

## New U.S. Grant Bridge a First for ODOT



Ron Poole, *Central Office* and  
Kathleen Fuller, *District 9*

Photos: top – David Norris, District 9; below – Betsy Brown, District 9

**T**HE REPLACEMENT OF THE U.S. ROUTE 23 U.S. Grant Bridge over the Ohio River was a first for ODOT in more ways than one. The project is the department's first completed cable-stayed bridge in the state. It is also the first bridge to be constructed across the Ohio River by ODOT.

The new steel-based structure connects Portsmouth with South Shore, Ky. The bridge includes two 12-foot lanes, wide shoulders, stainless steel tower caps and aesthetic lighting.

Following a ceremony hosted by ODOT, the city of Portsmouth and the Portsmouth Area Chamber of Commerce, the new \$38 million U.S. Grant Bridge opened to the public on Oct. 16.

"The community has waited a long while to open the new bridge, and the grand opening marks a major milestone in ODOT's history," said District 9 Deputy Director Harry Fry.

The original U.S. Grant Bridge was first erected in 1927 as a toll structure. It was acquired by ODOT in 1974 as one of only four Ohio River bridges owned by the department. After numerous rehabilitations, the department decided to replace the entire structure with a new design that could meet current and fu-

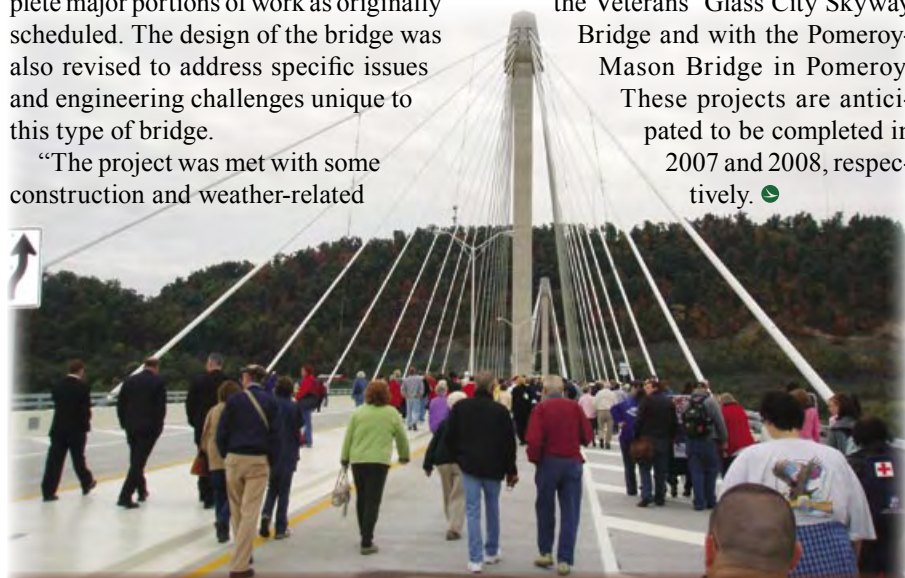
ture traffic needs. The replacement project was contracted by the department in 2001.

Though the project had an original completion date of June 2004, the opening was revised to October of this year. Unusually high rains and snowfalls caused high river elevations. Since higher water levels made working safely over the river impossible, contractors could not complete major portions of work as originally scheduled. The design of the bridge was also revised to address specific issues and engineering challenges unique to this type of bridge.

"The project was met with some construction and weather-related

challenges," said Fry. "These issues were met with a commitment to complete the project and a goal toward quality. As a result, both the state of Ohio and the city of Portsmouth have a signature bridge that can be treasured for years to come."

The department was pleased with the outcome of the overall construction project. ODOT is in the process of constructing cable-stayed bridges in Toledo with the Veterans' Glass City Skyway Bridge and with the Pomeroy-Mason Bridge in Pomeroy. These projects are anticipated to be completed in 2007 and 2008, respectively. ☺



Community members who attended the Oct. 16 bridge opening ceremony had the opportunity to walk across the bridge before it opened to traffic.

# Ohio EPA Approves Use of Linear Retention Ponds

Robert Lang, Central Office, Office of Environmental Services

**Y**OU MAY HAVE NOTICED THAT MANY NEW RESIDENTIAL AND COMMERCIAL developers build a storm water retention pond on their property. It may look like an ordinary farm pond, but a storm water retention pond is typically a highly engineered, water quality treatment device that is required by law.

The Clean Water Act (CWA) of 1972 is the law that governs storm water runoff to prevent soil ero-


sion, downstream flooding and requires actions that remove impurities from runoff before it reaches rivers and streams. In 2003, new rules were added to the CWA that began to require developers, including public agencies like ODOT, to capture a certain amount of storm water runoff from disturbed land and slowly release it into a stream by use of a retention pond. The new rules impacted the way ODOT designs permanent drainage along the highways.

“Pollutants in storm water have become a focus of recent environmental regulations and ODOT is determined to do its part in protecting water quality,” said Timothy Hill, administrator of ODOT’s Office of Environmental Services. “Following EPA regulations, ODOT

has developed a detailed Storm Water Management Plan that is the cornerstone of our water quality programs.”

Completed in March 2003, the Storm Water Management Plan acts to unify a cross section of ODOT programs such as training, maintenance, construction and facilities management with a common focus on water quality issues.

As part of administering ODOT’s Storm Water Management Plan, the Office of Environmental Services works closely with the Hydraulic Section in the Office of Structural Engineering to not only identify best practices that meet the requirements, but also to ensure these best practices become standard designs included in the Location and Design Manual.



ODOT’s Hydraulics Section designed and tested exfiltration trenches with various permeable pavement materials, including the pilot asphalt/aggregate mix shown here, before deciding on a specific concrete/aggregate mix with the best filtering and drainage properties.

Recently, ODOT received an approval from Ohio EPA to use the newly-designed set of linear “post-construction storm water best management practices (BMPs)” as part of the department’s permanent drainage design for highways. As of November, Ohio EPA’s approval of the BMPs is conditional based on ODOT researching the effectiveness of the BMPs. As part of the research, ODOT will be working closely with Ohio EPA to monitor the effectiveness of the new designs as well as conducting research projects on the designs.

The use of storm water retention ponds, or a feature with a similar purpose, is a requirement of the CWA and essential

(see **LINEAR PONDS** on page 3)

## LINEAR PONDS (from page 2)

for ODOT to receive and comply with a Statewide Construction permit needed from Ohio EPA. The permit is required for construction sites larger than one acre, which includes almost every ODOT construction project.

The purpose of a retention pond is to hold storm water and slowly release it to a stream, lake or other drainage system. Holding the water allows sediment and other pollutants to settle out. Slowly releasing the water helps prevent downstream flooding and damage to streams from excessive erosion.

While ODOT diligently works to meet all the requirements of the CWA, placing storm water retention ponds along highway right of way can create safety issues for vehicles that run off the road. In addition, the size of pond that is required is not likely to fit within existing right of way. Buying additional right of way for the ponds could exponentially increase the cost of ODOT's projects.

To more closely compliment highways, ODOT felt a more linear drainage system was needed. David Riley, head of the Hydraulic Section, was tasked with designing a drainage feature that would meet the requirements of the permit and new 2003 regulations. The drainage system needed to be feasible for ODOT to build along highways where there is limited right of way and eliminate the safety issue of placing large ponds next to the highway.

"ODOT faced a considerable challenge to design a linear feature in existing right of way that served the purpose of a storm water retention pond and was acceptable to Ohio EPA," said Riley, who was also one of the key players in working with Ohio EPA to get ODOT's new storm water treatment design approved. Riley and other ODOT staff have been meeting with Ohio EPA on this issue since 2003.

One of the linear BMPs that ODOT will be using involves altering the design of roadside drainage ditches to be more shallow and wider and include an aggregate bottom for the last 50 feet of the

## STORM WATER MANAGEMENT

# to the Road Clean Water

OHIO DEPARTMENT OF TRANSPORTATION

ditch. These 'over wide ditches' spread the flow of storm water across a larger surface and, when combined with the aggregate outlet, result in slower water flow which promotes the settling of sediment and other pollutants without creating a pool of water like a normal retention pond.

Another linear BMP called an "exfiltration trench" may be designed into construction plans, especially in urban areas. An exfiltration trench is similar to an underdrain, but it runs along the outside edge of pavement. Storm water flows off the roadway surface and water percolates down through different sizes of

aggregates in the trench before reaching a drainage pipe which outlets to a stream or ditch. The aggregates slow down the flow and provide a water quality benefit by removing pollutants.

Particularly in urban areas, the use of exfiltration trenches could save ODOT millions of dollars in right of way costs on highway projects. Including these trenches in the design of

the Interstate 270/U.S. Route 23/State Route 315 reconstruction in Columbus saved ODOT about \$55 million in right of way expenses.

"We're confident in these new designs," said Riley. "While retention ponds are still a viable option for situations where we have enough right of way, these new linear systems can give ODOT the flexibility to meet environmental regulations and still design a safe and extremely cost-effective drainage system."

ODOT will continue to research and improve the BMPs to find those approaches that work best with the highway system and meet regulatory requirements. 🌱



Laboratory and field tests were done on the concrete/aggregate mix used in exfiltration trenches. The combination of larger aggregate on top with smaller sizes on the bottom near the outlet pipe allows sediments and other pollutants to filter out of the water before it is released.

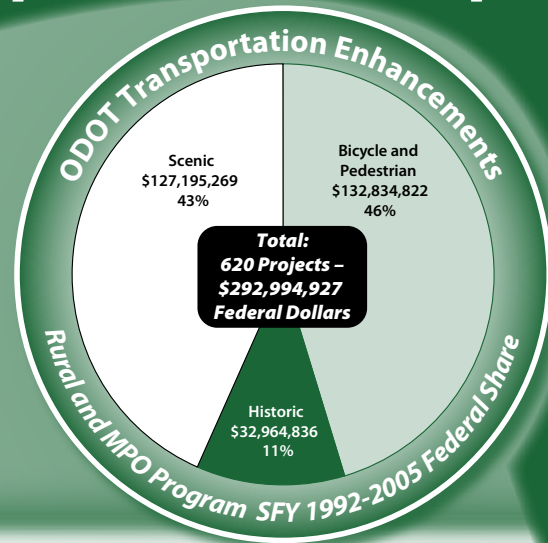
# Enhancement Program

## Expands Usual Scope

Ron Poole, Central Office

**W**HEN YOU THINK OF ODOT PROJECTS, you think of major highway repairs, bridge replacements and resurfacing projects. However, ODOT is also the administrator of federal funds designated for local governments to build road, safety, signal, bridge, enhancement and safety projects. ODOT's Office of Local Projects administers these programs.

Of these programs, the Transportation Enhancement Program is one of ODOT's most unique. It makes federal funds available to local governments not located within Metropolitan Planning Organization (MPO) regions to undertake projects that expand travel choices and enhance the transportation experience by improving the cultural, historic, aesthetic and environmental aspects of



## Zoarville Station Bridge and Eldean

### Zoarville Station Bridge

**I**T IS NOT YOUR USUAL BRIDGE RESTORATION. Six years ago, a contractor began to disassemble the corroding Zoarville Station Bridge in Tuscarawas County and move it from its location for restoration and repair. This project is one of many around the state made possible by ODOT's Transportation Enhancement Program.

Designed by noted bridge builder Albert Fink, the iron bridge was built in 1868 and is the only known Fink through-truss bridge remaining in the country. It is listed on the National Register of Historic Places.

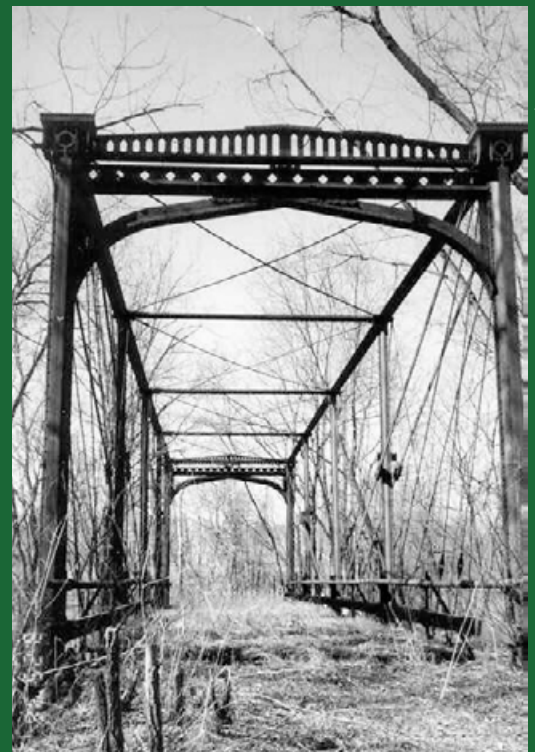
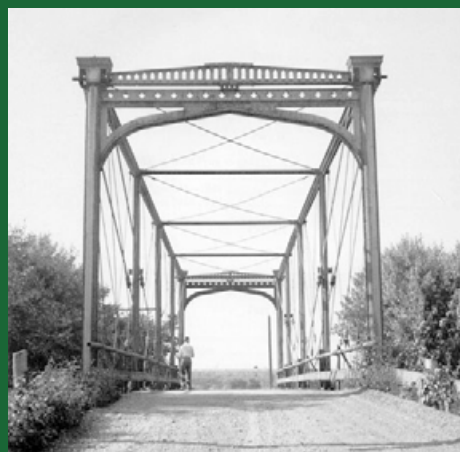
Currently, the bridge's parts are in a Hocking County blacksmith shop. There, two modern blacksmiths are working to restore the structure using old-fashioned rivets to fit parts together. They are removing as many as 4,000 of the original, rusted

rivets from the bridge's columns and replacing them using a pneumatic rivet gun.

The historic bridge was suffering from gradual dete-

rioration and old age when the Camp Tuscazoar Foundation (CTF) acquired it.

*below:* The Zoarville Station Bridge in the early 1940s, shortly before the bridge was abandoned. *right:* The abandoned bridge before rehabilitation began in the late 1990s.



file photos

our transportation infrastructure. Enhancement projects allow communities to not only build infrastructure, but also to develop projects that directly enhance the quality of life of their residents and make their communities more desirable places to live or work.

Historically ODOT receives about \$11 million to distribute annually. Projects are solicited beginning each January. The Transportation Enhancement Program accepts project proposals in three categories. Bicycle/pedestrian projects can include creating new paved trails for those activities. Scenic/environmental projects can include downtown

streetscape improvements and landscaping along transportation corridors. Historic projects include the preservation of structures along with the rehabilitation and operation of historic transportation buildings or facilities, including railroad facilities and canals. If a project is accepted, the program provides 80 percent federal funding for all construction related activities. The remaining 20 percent must be provided in cash from the local government sponsor. When the projects begin, ODOT's district offices oversee the projects as they would any other state construction or repair effort.

There is no maximum to the amount of money that can be requested for each project. Besides construction, funds can

be used for the purchase of abandoned railroad corridors for trails or for scenic or historic easements.

ODOT has been funding transportation enhancement projects since 1992. In the past 14 years, the department has funded 620 projects for a total of \$292 million. Two of the program's projects are highlighted below.

ODOT's Office of Local Projects is preparing to solicit a new round of project proposals in January 2007. Those awarded funding will commence in the 2010-2011 construction season. For more information on ODOT's Transportation Enhancement program go to [www.dot.state.oh.us/local/](http://www.dot.state.oh.us/local/) and click on Transportation Enhancement Program. ☺

## Bridge Projects Preserve History

CTF saw the potential to save the aging structure as well as enhance its usefulness for the camp. The bridge became a great hiking destination and teaching tool for the camp. They set about the major job of having the bridge fully restored and found it to be a prime candidate for ODOT's Transportation Enhancement Program.

Not only is CTF restoring a histor-

ic structure, but upon completion, the bridge will be used by pedestrians and bikers along the Buckeye Trail and three other recreational trails in the area.

The Zoarville Station Bridge project received \$700,000 in funding from the enhancement program. Following the completion of the riveting work, the plan is to reassemble the bridge back in place across Conotton Creek by 2007.

For more information on the Zoarville Station Bridge Restoration, go to <http://www.tuscazoar.org/ZSB.htm>. ☺

### Eldean Bridge

**T**HE ALLEN'S MILL BRIDGE SPANNING the Great Miami River in Troy was built in 1860. It was one of at least 29 covered bridges built during this era. But 146 years later, it is the only one still standing, thanks in part to a helping hand from ODOT.

The bridge received funding from the Federal Highway Administration (FHWA) through the National Historic Covered Bridge Preservation Program in 2003, but it was Transportation Enhancement funding from ODOT that allowed the project to move forward fully

A comparison of before (below) and after (left) views of the Eldean Bridge reveal how restoration painstakingly preserved the design of the original structure.



photo by Randy Lane, Central Office

photo by Reza Zandi, Central Office

(see **BRIDGES** on page 6)

funded. The structure, now called the Eldean Bridge, was recently reconstructed over a three-year period.

“Out of all the bridge projects we reviewed that year, the Eldean Covered Bridge restoration was ranked as our number one priority,” said Linda Bailiff, administrator of ODOT’s Office of Local Projects. “The bridge is not only the second longest covered bridge in Ohio, it is also the longest ‘Long Truss’ bridge in the United States.”

Its overall length of 224 feet made it the second longest covered bridge in the state, but its design was most important. It was a “Long Truss,” first patented in 1830 by Stephen H. Long. The Long Truss design was considered the first scientifically-designed truss bridge in the country. The designers used mathematics to determine ahead of time how strong the bridge needed to be to withstand the forces acting upon it. The entire project cost just slightly more than \$4,000 to complete in the fall of 1860.

By the 21<sup>st</sup> century, the historic bridge needed major reconstruction of its roof, sides and trusses. A further challenge to officials was to preserve as much of the design integrity of the bridge as possible. The cost of this restoration would be more than \$400,000 – more than 100 times its cost to build in 1860.

“This restoration was undertaken with a real passion for preserving the original design,” said Randy Lane, program manager with the Office of Local Projects. “The aim of the project was to keep the original materials in place and in service wherever possible.”

Instead of removing whole timbers, only those parts absolutely needing removal were taken. Replacement parts were custom-cut to fit. The newly restored Eldean Covered Bridge was reopened in a ribbon-cutting ceremony in the fall of 2006, the same season it was completed in 146 years ago. The ceremony saw a strong turnout of local officials and residents showing community spirit and affection for the bridge. ☺

# ODOT Library Turns 30

Ron Poole, Central Office

ODOT, THROUGH ITS BUREAU OF Research and Development, first offered Library Services in August of 1976. The new library promised to help the agency with general work or research projects, writing a speech or presenting a paper at a conference. The staff oversaw a collection of an estimated 10,000

books and reports and 80 different magazines.

The early library staff even offered to conduct then-cutting-edge literature searches for their patrons through a computer database of transportation research information as well as searches through dial-

up connections to databases through State Library Services on groundbreaking topics (for the time period) such as pavement grooves, parking permits on residential streets and solar heating on asphalt. “We can find the answers,” appeared on an early brochure for the ODOT Library, and became their unofficial motto.

As the ODOT Library recognizes its 30<sup>th</sup> year with the agency, that motto contains even more meaning. Located on the second floor of Central Office, the ODOT Library has about 30,000 titles in books and reports. There are more than 250 magazines and newsletters, with new acquisitions always being added. And with internet access to multiple

national and international transportation databases, information from around the state and the world is easier to acquire than ever.

Yet even as things have changed and grown through the years, the staff of the library still wants ODOT employees

from all over the state to come to them for answers. Their motto, even if it’s still unofficial, has the same spirit as it did three decades ago: “If you need to know, ask us!”

For information about the ODOT Library and its services, visit their intranet page at <http://intranet.dot.state.oh.us/library>. ☺



Early promotional pamphlets detailing materials and services offered by the ODOT Library.

# The Beginning of the End for Interstate 71

Joyce Dunford, *District 3* and Lindsay Komlanc, *Central Office*

**O**DOT HAS BEEN WORKING ON THE widening of Interstate 71 between Columbus and Cleveland since the late 1990s. When complete, I-71 will be a six-lane highway between Columbus and Cleveland – three lanes in each direction. These improvements should add enough capacity to carry traffic for the next 20 years, which is the design life of the highway. This fall, District 3 began construction on the last leg of widening and reconstruction on the I-71 corridor in the district boundaries.

“Interstate 71 has become a workhorse for the state,” said ODOT Director Gordon Proctor. “From heavy commuter traffic between Columbus, Akron, Canton and Cleveland to significant truck volumes, the route is essential for motorists and commercial vehicles alike.”

Much of I-71 in the Cleveland area was originally built with three lanes in each direction because of the high demand. In 2002, District 12 completed a \$39 million project to widen the only two-lane section of the route to three lanes in each direction from just south of Cleveland, near Strongsville, to the Cuyahoga County line. Also in 2002, District 6 completed a \$54 million project to widen a 10-mile stretch of I-71 between State Route 161, just north of downtown Columbus, and U.S. routes 36/37 near Delaware.

From there, the next big chunk of construction fell to District 3. Through a series of 10 major projects, District 3 worked to widen I-71 through Medina, Wayne, Ashland and Richland counties. The final project is one of the most difficult and largest contracts the district has undertaken and includes the complete overhaul of the I-71 interchange with Interstate 76. Ramps connecting the two heavily-traveled highways will tower above what was once fields and farm land.

The \$70.4 million project began this October and will be completed in 2010; however, motorists will begin seeing the results of the bulk of the work along the corridor in 2007 when two other projects

are completed between State Route 18 and the Wayne County line.

“This is the beginning of the end for those traveling on this major thoroughfare in north central Ohio,” said Bill Lindenbaum, deputy director of ODOT’s Division of Construction Management. “ODOT has made this corridor a priority for the last 15 years, and motorists will soon start to see the results of more than a decade of work.”

Over the last several years, District 3 has focused on completing the I-71 corridor as part of Governor Taft’s Jobs and Progress plan to update the state’s aging highway system and complete rural and urban corridors across the state.

The entire corridor will be complete sometime after 2014, when the last of a series of three projects in District 6 is completed. These last three projects include the southern portion of the corridor between U.S. 36 in Delaware and the Richland County line. District 6 is developing these projects, which are estimated to begin in 2012, 2013 and 2014 with an estimated cost of \$70 million.

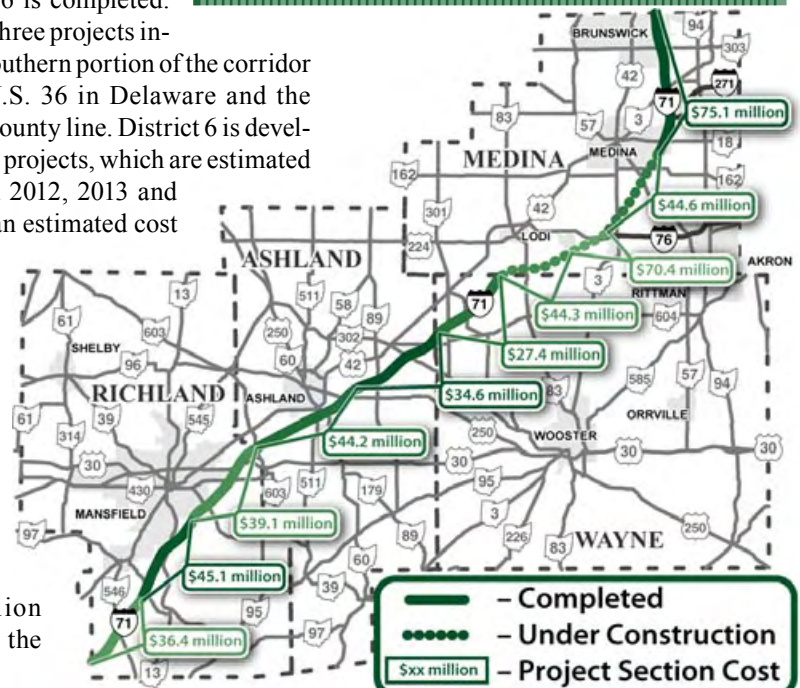
When all the projects are complete, ODOT will have invested more than \$600 million to upgrade the corridor. ☺

## District Three Interstate 71 Facts

- 71 10 reconstruction projects on the D-3 corridor; the first began in May 2000 and the last will finish in 2010.
- 71 Contractors have removed 1,846,079 square yards of pavement during the reconstruction – the area equivalent to nine football fields.
- 71 The total bid amounts for these projects is \$430,004,380.98.
- 71 ODOT’s construction engineering labor costs alone were \$20,425,208.10.
- 71 There have been 280 additional lane miles constructed, including 126 total structures as part of the widening in District 3.
- 71 441 miles of underdrains were installed – the driving distance between Akron to New York City.
- 71 The final project has the least amount of total lane miles to be reconstructed (12.6) but it is the most expensive project to build because of its design and the complexity of the work.

## Statewide I-71 Facts As of Nov. 2006:

- 71 Completed Projects: \$394.9 million
- 71 Projects Currently Underway: \$157.6 million
- 71 Future Projects: \$70 million (estimate)
- 71 Total: \$622.5 million (estimate)



# Technology Helps Ease Congestion

Ryan Larzelere, *Central Office*

**N**EARLY 10 YEARS AGO, THE Advanced Regional Traffic Interstate Management & Information System (ARTIMIS) was introduced to the motoring public of Cincinnati. Its job was, and still is, to help ODOT manage and, if possible, ease congestion. ARTIMIS was the first regional Freeway Management System (FMS) in the state and now serves as a model for future systems.

“Crashes and other incidents account for more than half of the congestion delay on Ohio’s urban highways,” said Dave Holstein, administrator of ODOT’s Office of Traffic Engineering. “Managing congestion and eliminating delays are critical to reducing accidents and increasing safety on our highways.”

One way to reduce the severity of congestion is through early identification and remediation of incidents. This involves a coordinated effort of multiple agencies including ODOT, local jurisdictions and emergency responders, collecting and disseminating data to each other and the public in real-time. The FMS is a key tool ODOT uses to aid this task.

While the Cincinnati and Columbus areas have the only operational systems in the state, others are currently under development. Modeled after ARTIMIS, all of the FMS will use cameras, changeable overhead message boards

and highway advisory radio systems to identify incidents, respond quickly and disseminate real-time information to motorists.

ARTIMIS became fully operational in Cincinnati in 1998 and the first phase of the Columbus FMS was operational in 2000. ODOT began work to add on to the Columbus FMS system in 2004. The upgrade should be complete at the end of 2006, adding additional traffic cameras and message boards around the Columbus metro-area. ARTIMIS is a partnership between ODOT and the Kentucky Transportation Cabinet and the Columbus FMS is a part-

nership between ODOT and the city of Columbus. By 2011, FMSs will be operational, or close to operational, in the Akron, Canton, Cleveland, Dayton and Toledo metro areas. ☺



Screenshots from the Cincinnati area Advanced Regional Traffic Interstate Management & Information System (ARTIMIS) Web site. This type of Freeway Management System – which includes cameras, message boards and highway advisory radio – serves as the model for similar efforts underway or planned for other Ohio metropolitan areas.

## Transcript

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