SCANNER

NEWSLETTER OF THE AMERICAN SOCIETY OF HIGHWAY ENGINEERS

August - 1996 - 3

PRESIDENT'S MESSAGE

By: David A. Greenwood, P.E.

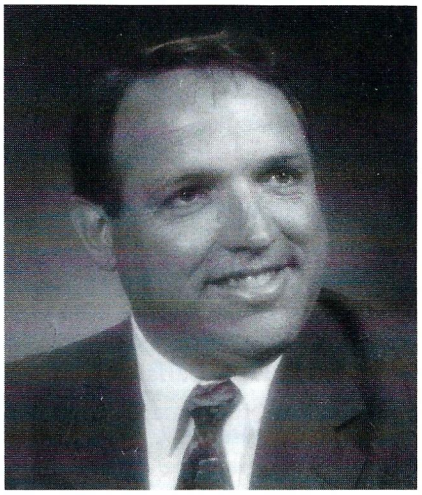
This coming year will be one of transition for the American Society of Highway Engineers. To accommodate the continued growth and geographic expansion of the last several years, the Society will implement the recently approved reorganization plan, providing balanced representation for all 29 sections through a regional restructuring overseen by 9 national directors. Regional boards will be developed, encouraging communication and information exchange at that level. I will work to ensure the success of the reorganization plan for existing and new sections during the next year.

The growth of and support for ASHE over the last eight years has truly been impressive. For example, this year's National Conference was held in Orlando, Florida, sponsored by the Orlando Section of ASHE. I had the pleasure of helping in the formation of this Section just a few short years ago. The members and families of the Orlando section are to be commended for their time and effort in planning and running such a successful conference.

The founding of the Orlando Section came in the midst of a number of new sections in recent years. Since 1988, we have added 10 new sections in 7 states, both existing and new section states. As a result, we have doubled the number of states in which sections now operate. We are excited about the preliminary formation of several other new sections located in South Carolina, Georgia, Florida, Texas and Missouri.

We are truly evolving into a National Organization. With evolution, expansion and continued growth come the challenge and need to evaluate potential change in the way we do business at National. Growth and change are key words for the future of the Society - both can be good and necessary if properly planned.

In addition to the reorganization plan there will be several other "firsts" for the Society. The *SCANNER*, our "keystone", linking all of our members together through a professional newsletter medium, will be published by Wanner Associates, an association management services company. We have spelled out the terms and criteria for the production of the *SCANNER* and will monitor its progress during the coming year.



The Board will provide a thorough review of the constitution and by-laws by an outside firm. The first major/complete review since the Society's inception, it will ensure conformance with current legal and ethical policies, the Society's incorporation, its continued growth, bringing ASHE "in-line" with other professional/ technical societies.

The new year also will bring the first complete update and revision to the Society's *Operating Manual,* first published in 1991. Involving a cover-to-cover review of the policies and procedures of the Society for both existing and new sections, this will be a major undertaking and will serve ASHE well for future operations.

Finally, the implementation of our new *Long Range Plan for 1997* will take us through the turn of the century, the year 2000. The organizational structure of ASHE has been likened to partnering, bringing all elements of the highway industry together to discuss mutual transportation project and program issues. We must take every opportunity to use this forum in concert with the long-range plan to confront the issues that lie before us.

We are on the brink of a new millennium, poised to address these important challenges. With the assistance of my fellow board members and associates, and you, the membership-at-large, I look forward to meeting these challenges head-on to ensure the continued success of the Society. ■

Delaware Valley Section invites ASHE Members and their families to the 1997 National Conference May 15-17, 1997, Valley Forge Sheraton Hotel, Valley Forge, Pennsylvania.

SCANNER NOTICE

The National Board has approved Wanner Associates, Inc. fot the contract services to produce and distribute the ASHE SANNNER beginning with the Fall Issue in November, 1996. Wanner will be the editor and all future materials such as articles, advertisments and section information should be sent to:

Robert Peda - Managing Editor
c/o Wanner Associates, Inc.
908 N. Second Street, Harrisburg, PA 17102
Phone - (717)-236-2050 • Fax - (717) 236-2046

NATIONAL BOARD NEWS

The National Board met for a transitional board meeting on June 7, 1996, in New Stanton, PA. National President Thomas J. Haslett, P.E. presided over his last official board meeting thanking all for a successful year. He turned the meeting over to incoming National President David A. Greenwood, P.E. to conduct the meeting beginning with the new business. The incoming National Directors were present for ASHE's first meeting under the new Regional Reorganization Plan. The following are highlights of the committee reports and actions.

NEW SECTIONS COMMITTEE:

Cooper Curtis reported that **Jacksonville, Florida** is moving toward chartering a section in July or August of this year. also, much interest in the **Fort Lauderdale** area may result with a charter in early 1997. **Tallahassee, Florida** will likely charter a section in early 1997. Robert Pearson will approach Atlanta, Georgia once again in the Fall and will continue to work with officials in the Dallas/Fort Worth area.

CONSTITUTION & BY-LAWS:

Chairman Frank Bush reported on activities being pursued to establish a possible student section with the University of Delaware. Currently student scholarships are offered by many ASHE sections and interest is growing to establish a student section by the Altoona Section and in the Florida sections of ASHE. The Constitution & By-Laws and Membership Committees will pursue development of guidelines for student membership.

Robert Yeager discussed the need for a legal review of ASHE's Constitution which originated in 1958 with few revisions since then. The purpose of the review is to assure compatibility with laws, to refresh the language and address possible oversites. The Board approved a motion to hire legal counsel to perform this review.

CONVENTION:

Conference 96: Cooper Curtis provided a report on final progress being made for the National Convention in Orlando. In order to boost DOT membership in Florida, free membership registration is being offered to DOT employees who register for the Convention.

Conference 97: Pat Dougherty invited the National Board to conduct its October meeting at the Valley Forge Sheraton which is the site of the 1997 Conference to be held on May 15, 16 and 17, 1997. Many corporate sponsors have been committed and PennDOT is asked to coordinate regularly scheduled meetings in Valley Forge at the time of the Conference to boost DOT attendance. also, CEU's will be available for participation in the technical program.

TECHNICAL/SCANNER:

Chairman Robert Peda reported on the Committee's results of adding nearly 200 DOT officials to the non-member mailing list to expand distribution of the *SCANNER* to increase public relations for ASHE.

ASHE's new association management services firm will begin publishing the *SCANNER* with the Fall issue. A *SCANNER* editing committee consisting of Sandra Ivory, Robert Peda and Al Kozel, Jr. will coordinate publishing of the *SCANNER*. The Board favored an upgrade in the ad structure and requested the committee to make recommendations as to size and cost of ads.

EXECUTIVE DIRECTOR:

Chairman Michael Martin discussed details of a two-year contract to hire Wanner Associates, Inc. to provide association management services consistent with the three-year plan approved by the Board at its April meeting. Wanner Associates will begin publishing the *SCANNER* with the Fall issue and investigate non-profit bulk mailing and additional sponsorship of the *SCANNER*.

A motion was made and passed to authorize President Haslett to sign the contract. Michael Martin expressed many thanks to all who worked in this effort to further enhance the ASHE organization.

LONG RANGE PLAN:

Chairman Pasquale Dougherty distributed copies of the **Long Range Plan 1997-2000** as approved by the National Board at its April meeting. The plan will be distributed to all members by inclusion in the **1996-97 National Membership Directory.** ■

CENTRAL OHIO ASHE SPRING SEMINAR

Submitted by: Angela M. Christo, P.E., ASHE - Central Ohio Section

The Central Ohio Section held its second annual Spring Seminar on March 28, 1996 in Columbus, Ohio. The seminar titled "Road Map Through ODOT's New Transportation Development Process" was sponsored by ASHE in cooperation with the Ohio Department of Transportation (ODOT) and the Federal Highway Administration (FHWA).

The one day seminar was attended by 100 people, members and non-members, representing consultants, County engineers, municipal engineers and other transportation professionals from across Ohio. The seminar provided an opportunity for transportation professionals to obtain an overview of the changes in the Transportation Development Process (TDP) from both ODOT and FHWA.

The TDP establishes standards for statewide, regional and local transportation system development. Basic elements included in the decision process include: best accepted engineering practices, multi-disciplinary expertise, consideration of alternatives, public involvement, the public hearing, and evaluation and decision making.

Some topics of the seminar included:

- The importance of the Transportation Development Process.
- Additions and deletions to the TDP
- How to successfully steer a project through the process and a review of the new flow chart.
- Scope of services/consultant agreements.
- Understanding ODOT's new project selection process.
- Public involvement and public hearings

The new TDP process seeks to deliver products on time, improve efficiency, deliver balanced transportation decisions, address public concerns and needs, and be flexible in addressing project changes. While accomplishing these tasks, it also needs to be responsive to government and community needs and respond to social, economic and environmental concerns.

Each seminar participant received a copy of the new TDP manual. The seminar provided an excellent opportunity for cooperation between ASHE, ODOT, and FHWA to bring current issues and professional development opportunities to the engineering community. ■

ROBERT L. BROWN MEMORIAL SCHOLARSHIP AWARDED

Robert Brown Memorial Scholarship Award Dinner - May 21, 1996. From left to right: Bob Donovan, Gloria Brown and Adam Sawyer.

The East Penn Section of the American Society of Highway Engineers at its recent monthly dinner meeting awarded a scholarship to Adam M. Sawyer of Reading, Berks County, Pennsylvania.

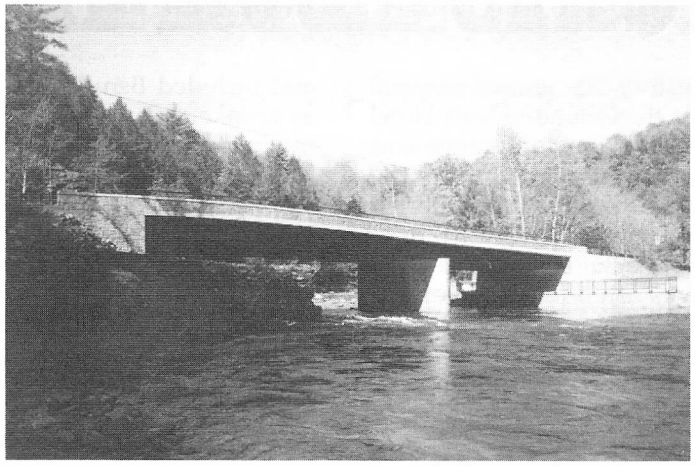
The scholarship was established in honor of the late Robert L. Brown in appreciation of his many years of friendship and dedicated service as one of the founding members of the East Penn Section in 1965.

This year's recipient, Adam M. Sawyer, is a senior at Exeter Township Senior High School in Reading. His achievements as a student not only includes high academic performance, ranking third in his class of 250 but also as a student athlete in track and cross country and captain of the cross country team and as a student leader serving as vice-president of his class and vice-president of the National Honor Society. He has been the recipient of many student honors such as the American Legion Award and the Gold Eagle Academic Award in grades 9 through 12. In addition he works in his spare time at McDonald's as a crew trainer. Adam will attend the United States Military Academy at West Point beginning in July.

Adam accepted the award from Gloria Brown, widow of the late Robert L. Brown. ■

WORLD'S END STATE PARK BRIDGE REPLACEMENT

Pennsylvania's State Parks are favorite recreational areas for many people. Accommodating visitors while preserving the natural environment has always been a concern. Fortunately, eco-friendly engineering is available. Larson Design Group, Inc. (LDG) was retained by the Pennsylvania Department of Transportation (PennDOT), to provide engineering studies, design, and construction consultation for the replacement of a much-used bridge across Lycoming Creek in the World's End State Park. Susquehanna Supply Company was awarded the contract for construction of the bridge. The study requested by PennDOT was to conduct geological studies of the World's End State Park Bridge to determine the stability of the existing rock mass supporting the abutments. The study concluded that the rock mass was not in danger of an immediate failure; however, the continued deterioration of the rock mass would seriously jeopardize the stability of the foundation and lead to a structure failure. Based on the results of the study, the narrow unsafe condition of the existing structure, and the detrimental impact on the community if the bridge would need to be closed, PennDOT decided to immediately initiate the design and construction for a new bridge replacement.



The World's End State Park Bridge. This structure was nominated for PennDOT's 1995 Excellence in Engineering Design Award.

The bridge is located within the boundaries of World's End State Park. Parking and swimming are immediately adjacent to one end of the structure. Also, the Loyalsock Trail, a popular trail for hikers, uses this bridge to cross Loyalsock Creek. Loyalsock Creek and this area of Sullivan County is visited by more than 150,000 people a year. It was apparent that the new bridge should be safe, aesthetically pleasing, and require the least amount of disturbance to the surrounding environment.

The existing alignment of the structure could not be improved due to the surrounding terrain and negative impact it would have on the park. To improve safety, the proposed structure was widened from 22 feet to 28 feet curb to curb with a four foot sidewalk on one side. The horizontal curvature was carried across the structure with the use of curved weathering steel girders. Both approaches to the structure were curbed to aid in improving the safety of the alignment.

To improve safety for the park users, a pedestrian ramp was constructed beneath the bridge connecting the parking and bathhouse facilities with the beach. This ramp was also designed to meet handicap criteria; thereby, making the beach handicap accessible.

To preserve and complement the existing landscape, several aesthetic treatments were used on the new structure. Formliners, stain, and grouting were used on the exposed substructure units and outside face of parapets. The formliners and stain were selected so they would simulate the existing stone walls adjacent to the beach area. All of the aluminum bridge rail and handrail for the pedestrian ramp was anodized a dark brown color. The area of disturbance to the park was held to a minimum during construction, and the park facilities remained open during construction.

Due to the sharp degree of horizontal curve on the near half of the structure, curved plate girders were selected for the superstructure. To provide an economical steel section and an accurate analysis of the beams and cross bracing, a three-dimensional finite analysis was utilized that could model the curvature of the bridge.

To prevent future stream scouring of the rock mass that initiated the urgency of this project, the new stub abutment was set back approximately 20 feet behind the location of the existing abutment. This location was determined to be beyond the safe failure plan of the existing bedrock. Also, as an added measure, a concrete jacket was constructed along the base of the rock mass beneath the structure. This jacket serves to provide protection from the streams eroding force. Formliners and stain were also incorporated into this jacket.

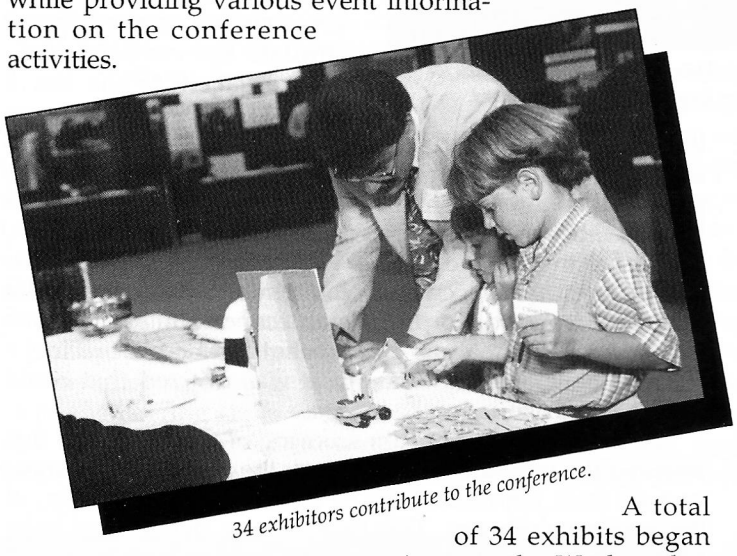
Time was of the essence for this project. The design and preparation of the construction plans and specifications was completed in four months. This included the environmental clearance and all the necessary permits required. The construction of the new bridge had to be completed and open to traffic in 5 months, as traffic had to be detoured 20 miles, including school buses from the local school district. Due to excellent construction practices, the bridge was opened to traffic five weeks ahead of schedule.

This project is an excellent example of cooperation. The common goals of the project were held foremost, resulting in the design and construction of a new bridge, with minimum impact on the environment and improved use to visitors, that was completed in ten months. ■

HIGHLIGHTS FROM THE 1996 NA

For the first time in ASHE history, the annual national conference was held in Florida at the Orlando Hyatt Hotel from June 26-29, 1996. The theme of the conference was "Transportation Challenges Planning for the Future. " The conference drew 399 attendees from 15 states and reflected attendance by 20 of 27 Sections.

Attendees began arriving on June 26 for the conference and evening icebreaker that was attended by over 125 members and guests. Registration Chair, Howard Russell, Financial Chair, Al Jenkins, and Publicity Chair, John Murphy were ready to receive the attendees (and their money) while providing various event information on the conference activities.



34 exhibitors contribute to the conference.

A total of 34 exhibits began preparations early Wednesday morning, to ready their displays in the exhibit hall to host the icebreaker. Exhibit Chair, Ken Atkins, was on hand to direct the efforts of the many exhibitors representing a broad cross-section of the highway services and support industry.

Evening entertainment at the icebreaker was provided by a roving magician and Steve Ferrell, who also served as Golf Outing Chair. Participants were invited to receive signatures from at least 10 exhibitors in order to be eligible for the door prize.

Convention Chair, Greg Smith opened the 1996 Conference on Thursday morning and introduced President, Tim Haslett to conduct the Annual Meeting. Delaware Valley Section won the attendance award. Almost 100 individuals were in attendance for the opening session.

Osceola County Chairman, Charles Owen formally welcomed everyone to Central Florida and read a proclamation from Florida Governor, Lawton Chiles, recognizing June 23-29, 1996 as American Society of Highway Engineers Week. Nancy Houston, District Secretary for the Florida Department of Transportation, District 5, gave the Keynote Address on a broad range of subjects covering the highway industry and elicited a number of questions on innovative programs being undertaken by FDOT.

Program Chair Leila Nodarse assembled an outstanding technical program which began after the morning break. Two concurrent technical sessions were held that morning, featuring discussions on GIS Technology and Construction Partnering. The GIS session was moderated by Al Jenkins and included Ben Breedlove, Troy Russ, and Larry Minor as speakers. The session on Construction Partnering was moderated by Peter Markham and included Greg Xanders, Michael Bougher, Stephen McGucken, Harvey Armstrong, Karl Trewick and Allan Strickland as speakers.

The morning's activities also included a tour of historic Winter Park that was organized by Spouse Event Chair, Sandy Winkler. A few others were additionally seen leaving the hotel for area attractions and golf courses.

Rusty Sievers, President of ASHE's Central Florida Section, served as Master of Ceremonies for Thursday's luncheon. Kenneth C. Afferton, P.E. was honored as the Society's Man of the Year for 1996. Mr. Afferton recently retired as Assistant Commissioner for Design and Right-of-Way for the New Jersey Department of Transportation and provided a thought-provoking discussion of changes in the highway industry observed from his 33 years of experience.

Following Mr. Afferton's remarks, Gene Skorpowski from Florida Overland Express (FOX) gave an intriguing presentation on the efforts by their organization to bring high-speed rail to Florida. The FOX consortium has won the franchise in this state to build high-speed rail facilities connecting Tampa, Orlando, and Miami within the next ten years.

Following the luncheon, attendees divided among the afternoon's technical sessions and a tour of the electronic toll systems at Osceola County's and Orlando-Orange County Expressway Authority's facilities. Approximately 17 individuals received a fascinating tour of the latest high-tech automated toll collection systems utilized by both agencies to process vehicles quickly and efficiently with less employees.

The afternoon's technical sessions featured discussions on New Construction Materials and Techniques, Intermodal Facilities, ISO 9000, and State of the Art Bridges. The session on new Construction Materials was moderated by Leila Nodarse and included Jim Musselman, Robert Jones, and Randy West as speakers.

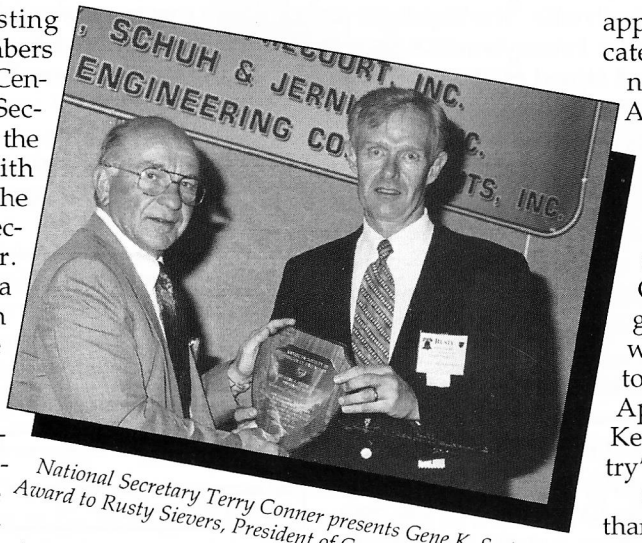
The session on Intermodal Facilities had as speakers, John Barr, Myrna Valdez, and David Shen. The session on ISO 9000 was moderated by Bill McDaniel and included William Hayden as the featured Speaker. Jim Barker moderated several fine presentations on State of the Art Bridges which included Brett Pielstick, Michael Waddell, John Corven, and Raymond McCabe as speakers.

Thursday's activities culminated with the Past President's dinner that was arranged by Entertainment Chair, Luis Munoz, Cooper Curtis, Sponsor Chair and National ASHE Director, served as Master of Ceremonies for this dinner that had over 120 members and quests in attendance.

Ten past presidents were present and recognized at the evening's dinner including James Barnicle, James Weaver, Sr., Robert Yeager, John DeRoss, Gene Smith, Dixon Early, Stephen Lester, Sam Callisto, Roland Nesslinger, and Raymond Petrucci. National ASHE President Tim Haslett introduced each individual and provided these distinguished leaders the opportunity to say a few remarks about their profession and ASHE as well as some extraneous comments that will go unmentioned here.

IONAL CONFERENCE IN ORLANDO

After posting 59 new members in 1995, the Central Florida Section received the Gene K. Smith Award, for the second consecutive year. The Tampa Bay Section received the George K. Hart Award for the highest percentage increase in membership. The evening concluded with music and entertainment.



National Secretary Terry Conner presents Gene K. Smith Award to Rusty Sievers, President of Central Florida Section.

Friday's opening technical sessions included presentations on Public-Private Opportunities and Automated Highway Systems. The session on Public-Private Opportunities was moderated by Howard Russell and included Larry O'Dell, Charles Sukanek, George Figuerido, Nicholas Pope, Kenneth Stokes, Kendell Keith, an Max Crumit as speakers. Michael Martin moderated the session on automated Highway Systems and also provided a presentation on this subject. Other speakers during this session included Richard Bishop, James Rillings, and Harry Campbell.

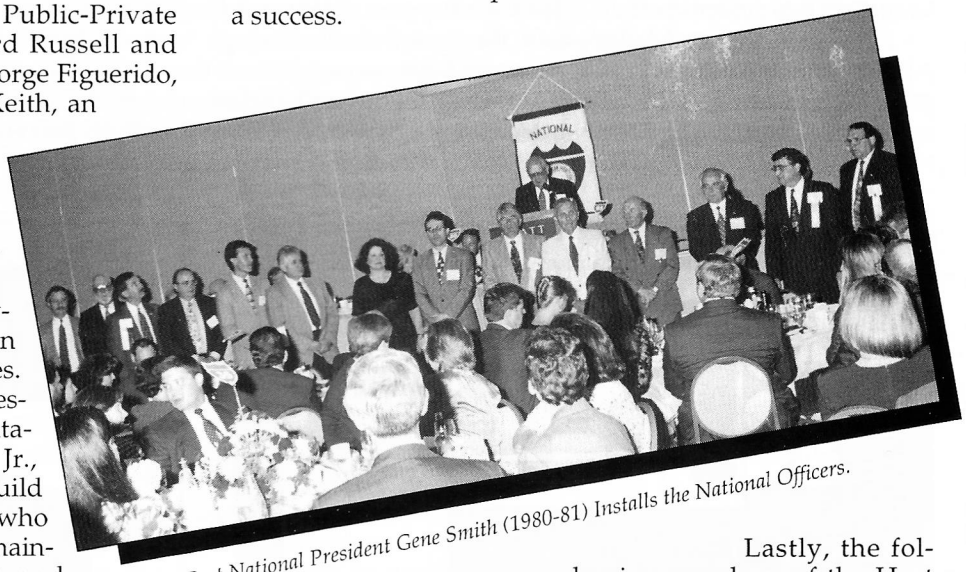
The remainder of Friday morning's activities included two more technical sessions on Metrication and Design-Build Opportunities. Glenn Forrest served as moderator for the session on Metrication which included presentations by Fred Faridazar Austin Skromme, Jr., and Geoff Scales. The session on Design Build Opportunities was moderated by Jim Vick, who also served as one of the speakers. The remainder of the presenters were Richard Bean and Lynn Kendrick.

Following lunch, members had their choice of taking a construction tour of Seabreeze Bridge in Daytona Beach or attending the last technical session on Computer Technologies for Highway Design. Rusty Sievers moderated this session which featured Keith Hogsed, Jane Caldera, John Zegeer, and Elford Jackson as speakers.

On Friday night, the Annual Banquet was held with Greg Smith, Conference Chair, serving as Master of Ceremonies for approximately 220 in attendance, Roland Nesslinger dedicated a toast to the membership. Other highlights of the night included the formal introduction of the National ASHE Board with Tim Haslett passing the gavel to David Greenwood as President and also, the introduction of the Central Florida Section Board with Susan Gratch taking the reins as Section President.

For those able to rise early on Saturday morning, members had their choice of the golf tournament at The Oaks Golf Club, a tennis tournament at the Hyatt. The golf tournament was won by the team from Greiner, while Joanne Wiles, Robert Berkowitz, and Ed Addicks took top honors in their class from the tennis tournament. Approximately 35 members and guests traveled to the Kennedy Space Center for a fascinating tour of our country's only space port and its facilities.

On behalf of the Central Florida Section, we wish to thank all those that attended in 1996 conference in Orlando and we hope that all of you will return to the Orlando area in the future. We especially wish to thank the many sponsors and advertisers that donated significant monetary and other resources to help make this conference a success.



Past National President Gene Smith (1980-81) Installs the National Officers.

Lastly, the following members of the Host Committee should be recognized for their help and contributions without whose assistance this conference could not have been possible:

Conference Chair- Greg Smith
Registration and Reception - Howard Russell
Entertainment - Luis Munoz
Golf Outing - Steve Ferrel
Program - Leila Nodarse
Spouse Program - Sandy Winkler
Financial - Al Jenkins
Publicity/Advertising - John Murphy/Rusty Sievers
Exhibits - Ken Atkins
Sponsors - Cooper Curtis

Past National President Tim Haslett (1995-96) received a plaque from National President Dave Greenwood.

Our best wishes go out to the Delaware Valley Section for the 1997 National ASHE Conference. We hope to see y'all there. ■

RECORD ATTENDANCE FOR PADOT SECRETARY

1995-96 Delaware Valley ASHE Section President Jim Pease (left) and 1995-96 Philadelphia ASCE Section President William Richards (right) at the January 17, 1996 ASHE/ASCE Joint Dinner Meeting in King of Prussia, Pennsylvania.

Attendance at the Delaware Valley Section's ASHE meetings has skyrocketed this past year despite the continued scarcity of highway lettings in southeastern Pennsylvania. The highlight of this year's meetings was a January 17th presentation by Pennsylvania's Secretary of Transportation, Mr. Bradley Mallory. A record crowd of 350 people turned out to hear Secretary Mallory's talk on "Moving Pennsylvania Forward."

Secretary Mallory began his presentation with praise and thanks to PADOT employees and contractors for their tremendous efforts in clearing the Commonwealth's highways of the record breaking snowfall of the '95-'96 winter season. The storms, he said, pointed out the importance of unrestricted highway travel and how, in our everyday lives, we take for granted this mobility.

The main theme of Secretary Mallory's talk, however, focused on the current poor status of Pennsylvania's roadway funding which is reducing and/or delaying such sorely needed road projects as Routes 202, 309, and the I-95 and Mon-Fayette Expressways. The Secretary discussed the controversial, proposed gas tax as being a main step in curing Pennsylvania's road woes. He stressed the importance of the Commonwealth's House and Senate both agreeing on a gas tax plan that Governor Tom Ridge could support. Secretary Mallory strongly urged our members and guests to contact their elected officials for their support of increased highway funding.

Finally, Secretary Mallory told the crowd that, although he and District 6-0 Administrator Andrew L. Warren were both non-engineers, they both have competent engineering staffs which will keep them free to administer to the Department and District. The Delaware Valley Section of ASHE wishes both Secretary Mallory and Mr. Warren continued success in their respective positions. ■

BURLINGTON COUNTY TRAFFIC CONTROL ENTERS THE 21ST CENTURY

By: Joseph M. Pavlik, Jr. PE, Burlington County Traffic Engineer and Beth Pover Angstadt, PE, Parsons-Brinckerhoff - FG

The Engineering Department for Burlington County, NJ will be installing a computerized Internal Closed Loop Traffic Control System that will interconnect 19 traffic control signals. The project goal is to reduce traffic delays, congestion and vehicle emissions, improve safety, monitor signal failures, improve maintenance operations, and collect traffic volume data. The County expects to expand the system to all of its 200 signaling devices.

Burlington County contracted with Parsons Brinckerhoff-FG, Inc. to perform the engineering design for this project. The scope of the project included collecting traffic data, surveying each intersection, feasibility reports for communication medium and system detectors, designing the Closed Loop System, and preparing contract plans and specifications. The project required the use of three traffic analysis programs: Transyt-7F, Passer II and the Highway Capacity Software. These programs were used to establish background cycles, maximize through-band and provide a good intersection Level-of-Service.

The Closed Loop System is comprised of three major components: the Traffic Signal Controller, On-Street Master, and Central Computer. These three components must have a good communications medium to make the system operational. A feasibility report was required to evaluate the various types of media.

Another critical link is system detectors. System detectors provide real-time traffic volume data to the On-Street Masters. This allows the Closed Loop System to perform as a vehicle-demand operation, permitting the signals to vary the background cycles based on real-time traffic volume. A feasibility report was also required to evaluate the various detectors.

The communication media report evaluated the use of twisted pair copper cable, fiber-optic cable, leased lines, UHF radio band, trunked radio system, spread spectrum radio, microwave radio, and satellite radio. The twisted pair copper cable and fiber-optic cable each require the installation of conduit between each communication node. This escalates the cost quickly, especially in areas where the nodes are in excess of 1,500 feet apart. The twisted pair cable provides limited data transmission speed. The fiber-optic cable provides unlimited transmission speed. These media are susceptible to damage by anyone performing excavation work, and they do not offer much flexibility for changes and expansion. The annualized costs are approximately $104,000 for each type.

Leased lines require a third party to maintain the medium. The initial costs are relatively low; however, there are monthly charges for system maintenance. As more intersections are added to the Closed Loop system, the monthly charges increase. This is a disadvantage for a government agency under pressure to keep annual operating costs down. This medium provides flexibility for changes and expansion. The annualized cost is approximately $27,300.

Radio frequencies have many disadvantages, such as FCC licensing, a clear line of sight between nodes, frequency interference in congested areas, and expansion difficulties due to additional licensing requirements. A trunked radio system takes several minutes to obtain a channel. Both of these media were deemed inappropriate

Spread spectrum radio is a relatively new technology in the commercial market. This medium does not require FCC licensing. The technology was first introduced by the military because it resists jamming and is difficult for enemy to intercept. This provides an advantage in urban areas where frequency interference is common. The spread spectrum radio can bypass interference due to a method known as "frequency hopping". The radio continually transmits over a range of frequencies, normally between 902-928 MHZ, to provide clean data.

The power output of spread spectrum radio is limited to one (1) watt. This limits the transmission range to 5 miles, depending on line of sight. The most critical design parameter for installing spread spectrum radio is to insure a proper line of sight between nodes.

The data transmission of spread spectrum radio is limited to 2200 bps. This is not acceptable for an IVHS system; however, it is fine for the Closed Loop System. Since Burlington County does not intend to expand its system, this limitation is not a problem at this time. This medium provides a lot of flexibility for changes and expansion. The annualized cost for spread spectrum radio is approximately $22,700.

Microwave radio provides a high capacity transmission of data at a high rate of speed. The difficulties of microwave radio are the need for licensing, fade-out caused by atmospheric changes or long distances, and the requirement of towers to install antennae. This alternative was deemed inappropriate.

Finally, satellite radio was explored. This medium provides the finest of communication devices; however, at an annualized cost of $760,000, it was determined to be too costly.

PG-FG recommended spread spectrum radio as the communications medium. Burlington County conducted several site inspections to evaluate an existing spread spectrum radio system in Georgia. The results found this medium dependable and cost effective. Therefore, spread spectrum radio will be the communications medium.

The detector technology report evaluated the use of inductive loops, microloops, magnetometer, ultrasonic radar, microwave radar, active and passive infrared, and video image processing. The inductive loop detector is the most commonly used loop detector in the USA. They are sawcut into the pavement area needing detection. Their advantages include an excellent pulse and presence detection, they do not fail in severe environmental conditions, and familiarity to contractors and County maintenance workers. The disadvantages are that they are difficult and time consuming to install, difficult to maintain, their installation disrupts traffic, and they reduce the pavement strength.

The use of microloops, ultrasonic radar, and active/ passive infrared were eliminated because they do not perform the proper functions required for the Closed Loop System. The video image processing equipment was deemed too costly for an isolated detector site.

The magnetometer is a probe which is installed in a drilled hole in the pavement. A lead-in cable is inserted in a sawcut back to the edge the roadway. This device has the same advantages and disadvantages as inductive loops except that the

Continued on page 11

As the Wheel Turns...

MARK E. LEWIS, P.E. NAMED PSPE'S 1996 YOUNG ENGINEER OF THE YEAR

At the sixty-second annual convention of the Pennsylvania Society of Professional Engineers (PSPE), Mark E. Lewis, P.E., was recognized as the Society's Young Engineer of the Year. Mr. Lewis is the Assistant Vice President/Regional Manager of the Gettysburg, PA office of Herbert, Rowland & Grubic, Inc. (HGR).

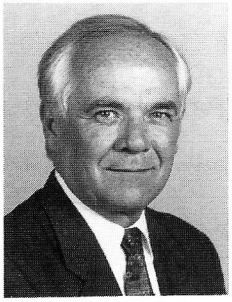
Mark has nine (9) years experience in the municipal and transportation engineering fields, and is a member of Harrisburg Sections of the American Society of Highway Engineers. He received his Bachelor of Civil Engineering degree with honors from Villanova University in 1987.

ASHE MEMBER NAMED ASCE CIVIL ENGINEERING MANAGER FOR 1996

The Philadelphia Section of the American Society of Civil Engineers has recognized Harry E. Laspee as its Civil Engineering Manager of the Year for 1996. the award was presentd to Mr. Laspee at the Annual Spring Social, which was conducted on May 3, 1996.

Mr. Laspee is a Project Engineer in the Transportation Division of Pennoni Associates of Center City Philadelphia. He is a 1979 graduate of Temple University where he received his Bachelor of Science degree in Civil Engineering and Construction Technology. He is a member of the Delware Valley Section of ASHE.

URBAN ENGINEERS, INC. NAMES VICE PRESIDENTS



Jim Charles has been named Vice President escalating his role and responsibilities for Computer Services De-partment and client relations in New Jersey. He has been with Urban Engineers for 22 years. He is a graduate of Villanova University and resides in Marlton, NJ. He is currently ASHE National 2nd Vice President and has been very active in ASHE, ASCE and ITE.

John E. McCann has been named Vice President exalting his role and responsibilities in the Construction Inspection Department. He has been with Urban Engineers for 8 years, and a previous NJDOT employee for 17 years. He is a graduate of Delaware Valley College and has an Advanced Certificate in Construction Technology from Rutgers. He is a member of ASHE and has been the Treasurer of the South Jersey Section since 1986. He resides in Cape May Court House.

GREENHORNE & O'MARA ACQUIRES ALLIGOOD AND ASSOCIATES

The Greenbelt, MD-based environmental and engineering firm of Greenhorne & O'Mara, Inc., has acquired Alligood and Associates, an engineering firm based in Raleigh, NC. Gil Alligood will serve as G&O's Raleigh Office Manager. ■

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BURLINGTON COUNTY TRAFFIC CONTROL ENTERS THE 21ST CENTURY

(Continued from page 9)

County maintenance workers are not familiar with this type of detector.

Microwave radar is an over-the-road detector. The advantages are that there is little disruption to traffic during installation, and it can be placed on the side of the road or in line with the lane it is detecting. The disadvantages are that locating the detector over the lanes requires a rigid structure for attachment of the detector, and locating the detector on the side of the road decreases counting accuracy and increases false detection. This detector is considered to be less accurate than the inductive loop and the magnetometer.

Parsons-Brinckerhoff recommended to use inductive loops as System detectors. The decision to use inductive loops is basically due to familiarity with the technology, providing the most accurate detector, and cost. Burlington County agreed with this recommendation.

Plans and specifications have been completed for the Internal Closed Loop Traffic Control System. The contract has been awarded and is currently under construction. The project is being funded by FHWA through the CMAQ portion of ISTEA. ■

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