

CONTINUOUS IMPROVEMENT PROJECT DATABASE

BUSINESS UNIT PROJECTS

Project Name	Project Description	Division	Project Year	Contact Name	Contact Number	Project Category
Network Print TIP	<p>Printing and assembling TIP documents using offset printing is labor intensive consisting of 5 separately printed documents. Documents are printed at various intervals on odd/even years requiring several months and significant overtime. The team developed a plan to utilize electronic printing on CD technology on a Xerox 4890. Actual number of copies printed were reduced due to print on demand technology. It provided effective highlight color printing, reduced amount of errors and significantly reduced print production window. Documents were in-house outsourced to Mainframe/Network Printing operation at DMV. Total savings were 1,860 labor hours</p>	Administration	2003	Keith Wilder	(919)715-0400	Labor Hour Savings
PR-139 Electronic Reporting	<p>Civil Rights Compliance officers needed to have the method of checking, summarizing, and reporting of statistical information regarding minority and female employment on form PR-1391 (annual report federally mandated from contractors and subcontractors working on federally funded highway projects) improved. An electronic version was developed which identifies errors and eliminates the need for hand adding of hundreds of numbers. There is a request for the Construction Unit to make this electronic reporting available to the Resident Engineer Offices to expedite the submittal process.</p>	ADMINISTRATION	2002	Candie Auvil	(919)733-2300	Labor Hour Savings
NCDOT Swap Shop	<p>NCDOT's 14,000 employees state-wide had no formal process in place to view and obtain NCDOT item(s)/material(s) that were in the process of being surplus.</p> <p>The NCDOT Swap Shop Program established a formal process where employees can view and obtain these items/materials. This program not only improves communication and information sharing among all employees, but also demonstrates our commitment to preserve natural and financial resources and in being good stewards of the environment</p>	Administration General Services	2005	John Sharp	(919) 715-6054x230.	Environmental Sustainability
Silt Trap Cleanout	<p>Problem: The Materials and Tests Unit has large silt traps installed in the main laboratory that collect fine material (silts, sand, cement, etc.) and prevent the clogging of drains. The traps have to be cleaned once every six months and have traditionally been cleaned by removing the lids or grate, bailing the water out of the trap, and scooping the material out by hand. The cleanout process required four employees working two days to complete. The operation was disruptive to testing processes since laboratory personnel had to work around the crew and could not perform tests that used the drain being cleaned out. Employees were also exposed to whatever bacterial or chemical material had accumulated with the silt in the drain and it posed a slip hazard due to water and silt being dripped across the floors as the material was carried out of the building.</p> <p>Solution: A septic tank pumping service was hired to pump all the silt traps and dispose of the waste material offsite.</p>	Administration - General Services	2006	Mike Cottle	(919) 733-4101	Cycle Time Reduction
Electronic File Storage & Paper Consumption Reduction	<p>Problem: The problem centers around the amount of paperwork that is submitted for driveway permit and encroachment applications. Currently the Department requires 4 sets of drawings and plans for driveway permits and 5 sets for standard encroachments (additional copies are necessary for Raleigh review). Because of the numerous copies, large amounts of paper products are being utilized. The number of copies also require adequate storage space for the documentation.</p> <p>Solution: The apparent solution is to reduce the number of paper submittal copies. The Department could reduce the amount of submitted paperwork by converting the internal circulation to electronic files. This would require relatively inexpensive hard drive storage areas. District Offices could scan the smaller documentation, using the local scanners. Large plan copies could be scanned at the Division Office. All approvals and comments could be handled through electronic approvals, thus reducing the need to transport files. Electronic approvals would also allow a clear file history. The encroachment and driveway packets could be scanned into a hard drive system. Copies for the Division, District, and County Maintenance Office would be completely electronic and allow instant access as necessary.</p>	Boone District	2008	Brandon Greer	(828) 265-5380	Energy and Environment

Sign Attachment Study	<p>Problem: Isolated incidents of falling sign panels resulted in a statewide study of the welded studs used in attaching overhead sign. The study speculates that less than 10% of existing structures have significant stud failures.</p> <p>Solution: The study recommends the use of an additional connection. Thru bolts placed in each interior panel, similar to existing requirements for end panels, will improve the safety factor.</p> <p>Results:Standard drawings were revised to implement the current attachment practice.</p>	Congestion Management & Signing Unit Date	2008	Ron King	(919)662-4339	Safety Improvement
Construction Career Days	<p>One out of every 10 workers in the United States either directly or indirectly makes his or her living in the construction industry. The shortage of skilled craftsmen and construction equipment operators creates employment opportunities. The North Carolina Department of Transportation's On-The-Job Training Program and the Carolinas Association of General Contractors (CAGC) uses its Construction Career Days Program to make high school juniors and seniors aware of the opportunities available after high school. This program allows high schools students from across the to state talk with dozens of commercial contractors and NCDOT personnel about employment opportunities and careers in the construction industry. Representatives from industry and community colleges staff vendor booths, provide information, and give students hands-on experience with the latest equipment. Students experience the latest tools and equipment used by the construction industry, ask questions and get feedback. During the hands-on exercises, students get the opportunity to view heavy equipment, talk to the operators and see demonstrations of heavy equipment in action.</p>	Construction	2004	Marvin Butler	(919)733-7174	Communications
Safety City at the 2002 NC State Fair	<p>NCDOT strives to provide a safe, efficient transportation system for the traveling public. With increase in highway construction work zones across the state, motorists, tourists and construction personnel are at greater risk of injury. Over the last 5 years, 166 people were killed in NC construction, utility and maintenance work zones. A need for an aggressive and effective education effort directed at safety and awareness in work zones was realized due to the number of deaths. At the 2002 NC State Fair, NCDOT partnered with 9 other state agencies.</p>	Construction	2003	Jimmie Travis	(919)733-2210	Communications
Work Zone Safety Poster Contest & Calendar	<p>It is the goal of the N.C. DOT to continuously provide a safe, efficient, customer-service driven transportation system for the citizens of North Carolina. The department faces many new challenges regarding the safety of highway workers and the traveling public. With increased growth throughout the state, work zones and construction-related activities are reaching a new historical high. There are currently over 400 major work zones across the state, which places North Carolina motorists and tourists at a potentially greater risk. In 2001, there were 30 motorists killed in North Carolina work zones. Since January 1996, over 180 people have been killed in N.C. construction, utility and maintenance work zones. These numbers confirm the need for an aggressive and effective education effort directed at increasing safety and awareness in highway work zones.</p>	CONSTRUCTION & MAINTENANCE	2002	Jimmy Travis	(919) 733-2210	Communications
Emergency Call-Out Program	<p>The State Road Maintenance Unit is responsible for maintaining records of vehicles that respond to emergency call outs after normal working hours. Forms were filled out manually, then compiled, photocopied & sent in. It was then entered into an excel program which substantiate the need for commuting in state vehicles. This time consuming process created problems with information not being submitted to Divisions on time, confusion of types of calls, repeated handling, multiples copies of same material, accuracy and time used in verifying missing or inaccurate information. The Unit worked with IT in developing a web accessible database to capture the emergency callback information with the goal of most efficient way to obtain information, systematically enter it & generate reports in a quicker & more efficient manner.</p>	CONSTRUCTION & MAINTENANCE	2002	Dianna Turner	(919) 733-3725.	Labor Hour Savings
Asphalt Pavements Online Study Course & Exam	<p>Due to budget constraints, the units had to find a more cost effective way to provide the course to Technicians who are required to complete it. The solution Develop an online course that would reduce costs for both the Department and Industry.</p> <p>Application fee per student was reduced from \$100 to \$50</p> <p>Passing rates rose from 80-90% to 95-100%</p> <p>The transferable format can be used for other certification classes</p>	Construction & Materials and Tests	2009	Wiley Jones	(919)733-2210	Dollar Savings

Field Concrete Technician CD	NCDOT's Concrete Field Certification is currently effective for 5 years. It involves classroom time, passing a written exam and demonstrations. Graduates of the program tend to forget procedures and tests during the period between certification and re-certification, plus there are also routine updates and changes to specifications and test methods. A method was needed to serve as a reference for technicians in the field. Materials & Tests Unit Concrete School personnel developed a CD that included information on the proper running of field tests used in the acceptance of concrete. It serves as a reference tool and learning aid for unit's Concrete Technician Certification Classes.	Construction-Materials and Tests	2005	Walton Jones	(919) 329-4221.	Communications
Prequalification Automation Web Application	Problem: Paper applications and limited human resources for centralization of the prequalification process. At present, all contractors are submitting paper applications. Furthermore, private consultants have to submit individual packages to every unit or branch with which they are seeking approval. With centralization, all contractors will have one primary point of contact as regards prequalification, the Construction Unit. Solution: We created an online application to serve both contractors and consultants. Results: Firms can now go online to submit their prequalification materials. Essentially, they will now have one primary point of contact regarding their prequalification. Some items cannot be digitized and will have to be shipped. Once information is entered, future renewals will be much simpler. The Department's reviews will also be simpler and quicker.	Construction Unit	2008	Greg Keel	(919)-733-2210	Customer Service
In the Zone Driver Education Kit	As NCDOT works diligently to improve the states highway system, the safety of the public, NCDOT employees and contractors continues to be a challenge. Data shows that 221 people were killed in NC work zones between January 2000 and December 2004. An aggressive and effective education directed at safety and awareness in work zones is needed. Increases in the state's population and the number of work zones and related activities will put more motorists and tourists at greater risk. New drivers will face an increased number of work zones early in their driving careers. To better prepare new and inexperienced drivers for their roles as safe drivers in work zones, NCDOT partnered with ATSSA, IRTBA and NCHP to produce an educational video package entitled In the Zone. The video was filmed in a North Carolina work zone and features volunteers, construction personnel, NCSHP and NASCAR driver, Todd Bodine.	Construction Unit	2005	Jimmy Travis	(919)733-2210.	Communications
Plastic Cylinder Crate for Concrete Cylinder Molds	The Physical Testing Lab of the Materials and Test Unit is responsible for performing compression tests on 4x8 concrete cylinders made out in the field. These cylinders represent the concrete used on NCDOT projects. It is very important that the top of the cylinders be completely level. It is also important the cylinders are not damaged when being transported to the laboratory. When the fresh concrete is cast in the cylinder molds they are supposed to be taken to a safe, level location to set up. In many instances the cylinders were set on uneven ground or they would tip over resulting in crooked cylinders. When cylinders are received in our lab considerable work went into cutting, grinding, and measuring any uneven cylinders. Another common problem was cylinders being damaged while being transported to the lab if they became loose in the vehicle. Again, once they were received, extra work had to be done in order to make the cylinders testable	Construction-Material and Tests	2004	Sam Frederick	(919) 733-7091	Customer Service
Self Study Concrete Class	M&T offers a concrete certification class for field technicians. It takes 2 days of instruction and 1 day of tests. Limited seating and scheduling problems prohibited many field technicians from attending. A self-study class was developed to reduce the amount of time spent in class. During 2005 four self study class were held with an average attendance of 30 technicians who had to be away from their assigned duty station for only one day instead of three.	Construction-Materials and Tests	2005	Walton Jones	(919) 329-4221.	Labor Hour Savings
Online Defensive Driving Course	The Materials and Tests (M & T) Unit staff members drive a combined 2.2 million miles a year in a variety of vehicles provided by both the NCDOT Equipment Unit and by DOA Motor Fleet Management. As part of an ongoing Unit goal to improve safety both in the workplace and in the lives of the Unit's employees, a defensive driving class was arranged. The National Safety Council was contacted and their on-line defensive driving course was made available to all M & T Unit employees. After completion of the course, the provider administered a test on-line and certificates were presented for successful completion of the course. All 186 members of the M & T Unit took and passed the course. Arrangements were subsequently made for the Construction Unit's staff to participate in the program.	Construction-Materials and Tests	2005	Randy Pace	(919) 733-7091.	Safety Improvement

E-mailing of Test Reports Between Departments	<p>The processing of grass seed test reports has been made easier and faster with the use of a scanner and e-mail.</p> <p>The Department of Agriculture must certify Grass seeds used by the Department and its contractors before it is used. Grass seed is sampled by either Department of Agriculture inspectors or NCDOT Materials Inspectors and sent to the Department of Agriculture laboratory in Raleigh for testing. Test results are then sent to the Materials & Tests Unit and the Roadside Environmental Unit for evaluation, processing and entry onto the Materials and Tests Unit Web Page. The Department tested 732 lots representing 8,761,392 lbs. of grass seeds in 2003.</p> <p>Previously, the Department of Agriculture laboratory's five page test reports were mailed through the Courier Service which charged \$.18 cents per envelope with an average of delivery of five business days. Sometimes the reports did not arrive in a timely manner and usage of the seed on the project was delayed as the seed supplier and contractor had to wait for the test results to be posted by the Materials and Test Unit.</p>	Construction-Materials and Tests	2004	Abby Daniel	(919)733-7091	Cycle Time Reduction
Substitute Vacuum Pump Oil Source	<p>M&T purchased an instrument to test metal alloys in May 1996. It uses two vacuum pumps to keep the various chambers under vacuum when needed. The pumps must run continuously and require oil changes each 90 days at 1 liter per pump. An approved fluid must be used which costs \$86.50 per liter from the instrument manufacturer. This year a source was found which will furnish the fluid directly to the Department so that the instrument manufacturer's price markup is avoided. The oil from the new source costs \$8.75 per liter, creating a savings of \$77.75 per oil change.</p>	Construction-Materials and Tests	2004	Kelly Croft	(919)329-4090	Dollar Savings
Bus Placards	<p>Each year trash finds its way to the 78,500 miles of roadsides maintained by NCDOT. This trash becomes litter when it hits the roadway regardless of its source. The NCDOT spends more than \$12 million annually to clean up roadside litter. Providing citizens information on what constitutes litter and that litter is illegal will help change the cultural practice of disposing of trash illegally. One item, cigarette butts, accumulates by the millions along the roadsides. These are difficult to pick up and take over a decade to decompose. The toxic chemicals in cigarette filters leach out slowly over the years and negatively impact the environment. A campaign was started to inform riders of mass transit buses. Some riders smoke and dispose of their cigarettes onto the ground to snuff them out prior to boarding. These discarded cigarettes butts become litter when they are left behind on the ground. These discarded cigarettes butts become litter when they are left behind on the ground. If cited by a law enforcement officer and upon conviction, this littering offense could cost the individual a fine of up to a \$1,000.</p>	Construction-Roadside Environmental	2004	George Kapetanakis	(919)-715-3188.	Communications
Roadside Environmental Training/ Competition	<p>Roadside Environment recognized the need to improve employee recognition for knowledge, skills, safety and environmental awareness as related to performance of the major operational functions of the unit and Highway Division. A 3-year training/ competition program was developed for personnel to promote work zone safety and environmental stewardship. It involved one year each in Roadside Roundup, Hydrodeo and Landscape Roadeo.</p> <p>Participation from all 14 Highway Divisions was strongly encouraged. They had to meet the minimum criteria regarding classification, licenses and skill block completion. The format consisted of various stations with obstacle courses for trucks, targeted spray application areas, written examination/work exercises, equipment appearance/condition, troubleshooting, safety checklists, inspections, plant/weed identification, etc. The overall training experience was enhanced by lectures and tours. First and second place awards were presented at the NCDOT Roadside Environmental Annual Conference held in December</p>	Construction-Roadside Environmental	2004	Ted Sherrod	(919)-7233-2920	Communications
Salt Works Poster	<p>The Highway Stormwater Program (HSP) has been trying to develop a simple but effective means of communicating with the various NCDOT field operation units across the Sate concerning stormwater related issues. HSP wanted to develop some type of media that defined potential stormwater impacts and preventive measures for various NCDOT operations.</p> <p>The HSP first wanted to relay environmentally sound steps for applying salt to roadways during the winter. Based on comments received from two earlier maintenance focus groups, the idea emerged to develop a poster on each stormwater topic of concern.</p>	Construction-Roadside Environmental	2004	Bob Holman	(919)733-2920	Communications

Adopt-A-Highway Coordinator Manual	<p>The State of North Carolina established the first Adopt-A-Highway (AAH) program in 1988. Each year the program saves taxpayers up to \$4 million in labor costs associated with roadside litter cleanup. NCDOT administers the program through the Roadside Environmental Unit's Office of Beautification Programs. The AAH program incorporates the participation of 56 statewide coordinators at the county level. In some cases one coordinator may have responsibility for multiple counties.</p> <p>It is common for coordinators to rotate out of their positions. New personnel coming in as coordinator are immediately immersed into administering the program with minimal training. Satisfaction of the coordinators and other volunteers diminishes with the lack of program knowledge. To improve satisfaction within the AAH program and fill the knowledge void for new and veteran coordinators, it was necessary to provide an AAH Coordinator's Manual for reference.</p>	Construction-Roadside Environmental	2004	George Kapetanakis	(919) 715-2553	Customer Service
ERCON Database	The REU utilized a mainframe application to submit erosion and sedimentation control evaluations to Division Operations and Construction. The application had many limitations and had quickly become outdated. DOT Engineering Application Development, Highway Systems Support and REU developed a database and electronic distribution system that could be supported with laptop and desktop flexibility.	Construction-Roadside Environmental	2004	Ted Sherrod	(919)733-2920	Labor Hour Savings
Rest Area Safety	In 2003, NCDOT engaged the qualified assistance of Edwin Weaver, PE of the NCSU School of Civil Engineering for a comprehensive study of the 61 North Carolina rest areas. The purpose of this study was to justify the levels of funding allocated to backlog maintenance and for necessary facility upgrades. The information gathered during the study provided NCDOT with the current condition of the rest area sites as well as an overall inventory of the infrastructure components (restroom buildings, vending buildings, picnic tables and shelters, HVAC, plumbing, etc.).	Construction-Roadside Environmental	2004	Tad Davis	(919)733-2920	Safety Improvement
NC Executive Committee for Highway Safety	While major strides have been made in highway safety in North Carolina over the years, in 2003 there were 231,247 reported traffic crashes that resulted in 1,552 persons killed and over 134,000 injuries on our highways. After ten (10) months of coordinating the many safety initiatives within and outside of NCDOT, the N.C. Executive Committee for Highway Safety (ECHS) was formed and held its first meeting. The ECHS identifies, prioritizes, promotes and supports the AASHTO Strategic Highway Safety Plan (SHSP) in North Carolina's highway safety strategy to save lives and reduce injuries. It is comprised of six active Working Groups, each assigned a specific emphasis area to analyze problems and developing specific strategies and countermeasures.	Department of Transportation	2004	Cliff Braam	(919)-733-3915	Safety Improvement
Move It On Over Public Awareness Campaign	Based on national statistics, approximately 50% of the nation's congestion is due to unplanned traffic incidents. Secondary crashes account for approximately 20% of vehicular crashes and approximately 18% of freeway fatalities. The Move Over Law and the Fender-Bender Law both deal with the movement of vehicles and motorist safety along North Carolina's highways. However, the public was not aware of the relatively new laws. A committee was formed with representatives from NCDOT, NC State Highway Patrol, Governor's Highway Safety Program, NC Trucking Association, and Federal Highway Administration in an effort to develop a public awareness program for the two laws.	Department of Transportation	2004	Rob Stone	(810) 944-2344	Safety Improvement
Disaster Recovery Query Application	When there is a federally declared disaster, NCDOT receives funds from 2 federal agencies for cleanup & relief work. FHWA & FEMA require extensive data to verify the claims for reimbursement. NCDOT must prepare their applications for reimbursement carefully to ensure that all eligible funds will be claimed. This preparation relies extensively on data stored on mainframe computer systems even though the systems are not designed to manage the data needed by FHWA and FEMA. Data gathering traditionally consisted of calls placed to ITBUS to run reports for each disaster. The reports were analyzed by the Disaster Recovery Team (DRT) and were manually entered into spreadsheets for analysis, averaging 7 reports/week. The solution consisted of a mainframe program coupled with a Microsoft Access application. The mainframe program generates a file for each disaster that contains complete data necessary for FHWA or FEMA applications. The Access application allows DRT to import the disaster-specific data, run queries on the data & exports the data to their analysis spreadsheets.	DEPARTMENT OF TRANSPORTATION	2002	Cora Bright	(919) 508-1878	Labor Hour Savings

Asphalt Solvent Testing Program	<p>The Department was purchasing a variety of asphalt solvents at \$8.75 to \$16.29 per gallon from various vendors at different prices with little knowledge of the products, or their impact on field personnel time & resources. These products used were not evaluated for environmental, safety or performance criteria.</p> <p>State Road Maintenance sought the help of NCSU, Roadside Environmental, NCDENR and EPA. Sampling & testing protocol were established and test procedures were developed for evaluating asphalt solvent effectiveness. Roadside Environmental developed protocols to eliminate harmful constituents by coordinating with NCDENR to meet existing EPA regulations and consulted safety/environmental regulations to establish safe handling criteria for field personnel. A Qualified Products List (QPL) was developed and submitted to Purchasing for proper procurement of asphalt solvents. Changes are made in the testing program as deemed necessary by the implementation team.</p> <p>As a result of implementing this program, the Department now has a QPL resulting in an annual contract with one vendor providing asphalt solvent that meets established environmental, safety and performance criteria. At \$8.17 per gallon in 2006, the Department realizes a cost saving of approximately \$250,000 per year.</p>	Division of Highways	2009	Kelly Croft	(919)329-4090	Energy and Environment
Safety and Traffic Operations Meetings	<p>Problem: The North Carolina Department of Transportation Safety and Mobility Policy requires that work zones be monitored during construction to enhance safety and reduce congestion and delays.</p> <p>Solution: The Safety & Traffic Operation Meetings provide an opportunity for key stakeholders to discuss upcoming traffic shift, enforcement, speed limit, incidents, public information, and construction updates. Regular agenda items included upcoming traffic shift, enforcement, speed limit, incidents, public information, and construction updates.</p>	Division of Highways	2007	Jennifer Portanova	(919) 250-4159	Safety Improvement
Work Zone Education & Safety Program	<p>The safety of highway workers and the traveling public throughout the state continues to be one of the most important challenges the department must face. NCDOT continuously strives to provide a safe, efficient, customer-service driven transportation system for the citizens of North Carolina. Construction on North Carolina highways is reaching a new historical high. With increased growth throughout the state, work zones and construction-related activities also are reaching unparalleled proportions. There are currently over 400 major work zones across the state. The increase in highway construction work zones places North Carolina motorists and tourists at a potentially greater risk. Data shows that 151 people were killed in N.C. construction, utility and maintenance work zones between January 1996 and December 2000. This number alone confirms the need for an aggressive and effective education effort directed at increasing safety and awareness in highway work zones. In April 2000 & 2001, the NCDOT kicked off a Work Zone Safety public information initiative -- Speed a Little. Lose a Lot. -- targeting speeding in the work zone.</p>	DIVISION OF HIGHWAYS	2001	Jimmy Travis	(919) 733-2210	Communications
Driving Records Online	<p>Problem: DMV had a slow and outdated process of providing driving records to the public. Time sensitive material could take up to eight to ten days to be received.</p> <p>Solution: To use the existing mainframe database and applications to develop a new application by which customers could electronically request, and in some cases receive, save, and print Non-Certified Driving Records at their own personal computer. The new application reduces the processing time for Certified Driving Records by as much as 50 percent. The new process does not eliminate the previous system but offers the public another option which results in improved service.</p>	Division of Motor Vehicles	2007	Laura Main	(919) 861-3301.	Customer Service
Motor Carrier Internet Renewal	<p>Motor carriers engaged in interstate commerce transporting federally regulated goods require a Single State Registration Receipt (RS-3). Motor carriers engaged in interstate commerce transporting goods exempt from federal regulations in North Carolina are required to have a Bingo Stamp affixed to a federal D-1 Cab Card. The motor carrier was limited to thirty-nine locations within the state where they could renew the motor carrier accounts. Otherwise, they had to rely on using the U.S. mail service to renew their accounts. This presented problems, including 1) having to rely on the U.S. mail service, 2) long waits to receive services, 3) inconvenience, and 4) large fines from citations for failure to have required documents by the renewal deadline. To minimize problems, motor carrier internet renewal was developed and implemented in January 2003. This consisted of the Single State Registration Renewal and the Interstate Exempt Renewal</p>	Division of Motor Vehicles	2004	Tony Spence	(919) 861-3332.	Customer Service

IRP Clearinghouse	<p>As a member of the International Registration Plan, there exists a reciprocal agreement between the jurisdictions to collect all monies due from each IRP registrant for all jurisdictions of travel, followed by monthly disbursement in a timely manner. This process presented several problems, including the manual process of mailing recaps/transmittals and checks each month to all jurisdictions, not receiving monies due from other jurisdictions in the timeframe established by IRP, Inc., loss of revenue from interest on monies not received in a timely manner, and reissuing checks that were lost in the mail.</p> <p>To reduce these problems, North Carolina IRP joined the IRP Clearinghouse in July 2001, Currently, 43 jurisdictions participate in the program.</p>	Division of Motor Vehicles	2004	Tony Spence	(919) 861-3332	Customer Service
IRP Internet Renewal	<p>The interstate trucking industry in North Carolina was limited to two locations in the state (Raleigh and Charlotte) to process their annual IRP renewal application. The only other option for renewal was by mail. The annual IRP renewal period for the approximately 12,000 North Carolina based carriers was open from January 1st to February 15th each year. This presented problems for carriers and service providers, including a large number of customers at each of the two renewal locations during the renewal period, long waits for customers to receive services, having to rely on the mail service, and employees working mandatory overtime. To resolve these problems, the IRP internet renewal was developed and implemented in January 2002.</p>	Division of Motor Vehicles	2004	Tony Spence	(919) 861-3332	Customer Service
New Fraud Unit	<p>The Fraud Unit was created in September 2003 within the License & Theft Bureau and is responsible for identifying fraudulent documents. The unit also assists citizens who are victims of fraud by working with local, state, and federal agencies. The unit has two certified instructors who have been trained by the American Association of Motor Vehicle Administrators. They will train DMV employees in the recognition of altered or counterfeit paper and plastic documents.</p> <p>In keeping with the DMV Commissioner's mandate of one DMV, the Fraud Unit also works closely with all DMV sections to ensure fraud is not committed against the division. This ensures that records and files are accurate and that precise information is provided. It will also help to safeguard files from contamination and fraudulent information from being received, both of which will save time and money.</p>	Division of Motor Vehicles	2004	R.E. Flaherty	(919) 861-3185.	Customer Service
Call Center Consolidation	<p>When customers contact the Division of Motor Vehicles they are given the option to select from three separate service areas; Vehicle Registration, Drivers License, and Liability Insurance. Once the customer has selected a particular call center the call is then transferred to a customer service representative for assistance. If the customer's question exceeds the knowledge of the answering customer service representative the caller would then have to be placed on hold and transferred to another call center. This in turn increased the wait time for customers by placing them back in queue. Upon review of the present call center system, it was decided to combine the three call centers to form a consolidated call center.</p>	Division of Motor Vehicles	2004	Paula Windley	(919) 861-3332.	Customer Service
Automated Open Suspense File	<p>When the Division of Motor Vehicles contacts a vehicle owner by mail, a suspense file is set up. These files are housed on 94 feet of shelving in our Telephone Communication Center. At any given time there are approximately 11,000 files on these shelves. When a phone call concerning a file is received, the file must be pulled from the shelf. It takes about 5 minutes to locate and pull each file and have it available to respond to the caller. There are times when the file is already out to someone else or misfiled, which would add additional time to locate the file. There is one full time file checker and she is assisted by others when needed. After a review of the present system it was decided that the file system should be automated. This would allow review of the file on line.</p>	Division of Motor Vehicles	2004	Richard Howard	(704) 480-5580	Cycle Time Reduction
Revision of DWI Restoration Hearing Process	<p>From March,1988 until May,2004, the DWI Restoration Hearing process required a panel of three (3) Driver License Hearing Officers to conduct the DWI hearings. Forty (40) hearings were scheduled one week per month per panel in established hearing locations. On average, there were six (6) DWI Panels assigned each month to conduct these hearings. The cost for one Driver License Hearing Officer to travel for one week each month was averaged to cost \$450.00 per week. This included overnight lodging and meals at or below the state allowed per diem. For one 3-person panel, the average cost was estimated at \$1,300.00 per week or \$8,100.00 per month for 6 panels which averaged \$97,200.00 per year. The average cost for 7 panels was estimated at \$9,450.00 per month or \$113,400.00 per year.</p>	Division of Motor Vehicles	2004	Wayne Hurder		Dollar Savings

Transportation Notification System	Federal Motor Carrier Safety Administration Regulations required commercial trucking companies and transportation companies to request a motor vehicle report (MVR) from each driver on a semi-annual basis. Transportation companies advised DMV that there were little to no voluntary driver reports on traffic convictions, license suspensions or license cancellations nor commercial driver license disqualification outside of the required semi-annual MVR checks. The North Carolina Division of Motor Vehicles took the initiative to develop a computer system that would give companies access to real time driver license record reporting. The NC DMV (Driver License Section) and the Transportation Information Technology team developed a proof of concept system known as the North Carolina Transportation Notification System (TNS).	Division of Motor Vehicles	2004	Barbara Webb	(919)861-3299	Safety Improvement
Prima Facie (False Certification)	The Vehicle Financial Responsibility Act of 1957 (General Statute 20-309) requires all vehicles registered in North Carolina to maintain financial responsibility (liability insurance, financial security deposit, or self-insurer). Per General Statute the state is obliged to revoke the license of those giving false information to DMV for operation of a motor vehicle. Once DMV is notified that liability insurance coverage has terminated, the customer is sent a request for verification of insurance. In the event of a discrepancy, a prima facie is processed and held for a set time until the customer responds. If the customer does not submit proof or pay a fine, the prima facie file is applied revoking the license plate. This manual process proved to be inefficient.	DIVISION OF MOTOR VEHICLES	2002	Brenda Freeman	(919)861-3332.	Communications
IRP Internet Renewal	The Interstate Trucking Industry in North Carolina was limited to two locations in the state (Raleigh and Charlotte) to process their annual IRP renewal. At the time, applications or renewals could be processed by mail. The annual IRP renewal period for the approximately 12,000 North Carolina based carriers runs from January 1st through February 15th of each year. This presented numerous problems, such as hundreds of customers at each IRP Headquarters office each day during the renewal period, extremely long waiting time for customers to receive service, having to rely on the mail service, and employees working mandatory overtime. To overcome the problem, an IRP Internet renewal was developed and implemented in January 2002.	DIVISION OF MOTOR VEHICLES	2002	Lois Warren	(919)861-3503	Customer Service
Duplicate Driver License On-Line Service	The number of driver license customers has been increasing 5% to 6% per year for the last several years but the number of examiners has remained the same. This has resulted in long lines, especially in high growth areas. In January 2001 a team was assembled to review the possibility of issuing driver licenses via the Internet. Under statute duplicate licenses can be issued for persons with a change of address, lost or stolen license, or damaged license. The team initially developed business rules to accommodate the average customer as well as keep within the guidelines established by North Carolina General Statutes. The challenge was to create a user friendly, yet secured application that required a minimum of user interaction and time. Security issues were discussed with Massachusetts, Ohio and Virginia DMVs. Based on these states' experiences, the team developed a process for issuing duplicate driver licenses over the Internet incorporating a Personal Identification Number (PIN) to enhance security.	DIVISION OF MOTOR VEHICLES	2002	Barbara Webb	(919)861-3210.	Customer Service
Liability Insurance/Notice of Termination FS-4B	The Vehicle Financial Responsibility Act of 1957 requires all vehicles registered in North Carolina to maintain continuous financial responsibility. Insurance terminations are received from insurance companies upon cancellation of a policy. The customer has 20 days to respond, after which, the license plate is revoked for 30 days. Prior to October 2001 STARS (State Titling and Registration System) did not interface with LITES (Liability Insurance Tracking Enforcement System) to display multiple insurance lapses. License plate agencies do not access LITES and are unable to advise customers of pending insurance lapses when current insurance penalties are collected. This created confusion for the customer as notification for a subsequent insurance lapse was generated the next business day requesting the customer to respond within 20 days to avoid revocation. If the customer was not aware of subsequent insurance lapses, the notification was often ignored and the license plate was eventually revoked for failure to comply.	DIVISION OF MOTOR VEHICLES	2002	Brenda Freeman	(919)861-3332.	Customer Service

Establishing Performance Measures for Motor Vehicle Inspectors	The DMV Enforcement section have uniformed and non-uniformed personnel. Non-uniformed personnel, known as inspectors, are charged with the responsibility of investigating auto theft, administering the safety and emission inspection program for motor vehicles, and the licensure and regulation of automobile dealers. The staff is required to provide data regarding the activities of all personnel. Typically, the requests may originate as legislative inquires or due to budgetary planning needs. To compound the problem, activities of inspectors are difficult to quantify, as they conduct a wide variety of different types of investigations that range greatly in the amount of time needed for completion. working team was organized to address the problem. The team developed a computerized Excel form, which allowed inspectors to electronically transmit a monthly report to their district offices. In turn, the district offices copied and pasted the report on a spreadsheet and transmitted a district summary to headquarters.	DIVISION OF MOTOR VEHICLES	2002	B. A. Riggs	(919)861-3135.	Customer Service
IRP Clearinghouse	As a member of the International Registration Plan, there existed a reciprocal agreement between the jurisdictions to collect all monies due from each IRP Registrant for each jurisdiction of travel and disburse them monthly in a timely manner. This process presented several problems: 1) This was a manual process of mailing recaps/ transmittals and checks for payment to all jurisdictions each month, 2) NC did not always receive the monies due from other jurisdictions in the time frame set forth by IRP, Inc., 3) Loss of revenue from the interest on all monies not received in a timely manner, 4) Checks had to be reissued due to being lost in the mail. NC IRP joined the IRP Clearinghouse in July, 2001. Currently 24 jurisdictions participate in the IRP Clearinghouse.	DIVISION OF MOTOR VEHICLES	2002	Lois Warren	(919)861-3503.	Cycle Time Reduction
I-95 Work Zone Team	From a traffic safety standpoint, construction work zones are problematic because they present drivers with changes to the roadway environment (i.e., lane restrictions, changes in alignment, absent or poor centerline, absence of paved shoulder, etc.). The increased risks associated with these conditions are accentuated by high vehicle speeds and motorists who follow too closely. NCDOT attempts to maintain throughput without creating unsafe speed differentials often result in little or no posted reduction in vehicle speeds. Because of the constrained roadway and shoulder environment in the work zone, traditional enforcement operations are difficult, limited for the most part to officers and vehicles positioned in advance of the work zone or merge points with blue lights flashing.	DIVISION OF MOTOR VEHICLES	2002	Lt. Mark Nichols	(919)861-3185.	Safety Improvement
GPS/GIS Application for Commercial Motor Vehicle Enforcement	The Motor Carrier Safety Assistance Program (MCSAP) administered by NCDMV Enforcement is responsible for commercial motor vehicle safety efforts statewide. These efforts are managed out of eight (8) districts. The present pilot project involves the implementation of Global Positioning System (GPS) and Geographic Information System (GIS) technologies in the 12-county area covered by District III. The NCDOT Engineering Applications Group developed a specifically designed GPS event capture capability. By entering enforcement events and their geo-specific locations into the same GIS database environment as (truck-involved) crashes, NCDMV Enforcement will be able to relate the spatial and temporal characteristics of specific commercial motor vehicle (CMV) enforcement activities. The system also documents enforcement vehicle location on a continuous basis (i.e., every 5 minutes).	DIVISION OF MOTOR VEHICLES	2002	Capt. George Gray	(919)861-3185.	Safety Improvement

Central Insurance Verification	<p>Prior to the Statewide Driver License Central Issuance Project, DMV's DL/ID issuance process was performed utilizing an over the counter methodology. The over the counter methodology has been proven to be DMV's largest area of vulnerability in both the issuance process as well as overall security of facilities, equipment and DL/ID card materials. In addition, during the issuance process, the over the counter methodology afforded DMV limited time to verify the customer's identity documents prior to the customer receiving a DL/ID. The verification and record review process was deemed inefficient, arduous and untimely. Because of limitations, detection of identity fraud and identity theft occurred well after the customer received the actual DL/ID. Most often the customer would have already transferred the fraudulent issuance to another state, therefore adding more complexity to the case review. The Driver License Central Issuance Project deters the attempt to obtain an issuance under false pretense. The Project has eliminated facility security vulnerabilities. DMV now houses a secure Central Print Facility within its headquarters site. The Central Issuance Project affords DMV time to complete the electronic verification process prior to mailing the DL/ID to the customer. The Central Issuance electronic verification process includes verification of lawful status in the United States which helps safeguard not only North Carolina but U.S. borders as well. The address verification process combats address fraud. The verification of social security data foils identity theft. The face recognition initiative detects multiple identities and the verification of out-of-state licenses that are transferred to NC authenticates other state's DL/IDs. If the customer information fails the verification process, the customer is notified via correspondence and the DL/ID card is withheld.</p> <p>Although the Central Issuance Project has visibly changed the manner in which we conduct business with the citizens of North Carolina; DMV's effort to elevate security and the protection of citizens' data reaches far beyond the North Carolina Division of Motor Vehicles. These elevated security efforts have proven to have nationwide implications.</p>	DMV	2009	Barbara Webb	(919)861-3299	Customer Service
Special Vehicle Replica Project	<p>According to the Bureau of License & Theft and the State, Custom-Built & Antique Registration Procedures booklet, Replica vehicles are to be titled with the year model of the vehicle they are intended to replicate. In addition, GS 20-79.4 (Historic Vehicle Owner) allows issuance of an Antique or Horseless Carriage plate for a motor vehicle that is at least 35 years old, measured from the date of manufacture.</p> <p>Prior to implementation of the State Titling and Registration System (STARS) Vehicle Replica Project enhancement, vehicles were being titled by License Plate Agencies as antiques that were actually kits or replicas.</p> <p>Modifications were made to STARS using existing hardware and software to allow the Special Title Unit to label a vehicle as a Replica, Street Rod, or any other approved label, or remove a label if done in error. Labeled vehicles are automatically branded as Reconstruction. The modifications were made to Titling, Registration, and Inquiry and Correspondence subsystems.</p> <p>As a result of the Special Vehicle Replica Project enhancement, STARS can now:</p> <ol style="list-style-type: none"> 1. Provide for labeling of a vehicle 2. Automatically brand labeled vehicles 3. Print the chosen label on Titling and Registration services documents 4. Display the chosen label for online services when appropriate 5. Display the chosen label on selective Correspondence 6. Prevent the issuance of an antique or horseless carriage plate to a Replica vehicle only. 	DMV	2009	Jeff Martin	(919)508-1778	Customer Service
NC National Law Enforcement DMV Image Retrieval	<p>Problem:</p> <p>Law Enforcement officers could not easily verify the identity of individuals during roadside stops, if the driver did not have a photo ID.</p> <p>Solution:</p> <p>Working with several agencies, DMV made driver license photos appear along with driver data when officers search the network.</p> <p>Image retrieval data is available to participating states and other agencies</p>	DMV	2009	Carla Thorpe	(919)508-1753	Safety Improvement

Driver License Face Recognition	<p>Identity theft and identity fraud are the fastest growing crimes in the U.S. Theft of identity or the creation of a false identity is typically used to commit financial fraud, to escape criminal prosecution, or to expedite the commission of terrorist crimes.</p> <p>DMV has a database of over 19 million customer images, representing almost 99% of all North Carolinians with a driver license or identification card. Face recognition technology is a relatively new form of biometric identifier that uses unique measurements of key facial points to create an algorithm to establish a face recognition score to match images in seconds across the 19 million images in the DMV database.</p> <p>In 2005 DMV began rolling out face recognition technology. Its database is the third largest in the world, behind Pakistan and the state of Illinois.</p>	DMV Driver & Vehicle Services	2005	Barbara Webb	(919) 861-3210.	Customer Service
Positive Drug Testing	<p>In 2004, transit company representatives approached DMV with concerns that they had no way of identifying new hires who had been previously dismissed after testing positive on mandatory drug tests required of commercial drivers. The transit companies wanted to establish some way to mark a commercial driver license with information that the driver had previously failed a federally required drug test.</p> <p>DMV sought legislation that mandates that The employer of any employee who tests positive in a drug or alcohol test required under the Federal Motor Carrier Safety Administration (FMCSA) regulations shall notify DMV in writing within five business days following confirmation of a positive drug test. The legislation also provided for disqualification of the drivers.</p> <p>In the first 14 months of operation, this regulation has helped keep 273 persons with a drug and alcohol problem off the road. The law also creates an incentive for drivers to get treatment for their drug/alcohol problem and, thereby, have the disqualification removed from their record. Sixty-five (65) persons have taken advantage of this option for treatment.</p>	DMV - Driver and Vehicle Services Section	2009	Debbie Jones	(919)861-3231	Safety Improvement
Reduced Copies of Motor Vehicle Laws	<p>Each year all Drivers License examiners and many others in different departments of state and local government receive a personal copy of the Motor Vehicle Laws of North Carolina, Annotated. If each office or work area received just one copy this would be and obvious savings in cost and materials.</p>	DMV Driver & Vehicle Services	2005	Bruce Goeden	(919) 468-0319.	Dollar Savings
Staggered Renewal	<p>NCDMV currently requires all Apportioned Motor Carriers, Commercial Vehicles, Special Mobile, For Hire, Non-Dealers transporters, Drive Away, Taxis and Unassigned National Guard to expire on December 31st of each year. During the peak renewal period from Jan 1 through Feb 15, the two state DMV agencies are required to work overtime and temporary personnel must be hired in order to assist during the peak time. Customers have to wait in long lines, which causes to be very customer unfriendly.</p> <p>Recent legislation allows for staggered renewals for the above listed vehicles. The team helped in the design and functionality of converting the customers' expiration date to spread the renewals throughout the year.</p>	DMV- Driver & Vehicle Services	2005	Don Ferrier	(919) 861-3332.	Dollar Savings
Notice Storage and Theft Unit Automation Project	<p>The Notice, Storage and Theft Unit is responsible for receiving unclaimed vehicle reports filed by businesses where vehicles are garaged, repaired, parked or stored for the public and the vehicles have been unclaimed for 10 days. In 2006 this unit received and processed 49,716 unclaimed vehicle reports and 38,027 notice of intent to sell vehicle reports. Due to the manual labor in processing, there was a 4-week backlog in processing reports which created a financial impact on the owners and lien holders who had to pay storage-related fees each day the vehicle remained unclaimed.</p> <p>A detailed feasibility study was completed in which the DOT Information Technology Unit recommended that the current systems be incorporated with the Stars Vehicle Registration System. This allowed automation of the notification letters with minimal data entry from unit employees. At a minimal cost IT and team members from the NST Unit implemented the software solution.</p> <p>The software solution resolved the backlog, allowed owners and lien holders to save money by being notified sooner of the storage of their vehicle and helped reduce errors that resulted in tort claims. The new system provides notification letters with accurate owner, lien holder and address information.</p>	DMV NST	2006	Joseph Gardner	(919)861-3137	Customer Service

Pre-Augering H-Piles in Weathered Rock for Interior Bents	<p>Problem: Several decades ago bridges were designed to resist scour. In recent years, to improve lateral stability of interior bents that will resist the destabilizing effects of scour, NCDOT engineers have shifted from driven pile foundations and spread footings to drilled pier foundations resting within rock sockets. These drilled pier foundations are significantly more costly than previously used foundations. To save money and better utilize resources, we developed a new installation technique for piles to be installed within a rock socket.</p> <p>Solution: The Geotechnical Engineering Unit uses one of their CME 55 drill rigs with 12 inch augers to pre-auger the hole into weathered rock to a depth sufficient for lateral stability. Bridge Maintenance then drives the H-pile with their pile driving hammer into the pre-augered hole.</p>	DOH- Div 9, Div 12, BMU, & GEU	2007	John Fargher	(704) 455-8902.	Dollar Savings
State Infrastructure Bank (SIB) Management	<p>As North Carolina grows, many local needs for safe and efficient transportation will go unmet. Necessary transportation improvements will be shelved because of strained local budgets that meet only minimum public requirements. Transportation projects will be passed over from year to year for lack of resources to meet the local financial match responsibility. A small town or rural county may have limited revenue for basic services and lack a large enough cash reserve to match many federal and state transportation programs.</p> <p>The State Infrastructure Bank (SIB) arose out of the need to improve, rehabilitate, and renovate transportation facilities. The Department of Transportation will utilize reserve balances and cash flows for loans to local governments and transportation authorities to stimulate and advance needed projects</p>	Environment & Planning-Program Development	2004	Moy Biswas	(919) 714-2465.	Customer Service
Research Program Management Database (eXpress)	<p>Due to the high volume of research projects managed by The R&D unit, the large number of internal Department customers involved in guiding the research and the extensive list of universities and academic researchers conducting the research, the R & D Unit embarked on a plan to better organize the project information and management procedures. A database was constructed in modular fashion. Because of the database a higher percentage of time can be spent on assuring that research project objects are achieved and more attention is given to implementing the results.</p>	Environment & Planning-Program Development	2004	R. Rochelle	(919)250-4128	Labor Hour Savings
Environmental Permit Process Improvement	<p>The environmental permitting process associated with building and maintaining North Carolina's transportation system is lengthy and highly complex, involving many state and federal agencies. In an effort to improve the workflow effectiveness and efficiency of the environmental permit development, coordination, and issuance process, the NC Department of Transportation (NCDOT), along with the NC Department of Environment and Natural Resources (DENR), and the US Army Corps of Engineers (USACE) jointly sponsored a process improvement initiative. The initiative was initially undertaken with the primary purpose of developing quality permit applications and issuing environmental permits that support the timely delivery of the transportation program while minimizing disruption to the natural and human environment. In North Carolina, the permitting process is integral with the project development and National Environmental Policy Act decision-making process. While the original intent of the initiative was to improve the permitting process, the project development process also had to be examined in order to effect substantive change.</p>	Environment & Planning-Project Development	2004	Debbie Barbour	(919)733-8425	Cycle Time Reduction
Mitigation Process Improvement Initiative	<p>The Mitigation Process Improvement Initiative was initiated through a mutual agreement with the NC Department of Transportation (DOT), the NC Department of Environment and Natural Resources (DENR), and the US Army Corps of Engineers Wilmington District (USACE). The process mission was to develop a structured mitigation process that supports the timely delivery of NC's Transportation Program while appropriately compensating for unavoidable and minimized wetland, stream, and buffer impacts. The initiative was undertaken with the overall purpose to improve the effectiveness and efficiency of the DOT/DENR/USACE compensatory mitigation process. This process improvement initiative is highly complex and has involved numerous representatives of various state and federal resource agencies.</p> <p>The Ecosystem Enhancement Program (EEP) was the result of recommendations developed by the process owners.</p>	Environment & Planning-Project Development	2004	Bill Gilmore	(336) 903-9184	Environmental Sustainability
Cultural Resources Programmatic Review	<p>NCDOT Cultural Resources Unit and the Roadside Environmental Unit were interested in reducing amount of paperwork, review time and project delays required to obtain State Historic Preservation Office review on Division projects. A need for a more proactive approach was identified. Meetings with the Office of State Archeology, the Historic Preservation Office and the Army Corps of Engineers resulted in a process flow chart and final protocol that required more info early in review process. Utilizing this approach resulted in time saving, labor saving and environmental sustainability.' Time savings of 4,300 hours and labor cost savings of \$144,000 were realized.</p>	Environment Planning & Local Government	2003	Robin Little	(919) 715-1757	Cycle Time Reduction

HVAC Run Time Adjustment	<p>Problem: The Materials and Tests Unit main laboratory building in Raleigh is a 33,515 square foot facility with a volume of 526,882 cubic feet that was constructed in 1963. The heating and ventilation system is essentially the same as when it was installed with no design or operational changes and only replacement of components as they have worn out. The building is a complex one with sections of the building requiring having specific temperature and humidity requirements for sample curing and testing and where the users in one section may be requiring air conditioning due to the generation of heat through the use of laboratory equipment such as ovens, burners, and electronic equipment whereas the users in another section may be requiring heating due to outside air exchange for ventilation (dust and fume removal) and from operation of large roll up doors located on the loading dock. As a result, both the heating (boiler) and air conditioning (chillers) run all day, all year, at an enormous energy cost.</p> <p>Solution: Upgrade the system controls so that the building HVAC system could be regulated up/down with adjustment of airflow to sections of the building in order that the boiler, chiller, air handler units, and other motors, do not run at full capacity all day every day but run only ten hours per day on workdays.</p>	Facilities Management /Materials and Tests Unit	2008	Mike Cottle	(919)329-4299	Energy and Environment
JOINT VESSEL SECURITY PLAN IMPLEMENTTION	<p>Problem: Due to the many U.S. Coast Guard rules and regulation the 33 CFR Navigation and Navigable Water reference manual was utilized as a guide. This was a very lengthy and extensive process to follow for compliance. Many hurdles had to be made to meet the requirements and additional communication devises needed for compliance not to mention required training, drills and exercises (still required), public access and applicability. Numerous telephone and correspondence transpired with the Commander of the U.S. Coast Guard.</p> <p>Solution: All aspects of Maritime Security for vessels and facilities were implemented for compliance and approval by the U.S. Coast Guard before acceptance of the plan. This was a tedious process set forth involving coordination and scheduling, record reporting and massive training and control measures of safety for the shore facilities and vessels. Massive man-hours were utilized to meet the compliance levels required to meet the Homeland Security guidelines set forth.</p>	Ferry Div	2008	Robert Hill	(252)-447-1055	Dollar Savings
Productivity Services Marketing Survey	As part of a broader marketing strategy for the unit, Productivity Services wanted to gain insight into the level of awareness other NCDOT units have with our range of services. A decision was made to develop a brief questionnaire. A team prepared a draft questionnaire for review among all unit members. The survey form consisted of a measurement for overall familiarity with the role of Productivity Services, an indicator concerning use of the section's services over the past three years, and a measurement for level of awareness of Productivity Services' various offerings. Recipients were also asked to indicate if they would like to be contacted with additional information. The questionnaire was distributed by mail to all senior managers as well as division/unit/section managers throughout the department.	FINANCIAL	2002	Doug Cox	(919) 733-2806	Customer Service
Tying Balanced Score Card to Performance Management System	<p>In 1999, the Productivity Services staff developed and implemented a Balanced Score Card system to measure individual performance and effectiveness in providing services to the department. To further enhance this system, the staff embarked on tying the results of Balanced Score Card measures attained by each staff member to his or her Performance Measurement evaluation.</p> <p>The three Balanced Score Card measures used (client ratings, staff cost versus hiring outside consultants, and percentage of project objectives achieved) represent three of the five rating criteria for the key responsibilities portion of the Performance Management review. As with all other Performance Management dimensions, each Balanced Score Card measure is defined in terms of staff expectations in order to meet prescribed levels of performance ratings, as well as required documentation to validate the performance rating.</p>	FINANCIAL	2001	Ron Oates	(919) 733-2083	Communications
Automated Leave Request	<p>Personnel regulations require that employees submit leave requests to the supervisor in order to take time off. In the past a Leave Request Form was completed by the employee, submitted to the supervisor via mail system, the supervisor approved the request by signing the form, and then returning it to the employee. This took anywhere from an hour to several days depending on schedules.</p> <p>To eliminate the paperwork and to reduce the time to receive approval, the team developed an Automated Leave Request System. By using the LAN and PC system, the employee selects New Daily Note on the date for which he/she requests leave on the Netscape Calendar. The employee enters the supervisor's name and records their name and the time for which he/she requests leave. Their request appears on the supervisor's calendar. The supervisor selects the keep in agenda to indicate approval. The employee can check their calendar to know if it has been approved.</p>	FINANCIAL	2001	Ron Oates	(919) 733-208	Communications

Emergency Meal Reimbursement for Employees	<p>Historically, the department has reimbursed employees \$10 for meals (other than lunch) when an employee was on duty for twelve hours or more continuously due to emergency situations involving hurricanes, severe snow storms or other crises. In order to receive this money, EACH employee had to complete an Expense Voucher Form 600-EXP and send it to Fiscal for payment. Processing the large number of expense vouchers involved much time, especially after storms like Hurricane Fran when hundreds of checks were processed. It was not uncommon to still be processing payments four to six months after the event under the old system.</p> <p>Effective November 20, 2000 a new procedure was established for employees to receive emergency pay. Under the new guidelines divisions may reimburse employees for emergency meals through imprest cash. Instead of completing individual expense voucher forms, the division lists all employees eligible for emergency meal reimbursement during a pay period on form ERPM-5. Form ERPM-6 serves as a request for a warrant. The division then processes a check made payable to the supervising engineer, who in turn cashes the check and distributes the money.</p>	FINANCIAL	2001	Brent Hamilton	(919) 733-3624-452	Cycle Time Reduction
On-Line Expense Voucher System	<p>The manual process of paying expense vouchers was very labor intensive and slow. From the field perspective, forms had to be completed, charges required the correct charge code and had to be added by charge code, all rules had to be remembered and followed, and then all forms and receipts had to be mailed to Fiscal in Raleigh. From Fiscal's perspective, the forms had to be audited for adherence to the rules, charge codes had to be verified, forms had to be re-added, data had to be entered into the warrant system, and then the check, form, and receipts had to be indexed and scanned. This process could take 3 weeks or more to complete.</p> <p>A new on-line expense voucher system was developed to allow direct input of expense voucher information from any computer with mainframe access. 95% of the rules are built into the program so that the user need only enter dates and locations.</p>	FINANCIAL	2001	Brent Hamilton	(919) 733-3624-452	Cycle Time Reduction
Flowcharts for Business Processes	<p>Problem: Many NCDOT customers, both internal and external, are not familiar with the funding process of the Program Development Branch. It is a very complicated process to understand based on the various types of funding. Examples of the difficulties faced by customers include how to receive project funding on time, what is needed for a funding request, how to validate the required information, and how to process all the details of a funding request to the Board of Transportation.</p> <p>Solution: We believed that our processes were difficult for our customers to understand so we simplified these processes through the development of flowcharts. A high level of information is represented in the flowcharts that gives a complete understanding of our business process as well as validation checks for Board of Transportation funding authorization and other related issues.</p>	Financial - Program Development	2006	Majed Al-Ghandour	(919) 733-2039	Customer Service
Program Development Document Management System (PDDMS) IXOS Tool	<p>Problem: The Program Development Branch receives numerous printed project documents from various NCDOT units. Substantial time and personnel are expended to manually file and retrieve so many documents for BOT members, state auditors, and FHWA officials as needed.</p> <p>Solution: A complete Document Management System was designed within SAP for all Program Development needs using the IXOS system that is connected to WBS. At any time, SAP users can go to the TIP Project and find pertinent documents that have been scanned to the system. This system helps to speed up retrieval for any document related to a TIP project, thus freeing up personnel for other activities.</p>	Financial Management - Program Development Branch	2007	Majed Al-Ghandour	(919) 733-2039.	Customer Service
Loading TIP Data into SAP Tool	<p>Problem: Extensive time and personnel were expended to manually transfer the latest TIP Data into the SAP//PMII system. It was slow and tedious, with a significant financial and scheduling risk resulting from input delays or data inaccuracies. It took approximate 2560 hours to manually enter TIP data.</p> <p>Solution: We automated the annual TIP Data entry, improving the timeliness and accuracy of the data transfer, decreasing the financial and scheduling risk and freeing up personnel for other assignments</p>	Financial Management- Project Development	2007	Majed Al-Ghandour	(919) 733- 2039	Labor Hour Savings
Inactive Project Report	<p>Problem: Funding issues existed which needed to be addressed. There were active projects that needed additional funds for activity completion. These additional funds are limited within the constraints of the Department's annual highway budget.</p> <p>Solution: To find available funds to be better used on active projects or future priority projects created a need for an inactive project report to show those projects which have had no activity/expenditures within a specified (24 months) range.</p>	Financial Management- Project Management	2007	Majed Al-Ghandour	(919) 733-2039.	Dollar Savings

Electronic Draft of the 12-Month Let List and the Design Build Let List	For many years Project Management sent as many as 500 copies of the 12-Month Let List and the Design-Build Let List to various consultants and preconstruction units every month. As a result of computer technology, it has been determined to be more beneficial both monetarily and from a human resource standpoint to utilize available resources to improve upon our service industry	Financial- Program Development	2005	David Rhodes	(919) 733-2039 ext 301.	Labor Hour Savings
Construction Waste Reduction	<p>NCDOT has an aging building stock. Based on that reality, there was a potential to do a great deal of environmental damage by putting this material into the landfills. In addition to the environmental damage, the cost of putting construction waste into the landfill is increasing, and, in the foreseeable future, this material will not even be allowed in the landfill.</p> <p>Solution: Create an ad-hoc team to develop and implement a Construction Waste Reduction and Recycling Program, implemented state-wide, for all NCDOT building demolition, renovation, and new construction projects.</p> <p>Results: The Construction Waste Reduction and Recycling Program has been in place for two years, continues to successfully create significant reductions in the amount of material going to the landfills, continues to create savings and generate revenue for NCDOT, and, most importantly, continues to enhance, not degrade, the natural and built environment.</p> <p>The program continues to foster a team effort between NCDOT as Owner/designer, and the General Contractors, in taking joint responsibility for this environmental stewardship.</p> <p>The five pilot projects documented in this CPI entry resulted in the following avoided cost, savings, and revenue to NCDOT a net total of \$92,183.02. These projects diverted the following total material from the landfill: 1,652 tons.(with a diversion rate of 82.5%) The original goal was to divert at least 50% of the waste material from the landfill the resulting 82.5% diversion rate greatly exceeded the original goals, and appears to be a realistic goal for the future</p>	General Services	2009	John Sharp	(919)715-3708	Dollar Savings
Safe Storage of Chemicals	<p>NCDOT stores and uses chemicals in almost all of their processes and procedures. Safely storing and using these chemicals is an ongoing challenge. The Architect has developed a simple, color coded system for identifying and storing the chemicals with a system that can be used by all NCDOT Units, to increase the life safety in storage facilities for all NCDOT staff. This system of safe storage of chemicals was piloted in new Truck/material storage facilities for the Roadside Environmental Unit in Division 4, and the new Truck storage facility for the Roadside Environmental Unit and the Traffic Services Unit in Division 2.</p> <p>Solution: Using the North Carolina Building Code as a guide, all of the bid list chemicals from the Roadside Environmental and Traffic Services units were itemized and color coded by flash point. A spreadsheet was developed and provided that showed the maximum amount of each flash point (color) that could be safely stored in one control area (room), then the palette labels were color coded to match. As material is purchased and delivered, the user can then easily determine what material, and how much of each type, can be stored in each control area.</p> <p>This organizational system for safely storing chemicals will now be applied to all of the NCDOT building types; because the system is so simple and easy to implement, the program has created a much safer work environment for present and future NCDOT staff.</p>	General Services	2009	Randi Taylor	(919)715-0400	Safety Improvement
Contaminated Waste Minimization	<p>Problem: US Highway 17 Bypass in Beaufort County crosses an unregulated abandoned landfill and an actively monitored US EPA Superfund Site. Material in the landfill posed an environmental risk, a constructability risk for proposed 30- inch concrete piles to support the Pamlico River Bridge. The Superfund site contained documented herbicides and pesticides in both soil and ground water, originating from a former agricultural supply facility at the site, which posed health risks to site workers, nearby residents and business patrons. The amount of material recommended for removal and disposal was estimated at 57,000 cubic yards at an estimated excavation and disposal cost of \$4 million.</p> <p>Solution: A comprehensive Contaminated Waste Minimization Plan was successfully developed by the Geotechnical Engineering Unit, in coordination with state and federal regulators and the Design Build contractor, to address concerns regarding waste disposal, workers' safety and project schedules. Through utilization of this plan, the amount of material requiring disposal was reduced by 99% to only 600 cubic yards of landfill debris. All contaminated material excavated from the Superfund site was incorporated into the roadway fill under a 12-inch compacted cap to act as a physical barrier to prevent health risks to the site workers, nearby residents, and businesses. The waste minimization resulted in a cost avoidance of almost \$4 million.</p>	Geotechnical Engineering Unit	2008	Cyrus Parker	(919)-250-4088	Dollar Savings

GIS Map & Data Distribution	<p>Previously, DOT county maps were distributed by another unit during limited hours - 78% of maps were 4 years old, thus outdated. GIS created the GIS Distribution Center (DC) to serve as central location for processing and distributing GIS info and products. In December, 2002, county map distribution was transferred to the DC which created a central location for creation and distribution of maps. Map sales are now recorded in an electronic database. Improved communications have been initiated between the DC and mapping sections. Customers may contact the DC between 8 am and 5 pm, and most requests are filled within 24 hours</p>	GIS	2003	L.C.Smith	(919) 212-5000	Customer Service
3D Measurement Implementation	<p>NCDOT has attempted to obtain reliable route & milepost information for decades. Due to the creation of the Linear Referencing System (LRS) for the purpose of sharing (or linking) data between multiple data sets this information has become very important. The primary way of collecting route and milepost information was the use of an automobile mounted survey meter. A 2-man team would be sent to the subject location & record measurements on paper maps, which is used to update information for mileage dependent database tables. This time consuming process allowed many errors. These errors in the DOT mileage database were unacceptable for the building of the LRS. The GIS Unit has developed a procedure for identifying accurate milepost information. Graphical linework was moved to match corresponding locations on photography. This process is called photo-revision. Revised linework is overlaid on Digital Elevation Model data to generate 3D measurements, which are extremely accurate. The difference between 3D & survey meter measurements are within a hundredth of a mile per half-mile section of road.</p>	GIS	2002	Chris Tilley	(919) 212-6040.	Labor Hour Savings
NC Improved STAA Truck Route Tools	<p>Since the National Surface Transportation Assistance Act of 1982, North Carolina has experienced tremendous growth and significant changes in its highway system and freight needs. North Carolina's Surface Transportation Assistant Act and National Truck Network Map and supporting materials were in need of a major overhaul. In the electronic age customers, including terminal operators, trucking industry, and the enforcement community, have an expectation and need for immediate on-line access to these critical networks and North Carolina was still exclusively utilizing US Mail to send hard copies of these maps. The solution involved a comprehensive multi-agency process improvement effort (NCDOT, GIS, Regional Traffic Engineering, Traffic Safety Unit, and NCSHP) to research, investigate, and update North Carolina's National Truck Network Map while also working toward producing a version of tools that was accessible via the internet. Through a multi-agency process improvement effort, the result was the Updated and Improved STAA NC National Truck Network Map tool with insets available in traditional paper and electronic (PDF) formats.</p>	GIS and Traffic Engineering & Safety	2009	Terry Norris	(919)212-5950	Customer Service
Bridge Survey Report Preliminary Review	<p>Hydraulic Bridge Survey Reports were completed and sealed by Professional Engineers before submitting them to the Structure Design Unit. At times Structure Engineers disagreed on the most appropriate span arrangement or proper girder selection for a particular stream crossing. Requests for revisions to Hydraulic Bridge Survey Reports resulted in rework and possibly going back to a private firm at additional cost. There was no formal process in place to insure agreement between units and to prevent rework. At approximately 14 months prior to R/W the Hydraulic Design Engineer submits the draft layout to the Structure Design Engineer for review. He coordinates with the Bridge Construction Engineer and FHWA for comments on the proposed layout and selection of structure type. Within 13 months prior to R/W the Structure Design Engineer concurs with the layout as submitted or requests changes as necessary. At 12 months prior to R/W, the Hydraulic Engineer submits the Final Bridge Survey Report to the Structure Design Unit. The results of this preliminary review process of the Bridge Survey are that reports have greatly reduced, the amount of rework by the Hydraulics Unit. It has improved the lines of communication between the two Units. Input from the Construction Unit during the review process has also improved constructability and helped to avoid problems in the field after the projects are let to contract.</p>	Highway Design Branch	2009	David Chang	(919)250-4100	Communications
Employee Training Profile Management System (Update & Revision)	<p>Since the implementation of Skill Base Pay and Competency Base Pay, training has become the focus of improvement projects. With many units in DOT conducting training and tracking training in various types of tools including paper tools, training records and data management was fragmented. Additionally, this was frustrating to employees, supervisors and managers who were trying to track training records, or analyze and report on various training data and information. To resolve this issue, a committee was formed to develop one web-based application that would serve the needs of all training groups, provide employees easy access to training records and information, and give management a tool to improve the productivity, efficiency, and effectiveness of training data management. Since its implementation, this system has given employees unlimited access to their individual training records and training data, allowed management to query the system and provide reports, and all information is in one central location.</p>	Human Resources	2005	Angela Crawford	(919)662-3582.	Communications

E-learning	The Division of Human Resources has been looking for innovative ways to improve communication and customer service. With employees working in every county of the state, DOT faces many challenges regarding communication and information sharing among employees. With the implementation of Career Banding, training of employees has become more important than ever. HR decided to pilot e-learning which delivers training via the internet, intranet, audio/video tape, satellite broadcast, interactive TV and CD-ROM. HR implemented five pilot e-learning courses: (1) Introduction to Career Banding; (2) Mentoring as a Workforce Development Strategy; (3) Workforce Planning; (4) Unlawful Workplace Harassment Update, and (5) Unlawful Workplace Violence Update. DOT's e-learning courses are free, take little time to complete, and have no associated travel expenses, HR does not require prior supervisor's approval or going through the training coordinator. Just click on the links for e-learning.	Human Resources	2005	Angela Crawford	(919)662-3582.	Communications
DOT Training Inventory Catalog	The Human Resources Division's customers include those applicants applying for position at DOT, as well as the 14,000 DOT employees that it serves. Since HR considers the work force the most valuable DOT asset, it is always looking for innovative ways to improve communication and customer service. With people working in every county of the state, DOT faces many challenges regarding communication and information sharing among employees. Furthermore, with many units in the department organizing and implementing various train opportunities, training had become fragmented and there was no central point of contact for information regarding what training was available to employees. To make this information readily available to employees and provide supervisors and managers with an inventory of available training so that career development plans would be easier, a DOT training Inventory Catalog was developed. The publishing of this catalog took over a year to develop.	Human Resources	2004	Angela Crawford	(919)662-3582	Communications
DOT SECC Centralization	The Human Resources Division's customers include those applicants applying for position at DOT, as well as the 14,000 DOT employees that it serves. Since HR considers the work force the most valuable DOT asset, it is always looking for innovative ways to improve communication and customer service. The State Employees' Combined Campaign is no exception. For many years, the DOT campaign was fragmented with different areas of the department moving in different directions, different kick-off dates, processes and goals. State level campaign organizers directed information to central administration located in Raleigh to build support for the campaign in Raleigh/Wake County. Outside of Raleigh, employees in divisions and branches located in regional offices were receiving information from Raleigh-based division heads as well as local coordinators that often conflicted and confused regarding the process and submission of forms.	Human Resources	2004	Angela Crawford	(919)662-3582	Communications
T & D On-line Calendar	The Division of Human Resources' customers includes not only those applicants applying for positions at NCDOT, but also the 14,000 department employees that the division services. Since Human Resources considers the workforce the most valuable NCDOT asset, it is always looking for innovative ways to improve customer service. With employees in all counties of the state, NCDOT faces many challenges regarding communication and information sharing among its workers. The Training & Development Section of Human Resources wanted to provide better customer service by making its training course schedule available to employees online. After management approval was gained. A committee was formed to discuss how the new process would work. The committee included an administrative person, a trainer, and a web developer from IT.	Human Resources	2004	Angela Crawford	(919) 662-3582.	Customer Service
Career Banding, SBP, CBP Procedures Manual	The Department of Human Resources' customers not only includes those applicants applying for positions, but they also include the 14,000 DOT employees the division services. Since HR considers the work force to be the most valuable DOT asset, it is always looking for innovative ways to improve communication and customer service. With employees in each county of the state, DOT faces many challenges regarding communication and information sharing. As the department implemented more Career Banding, Skill Based Pay and Competency Base Pay programs, HR identified a need for consistency among programs and across occupational areas, and for better communication on these programs. One way to ensure consistency, better communication, and improved customer service was to provide a procedures manual to each division, section and unit to serve as a foundation for individual program development.	Human Resources	2004	Angela Crawford	(919) 662-3582.	Customer Service
SDP/DBP Database Systems	The skill based pay and competency based pay database systems were each independently run. Efforts have now been made to standardize them and make them more user friendly. One of the ways that this has been accomplished is by tying the personnel main frame system information to the databases. A person entering the data only has to type in the personnel number of the employee and all data fields are populated.	Human Resources	2004	Angie Fanelli	(919) 733-2987.	Customer Service

Employee Training Profile Management System	The Department of Human Resources' customers not only includes those applicants applying for positions, but they also include the 14,000 DOT employees the division services. Since HR considers the work force to be the most valuable DOT asset, it is always looking for innovative ways to improve communication and customer service. With employees in each county of the state, DOT faces many challenges regarding communication and information sharing. Since the implementation of Skill Based Pay and Competency Based Pay, training (which is a key element in these programs) has become the focus of customer service and communication improvement projects. With many sections/units conducting and tracking training, records and data management was fragmented. Also, it was frustrating to employees trying to track their training and to managers trying to report and analyze training data. To resolve this issue, a committee was formed to develop a web-based application to serve the needs of all training groups. It would give employees and managers easy access to records as well as better tools for productivity and efficiency.	Human Resources	2004	Angela Crawford	(919) 662-3582.	Customer Service
SBP/CBP Training Toolbox	The Department of Human Resources' customers not only includes those applicants applying for positions, but they also include the 14,000 DOT employees the division services. Since HR considers the work force to be the most valuable DOT asset, it is always looking for innovative ways to improve communication and customer service. With employees in each county of the state, DOT faces many challenges regarding communication and information sharing. As the department implemented more Skill Based Pay (SBP) and Competency Base Pay (CBP) programs, the SBP/CBP Training Work Group noticed a need for consistency among various training programs across the state, and a need for tools to help divisions, sections and units develop their SBP/CBP training programs in an efficient, effective and consistent manner. A SBP/CBP Training Toolbox was created.	Human Resources	2004	Angela Crawford	(919) 662-3582.	Customer Service
LE Training Request System	The Department of Human Resources' customers not only includes those applicants applying for positions, but they also include the 14,000 DOT employees the division services. Since HR considers the work force to be the most valuable DOT asset, it is always looking for innovative ways to improve communication and customer service. With employees in each county of the state, DOT faces many challenges regarding communication and information sharing. The old training request process included a long paper trail from the employee, to the supervisor, to the training administration unit for approval or denial. Compiling data on requests, approvals and denials was a cumbersome process of going through numerous files. The License & Theft Unit wanted to streamline the request process and make it easier for management to monitor and track the training that had been requested, approved or denied	Human Resources	2004	Angela Crawford	(919) 662-3582	Customer Service
NCDOT Annual Statewide Model Bridge Building Competition	In 1999, the Human Resources Unit, assisted by the Construction Unit, developed the first NCDOT Model Bridge Building Competition. The competition, which complemented educational outreach programs already offered, addressed the need for new methods of recruiting civil engineers. The number of college graduates entering the engineering profession had dropped significantly. It was believed that if students' interest could be sparked as early as middle or high school, perhaps more college students would consider careers in engineering and other transportation fields; hence, the Bridge Competition Committee created this innovative, hands-on approach to learning. The competition would stress the importance of excelling in all school subjects by including a written report, oral presentation, Design Drawing, and Model Efficiency.	HUMAN RESOURCES & INTER-GOVERNMENTAL	2002	Helen Dickens	(919) 733-7686	Communications
Literacy Improvement Program	It was felt that NCDOT could do more to help its employees improve their literacy. The Secretary commissioned HR to examine the possibilities of setting up a formal structure so literacy improvement opportunities could be continuously offered to all DOT employees at all literacy levels. A Literacy Committee was established to study literacy levels of DOT employees, and establish a literacy program. The first task was to determine the literacy levels in the organization. We enlisted the help of the North Carolina Community College System (NCCCS). They recommended the Comprehensive Adult Student Assessment System (CASAS) and agreed to administer it for us. Our selected sample groups came from the Division of Motor Vehicles (30% randomly selected) Century Center (30% randomly selected) and 3 counties in one of the 14 Divisions (all employees in the counties). Lists of all names for the first two groups were provided to our Information Technology group, who made the random selection of testees. Testing dates and locations were coordinated with NCCCS personnel. We attempted to minimize the travel time for employees. The testing was completed and the report submitted back to us on 1 Nov 00. Roughly 50% of DOT employees could use some help. A formal policy was written, coordinated through the heads of major DOT divisions and subsequently approved by the Secretary on November 13, 2000.	HUMAN RESOURCES & INTER-GOVERNMENTAL	2001	Angela Strach	(919) 733-5846	Communications

State Employees Wellness Fair	The Department of Human Resources' customers not only includes those applicants applying for positions at DOT, but they also include the 14,000 DOT employees that the division services. Since HR considers the work force the most valuable DOT asset, they are always looking for innovative ways to show appreciation for, support, recognize, honor and help employees. Studies done by insurance providers suggest that, due to medical expenses, state employees may neglect their health, avoid preventative medical care, and are often a high risk for problems such as high blood pressure and cholesterol. An Employee Wellness Fair was designed to educate employees about the importance of preventative health, safety, and physical and mental well being. After DOT began putting on a Wellness fair, several state agencies approached DOT about co-coordinating a wellness fair for all state employees. A State Agency Wellness Committee was formed whose purpose was sponsoring a multi-agency Employee Wellness Fair for Raleigh-based state employees. The Wellness Fair provides state employees an opportunity to check cholesterol levels and to learn ways of reducing their HDL and Tri-glycerides. Other screenings include glaucoma tests, stress and allergy tests, hearing test and spinal examinations.	HUMAN RESOURCES & INTER-GOVERNMENTAL	2001	Angela Strach	(919) 733-5846	Communications
Human Resources Reorganization	The Division of Human Resources for DMV operated autonomously from the Department's Human Resources Office. This created duplication of effort, cost deficiencies and confusion for managers and employees. The DMV is one of the many divisions staffed to DOT. There were 8 positions staffed to the DMV HR Office that provided the same services to 2,000 employees that 16 staff members provide 12,000 DOT employees. To ensure consistency, reduce expended resources and increase productivity the DMV HR function was consolidated into the DOT HR Office. The DOT HR Office absorbed some of the DMV employees into vacant positions within the DOT HR Department. One of the DMV employees came over and assumed the role for vacancy postings and another position came to the section to perform Personnel Technician duties in reviewing DMV hiring packages for qualification status. Another Personnel Technician remained on site to provide benefits and retirement services to the DMV employees. This position will report to the DOT Benefits Manager. Two other positions were transferred to our Training and Development Division.	HUMAN RESOURCES & INTER-GOVERNMENTAL	2001	Becky Keith	(919) 733-5846	Customer Service
HR Web Page Redesign	The Division of Human Resources was interested in improving its external customer service and communication through a more simplified and user friendly website. In reviewing our previous website, we noticed areas that were hard to navigate, and identified areas that needed redesigning, which would assist DOT employees, other state agencies, and the general public. More importantly, we realized that our customers might not necessarily understand all the personnel terms therefore making it hard to navigate or find various topics such as sick leave, salary ranges, and job postings. A team was formed to review the website for ease of use, range of services, and communication of programs, policies and services. A timeframe was also established as to when our new website would be available for on-line customer service. The team leader worked with the various sections in personnel such as Merit-Based Hiring, Salary & Policy Administration, Retirement & Benefits, Personnel Training, Personnel Recruitment, and Position Management to coordinate collecting information to be put on the web pages.	HUMAN RESOURCES & INTER-GOVERNMENTAL	2001	Angela Strach	(919) 733-5846	Customer Service
Qualification Evaluation System	In October of 1997, Senate Bill 886 was passed to ensure qualified persons were hired for State Government positions. The Bill required all State Agencies to recruit and hire applicants based on merit. To ensure that DOT complied with the new law, the Human Resources Department created the Qualification Review Section and implemented the Merit-Based Selection and Recruitment Plan. The Qualification Review Unit set a standard of evaluating all personnel packages within 24-hours. However, storing, compiling, and providing applicant information to applicants, the Legal Department, the General Assembly, OSP, or Employee Relations became a time consuming, tedious process. The Human Resources Department noticed that there was a great demand and need for applicant data and partnered with the Information Technology Section to develop the "Qualification Evaluation System" (QES). The system maintains a database on all applicants that have applied for positions with the Department of Transportation and Division of Motor Vehicles.	HUMAN RESOURCES & INTER-GOVERNMENTAL	2001	Angela Strach	(919) 733-5846	Cycle Time Reduction
DMV Fiscal Refund System	The DMV Fiscal Section issues refund checks to customers who have overpaid for license renewals, personalized tags and the like. Issuing more than 5,000 refunds/month through an antiquated system created in 1983 with limited functionality. It is largely a manual effort that is prone to error, creates a strain on resources and limits a timely response to customer inquiries, becoming more difficult to manage as the volume increases. The ITBUS team redesigned the existing system by adding new functionality to complement the current functionality. The goal was to automate the manual effort of processing refunds. To redesign -1) Document the current 'As Is' refund process to determine what areas could be improved. 2) Document the user requirements for the existing functionality and all improvements. 3) Create a Detail Design document of the new refund system to use as a guide for programming and implementing the new refund system.	INFORMATION TECHNOLOGY	2002	Eric Lingerfelt	(919) 508-1790.	Labor Hour Savings

Defining the GIS Distribution Center	<p>The GIS Unit infrastructure is comprised of three technical operating sections: Mapping, Road Inventory and Program & Analysis. Together these sections provide Geographic Information Systems, Mapping, and Road Inventory services to the NCDOT. In addition, the unit is working cooperatively with other state, county, and local agencies to build a statewide digital spatial database.</p> <p>The GIS Distribution Center was created in 2003 to serve as the primary contact for geospatial information for the NCDOT. One of the many successful results was allowing county map creation and distribution in one central location, the GIS Unit. We experienced immediate growth receiving multiple map order requests daily.</p>	Information Technology- GIS	2004	L.C. Smith	(919)212-6002	Communications
Parcel Information Service	<p>DOT offices need address information on property (parcel) ownership for various purposes. This information is valuable for contacting property owners to inform them of citizen information workshops, design public hearings, etc. In the past, DOT offices would send personnel to local tax agencies to gather parcel owner information, or would collect the information directly in the field. These were expensive (travel costs and subsistence) and time-consuming methods of collecting the information.</p> <p>Sometimes different DOT offices would contact a local agency at different times for the same data. That was a source of irritation for the local agency because it demonstrated an uncoordinated effort by DOT offices, and caused the agency to do duplicate work.</p> <p>The GIS Unit developed a service to obtain digital parcel data from local agencies and redistribute the information to DOT offices as needed. Most counties now have parcel data in electronic format. GIS collects data from local agencies through web download or phone ordering. The data is stored and organized into a standard GIS format. The GIS Unit currently possesses 87 (87% of state) county parcel layers.</p>	Information Technology-GIS	2004	Chris Tilley	(919)707-2156	Cycle Time Reduction
Special Alert Checklist	<p>NCDOT strives to provide a safe and efficient transportation system for its citizens. Unfortunately, accidents occur everyday on North Carolina's highways that disrupt their travels. NCDOT has many mechanisms in place to provide information to the motorists about these disruptions including a website, the 511 Traveler Information Telephone System, Dynamic Message Signs, Highway Advisory Radios, etc. These resources are typically used by individual Divisions to provide information in their local areas. Before late 2003 there was no structured process in place to assure that information was disseminated across the state using these tools. In 2003 the ITS Operations Unit created a Special Alert Checklist which identifies all of the methods of traveler information available to let the public know about major accidents. The user can select all of the appropriate tools for the situation from this list. Contact information is then provided in a companion notebook that allows the user to reach all of the necessary parties to begin the process of regional or statewide traveler information.</p>	Information Technology-Operations	2004	Kelly Damron	(919)-233-2330.	Communications
511 Travel Information Line	<p>Travelers in NC want access to information about their trips. Several agencies within the Department of Transportation and within other public agencies have access numbers that the public can call to retrieve information. However, there was no single number that a caller could dial to access these information resources within the state. A caller must remember all the numbers to each individual agency to obtain information they desired.</p> <p>The NC 511 system is a comprehensive multi-modal voice activated/voice response system that encompasses many of the different agencies that provide travel information to our customers into a single phone call. The NC 511 system provides real time travel information on impacts to our roadways due to usual events and/or weather. The system also acts like a speed dial to various other agencies.</p> <p>Another feature of the NC 511 is that it has the capability of a floodgate message that allows NCDOT to input an event that is having a high impact on travel in NC (i.e., AMBER Alert).</p>	Information Technology-Operations	2004	Kelly Damron	(919) 233-9331.	Customer Service
Dynamic Message Sign Installations	<p>The previous practice of Dynamic Message Sign (DMS) installations was to install overhead sign structures with ground-mounted control cabinets. The cost of these structures averaged \$50,355.</p> <p>The ground-mounted control cabinets were prone to flooding and damage by mowing crews.</p> <p>To alleviate concerns with overhead installations, the ITS Section has changed the practice to place the DMS's on the roadway shoulder using Pedestal or Butterfly type structures. The DMS displays are mounted 25 feet above ground and the control cabinets are attached near the base of the structures.</p> <p>This has resulted in improved visibility of the DMS from all travel lanes, ease of installation and maintenance and a 50% reduction in the cost of DMS structures and approximately \$1,500 cost savings on the control cabinet installation. This equates to approximately \$25,000 cost savings per DMS installation.</p>	ITS and Signals	2009	Greg Fuller		Dollar Savings

Field Welder Certification Program	<p>Prior to January 1, 2006, all contractors' welders were required to be tested by an approved independent testing agency. After successfully completing the test, the testing agency issued a certification and submitted it to the Materials and Tests Unit for review and approval. The Department did not have any guidelines for what qualified a testing agency. Some testing agencies were not using qualified individuals to witness the testing. Some were not requiring a picture ID to identify the person taking the test, and, in some cases, falsified certification papers were found.</p> <p>The Materials and Tests Unit developed a Field Welder Certification Program. This program is designed to have Materials and Tests personnel have one-on-one contact with each welder prior to them showing up on an NCDOT project. This allows M&T to verify the individual's identity by requiring a picture ID, to witness the field test, and to review the Department's and Bridge Welding Code requirements. Successful applicants are issued a Department picture certification card.</p> <p>This program has improved the quality of welding performed on NCDOT construction projects. It has educated welders on the requirements for proper welding, the proper equipment and proper storage of welding electrodes. It brings about personal contact between the welder and a Materials and Tests Unit inspector prior to certification.</p>	Materials & Test	2009	Gary Bristow	(336) 993-2300	Customer Service
Analytical Instrumentation Update	<p>The Chemical Laboratory had an outdated X-ray instrument that was use to analyze Portland cement, fly ash, and metal alloys. Traditional wet chemistry methods, which provided more accuracy, were used to analyze materials that failed the X-ray test. The Chemical Laboratory is accredited by the Cement and Concrete Reference Laboratory (CCRL). The old unit was not capable of passing accreditation testing.</p> <p>Research determined that wavelength dispersive X-ray fluorescence (WDXRF) equipment would pass the stringent requirements of ASTM C-114 Standard Test Methods for Chemical Analysis of Hydraulic Cement. A new unit was purchased and placed in service allowing more accurate tests than with the old instrument and avoiding time consuming wet chemistry methods.</p> <p>The new unit streamlined many of the tests above and beyond expectations. It is accredited by CCRL for Portland cement testing and is used for proficiency sample testing of various grades of cement and fly ash materials. The new unit is capable of testing cement percentage in concrete cores, composition of slab zinc alloy, zinc dust, and identification of material for oxides. It reduced the need for many traditional wet chemistry tests performed by the laboratory and now saves approximately 1,594 labor hours annually.</p>	Materials & Test	2009	Kelly Croft	(919)329-4090	Cycle Time Reduction
Certification & Bridge Coating	<p>NCDOT has approximately 5000 bridges in the state that were coated with lead paint before it was known to be a hazardous material when it is being removed. When 29CFR 1926.62 was enacted, it became part of the responsibility of the Chemical Laboratory, Materials and Tests Unit, to determine if lead paint existed on a bridge, needed to be stripped and recoated, or removed and spot painted.</p> <p>There were a number of solutions, such as: 1) hire a staff of inspectors to cover bridge painting and lead abatement projects across the state and certify inspectors already in the workforce; 2) hire CEI firms which would have been an expensive solution (4 times our in-house costs); 3) train the inspectors already in the field prior to a project being let in their area. Training the inspectors already in the field - a "train on-demand" concept was the best solution. This allows the instructor and assistant to become mentors, troubleshooters and experts when needed on the projects.</p> <p>The "train on-demand" concept became a nationally recognized certification course consisting of a 2-day classroom instruction, with hands-on training, testing with equipment used in the field, a textbook, as well as a reference for inspectors. An exam is given requiring a passing grade of 70% and a certificate showing the course was completed and passed.</p>	Materials & Tests	2009	Chris Peoples	(919)329-4090	Labor Hour Savings

Down Hole Video Inspection	<p>Problem: The Materials and Tests Unit routinely performs video inspection of Pipe Lines and Drainage Structures using cameras mounted on remote operated, self propelled pipe rovers that are inserted into the pipe or structure that provide both real time and recorded imagery of the interior of the structure so that the condition of the structure may be assessed. Unfortunately, the equipment is bulky. The large rover (used on pipe 24 in diameter and larger) weighs approximately 285 lbs. and must remain tethered to a power/control unit mounted in a 24,000 lb. GVW support truck that includes a crane for lifting the rover in and out of the vehicle. The smaller rover (used on pipe 6-24 in diameter) weighs approximately 60 lbs. and must also be operated from the same support truck. The rovers require a minimum two-man crew to operate and are based in Raleigh. Since the equipment is based in Raleigh, the support truck is also used for other purposes (such as concrete coring), and it requires a two-man crew, response time for inspections has been less than adequate at times.</p> <p>Solution: The Unit has acquired two Quickview Down Hole Video Inspection units that have been assigned to locations in both the eastern and western ends of the State. These units are lightweight, portable cameras that can be operated by a single technician located at the drainage structure that also provide both real time and taped imagery of the interior of the structure so that the condition of the structure may be assessed. The units weigh approximately 15 lbs. and may be used to inspect pipe 6-60 in diameter as well as shallow bridge foundations, box culverts, masonry drainage structures, and sinkholes.</p>	Materials and Tests Unit	2008	Jason Fragnito	(919)-329-4203	Customer Service
Fatal Slip Reporting	<p>Problem: Local town, city and municipality fatal crashes not being reported to the Traffic Safety Systems Management Section. To date only those crashes that are being investigated by NCSHP are reviewed and investigated for possible safety improvements to the area in which the fatal crash occurred. The fatal crashes that occur in these towns, cities and municipalities are not being reported accurately which accounts for approximately 24% of fatal crashes that are occurring in just the Eastern Region (Divisions 1, 2 and 4). When computed statewide many fatal crashes are going unnoticed. Were they less important?</p> <p>Solution: Have local town, city and municipalities report, in the same fashion as does NC Highway Patrol, their fatal crashes to the Traffic Safety Systems Management Section for an investigation of the crash site for possible safety issues concerning the roadway. A Fatal Reporting Form has been developed to allow town, cities and municipalities to report fatal crashes that are occurring within their jurisdictions. This allows these agencies to receive the benefit of the Regional Traffic Investigation Teams to assess the area and to assist in providing solutions for safety improvements if needed.</p> <p>Results: The results will be safer roads and highways within the state of North Carolina.</p>	NC DOT/Division of Highways	2008	Debroah Leonard	(252)237.6164	Safety Improvement
Sampson County Rest Area Septic System	<p>Problem: The Wastewater Treatment Plant (WWTP) at the Sampson County Rest Area was costing the NCDOT in excess of \$19,000 per year due primarily to labor expense for an Operator in Responsible Charge (ORC) to operate the WWTP.</p> <p>Solution: The Roadside Environmental Unit Central Office and Division 3 Roadside Environmental Unit staff worked together to install a traditional septic system at the rest area to take the place of the WWTP. The traditional septic system does not require an ORC and so would result in dollar savings to the NCDOT.</p> <p>Results: The septic system was activated on September 6, 2007 and the WWTP was deactivated. As of December 31, 2007, the NCDOT has saved \$4,790 resultant from the conversion. The septic system installation and deactivation of the WWTP is resulting in savings of in excess of \$19,000 per year.</p>	NCDOT-Roadside Environmental Unit	2008	Stonewall Mathis	(910) 259-4919	Dollar Savings
Reclamation of Calcium Chloride	<p>Problem: During a snow and ice event we load our spreaders saddle tanks with 100 gallons of calcium chloride in order to pre-wet salt before application. The problem occurs when a storm event don't develop in the manner in which it was forecasted and we do not use the material we loaded onto the trucks. Traditionally our department has been able to unload unused salt back into its storage bins, but there is no way to unload hundreds of gallons of calcium chloride back into its original 5000 gallon storage tank directly from the trucks saddle tanks.</p> <p>Solution: Our solution to returning this unused material back to its original tank is to create an intermediate tank in which to drain the saddle tanks into. After the intermediate holding tank has been filled, the material can then be pumped mechanically back into its original 5000 gallons storage tank located at the salt brine plant.</p> <p>Results: At 0.63 cents per gallon there isn't much cost savings in reclaiming this material, however the benefits lie in not storing this corrosive material in our equipment or discharging this chemical all at once into the environment.</p>	Newell Maintenance	2007	John Edmonds	(704) 596-5782	Cycle Time Reduction

Adopt-A-Highway Web 3.0 Application	<p>The Adopt-A-Highway (AAH) program was in need of an upgrade from its legacy mainframe system that would allow the program's 96 AAH coordinators and co-coordinators quick and accurate processing of new applications, as well as producing management reports and labels for more than 6,000 AAH groups. The legacy database was state of the art when it was designed in 1989.</p> <p>A Web-based AAH database and report system that integrates the mainframe legacy system and the IVR system was developed, resulting in improved efficiency in the workplace and improved customer service to AAH groups.</p> <p>AAH coordinators now use the most advanced AAH system in the nation. Applicants are now able to enter data using the web site, reducing the coordinator workload. Management reports may be sorted easily by various criteria, giving AAH coordinators time saving management tools. Searches for any group and researching pickup history is easily done and available more quickly. Pickup reports are available in real time and labels for groups may be printed locally. The new system saves 1778 labor hours annually.</p>	Office of Beautification Program	2009	Tiffany Crosby	(919)733-2920	Cycle Time Reduction
Secure Your Load	<p>Problem: Roadside litter is a problem in North Carolina. In 2006, the NCDOT spent more than \$16.6 million to remove more than 10.1 million pounds of roadside litter. More than 5,600 litter citations were issued by a multitude of law enforcement agencies. Yet the littering continues. Mecklenburg County Solid Waste and Recycling states that in North Carolina, half of all litter is blown, not thrown, from vehicles whose loads are not properly secured.</p> <p>Solution: The strategy is to continue litter cleanup events, education, prevention and law enforcement all of which are necessary to control littering. This project focussed on education and prevention by communicating to North Carolinians that securing loads will increase roadway safety and reduce litter.</p>	Office of Beautification Programs	2008	George Kapetanakis	(919)-715-2553	Communications
QC/QA Program for Epoxy Coating of Reinforcing Bars	<p>Previously, inspection of epoxy coated rebar was done after it was loaded onto the truck which is very difficult. M&T implemented the QC/QA Program which requires the coater to take full responsibility for production and testing of coating process and includes having an internal quality control plan and maintaining CRSI certification.</p> <p>No price increase was incurred due to implementation of program. Annual savings for this implementation is over 3,100 hours and a related annual cost savings of \$150,000</p>	Operations	2003	Cecil Jones	(919)733-7411	Labor Hour Savings
Traffic Engineering Roundtable	<p>Problem: With the graying of the profession, North Carolina, like many other states, has found itself with a shortage of highly trained and seasoned professional traffic engineers. It is also without an effective regular accessible mechanism for traffic engineering professionals to network and work together to improve processes, and procedures. Recognizing the significance of professional development and the critical role that traffic engineers will play in addressing congestion, safety, regulatory, and access management issues, the need for an effective, ongoing, productive forum involving all of the state's traffic engineers became apparent.</p> <p>Solution: The Traffic Engineering and Safety Systems Branch joined with the DOH-Operations to develop Roundtable Solutions forums. These were technically engaging and built on contemporary traffic and safety issues for NCDOT's Field Traffic Engineers. The meetings were designed to provide consistent and, critical traffic engineering information in an atmosphere that promotes challenging the status quo and improving the level of service provided the traveling public by NCDOT.</p>	Operations - All Divisions	2006	A. D. Wyatt	(919) 733-1593	Communications
Adopt-A-Highway Web 3.0 Application	<p>Problem: The Adopt-A-Highway (AAH) program was in need of an upgrade from its legacy mainframe system that would allow the program's 96 AAH coordinators and co-coordinators quick and accurate processing of new applications, as well as producing management reports and labels for more than 6,000 AAH groups. The legacy database was state of the art when it was designed in 1989, but technical support was becoming less available, making it difficult to sustain the integrity of the legacy system. In addition, the AAH program needed an intuitive type database and report system that was easier to learn than the legacy system, which no longer had training classes available.</p> <p>Solution: A Web-based AAH database and report system that integrates the mainframe legacy system and the IVR system was developed, resulting in improved efficiency in the workplace and improved customer service to AAH groups.</p>	Operations - Asset Management	2006	Anne Walker	919-715-2551	Cycle Time Reduction

Distribution of Pavement Review Packets Using Website	Every month a review of TIP project pavement designs is held. Typically, the review will cover four projects and for each project the pavement designer prepares a summary of two to four alternative pavement designs and summary design inputs. The report prepared by the Geotechnical Unit is also attached. In the past, this information was compiled for all the projects for that month, a cover sheet was attached, and copies were prepared for everyone invited to the Pavement Review Committee meeting. Typically, 25 copies would be made and then hand-delivered to Raleigh attendees and delivered by courier service to Division personnel. In order to improve the process, reduce copying, and save the delivery time, the Pavement Design team started scanning the review package information and posting it on the Pavement Management Unit website. An email message is then sent to all individuals who previously received review packets alerting them of the new material, including a hot button to access the material for review.	OPERATIONS CONSTRUCTION	2001	Judith Corley-Lay	(919) 250-4094	Labor Hour Savings
Electronic Utilization of Pavement Condition Survey	Every two years Division personnel conduct a pavement conditionsurvey of all primary and secondary roads. The Pavement Management Unit is responsible for processing and transmitting this data to Division, District and County maintenance personnel.Previously, hard copies of this data were given to all Division,District and County Maintenance Engineers The Pavement Condition Survey data is now available on the Pavement Management Unit web site and a CD containing this data is given to each Division, District and County Maintenance Engineer.Hard copies are now processed only for the Pavement Management Unit and each Division office.	OPERATIONS - CONSTRUCTION	2002	Jerry Blackwelder	(919) 250-4094	Dollar Savings
“Under Construction: Trucking in the Work Zone”	<p>Problem: In 2005, there were 30 fatalities in North Carolina work zones. Although this number reflects a 40% decrease in work-zone related fatalities from 2004, there remains an obvious need for increased education about the hazards associated with driving through work zones. As an integral part of North Carolina’s economic infrastructure, professional truck drivers spend the majority of their time on the road. The amounts of time truckers spend in work zones will only increase as the state’s population continues to grow making work zone crashes involving large trucks significantly more likely.</p> <p>Solution: In an effort to educate professional truck drivers about the hazards associated with work zones and highlight their roles as one of NCDOT’s partners in highway safety, NCDOT and CAGC partnered with various trucking industry representatives to produce a video entitled Under Construction: Trucking in the Work Zone. The video highlights truckers’ responsibilities and provides them with tools for driving safely through work zones.</p>	Operations - Construction Unit	2006	Michelle Long	(919) 733-2210, ext. 221	Communications
Central Inventory Improvement	<p>A warehouse of about 4900 square feet has been established in Newton, NC with a primary objective of providing a satellite warehouse location for certain assets managed by Central Inventory. The goal of this satellite warehouse was to make these assets more readily available to western divisions. The location was managed by a Storeroom Manager (GR 59), who utilized a pickup truck and two forklifts in the performance of his duties.</p> <p>The location did not have delivery capability except to the local community, thus assets had to be picked up by the divisions or arrangements were made for Central Inventory delivery trucks to stop and pickup the assets for delivery to the western divisions. Additionally, the movement of assets through the warehouse indicated the activity might not justify the costs. A thumbnail analysis of the system indicated the assets could be distributed through Central Inventory nearly as effectively with a negligible difference in costs. As a result, the warehouse was closed effective April 27, 2001 with personnel transferred to Division 12</p>	OPERATIONS EQUIPMENT	2001	Dave Vanpelt	(919) 733-2220	Dollar Savings
Traveler Information Management System (TIMS)	<p>In the aftermath of Hurricane Floyd, over 1,500 roads were closed due to flooding. Motorists attempting to return home or check on relatives and friends needed to know the conditions of the road system. Emergency responders such as the Red Cross needed to get supplies to the persons stranded in flood areas. The Traveler Information Management System (TIMS) was created to provide real-time road condition information to as many people as possible via the Internet.</p> <p>The purpose of the system is to have a central location where the public, media, emergency service providers, other state and federal agencies, and NCDOT personnel can go for real time information on the condition of the state’s highways. TIMS provides this location while minimizing the amount of additional work required of NCDOT field forces. TIMS automated several existing paper processes performed by NCDOT field personnel related to road condition. Information relating to road construction and maintenance, bridge projects, ice and snow conditions, and road closures are now collected at one site and provided to anyone with access to the Internet. In addition, TIMS allows NCDOT users to subscribe to the system and be alerted, via e-mail or pager, when an incident that meets their pre-set criteria is entered into the TIMS system.</p>	OPERATIONS ITS	2001	Kelly Hutchinson	(919) 233-9331	Customer Service

Aerial Device Boom Inspection Intervals	<p>Due to the time frame set up by National Crane Mfg. Company, it was necessary for DOT to perform a major tear down inspection once every three years regardless of utilization. Due to the suggestion of our Crane Committee, the end result was that the interval was changed from once every three years to once every 3,000 hrs. of utilization. The only modifications to the aerial device necessary to accomplish this was to install an hour meter that worked only when the Aerial equipment was in use, which was a cost of about \$75 per unit. By doing this, it extended the crane inspection interval to about once every ten years. By changing the interval from a time interval to utilization interval was a great savings on labor, material, and cost of downtime (departments having to do without their equipment during tear down period).</p> <p>Crane tear down inspections typically cost from \$8,000 to \$12,000 each. These factors multiplied by about 80 units in the DOT fleet adds up to substantial savings.</p>	OPERATIONS MAINTENANCE	2001	H. R. Hoyle	(919) 733-3572	Dollar Savings
Equipment Identification Numbers	<p>Since 1994 the Equipment Unit has used adhesive vinyl lettering and numbers for marking equipment identification numbers on our over the road vehicles. This produced a much neater job than spray painting the signage as had been done in the past. As we continued to use adhesive vinyl more and more, its usefulness for special signage and equipment marking became more apparent. However, the cost of purchasing the finished vinyl product continued to rise.</p> <p>A team was assembled to investigate the feasibility of purchasing a vinyl plotter and the software necessary to produce our own signage in-house. Prices were obtained for materials. A demonstration of the sign making process was viewed. The cost of the signage over the past twelve months was compared to the cost of purchasing the vinyl material and estimated cost for a twelve-month period. Calculations showed that producing our signage in-house would generate significant savings.</p>	OPERATIONS - MAINTENANCE	2002	Charles Jones	(919) 733-3572.	Dollar Savings
Skill Block Tracking	<p>The Skill Based Pay Program recognized four functional areas of maintenance operations-roadway, roadside, bridge and traffic services. Approximately 4,000 transportation workers (TW's) participate in this program. Since inception of the program grants on average 2,000 skill blocks per year. An important factor in administering and monitoring the Skill Based Pay Program is the ability to monitor and track the awarding of skill blocks to TW's. Prior to June 2000, Position Management collected data on skill blocks that were granted at six-month intervals. This data was entered into an Excel spreadsheet and then distributed to each division. The divisions would then cut and disburse the segments to the appropriate people for them to interpret. This process was used from the inception date of the program August 1996. By 1999, the spreadsheet had grown to approximately six feet in length and become unmanageable and almost impossible to interpret</p>	OPERATIONS - MAINTENANCE	2001	Don Aschbrenner	(919) 733-3725	Customer Service
Windsor Probe	<p>Materials and Tests Unit performs investigations on materials that do not meet the minimum requirements for specifications. One investigation involves in-place strength of concrete when test cylinders do not meet the required strengths. In the past, M&T would remove cores from the structure and then test for strength. This method is the most accurate, the most costly and time consuming. The time and cost makes this method not very economical. The Rebound Hammer, a non-destructive test system, was then introduced as a strength indicator and became the standard for our investigation and recommendation. The rebound hammer system requires ten different readings within a specified area. These readings are then averaged and strength is then interpolated using a graph. This method is very quick and efficient, but there have always been questions concerning the depth at which the individual readings can measure. A large percentage of the investigations using the Rebound Hammer still required a core sample be taken to achieve an accurate measure. Recently M&T has purchased six Windsor Probe Test Systems to be used statewide.</p>	OPERATIONS MATERIALS & TESTS	2001	Sam Frederick	(919) 733-7091	Customer Service
Analytical Instrumentation Update	<p>Problem: The Materials and Tests Unit Chemical Laboratory had an outdated X-ray instrument with which to analyze Portland cement, fly ash, and metal alloys. Analysis of materials that failed the X-ray test were re-tested using traditional wet chemistry methods which were more accurate than the X-ray method, and for which the Chemical Laboratory is accredited by the Cement and Concrete Reference Laboratory (CCRL). This involves handling hazardous solutions and is extremely labor intensive. The old unit was not capable of passing accreditation testing.</p> <p>Solution: Research determined that wavelength dispersive X-ray fluorescence (WDXRF) equipment would pass the stringent requirements of ASTM C-114 Standard Test Methods for Chemical Analysis of Hydraulic Cement. A new unit was purchased and placed in service allowing more accurate tests than with the old instrument and avoiding time consuming wet chemistry methods</p>	Operations - Materials and Tests Unit	2006	Kelly Croft	(919) 329-4090	Cycle Time Reduction

Route Audit Survey	<p>Problem: There was a need to update and make corrections to the Pavement Condition Survey report. To do this, it was first necessary to make corrections to the Universal GIS report.</p> <p>Solution: We began by taking a map, a copy of the maintenance road list both alphabetical and numerical and a notebook for notes into the field. Following the routes on the map, data that is posted in the field at each intersection was compared to data on the map and both maintenance road lists. When data matched up, we proceeded to the next intersection. When data did not match or was missing, a note was made of the needed corrections. After collecting all differences on the map, research was conducted to find the correct data. This research included going through maintenance road files, old GIS maps, GIS road files, the county GIS iMap, county court records and talking with people responsible for those files and reports. After finding the correct data, the unit responsible for reporting the data was contacted and given the correct data to update their files.</p>	Operations – Pavement Management Unit	2007	Steven G. Hinnant	(919) 250-4094.	Customer Service
Online Submission of Oversize/Overweight Permit Application	<p>Due to 2000 legislative changes in the North Carolina Motor Vehicle Law and the NCDOT Administrative Code, both of which govern issuance of Oversize/Overweight (OS/OW) permits, the volume of applications for permits greatly increased. This required both the DOT Central Permit Office and the trucking industry to do more with less. Implementation of the Automated Routing Permit System (ARPS) brought a more efficient application process for obtaining the OS/OW permits.</p> <p>Prior to installation of the ARPS Internet web application program in August 2001, movers had four options for requesting an OS/OW permit. These options were telephone, facsimile, in person, or by mail. The two options most often used, telephone and facsimile resulted in lost productive man-hours for both the movers</p>	OPERATIONS - PERMIT	2002	Gwen Hobby	(919) 733-4740.	Customer Service
Stormwater Pollution Prevention Plan and Spill Prevention Control	<p>Problem: The SPPP and the SPCC programs are paper and process intensive programs that require reporting and updating over time. The initial versions were hard copy documents that were soon out of date after the program was established. Reprinting and coordinating updates required significant resources and staff. In addition, programs required reporting which would have resulted in thousands of hard copy documents being sent to a central location.</p> <p>Solution: Development of an internet based management system that allowed for the over one-hundred and fifty (150) end users across the state to input, update, and receive information in an efficient process that facilitates communication and control while maintaining environmental compliance.</p>	Operations Roadside Environmental	2007	Johnie Marion	(919) 861-3770.	Labor Hour Savings
Go wild with the NC Wildflower Program Video	<p>The Office of Beautification Programs and members of the Roadside Environmental Unit's vegetation management team developed a 5-minute instructional video to teach anyone from the wildflower enthusiast to the master gardener how to plant a wildflower garden. A vegetation management expert demonstrated the necessary steps to plant a wildflower garden in the video. The narrator of the video was Mike Gray who is a well-known gardening guru and has his own show The Almanac Gardener that airs on UNC-TV. The video was produced in response to numerous inquiries by the public, media, garden clubs and county extension offices to learn how we prepare and maintain wildflower beds with such success. Garden clubs and county extension offices each received a complimentary copy of the video that has been made available for people to check out.</p>	OPERATIONS ROADSIDE ENVIRONMENTAL	2001	Heather Thompson	(919) 715-2553	Communications
Rest Area Forms Reduction	<p>The Central Roadside Environmental Unit's Rest Area Section receives several different reports monthly from the Divisions. Each Rest area turns in monthly, a daily meter reading, a monthly usage survey, a recycling report and Division Inspection reports. The Division inspects contractor-maintained rest areas a minimum of 3 times weekly. This paper work, along with monthly invoices, Weekly Contract Supervisor Worklogs and Employees Monthly Worklogs are all very important for the day to day administering of the Maintenance contracts by the Divisions. When low bid maintenance of rest areas was first begun, the central office monitored it very closely for any problems that might arise with the proposals, that are generated in this office, and to insure that the Department was getting the service that we expected. Since the program has matured over the years and is now a normal practice, the close monitoring of all the day to day paperwork by the central office is no longer necessary. The Divisions have been asked to no longer send copies of the Monthly Invoice, Supervisors Weekly Worklog, and Employees Monthly Worklog to the central office. They should keep all originals in their files until the contract is complete. The central office does want to remain aware of the condition of the facilities. Therefore, the Divisions have been requested to send in a copy of 1 weekly inspection report for each facility, instead of the original 3 inspections per week. Many of the Divisions are now sending the reports and inspections by E-mail.</p>	OPERATIONS ROADSIDE ENVIRONMENTAL	2001	Jennifer Pitts	(919) 733-2920	Customer Service

AAH & the Spanish Speaking Community in NC	<p>The steady increase in the growth of North Carolina's Spanish-speaking population offers an opportunity for the Adopt-A-Highway (AAH) program to grow as a multicultural anti-litter program and increase its effectiveness in keeping our state clean and beautiful. It was decided that the basic tools needed to support the participation of the Spanish speaking community in the Adopt-A-Highway program were a Spanish language volunteer highway safety training video and informational brochure. The N.C. Agency for Public Telecommunications expertly provided the services to accomplish our goal. As a consequence, North Carolina is the first state to provide an AAH brochure ("Cómo adoptar una carretera en Carolina del Norte") and highway safety training to its Spanish-speaking community in the Spanish language.</p>	OPERATIONS ROADSIDE ENVIRONMENTAL	2001	Anne Walker	(919) 715-2550	Customer Service
Confront vs. Transline/Garlon 3A	<p>Transline and Garlon 3A are two herbicides that can be combined together to form a highly effective broad-spectrum herbicide. A mixture of these two herbicides is available in a product called Confront. For several years NCDOT mixed Transline and Garlon 3A together, in effect making their own Confront. This had been the most cost-effective utilization of these products due to the high cost of Confront when first introduced. NCDOT has been able to negotiate the price of Confront downward to the point that it is now cheaper to buy Confront than it is to mix Garlon 3A and Transline.</p>	OPERATIONS ROADSIDE ENVIRONMENTAL	2001	Derek Smith	(919) 733-2920	Dollar Savings
Litter Pick-Up Sticks	<p>Adopt-A-Highway and other volunteers, maintenance work crews, inmates and community service workers collected more than 10 million pounds of litter from North Carolina's roadsides during 2000. Cleanup supplies are provided to volunteers and workers to make cleaning our roadsides more efficient and economical. The litter pickup stick was a tool provided to increase labor efficiency in picking up litter. While the pickup stick did increase efficiency, it was costly at \$5.50 each and the stick point that pierced the litter was easily breakable, resulting in sticks having to be replaced frequently.</p> <p>A department employee submitted a suggestion and blueprint showing how DOT could make its own more efficient and lower cost pickup stick with PVC tubing, caps and glue, flat head screws and red colored duct tape. The material and labor cost of the new stick is \$2.50 each, a saving for DOT of \$3.00 per stick. The point on the new stick is more durable than the point on the old stick and, therefore, will result in fewer replacement sticks requisitioned from inventory control, resulting in an even lower annual cost for pickup sticks as we work to keep our roadsides litter free. The new stick has a sturdy point that can pierce aluminum cans and heavier objects, which the previous stick could not do. The new stick is also lighter in weight, and easier to manipulate than the previous stick.</p>	OPERATIONS ROADSIDE ENVIRONMENTAL	2001	Anne Walker	(919) 715-2550	Dollar Savings
Monarch Butterfly Program	<p>The annual migration of monarch butterflies is one of the marvels of nature. Monarchs stay over winter in parts of Mexico and southern California. Each spring they begin a round trip journey of several thousand miles that takes four or five generations to complete. They fly north as far as southern Canada, then return each fall to the same spot where their ancestors spent the previous winter. Monarch larvae feed exclusively on species of milkweed. Without milkweed along their migration routes, monarchs would be unable to reproduce.</p> <p>Due to development, farming practices and changes in land use, milkweed is becoming increasingly less common throughout the United States, including North Carolina. There has been a corresponding noticeable decline in the number of monarchs that visit North Carolina during their migration. In late 1999, Dr. Voit Gilmore, Chairman of the Governor's Clean NC 2000 Board, approached the NCDOT with concerns about the downward trend in the monarch butterfly population. The Roadside Environmental Unit agreed to research the issue, and as a result, the "Monarch Butterfly Program" was implemented.</p>	OPERATIONS ROADSIDE ENVIRONMENTAL	2001	David L. King	(919) 733-2920	Environmental Sustainability
Rainfall Estimate Website	<p>Problem: There is a National Pollutant Discharge Elimination System permit requirement to check erosion control devices after a one-half inch or greater rainfall event. Traveling to road construction sites to check conditions after every rainfall event is very time-consuming. There was a need to determine when one-half inch of rainfall has occurred at a highway construction site without having to visit the site.</p> <p>Solution: The Highway Stormwater Program staff worked with the NC Climatic Office to develop a rainfall estimate website that allows users to estimate the rainfall at any road construction site in North Carolina and send an email alert to the user when one-half inch of rainfall has occurred.</p>	Operations - Roadside Environmental	2007	Bob Holman	(919) 861-3779.	Cycle Time Reduction

Yes! Yes! We Can Stop Littering	The citizens of N. C. expect the department to provide a high standard of motoring safety and environmental soundness, as well as beauty along our roadsides. The North Carolina school system provides an ideal opportunity to educate the state's youth and by extension their parents and their communities about the harmful effects of litter and how we can stop littering and improve our quality of life. With this view in mind the Union County Rotary Club and the schools system in Union Count developed a classroom course entitled YES! YES! WE CAN STOP LITTERING. The department was a partner in implementing the program successfully in the Union County school system and is working with the Rotary Clubs of N. C. to implement the program in the school systems of all 100 counties.	OPERATIONS - ROADSIDE ENVIRONMENTAL	2003	Anne Walker	(919) 715-2550.	Environmental Sustainability
Creation & Implementation of a Utility Herbicide Request Form	By law NCDOT has governing authority over all vegetation growing along our rights of way. In order to accommodate utilities that wish to use these rights of way, NCDOT has prescribed to a standard permitting process. This permitting process was confusing and some utilities were unaware that they needed to obtain a permit to control vegetation under their power lines. In order to clarify the Department's position and to streamline the permitting process, NCDOT's Roadside Environmental Unit developed a Utility Herbicide Request form. This form is accessible via the NCDOT's website to North Carolina's major power companies and the State's 27 Electric Membership Cooperatives.	OPERATIONS - ROADSIDE ENVIRONMENTAL	2002	Derek Smith	(919) 733-2920.	Communications
Access to Skill Based Pay Manuals via REU Web Site	Over the last 5 years, NCDOT and its division field personnel have benefited from an innovative program referred to as Skill Based Pay (SBP). The program cornerstone rests in the employees who wish to become proficient in specific skills (e.g., operating equipment, obtaining state certification to apply herbicides, or learn advanced soil stabilization techniques). Once these self-motivated employees meet the objectives set forth in the training manuals and pass topic related final exams, the department rewards the employees monetarily. As divisions identify needs for employees with specific skills, employees are able to proceed with training by completing related Skill Block Training Manuals. Obtaining SBP Manuals was a time consuming and laborious process that was subject to mishandling	OPERATIONS - ROADSIDE ENVIRONMENTAL	2002	Derek Smith	(919) 733-2920.	Communications
Development of CD of Pesticide Labels & Safety Information	Annually, by competitive bid process, NCDOT's Central Roadside Environmental Unit purchases a diverse array of pesticides for Division field forces. These pesticides are necessary tools for managing vegetation along the State's 78,000 miles of rights-of-way. Every vendor is required to supply 50 labels and MSDS's for every product they are awarded. It is required that this information be the most current available from EPA. In previous years no monetary penalty was associated with this contract thus vendors would: 1) Supply the wrong label and MSDS for the specific product formulation requested; 2) Provide illegible photocopies of the labeling; 3) Try to shift this responsibility to the manufacturers. 4) Fail to provide this material in a timely fashion despite repeated telephone calls.	OPERATIONS - ROADSIDE ENVIRONMENTAL	2002	Derek Smith	(919) 733-2920.	Customer Service
Granville County Rest Area Automatic Doors	In the fall of 1998 the Roadside Environmental Unit replaced the twenty-two year old manual swinging doors on the I-85 Granville County North Bound Lane Rest Area with an automatic sliding door. The cost was \$4,660.50. During the plan preparation stages of the Granville County Rest Area renovation, the REU instructed the architect to design the new building addition so that the existing automatic doors could be reused instead of a new set of doors being purchased.	OPERATIONS - ROADSIDE ENVIRONMENTAL	2002	Jennifer Pitts	(919) 733-2920.	Dollar Savings
Roadside Quail Habitat Area	The Roadside Environmental Unit is working with the Division of Wildlife Resources to develop and enhance habitat suitable for quail on NCDOT rights-of-way in Division 12. The REU was approached by Wildlife Resources biologist Terry Sharpe, who needed our cooperation to maximize quail habitat areas adjacent to I-77 north of Statesville. Several of the landowners along this corridor had agreed with the Division of Wildlife to develop quail habitat on their land. The effectiveness of this project was limited, however, in that the habitat areas lacked continuity. Our right-of-way provides a link between the properties. Through selective mowing and tree removal and replacing fescue with native grasses, we hope to develop a stretch of 3.5 miles of right-of-way into a corridor for quail movement and habitation. This area incorporates two existing wildflower beds and includes a median meadow area.	OPERATIONS - ROADSIDE ENVIRONMENTAL	2002	Derek Smith	(919) 733-2920.	Environmental Sustainability

Erosion Control Quantity Mapper	<p>Problem: There was an increased workload on Soil and Water Engineering Section staff from TIP letting schedule and other POC projects.</p> <p>Solution: Reduce the time required to compile and estimate erosion control quantities to allow more time for erosion control plan production. By nature of NCDOT erosion control standards and Microstation/Geopak quantity computation methods, the EC quantities are scrambled throughout the EC design spreadsheets and are not organized consistent to the master EC quantity spreadsheet. The EC Quantity Mapper serves as a link between EC design spreadsheets and the master EC quantity spreadsheet, and allows for Soil and Water Engineering staff to copy and paste quantity values from the EC design sheets to the Mapper. Then, the Mapper arranges the quantities for copying and pasting into the master EC quantity spreadsheet.</p>	Operations - Roadside Environmental Unit	2007	Barney Blackburn	(919)-733-2920	Labor Hour Savings
A Good Tomorrow	<p>New hires at NCDOT are given a mandatory two-day employee orientation session which includes an overview of NCDOT benefits and policies and safety training. Since environmental awareness is also very important to NCDOT, and training is expensive, the concept of an environmental stewardship video for new hires was developed. The video is less than ten minutes long and showcases NCDOT environmental stewardship programs and emphasizes environmental excellence.</p> <p>The concept was developed in collaboration between the NCDOT Media Unit and the Environmental Operations Section of the Roadside Environmental Unit. The video, titled A Good Tomorrow, highlights NCDOT environmental stewardship actions and environmental programs across the Department and strives to instill team-based environmental pride, responsibility and ethics in the new employee.</p>	Operations Asset Management	2005	Robin Little	(919) 861-3781	Environmental Sustainability
A, B, C's Litter Project	<p>North Carolina has a roadside litter problem. By the end of 2004, the Department of Transportation expended more than \$15 million dollars to remove more than 10 million pounds of litter from the state's roadways. Littering is both intentional and unintentional by citizens and visitors who travel the highways of North Carolina. The law defines littering as illegal and imposes fines and community service work upon those convicted. More than 4,000 litter citations were written in 2004.</p> <p>One component to abating litter accumulation is education. Litter Project A, B, C's purpose was to utilize the K-12 classrooms as a means to promote the litter prevention message. The project undertaken was to use the Roadside Environmental Unit's State Fair Booth, within the Gardener's Flower Show section of the State Fair, as a means to promote litter prevention to the state's youth through their teachers. The Office of Beautification Programs set up a teachers' window where teachers could request a teacher's kit. The kits were comprised of Don't Litter Decals, Swat-A-Litterbug cards, temporary tattoos and stickers, litter law flyers and car litter bags that had a stop the littering message printed on one side. The kit provided litter prevention material for 30 students.</p>	Operations- Asset Management	2005	George Kapetanakis	(919) 715-3188.	Customer Service
Pavement Condition Survey Data Entry Project	<p>For 20 years, NCDOT has conducted a biannual Pavement Condition Survey (PCS) of NC highways. The survey is conducted using pre-printed forms. After completion, the results of the surveys are keyed in by personnel in the field offices. The results of the survey are then used to calculate funding needs for NCDOT road maintenance, distribution of hundreds of millions of maintenance dollars & to track the long-term performance of the highway network. From 1982 to 2002, data entry and reporting was carried out on a mainframe system. For the last decade, data has been transferred from the mainframe to an Oracle database for long-term storage & data modeling purposes. After this transfer it was possible to conduct extensive error checking & perform QA/QC checks. The data was then uploaded back to the mainframe for final report generation. As the data set grew to 1,000,000 lines or more, it became difficult and time-consuming to maintain and update the data. New software was developed to allow direct entry into the Oracle system.</p>	Operations- Asset Management	2005	Neil Mastin	(919) 250-4094.	Labor Hour Savings
CEI Contract Administration Guidelines & Workshop	<p>In early 1990's, NCDOT wrote its first contract for private construction and engineering inspection (CEI) services.. No guidelines to aid in administering contracts or to describe program - only construction personnel served as resources.</p> <p>Team was formed to write guidelines and to conduct a series of workshops for NCDOT construction engineers and private firm personnel based on these guidelines. As a result, both NCDOT personnel and private firms have a better understanding of the CEI program.</p>	Operations Construction	2003	Jimmie Travis	(919)733-2210	Communications
Improving the Earthwork Measuring Process	<p>Measuring unclassified excavation was a time consuming process involving photo missions by plane and significant field personnel computations to obtain final measurements.</p> <p>New process process involved several changes - lump sum payments on smaller projects and producing the computation during design and showing on plans. This eliminated template computation by field personnel on all projects and eliminated flights on lump sum projects</p>	Operations PreConstruction	2003	Ellis Powell	(919) 733-2210	Cycle Time Reduction

Hydro Demolition	<p>A Process was needed to reduce the time need to rehabilitate a bridge deck for a project in Bertie County. The project would take 18 months using standard methods forcing traffic to be detoured for 50 miles during the rehabilitation of the structure. A project in Columbia, SC was using the Hydro-Demolition process for dual three lane structures on I-77. Each structure was approximately 5500 feet long. The Bertie County structure is approximately 1 mile long. Both structures in SC were completed and open to traffic in 25 days. The Bridge Maintenance Unit set up a pilot project using the Hydro-Demolition in Greene County. The Greene County project, using our standard method of deck rehabilitation would have taken 14 weeks. Using Hydro-Demolition, the project was complete and open to traffic within 2 weeks. Using this project on the Bertie County project will reduce the time from 18 months to 30 days.</p>	Operations-Asset Management	2004	Mike Summers	(919)835-8277	Cycle Time Reduction
Natural Resources Tech Report	<p>The Natural Environment Unit (NEU) is responsible for overseeing the preparation of Natural Resource Technical Reports (NRTR). The NEU develops the standard templates for these documents so that in-house staff biologists and consultants can produce similar products. NEU sought ways to reduce the amount of time necessary to complete NRTR's to improve the cycle time for NEPA document preparation.</p> <p>A team of NEU biologists and managers was established to reevaluate the NRTR template. This team met several times to evaluate the various components of the document and decide what was truly necessary and what could be reduced or eliminated. Ultimately, the NRTR template was simplified to only those topics essential for compliance with NEPA requirements.</p> <p>The NRTR documents have been considerably streamlined. The text of a typical NRTR document has been reduced by over 50%, and a consistent format has been established for all deliverables. Increased efficiency in document preparation and review translates into man-hour savings, cost savings and reduction in cycle time for NRTR preparation in the NEPA process.</p>	PDEA	2009	James Hauser	(919)431-6631	Cycle Time Reduction
County Maintenance Map TIF Image Conversion & Distribution	<p>County Map users were having difficulty reading Microstation files downloaded off the GIS web site correctly. A new digital product was needed to allow users to view county maps without the use of special CAD software. TIF images were decided to be the best format to help distribute consistent maps over the GIS web site. Digital images made it easier for other units in DOT (as well as the general public) to view all 282 county map sheets. County maps are available on the GIS web site and are updated after every workday.</p> <p>Maps can be plotted directly from the TIF image if a hard copy is necessary and small sections can also be printed. If an office had a PhotoShop software or paint program such as Adobe PhotoShop, areas could be highlighted or additional text could be added before the image is printed and allow users to customize their own maps.</p>	PLANNING & ENVIRONMENT	2002	Terry Norris	(919) 250-4188 x 204.	Customer Service
Environmental Streamlining for Enhancement Projects	<p>All projects receiving federal funding must undertake an environmental review consistent with the National Environmental Policy Act (NEPA). Environmental documentation for Enhancement projects typically are Categorical Exclusions (CE), but could require the more detailed Environmental Assessment (EA) or Environmental Impact Statement (EIS). CEs are further subdivided into Type 1 and Type 2 CEs. For projects requiring a CE review, the NCDOT had developed a standard eight-page form to be submitted. For the Enhancement projects, Enhancement staff (in conjunction with PD&EA and FHWA staff) have developed two methods to streamline this environmental documentation requirement.</p>	PLANNING & ENVIRONMENT	2001	Rob Ayers	(919) 733-2039	Customer Service
Enhancement Program Implementation: Project Manager's Guide	<p>In 1998, the Board of Transportation decided to allocate a portion of the Federal Enhancement funds externally to communities in order for these communities to implement projects. This differed from past guidance, as between 1991 and 1997 the BOT allocated all of the Enhancement funds internally to support Department goals. Statewide Calls for Projects were held in 1999 and 2000, resulting in more than 160 awards to communities throughout the state. Although these projects were all included in the Transportation Improvement Program, the Enhancement staff (initially two employees--now four) were tasked with managing these projects, including the oversight of all aspects of project development--from project inception through project completion. Essentially the Enhancement staff had to learn about all of the relevant issues associated with program implementation, and then create a management system for these projects.</p> <p>Enhancement staff developed the Enhancement Program Implementation: Project Manager's Guide (hereafter referred to as the "document") to assist DOT project managers with project management. In addition, this guide is distributed externally to award recipients to assist them in project implementation. Processes, relevant state and federal guidelines, and sample documents have been researched and compiled into this one source.</p>	PLANNING & ENVIRONMENT	2001	Rob Ayers	(919) 733-2039	Customer Service

Point of Contact List	<p>The mission of Statewide Planning is to provide a "customer responsive process" as a part of our partnership with local officials in the state's 17 MPOs, as well as other NCDOT branches. A large portion of each MPO Coordinator's time is spent answering questions concerning the status of TIP projects in their area, although project specific work is done in other branches of NCDOT (Roadway, PD&EA, Public Involvement). Citizens often find NCDOT to be vast and confusing when seeking information on their own.</p> <p>In order to improve both internal and external communications, as well as provide quick and accurate responses, several coordinators have created a point of contact list for TIP projects in their area. At a minimum, this list provides the name and telephone number of a contact for the latest project information in each of the pre-construction areas. Other information that may be included is the stage of the project, opportunities for public involvement, e-mail addresses, and construction start date.</p>	PLANNING & ENVIRONMENT	2001	Beverly Williams	(919) 733-4705	Customer Service
Roughness Averaging Automation	<p>Members of the Primary Roads section need to have the ability to quickly sum-up and average a series of values for the processing of the roughness section reports. This task is accomplished by delineating a section of roadway into 1/100ths of a mile and then summing up the inclusive value. This procedure is relatively easy unless the section becomes ponderously long (i.e., keying in 76 entries for a 7.53 mile section without missing a value or the miscounting of entries which would cause an error in the averaging computation).</p> <p>The Geographic Information Systems Unit wrote a visual basic macro that copies the contents of an ascii file into an existing EXCEL worksheet. This spreadsheet was set-up to do summation and average computations using a collapsible or expandable bracketing frame that can slide up and down the column of data creating the bounds for the summation and average calculations.</p>	PLANNING & ENVIRONMENT	2001	Tony Medlin	(919) 250-4188	Labor Hour Savings
Realignment of the Planning Units	<p>assessment of our capabilities in meeting the future demands of state and local officials, agency and environmental partners and the citizens of North Carolina. As a result of this assessment, we have determined that our organizational structure limited our ability to provide effective and efficient transportation planning service for all of North Carolina. The Planning Group of the Statewide Planning Branch realigned along geographic boundaries. Under the new alignment, transportation planning for the MPOs, RPOs, counties and small urban areas would be done by staff on a geographically based team with the state broken down into six regions, including the Mountains, Metrolina, Triad, Triangle, Southeast and Northeast.</p>	PLANNING & ENVIRONMENTAL	2002	Laura Cove	(919) 715-5737.	Customer Service
Turning Movement Request Form	<p>The Traffic Survey Unit collects different types of traffic related data for many users in the Statewide Planning Branch. Turning Movement s are one type of traffic count that is required for most project work and model updates. Historically, requesting turning movements counts required a memo specific to the project location, a map and two forms that had to be manually completed for each project. A requestor could take up to several hours to complete all the necessary forms for just one project. Additionally, the Traffic Unit was relocating to a remote location from the branch, so additional lead-time would be required to send the request to send the request by interoffice mail or unit.</p>	PLANNING & ENVIRONMENTAL	2002	Kent Taylor	(919) 733-4705.	Customer Service
Streamlining Street Name Database Processes	<p>The Secondary Roads Group of the GIS Unit-Road Inventory Section maintains a cross-reference file of state maintained secondary roads and their respective numbers. This file is updated monthly. The file has been maintained on the NCDOT mainframe system for years. When a list of a county road number/name file was needed, the request would be made by phone, mail, e-mail, or walk-in. The request would usually take 3 or 4 days to be delivered. Other circumstances, such as orders of 15 counties or more that required an invoice to be prepared or digital copies, added up to two additional days.</p> <p>Realizing the need for a more efficient system for distributing this information, the programming staff of the LRS Group of the Road Inventory Section was called upon to build an Access database of the file with update capability, report production, and availability over the Internet. A program was developed over a three-week period whereby the file could be updated with networked computers. Short reports could be printed in the Road Inventory Section immediately, and completed reports of the entire file could be printed and bound into a book the same day in the NCDOT Reproduction department</p>	PLANNING & ENVIRONMENTAL	2001	L. C. Smith	(919) 250-4188	Customer Service

T.I.P. Web	<p>The Transportation Improvement Program provides state and federal government agencies, the business community, and the citizens of our state with a comprehensive document for the transportation projects within the State of North Carolina. Up until this year the only means of providing project information has been in printed format - one book containing scheduling information and the second book consisting of maps for the highway construction portion of the T.I.P. Each of the books has a production cost of \$25.00, and additional cost is incurred for postage.</p> <p>This year for the first time all the information contained in both of these books is on the Internet. The text information stored in a Microsoft Access Database, an Excel Spreadsheet, or a Word Document were converted to an .PDF file type and incorporated into the T.I.P. web site. The 1692 individual project maps were converted to .JPG file type, and links to these individual project maps were created by outlining the project alignment (location) on the fourteen division maps.</p> <p>To date the Transportation Improvement Program (T.I.P.) web site has had over 55,000 hits since going online on June 7, 2001.</p>	PLANNING & ENVIRONMENTAL	2001	Chuck Short	(919) 733-2039	Customer Service
County Maintenance Map Automation	<p>The NCDOT GIS Unit wanted to reduce the long update cycle for county maintenance maps. User's of the county maintenance maps traditionally had a one to two year turnaround time before they were able to view the changes to the state maintained road system.</p> <p>County maintenance maps have been converted to a digital product and are now available for download on the GIS web page.</p>	PLANNING & ENVIRONMENTAL	2001	Terry Norris	(919) 715-3700	Cycle Time Reduction
Permit Process Improvement Initiative	<p>The environmental permitting process associated with building and maintaining North Carolina's transportation system is lengthy and highly complex, involving many state and federal agencies. The current process takes as many as 10 or more years for a highly complex project. In an effort to improve the workflow effectiveness and efficiency of the environmental permit development, coordination, and issuance process, the NC Department of Transportation (NCDOT), the NC Department of Environment and Natural Resources (DENR), and the US Army Corps of Engineers (COE) are jointly sponsoring a process improvement initiative. The initiative was undertaken with the primary purpose of developing quality permit applications and issuing environmental permits that support the timely delivery of the transportation program while minimizing disruption to the natural and human environment.</p> <p>Recommendations to streamline the project development and permitting process as well as a high level implementation plan and detailed implementation project plans have been developed. A coordination team has been assembled to oversee implementation and facilitate communication and decision making.</p>	PLANNING & ENVIRONMENTAL	2001	Julie Hunkins	(919)508-1852	Cycle Time Reduction
Utilizing GPS in Gathering HPMS Data	<p>As part of NCDOT's compliance with the FHWA Highway Performance Monitoring System program (HPMS), the Road Inventory section must gather data for specific stretches of existing roadways. The Road Inventory section maintains data for approximately 3,600 samples statewide. While the current method yields accurate data, collecting travel lane curve and grade readings in traffic can be hazardous and time-consuming.</p> <p>A Trimble Pathfinder GPS unit was integrated into the data gathering process, specifically to replace the manual collection method currently used. The present field form was formatted via the Pathfinder software into the hand unit of the GPS. This allows all the required data to be compiled electronically and in one file.</p>	PLANNING & ENVIRONMENTAL	2001	Hardee Cox	(919) 250-4188	Labor Hour Savings
Innovative Centerline Rumble Strips on US 421 in Chatham County	<p>Problem: A severe pattern of vehicles crossing the centerline developed on a two-lane section of US 421 from approximately SR 2119 to SR 1010 in Chatham County. These types of accidents resulted in several high profile fatal and severe injury crashes. With traffic volumes increasing and work beginning on the US 421 widening project, immediate action was required to attempt to eliminate the head-on type crashes along US 421 in Chatham County.</p> <p>Solution: A multi-unit team consisting of Division 8 staff, Sandhills Regional Traffic Engineering, Traffic Safety Systems, and Work Zone Traffic Control, was charged with developing and rapidly implementing an effective corrective countermeasure. The team developed and implemented the split centerline rumble strip configuration treatment.</p>	Preconstruction - Traffic & Operations - Division	2006	Renee Roach	(910) 437-2614	Safety Improvement
PEF Estimate Database Application By: Traffic Control	<p>Previous PEF application was part of a large database which required users to figure work estimates offline and enter into database. New process uses linked databases to import info from other existing Oracle database and allows for data entry without offline computations (now done by system). New process reduces time involved by 50% and increases accuracy .</p>	PreConstruction	2003	Glenn Dennison	(919)250-4151	Cycle Time Reduction

Ddraft	Right of Way agents prepare all deeds and easement agreements associated with acquisition or purchase of rights of way and easement areas for projects. Average time to complete these was approximately 2 hours. A CADD section in the Branch was created to to draft the deed descriptions from electronic plans. Time required to to produce deed descriptions was reduced to 19 minutes for highway project and 25 minutes for bridge projects.Total time savings is 7,726 hours.	PreConstruction	2003	Grady Morris	(919) 733-7932	Labor Hour Savings
AG's Office Crash Report Retrieval Project	Each year the AG's Tort Claim Section processes thousands of tort claims against the State of North Carolina. The Tort Claim Section addresses all general liability claims made against the state. Regardless of a case's outcome, the crash report (DMV-349 Form) is one of the most important records that must be viewed in order to better understand the case and further defend the state in motor vehicle crashes. Traditionally, the Tort Claim Section obtains this document by sending staff members to DMV to complete forms to request hard copies of crash report. TSSMU and/or DMV personnel retrieve the crash reports, print copies, and send them back to the Tort Claim Section as requested.	PRECONSTRUCTION	2002	Tony Ku	(919) 733-5418.	Communications
On-Line Bidding	The NCDOT Highway letting process has remained unchanged for decades. Contractors have been required to attend highway lettings in person, physically delivering their bids and witnessing the opening of bid proposals. This required contractors to travel from all parts of the state to Raleigh once a month and arrive in time to attend the 10:00 a.m. letting. In most cases, this resulted in appreciable expenses to the contractor for travel, lodging, and sustenance as well as lost production for personnel attending the letting. Even though we furnished diskettes to the contractors to facilitate their bid preparation, the Department required and only accepted hand-signed printouts as official bids. Also, DOT expended considerable resources in purchasing and preparing diskettes, travelling to the letting, and hand entering bid information into the letting system.	PRECONSTRUCTION	2002	Randy Garris	(919) 250-4124	Communications
"SMARTZONE" on I-95 in Cumberland County	NCDOT needed a system or method to mitigate traffic backups and delays on TIP construction projects through the use of intelligent transportation technology deployed for "workzone" applications. The I-95 corridor has a past history of crashes and fatalities during major construction projects. Our goal was to find a system that would offer "real time" traffic information that would reduce backups, which contribute to congestion and crashes. The team developed conceptual drawings and a specification that utilized available technology in a "portable" system that works independently of human intervention, thus creating a "SMARTZONE". The system consists of changeable message signs, traffic sensors, cameras and computer software that calculates delays, measured in minutes in the workzone. These delays are displayed on the changeable message signs in a "real time" manner via wireless media.	PRECONSTRUCTION	2002	Steve Kite	(919) 250-4151	Communications
Information Transmittals	The need for timely transmittals of guidelines and policies to employees of the section is crucial for maintaining consistent and efficient customer service. Guidelines and policies impact not only employees of the section but also others that do business with the section such as engineering firms, attorneys, private citizens and other NCDOT units and sections. Traditionally guidelines and policies were given to employees at meetings and/or through the dissemination of paper copies. When a prior implemented guideline was needed, time was spent researching and tracking down the paper copy. In an effort to remedy this problem and provide employees with timely and consistent notification of guidelines and policies, a public drive was established on the section's computer network to accommodate scanned and electronic documents. All employees have read-only access to this drive.	PRECONSTRUCTION	2002	Richard Mullinax	(919) 733-5569	Communications
Area Traffic Database	The Area Traffic Office is a multi-task operation responsible for a variety of work that requires a diverse filing system. Files include TIP Projects, WProjects, Spot Safety Projects, Fatal Investigations, Governor's Highway Safety Program Studies, Signals, Intersections Studies, and Railroad Crossing Studies. The nature of these studies and projects makes it difficult to track files, find related files, or determine if a location had ever had a study conducted. It required physically searching the file cabinets, sometimes with little information. A great deal of time was lost determining if there was an existing study or project on a location, and then it could take from 15 minutes to 2 hours to locate the file. Attempts were made to organize the system but there was no central database to handle the entire file. In addition, there was no electronic capabilities established to produce related forms or reports that had to be developed by physically gathering information from related files, then compiling the data manually. This process could take anywhere from an hour up to a day to complete.	PRECONSTRUCTION	2002	Janet Whetstone	(910) 437-2614.	Communications

NC Traffic Signal Operations & Maintenance	<p>There are approximately 8,000 traffic signals on the NC State Highway System for government agencies to maintain and operate. Operations and maintenance activities have been fragmented with a lack of a baseline performance standard for division staff, municipal personnel, and contractors. This project established requirements for a good traffic signal system management program to promote safe, efficient function of traffic signals along the State Highway System.</p> <p>The program promotes a transition from emergency maintenance activities to preventive maintenance activities. Included in the program is the updating of municipal maintenance agreements. Reimbursement schedules for the municipalities were updated and five levels of service were established to ensure baseline standards are met. The program further establishes methods for performing audits including a signal inventory and maintenance tracking system to electronically track maintenance calls, equipment inventory, worked performed, and work time.</p>	PRECONSTRUCTION	2002	Troy Peoples	(919) 733-3915	Customer Service
Guidelines for Agreement Process & Reimbursement to NCDOT by Municipality/Developer	<p>When a developer/municipality requests a change to be made to an active DOT project, such as adding a left or right turn lane, a problem occurred in incorporating these design changes and collecting the cost associated with the changes. It created difficulty for our Design and Construction engineers to determine what steps to follow to execute the request. In addition, the developer or municipality did not know whom to call to track the progress of the request. A cross-functional team was developed. The team was responsible for the preparation of guidelines to follow when additional design or construction improvements are requested on active TIP projects. The team was also responsible for developing a way to show how the new process will help NCDOT to be reimbursed for improvements</p>	PRECONSTRUCTION	2002	Wayne Johnson	(919) 250-4128	Customer Service
Form Letter Application	<p>refer to an "Index" which listed all forms available for their projects. The users had to look in separate file folders for the letters and procedures. In order to complete the forms, users had to look up all their project information and who the letter should be addressed/ copied to along with their appropriate titles. The Form Letter database was developed that pulls data from a "backend" database that is linked to an NCDOT Oracle database. This allows the user to select their Project TIP number and any other pertinent information if automatically filled in for them. Other features include: 1) Procedures are readily available; 2) An automatic merge function creates a MS Word document allowing further edit; 3) Temporary tables associated with each form; 4) An e-mail feature is included to report problems; 5) A web link is included for easy access to the 12-Month Let List.</p>	PRECONSTRUCTION	2002	Paula Bausch	(919) 250-4151.	Cycle Time Reduction
APA Repair	<p>The asphalt lab owns an Asphalt Pavement Analyzer manufactured by PTI, Inc. This wheel-tracking device runs a continuous load over asphalt specimens to try to predict rutting. Rut tests are becoming an integral part of our mix design process. Specialized maintenance skills are required to keep this equipment in working condition, and over the years, numerous repairs have been made to this machine. Chris Bacchi, the Assistant Asphalt Design Engineer, has made a trip to PTI in Atlanta in the past and has learned how the APA is built and how it functions. Through numerous phone calls and this training, Chris has learned how to perform all of the necessary repairs, including part replacement and calibration. The manufacturer charges for travel time as well as labor to come and make repairs.</p>	PRECONSTRUCTION	2002	Chris Bacchi	(919) 733-3563.	Dollar Savings
Electronic Copies of Aerial Photos	<p>The Department prints numerous amounts of aerial photos each year. Each photo costs approximately \$50 to print. Congestion Management alone spends over \$3,000 a year printing aerial photos. In addition, these photos can be very large in size and can lead to filing space concerns.</p> <p>Congestion management is addressing this by having aerial photos sent electronically as jpeg files instead of printing hard copies.</p> <p>Less money is spent on printing the hard copy of the photo, filing space is reduced, and manipulating the photo is much easier. Additionally the photo can be obtained within hours instead of up to three days.</p>	PRECONSTRUCTION	2002	Stacey Silva	(919) 250-4151.	Dollar Savings
Project Management Database	<p>The Traffic Control Section was using a local database to track TIP Project assignments, lettings and manday requirements. Section personnel including data from other systems and printed materials entered all data. A new system was needed that would have Branch-level use and track project development milestones. Traffic Control worked with IT to develop a Traffic Control function within the existing Project Activity and Workday Scheduling (PAWS) system. It was developed, tested and refined. Beginning December 2001, the PAWS system became the new project management application for Traffic Control.</p>	PRECONSTRUCTION	2002	Glenn Dennison	(919) 250-4151	Labor Hour Savings

CrashWeb Batch Print Service	Our unit does crash analysis, which requires copying thousands of DMV 349 crash reports. We either had to print off reports from a microfiche machine or from a web application (CrashWeb) which allows retrieval of only one crash at a time. Since no longer keep microfiche copies of any crashes after 2000, we are increasingly dependent upon CrashWeb. It was extremely time consuming, pulling and printing each crash one by one. The solution was for the CrashWeb application to allow for the creation of batches that could be retrieved and printed in one process. The system allows us to copy a list of crashes and paste them into the CrashWeb service and then submit the request. Moments later a batch' is created which can either be viewed or printed.	PRECONSTRUCTION	2002	Jeff Rom	(919) 733-8304	Labor Hour Savings
Using OPUS to Control Proposed Bridge Replacement Projects	DOH uses aerial photography to develop base mapping & digital terrain modeling for bridge replacement projects, requiring photo ground control by Location & Surveys to adjust the photography for photogrammetric survey methods & to reference the digital mapping to project coordinate datum for planning, environmental impact studies, design, right-of-way acquisition, & construction. L & S uses Global Positioning System (GPS) technology to provide State Plane Coordinates for required photo ground control points. When controlling bridge replacement projects using GPS technology, the fast static method was applied for the horizontal & vertical coordinate network. It used 1 technician for 4 man-hours to plan, schedule, & post the GPS network data. This method used 3 technicians & 2 vehicles for 2 workdays to set the aerial photo targets (6-8 targets), locate Geodetic control monuments, obtain GPS Obstruction charts, operate GPS session receivers, & remove aerial photo targets from locations after completion of photogrammetric flight. Setting 2 GPS azimuth monuments for an average of 52 man-hours per project and 32 vehicle hours.	PRECONSTRUCTION	2002	Pat Tuttle	(336) 896-7008	Labor Hour Savings
Administrative Tracking	Tracking incremental salary raises for TEI Trainee and probationary status with dates had become an administrative paper trail nightmare. As we have gotten more comfortable with Netscape calendar and learned its usefulness as a task-tracking tool, we realized how the probationary period and incremental trainee raises could be noted on key dates for responsible parties to handle at the appropriate time. Administrative staff schedules notes with reminders for the employee, immediate supervisor, section head and clerical supervisor on the calendar so that incremental raises will occur on a timely basis. This practice eliminates dealing with Personnel on retroactive salary issues. Administrative staff will enter reminders of employees on probationary status on the calendars of the immediate supervisor and the section head. Nine months probation will be used initially, but section head can request that they come off probation earlier if they so desire.	PRECONSTRUCTION	2001	Peggy Barnhill	(919) 250-4151	Communications
The Beacon" Unit Newsletter	In order to minimize unit-wide emails and to improve information sharing within the Traffic Congestion & Engineering Operations Unit, a committee was formed to develop a monthly newsletter. The newsletter is predominantly distributed in an electronic format using HTML and placed on our unit's server so our employees can view the newsletter from their workstations. Using HTML also makes it possible to include live links to any referenced web pages and email addresses. A PDF version is also available for anyone that does not have access to our server. This version is forwarded to interested individuals each month in addition to the release of the newsletter to unit employees. The newsletter announces employees that are joining or leaving the unit as well as anyone receiving a promotion, technical articles, section accomplishments, special projects and tips for improving various work-related tasks are submitted each month and included. Birthdays, volunteer opportunities and even employee highlights touch on the personal side of the unit. The newsletter also introduces and provides updates on various professional organizations relevant to our employees to encourage extracurricular career development.	PRECONSTRUCTION	2001	Jeffery Dale	(919) 250 4151	Communications
TCEO Unit Orientation Checklist	The majority of the personnel issues are covered by the new employee orientation that is offered on the first Monday of every pay period. Our checklist was revised to serve as a supplement of this training. The checklist has two major parts, the Operational Functions and the Administrative Functions. The Operational Functions has eight parts that include: 1) Introduction to the Administrative Staff; 2) Work Hours; 3) Telephone Operation; 4) Computer; 5) Layout; 6) Safety/Equipment; 7) Seating Assignment; and 8) Organizational Chart. The Administrative Functions portion includes six sections: 1) Time Sheet; 2) Supplies; 3) copiers/Printers/Plotters/Fax Machine; 4) Cutting/Trimming Machine; 5) File Room; and 6) Mail. Each of these sections is then broken down into anywhere from tow to fifteen check items.	PRECONSTRUCTION	2001	Ron King	(919) 250 4151	Communications

Fatal Accident Database	<p>As part of the Area Traffic staff, the Area Accident Investigation Engineers are required to investigate fatal accidents. There are five Area Offices located across the state with each office responsible for a certain section of the state.</p> <p>Information gathered as part of the accident investigation includes a copy of the accident report, the date and location of the accident, specifics of the accident (alcohol and seatbelt usage, age of driver, etc.), accident site information (road geometrics, signing, etc.) and the remarks and recommendations of the Accident Investigation Engineer.</p> <p>The Fatal Accident Database was developed to better handle this information. Following an investigation, the information gathered is entered into a database file. The database will allow the engineer to quickly reference this information in the future. For example, if the Accident Investigation Engineer wanted to find all the fatalities that he or she has investigated on a particular road or highway in the past year, searching the database would take considerably less time than searching through the hard copies kept in a filing cabinet.</p>	PRECONSTRUCTION	2001	Scott Collier	(919) 233-9331	Communications
Safety Project Development Guide Website	<p>The evaluation of safety projects determines what type of projects work best to improve safety at a particular location. Project evaluations provide feedback to the project development engineers so they can select cost effective projects in a timely manner, thereby improving the safety and efficiency of North Carolina's roads. This web site was developed to provide support to engineers in a consistent and convenient manner. The web site has opened a channel of communication between safety evaluation engineers researching traffic safety statistics and the traffic engineering field engineers who use the safety statistics in their daily jobs. As engineers evaluate previous safety projects and discover countermeasures and crash reduction factors pertinent to certain situations, that statistical data is made immediately available via the web site. The online tool aids the traffic engineers in developing safety projects by organizing and disseminating necessary information into an easily accessible format, which will save man-hours and improve the overall project development process.</p>	PRECONSTRUCTION	2001	Laura Slusher	(919) 7331593	Communications
Work Zone Traffic Control Rodeo	<p>A wide range of Traffic Control Devices is used in the maintenance of traffic in a work zone. With 14 divisions statewide and approximately 70,000 miles of state maintained roads, the Traffic Control Section saw a need to develop the 2001 Work Zone Traffic Control Rodeo to train NCDOT, municipalities, and private industry in maintenance, troubleshooting and information on specific devices. The Rodeo was compiled of 7 classes that were attended by all participants; Overview of Work Zone Elements, Advance Warning Signs, Electronic Advance Warning, Channelizing Devices, TMIA's and Crash Cushions, Work Area Protection and Other Work Zone Devices. Each class focused on theory, installation, maintenance, usage and troubleshooting of the respective devices. Manufacturing industry, the contractor, NCDOT field personnel and the Traffic Control Section provided class materials. This collaboration insured the material taught was informational, accurate and included the latest technology.</p>	PRECONSTRUCTION	2001	Meredith McDiarmid	(919) 250-4159	Communications
English/Metric Project Special Provisions	<p>With the Department's implementation of the metric system unit of measurements on construction projects, traffic signal project special provisions were developed as two separate document files; one for metric units of measurement and one for English unit of measurements. This made it necessary to ensure two separate, but similar, documents were simultaneously kept up-to-date. It also increased the potential for errors in translating English to metric values or visa-versa, as well as the potential for the project special provisions with the incorrect system of measurements being selected for a particular project.</p>	PRECONSTRUCTION	2001	Richard Mullinax	(919) 733-3915	Customer Service
Publication of AADT Maps on the Internet	<p>The Traffic Survey Unit responds to many requests for traffic information from the public. Previously, customers had to provide a description of the location they needed data for over the telephone. The data was researched while the customer was on the telephone for small requests, or a list was provided and the data was faxed for larger requests. Some customers had to purchase maps to meet their traffic data requirements. Many customers had expressed interest in being able to view on the Internet the Annual Average Daily Traffic (AADT) maps that are published annually. A team was organized to develop a better way to serve external customers.</p> <p>The team coordinated with the GIS Section to determine what was needed to provide Internet access to maps. Arrangements were made to print our publication with a contractor who used printing technology that produces electronic images of large-scale maps. We implemented a quality control process to ensure the scanned images were legible and complete. The images were placed on a web image server and the GIS Section set up a viewing application. The web pages and viewing application were tested and altered to better suit a user's needs. Web pages are updated annually and electronic images are produced internally.</p>	PRECONSTRUCTION	2001	Kent Taylor	(919) 733-4705	Customer Service

Directional Drilling	<p>Two methods have accomplished the process of installing conduit under existing roadways in the past. The least preferred method was to physically cut out a section of the roadway, open a trench, and install the conduit. Once the conduit was installed and the trench compacted, the roadway was replaced.</p> <p>The second method is known as Jack & Boring. In this process a pit is dug and a horizontal drilling machine is placed in the pit, which basically drills a hole under the roadway in which a conduit is to be pulled back through. This process, while preferred over open cutting the roadway, has drawbacks. In most areas there is not enough right-of-way to place the machine or a suitable pit area cannot be selected due to the underground utilities that are already present.</p> <p>Traffic Management Systems has adopted directional drilling as the preferred method. The drill head is launched from ground level at an angle into the ground and makes a bore under the roadway. However, in this process the drill head can be controlled by the operator who controls the drill head's horizontal and vertical positioning underground. A locating device that is operated by a second individual tracks the drill head. When the drill head reaches its exiting point, it is removed and a back reamer is installed in its place, along with the conduit to be pulled back through.</p>	PRECONSTRUCTION	2001	Greg Fuller	(919) 733-8021	Customer Service
Standard Strain Pole/ Metal Pole with Mast Arm Designs	<p>Traditionally, the use of wood poles at signalized intersections has been the most common method for suspending signal head assemblies over a roadway. The use of strain poles / metal poles with mast arms was generally limited. Initially cheaper to install, wood poles require a higher level of maintenance over strain poles/ metal poles with mast arms. Strain poles / metal poles with mast arms provide for a longer service life and more consistent strength over time. Generally, there is no hardware tightening, and no re-treatment of the assemblies is necessary to ensure reliable service life. Unlike wood poles, strain poles / metal poles with mast arms may have a salvage value at the end of their service life and pose no hazardous material disposal concerns. A major disadvantage of strain poles / metal poles with mast arms was the time consuming preliminary engineering for the department and pole fabricators.</p> <p>Recognizing this, a task force was established between the Signals and Geometric Section and the Structure Design Unit to develop standard strain poles / metal pole with mast arm designs for use statewide at signalized intersections. As a result, the work group developed and has implemented new standard designs. The standard designs are applicable for about 80-90 percent of the installations requiring strain poles / metal poles with mast arms.</p>	PRECONSTRUCTION	2001	Richard Mullinax	(919) 733-3915	Customer Service
Traffic Signals: Review & Approval Process for Private Developers	<p>Traffic signals are being installed by private developers at an increasing rate. These signals, although privately funded, still must be approved by DOT through permits, agreements, and plan review. Longer review turnaround times have resulted due to increasing volumes. Though a review process was in place, many developers, PEFs, and even DOT personnel were unaware of the existing procedure. In addition, although steps to the process were defined, no time frame was specified for the amount of time required to follow each step. A committee was formed to review and revise the approval process and educate all involved parties on the revised process. The ultimate goal was to accelerate the approval process through clarity and education.</p> <p>The committee was comprised of representatives of municipalities, PEFs, and all areas of DOT in an effort to involve all aspects of the approval process. The committee met many times over an 18-month period, carefully examining every step of the approval process for efficiency, clarity, and time frames.</p>	PRECONSTRUCTION	2001	Ken Ivey	(919) 715-7736	Customer Service
Traffic Control Estimate System	<p>The Traffic Control Section is required to provide at least four traffic control estimates for every Transportation Improvement Program (TIP) project in NC. The estimates include scoping, letting list verification, preliminary and final quantity estimate. Each estimate is hand calculated to itemize and document each and every traffic control device that will be used in a specific TIP project. It involves many hours of calculation and the data from these estimates have to be keyed into three separate programs. Other than being inefficient, entering the same data into three separate programs allows for possible inconsistencies between estimate reports on the same project.</p> <p>A consolidated estimate program was created to more efficiently create traffic control estimates.</p>	PRECONSTRUCTION	2001	Jeff Rom	(919) 250-4159	Cycle Time Reduction

ASC Battery Replacement Program	<p>The batteries in Econolite ASC-8000 traffic signal controllers are difficult to replace because they are soldered to a printed circuit board. Field technicians normally do not perform solder/desolder operations on printed circuit boards. In addition, the batteries are not a common type so they must be ordered through electronics parts suppliers. Therefore, the batteries were not changed on controllers in the field. While depleted batteries are replaced when controllers are repaired in our Traffic Electronic Center (TEC), only a limited number of these controllers have required repair. TEC technicians observed several controllers, in which battery decay had sent corrosive fumes onto the controller printed circuit board, rendering the controller beyond repair. When these controllers failed at an intersection, the intersection traffic signals would revert to flashing operation, and undesirable mode of operation.</p> <p>A proactive battery replacement program was initiated. TEC technicians then scheduled visits to each division to replace batteries on an established schedule.</p>	PRECONSTRUCTION	2001	John Montgomery	(919) 733-5666	Dollar Savings
Heat Shrink Tubing Method	<p>Traffic Management Systems Section specified mechanical sealing bushings to seal riser/conduits where communication cables (fiber optic cables) enter and exits the riser/conduit at the top of a utility pole. The conduit extends from the base of a utility pole to the point where the cable enters the riser/conduit. The bushing is used to prevent water from entering the conduit and running down into a cabinet where it can damage equipment.</p> <p>To install the mechanical sealing bushing requires the installer to tighten screws, which compresses two steel plates with a neoprene gasket between them to achieve a proper seal between the riser/conduit and the communications cable. Since this operation is performed at the top of a utility pole it is difficult to inspect.</p>	PRECONSTRUCTION	2001	Greg Fuller	(919) 733-8021	Dollar Savings
Hydrostripper	<p>Aluminum sign recycling is conducted through arrangements between the NCDOT and Department of Corrections. In the past, DOC used old archaic abrasive dry sanding machines to remove the reflective material from signs. It frequently took 10 passes through the sanding machine to get the old reflective material from signs. In addition to eventually grinding down the thickness of the aluminum, this process also remove the chromate conversion coating necessary to retard corrosion. The cleaned sign was then shipped to Pennsylvania, where the chromate coating was reapplied. In addition to the added cost, the chromate conversion treatment is an environmentally unfriendly operation due to the chromium in the coating.</p> <p>The desire was to establish an efficient, environmentally friendly, state-of-the-art highway sign reclaiming operation. After further research, DOC purchased a Hydrostripper. The Hydrostripper utilizes a high-pressure water system to remove old reflective material from the signs. Because it uses water, the signs are not ground away which allows the aluminum to be used over and over. The most outstanding feature of this method is that the aluminum is not affected during the cleaning process, thereby eliminating the need to reapply the chromate coating.</p>	PRECONSTRUCTION	2001	John Grant	(919) 715-0951	Environmental Sustainability
Metal Strain Pole Program	<p>The Structure Design Unit of the Design Branch was interested in improving the turn-around time of the numerous numbers of the tubular structures of signal supports among other assignments of this group. An old DOS analysis program was being used, in addition to hand calculations. Because of the nature of this DOS program, the review of the input prior to printing was impossible, resulting in waste of time and paper. Personnel averaged 6 to 8 hours of calculation per pole, and 24 to 32 hours of calculation per 4-pole intersection. Periodically, because of change in type or specification of the loading, the calculation had to be repeated.</p> <p>The Structure Design Unit team designed a computer program to enter and analyze the data. The goal of the new program is to perform complex structural analyses based on the available information from traffic engineers and in accordance with the latest national code. A statewide standard for the different intersection geometry has been implemented and is in use.</p>	PRECONSTRUCTION	2001	Wahid Naim	(919) 250-4047	Labor Hour Savings
Light Emitting Diode (LED) Signal Module Evaluation	<p>To ensure that LED modules are visually effective and will provide a safe traffic flow under windy, swaying conditions, they are visually evaluated. The evaluation process required 17 people and one bucket truck for eight hours for every evaluation. The evaluating observers would determine whether there was a significant reduction in the brightness of the indication prior to being obscured by the visor. This test method allowed some variability in the testing parameters from each test set-up. Vendors suggested the variable test parameters could have a negative effect on the evaluation of their products.</p> <p>To develop a more objective visual evaluation, a new test fixture was designed and installed at a new test site that did not require the bucket truck to mount and change the modules. The test fixture allows more accuracy in determining when the signal indication blanks out during swaying by using a mechanical tilting mechanism, and cuts the evaluation time in half.</p>	PRECONSTRUCTION	2001	Ken Morge	(919) 233-1209	Labor Hour Savings

Development of a Simplified Method for Predicting Dead Load Deflections of Steel Plate Girders	<p>Problem: Bridges are being constructed with longer spans, higher skews, and/or in stages to minimize traffic interruptions or environmental impacts. Over the last few years, matching final deck elevations to the plan elevations has become a problem since the predicted deflection of steel plate girders does not match the actual deflections measured in the field. The current deflection prediction is based on a single girder line analysis that doesn't take into account skew or stiffness of adjacent girders.</p> <p>Solution: The solution to this problem of extensive computer modeling was to create an empirically based simplified method that would significantly reduce the amount of time required to predict the deflection of steel plate girders. It takes into account the effects of bridge skew, girder length, girder spacing, cross-frame stiffness, in-place deck slab thickness & composite action on a portion of the girder length. Structure Design partnered with NCSU in a research project. Taking what NCSU had done, Structure Design created a simple spreadsheet program that incorporates the empirically based method and that is now integrated directly into the design process.</p>	Preconstruction - Highway Design	2006	Tom Koch	(919) 250-4037	Labor Hour Savings
Redesign of Survey Equipment Box	<p>Problem: A survey equipment box on the work vehicle is used in both transporting engineering equipment and storing supplies while simultaneously providing quick access. The standard plywood equipment box and Lexan shield installed in the rear cargo area prevent safe operation of the vehicle. The height and position of the box combined with the shield's construction significantly reduces visibility and impairs the operator's ability to safely back-up the vehicle and monitor rear-approaching traffic.</p> <p>Solution: A newly designed survey equipment box was built and installed. The new box increased rear visibility to the original equipment manufacturer's specifications. The new box is constructed from 16-gauge mild steel sheeting providing improved containment of the equipment.</p>	Preconstruction - Highway Design	2006	Charles Brown	(919) 250-4109	Safety Improvement
Low Volume Bridge Approach Investigations	<p>Problem: The FHWA identified significant cost and scope issues with the re-construction of very low volume bridges under North Carolina's TIP and Bridge Replacement/Upgrade programs. Most significantly many of these structures on lower tier facilities were utilizing the same basic design and permitting criteria as those major structures on new TIP and new Bridge projects on high speed higher tier Strategic Corridors. The costs environmental- financial- project delivery time - were significant and the cumulative impact was that fewer bridges were able to be replaced resulting in longer than optimal operational lives for structures with low sufficiency rating.</p> <p>Solution: A process improvement team was activated with an ambitious goal of identifying issues and outlining a plan to improve our bridge project scoping process and associated recommendations. The inter-agency team produced and implemented recommendations for bridge projects</p>	Preconstruction - Highway Design & Traffic Engin	2006	Anthony Wyatt	(919) 733-1593	Environmental Sustainability
Overhead Sign Design Wind Area Reduction	<p>Problem: Find a way to reduce the design wind area used to compute wind loads on overhead sign structures while maintaining flexibility to add additional wording to signs. The design wind area exceeds the actual sign area by as much as 80%. This is done to allow flexibility in making last minute changes to overhead signs during and after construction. However, it also results in design wind force effects that are larger than those produced by the actual sign "wind area. The larger force effects require larger and more costly structural members and larger foundation sizes.</p> <p>Solution: Eliminate design wind area and use a slightly larger sign panel size to accommodate additional text. Use that actual sign panel area to compute design wind forces.</p>	Preconstruction - Highway Design Branch	2006	James Gaither	(919) 250-4042	Dollar Savings
Webcast Field Inspections	<p>Problem: Roadway Design meets with field offices for most projects during the design phase. These field inspections are in the division office where the project is to be built. If a project is being built in Division 1, 2, 12, 13, or 14, members of the design team (Roadway, Hydro, Traffic, Structures, etc) drive from Raleigh to these Divisions (up to six hours away) to meet and discuss project specifics.</p> <p>Solution: Web conferencing allowed everyone in Raleigh (approximately 6 to 10 people) to meet in a conference room and discuss the project with everyone in the division without Raleigh personnel having to drive to the Division office. A license was required for \$100 (\$50 per location) which allowed viewing of the plans over the internet. The Web conferencing meeting lasted only 30 minutes.</p>	Preconstruction - Highway Design Branch	2006	Jim McMellon	(919) 250-4016	Dollar Savings

Standard Overhang Falsework Designs	NCDOT requires submittal of plans and calculations for concrete forms for bridge decks, called falsework, to the Structure Design department for approval. Structure Design staff reviews proposed designs for strength, constructability and safety. Especially important is a review of the falsework of bridge deck overhangs which cantilever from the exterior girder. Falsework is subject to the load of the concrete before it hardens and the weight of the screed, a machine that spreads and smoothes the freshly poured concrete to the proper thickness and finish. Due to the many screed types, overhang lengths, concrete thicknesses, exterior girder types, and the proprietary nature of the falsework supports, the designs for overhang falsework are highly variable. Disagreements between DOT and Contractors have often lead to delays and unexpected costs to the Contractor since they are often required to use more substantial falsework than was assumed in the original bid. On large projects this has been a source of substantial litigation.	Preconstruction - Highway Design Branch	2005	Tom Koch	(919) 250-4046.	Cycle Time Reduction
Development of Prestressed Concrete Box Beams	Historically, NCDOT has utilized two types of precast prestressed concrete units for use in bridge decks—voided (cored) slabs and prestressed concrete girders. Each has its advantages and limitations. Girders are more durable, have greater capacity, and can span longer distances. Slabs have a much more shallow structure depth and are faster to install, leading to faster construction times. Slabs are especially viable on rural, off-system stream crossings with low traffic volumes, which accounts for a high percentage of bridge replacement projects each year. To provide bridge designers with more choices, Engineering Development developed standard box beams. These structural units can span up to 105 feet (up to 65 feet for top down) while maintaining a structure depth about 1.5' less than a comparable girder bridge.	Preconstruction – Highway Design Branch	2005	Tom Koch	(919) 250-4046	Dollar Savings
Alternate Method for Sign Illumination	Rising electrical service costs and limited maintenance resources are impending problems for overhead sign lighting. The Signing Section aimed to reduce the costs of sign lighting. The section investigated alternate methods of sign illumination, finding a method that meets the federal requirements and reduces cost. As a result, overhead signs no longer require the traditional lighting methods and its costs. The Signing Section now endorses Type IX retro-reflective sign sheeting as an alternate method for sign illumination. This alternate method reduces signing cost while maintaining a high quality, safe, and effective transportation system.	Preconstruction Traffic Engineering	2005	Ayman Alqudwah	(919) 250-4151	Dollar Savings
NC Safety Summary Map Tools	Problem: Safety information is frequently presented and accessible in formats that are difficult to read and understand. In support of strategic highway safety efforts aimed at reducing fatal and severe injury crashes on North Carolina streets and highways, there was a need for additional visual mechanisms and improved formats to present aggregate safety information for a variety of safety partners. Solution: Working with representatives of North Carolina’s Executive Committee for Highway Safety (N.C. State Highway Patrol, Governor’s Highway Safety Program and the Traffic Safety Unit), team members from NCDOT’s GIS Unit and Traffic Engineering & Safety Systems Unit researched, developed, refined, and published a series of simple color coded three-year Safety Summary Maps. The maps visually summarize all reported vehicle crashes, large truck involved crashes and motorcycle involved crashes.	Preconstruction - Traffic Engineering	2006	A. D. Wyatt	(919) 733-1593	Customer Service
NC Improved STAA Truck Route Tools	Problem: Since the original National Surface Transportation Assistance Act of 1982, North Carolina has experienced tremendous growth and significant changes in our highway system and freight needs. Largely unchanged since originally designated in the Code of Federal Register in the 1980’s and subsequently into North Carolina General Statutes and Administrative Code in the early 1990’s, North Carolina’s Surface Transportation Assistant Act and National Truck Network Map and supporting materials were in need of a major overhaul. In the electronic age the customers (terminal operators, trucking industry, and enforcement community) have an expectation and need for immediate on-line access to these critical networks and unfortunately North Carolina was still exclusively utilizing US Mail to mail hard copies of these maps. Solution: The solution involved a comprehensive multi-agency process improvement effort (NCDOT, GIS, Regional Traffic Engineering, Traffic Safety Unit, and NCSHP) to research, investigate, and update North Carolina’s National Truck Network Map while also working toward producing a version of tools that was accessible via the internet.	Preconstruction - Traffic Engineering	2006	A. D. Wyatt	(919) 733-1593	Customer Service
Procurement Cost Reduction of LED Traffic Signal Modules	Problem: The cost of LED signal modules is higher than the cost of incandescent bulbs. We would like to achieve a reduction in the procurement costs of these modules. LED traffic signal modules are becoming a standard commodity. Companies are now manufacturing larger quantities and more companies are manufacturing the modules. These factors may provide an opportunity to lower procurement costs. Solution: The solution is to create a new contract bid for LED traffic signal modules rather than to extend the present contract.	Preconstruction - Traffic Engineering	2006	Milton Dean	(919) 733-5666	Dollar Savings

DMS Installations Project	<p>Problem: The previous practice of Dynamic Message Sign (DMS) installations was to install overhead sign structures with ground-mounted control cabinets. The cost of these structures averaged \$50,355. The ground-mounted control cabinets were prone to flooding and damage by mowing crews. Previously with flip disk technology, the control cabinets were placed 50 to 75 feet in advance of the DMSs. This allowed maintenance personnel to view the DMS display while working in the control cabinet. With the new LED technology, placing the control cabinet in advance of the DMS does not provide message legibility from a distance of 50 to 75 feet; therefore, placing ground mounted control cabinets in advance of the DMSs are no longer effective.</p> <p>Solution: To alleviate concerns with overhead installations, the ITS Section has changed the practice to place the DMSs on the roadway shoulder using Pedestal or Butterfly type structures. The DMS displays are mounted 25 feet above ground and the control cabinets are attached near the base of the structures.</p>	Preconstruction - Traffic Engineering	2006	Tom Parker	(919) 733-1506	Dollar Savings
Robotic Total Station Surveying Equipment	<p>Problem: The safety procedures adopted by the Signals & Geometrics Section of the ITS & Signals Unit require a spotter be present with the rodman to ensure the rodman's safety when performing stadia surveys of existing intersections for signalization at high speed locations. The Section will not be able to obtain new positions for an increasing workload associated with its responsibility to provide safe, efficient designs for traffic signals along the state highway system. A team was formed to investigate a means to more effectively utilize manpower for stadia surveys.</p> <p>Solution: Robotic total station survey (RTSS) equipment is the most effective & economical means to utilize manpower for stadia surveys. RTSS equipment allowed fewer employees on a survey team and it enabled employees to develop traffic signal plans utilizing less manpower while maintaining required survey stadia accuracy without decreasing safety for employees. The NCDOT Locations & Surveys Unit ensured that the equipment purchased would meet the needs of the Section and be compatible with equipment used by other Units within NCDOT.</p>	Preconstruction - Traffic Engineering	2006	Richard Mullinax	(919) 733-5569	Labor Hour Savings
Completing Highway Safety Improvement Program Investigations	<p>Problem: The Traffic Safety Systems Management Section identified 3,456 potentially hazardous locations statewide at the beginning of their two-year HSIP cycle in April 2005. With limited manpower, Traffic Operations and Investigations Section is charged with completing investigations, making recommendations, and developing improvement projects for as many of these locations as possible during the two-year cycle period.</p> <p>Solution: A full-time temporary engineer with almost 40 years of directly related traffic engineering and highway safety experience was hired to focus entirely on the task of completing HSIP investigations and developing treatments/countermeasure projects.</p>	Preconstruction - Traffic Engineering	2006	P.H. Daughtry	(252) 296-3522	Safety Improvement
Electronic Distribution of Memorandums	<p>Problem: The Congestion Management Section observed the following items related to distribution of our memorandums (1) traditional distribution of our memorandums was consuming a lot of office paper and energy, (2) memorandums that were being sent out by mail were being distributed through our courier service, which was consuming gas at increasing prices, and (3) units were receiving multiple copies of our memorandum thus wasting paper and energy.</p> <p>Solution: The Access Review, MSTA, and Plan Review squads implemented multiple pilot projects throughout 2006 to determine the feasibility of electronic distribution of our memorandums. Since we were receiving positive feedback from our recipients, we implemented full scale electronic distribution.</p>	Preconstruction- Congestion Management	2007	Erin Hardee	(919) 773-2884.	Labor Hour Savings
Contaminated Waste Minimization	<p>Problem: US Hwy 17 Bypass in Beaufort County crosses an unregulated abandoned landfill and an actively monitored US EPA Superfund Site. Material in the landfill posed an environmental risk, a constructability risk for proposed 30- inch concrete piles to support the Pamlico River Bridge. The Superfund site contained documented herbicides and pesticides in both soil and ground water, originating from a former agricultural supply facility at the site, which posed health risks to site workers, nearby residents and business patrons. The amount of material recommended for removal and disposal was estimated at 57,000 cubic yards at an estimated excavation and disposal cost of \$4 million.</p> <p>Solution: A comprehensive Contaminated Waste Minimization Plan was successfully developed by the Geotechnical Engineering Unit, in coordination with state and federal regulators and the Design Build contractor.</p>	Preconstruction- Geotechnical	2007	Cyrus Parker	(919) 250-4088.	Dollar Savings

Utilization of GPS RTK (with and without NRTK) in Stakeout	In field surveying, the location of points (aerial targets, property corners, drainage features, edges of pavement, etc.) is time-consuming. Using traditional survey methods, a 3-person survey crew has to traverse distance to locate or set points. Prior to fieldwork, often-complex calculations are necessary to determine angles & distances. Someone must compute the desired information from recorded notes requiring substantial man-hours. With GPS RTK (Real Time Kinematic) Surveys, fewer personnel are needed for fieldwork & traversing is no longer necessary. This results in greater accuracy & reduced field time, both in elapsed procedure time & man-hours. Since data is electronic, office computations are substantially reduced or eliminated, resulting in a further man-hour reduction. In many cases, when an answer is needed right away, the GPS RTK information is immediate,	Preconstruction-Highway Design Branch	2005	Charles Brown	(919) 250-4109.	Labor Hour Savings
Toe Scour Protection System	Rains from the 2004 hurricane season caused a massive amount of damage to western North Carolina. Interstate I-40, which is the major transportation artery between North Carolina and Tennessee, was closed when several landslides occurred near the NC-Tennessee border. The Highway Design Branch was directed to design a solution that would repair the slopes and open I-40 as soon as possible. A significant amount of coordination and teamwork between the Highway Design Branch, Construction Unit, and Division 14 was required to complete the design work and contracts within 23 calendar days. The Geotechnical Engineering Unit, Structure Design Unit, and the Hydraulics Unit developed a new solution to prevent future erosion at toe of repaired slopes and preserve the safety of the traveling public.	Preconstruction-Highway Design Branch	2005	Nilesh Surti	(919) 250-4088	Safety Improvement
Environment Unit Data Warehouse	Problem: The NEU tracked project information using an assortment of reports, databases and spreadsheets. Information tracked individual staff oftentimes was needed by the whole unit. This created a crisis if the staff member was out of the office and others could not retrieve the information. Additionally, if a request came in from other units, it presented a challenge to find out who had the answer to a particular problem. Solution: NEU surveyed its existing resources for tracking project information. We then solicited input from our customers to evaluate needs and existing data gaps. Finally, NEU partnered with NCDOT IT Web Services Team to develop a web accessible database that would enable better data storage and information sharing.	Preconstruction-PDEA	2007	James Merrick	(919)707-2207	Communications
ROW-EFS	Historically, ROW files including deeds and agreements, individual project claim files, appraisals and other documents have been filed as hard copy documents within an ever-expanding series of file rooms and storage cabinets. Due to space restrictions, 3,000 files annually had to be transferred to State Records Center which were then destroyed after 10-15 years and lost to both ROW and general public. ROW put in an electronic scanning and filing system in place.This system allows immediate access to needed information to multiple users and eliminates hard copy filing. Also, when internal network is expanded to Division offices, more user will be able to easily access files.	PreConstruction ROW	2003	Grady Morris	(919) 733-7932	Customer Service
Ground Mounted Support Design Program	Safety, consistency, and working productivity are issues that challenge NCDOT to improve. The Ground Mounted Support Design Program is a software solution that addresses all of these issues by communicating updated safety information to signing personnel while increasing design productivity and consistency. Larger ground mounted signs cannot be supported by direct driven posts. Steel beams in concrete footings are used to resist the large wind forces generated by these signs. The support chart's fundamental task is to design beam sections and concrete footings from sign sizes and field conditions. However, drivers who have departed from the road are in danger of being hurt by hitting these steel beams. In response to this, the program incorporates the latest AASHTO breakaway requirements into the initial design, producing a safe crashworthy design. The final product becomes a complete solution to all support and footing design needs.	Preconstruction-Traffic Engineering	2005	Clarence Bunting	(919) 250-4145	Communications

Signing Rodeo	<p>The Signing Section takes pride in fulfilling its mission to provide a safe and integrated transportation system to the traveling public. With this in mind, the Signing Section took on the challenge of sponsoring its first signing workshop to provide consistent statewide training. The following classes were taught:</p> <p>Sign Placement and S Dimension Verification, to develop and define the concepts of sign placement, horizontal and vertical clearances, approach distances, and survey verifications.</p> <p>Materials, which focused on sign retroreflectivity and the how and why of nighttime sign visibility.</p> <p>Inspections, to explore practical examples of sign inspection by providing clear direction on acceptable sign installations as well as common pitfalls and their resulting problems.</p> <p>Signing Supports and Storage, which gave instruction on the correct installation and application of crashworthy supports in addition to developing consistency in practice with sign storage and cover.</p> <p>Sign Fabrication, which included a brief video tour of the largest sign plant in the country, followed by examples of sign fabrication</p>	Preconstruction-Traffic Engineering	2005	Clarence Bunting	(919) 250-4145	Customer Service
Plan & Permit Review Process	<p>Design plans and / or recommendations from the Roadway Design Unit, the Structure Design Unit, the Geotechnical Unit, Hydraulics Unit, Roadside Environmental, Traffic Control Unit, Utility Sections, Traffic Engineering Branch, and the Division Offices are an integral part of the permit drawings used for the Department's permit application submittal to the U.S. Army Corps of Engineers (USACE), Division of Water Quality (DWQ), and Division of Coastal Management (DCM). In order to improve the accuracy and coordination between the permit drawings and roadway design plans, a revised process is needed that will provide final plans earlier in the process. In other words, there needs to be a time when design changes that occur beyond that point are the extreme and not the norm.</p> <p>To allow this to happen, procedural changes are recommended to the project development process that occur on a project between the public involvement phase until letting. Key groups, i.e. Division, Congestion Management, Utilities, Right of Way, and others, will partner with the Highway Design Branch earlier in the design decision making process.</p>	Preconstruction-Highway Design	2004	Ron Allen	(919)212-5730	Cycle Time Reduction
LIDAR Utilization for Design Base Mapping	<p>Accurate elevation data is required to produce base mapping products for functional, preliminary and final design. NCDOT collects this data using photogrammetric techniques. When other sources of current and accurate elevation data are available, the Photogrammetry Unit will utilize that data. NCFMP (North Carolina Floodplain Mapping Program) collected LIDAR (Light Detection and Ranging) elevation data in 2001 and 2003 for approximately 85% of the state. The availability of the NCFMP LIDAR elevation data has improved the Photogrammetry Unit's capacity to rapidly produce base mapping products in response to catastrophic emergency events such Hurricane Isabel. It has also enabled Photogrammetry to produce significantly more accurate base mapping for functional design.</p>	Preconstruction-Highway Design	2004	Keith Johnston	(919)250-4001	Labor Hour Savings
Revised Rumble Strip Policy	<p>The old guidelines for rumble strips used by the NCDOT specified that rumble strips should only be placed on the following types of median divided roadways: Interstate Through Routes, Rural Freeway Segments, and Expressway Segments that are located in sparsely developed rural areas. Rumble strips are raised or grooved patterns that are placed along paved roadway shoulders to provide both an audible warning (i.e., rumbling sound) and a physical vibration. As drivers drift beyond their designated travel lane, the warning alerts the motorist that a steering correction is required. Recognizing the growing run-off-the-road (ROR) safety problems and the fatigued and distracted driver benefits of continuous milled rumble strips, an aggressive effort to reduce the number of ROR crashes was initiated by the NC Board of Transportation and North Carolina's Executive Committee for Highway Safety.</p>	Preconstruction-Highway Design	2004	Roger Thomas	(919)250-4016	Safety Improvement
Right of Way Electronic File System	<p>The Right of Way Branch is responsible for the acquisitions of property for construction. A large amount of legal documentation is generated for each claim. Right of Way is required by State and Federal Laws to retain this documentation from 2 to 15 years, depending on the type of claim. The State Records Center is where the documentation was retained. Due to the recent State Budget Crunch, State Records was no longer able to store our documentation. Right of Way had to devise a new method of storing its documentation.</p> <p>After reviewing several alternatives, Right of Way initiated a system called ROW-EFS (Right of Way Electronic File System) where the information is processed, stored and archived electronically using existing computer technologies already in house. This system would incorporate all 20 Right of Way offices. New procedures had to be developed and taught to all of the Right of Way employees.</p>	Preconstruction-Right of Way	2004	Grady Morris	(919)733-7932	Dollar Savings

Cyberstreet Internal Bulletin Board	Employees were finding it difficult to find manuals, organization web sites, employee policies and procedures, and engineering reference materials. Also, there was a need for employees to have a central location to receive information for meetings and employee functions. In addition, employees needed a common place to store and easily access training information, personnel materials and orientation information. An internal electronic bulletin board (Cyberstreet) was created using HTML. Cyberstreet is an internal webpage that is located on the server where all employees can access it. The homepage has links to each section in our unit along with links to the NCDOT homepage and our unit's homepage. There is room to place messages about any pertinent meeting that employees need to attend and important information they need to know. Cyberstreet has links to the NCDOT internal portal, directory, and Human Resources Manual. It is a quick reference for important information.	Preconstruction-Traffic Engineering	2004	Amanda Smith	(919)-250-4151.	Communications
Design Manual	The ITS and Signals Unit's Design Manual is used by private engineering firms, municipalities, and others, in addition to in-house staff to provide guidance in the design of signals and ITS. This manual was only available in paper format, causing delays in getting the information to the recipients.	Preconstruction-Traffic Engineering	2004	Greg Fuller	(919) 733-8333.	Customer Service
Sign Lighting Outline Qualified Product List	Through the use of critical analysis and problem solving, collaboration, and relationship building, the members of the signing electrical squad streamlined a cumbersome and time-consuming process. In the past, contractors were required to submit a description of each proposed sign lighting construction material to the Resident Engineer. This catalog cut submittal was sent to the signing section, researched for compliance with NCDOT specifications, approved, and sent back to the Resident Engineer. Analyzing possible ways to minimize the processing time for catalog cut submittals, the signing section electrical squad learned of web-based tools that could provide a good solution. With help from IT, the signing section electrical squad developed a qualified product list (QPL). The Signing QPL (SQPL) is an online database containing sign lighting materials approved for construction. The development of the SQPL has allowed the signing section to rewrite the policy for submitting catalog cuts.	Preconstruction-Traffic Engineering	2004	Ayman Alqudwah		Cycle Time Reduction
Access Management Signal Analysis Check List Program	The AM Group does approximately 1,000 annual analysis of Roadway Network files from private engineering firms. Data is text doc. by Signalized System Analyses Software (Synchro). The Process Management Section created an Access 97 Visual Basic application (Signal Analysis Check List) that reads the Synchro output, analyzes the data and outputs the data in both a macro and micro report format and stores the data for future retrieval. Before implementation of Signal Analysis Check List it took an hour to analyze an average file however, now it only takes 2 minutes.	Preconstruction-Traffic Engineering	2004	Louis Kudelka	(919)250-4151	Labor Hour Savings
Signing Rodeo Database	The Signing Section recognized a need for a tool that would organize and automate the registration and associated administration processes involved with the Signing Rodeo, a training program. Process Management developed an Access 97 database application that automates all recognized data centric business processes. Manually completing these tasks would take approximately 240 hours per training event.	Preconstruction-Traffic Engineering	2004	Louis Kudelka	(919)250-4151	Labor Hour Savings
Timesheet Data Entry Process	The timesheet data entry process required the same data to be entered into electronic spreadsheets twice. The process was redesigned to eliminate the second manual entry of timesheet data from the paper copy. A new spreadsheet was developed for NON-TIP employees and the Pmii spreadsheet was used for TIP employees. The first spread sheet is saved to the file server and the time entry personnel copy and paste directly into the SAP system.	Preconstruction-Traffic Engineering	2004	Jennifer Portanova	(919)250-4151	Labor Hour Savings
Regional Traffic Safety Council/Robert Waterhouse	In 2003, there were 250,933 reported traffic crashes in North Carolina that resulted in a total of 1,559 persons killed and 134,00 injuries on our highways. The NC Executive Committee for Highway Safety (NCHS) was formed in April 2003 to identify, prioritize, promote and support all 22 key emphasis areas in the AASHTO Strategic Highway Safety Plan (SHSP). The Executive Committee adopted the national goal of 1.0 fatalities/100 MVM (million vehicle miles of travel) by the year 2008. Presently, North Carolina's rate is approximately 1.6 fatalities/100 MVM. In an effort to reach the goal of 1.0/100 MVM in North Carolina, NCDOT representatives held meetings with the Executive Director of the Piedmont Authority for Regional Transportation (PART) to establish a safety council made up of representatives from rural areas of the Piedmont area. This council would assist the rural areas and give those citizens a place to turn with their safety issues and/or problems.	Preconstruction-Traffic Engineering	2004	Vickie Embry	(336) 896-7037	Safety Improvement
The Book Federal FY 2003 Appropriations Requests	NCDOT needed to develop a resource for NC's congressional representatives to use during appropriation bill process since there was no systematic effort towards influencing such bills. A working group was formed to develop a process for generating NCDOT's input for the FFY 2003 appropriations. Project resulted in The Book, a bound catalog of desirable earmarked projects categorized by US congressional districts and by all modes. Copies were delivered to NCDOT personnel, NCDOT's Federal Legislative liaison in Washington. They in turn met with NC's congressional representatives and provided copies. Subsequently, the FFY 2003 Appropriation Bill passed and NC's projects that were included came primarily from the wish list included in The Book.	Program Development	2003	Moy Biswas	(919)715-2465	Communications

Paperless Solutions for Documents Sent to PMU	<p>Project Management funds over 1800 projects annually through various project phases Preliminary Engineering, Right Of Way, Construction, and Mitigation. Each project contains from 80 to over 300 pages of documentation needed for project funding. As society becomes more technologically advanced, cost wise, and conservative in expending our natural resources, Project Management felt there was a better way to proceed regarding document management.</p> <p>As a result of SAP and IXOS integration, it was decided that it would be beneficial to encourage a paperless way of sharing needed information/documentation via the document originator scanning the document to the 3rd Level WBS Element of the appropriate project phase, and notifying the recipients electronically.</p> <p>As a result, cost, labor, and environmental savings can be realized by reduction of hardcopy distribution. Each recipient receives from 144,000 to over 540,000 pages annually of essential funding documentation. Taking these numbers into account and considering that most distribution lists contain an average of 10 recipients, there can be a median annual cost savings of \$30,590.00 per recipient.</p>	Project Management Unit	2009	David Rhodes	(919)733-2039	Dollar Savings
In The Loop A Monthly Newsletter for Employees of NCDOT	<p>With 14,000 people working in every county of the state, NCDOT faced many challenges regarding communication and information sharing among employees. Several years ago, the department published a paper based employee newsletter called theExtra Mile. The cost and procedures associated with printing and mailing it caused the newsletter to be out of date by the time it reached all units and divisions.</p> <p>To remedy this, Secretary Tippett requested a new, web-based newsletter to be produced and distributed by the Public Information Office. The goal is to provide information to help employees do their jobs better. These features include news from the field, project profiles, training and development resources, safety tips and announcements from Human Resources. Another goal is to encourage communication among all employees in every unit in every county. Features include human-interest stories, employee profiles and employee awards and achievements. Newsletter correspondents were recruited from divisions and units across the department. It was determined that the web provided the quickest and most effective method of distribution.</p>	PUBLIC INFORMATION	2001	Cherie Gibson	(919) 733-2522	Communications
Improved Research Products & Technology Transfer	<p>Research & Development Unit solicits, promotes and manages research for all modes of transportation. Unit currently facilitates 80 contract research projects ranging from use of bio-diesel fuels to using innovative polymer materials for bridge rehabilitation and taking between 1 and 3 years and costing between \$30,000 and \$1.5 million. Recently R&D has implemented a process which involves faster dissemination of research results through the use of web sites, interactive CD's, video, datasets and software developed as part of the research. This has led to research customers throughout DOT being able to implement research in a more timely and powerful manner through a more efficient and effective means of technology transfer.</p>	Research & Analysis	2003	Rodger Rochelle	(919) 715-4657	Customer Service
Decision Aid for Wildflower Management Program	<p>Wildflowers are recognizable component of NC's Roadside Enhancement Program which tourists and citizens give positive feedback to the Department. Weed competition makes keeping these beds looking their best very difficult.</p> <p>NCDOT and NC State entered into an agreement to evaluate cultural and chemical management techniques for wildflowers. Greenhouse and field trials have been conducted on 28 species of wildflowers and the effectiveness of 31 herbicides on these wildflowers have been evaluated.</p> <p>An interactive CD which allows managers to cross-reference various combinations of wildflowers, herbicides and weed species to determine the best control methodology for specific planting sites.</p> <p>This CD is shared with Division personnel as well as other DOT's across the country.</p>	Roadside Environmental	2003	Derek Smith	(919)733-2920	Communications
Special Provisions & Standard Drawings on the Internet	<p>Previously, consultants would have to request special provision and drawings for erosion control from the Soil & Water Section of the Roadside & Environmental Unit. Hard copies would then be mailed to consultant. Soil & Water and Emerging Technologies Section designed and implemented a web site from which the consultants could retrieve the standard drawings and special provisions. Contractor's no longer have to formally request items and wait to get them back.</p> <p>Also, having drawings online facilitates revisions to drawings</p>	Roadside Environmental	2003	Derek Smith	(919)733-2920	Customer Service

Sustainable Rest Area Design U.S. 421 Wilkes County	<p>Problem: In the U.S., buildings account for: 39 percent of the total energy use 68 percent of the total electricity consumption 12 percent of the total water consumption NC's rest areas need to serve the traveling public in a much more sustainable way to help preserve our state's natural resources.Solution: Built a more environmentally sustainable facility. It conserves natural resources and teaches the importance of sustainable building practices and the benefits that can be achieved by using them.</p>	Roadside Environmental Unit	2009	Connie Morgan	(919)733-2920	Energy and Environment
Drought Assistance to the State's Livestock Farmers	<p>Problem: The severe drought of 2007 caused a critical shortage of forage hay for North Carolina's livestock farmers. Due to the drought, hay production in the State was 37% less than the previous year. The preliminary estimate was a shortage of 800,000 large bales of hay; later that estimate was increased to 1.8 million bales. The NCDA&CS began to seek any and all available sources of forages for livestock. One potential source was the hay mulch used annually by the NCDOT for its wildflower program. Solution: The NCDA&CS contacted the NCDOT Roadside Environmental Unit requesting that the DOT divert our contracted hay mulch to the State's livestock farmers, due to the extreme shortage of hay for feeding livestock. The Roadside Environmental Unit considers the request and decides to respond positively to the NCDA&CS request, in the best interest of the State's economy. Correspondence is prepared and sent to the NCDA&CS to confirm the affirmative response and to provide a list of the suppliers.</p>	Roadside Environmental Unit	2007	Don C. Smith	(919)-733-2920	Customer Service
Stormwater Pollution Prevention Plan (SPPP/SPCC-IIP)	<p>Problem: The SPPP and the SPCC programs are paper and process intensive programs that require reporting and updating over time. The initial versions were hard copy documents that were soon out of date after the program was established. Reprinting and coordinating updates required significant resources and staff. In addition, programs required reporting which would have resulted in thousands of hard copy documents being sent to a central location. Solution: Development of an internet based management system that allowed for the over one-hundred and fifty (150) end users across the state to input, update, and receive information in an efficient process that facilitates communication and control while maintaining environmental compliance Results: The benefits of an integrated SPPP/SPCC Plan include: The ability to readily access regulatory information from different locations; Streamlined management and the ability to efficiently make global changes; Version control and assurance that each facility's Plans are up-to-date and in compliance; Centrally located data that can be verified by the appropriate users; Readily accessible performance measures for compliance checks; Elimination of thousands of hard copy records per year; Ability to update and assign compliance personnel from local or centralized location; and Maintain a sustainable system that can be managed with minimal resources</p>	Roadside Environmental/Hydraulics Unit, Web Service	2008	Johnie Marion	(919)-861-3770	Labor Hour Savings
NC OSH 300 Form Statewide Teleconference	<p>The Federal DOL and NC OSHA adopted the use of three new forms and reporting procedures for incidents/injuries beginning January 2002, a statewide requirement for the private and public sector. Failure to abide by the new regulation could result in OSHA fines and a loss of information related to safety programs. Training on the use of the new forms and procedures was only available through costly seminars provided by private companies or through sessions presented by OSHA at various Community Colleges. State agencies and municipalities do not have the same issues as the private sector, thus the OSHA all-inclusive training would be lengthy and not as cost effective. Although never before utilized for the statewide training of a large segment of state employees, the use of a statewide teleconference to provide the necessary information to these entities was a logical choice.</p>	SAFETY & LOSS CONTROL	2002	Chuck Stanfill	(919) 250-4200 x 241.	Customer Service

Combined State Form 19 & OSH 301	Incidents, injuries and accidents are required to be reported to two separate State agencies. In many cases the information and criteria to report is similar. However, historically, each agency has required the use of its particular form. (Form 19 for the NC Industria ICommission and a separate form for NC DOL, form 301.) This reporting requirement is applicable to a majority of the private sector, third party insurance companies and all state agencies. This created a duplication of effort. Research was done the see where areas of overlap occurred. Since information on the form is treated as data input, the form was developed to not interfere with that process. A consolidation of the forms was approved for use in June 2002.	SAFETY & LOSS CONTROL	2002	Chuck Stanfill	250-4200 x 243.	Labor Hour Savings
Enhancements to On-Line TIP	Previously, access to TIP online was gained by clicking on links labeled by NCDOT division. This was useful to personnel familiar with division geography, but very confusing to others. In addition, project location maps were accessed by separate links. Beginning with the 2004-2010 TIP, the web site was reconfigured to provide users a clickable map of the state showing both counties and divisions. Users may also access projects by category. Also, a second enhancement allowed the user to pull up all data for a project from one place and data was provided in separate window formatted for printing.	TIP Unit	2003	Brian Padfield	(919)733-2039	Customer Service
New Information Technology	Obtaining accurate field data required site investigations or field meetings. Team developed method which utilized web sites aerial photography and GIS to acquire same data. New method saves time by reducing field investigations. Review time for projects has decreased by 50% and outstanding projects have been reduced by the same amount. Nearly 50,000 labor hours per year have been saved.	Traffic Engineering	2003	Gary Faulkner	(919)250-4151	Labor Hour Savings
Access Management	Due to poor past management of street and driveway access, the state highway system is operating below its original intended purpose. Because of numerous points of access/conflicts, safety is compromised, capacity is being reduced and driver workload is diminished due to poor management of side street conflicts. An NCDOT Access Management policy has been developed and recently implemented. Access Management has the potential to save the traveling public as much as \$240 million per year in crash costs alone. The goal is to enhance road safety, improve motorist mobility and reduce environmental impacts.	Traffic Engineering	2003	Gary Faulkner	(919)250-4151	Safety Improvement
Robotic Total Station Surveying Equipment	The safety procedures adopted by the Signals & Geometrics Section of the ITS & Signals Unit require a spotter be present with the rodman to ensure the rodman's safety when performing stadia surveys of existing intersections for signalization at high speed locations. The section is not able to obtain new positions to meet the increasing workload related to safe, efficient designs for traffic signals along the state highway system. A team was formed to investigate a means to more effectively utilize manpower for stadia surveys. Robotic total station survey (RTSS) equipment is the most effective & economical means to utilize manpower for stadia surveys. RTSS equipment requires fewer employees on a survey team and it enables employees to develop traffic signal plans utilizing less manpower while maintaining required survey stadia accuracy and safety for employees. The NCDOT Locations & Surveys Unit ensured that the equipment purchased would meet the needs of the section and be compatible with equipment used by other units within NCDOT. Manpower required for a survey team has been reduced by one person for high-speed locations requiring a stadia survey and resulted in saving 10 to 25 percent in field survey time.	Traffic Engineering & Safety Systems and ITS Signa	2009	Nathaniel Bitting		Labor Hour Savings
Innovative Rumblestrips on US 421 in Chatham County	A severe pattern of vehicles crossing the centerline developed on a two-lane section of US 421 from approximately SR 2119 to SR 1010 in Chatham County. Accidents resulted in high profile fatalities and severe injuries. With traffic volumes increasing and work beginning on the US 421 widening project, immediate action was required to attempt to eliminate the head-on type crashes along US 421 in Chatham County. A multi-unit team consisting of Division 8 staff, Sandhills Regional Traffic Engineering, Traffic Safety Systems, and Work Zone Traffic Control, was charged with developing and rapidly implementing an effective corrective countermeasure. The team developed and implemented the split centerline rumble strip configuration treatment. With the development and implementation of the split pattern centerline rumble strips, there has been significant reduction of the drift across center lane departure type crashes during critical construction phase.	Traffic Operations & Investigative Section - Sandh	2009	Al Grandy	(910) 437-2614	Safety Improvement
Reduced Environmental Documentation Using Abbreviated Format	The Environmental & Planning Branch of the Rail Division was interested in reducing the amount of documentation for a Final Environmental Impact Statement (FEIS) on the Southeast Highspeed Rail Project (SEHSR). The FEIS covers a large study area corridor of approximately 500 miles, across the state of Virginia and North Carolina. After reviewing public and agency comments on the draft document, it was found that no significant changes would need to be made. The team investigated using an abbreviated format for the FEIS. The team discussed this approach with Federal Highway Administration, and it was agreed that the approach was appropriate.	TRANSIT - RAIL	2002	David Foster	(919) 508-1917	Dollar Savings

Electronic Transfer of Railroad Crossing Signal PS&E Packages	The Rail Division and railroad companies who are responsible for final engineering and construction of railroad crossing safety projects, have experienced delays of 2 to 4 weeks in delivery of plans, specifications, estimates, and materials lists being forwarded by regular mail. In addition, NCDOT and Norfolk Southern have experienced submittals being lost in the mail, with further time and cost involved in duplicating and resubmitting the packages. A trial transmittal of project documents, including NCDOT plans on aerial photography, was initiated. Norfolk Southern was unable to utilize NCDOT's CADD file formats. The team developed a protocol by which NCDOT's CADD drawings could be transmitted by converting them to JPEG format. Norfolk Southern returns its civil and electrical engineering drawings, materials lists, and cost estimates in PDF format.	Transit - Rail Division	2005	Jason Field	(919) 733-5587	Cycle Time Reduction
Crossing Signal Construction Inspection Process Improvement	<p>Previously applied methods of crossing signal construction inspection were proving less adequate due to the advance in technology and construction methods in the railroad industry. Rail Division Crossing Hazard Elimination Unit Construction Project Engineers, in conjunction with NCDOT and Federal Railroad Administration (FRA) Signal Inspectors, determined that the former construction inspection method required improvement in crossing signal functional and operational parameters to meet Federal regulatory requirements and the public safety purpose of crossing safety projects.</p> <p>Construction Project Engineers developed and refined the crossing signal construction inspection process and checklist, with input from Unit and Branch management, NCDOT and FRA Signal Inspectors, and key railroad company personnel.</p>	Transit - Rail Division	2005	Donald Hudson	(919) 715-7295.	Safety Improvement
SARAH 2.0 (Statewide Authoritative Railroad & Highway	SARAH 1.0 was a MS Access front end application with an Oracle backend which was cumbersome, slow, difficult to maintain & limited to 3-6 users. There were logic problems in the existing Data Model, which caused a series of failures in various required reports. SARAH database maintains inventory records of 10,477 rail/highway crossings in NC, allowing for data-entry, adhoc query capability, trend analysis, rail crossing modeling used in the Crossing Safety improvement programs, project tracking capability, & construction/maintenance contract & payment tracking. SARAH 2.0 was developed in a rapid prototypical environment which resulted in a web browser thin client application with a 3-tier enterprise architecture, allowing SARAH to support 40-50 clients in an intra-net environment. All requests (which include: media, federal & state agencies, special studies conducted by private & public agencies & contractors/consultants) can be accessed by all sections within the Eng & Safety Branch on individual clients computers using of a web browser; allowing instant access to data, reports, analysis & visual information on rail/highway crossings.	TRANSIT - RAIL DIVISION	2002	Ric Cruz	(919) 715-6129	Labor Hour Savings

<p>Increased Public Awareness & Context Sensitive with Existing Systems</p>	<p>Problem: As the number of registered vehicles increases throughout the State of North Carolina, traffic engineers and designers have had to deal with an ever-increasing amount of traffic on the State's highway system. This increase in traffic has created significant pressure on the system, resulting in increased congestion and the consequent loss of social and economic productivity. Traditional solutions to these types of problems have involved planning, designing and constructing new highways and additional public infrastructure. In the present circumstance, with declining revenues and increasing costs of highway construction, the ability of the State to continue on this course has been compromised in the extreme. As a result, new, creative strategies must be developed in order to take better advantage of our existing transportation assets.</p> <p>The solutions described in this document have, and should continue to have, a positive impact on the State's ability to maximize the efficiency and effectiveness of its current transportation assets.</p> <p>Solution: In order to address the issues described in the problem statement presented above, it is important to know what assets are available so that they can be effectively implemented and deployed. For the purposes of this discussion, the primary assets that are utilized are the portable Changeable Message Signs and overhead Dynamic Message Signs that are currently in the Department of Transportation inventory. The key to the success of this project is the use of these devices in circumstances and situations that will maximize the efficiency of the highway system.</p> <p>To accomplish this task, the Transportation Management Center has chosen to involve various stakeholders in a process that increases communication and understanding among the various players in the transportation environment. Through this process, relationships among participants have been improved and better communications have been established. This has allowed comprehensive regional planning to take place, particularly when significant events occur that transcends jurisdictional boundaries.</p> <p>Communications have also been improved using the State's TIMS system in a manner that provides information to the public that has not traditionally been made available to them. This information includes graphic and geographic imagery, more user-friendly 511 information, as well and information specific to projects catalogued on the system. The overall strategy of engagement and <i>creative uses of current technology has proven to be a viable solution to the problem of congestion and other related transportation</i></p>	<p>Triad TMC</p>	<p>2008</p>	<p>Michael Venable</p>	<p>(336)-315-7080</p>	<p>Communications</p>
<p>ITS Site Survey & Rapid CCTV Survey</p>	<p>Conventional CCTV (Traffic Camera) Surveys require the use of a great deal of time, manpower and equipment. Bad weather, soft soil and the size of the truck limit the setup options available to the crew and lengthen the time required. This resulted in less than optimal images that had to be transferred to a computer for finishing touches. All of this was time consuming.</p> <p>A rapid CCTV system was developed using materials on the service truck the required no additional money. A telescopic height pole was fitted with a small CCTV test unit. The images were captured on a laptop computer using software developed in-house. The software captured and cataloged the images, allowing for quick processing and use. Images are immediately mailed from site to engineers.</p> <p>After the initial test site the unit was able to process four sites. A service truck was able to survey 18 sites in a day during rain with serious soft soil conditions in the survey zone. The data was processed in a quarter of the required time for a standard site survey.</p>	<p>Triad Transportation Management System</p>	<p>2009</p>	<p>Michael Venable</p>	<p>(336) 315-7080</p>	<p>Cycle Time Reduction</p>