

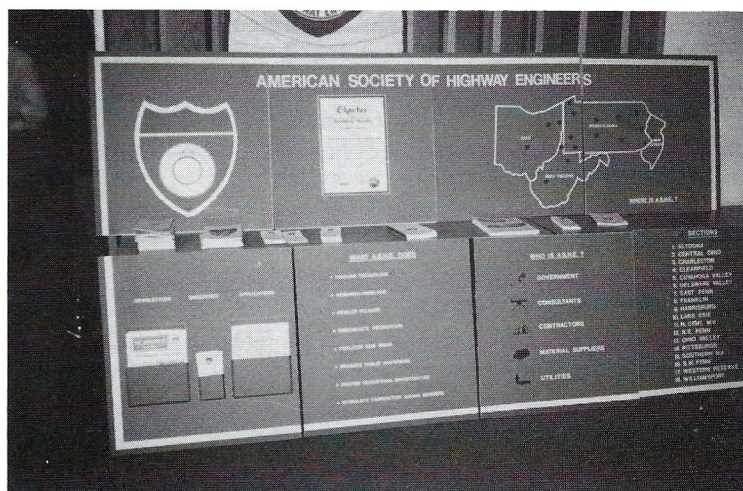
SCANNER

NEWSLETTER OF THE AMERICAN SOCIETY OF
HIGHWAY ENGINEERS



Feb. 1987

40th Annual Ohio Transportation Engineering Conference



ASHE National Exhibit on display at the conference, held December 2 and 3, 1986 at Ohio State University.

The 40th Annual Ohio Transportation Engineering Conference, attended by approximately 800 State, County, Municipal and Federal Highway and Transportation personnel along with contractors, consultants and suppliers, was sponsored by the following:

The Ohio Department of Transportation, The Ohio State University, The Ohio Section, Institute of Transportation Engineers, Federal Highway Administration, The County Engineers Association of Ohio, American Society of Highway Engineers, Student Chapter of the Institute of Transportation Engineers, American Society of Civil Engineers.

Representatives from the four Ohio ASHE Sections attended the conference and all felt that it is a very worthwhile yearly function not only because it brings

together all those interested in the betterment of the transportation system, but it gives ASHE the exposure to those groups who have common interests.

ASHE Ohio Sections provided coffee and doughnuts Tuesday morning during the registration hours. The following are dedicated ASHE members who helped with ASHE sponsorship and exhibits:

Ronald Nessinger - Central Ohio Section
Ronald Zook - Central Ohio Section
Joe Kindler - Central Ohio Section
Pat Welsh - Cuyahoga Valley Section
Tom Crisswell - Cuyahoga Valley Section
Bob Wallace - Western Reserve Section
Tom Kreczko - Lake Erie Section

Topics discussed during the conference were:

Can We Afford the Future?; Aviation Developments, Present and Future; ODOT's

Engineer-in-Training Program; Bridges; Transportation of Hazardous Materials; Paving Materials Developments; Traffic Safety in Work Zones; Hazardous Materials Use, Storage & Disposal; Rural Technology Assistance Program for Local Governments and Strategic Highway Research Program; Quality Control in Construction; Traffic Efficiency and Safety Projects; and New Advances in Old Technology.

Copies of the proceedings may be obtained through the Ohio State University Civil Engineering Dept. at

470 Hitchcock Hall
2070 Neil Ave.
Columbus, Ohio 43210
(614) 292-2771

The next conference is scheduled for December 1 & 2, 1987.

By: Tom Crisswell



AS CASEY WINS —

Highway Outlook Stable

With the election of Bob Casey as governor, Frankie PHIA feels our highways and bridges will remain high on the priority list and continue to improve our state's economy.

Though the governor will change in January, the stabilizing force of our highway program, the bi-partisan State Transportation Commission, will remain intact. The 15-member Commission, which has staggered terms of office, sets the Department's objectives and gives final approval to the 12-year plan of transportation projects in Pennsylvania.

Though the Commission remains, a governor committed to transportation can boost the state's economy by increasing highway funding. The Thornburgh administration committed itself to highways and improvements at PennDOT.

Thornburgh, with the approval of the General Assembly, increased road and bridge contracts from \$180 million in fiscal 1978-79 to the current \$1 billion program.

PennDOT Secretary Tom Larson, appointed by Thornburgh, greatly improved efficiency at PennDOT through a program that dedicated the Department to excellence. PennDOT's number of employees has decreased every year since fiscal 1982-83, while highway and bridge contracts increased and now total over \$1 billion a year.

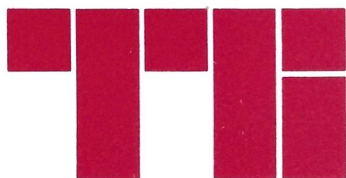
When Bob Casey is sworn in as governor, Frankie feels comfortable that our highway program will remain strong, but he will be watching the results.

Publications Catalog Released

The American Concrete Institute announces their new 1987 publications catalog. Containing over 325 listings, the new ACI catalog offers access to "The World's Most Complete Technical Library". Publications available include those on concrete technology, structural design, and concrete construction as well as all ACI standards, codes and specifications. Also listed are design handbooks, monographs, symposia, bibliographies, and special publications.

To obtain a free copy of ACI's new catalog, write: American Concrete Institute, P.O. Box 19150, Detroit, MI 48219-0150.

The American Concrete Institute is an international, non-profit society organized to provide research and information to improve the design, construction, use and maintenance of concrete structures.



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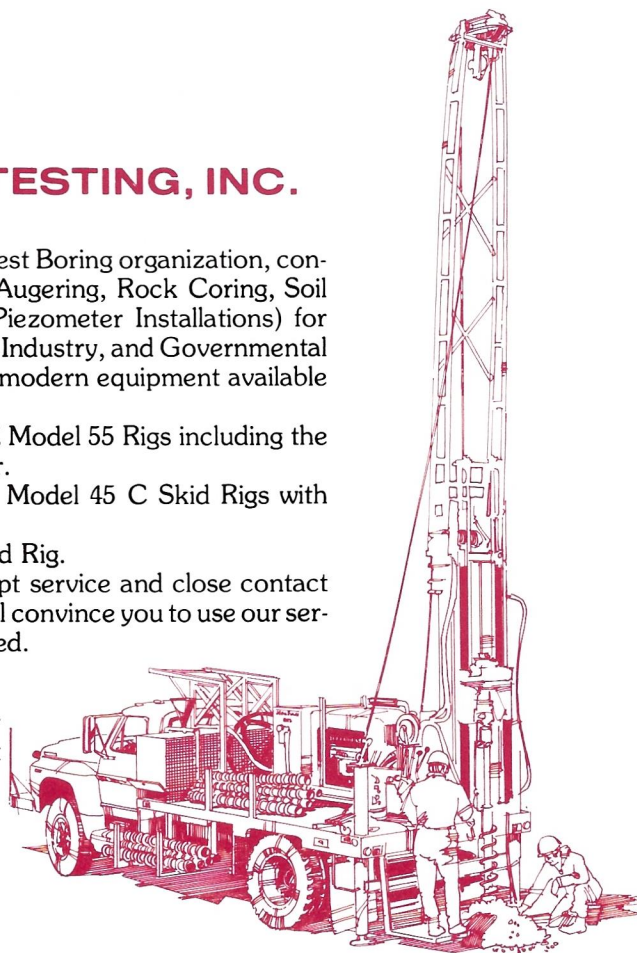
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Technical Bulletin

Maintenance Practices for Local Roads

The Pennsylvania Department of Transportation (PennDOT) recently produced a practical, easy-to-use series of manuals entitled Maintenance Practices for Local Roads. This multi-volume set (pictured below) is a comprehensive body of information which assists municipal officials in making decisions about their locally owned roads.

The Federal Highway Administration and PennDOT provided funding for this research and development project. It is aimed at transferring technology currently used by federal and state agencies to municipal agencies throughout Pennsylvania.

A project advisory panel comprised of representatives from municipalities, industry, federal and state transportation departments and the Legislature are credited with the straight-forward, directly applicable nature of the manuals' contents. The four manuals are the result of three years of extensive work by the advisory panel.

Some general information about municipal responsibilities is helpful in determining the importance of this effort. Municipal governments in Pennsylvania maintain 68,500 miles of roadway, 1½ times the number of miles the Commonwealth (PennDOT) maintains. Also, in 1984 Pennsylvania municipalities received a record total of \$118 million in liquid fuels tax funds, 90% of which is allocated to highway maintenance.

As with all road and bridge work, municipal efforts are often complex and in many cases extensive; they also require state-of-the-art techniques. Therefore, high payoff areas such as new technology, productivity improvements and cost savings are central themes of the manuals.

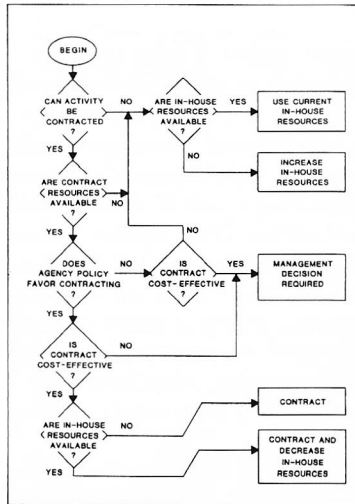


Figure from manuals.
Logic chart that can be used to assist managers in deciding when to contract out for services.

The project advisory panel sees a continued return on the \$60 cost to produce a set of manuals for each municipality. An estimated 10-15% annual savings is anticipated for municipalities using techniques put forth in these volumes. This is like receiving a 10% or greater increase in municipal funds each year.

In August 1985, PennDOT's Bureau of Municipal Services distributed one complete set of manuals to each municipal jurisdiction. To further promote use of these manuals, the department's sponsored Rural Technical Assistance Program (RTAP) and the Pennsylvania Department of Community Affairs are incorporating these manuals as resources in their training sessions to be offered to municipalities during the next several years.

Further information on this or any other Innovation Through Research and Technology Summary may be obtained by contacting the PA Department of Transportation, Office of Research and Special Studies, Technical Reference Center, Room 903 Transportation and Safety Building, Harrisburg, PA 17120, telephone number 717/787-6527.

Reference #82-19 — Establish Maintenance Practices for Local Roads

Researcher — Byrd, Tallamy, McDonald and Lewis

#SS006 — A Rural Technical Assistance Program (RTAP)

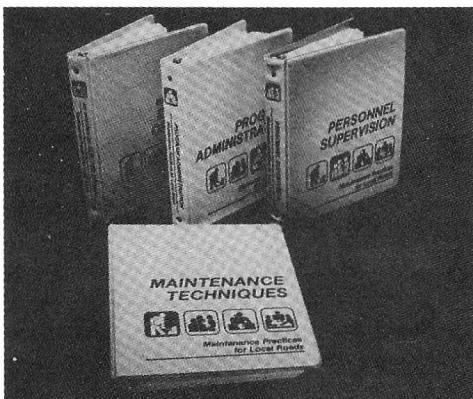
Researcher — The Pennsylvania State University

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"Computer Aided Drafting and Design in the Contemporary Engineering Setting"

To CADD or not to CADD?" is a quick paraphrase of the Old Bard. Today this question is not as relevant as it was in the recent past. CADD systems have been proven to be an extremely effective production tool. CADD is not a passing fad. It is here to stay and the organization that learns it and manages it effectively has the edge on success.

A better question for the modern engineering firm to ask is "What can CADD do for me?" I will present to you PennDOT's experience with CADD and, hopefully, our program will provide some background material for future consideration.

PennDOT has had a CADD system for over three years, obtaining the first shipment of hardware and software in November, 1983. The Central Processing Unit was placed in the District 3-0 office in Montoursville along with four workstations. Three additional workstations were established by remote in the Central Office in Harrisburg. Since that time a tremendous expansion program has been instituted with all District offices receiving at least two workstations. The last District was put on line in November, 1986 making a total of 40 workstations in operation statewide.

CADD, to this point, has primarily been a drafting tool with very little design work being done. Overall, drafting productivity has increased by experienced operators to a ratio of at least 3:1. Drafting has been taken out of the critical path of design development. Some of the line item productivity increases include plotting profiles (18 times faster), plotting gradelines (18 times faster), tabulation sheets, summary sheets and general notes (3 times faster), and plotting topography (2 times faster).

The productivity curve with drafting is expected to make only moderate increases in the future. These increases will be due to greater experience by operators and certain enhancements to software.

However, the major increases in productivity will be in the area of design, and we see only the "tip of the iceberg". PennDOT is presently beginning to enter the automated design era, and is reviewing several design packages.

One of the software packages of which PennDOT is most proud is Bridge Automated Drafting and Design II (BRADD II), which is being developed by contract with Michael Baker and Buchart-Horn. This software enables the

bridge engineer to design a single span structure up to 200 feet long, utilizing various geometric configurations and structural types within a time period of less than eight hours. BRADD II should be in production in the spring of 1987.

We are presently developing software to implement Total Station Survey using Electronic Theodolite Interface and Map Feature Coding. This software will enable survey information to be downloaded directly into the computer and plotted interactively, giving a great increase in productivity over conventional plotting. The system is being tested and should be in full production statewide by the spring of 1987.

PennDOT is involved in a software package being developed by AASHTO, called Interactive Graphic Roadway Design System (IGRDS). This system is still under development and our review and testing will not begin until mid-summer of 1987. This software will enable the designer to interactively establish alignments and gradelines, plot templates and compute quantities including earth work. There are several packages either being developed or already in operation that are similar to IGRDS and they deserve consideration in design enhancements.

We are reviewing a storm drainage design software system that enables the designer, with minimum input, to determine runoff, pipe size and length, plot a profile of the system and establish the hydraulic gradeline. This system, if feasible, could be operational in the spring of 1987.

These, and other, software packages developed either in-house or through outside vendors will continue to keep PennDOT on the leading edge of design technology. Forty state Department's of Transportation have CADD. A great amount of technology transfer is taking place between these agencies which is of great benefit to all citizens. The wheel is not being reinvented.

Of concern to PennDOT is the role consulting firms play in this expanding technology. There are many legal, ethical, operational and financial questions to be considered before a formal policy is implemented concerning CADD plans developed by consultants. Suffice it to say that all factors will be considered in the policy.

Technology is changing so rapidly it sometimes seems that the prudent attitude to take is wait and see. However,

there appears to be no end to the changes, so the best advice is to get involved and become a CADD user. The productivity increases are well worth it.

Submitted by:
W.C. Hutchison, P.E.
Williamsport Section

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Harrisburg Section News

Four well attended programs marked the fall-winter portion of the 1986-87 Harrisburg ASHE year.

A joint ASHE-PSPE picnic outing at Blue Mountain Park in Linglestown on September 10, 1986 served as a popular get-together for many new members and guests. The weather, food and hospitality all made the evening most enjoyable.

An October 6th dinner program at Harding's Restaurant in Camp Hill featured an illustrated talk by Mr. James C. Byerly, a respected authority in the insurance industry, on the effects of the liability crisis in engineering, design and construction.

In November over 90 members were entertained by Dr. John Kulicki and Mr. Russ Christie of Modjeski and Masters who presented a superb talk on the I-78 bridge over the Delaware River near Easton. The twosome shared their experiences in the location, design and construction of this last major river crossing link on the interstate system in Pennsylvania.

On December 8th, the Lewisburg River Bridge was featured in an illustrated talk by Mr. Phil Malachowski of High Steel Structures. Much interesting behind the scenes thinking and planning for this first major bridge turnkey project in Pennsylvania was presented.

Submitted by: **Brian A. McCoola**
Harrisburg ASHE

Maintenance Quality Assurance

by
Norman T. Cochrane, P.E.

Senior Member, Pittsburgh Section, ASHE
Pa. Dept. of Transportation
Maintenance Q/A Engineer, West

Shortly after becoming Secretary of Transportation, Tom Larson instructed maintenance forces to "Do it right". If the work is done right the first time it will not have to be done again for a long time. The result would be better service to the motoring public at a lower cost. Performance Standards which detail how various maintenance activities are to be done have existed for many years but were not always followed. So a Quality Assurance program was needed.

In 1983 the Bureau of Maintenance and Operations was assigned the task of developing and implementing a Quality Assurance program for important maintenance activities. Three Division Engineers were reassigned as Quality Assurance Engineers and given total responsibility for the program.

The first priority was to develop programs for those activities which accounted for the largest dollar expenditures of the maintenance budget. The initial activities were:

1. Manual Patching - 14.4% of the budget
2. Surface Treatment - 7.2 % of the budget
3. Pipe Replacement - 3.9% of the budget
4. Shoulder Cutting - 3.8% of the budget

Additional activities that have been added to the original list are mechanized patching, leveling, crack sealing, joint sealing and winter stockpile management.

The evaluation is done by a Quality Assurance Engineer who observes the field operations and rates the various elements in accordance with a rating sheet on a scale of 1 to 5. A final numerical score is converted into a rating of VERY GOOD, GOOD, MINIMAL ACCEPTABLE or UNSATISFACTORY.

Projects are UNSATISFACTORY if the minimum requirements of the Performance Standards or Form 408 are not met. They are MINIMAL ACCEPTABLE if the basic requirements are just met. A project is rated GOOD if it exceeds the basic minimum requirements. To achieve a VERY GOOD rating requires a near perfect score of over 4.75.

The following tables give a breakdown by rating for each of the four activities since they were started.

MANUAL PATCHING				
Rating	1983	1984	1985	1986
Very Good		9.1%	27.8%	18.9%
Good		54.5%	57.4%	72.4%
Minimal Acceptable		6.5%	1.0%	3.5%
Unsatisfactory		29.9%	13.8%	5.2%
SURFACE TREATMENT				
Very Good	5.9%	14.3%	25.0%	23.8%
Good	52.9%	71.4%	50.0%	61.9%
Minimal Acceptable	0.0%	0.0%	6.3%	0.0%
Unsatisfactory	41.2%	14.3%	18.7%	14.3%
PIPE REPLACEMENT				
Rating	1983	1984	1985	1986
Very Good	7.4%	0.0%	17.5%	13.1%
Good	48.2%	63.6%	72.5%	76.1%
Minimal Acceptable	14.8%	9.1%	0.0%	4.3%
Unsatisfactory	29.6%	27.3%	10.0%	6.5%
SHOULDER CUTTING				
Rating	1983	1984	1985	1986
Very Good		2.3%	5.8%	8.7%
Good		58.2%	61.5%	76.1%
Minimal Acceptable		16.2%	19.2%	0.0%
Unsatisfactory		23.3%	13.5%	15.2%

From these tables you can see the significant increases that have been made in the quality of department forces maintenance work. The combined percentages in the Very Good and Good categories have increased 62% in Pipe Replacement, 48% in Manual Patching, 24% in Surface Treatment and 11% in Shoulder Cutting.

Productivity is also considered when doing a Q/A review. It does not enter into the final rating but is observed and reported to the County Manager. Quality is the first consideration and productivity comes next.

A third item looked at is safety. That

includes traffic control and the use of personal safety equipment and working in a safe manner. Again safety does not enter into the final rating but is reported to the County Manager.

The Maintenance Quality Assurance Program is now an integral part of the departments every day operation. The Engineering Districts have established their own Quality Assurance programs patterned after the Bureau of Maintenance and Operation's program. With such an emphasis, the quality of Pennsylvania's maintenance work will continue to improve.

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New Computerized Roadway Management System

A number of state DOTs across the country have been talking about it, but PENNDOT is the first to develop a computerized Roadway Management System (RMS) that will integrate its roadway management information systems. Other state DOTs have also considered automating their straight-line-diagrams or their equivalent (graphical representation of the roads and features), but again PENNDOT will be the first to implement such a system.

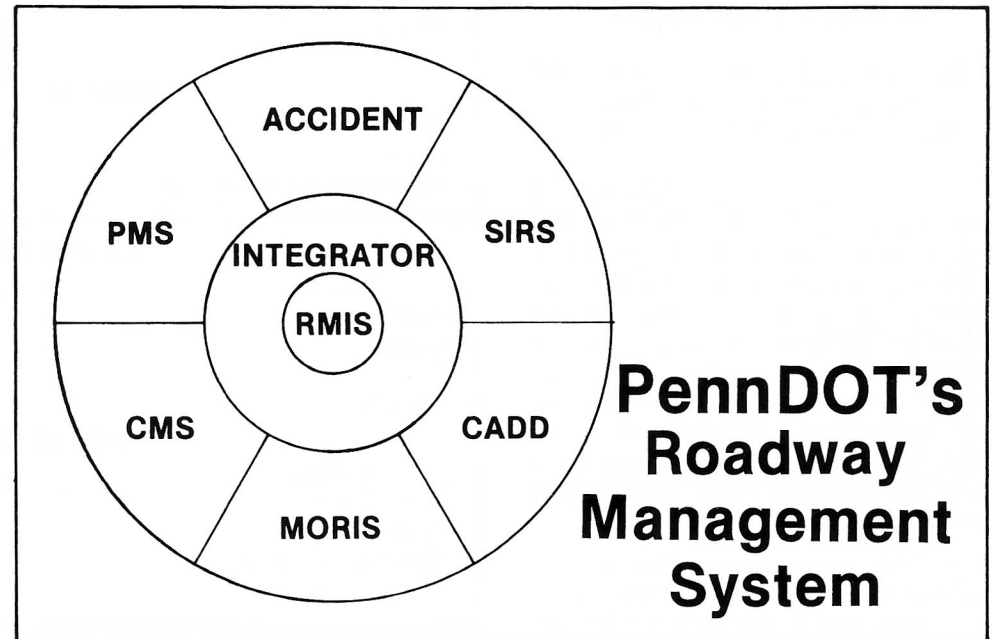
As an integral part of the RMS, the Department will also implement a new Location Referencing System (LRS) to replace the current Station Marker System that is used to identify specific locations on state highways. The new LRS will provide the common denominator to integrate the systems being designed and incorporated in the RMS.

Why the Need for a Roadway Management System?

Like most large organizations, state DOTs have developed their computerized roadway information systems over the years to meet specific purposes or needs. For example, at PENNDOT, this includes the following systems:

- Roadway inventory (existing PARIS system)
- Pavement management (new STAMPP system)
- Railroad crossing (existing RRX system)
- Highway performance measurement (FHWA HPMS system)
- Structure inventory (existing SIRS system)
- Bridge management (new BMS system)
- Highway maintenance (new MORIS system)
- Project management (existing PI/PMS system)
- Contracts management (existing CMS system)
- Accident data (existing ARS system)
- Financial management (new FMIS system)
- Computer Assisted Drafting and Design (new CADD system)

One of the problems resulting from developing systems to meet specific purposes, is that the same data such as average daily traffic (ADT) counts have to be inputted and maintained in several computer systems and files. Often the data does not agree. Another problem is that



someone needing information on a section of roadway must often go to a variety of places to get the information.

Many of these systems, such as HPMS, were developed to meet Federal and central office reporting requirements, and consequently are not responsive to the information needs of the people in the field who must collect and input the data. At the same time, a number of these systems were developed years ago and do not take advantage of the capabilities of the new and existing computer technology, which can help make systems much more responsive and user friendly.

But most importantly, RMS will assist Department managers in answering the

age old question — What is the most effective use of our available construction and maintenance dollars? Pennsylvania's construction and maintenance program is very large compared to most states - \$1.3 billion annually - nevertheless, transportation needs always outweigh transportation funds.

To improve its effectiveness, the Department has launched a major effort to integrate its roadway management information systems. We call this integrating system - RMS. The diagram above shows the concept.

The core of the system is the new computerized Roadway Management Information System (RMIS). The RMIS will incorporate several existing data

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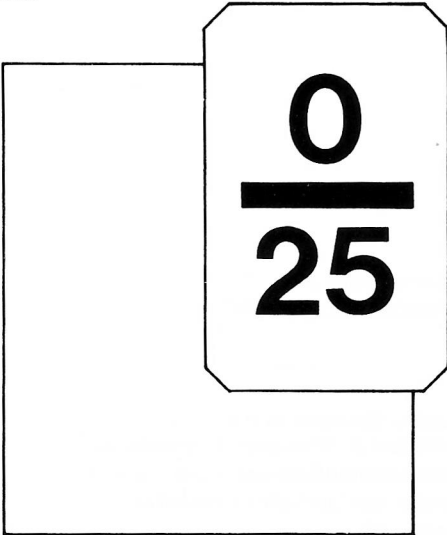
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bases including PARIS, STAMPP, RRX, HPMS and will have the capability of storing information on local roads. Through computer software, other data bases will be linked to the RMIS. These include SIRS, MORIS CMS, PMS, and ACCIDENT systems. The design of RMS will also include provisions to integrate the BMS and CADD systems to the RMS data base in the future.

A major output of RMS will be the new automated straight-line-diagram (SLD). Our District and County employees will be able to obtain an up-to-date computerized printout, for a specific section of roadway, listing all the information now found in our hand-drawn SLDs.

New Location Reference System

Pennsylvania's current Station Marker System has evolved over the past 50 years. Essentially, it is based on the identification of locations on roadways by Legislative Routes (LRs) and physical markers called station markers. The markers are placed every 500 feet on major routes starting the beginning of the LR (often the county line). The drawing below shows what a station marker looks like.



The zero over 25 means that the station marker is 2,500 feet along the road from the beginning of the LR. The major difficulty with the existing system, is that the location identification is subject to constant change. For example if a curve in a road is straightened as part of a maintenance or construction project, all the station markers beyond that location become incorrect.

The existing Station Marker System is a barrier to achieving the potential benefits offered by the new computer technology because it was not designed to serve modern information management needs.

With the advent of modern computer-based information systems, there are

What is the cost of the design and implementation of the system?

Major Activities	Consultant Contracts (millions)	PENNDOT Personnel Costs (millions)	Status
1. Feasibility and Requirements Study, Business Analysis, and Conceptual Design of RMS	\$1.5	\$.3	-Completed
2. Detail Design of RMS and Development and Implementation of RMS Software	5.8	1.7	-In-process
3. Implementation of New Highway Location Reference System	1.8	4.9 (includes \$3.3 for signing)	-In-process
Cost Sub Totals	\$9.1	\$6.9	
TOTAL COST		\$16.0	

Note: Almost \$13 million or 80 percent of the project cost is being provided by the Federal Highway Administration through their Highway Planning and Research funding.

opportunities to improve the collection and availability of roadway information. The key to the collection, storage and integration of the information is the new Location Reference System.

After considerable research and testing in the field, a new highway Location Reference System has been developed. The roadway will be identified in average one-half mile segments. And most importantly, segment beginning and ending points will be placed at physical features like bridges and intersections.

The new Location Reference System will:

- Enable the Department to take advantage of the benefits offered by the new computer technology.
- Add permanence and stability to our marker system.
- Cost less to maintain.
- Be easier to understand.
- Provide the ability to interface with geographic coordinate based systems.
- Provide the ability to produce a computerized representation of the state highway network.

It's Been A Team Effort

The Roadway Management System has been designed and will be implemented jointly by the Department and consultants. The Department has provided the overall direction to the development effort. District Offices have actively participated in defining the requirements

of the system and have also helped to design it.

The staffing for this multi-year project involves 40 percent Department personnel and 60 percent consultant personnel. About half of the Department's staffing for RMS includes employees from the Districts and the other half are from Central Office.

The consultants have been responsible for performing the systems analysis work and developing end products. The Department has provided direction to the project and made decisions at key milestone points.

What are the benefits of the systems and what will they do for the Department?

- **Plan further ahead:** With better and more extensive information about highway locations, characteristics and conditions, highway managers will be able to develop maintenance and rehabilitation plans that have greater range and are more dependable.
- **Better quality decisions:** Given complete highway information, easily accessed, highway managers can better answer the question, "Where and how should limited available funds be spent to achieve the greatest benefits to users of the highway network?"
- **Improved highway records keeping:** Through systems integration, the process of collecting, storing, main-

taining and retrieving highway information will be much more orderly and efficient; for example, data redundancies and input duplications will be eliminated.

- **Better reporting tools:** An automated straight line diagram (SLD) and an improved reporting language are examples of reporting tools that will enable Department personnel to make better use of the system. The automated SLD will eliminate much drafting and clerical effort, provide a graphic report that is always up-to-date and enable the Department to decrease reliance upon field markers.
- **Improved location reference capabilities:** The new Location Reference System will be easier to use and understand, more accurate, more stable and flexible and less expensive to install and maintain than the current legislative route system. In the future, the new system can support computerized mapping, satellite navigation and other emerging technologies.
- **Verified highway data:** The baseline verification process will establish complete, accurate records of highway mileage and such features as bridges, intersections, local road names, lane counts and interchanges.



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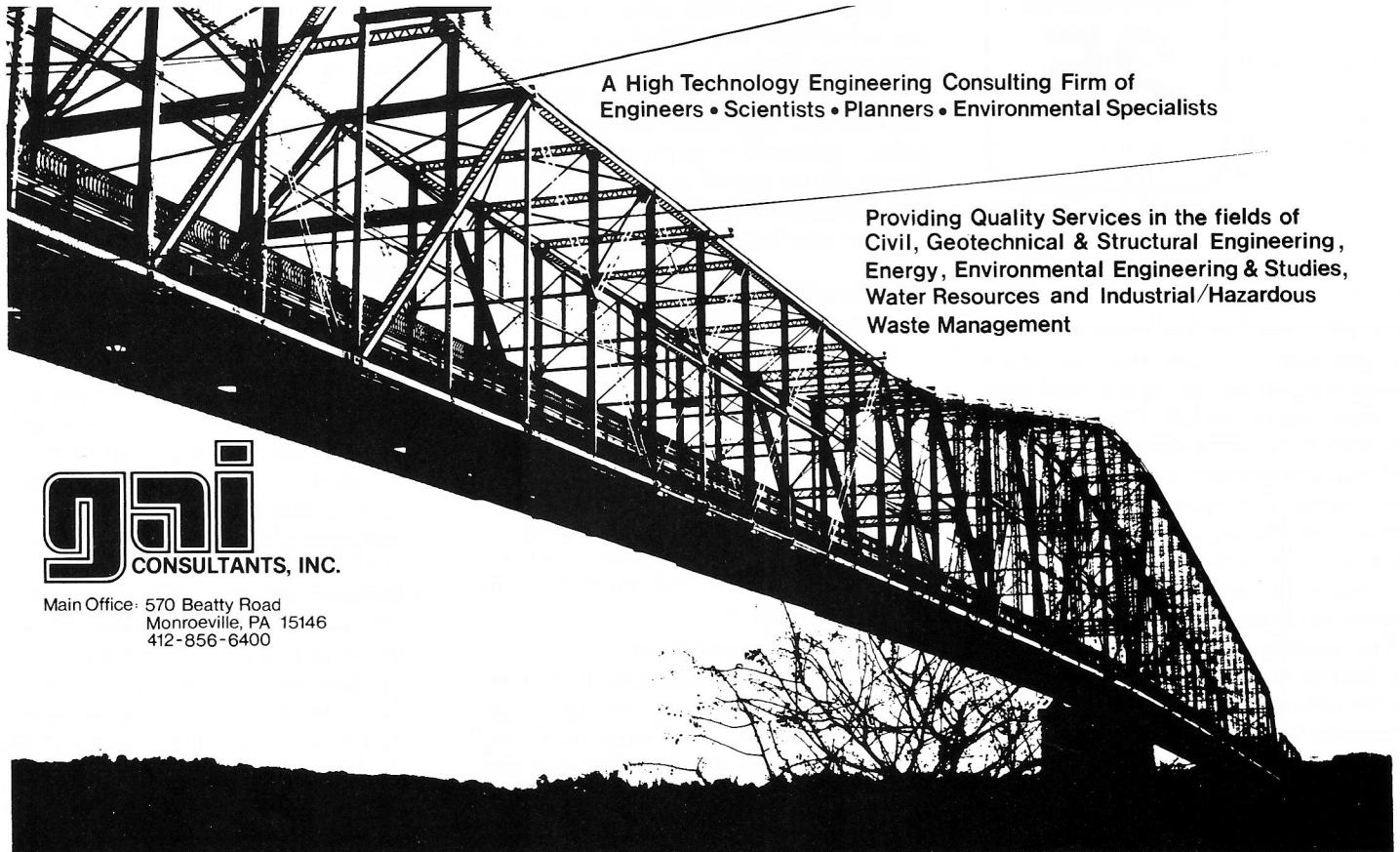
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Technical Bulletin

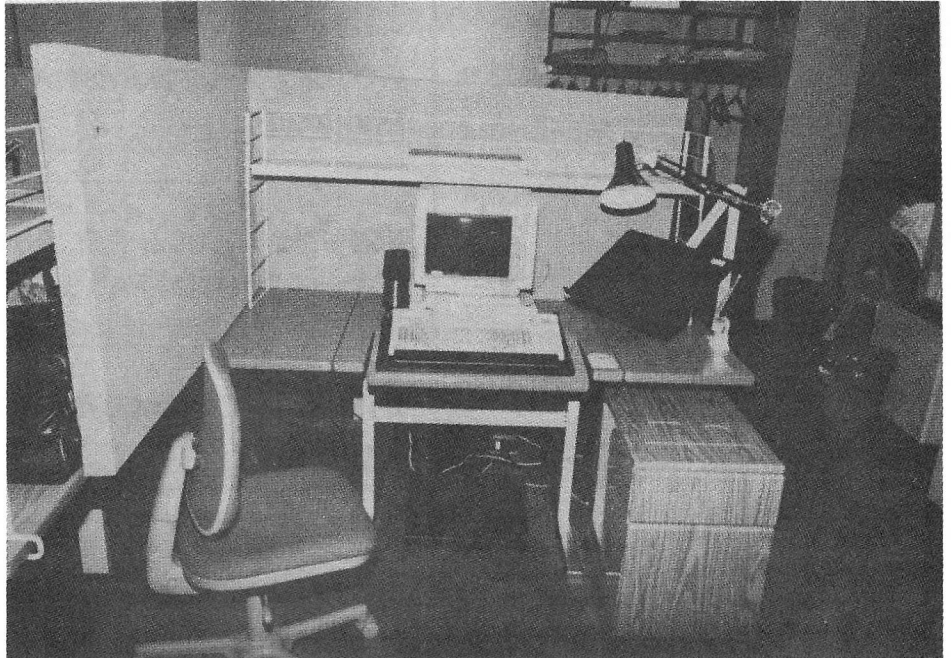
Video Display Terminals and Ergonomics

The Video Display Terminal (VDT) has allowed the Pennsylvania Department of Transportation (PennDOT) to access leading-edge technologies in accommodating modern day demands for better transportation services. Throughout the Department more and more individuals are using computer terminals in their daily routines.

As with all forms of technology, the VDT has its drawbacks. Concern for detrimental effects to worker health through continued use of the VDT prompted research into visual impairments, muscular problems, and various stress-related symptoms linked to extended use.

The Pennsylvania Department of Transportation responded to this research need by sponsoring a study of its data entry operations in the safety administration area. The prolonged and intensive VDT usage required by data entry operations provided an excellent environment for investigation. The primary goals of the research were to study and document health effects and to recommend changes which would upgrade the present environment to one specially designed for VDT usage.

A survey of departmental personnel was conducted to evaluate the current data entry operations and facilities. Because other states have successfully used this survey, the Department had a



A closeup of the ergonomic workstation showing desk, chair, storage units, task light, wrist rest, foot rest, document holder, glare screen and smokeless ashtray.

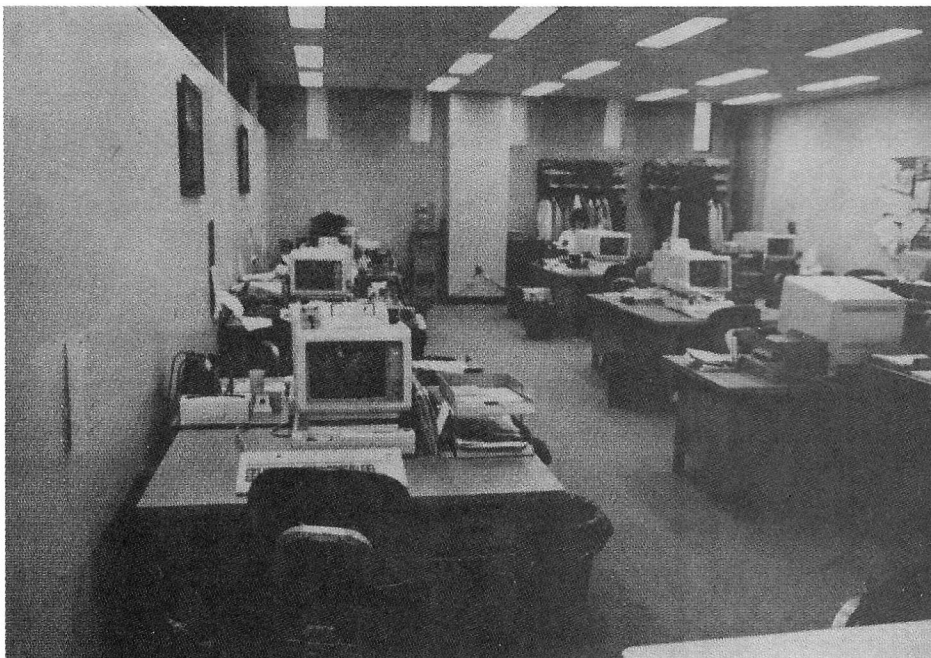
well tested means to gather information on —

- working relationships with the computer system
- document layout and flow
- desk, chair, and storage components
- air quality data

- overall work intrusion and organization activities
- general workspace layouts
- room and task lighting needs

Following the analysis of current operations, an experimental ergonomic (the study of the surroundings and relationships between man and technological machinery) unit was installed with 12 workstations. These workstations collected data and measured reactions of department personnel in the new modernized setting. New desks, chairs, drawer and shelf storage units, foot rests, wrist rests, document holders, and glare screens were installed to meet recommendations for ergonomic workstations and accessories. In addition, indirect lighting diffusers were installed in one-half of the available light fixtures and the remaining fluorescent tubes were completely removed. Numerous other features were included such as individual desk lights; a sound masking system and acoustic panels; plus a central ceiling fan, smokeless filtered ashtrays and air purification devices.

As a result of this innovative research, the Department can expect to see a return on its investment through a 20 % reduction in overtime, which will significantly reduce labor costs, a 6% increase



This picture shows Data Entry Unit 3 in the current environment.

in productivity, decreased worker absenteeism, and a decreased error rate.

These improvements will benefit Pennsylvania citizens through more efficient use of tax dollars and particularly through reduced errors in vehicle registrations. The study concluded that the introduction of specifically designed equipment and work environment enhancements will help to overcome the negative impacts of continuous VDT data entry.

Further information on this or any other Innovation Through Research and Technology Summary may be obtained by contacting the PA Department of Transportation, Office of Research and Special Studies, Technical Reference Center, Room 903 Transportation and Safety Building, Harrisburg, PA 17120, telephone number 717/787-6527.

Reference #84-16 — Ocular Discomfort, Musculoskeletal Difficulties, and Physiological Effects of Long Term Video Display Terminal Usage.

Researcher—KETRON, Inc.

Technical Bulletin New State-of-the-Art Report

The American Concrete Institute announces a new publication entitled "State-of-the-Art Report on Parking Structures".

Repeatedly, parking structures have strength, serviceability, and durability problems associated with their unique structural requirements and exposure to the elements. Many parking structures that are exposed to a deicer environment show early signs of corrosion, scaling due to cyclic freeze-thaw damage, and through-slab water penetration. Special considerations are discussed to address the problems resulting from design, construction, maintenance, and user practices. Methods used to evaluate conditions of existing structures are reviewed as well as the strategies for their future use. A breadth of maintenance, repair, and protection methods are discussed.

ACI 362R-85, "State-of-the-Art Report on Parking Structures," 1985, soft cover, 35 pages and available to ACI members for \$13.65 (nonmembers \$18.25). To order, contact the American Concrete Institute, P.O. Box 19150, Detroit, MI 48219.



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ACI To Publish Two New Journals

To keep pace with the tremendous growth in concrete information available for publication, the American Concrete Institute is responding with two new journals.

These two new journals will expand considerably the publishing power of the Institute and beginning in 1987 replace the existing **ACI Journal**. Entitled respectively the **ACI Structural Journal** and the **ACI Materials Journal**, these new publications will bring to the membership a vastly improved information capability.

The decision to retire the existing **Journal** and replace it with the two new journals was reached by the ACI Board of Direction as its recent meeting in San Francisco. It was felt that this action would expand the information available to members through the publication of more papers. By concentrating the new

journals into a structural journal and a materials journal, a member can choose, as part of his dues, whichever publication best satisfies his professional needs and avoid paying additional dues for information he may not require. The second journal would then be made available for a modest subscription fee. To provide maximum service to the membership, abstracts from each journal will appear in the other, with copies of each paper available upon request for a nominal charge.

In approving the two new journals, the Board emphasized that it was their intent, that the Institute will be affording more opportunities for authors to submit high quality manuscripts for publication.

The change to the new two journal concept will not affect **Concrete International: Design & Construction**, published monthly and included as part of the members basic dues.



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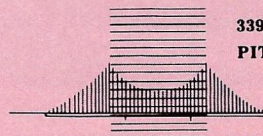
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Construction Definitions

AUDITOR - People who go in after the war is lost and bayonet the wounded.

BID - A wild guess carried out to two decimal places.

BID OPENING - A poker game in which the losing hand wins.

COMPLETION DATE - The point at which liquidated damages begin.

CONTRACTOR - A gambler who never gets to shuffle, cut, or deal.

CRITICAL PATH METHOD - A management technique for losing your shirt under perfect control.

DELAYED PAYMENT - A tourniquet applied at the pockets.

ENGINEER'S ESTIMATE - The cost of construction in heaven.

LAWYER - People who go in after the auditors and strip the bodies.

LIQUIDATED DAMAGES - A penalty for failing to achieve the impossible.

LOW BIDDER - A contractor who is wondering what he left out.

OSHA - A protective coating made by half-baking a mixture of fine print, split hairs, red tape and baloney...usually applied at random with a shot gun.

PROJECT MANAGER - The conductor of an orchestra in which every musician is in a different union.

STRIKE - An effort to increase egg production by strangling the chicken.

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