existing structure.	Bay Region	Highway Maintenance	2012	2012		
<b>Zilwaukee Bridge Project</b> - Savings on Z-bridge project using Construction Manager/General Contractor (CM/GC) process with completion scheduled for late 2014.	Bay Region	Highway Maintenance	2012	2012	\$2,450,000	
<b>Bridge Joints</b> - Tools and technologies being used for bridge joint installation have reduced costs by 40%, reduced construction time by 50% and provide a better surface after construction. Savings are based on eight projects. This technique could be applied statewide.	Grand Region	Bridges & Structures	2012	2012	\$78,000	
<b>Employee Resources</b> - Shared employee resources between offices for 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.	North Region	Finance & Contracts	2012	2012	\$60,000	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>E-Sign</b> - 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 e-sign and as other divisions and bureaus implement 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.</p>	Statewide	Finance & Contracts	2012	2012	\$4,000,000	
<p><b>Present, Adaptive Traffic Signal Systems</b> - Use of multiple detection sites along a corridor to continuously collect real-time volume data, analyze it and immediately implement signal timing adjustments smooths traffic flow. This Improves safety and traffic flow, reduces delay, fuel consumption and emissions and minimizes vehicle stop/go variations. This work is automated by an on street computer and roadway detection cameras. There are currently systems in Bay and University Regions.</p>	Statewide	Highway Maintenance	2012	2012		
<p><b>Carpool Lot Partnership</b> - MDOT partnered with Meijer Corp. to add additional lots to the carpool lot agreement. Each store will provide parking for up to 50 commuters and save the department approximately \$300,000 in construction and real estate costs.</p>	Statewide	Highway Operations	2012	2012	\$300,000	
<p><b>Bicycle Maps</b> - MDOT reduced the number of bicycle maps produced from 96 county and city maps to 11 regional maps. Savings in printing and storage costs and decreased mailing expenses have been realized.</p>	Statewide	Non-Motorized	2012	2012	\$838,000	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Wounded Veterans Program</b> - 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 six months. Currently, MDOT plans to employ as many as ten wounded veterans at a potential savings to the Department of \$150,000 over six months.	Statewide	Other	2012	2012	\$150,000	
<b>Carbon Reinforced Polymer Strands</b> - Pembroke Avenue over M-39 Superstructure Replacement - In 2011, the Michigan Department of Transportation reconstructed a three-mile segment of the depressed urban freeway M-39 in the cities of Detroit and Southfield. As part of that project, several local roadway bridges over M-39 were replaced or rehabilitated. Many of the bridges were simple span configurations with open joints and severe steel deterioration due to years of exposure. MDOT chose a bridge connecting two neighborhoods in which to replace the superstructure with durable, non-corrosive CFRP deck reinforcement and CFRP transverse posttensioning tendons. The deck reinforcement required little concrete cover, and the post-tensioning tendons did not have to be grouted in the duct.	Metro Region	Bridges & Structures	2011	2016		
<b>Reorganization</b> - Closed eight facilities and left 15% of positions vacant.	Statewide	Other	2011	2013	\$48,100,000	
<b>One-Time Savings</b> - Refinanced State Trunkline Fund, Comprehensive Transportation Fund and Aeronautics Fund bonds, other process improvements.	Statewide	Finance & Contracts	2011	2011	\$6,900,000	
<b>Carpool Lot Partnership</b> - MDOT partnered with Meijer Corp. to add additional lots to the carpool lot agreement. Each store will provide parking for up to 50 commuters and save the department approximately \$300,000 in construction and real estate costs.	Statewide	Highway Operations	2011	2011	\$2,100,000	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>I-94 Truck Parking Info and Management Systems</b> - MDOT deployed a system that assesses truck parking availability along Southwest Michigan's I-94 corridor and delivers near-time parking availability information to truck drivers using Dynamic Truck Parking Signs, MiDrive, a smartphone application and on-board connected vehicle equipment.	Southwest Region	Highway Operations	2010	2015		
<b>Non-Trunkline Federal Aid (NTFA) Program Agency Coordination</b> - The Non-Trunkline Federal Aid (NTFA) Program of the Data Inventory & Integration Division, is a cross-agency traffic data collection program created to meet the requirements of FHWA's Highways Performance Monitoring System (HPMS) set in 2010, which directs that each state must report count based Annual Average Daily Traffic (AADT) on all federal aid eligible roads. Coordinating with local agencies to collect/report AADTs has saved MDOT \$1,461,150 and Local Agencies \$1,188,600 over the past six years (6 Year collection cost = \$2,649,750).	Statewide	Asset Mgt. & Planning	2010	2015	\$243,525	\$198,100
<b>USDOT Safety Pilot (Ann Arbor)</b> - The Safety Pilot is a joint effort of USDOT, University of Michigan Transportation Research Institute (UMTRI), MDOT and other public/private entities. It is designed to test the maturity and feasibility of Vehicle to Vehicle (V2V) and Vehicle to Infrastructure (V2I) technologies and systems. USDOT has agreed to continue supporting the system designed as part of the Safety Pilot beyond the originally defined study timeframes.	Statewide	Highway Operations	2010	2015		
<b>Consultant Invoice</b> - MDOT and American Council of Engineering Companies simplified and streamlined the consultant invoicing process. A standardized invoice document was created and piloted by six companies. This new process eliminates additional pages and inconsistency of documentation.	Statewide	Finance & Contracts	2010	2013		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Risk Based Audit Approach</b> - Primarily based on addressing financial risks at the start of the financial prequalification process. Eliminates need to audit projects at contract close-out.	Statewide	Finance & Contracts	2010	2013		
<b>Time Reduction for Consultant Payments</b> - Requiring staff and supervisors to process payments and tracking improvement, payments to contractors were reduced from as much as 75 days to as few as 10 days.	Statewide	Finance & Contracts	2010	2013		
<b>Gap Graded Superpave</b> - Revised specification to allow for 1.5" applications which will result in cost savings.	Statewide	Highway Maintenance	2010	2013		
<b>Increased Reclaimed Asphalt Pavement (RAP) Usage</b> - Increased Reclaimed Asphalt Pavement (RAP) Usage. Cost savings difficult to determine.	Statewide	Highway Maintenance	2010	2013		
<b>Integrated Mobile Observations (IMO 2.0)</b> - Integrated Mobile Observations (IMO) 2.0 is a project funded by the FHWA Road Weather Management Program, as a grant to MDOT, the lead agency managing the project. The project uses data generated by the vehicle and cellular phones to develop weather/winter maintenance-related applications.	Statewide	Highway Maintenance	2010	2013		
<b>Intelligent Compaction</b> - Compaction of road materials using modern rollers equipped with Global Positioning System, accelerometers and other on-board computing technology to create a superior base layer extending pavement life. A 2013 pilot project assessed benefits.	Statewide	Highway Maintenance	2010	2013		
<b>Longitudinal Joint Specification</b> - Specification results in increased density which will lead to longer lasting pavements.	Statewide	Highway Maintenance	2010	2013		
<b>Permissive Shingle Usage</b> - Permissive Shingle Usage. Cost savings difficult to determine.	Statewide	Highway Maintenance	2010	2013		
<b>Rapid Set Concrete Pavement Repair</b> - Opens to traffic quicker with consideration of patch performance. Cost savings difficult to determine.	Statewide	Highway Maintenance	2010	2013		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Warm Mix Asphalts</b> - Allows longer hauling distances and assists with compaction of hot mix asphalt which leads to higher densities and increased performance.	Statewide	Highway Maintenance	2010	2013		
<b>Advanced Traffic Management System (ATMS) Software</b> - MDOT deployed comprehensive, statewide Advanced Traffic Management System (ATMS) software that seamlessly operates Intelligent Transportation Systems (ITS) devices . A user with appropriate access can operate the devices from any MDOT office.	Statewide	Highway Operations	2010	2013		
<b>Automated Vehicle (AV) Testing Support</b> - MDOT supported development and testing of automated vehicle (AV) technology in Michigan, including crafting of legislation enabling technology companies to develop and test AV systems on public roadways. MDOT is also exploring private and public partnerships to designate specific corridors as AV test areas.	Statewide	Highway Operations	2010	2013		
<b>Border Wait Time</b> - MDOT is working with Transport Canada and the Ontario Ministry of Transport to implement cross-border wait time measurements at major border crossings between Michigan and Ontario. Initial focus is a the Blue Water Bridge, with a future application at the International Bridge.	Statewide	Highway Operations	2010	2013		
<b>Mobility Transformation Center</b> - MDOT is supporting development of an automated and connected vehicle test track/environment on University of Michigan's North Campus. This facility will be accessible to MDOT for testing new technologies and applications.	Statewide	Highway Operations	2010	2013		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<b>Partner With Original Equipment Manufacturers (OEM) Diagnostic Fleets</b> - In return for development of a wireless data collection environment, MDOT partnered with original equipment manufacturers (OEMs) to collect data from a fleet of diagnostic vehicles. Examining this and other external data can help describe driving conditions at a specific time and place.	Statewide	Highway Operations	2010	2013		
<b>Tank Automotive Research, Development and Engineering Center (TARDEC)</b> - MDOT finalized a cooperative research agreement with the US Army Tank Automotive Research, Development and Engineering Center (TARDEC) to test automated vehicle technologies on MDOT applicable roadways used for civilian mobility applications.	Statewide	Highway Operations	2010	2013		
<b>Travel Times/Probe Data</b> - MDOT developed accurate travel times that are provided to motorists on freeways in real time via dynamic message signs and MiDrive.	Statewide	Highway Operations	2010	2013		
<b>USDOT Development and Test Environment (DTE)</b> - With 58 roadside units, the Connected Vehicle (CV) Development and Test Environment (DTE) deployed by USDOT in the Novi area is the largest single deployment of CV assets in Michigan. MDOT continues to maintain this test environment for use by USDOT and automotive companies.	Statewide	Highway Operations	2010	2013		
<b>Data Use Analysis and Processing (DUAP)</b> - Develop applications using connected vehicle data that improve the way transportation agencies do business. MDOT has identified over 50 possible applications, and is narrowing down potential candidates.	Statewide	Other	2010	2013		
<b>Critical Infrastructure Monitoring Project</b> - Working with Michigan State and Michigan Tech, MDOT developed and installed sensors, communications and applications to structurally monitor the Cut River Bridge.	Superior Region	Bridges & Structures	2010	2013		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Property Damage Reclamation Process (PDRP)</b> - Created 2007, the Property Damage Reclamation Process (PDRP) enables MDOT to search the Michigan State Police Traffic Crash Reporting System (TCRS) for crashes on state trunklines with potential damage. At that time, only the database was accessible, In 2012 a web based program was created enabling MDOT and contract local agencies to work within the system. Operation Field Services (OFS) hired a second coordinator to increase processing claims. By 2013 PDRP was the focus of lost potential reimbursement, leading to an increase of damage costs returned and submitted to Finance. Performance measures and training for MDOT regions and local agencies has provided better understanding of the program's importance and increased reimbursement returns.</p>	Statewide	Asset Mgt. & Planning	2010	2012	\$5,014,432	\$1,300,000
<p><b>Value Engineering</b> - Value engineering was conducted on projects greater than \$50 million.</p>	Statewide	Finance & Contracts	2010	2012	\$9,000,000	
<p><b>Warranty Assistant</b> - Carlo D'Alessandro from the Traverse City TSC created a single source guide to MDOT warranties. This innovation provides step-by-step instruction on warranty administration, as well as detailed instruction on each type of warranty and also has links embedded to common warranty forms.</p>	North Region	Highway Construction	2010	2010		
<p><b>Super Elevation Calculator</b> - Dave McCaw from the Traverse City TSC created a spreadsheet with a calculator for information pertinent to the super elevation of horizontal curves. The Super elevation Calculator gives you the lengths and stationing of all crown run out, super transitions, full super elevation, etc. It also generates cross slope at 50' intervals for both design sections and construction staking. A graphical representation of both the PC and PT ends of the curve are also generated.</p>	North Region	Highway Design	2010	2010		

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Reduce, Reuse, and Recycle</b> - This was a collective idea in our Atlanta Maintenance Facility to reduce waste going into the landfills. We would cut out the good section of broken sign posts, bevel the tops and paint them rustic brown by our Youth Development and Mentoring Program members. We have been using the posts as trail markers and delineator posts in our Roadside Parks. They look great in the parks and is a great example of reduce, reuse, and recycling something that would wind up in the landfill.</p> <p>Employees that collectively came up with this idea are: Rick Konecke, Shawn Fairman, Jay Cunningham, Roxsann Prell, Bob Gerrie, Mike VanWagner, Dennis Rhode, Dan Radziejewski, Jim Burns, Derek Styes, Chad Siecinski, Jason Domke, Jim Fenstermaker</p>	North Region	Highway Maintenance	2010	2010		
<p><b>Keyless Remote to activate Crosswalk Signals</b> - North Region Electrician Owen Werth worked with Rogers City Engineering Assistant Toby Kuznicki to install a new keyless remote (similar to that of a car) to activate the crosswalk signals on M-68 (Erie Street)/Doris Lane. The problem was ice on the locked signal cabinet would prevent the school crossing guard from getting the cabinet unlocked to activate the signals. He also installed two indicator lights in the cover of the cabinet to assure the crossing guard that the signals were activated.</p>	North Region	Highway Operations	2010	2010	\$0	
<p><b>One-Time Savings</b> - Build America Bonds (\$41M), restructuring Comprehensive Transportation Fund bonds, process improvements and other one-time savings.</p>	Statewide	Finance & Contracts	2010	2010	\$71,000,000	
<p><b>Carpool Lot Partnership</b> - MDOT partnered with Meijer Corp. to add additional lots to the carpool lot agreement. Each store will provide parking for up to 50 commuters and save the department approximately \$300,000 in construction and real estate costs.</p>	Statewide	Highway Operations	2010	2010	\$1,800,000	

## 2017 Economies, Efficiencies & Innovations Quantified Savings & Unquantified Efficiencies



Description	Office or Region	Innovation Category	Initial Year of Savings	Savings Expiration Year	Estimated Annual Savings for State	Estimated Annual Savings to Others
<p><b>Transverse Underdrain</b> - Underdrain placed on roads with steep vertical grades was placed somewhat diagonally across the subgrade on the Gibbs Hill job (2013) and the Crystal Falls hill (2007). The idea is the water wants to flow longitudinally faster than it wants to flow transverse, so it makes sense to get the underdrain in the correct location to capture the water. On the Crystal Falls hill, high underdrain flows were witnessed soon after placing the underdrain, which outlet into the catch basins. Plan drawing is available.</p>	Superior Region	Highway Design	2007	2020		