Ingenium

in JEN ee um: Latin. Natural disposition of talents. Root word for "engineer"

FALL 2020

A PUBLICATION OF EMH&T ENGINEERS, SURVEYORS, PLANNERS, SCIENTISTS

EMH&T

Traffic Engineering

Ohio Statewide Safety Program

Park Master Planning

Historic Cultural Resources Find

A Journey of a Thousand Miles.

A journey of a thousand miles begins with a single step. The ancient Chinese proverb is an encouragement to simply "begin." Take the first step. This issue of *Ingenium* is dedicated to recognizing that first step.

In honor of the disciplines of traffic and transportation, we explore the birth of modern transportation in Ohio. It is somewhat dubious that Ohio claims the very first recorded automobile accident when a single vehicle hit a hitching post just outside of Cleveland in 1891. We have two stories from that "first" in these pages; one exploring the onset of traffic signals on page 2, and the second on the robust safety program of the Ohio Department of Transportation on page 12.

Jim Dziatkowicz, PLA, ASLA, shares the process for park master planning that begins with the crucial first step of listening to the client and to the community. The final delivered park, a source of great pride for a community, begins long before a single pencil hits a single piece of paper. Read about three different park types and the common beginning all park planning shares on page 8.

Among the stories in these pages that salute a first step is an infographic portrayal on page 16 of "firsts" for which EMH&T was responsible. How gratifying to capture these "beginnings." There were so many that we share only the most recent 20 years in our graphic.

The Journey of a Thousand Miles proverb is also very much about taking a small first action, rather than focusing on the enormity of the task before you. In March 2020, many of us were overtaken with the impact of a "stay-at-home" order and how to transition a large operation to hundreds of small disparate operations in our individual homes. The first step was thinking of how to operate in this new world. Read on page 6 about how EMH&T's Information Technology Division implemented new software to make that transition work.

Join me in taking that first step with *Ingenium*…turn the page and begin.

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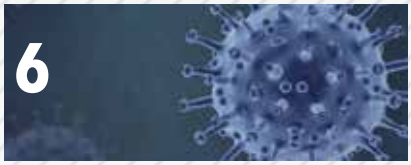

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Traffic on the Strand, Westminster, London (late 19th century).

TRAFFIC SIGNAL DESIGN KEEPS PACE WITH TECHNOLOGY

Picture it: London, England, in the 1860's. The streets of the world's then-largest city are clogged with pedestrians, horses, wagons, carriages, early bicycles, and various other forms of transport all trying to get from point A to point B. In the process, they create a jammed up mess! Then a railway engineer named John Knight stepped into the fray, bringing with him his "traffic light" as a way to control this cacophonous movement.

And while Knight's gas light invention was short-lived (it exploded within a month of installation!), it led to new and increasingly better ways of controlling the movement of vehicles and people. Various iterations of that first signal emerged over time, including manually operated semaphore signals (moving arms on towers that signal traffic to stop or go) and eventually the introduction of the first electric signal in Cleveland, invented by Garrett Morgan, which led to the ubiquitous three-light signals that exist pretty much everywhere today.

Changing Technology Changes Traffic Control

Traffic signals, like the vehicles they help manage, evolved as those vehicles increased in number and changed in nature, and as technology provided new and better options. The U.S. urban sprawl and a growing "car culture" played a significant role in the evolution of the traffic signal. More vehicles meant more signals in more locations were needed. As more signals appeared, the need to better control them followed.

Early electric traffic signals were managed by an electro-mechanical controller mounted inside a cabinet. Eventually, these gave way to the newer technology of signal controller boxes and solid state traffic controllers. The early controllers incorporated a power panel, a detector interface panel (connected to loop detectors or other detector systems), the controller, a police panel (which allowed the police to manually operate the signal if necessary), and various other components.

While today's traffic control systems provide the same basic capabilities for controlling the flow of vehicles and pedestrians, they do so by means of computer controlled electronics, providing a more efficient and adaptable method of promoting safe and efficient movement.

At EMH&T, traffic signal and signal system design have been key service areas since the firm added transportation engineering services in the 1970's. According to Traffic Engineering Division Director Larry Creed, PE, the way the firm designs signal systems continues to evolve with technology.

"Technology has taken us from analog timing devices controlling incandescent bulb signals on span wires to computer controlled signal systems that detect multiple vehicle types including bicycles, and monitor LED-lit signal devices attached to mast arms that overarch intersections," said Larry, "So it's not just the technology that has changed, but the way we deploy it," he added.

In 2020, there is significant use of LED bulbs for new signal devices. LEDs last longer, use significantly less energy, and provide better color clarity because they are brighter and easier to see. Many signals today are controlled by video or radar detection as opposed to inductive loop detectors or pre-timed applications. While video and radar have distinct advantages over the inductive loop detectors, the use of any vehicle detection increases efficiency by adjusting traffic signal timing

Intersection of Neil Avenue and Nationwide Boulevard in Columbus, Ohio.

Today's signal designer must combine civil engineering components including foundation and structural support specifications with electrical engineering elements. This also includes incorporating power service and distribution specifications and now Information Technology (IT) elements for Ethernet-based equipment and advanced communication systems.

in reaction to vehicle and pedestrian demand. Because video and radar detection do not require cutting asphalt pavement for installation, they typically have a longer life span and are easily adjusted for temporary or future modifications.

Other technology EMH&T uses in the design of signal systems includes: uninterruptible power supplies, Ethernet-based wireless radio interconnect communication, infrared and GPS based emergency vehicle preemption, Pan, Tilt, Zoom (PTZ) cameras, and fiber optic communication systems coordinated with Intelligent Transportation System (ITS) control centers.

"Each client we design for has its own preferences for aesthetics and specifications," said Jason Smallwood, PE, Senior Traffic Engineer. "We design signal systems that are tailored to their needs, while adhering to the requirements of the Ohio Manual of Uniform Traffic Control Devices, and providing consistency in equipment type and brand. This is important to ensure ongoing maintenance and any future repairs are as efficient as possible for the client."

Design Keeps Pace With Technology

Signal system technology impacts more than just how traffic signal systems function. It also impacts the way signal system infrastructure is designed. Today's signal designer must combine civil engineering components including foundation and structural support specifications with electrical engineering elements. This also includes incorporating power service and distribution specifications and now Information Technology (IT) elements for Ethernet-based equipment and advanced communication systems.

"A signalized intersection is complex and incorporates not only the physical infrastructure, but constantly changing technology to improve functionality, communication, and safety," said Jason.

Take for example the City of Dublin, Ohio, a long-time EMH&T client. This suburban Central Ohio city has orchestrated significant growth and development

Photo by Infinite Impact.

over the past several years. From its historic downtown area to the fast-developing Bridge Park mixed-use development, the changes to Dublin's streets and roadway infrastructure have been significant.

In an effort to upgrade aging infrastructure and to keep pace with increasing vehicular and pedestrian traffic, the City required upgrades to several of its signalized intersections. EMH&T provided Dublin with improvement plans to upgrade five intersections in different areas of the City. These designs improved and refreshed the traffic signal features.

The process began by assessing the existing infrastructure at these signalized intersections and preparing plans based on field assessments and the available construction budget. The upgraded signals included new traffic signal cabinet/controller, power service equipment, all new intersection wiring, radar based dilemma zone vehicle detection, and Americans with Disabilities (ADA) compliant pedestrian pushbuttons/signal heads.

According to Eagan Foster, PE, PTOE, Civil Engineer with Dublin, these signalized intersection improvements are important because of the impact they have on safety, efficiency, and maintainability.

"Improving these intersections provides the City with several advantages: first, is the improved safety and updated technology they provide, particularly at some of our high capacity intersections where we emphasize and promote pedestrian-friendly, walkable intersections. Additionally, we gain an improved functionality and reduced need for maintenance with upgraded equipment which includes controllers, detection, and new wiring," said Eagan.

Future Tech

As this century progresses and technology progresses with it, the impact on traffic signalization is inevitable. Vehicles are becoming interactive, electronic, computerized systems and today's designs focus on preparing for "smart signals" that are designed to provide vehicle to infrastructure (V2I) communication. The overall goal for communication between the traffic signal systems and automobiles is to improve safety and reduce collisions.

"These future tech-heavy systems require sophisticated design using multiple sensors in multiple locations compiling and analyzing large amounts of data," said Larry. "They carry a pretty high cost so for now they represent more of a Research and Development program, but Ohio's Transportation Research Center in East Liberty and the Center for Automotive Research at The Ohio State University put our region at the forefront of these developing technologies."

As the technology that operates these systems becomes more common and the costs decrease, chances are these systems will find their way into many future signalized intersection improvement projects. EMH&T's professional traffic engineers will keep pace with the technology, while continuing to deliver the signal design projects clients expect—even when that infrastructure takes to the sky to control the flying cars and drones that may very well be moving society in the years to come. ■

To learn more about EMH&T's traffic engineering design services, contact Larry Creed, PE, at 614-775-4640 or by email at lcreed@emht.com or Jason Smallwood, PE, at 614-775-4645 or by email at jsmallwood@emht.com.

Larry Creed, PE, organizes and directs the activities of one of the largest traffic engineering consulting practice groups in Ohio. Larry brings his 33 years of experience on both the municipal and consultant side of traffic engineering to working with constituents, advisory committees, elected officials, etc., on a wide variety of initiatives. He holds both a PE and a JD and is registered in Ohio, Kentucky, and Indiana.

Jason Smallwood, PE, has 23+ years of experience with the planning and design of traffic signals, signal systems, traffic control, maintenance of traffic, roadway lighting, and modern roundabouts. He holds a bachelor's degree in civil engineering from The Ohio State University and is a registered professional engineer in Ohio and North Carolina.

ENGINEERING IN THE COVID AGE

How Technology and a Nimble Response Equaled Business Continuity

This past March, the offices of EMH&T, like offices and businesses across the nation, experienced what will likely be remembered as one of the most significant events of the early 21st century.

As the spread of COVID-19 increasingly impacted daily routines, the firm's management monitored guidance from state and local government officials, ultimately realizing the governors' emergency declarations in both Ohio and North Carolina would significantly impact the normal, daily functioning of the business. So over just two days in late March, EMH&T's offices in Columbus and Charlotte rallied employees and, in a burst of organized chaos, packed up everyone's computers and equipment and sent just about everyone home to work.

Armed with their computer systems and virtual access to the company's computer network, about 250 of EMH&T's over 300 employees settled into home offices, dining rooms, spare rooms, or wherever they could set up a workspace and did what they always do: serve clients on the projects so important to their communities and businesses.

During this time, EMH&T's approximately 80 surveyors, rodmen, and other field personnel continued their important role working outdoors to provide the survey data needed for the engineers to do their jobs. They used technology as well to communicate with the engineers working from home. Their hard work and dedication were a major contribution to keeping the business going during this unprecedented time.

Over the next 15 weeks, the EMH&T team adapted to new ways of doing their jobs. This was only possible thanks to the nimble implementation of the necessary technology by EMH&T's dedicated group of IT professionals.

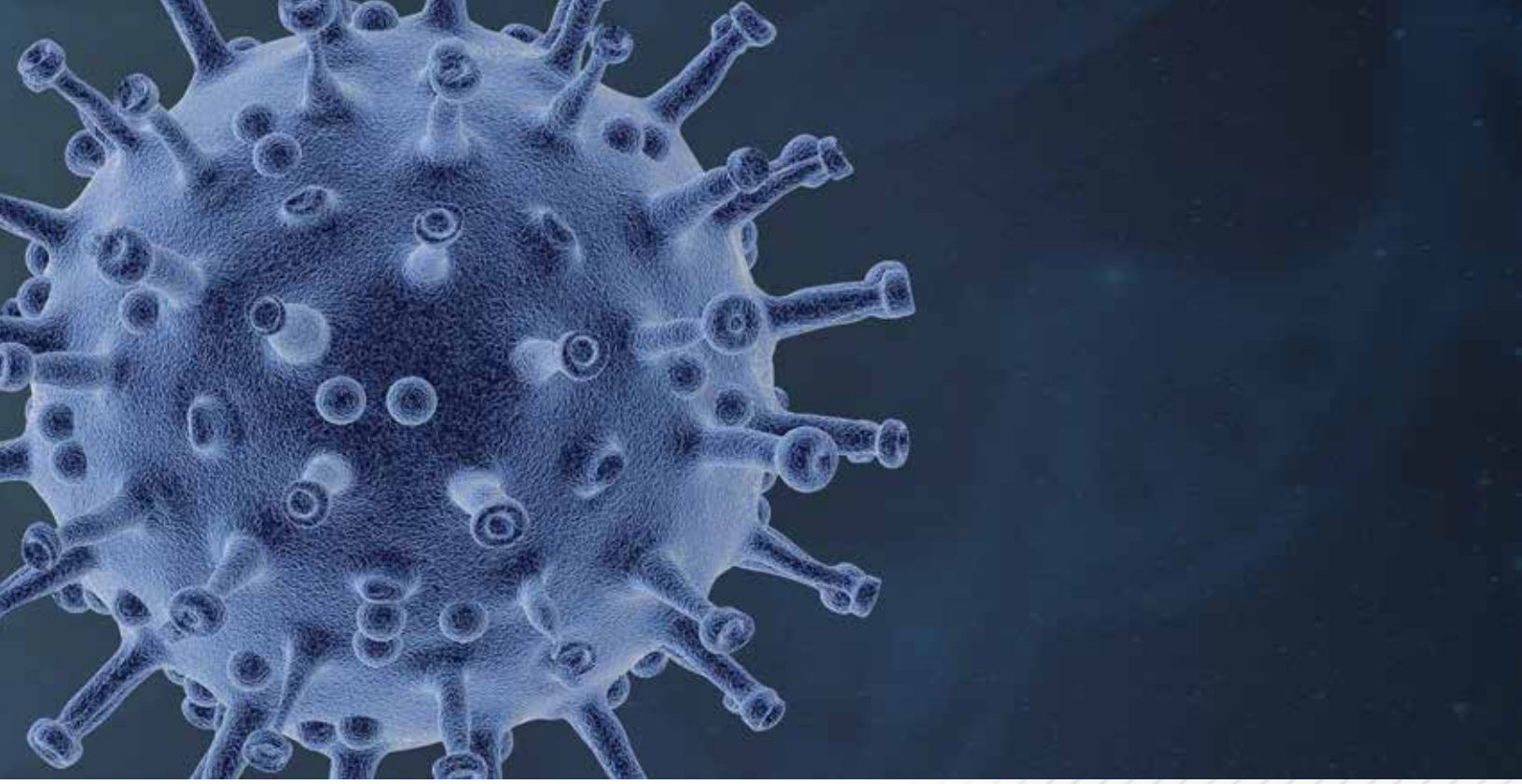
Ingenium sat down with EMH&T's Information Technology Manager, James Herriott, to learn more about how this significant feat was pulled off so successfully and what it might mean for the company in the future.

INGENIUM: What technology changes occurred with the very sudden change in work situation?

JAMES: EMH&T made quick changes on several levels. For plan production, we increased the use of Autodesk Design Review software, which provides remote review capabilities to help with plan markups. We also increased remote control access of CAD workstations within our corporate office, which allowed our senior technicians to work on large projects from a distance with little performance loss. For team collaboration, we rolled out Microsoft Teams to the entire firm, which integrates with the other products in the Microsoft Suite and allows for teams to communicate quickly and seamlessly, instant messaging, sharing screens, and using conference call functions to hold remote meetings. It really helped us to successfully work together, apart.

INGENIUM: How does the digital plan markup software, Autodesk Design Review, make the work environment more efficient?

JAMES: Autodesk Design Review provides the engineers and designers the capability to markup plan sets without changing the source drawing files. The plans are output to a shared, view-only format file where individuals can add comments, information, and suggested design changes. Once they make these markups, the technician can reimport the shared file into the original source file. An itemized list of markups is provided and made available for further questions, review, or completion. The software allows the technician to interact within the group without using a physical red line plan sheet. The firm's use of this software was particularly important



while everyone was apart, especially for our clients because it allowed project plans to be shared and viewed by the extended team and stakeholders, even though they don't possess our technical design software.

INGENIUM: What has the company found most beneficial about these technologies now that we are into our "new normal" work environment?

JAMES: During the period of the state's "stay-at home orders," the use of these programs allowed us to continue working together even when everyone remained at home. Now that we have all returned to the offices, we see the continued use of these programs as a way to maintain the efficiencies they created for us. For instance, Microsoft Teams will become a new standard installation for all of the firm's users as an efficient way to improve our collaboration. Even though we are back together, restrictions related to gatherings and group size, as well as a mask mandate, remain in place. Screen sharing works just as well when it's from one side or floor of the building to another as it does from one person's home to another. Again, it allows us to efficiently work together or apart, even though we are no longer quite as far apart!

INGENIUM: Do some of the technology changes also change the way we work with our clients?

JAMES: EMH&T has traditionally leaned toward being a "meet in person" kind of business. The personal collaboration is a hallmark of our customer service. Right now, Cisco WebEx has remained our client-side collaboration tool for multiuser meetings to date. Until we can really meet in person, WebEx has been an acceptable replacement. Also, our clients seem to like the efficiency of the Autodesk Design Review softwarebecause plans can continue to be reviewed using this efficient, virtual approach.

In addition, our clients see the benefit of continuing to use Microsoft Teams on a one-to-one basis. Using this program adds an opportunity for quick screen shares and conversations with people outside of the firm, particularly while the restrictions to in-person gatherings remain in place. Sometimes the extra effort of setting up a WebEx meeting is more than is needed to resolve a situation or to gain additional clarity on a design or other project issue. Using Teams will help us accomplish these tasks more efficiently. ■

James Herriot has been with EMH&T since 2002. He is the Information Technology Manager in EMH&T's Information Technologies Division. James earned his Bachelor of Science in Computer Science from Valdosta State University.

PARK MASTER PLANNING

Bringing Imagination and Creativity to Your Hometown

Parks and playgrounds are the soul of a city. That statement has never rung more true than during the past several months as people in cities worldwide headed to their nearest outdoor space attempting to find a sense of normalcy in the new COVID-19 world.

Parks come in all shapes and sizes, from urban and suburban city parks to more rural metro parks, but no matter the size or location, they all provide one very important thing: connecting people to the outdoors. This is so important for a well-balanced life because parks contribute to learning, while providing a chance for respite as well as active experiences.

Parks, playgrounds, and other open spaces also bring significant value to communities. Not only do they improve property values and overall health, they also provide a place where imagination and creativity can take center stage. Whether structured or unstructured, parks provide something for everyone no matter your age, your physical, or cognitive ability. And the best part of all: they are, in most cases, FREE!

The Art and Science of Park Master Planning

Master planning of individual parks and overall park systems provides a dynamic and long-term approach, ensuring consistent and organized development of a community's open space.

Park and open space master planning generates the best result when it provides the right mix of art and science, and an important component of the art side of the process is placemaking. According to Jim Dziatkowicz, PLA, ASLA, Director of EMH&T's Planning and Landscape Architecture Division, good master planning efforts and placemaking start with understanding context and listening.

"Working in a multi-disciplinary firm provides us with several perspectives when looking at a site and identifying its unique natural strengths and opportunities. We begin the design process by letting the space provide us with its own specific attributes. We can then determine the most efficient and responsible use of the land based on those attributes," said Jim.

"We then do a whole lot of listening."

He continued, "We gain such a tremendous understanding of what our clients want by just listening; prior to even putting pen to paper. The listening is accomplished by way of focus group settings, stakeholder inquiries, charrettes, or public meetings designed to solicit input from stakeholders, staff, volunteers, specific user groups, or the greater community."

◀ *Left to Right: Senior Landscape Architect Franco Manno, PLA, ASLA, LEED AP; Division Director Jim Dziatkowicz, PLA, ASLA; Landscape Architect Andy Filcik, PLA.*

There are a lot of options to think through when planning and designing park space. Sometimes park space has been newly acquired, vacant, or held off-line. Sometimes, the open space property may have been loved for many useful years and needs a renovation, and sometimes the open space needs to be re-imagined or changed. Regardless of the eventual outcome, the process must begin with an understanding of context and a thoughtful approach to understanding the needs and desires of the community.

Developing the Vision and Setting the Stage

Armed with the knowledge gained through public meetings and community engagement, EMH&T's landscape architects begin the process of developing the community's vision, goal setting, and eventual design and construction. Where the planning and design team adds value to communities is by understanding that needs and desires must also be fiscally responsible, as well as regularly maintained by the community's maintenance staff. EMH&T's landscape architects focus on being creative, with a clear understanding that at the end of the planning process each community is the steward of their own park properties and ultimately responsible for paying for them and taking care of them.

Design Springs from Planning

Individual park designs, whether large or small, complex or simple, always support the larger community vision developed during planning and design.

"One of the things that makes me most proud of the park planning we do for a community is the way we help them understand how the design meets the specific needs they believe exist for their community," said Jim. "Our collaborative process is true 'form following function' ultimately resulting in what we feel is a good design."

A shining example of good planning leading to good design can be found in Beavercreek Township near Dayton, Ohio.

Owen's Place is a universally-designed play environment located in Victory Park and designed as a completely new play space with a specific focus.

"We designed this play environment specifically to accommodate individuals with a wide range of unique cognitive and physical needs. The initial phase shadow play area is designed to be highly interactive, allowing visitors to move pieces and parts of colorized play elements to create interesting shadows and color combinations on the ground. Subsequent phases included a wheelchair carousel, universally accessible swings, a synthetic turf hillside slide, nature-based play elements, musical instruments, and a tree house," said Jim.

Owen's Place is an excellent example of successful placemaking and meeting a community-determined need.

For suburban Whitehall, Ohio, EMH&T landscape architects worked with the City's Parks and Recreation Commission to develop a park system master plan to guide the community, providing direction for future park development, appropriate long-range linear connectivity to adjacent communities, and meeting the overall needs of the growing community.

The system-wide plan will guide the City's park department decision making in regard to operations and future capital improvements. The plan's specifics identified needed facility improvements, development standards, analysis of existing parkland usage, a guide for the development of specific park concepts, and developed preliminary budget estimates for capital items identified in the master plan.

"We were able to provide Whitehall with a comprehensive road map focused on providing quality parks and recreation facilities in their community for years to come," said Jim.

Another way park design and planning benefits a community is through thoughtful, yet intentional, renovations to existing facilities known for being integral to the existing fabric of a community.

John F. Kennedy, otherwise known as JFK Park, in Reynoldsburg, Ohio, is a clear example. Completed in the summer of 2020, the City of Reynoldsburg undertook a significant

Owen's Place is a universally-designed play environment focused on kids with special needs. The latest addition is a fully wheelchair accessible tree house. Owen's Place is an excellent example of successful placemaking and meeting a community-determined need.

The Whitehall Community Park project pictured above received the Award of Excellence from the Ohio Parks and Recreation Association (OPRA) and competed against the first place winners in the two other capital improvements categories for the Governor's Award.

project upgrading the park by adding new age-appropriate playground areas, nature-based play elements, accessible swings, a unique web-based play feature, and restroom facilities. The upgrades attempted to integrate and preserve as much of the existing mature tree canopy as possible, while being fully accessible, close to parking, and conveniently connected to the park's looped trail system.

The park has been serving the community for several decades and it needed to be refreshed. EMH&T's landscape architects helped the City develop a plan to improve the park's amenities, including installing new playground equipment that is aimed at improving accessibility, and designed with special elements for individuals with cognitive and physical limitations.

Reynoldsburg's Director of Parks and Recreation, Donna Bauman, was pleased with the result.

"The knowledge and guidance that the EMH&T landscape architecture team brought to the JFK Park renovations project for the City was exceptional," said Bauman. "Their understanding of our community's needs and their creative approach will leave a lasting impression for years to come. As one of the most loved parks in the community, the renovations create a play space combining elements of "inclusive" play, nature-based play, and traditional play zones that make JFK Park a true destination for all families," said Donna.

None of these park designs and master plans exist in a vacuum. They are all part of communities and they all contribute to the quality of life in those communities. And because communities are dynamic and evolving entities, their parks and park plans need to be fluid, which means they should be revisited and improved upon as those communities change and grow. They must be a part of the overall community vision and should never be done in isolation. A well-executed plan will result in superior parks meeting the needs of the community, while helping to create a sense of pride.

"As design professionals, EMH&T's landscape architects are always thrilled when a community approaches us with their dreams for their park system," said Jim. "When community members work together to develop and understand a collective vision, they then become advocates at a grass-roots level, positively contributing to dynamic and successful parks for their entire community." ■

If you would like to learn more about EMH&T's Planning and Landscape Architecture Division and their park planning and design capabilities, please contact Jim Dziatkowicz, PLA, ASLA, at 614-775-4703 or by email at jdziatkowicz@emht.com.

HIGHWAY SAFETY IMPROVEMENT PROGRAM HELPS ALLEVIATE HAZARDS FOR TRAVELING PUBLIC

As automobiles began traversing the roads and streets of America, safety quickly became an issue for early passengers of this major advancement in transportation. New technology can bring new risks and automobiles certainly had their fair share, including the most dreaded of all… crashes.

Even early on, accidents were a significant safety issue. In fact, according to the Ohio History Connection, the first recorded automobile accident in the U.S. occurred in Ohio. The accident occurred in Ohio City (outside of Cleveland) in 1891 when the automobile of James William Lambert hit a tree root causing it to careen out of control and smash into a hitching post! Fortunately, neither Lambert nor his passenger was seriously injured.

While today's drivers are not very likely to hit a tree root, and there certainly aren't hitching posts to crash into, general auto crashes continue to be a significant issue on Ohio's roadways. The causes of crashes are varied, with many categorized as severe each year. A significant Ohio Department of Transportation (ODOT) program, however, exists to help alleviate issues that cause dangerous conditions, and thus crashes, on state and local roadways. The Highway Safety Improvement Program was established by ODOT to analyze crash statistics on state and local highways.

ODOT dedicates approximately $159 million annually for engineering improvements at high-crash (multiple incidents) and severe-crash (high rate of injury/fatality) locations. Ohio has the nation's fourth largest interstate system with over 8,000 lane miles, and Ohio's program is one of the largest safety programs in the country. Each ODOT District has a Safety Review Team that develops a Safety Annual Work Plan and performs engineering studies to determine causes of crashes at the locations noted within the report.

Eligible projects are not limited to Ohio's interstates, roads, or highways that ODOT oversees. In fact, most of these safety design projects occur on city streets as well as county and township roads. These ODOT dollars are allocated to local entities through the Local Public Agency (LPA) process, which provides federal funding, via ODOT, for projects that alleviate a safety problem or a potentially hazardous situation.

Improvements Begin With Studies

To understand some of the complex circumstances that create safety issues on Ohio's highways, a safety study is performed. These studies are conducted by independent consulting engineers in conjunction with ODOT engineers resulting in a clearer picture of the various safety conditions across Ohio's roadways. The study results are presented as a report that is then used to initiate actual Safety Design projects in any of ODOT's 12 districts.

For ODOT, safety studies represent the first step in a process that helps make Ohio roads safer. Over the past several years, team members in the ODOT Highway Safety Program have worked in partnership with various ODOT Districts, local governments, and various planning agencies across the state to improve safety at the state's most dangerous intersections and roadway segments under the "Toward Zero Deaths" initiative. The goal is to better understand the ever-changing landscape of traffic and transportation in Ohio, and develop actionable projects that make Ohio roadway networks safer for everyone.

EMH&T Expertise For Project Execution

"We are pretty deeply embedded in the ODOT Safety Design Program," said Abby Cueva, PE, Director of EMH&T's Transportation Planning and Design Division.

"EMH&T has executed multiple safety design projects for ODOT Districts over the past several years and was recently awarded another state-wide safety design contract under which the firm will continue to provide these services," she added.

The Transportation Planning and Design Division at EMH&T is focused on providing the analysis and design services that take the results of a safety study and turn them into a real solution for a given problem.

According to Abby, the first step is to verify the study, then design the project. "Our philosophy and the approach to these projects is to 'right-size the scope' before we start design," she said.

EMH&T engineers and designers begin by thoroughly reviewing the previous study to understand problems the study identified, the options considered, and the background surrounding the proposed improvements. This all contributes to a draft task list to be used as the project moves into initial meetings with ODOT.

EMH&T has used this approach since the firm's safety design project for ODOT District 12. At the end of that project, the ODOT Project Manager involved commented on how impressed he was with the EMH&T team being able to take the grey areas of the planning study, fill in the details, and analyze and summarize different possibilities for specific problems. He stated Abby and her team made it easier for the District to make the best decision for solving the problem while staying within budget and keeping the project on track.

Because many of EMH&T's professional engineers have ODOT pre-qualifications in a range of various specializations, their ability to execute these projects is enhanced. Being pre-qualified means these individuals possess the proper training, education, and project experience to perform a high level of engineering on projects, while adhering to stringent specifications, and consistently providing well-executed construction plans.

In addition to a 'right-size scope' approach to the project, EMH&T professionals also look at the proposed project through a designer's lens.

"Because the perspective of the study is more focused on traffic and safety, we always pause before we even start design work and look at things through the eyes of actual engineering design. That's how we see the full potential scope of the project, including issues such as right-of-way, utilities, environmental concerns, and other issues the original studies don't generally incorporate," said Abby.

This approach allows EMH&T to often achieve improved safety results with reduced project costs.

Technology and Design Innovation are also major components to the safety design projects EMH&T completes. The Design Innovation Division has integrated the AutoDesk InfraWorks software application into the engineering design process. This design approach provides a 3D project footprint to identify potential implications in the Preliminary Engineering (PE) design stage, and also for easy import into other design programs, eliminating duplicate steps and streamlining final design.

The ODOT Highway Safety Improvement Program is focused on making the roadways of Ohio safer for everyone who travels in or through the state. The projects that are funded are investments to improve safety on all public roads. So, until the traveling public has to learn how to fly cars safely, ODOT will be there helping make sure motorists can continue to drive on the roadways safely. And, EMH&T will be there working with ODOT to design projects that will allow that to happen. ■

If you'd like to learn more about how EMH&T can assist you with ODOT Safety Design projects, contact Abby Cueva, PE, at 614-775-4604 or email her at acueva@emht.com.

Abby Cueva, PE, is EMH&T's Director of Transportation Planning and Design. She has a strong background in project management and highway geometrics–specifically with interchange design and safety related projects–providing experience and leadership for public clients. Abby earned her BS in Engineering from Ohio Northern University, and she is a registered professional engineer in Ohio and North Carolina.

ARCHAEOLOGISTS DISCOVER 19TH CENTURY AFRICAN-AMERICAN CEMETERY

In 2004, a local amateur archaeologist discovered a headstone in the fencerow at the edge of a field. The most recent work recovered a headstone fragment with the letter "H" on it, but no other gravestones were found.

The area along the US 33 corridor, north and west of the City of Dublin's historic center along the Scioto River, has seen significant new development over the past several years. As part of Dublin's West Innovation District, this development will provide shovel-ready sites for a range of facility types for large innovation companies.

In order to maximize the site's developable land and add the necessary roadway and utility infrastructure, the City of Dublin needed to move a stream running through the center of the property. Heather Dardinger and EMH&T's environmental team began the process of obtaining a USACE permit for the stream relocation, which then triggered the required Phase I Cultural Resources survey led by Joel Brown and his team.

EMH&T's initial research turned up a previously recorded archaeological site that pointed to the existence of the 19th-century Brown-Harris Cemetery on a portion of the development site. In 2004, a local amateur archaeologist discovered a headstone in the fencerow at the edge of the field. The headstone seemed to be for a young boy named Joshua who died in 1854 at the age of 12. (The most recent work recovered a headstone fragment with the letter "H" on it, but no other gravestones were found).

Historic land atlas records show record of the land as previously owned by a local African-American farming family, the Browns. It also noted the existence of a cemetery containing members of that family and perhaps members of the Harris family, the neighboring land owners, and potentially other neighboring residents.

As the property changed hands over the years, it was eventually reclaimed for farming and traces of the cemetery forgotten because it was believed to have been moved. However, as it turns out, at most a few of the graves were potentially moved but most were left in place.

Fortunately, due to good public record-keeping and the memories of the owners from whom the City acquired the land, the possibility of existing undiscovered grave sites was high, which led to discussions with the City about discovery and preservation efforts. This led to the effort to locate and confirm their existence prior to the start of development activity.

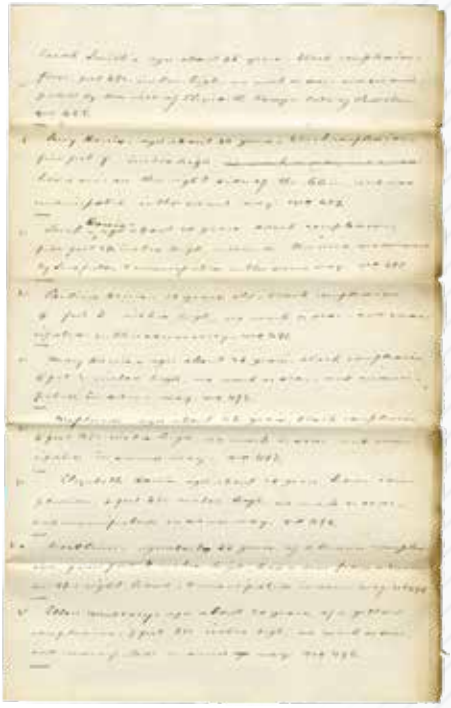
Usually, records for such cemeteries are lost to history and grave sites are not discovered until remains are unearthed during construction.

EMH&T's work confirmed that the cemetery area still includes at least 20 grave shafts and likely more. And, due to its historic significance as a 19th-century, rural, African-American burial site, is eligible for inclusion on the National Register of Historic Places. EMH&T is conducting ongoing research into the names of the people who may be buried in the cemetery based on census records, historic atlas maps, property records, and cemetery records. Joel has identified the burials of some of the Brown and Harris family members in other cemeteries such as Greenlawn Cemetery in Columbus,

Oakdale Cemetery in Marysville, and Forest Grove Cemetery in Plain City, Ohio. Others, who cannot be located and fit the timeline, are the most likely to be buried in the cemetery.

The City of Dublin has committed to preserving the cemetery site and it will be protected throughout the construction process. After that time, it will be fenced off or otherwise contained and will be designated with a historical marker. Public access will be made available as soon thereafter as plausible. The cemetery site is important to the overall history of Dublin, and more specifically to recognizing and preserving Dublin's African-American history. Thanks to the talent and capabilities of the firm's cultural resources professionals, this history will be preserved for future generations to learn from, experience, and enjoy. ■

If you'd like to learn more about EMH&T's Cultural Resources services, contact Joel Brown, MA, at 614-775-4526 or email him at jbrown@emht.com.



While researching the descendants of the area, Brown found what he believes are the emancipation papers for some of the people who lived on that property and adjacent properties. Jacob, Delia, and Sarah Ann Smith and Jeremiah Harris all lived on or adjacent to the site. The document notes Delia and Sara Ann's mother as Mary Harris. We know that Delia and Sara Ann lived with James and Mary Brown for much of their life and inherited the property when Mary Brown died, suggesting that Mary Harris and Mary Brown are the same person.

In this photo, you can clearly see the outline of a grave along with the edges of the ones next to it on either side.

Joel Brown has been an archaeologist since 1999 and the Principal Investigator with EMH&T since 2001. He is qualified by 17 state and federal historic preservation offices nationwide. Joel earned both his bachelor's and master's degrees in Anthropology from The Ohio State University.

Reflecting on "first steps," EMH&T has been leading the way on a number of technical and professional developments as we consistently move forward with the demands of our industry. Here are a few "first steps" taken in just the last 20 years.

2009

Service Order Request via GIS.

EMH&T pioneered custom technology-based solutions for municipal service requests and work orders using GIS applications.

2009

Stormwater Quality.

EMH&T helped pioneer a new stormwater detention/water quality practice at the Cherry Gardens Senior Apartments that ultimately served as a precedent for future projects in Charlotte, North Carolina.

2010

Universally Designed Playground.

EMH&T designed Owen's Place in Beavercreek Township, Ohio; their first universally designed playground meeting a full range of physical, intellectual, emotional, and social needs of children and adults with disabilities.

2010

Largest Grant Award.

EMH&T earned an OPWC award of $6,396,893 for the Stringtown Road Upgrades project–one of the largest single awards ever by OPWC. The project resulted in much needed infrastructure to provide for burgeoning development within the City of Grove City, Ohio.

2012

Traffic Signal Design Manual.

EMH&T's Traffic Division helped develop the Traffic Signal Design Manual for Columbus, Ohio, which was the first compiled documentation of City design standards.

2013

Pervious Pavement Specifications.

EMH&T's first of a kind construction plans for pervious pavement and rain gardens served as the model for a number of local and national consultants for Columbus, Ohio's Blueprint Integrated Solutions Initiative.

2013

Alternative Stream Channel Design.

EMH&T and a research team developed natural channel design techniques to reduce the need for repetitive maintenance at bridges and culverts, now used throughout Ohio.

2014

Largest Application of Pervious Pavement:

For the Easton Gateway Development Parking Lot, EMH&T designed the largest application of pervious pavement of more than 179,717 square feet (3.95 acres) to provide on-site water quality treatment.

2016

Columbus Roadway Information Design Manual.

EMH&T led a team of consultants to create a first-of-its-kind manual that organized existing City of Columbus roadway standards, policies, recommended practices, and standard drawings into one comprehensive formal document.

2016

Wide Span Rail Cranes.

For the Fairburn, Georgia, CSX Terminal expansion, EMH&T designed a wide span crane, on a curve, and with a tie and ballast system for the craneway which was the first use of this application within the United States.

2017

Largest Environmental Contract.

EMH&T's Environmental Division's performance on the ODOT District 4/11 Task Order gained them an unheard of 100% score when evaluated on everything from project management to quality and timeliness of submittals. An even greater accomplishment considering it was largest environmental task order awarded in Ohio at $1.5 million.

2019

Visualization and Design Innovation.

This new Division was formed to combine engineering and 3D design, resulting in a more precise product–not typically found with other visualization firms.

2020

Electronic Enhancements.

EMH&T adopts several technology solutions to enable staff to be fully productive under the Ohio and North Carolina COVID-19 stay-at-home orders and beyond.

Delivering **Solutions.**

EMH&T

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Shorts

CEAO Safety Study Approved Vendor

This summer, EMH&T was listed as a prequalified consultant available to County Engineers within the State of Ohio for Statewide County Engineers Association of Ohio (CEAO) Safety Studies for 2021. CEAO's goal is to provide quality transportation, drainage, surveying, and land record keeping services for the safe and efficient movement of people, goods, and services throughout Ohio. Being prequalified is more than just a check mark for EMH&T. It means we have the proper training, education, and project experience to perform safety studies, with a priority to provide the highest level of service for safety and mobility. Our team members provide leadership for systematic approaches to determining the cause of crashes and identifying strategies for improvements to high crash trends at specific locations. We regularly prepare analysis in accordance with the ODOT *Safety Study Guidelines* and the *Highway Safety Manual*.

Website Updates for LA & Visualization

An Internet surfer visiting emht.com looking at our Visualization or Planning and Landscape Architecture sections will now see something quite eye-catching. The nature of these two services is so visually oriented, we had special pages designed to present much larger images. In addition, the Visualization section includes a sub-category for Animation that includes embedded videos. A user might also recognize that under the news sections, we can also embed video clips. Since we post moving graphics on LinkedIn to capture a person on the scroll, we also wanted to mirror this on our company website. To view our comprehensive design services in landscape architecture and planning, visit: https://www.emht.com/expertise/planning-and-landscape-architecture/. Or, check out our Visualization project examples: https://www.emht.com/expertise/visualization/.

Top Workplaces Wins

EMH&T won the *Business First* "Best Places to Work" Award. The firm was an honoree for the third year in a row in the Extra Large Company category! Employees attended a virtual celebration in November.

EMH&T was also awarded a *Columbus CEO* magazine "Top Work Places of 2020" award. The award recognizes the firm culture, meaningful work experience, and encouragement of new ideas!

Michael Jordan's $7 million Gift Provides for Second Family Health Clinic in Charlotte, NC

EMH&T joins in celebrating the ribbon-cutting on Monday of the second Novant Health Michael Jordan Clinic in the Charlotte area, just one year after the first clinic opened. These healthcare clinics are designed to provide care to underprivileged citizens of Charlotte, NC.

Funded in part by former NBA star and current Charlotte Hornets owner Michael Jordan and his family, the facility, located in a lower-income section of the City, will provide vital access to primary and preventive care to individuals, including those who are uninsured or underinsured.

EMH&T is proud to have provided professional site development services for the project, including engineering plans, land survey, rezoning, and due diligence. EMH&T also contracted environmental services (Phase I ESA and PWI) as well as geotechnical engineering.

People In The News

New Employees


J. Looby

Joe Looby, PLA, ASLA, LEED GA, was hired as a Senior Landscape Architect with the Planning and Landscape Studio. He comes to us with 30+ years of extensive experience in both the public and private sectors, with talents particularly suited to the work within our Development I and Development II divisions providing site master planning, zoning exhibits, and landscape architecture for development community open spaces. Joe earned his BS in Landscape Architecture from The Ohio State University and holds professional licenses in Ohio, West Virginia, Kentucky, Michigan, and Indiana.


J. Kraus

Jason Kraus, PE, joins EMH&T's Construction Services Division as a Senior Construction Representative. Jason's background includes over 17 years in the construction field serving on both the construction management and design sides of a variety of public infrastructure improvements. He will work closely with the firm's Public Works Division in a specialized, hybrid role. Jason holds a BS in Civil Engineering from the University of Nebraska-Lincoln, and is a licensed Professional Engineer in Ohio and California.


A. Filcik


T. Brown

New Professionals

Congratulations to Andy Filcik, PLA, for earning his Professional Landscape Architect (PLA) license in Ohio.

Congratulations to Tim Brown, PLS, in EMH&T's Charlotte Office for earning his Professional Land Surveyor License (PLS) in North Carolina.

Schehl Recognized as BIA Associate of the Year


S.Schehl

Congratulations to EMH&T Principal Steve Schehl, PE, who has been named Associate of the Year by the Building Industry Association (BIA) of Central Ohio. Steve is Director of Development at EMH&T and focuses on providing professional engineering services to developers of single- and multi-family housing. The annual award is given to a BIA Associate Member in recognition of high business and ethical standards, and contributions to the home building industry and the BIA. Steve was recognized at the BIA's annual BIG Night, which was held at the Columbus Athenaeum with all safety protocols and guidelines followed, as provided by Ohio Governor Mike DeWine.

Doyle-Ahern Recognized for Leadership, Contributions


S. Doyle-Ahern

EMH&T President Sandy Doyle-Ahern has recently received recognition from several Columbus-are organizations for her leadership and many contributions to the Central Ohio community. She was named a 2020 Columbus Business First C-Suite Award winner in the Companies with 100+ employees category. Winners of this annual recognition represent the most admired CEOs and other top executives in Central Ohio as determined by a vote of their peers. Winners are selected based on several characteristics, including who inspires and encourages them. She was subsequently selected by this same group of peers as the winner of the "CEO of the Year" recognition from *Columbus CEO* magazine in the small business (<300 employees), for-profit category.

Sandy also recently accepted Homeport's request to be its 2020 Voice & Vision honoree. Sandy's work and support of Homeport over the years

was recognized when she was honored at Homeport's annual gala in October. Sandy's involvement with Homeport, who has established itself as the largest locally-focused nonprofit producer of affordable housing and related services in the region, demonstrates our company's commitment to addressing affordable housing options and community programs.

Sandy was also inducted as a 2020 Junior Achievement of Central Ohio Business Hall of Fame honoree, joining a prestigious group of Central Ohio business leaders. Each year JA of Central Ohio honors forward-thinking entrepreneurs and accomplished community leaders for their contributions to our region's economic development and their commitment to business excellence. Sandy was recognized at the organizations' dinner and induction program in November.

Giving Back

EMH&T's annual "Ugly Sweater Auction" has raised more than $25,000 for Homeport. Employee teams make ugly sweaters and then auction them to the highest bidder (usually a pooled bid) and assign the lucky person to wear it for a full day.

Contact Us

Contact EMH&T's Director of Business Development **Linda Peck** today to schedule a visit at your office. You can reach Linda directly at **(614) 774-1270** or by email at **lpeck@emht.com.**

You are also welcome to contact any of the experts identified at the end of each article in this issue of *Ingenium*.

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- Infrastructure Renewal
- Railroad Services