



michiganite

SUMMER 1991

VOLUME XXVI, NUMBER 2

OFFICIAL PUBLICATION OF THE MICHIGAN SECTION OF THE INSTITUTE OF TRANSPORTATION ENGINEERS

PRESIDENT'S COLUMN

FROM THE DESK OF

Ken Tsuchiyama



The Economic Policy Institute of Washington, D.C. recently completed a study on the dramatic decline in public works spending in the last two decades. The study concluded that this decline was a major cause of the slowdown in productivity growth in this country. If the United States had maintained the same rate of spending on public works (as a percent of Gross National Product) as it did during the 1950s and 1960s, the following results were predicted:

- Productivity growth would have been 2.1 percent rather than the actual 1.4 percent.
- Average profit for nonfinancial corporations would have been 9.6 percent instead of 7.9 percent.
- Private investment in plants and equipment would have been 3.7 percent of private capital stock instead of 3.1 percent

The person who did the study, David Alan Aschauer, economic professor at Bates College in Lewiston, Maine, and recently a senior economist with the Federal Reserve Bank in Chicago, stated that "After four years or so, each dollar of public investment in infrastructure will raise private investment by 45 cents contradicting the notion that a dollar of public investment crowds out... private investment." The study also noted that public investment in infrastructure had declined between 1970 and 1990 from 3.7 percent of GNP to 2.4 percent.

A recent monthly report from the U.S. Department of Commerce confirms that the trend of decreased spending is continuing. Spending of construction dollars for infrastructure is down 13 percent in constant dollars from a year ago. The Associated General Contractors reported the loss of 597,000 construction jobs in the same period.

The reason I mention all these gloomy facts is simple. The U.S. Senate has approved a \$123 billion surface transportation bill covering fiscal years 1992-1996. The House is coming up with its own version and the two measures will head for the conference committee with a target date of September 30, 1991 when the current act expires. The House bill calls for \$153.5 billion in spending. A federal gas tax increase is sure to be part of the final package. The president of the American Road and Transportation Builders Association (ARTBA), T. Peter Ruane said, "While this funding level is still not adequate to meet the \$40 billion a year... necessary to meet highway and bridge capital needs, it is nonetheless a significant step forward." Incidentally, the \$40 billion estimate came from a U.S. Department of Transportation study which ARTBA got by filing a Freedom of Information Act request.

As transportation professionals we all know the serious needs our transportation infrastructure has. We all know how serious it can be to public safety and welfare to continue postponing addressing those vital needs. We also know what I repeated above: public investment in infrastructure is an investment in our country's productivity and we, as a nation, have been neglecting that investment for over twenty years. It seems obvious that it is good for the country to put people back to work on necessary jobs restoring our transportation infrastructure; that a gas tax increase in these days of oscillating pump prices will be accepted by most of the public if they can see the results; that transportation professionals should be in the forefront of those on the local scene who are giving the public the facts it needs to support the measures necessary to restore our transportation system to a major asset in our national endeavors to be globally competitive. Will **YOU** be among those leading the way?

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MICHIGANITE
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TREASURER'S REPORT

1. INCOME

Dues	\$ 262.00
Interest	29.36
Lansing/ Flint Meetings	1,000.00
Vendors Day	4,450.00
Voluntary Fund Contributions	4.00

Total Income \$5,745.36

2. EXPENSES

Postage	88.28
Postage - Vendor's Day	119.50
Vendor's Day Hall Rental	535.00
Vendor's Day Caterer	1,459.64
Vendor's Day Misc.	37.86
Michiganite	750.00

Total Expenses \$2,990.28

Balance as of July 18, 1991 **\$3,503.78**

Education Fund Balance **\$3,530.00**

Respectfully Submitted, Samuel Lawson, Jr.
Treasurer, Michigan Section ITE

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MICHIGANITE is published quarterly by the Michigan Section of the Institute of Transportation Engineers. It is distributed to more than 300 ITE members and over 100 cities and counties in Michigan. Address communications regarding the Michiganite to the Editor, Michael F. Kobran, 1312 Kings Coach Circle, Grand Blanc, Michigan 48439; 313/695-8942. Send change of address to: Barton-Aschman Associates, 27600 Northwestern Highway, Suite 100, Southfield, Michigan 48034-4704.

MICHIGAN SECTION ITE 1991 MEETING SCHEDULE

<u>DATE</u>	<u>LOCATION</u>	<u>HOST</u>	<u>COMMENTS</u>
9/22-25/91	Milwaukee, WI	International ITE	Annual Outing
10/17-18/91	Frankenmuth, MI	Walther, Kobran	District III Annual Meeting
11/14/91	Grand Rapids, MI	LaMourie, Haagsma	Lunch/Tech Session
12/5/91	Detroit, MI	Marson & Others	Section Annual Meeting

ITE District III Annual Meeting Spouse Tour Scheduled

Roger Walther, co-chair of the ITE District III Annual Meeting to be held in Frankenmuth on October 17-18, 1991, announced that there will be a **free** Volkswagon bus tour of Frankenmuth at 1:30 p.m. on Thursday, October 17th. The tour will depart from the main lobby entrance of the Bavarian Inn Motor Lodge, the site of the meeting, and will take 45 minutes. A friendly tour guide will introduce the Main Street shops, a glimpse of the Frankenmuth residential area and rich farmland, and historic St. Lorenz Church.

Those interested should sign up at the ITE registration desk. We hope to get a good turnout of members and spouses from the Michigan Section. Remember the registration fee for members includes breaks both days, the Thursday evening social hour with hors d'oeuvres and entertainment (cash bar), banquet with a Bavarian Festival dinner, and breakfast on Friday. All for \$40. How can you go wrong? The technical program appears elsewhere in this issue. Advance reservations are due by 10/10/91.

Liddicoat Joins Barton-Aschman

Neal K. Liddicoat, P.E., has joined the Southfield office of Barton-Aschman Associates, Inc. of Michigan. Since 1980, Liddicoat has been located in Barton-Aschman's Pasadena, California office where he was involved in a wide variety of projects for both public and private sector clients. Among the projects for which he served as traffic and parking consultant were the expansion of the Disneyland theme park; First Interstate World Center, the tallest office building west of the Mississippi River; California Plaza, a five-million-square-foot mixed use development containing office, retail, residential, hotel, and cultural uses; a proposed 70,000 seat stadium for the Los Angeles Raiders football team; and a master plan considering alternate future uses of Warner Bros. Studios in Burbank, California.

Michigan Section Voluntary Fund Donors as of August, 1991

The response to the newly created ITE Michigan Section Voluntary Fund was created by the Section Board for the purposes of:

- * Providing free attendance at Section meetings for student members;
- * Providing awards for student paper competition.
- * Providing assistance for defraying student costs to attend ITE or TRB national meetings;
- * Providing a student scholarship fund.

The following have contributed since the last *Michiganite*:

Terry L. Anderson	Brett R. Kach
Michael & Linda Labadie	Kenneth R. Tiffany
Paul F. Miller	

What we give of ourselves to those who follow us in our profession is a recognition of the assistance that we ourselves received and a commitment to our profession's future.

Rumble Strips Blasted!

Roger Walther sends in a clipping from the editorial page of a Florida newspaper which comes to the conclusion that the proliferation of rumble strips in the area (Panama City/Walton County) is a distinct liability to the public. The editors felt that rumble strips, meant to make roads safer, may actually have the opposite effect. Reasons given are swerving into oncoming lanes to avoid the strip, lessening of speeding vehicles ability to brake, the cost of the strips, and the cost of repairs to cars because of the strips. It seems that the public eventually is able to recognize bad ideas for what they are. What do they recommend as an alternative? **Signs.**

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New Members: Michigan Section I.T.E.

One new technical affiliate, one commercial affiliate, one student member and eight regular members were approved at the June and July 1991 Michigan Section I.T.E. Board meeting following a review of their applications. Some information about the new members is listed below as an introduction to the rest of the membership.

Terry Anderson is a supervising engineer for the Michigan Department of Transportation in Lansing. He lives in Williamston, Mich., and is a graduate of Michigan Technological University. Terry has his P.E. and has applied for membership in the International I.T.E.

John P. Arnot is the city engineer for Trenton, Mich., and is a graduate of Toledo University. He has a P.E. and is a member of the International I.T.E. John lives in Trenton.

Stanley R. Blackledge is a section manager for the Michigan Department of Transportation in Lansing. Stan has his P.E., is a graduate of Michigan State University and lives in Laingsburg, Mich.

Robert C. Davis is an airport planner for the Southeast Michigan Council of Governments in Detroit and also lives there. He is a graduate of the University of Cincinnati and is a regular member.

Mark A. Fayta is a Midwest regional sales manager for Saratec/Traffic, Inc. of Mundelein, Ill., and lives in Lake Villa, Ill. He is a commercial affiliate.

Sonny A. Judun is a transportation engineer VIII for the Michigan Department of Transportation in Lansing. He lives in E. Lansing, Mich., and is a graduate of Michigan State University. Sonny has his P.E.

Brett R. Kack is an engineer for the Michigan Department of Transportation in Lansing in the Traffic and Safety Division. He lives in Perry, Mich., and is a graduate of Michigan State University. Brett has passed his E.I.T. and has applied for membership in the International I.T.E.

Mary E. McClain is a technician for the Michigan Department of Transportation in Lansing. Mary is a technical affiliate and lives in Lansing.

Wayne Pikka is a transportation engineer for the Michigan Department of Transportation in Lansing. He lives in Lansing and is a graduate of Michigan Technological University. Wayne has his P.E. and has applied for membership in the International I.T.E.

Jeffrey A. Short graduated from Central Michigan University and is a Loss Control representative for Creative Rist Management Corporation of Mt. Clemens, Mich. He lives in Montrose, Mich., and is a technical affiliate.

Bradley Strater is a senior planner for the WBDC Group in Bingham Farms and lives in Auburn Hills. Bradley is a graduate of M.S.U. and is a regular member.

Eric J. Tripi is a student at MSU in East Lansing in civil engineering interested in highway design.

Welcome to I.T.E. and may your profession and your careers benefit!

Vendor's DayMay 2, 1991



Vicky and Lynne at the registration table



Stan Lingeman, MDOT



3M Traffic Control Materials Division
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Vendor's Day



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IDC Corporation
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Callendar & Dornbos, Inc.
Jeff Dornbos, Ed Mayo (Kzo Co.)



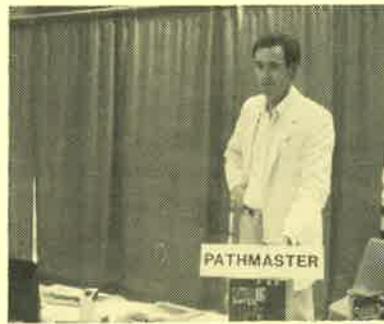
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Unistrut Corporation
Charlie Henton, Stacey Plenda, Glen Noble



Jack Doheny Supplies, Inc.
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Cliff Connolly



Energy Absorption
John Dvorak, Al Lariviere, Pete Pfeiffer



Carrier & Gable; Signfix
Jack Stone, Jim Harris, Rich Syakovich,
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Rick Mallon, Timothy DeWitt, Bill Lebel



Traffic Engineering Services, Inc.
Rich Syakovic, Earl Jarmol,
Dave Kowalske

Southfield, Michigan



Carrier & Gable, Inc.
Judd Doyle, Desi Strakovits, William Murphy



Traffic Control Corporation
Greg Walk, Steve Foreman, Jack McCleary



Traffic & Safety Control Systems
Rob Puhr, Tony Jaworowski



Service Instrument Inc.
Pat Costigan, Eric Maki, Gary Lewis



Rathco Safety Supply Inc.
Ron Dressander, Daniel Thompson



Saratec Traffic
Frank Spica, Dan Carrier, Mark Fayta



Microwave Sensors
John Somerville, Bob Hunter



Advantage Sign Supply, Inc.
James Novitsk



Michigan Barricading Equipment
Unknown visitor and Sandy Haines



Pave Mark Corporation
Carole Troxel



J.B. Products, Inc.
Clyde Marbry, Len Trzaskoma



Jack Doheny Supplies, Inc.
Sunny Jacob (DDOT), John Skryski

Student Papers: 1991 Section Winners

by Michael Kobran

Summaries of the three student papers that won the first three prizes in the 1991 Section competition.

The three winners in the 1991 Michigan Section I.T.E. student paper competition were announced at the July 18, 1991 technical session in East Lansing, along with a presentation of the papers and the awarding of \$100 and a plaque for first prize and \$50 for second prize. Bill Savage and Dave Merchant conducted the judging. The winners and summary of the papers follow. An honorary award was given in lieu of third prize because that person was ineligible for student membership in I.T. E. All the papers were submitted by Michigan State students.

First Prize Winner: Traffic Circles

First prize went to **Khaled Al-Sahili** of East Lansing for his work on "**Traffic Signal or Traffic Circles. Which is Better?**" Khaled explored the question of whether to use a traffic signal or traffic circle at a given intersection, a question which is a real issue in Europe, in the Middle East and South America, although not in the United States since the 1940's when they fell out of favor because of capacity problems. Traffic circles (also called roundabouts or rotaries) actually predate automobiles as a town circle common to many older cities in Europe which were continued by town planners in South America and on the eastern coast of the United States.

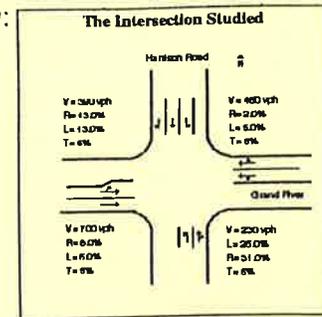
He discusses the priority concepts used in circles: the "nearside priority" (yield to the right where traffic drives on the right or left if otherwise) and the "off-side priority" (yield to the left where traffic drives on the right or left otherwise) and also the advantages and disadvantages. Studies in Paris, Seattle and other locations indicated that traffic circles significantly reduced accidents while Salem, Oregon was able to reduce motorist speed in residential areas.

Disadvantages include a larger area needed compared to signalized intersections and unsuitability for high traffic volumes (somewhere above 4000 vehicles per hour). Since the priority concept is not clear enough to present drivers, yield signs are necessary to prevent unnecessary delay.

The advantages of signalized intersections are the absence of confusion because of the clear assignments of right-of-way and the reduction of right-angle accidents. Disadvantages include an increase in rear-end accidents and a higher overall accident rate (although these are less severe).

An actual case study of the signalized intersection of Grand River Avenue and Harrison Road in East Lansing was done by Khaled using P.M. peak traffic counts and "NETSIM" to compare traffic operations for both the existing signalized

intersection and a traffic circle at the intersection. He enabled "NETSIM" to simulate a circle by assuming each entry as a multi-way yield control. The existing traffic situation is shown below:



The results of the analysis were considered favorable for the traffic circle by the author. As expected drivers travel a little longer distance around the circle as compared to a normal intersection, so the vehicle miles of travel are increased. The positive results were in 0.05 stops per vehicle compared to 0.64 stops for the signal and a higher average speed despite the lower speed used to simulate traffic motion (20 mph vs. 25 mph for the signalized intersection). The average vehicle delay was only 2.9 seconds for the circle compared to 14.03 seconds for the signalized intersection. Emissions and fuel consumption were also better for the traffic circle. The author concluded that traffic circles should be considered for the benefits stated as long as the traffic demand is below the capacity of the rotary which may be about 2,000 vehicles per hour.

Second Prize: Light Rail and Revitalization

Martin R. Kane, also of East Lansing, was the second prize winner with his paper on **Light Rail and the Revitalization of Communities**. Mr. Kane chose to look at the contrary forces guiding urban transportation today, the quest for cost effective and attractive transportation in our cities and the long love affair of our citizenry with the private automobile. The author has looked at three cities in North America that have been able to get people to leave their autos behind to see the reasons for their successes. The cities are Toronto, Ontario; Portland, Oregon, and San Diego, California.

At the end of World War II, when other cities in North America turned to freeway development, the leaders in Toronto decided to put their forced wartime savings into rapid transit development. Developers were forced to recognize the dedication of the government to the transit system and strove to locate office buildings close to transit hubs as the need for office space boomed. Some employers chose to subsidize transit usage by their employees because of the reduced need to provide auto parking. Land use planning was coordinated with transit planning and eventually, as the downtown area grew and expanded to where development costs became too high, alternate business centers were developed further out but close to the transit system.

The result is a transit system that recovers about 70% of its operating costs through fares collected with the remainder collected from business and property taxes. Unlike the U.S., the federal government of Canada does not provide any support for urban transit systems. Today, Toronto is working with developers on a growth management plan and to accommodate other modes through park and ride lots and coordination of bus systems with the rapid transit.

San Diego started operation of its trolley system between downtown and San Ysidro (adjacent to the Mexican border) in July of 1981 in response to increased congestion on the freeway system (20% was operating at level of service "F") and pressure to meet federal clean air standards. The city was able to purchase 108 miles of freight railway right-of-way for \$18.1 million.

The 16 mile San Diego to San Ysidro corridor was rehabilitated with new ballast and rail replacement. Another line was opened later to the east. Future plans call for a line to the north and expansion of the east line. In 1987 a one-half percent sales tax was voted in to fund projects with one-third going to transit improvements, one-third to local roads and streets and one-third to state roads.

The bus system has become part of a coordinated and integrated transit service. Originally built with just state and local funds, San Diego will also look for federal funding in the future.

The Portland Tri-Met light rail system opened in late 1986 after a ten year development period. It was developed in response to a resistance to building a freeway to serve the eastern portion of the Portland metro area. State and local jurisdictions worked instead on a balanced transportation plan incorporating a transit system with the highway system to serve the demand.

The City of Portland was concerned over the amount of pollution that would be caused by a diesel bus fleet and pushed for light rail. Once the outlying communities saw how light rail would help to manage growth, the project was assured. What has been surprising is the success of the system once it was in operation. Mr. Kane points out how the downtown Portland share of the retail market grew from 7% - 30%. Within 10 years \$30 - \$50 private dollars were invested for every public dollar spent on construction.

The operating costs of the light rail are lower than expected, being approximately one-half that of the operating bus system. Revenue recovery in the first year was 51% of operating costs versus 27% for the bus system. In 1990 the cost recovery rate was 52% with fare revenue covering about 30%, a payroll tax of 0.6% another 65% and state and federal grant monies the remainder.

The bus system has been coordinated to complement the light rail service. Park and ride lots are available outside of downtown. In the downtown area the system shares the streets with auto and pedestrian traffic. Signal coordination has been implemented to reduce movement conflicts among modes.

The Portland area has recently approved a bond issue to fund construction of a 19-mile segment of light rail to the west of downtown and commercial development has continued along the present rail route, recently surpassing the one billion dollar mark.

The author also briefly looks at some unpopular transit solutions including Miami, Florida's Metrorail system and Detroit's People Mover. The reasons for these transportation failures are discussed. The author's conclusion is that a light rail system is not a viable solution for many metropolitan areas unless the involvement of all the communities in the area along with the users is strong and continuous. He also cites the self-evident need to coordinate development and transportation planning.

Honorary Award: Simulating Peak Hour Volumes

Michael Goryl's paper focuses on the two newest warrants for traffic signals: **Warrant 10 (Peak Hour Delay)** and **Warrant 11 (Peak Hour Volume)**. His objectives were as follows:

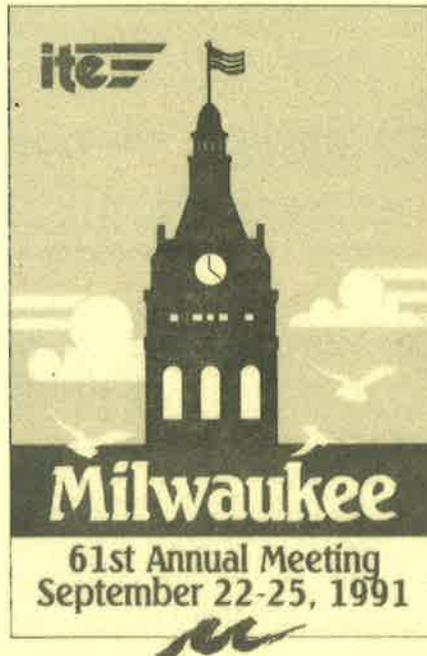
- Examining the intent of the peak hour warrants.
- Simulating traffic operations using warrant thresholds.
- Examining simulation results versus warrant intent.

The peak hour delay warrant requires total delay experienced by the minor street approach traffic (one direction only) controlled by a STOP sign to equal or exceed four vehicle-hours for a two lane approach with volume on the same approach equaling or exceeding 100 vph for one moving lane or 150 vph for two moving lanes. The total entering volume serviced during the hour must also equal or exceed 800 vph for four or more approaches and 650 vph for three approaches.

The second study was similar to the first except the volume splits on the major approach were adjusted to favor the northbound approach and the left turns on the minor approach were increased to 80% of the minor volume. The same ten simulations were performed for each of the ten data points.

The results showed that there can be extreme differences in vehicle delay for minor road approaches depending on the volume splits and turn percentages. The conditions in Study 1, representing the minimum threshold of Warrant 11, would only result in average delay equal to approximately one-third that required in Warrant 10. In the author's judgment, Warrant 11 may benefit from minimum delay requirement similar to Warrant 10. To rely on traffic volumes alone as guidelines may often produce delay characteristics lower than what would be considered excessive. For this reason, Warrants should be viewed as guidelines and be combined with knowledgeable engineering judgment and awareness of local conditions.

61st Annual Meeting of the Institute of Transportation Engineers



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**In Memoriam
Charles S. Michalski
1915-1991**

Charles S. Michalski died of a heart attack August 28, 1991 at the Tender Care Home in Traverse City. Mr. Michalski had retired in 1986 and moved with his wife from Milford to Traverse City, where he was a part-time traffic consultant.

A graduate of Wayne State University in electrical engineering, his career started in the 1940s as a junior traffic engineer in the City of Detroit. Between 1949 and 1952, he served as a chief engineer in New York City's Department of Traffic where he helped switch many of its streets to one-way operations. In 1952, Mr. Michalski moved to Chicago to join the Citizens Traffic Safety Board of Metropolitan Chicago. He returned to Metro Detroit in 1966 to join Red, Cool & Michalski Transportation Engineers in Southfield. During his career he worked on traffic projects in Johannesburg, south Africa and Kuwait City, Kuwait.

During World War II, Mr. Michalski was an officer in the U.S. Navy and earned a Bronze Star during the 1945 invasion of Okinawa. He was buried at Arlington National Cemetery in Virginia. Mr. Michalski is survived by his wife, a son, and two daughters.

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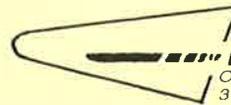
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**INSTITUTE OF TRANSPORTATION ENGINEERS DISTRICT III
ANNUAL MEETING PRELIMINARY PROGRAM AND REGISTRATION FORM**

October 17-18, 1991

FRANKENMUTH, MICHIGAN BAVARIAN INN LODGE

Thursday, October 17th

- 9:00-11:00 a.m. Directors' Meeting
11:00- 1:00 p.m. Registration
1:00- 1:05 p.m. **Danube Room**
Welcome and Opening Remarks - John C. Niehaus, P.E., Director, District III
1:05- 1:45 p.m. Funding Legislation and Issues - George Ostensen, Administrator, Michigan Division, FHWA
1:45- 2:15 p.m. Transportation and Economic Development - Lianna Zimney, Michigan Dept. of Commerce
2:15- 3:15 p.m. High Speed Rail
Ohio - Dr. Constantine Papadakis, Ohio High Speed Rail Authority
Michigan - Robert Kuehne, Michigan DOT
3:15- 3:45 p.m. BREAK
3:45- 4:45 p.m. Highway Safety and Tort Liability
Agency Viewpoint: from Ohio
Plaintiff's Attorney Viewpoint: John Kalo
Expert Witness Viewpoint: Elmer N. Burns, President, E.N. Burns & Associates:
4:45 - 5:00 p.m. District III Annual Meeting
5:00 - 6:00 p.m. **Courtyard**
Cash bar, hors d'oeuvres and entertainment
6:00 p.m. **Mosel/Rhine Room**
Frankenmuth Dinner

Friday, October 18th

- 7:30- 8:30 a.m. Buffet Breakfast (included in registration)
9:30- 9:15 a.m. Electric Car Development at General Motors Corporation
9:15- 9:45 a.m. IVHS Update - Robert Maki, Engineer of Transportation Systems, Michigan DOT
9:45-10:05 a.m. ITE Matters and Technical Council Activity - Jonathan E. Upchurch, International President
10:05-10:25 a.m. BREAK
10:25-11:10 a.m. Student Papers
Ohio - Speaker TBA, Ohio State University
Indiana - Paul Lombard, Purdue University, "*An Investigation between Highways and Economic Development in Indiana*"
Michigan - Khaled Al-Sahila, Michigan State University, "*Traffic Signals or Traffic Circles. Which is Better?*"
11:10-12:20 p.m. Clean Air Act Amendments
EPA - Steve Rauner, EPA Motor Emission Lab, Ann Arbor
Ohio - Speaker TBA
Indiana - Steve Strains, Northwest Indiana Regional Planning Commission

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