

MOVING FORWARD



"He who does not look ahead, remains behind." (Spanish Proverb)

Ohio Department of Transportation, Office of Research and Development

Spring 2002

Message from the Administrator

Monique R. Evans, P.E.

During the past quarter ODOT's Sr. Leadership approved our new research management process. One of the most significant changes to this process is the move to a biennial instead of an annual program. We feel this will enable us to focus more clearly on our long-term strategic research needs while allowing us enough flexibility to adapt to emerging issues. Our research needs are being defined in terms of 10-yr and 5-yr strategic research plans. The major difference between the two versions is that the 10-yr plan will consist of broad focus areas that address Ohio's unique transportation needs within the context of a comprehensive national transportation research agenda. The 5-yr plans, on the other hand, are more detailed lists of research needs in major program areas along with specific projects that should be investigated over the next five years.

ODOT's Sr. Leadership has identified several short and long term research focus areas including:

- reducing the life cycle maintenance costs of some of the most expensive items

in the county work plans, such as litter control and mowing,

- addressing the changing needs of our older transportation users through the examination of signing, pavement markings and other traffic control features,
- reducing the unexpectedly high number of collisions that occur at rail/grade crossings that have flashing lights and gates, and
- determining the state of the practice as well as predicting the future technological and economic impacts on the DOT of advanced automotive technologies such as fuel cells and alternative fuels.

While funding for the fiscal year 2003 program is expected to be significantly less than it was in prior years, we are confident that our focus on long-term strategic needs will allow us to continue to deliver a strong and vibrant research program.

Website Updates

Our website is being updated. The inclusion of the 2003 problem statements is the most recent addition. Vicky is now administering our website so if you have any suggestions or questions please contact her via the link on the bottom of the home page. You can visit our web site at <http://www.dot.state.oh.us/divplan/research>.

Need a copy of a report? Have a general question? Just want to express your opinion? Email us! Please send items of this nature to our new account: research@dot.state.oh.us.

Training for Technical Liaisons

On February 26, 2002 the first technical liaison training course was held at ODOT's central office. Twenty-four people from the Division of Highway Operations attended the training session. The purpose of the training was to update liaisons on changes to the research process and clarify their responsibilities and the role they play in the life of a project. The overall response from those who attended was very positive. Additional training courses will be offered in the near future to technical liaisons.



Spotlight on Geotechnical Engineering's Rick Ruegsegger

By: Karen Pannell, P.E., Central Office

There are 4138 known abandoned underground mines in Ohio, with possibly 2000 more in existence. As these mines age and deteriorate, the likelihood of sinkholes and slides increases, presenting a potentially large number of sites that will need to be addressed. The dangers could be significant, but until recently, there has been very little knowledge or experience in the field.

To combat this problem, ODOT held an Abandoned Underground Mine Workshop in 1997. Several other states and federal agencies attended, and the workshop

was so successful that the participants wanted to continue this sharing of information and experiences through a permanent organization. Out of the workshop, the Interstate Technical Group on Abandoned Underground Mines was formed. The activities of the group were detailed in a TR News article co-authored by Rick Ruegsegger, Special Projects Coordinator for the Design Resource Section of ODOT's Office of Geotechnical Engineering, and Tom Lefchik of the Ohio Division, FHWA titled "U.S. Roadways Undermined".

Rick's responsibilities at ODOT include establishing a state-wide inventory and risk assessment process for state roadway locations underlain by abandoned underground mines. He is also the principal author of the ODOT Manual for Abandoned Underground Mine Inventory and Risk Assessment (AUMIRA). While Rick was developing the manual, the need for a website to share information and experiences became apparent. As a result, the Interstate Technical Group on Abandoned Underground Mines now has a website at <http://www.fhwa.dot.gov/mine/> which allows members to ask questions and receive answers, and also announces demonstrations and other upcoming activities. A part of ODOT's AUMIRA manual can be found there.

The interest generated by this website has led Rick to several other opportunities to promote technology transfer on a national scale. In April, 2001, Rick was invited by the National Research Council (NRC) to make a presentation on the AUMIRA manual at a subcommittee meeting on Coal Waste Impoundment. Then, in May, 2001, the Transportation Research Board (TRB) asked the Interstate Technical Group on Abandoned Underground Mines to conduct a symposium on the subject. The symposium was such a success that the group was invited to submit a proposal to become a subcommittee of the TRB Engineering Geology Committee. Rick presented the proposal at the annual TRB meeting, where it was accepted and supported by the parent committee, naming Rick to the subcommittee for a three year term. The objectives of the subcommittee are to facilitate the flow of information related to abandoned underground mines and to encourage communication among states with similar concerns. They will also identify and develop research problem statements, greatly improving the safety of the traveling public. Rick was also honored at the TRB meeting by receiving an invitation to join the Engineering Geology parent committee.

Rick has Bachelors degrees in Civil Engineering and in Biological Sciences from the Ohio State University, and is a registered professional engineer. His work for the State of Ohio since 1974 has included 3 ½ years with the Ohio Environmental Protection Agency, 15 years with the Ohio Department of Natural Resources, and 9 years with ODOT.

GUE-70-14.10 Mine Research Project

**By: Rick Ruegsegger, P.E.,
Geotechnical Engineering**

Description of The Study Area

The Office of Geotechnical Engineering is coordinating an ongoing mine research project in eastern Guernsey County on Interstate 70. The research project study area is a roadway section approximately 2100-foot long within which several ground subsidence features occurred due to collapsing abandoned underground mine workings in 1994 and 1995. On March 4, 1995, a twelve foot section of the eastbound driving lane collapsed due to mine-related subsidence. A mine remediation project consisting of drilling and grouting through approximately 1800 injection holes was undertaken beginning in that same month at this location. The interstate was closed for four months while the state repaired the collapsed mine at a cost of \$3.6 million. Construction was completed in August, 1995.

In Spring of 1996, surface depressions were noted in the pavement over some of the grouted boreholes. The Contractor remobilized, redrilled, and regouted at the locations of the depressions beginning in May, 1997. This work was completed in September, 1997. Approximately 180 surface depressions over boreholes were remediated during this effort.

Project Description

The unexpected settlements in some of the completed 1995 project boreholes, the mine-related nature of the project location, and the strategic importance of the roadway to Ohio's interstate transportation highway system prompted ODOT to formulate plans to conduct a post-construction study of this location. ODOT recognized that the knowledge that would be gained through study of this unique location would have statewide informational value for the analysis of similar roadway locations in the future.

On this basis, the needed study of this 2100-foot roadway section was undertaken as the GUE-70-14.10 Mine Research Project. The specific goals of this project were:

1) to effectively evaluate the present day stability of the of the roadway included in the original GUE-70-14.10 Mine Remediation Project and; 2) to provide a technology transfer report which will identify site evaluation techniques utilized during this research work which might have state-wide application on similar roadway locations. The project work was structured as three phases which were to be completed in a total of three years. The researcher receiving the August, 1999 contract for this work was BBC&M Engineering, Inc. The value of this research contract was \$1,316,975.00.

The initial portion of research work was considered Phase I. This phase of the project work applied a variety of groundwater investigations, geophysical investigations, and geotechnical investigations to a 500-foot eastbound portion of the project area to determine which forms of testing were most effective for the site conditions.

Due to delays related to weather and availability of testing equipment, completion of Phase I required approximately 17 months instead of the planned 12 months.

Phase II and Phase III of the project work were to be completed in the second and third years of the research agreement period. After being delayed approximately 5 months by the extended time required to complete Phase I, Phase II of the research project was initiated. The purpose of Phase II is to provide an evaluation of the full width and length of the entire 2100-foot project area using the investigative techniques found to be the most successful during Phase I research. Phase III of the research project work will provide a technology transfer document. This technology transfer document will serve as a concise, easy to use technical reference for statewide applications of the knowledge gained through project work.

Present Status

The second half of Phase II is about to begin. When this portion of the Phase II work commences, Phase III work to formulate a technology transfer document will also start. ODOT has recently extended the expected completion date for this project to June 30, 2003.



Calendar of Events

April - 2002

4th - Midwest States Pooled Fund Crash Test Program Annual Meeting {Lincoln, NE}

4th-5th - 1st Upper Midwest Regional Freight Transportation Workshop {Chicago, IL - More Info: Aileen Switzer: aswitzer@engr.wisc.edu}

8th - FY03 Preliminary Proposal Deadline to R&D by 4:30 PM

25th - OTEC Abstracts Due - {More Info: Terri Barnhart: terri.barnhart@dot.state.oh.us}

June - 2002

Annual Research Work Program fo FY03 Published

NCHRP First Stage Research Problem Statements Due @ TRB

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