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In MOTION

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

Lessons Learned From Peer Review

by Joe McMahon, P.E., CEO

McMahon recently was the subject of an Organizational Peer Review (OPR), conducted under the auspices of the American Council of Engineering Companies (ACEC). A team of four principals of peer engineering firms looked over our operations. Over four intensive days, they examined seven areas, ranging from management to finance to human resources, interviewed staff, and reviewed reams of documents.

The four individuals of the OPR Team donate their time to these reviews, and their reward is to help their peers, like McMahon, improve their business practices. This example of selfless contribution, plus the relationships many of us at McMahon have established with the OPR Team, is sufficient to declare this process an unqualified success. As they say on TV: "But wait, there's more!"

Despite natural reluctance to "bare our souls" to strangers, we had been convinced for several years that the OPR would be good for McMahon. But, the time was never "just right." We should have done it years ago!

The OPR Team interviewed 80 percent of our staff and sent questionnaires to 110 of our clients. They plowed through

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Engineering Intern Program: It Benefits Us Both!

by Rodney Plourde, Ph.D., P.E., President

With much discussion focused in the engineering industry on the need for additional technical courses at our universities, due to shrinking curricula, often going unnoticed are those colleges and universities who offer on-the-job training as part of their engineering curriculum. Whether you call it an intern program or a co-op program, the benefits accrue to both firm and student.

McMahon has participated in intern programs with universities in the Mid-Atlantic, Massachusetts, and South Florida for several years. These interns have embraced both the engineering and computer science disciplines. Internships benefit students by assisting them in focusing their future careers toward either a specialist or generalist discipline; providing exposure, in most cases, to the public and private side of engineering practice; and usually offering decent pay. It also provides them with engineering experience, or on-the-job training, a plus upon graduation.

Rodney Plourde with McMahon interns, sitting from left, Rebekah Landis, Bariki Mlawa, and Kyle Kessler

Employers benefit too

Engineering employers, in turn, use the program to recruit for the future! It gives us, as firms, the opportunity to test a person's capabilities and character before we hire them permanently. This has been an excellent recruiting tool for McMahon, and we know other firms. So, to our teaming partners in both the public and private sectors who read our newsletter, we offer that, if you haven't tried it, please consider the engineer intern program. You are doing a service to our future engineering leaders and to yourselves!

DID YOU KNOW?

Cave drawings in Lascaux, France tracked migration routes with a basic structure similar to modern GIS.

Some 35,000 years ago, Cro-Magnon hunters drew pictures of the animals they hunted on the walls of caves near Lascaux, France. Associated with the animal drawings were track lines and tallies thought to depict migration routes. These early records followed the two-element structure of modern Geographic Information Systems (GIS).

Today McMahon's GIS engineers and planners use ESRI, Bentley, and AutoDesk products, along with other CAD and graphics software, to develop applications and provide support at any stage of the development or management of GIS. Our focus is on assessing a client's specific GIS needs and then designing and developing user-friendly customized databases and applications in the most beneficial way possible. The primary goal of the system developed is to provide electronic inventory, maintenance, management, and storage of each asset's associated documents, pictures, permits, plans, and CAD files.

Lessons Learned From Peer Review

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mountains of paper and electronic data. They then reported to the Board of Directors and Senior Management on their findings.

They affirmed many of the areas that we felt were good. They also shared their wisdom gained from their own experiences and that of dozens of other peer-reviewed firms. With a few tweaks here and there, our firm will move from good to great.

Lessons learned were many. Just preparing for this type of review motivated us to look hard in the mirror. Before we even began the OPR review, we strengthened and reaffirmed key areas such as our QA/QC procedures, risk management, professional development, and standard operating procedures. We also sharpened our pencil in our financial and management areas.

The OPR Team's report gave us excellent marks for a number of areas, including client service, work product, family-like environment and benefits, quality of staff, and business planning. Added beyond those areas cited above as requiring attention were improved communication, standardization of procedures across offices, and other minor, correctable business practices.

We have prepared an action plan to address these areas with responsibilities and timelines for implementation. We are monitoring our progress and will report our progress to our staff on a regular basis.

The bottom line is, while it takes courage, I highly recommend that every firm have a peer review. I am confident that McMahon will reap substantial benefits from the OPR for years to come.

Pennsylvania Highways: Looking Back – Looking Ahead

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highway industry has worked closely with structural engineers, material experts, and the FHWA, looking for better designs and materials.

New Materials

As a result of this effort, we now have Superpave and high-performance concrete for our highways. Plastic beams, and fiber-reinforced polymer coatings have also been developed. These lightweight, high strength, corrosion resistant materials give new life to bridges.

Smart Travel

Environmental laws will not allow endless widening of our Interstate highways, so other solutions are needed to relieve congestion. Although Intelligent Transportation Systems (ITS) may not be the total solution, it provides ways to improve the congestion problem. Today, ITS can monitor traffic flows, alerting drivers of congested areas with variable-message signs and radio announcements. Looking into the future, one day a platoon of smart cars (computer controlled) will be able to travel along a smart lane (pavement with imbedded guide wires) at 60 MPH with only 18-inches (spacing distance) between their bumpers. The result is one smart lane will be able to carry the equivalent of 12 non-smart lanes.

Our next, grand vision

Dwight D. Eisenhower's original vision carried us a long way over the last 50 years. As a McMahon employee and a member of the American Society of Highway Engineers, I believe that in order to make comparable strides over the next 50 years, we need a new vision. We must call upon the brightest and most talented among us to set a new vision and, over these next 50 years, plan and build beyond expectations.

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Keeping Boston Traffic Moving

by John Grieco, Senior Project Manager

Most engineers enter our profession because they are interested in solving transportation issues and enjoy the rewards of seeing their work. Engineers thrive on facing challenges and exploring new opportunities to develop effective engineering solutions. Transportation engineering challenges are global, but one can only imagine the challenges Boston has faced over the years, including a recent event.

Bostonians are proud that their city is the home of many famous events and places. Everyone has heard of the Boston Massacre, Boston Tea Party, Battle of Bunker Hill, Fenway Park, and the Big Dig. Famous does not necessarily always bring good connotations. Boston's Central Artery Project, the Big Dig, is the largest construction project in the history of the United States and comprised of many engineering firsts. This project is an engineering marvel that brings to mind both positive and negative emotions.

Planning needed after a tragedy

A ceiling panel in the I-90 Connector to the Ted Williams Tunnel collapsed on the night of July 10, 2006, closing Boston's new harbor crossing and causing major traffic problems. Boston's engineering

McMahon prepared more than 50 Traffic Management Plans to keep Boston traffic moving during emergency work on the Central Artery/Tunnel and I-90 Connector closure.

community had to act quickly and produce effective solutions for inspection, repair, and navigating traffic around the city. McMahon was called upon to help with Traffic Management Plan preparation.

Since that day, McMahon has been providing Traffic Management Plans (TMP's) and traffic setups for all the work associated with this devastating disaster. McMahon's staff has been on call from early morning until late night and even weekends, working on TMP's for the inspection and testing of ceiling panels, as well as closing travel lanes and roadway sections. Everyone involved realized that an I-90 lane of traffic had to be opened before Labor Day in order to accommodate the influx of vehicles returning on the Boston roads. Our staff committed their time and effort and was instrumental in reaching the goal of having new traffic setups that opened travel lanes on Labor Day Weekend.

Proud to be engineers

The Central Artery/Tunnel and I-90 Connector closure is an example of a project that requires immediate turnaround of plans during emergency operations. McMahon produced over 50 TMP's while meeting the schedule of various agencies and the contractor. All of the engineers involved should feel gratified to see their work come to life. This challenge was successfully investigated, solutions were developed and acted upon, and although unfortunate to the Boston community, engineers once again came to the rescue. This is another reason why we become engineers.

Technology Aids Transporation Statistics

by Diana I. Ospina, Project Manager

Today's transportation infrastructure has led to new and complex transportation modeling approaches to forecasting and assessing the growing transportation demand. These models require more detailed and diverse types of data—raising the need for employing more sophisticated techniques to collect high quality and statistically relevant data.

Now, the field of transportation statistics is expanding. Transportation statistics agencies are starting to meet to coordinate programs and develop comparable statistical models. Unfortunately, these programs have been slow in developing because of the difficulty in obtaining interagency data. There is an urgent need for comprehensive and standard databases that contain suitable vehicle volume and classification data, origin-destination, and employment information for modeling. That said, technology is making statistics, and communication, better.

Better results with cost-effective technologies

Much of the traditional data collection equipment, largely used to conduct roadway surveys, is becoming obsolete and unsafe just as new, less-obtrusive technology, oriented toward using video logging and remote sensing, becomes available.

Intelligent Transportation Systems (ITS), Geographic Information Systems (GIS), computer-based technologies, digital photographs, and other emerging technologies have proven to be more reliable, accurate, safe, and less-expensive collection mechanisms. ITS technology is already being used by different agencies to collect continuous 24 hour, 7 day traffic data, resulting not only in cost savings, but also in a dramatic increase in the amount of data available for analysis. GIS has been used to obtain urban travel data, such as trip origin and destination, length and duration of trips, and is more accurate than the data obtained using the traditional surveys and interviews.

Changes over nearly eight decades

It has been a long process since 1928, when the first known vehicle detection device was installed at a signalized intersection in Baltimore, creating the first semi-actuated intersection. To activate the first detector, the driver on the side street had to sound the horn that was mounted on a nearby utility pole. Later, a pressure-sensitive pavement detector was introduced. This technology consisted of two metal plates that produced an electrical contact when a vehicle ran over them. After these original technologies, a number of other devices were introduced with a goal to improve traffic flow and to monitor traffic volume and axle load data.

Pennsylvania Highways: Looking Back, Looking Ahead

by Richard S. Prentice, Senior Design Specialist Manager – Fort Washington

When our nation celebrated the Interstate Highway System's 50th Anniversary on June 29 this year, it was hard to imagine traveling throughout Pennsylvania without it.

The Federal Aid Highway Act of 1925 created the U.S. Highway System, which developed the first national standard for America's highways. US Route 1 connected the major cities of the east coast; running from Maine to Florida, it passes through Philadelphia, Pa. US Route 30 runs from New Jersey to Oregon and the Lincoln Highway, a major east-west highway in Pennsylvania, became part of US Route 30. These and other US Routes were built under the 1925 Highway Act.

Pa. Gov. Pinchot's Depression-era plan

The stock market crash in 1929 and the Great Depression that followed spurred the federal and state governments to become even more involved in rebuilding America's highways. In 1931, Pennsylvania's Governor Pinchot began his ambitious plan to pave 20,000 miles of dirt roads, creating innumerable road construction jobs for many of the Commonwealth's unemployed citizens. In 1938, the federal government backed up its commitment to the nations highways by re-writing the Federal Aid Road Act, but the following year World War II broke out. The U.S. government restricted the nation's road building efforts to only defense related projects.

Eisenhower's vision

After the war, President Eisenhower told Congress that our highway network was obsolete. The Federal Aid Highway Act of 1956 created the Interstate Highway System. Ultimately, today's Interstate System swelled to its current 46,837 miles of highways, 55,512 bridges, and 104 tunnels. Eisenhower had envisioned the $50 billion Interstate Highway program would be completed in ten years. In actuality, it took 50-years and $450 billion to construct the Interstate Highway System. Pennsylvania stakes claim to the first section of Interstate, since the Pennsylvania Turnpike between Irwin and Carlisle opened in 1940 and was incorporated into the Interstate System as I-70 and I-76. Pennsylvania has 12 Primary Interstate Highways and ten Interstate Spurs within its borders.

New technologies, such as smart cars, will change the way we look at transportation over the next 50 years.

Today: Truck miles top 388 billion

Twenty-six million trucks traveled 388 billion miles and carried 10.7 billion tons of freight worth $623 billion in the U.S. in 2005. The Interstate Highway System has played an important role in the nation's economy and quality of life, but the system requires renewed investment. Many portions are strained to capacity and 90 percent of the system is 30 years old or older, so we must focus on maintaining its infrastructure. The

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NEWLY AWARDED PROJECTS

NEW ENGLAND

- Lower Washington Street Industrial Zone Changes, City of Melrose, MA
- Brookline Street and Blanchard Road Design, City of Cambridge, MA
- Upper Shawme Lake Dam Rehabilitation, Town of Sandwich, MA

MID-ATLANTIC

- Traffic Engineering, Open End, Pennsylvania Turnpike Commission, PA
- Statewide Traffic Signal Asset Management Systems Contract, Subconsultant to PennDOT Central Office's Bureau of Highway Safety and Traffic Engineering
- Willow Grove Transportation Study, Upper Moreland Township, Montgomery County, PA

FLORIDA

- East Riverside Transitional Study, City of Fort Myers, FL
- Deleon Intersection Improvement Project, City of Fort Myers, FL
- Comprehensive Transportation Plan Update, City of Deerfield Beach, FL

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

OUR SERVICES

- Data Collection
- Land Survey
- Transportation Planning and Engineering
- Traffic Impact Studies
- Highway and Intersection Design
- Structural/Bridge Design and Inspection
- ITS/Traffic Signal Design
- Highway Access Permitting
- Geographic Information Systems
- Construction Observation and Management

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