



michiganite

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

International President Attends Annual Meeting



PRESIDENT'S COLUMN

FROM THE DESK OF . . .

RICHARD A. CUNARD

WHAT? \$22.00 FOR LUNCH?

I have heard comments from some members who felt the price of the Section's Annual Meeting/Technical Session, which was held on December 4th at the Plymouth Hilton, was too high. If all you got out of the meeting was a lunch, then I would have to agree that a \$22.00 tab might be excessive. However, you should be aware that there are a lot of other costs associated with putting on a meeting. These additional costs must be reflected in the price that we charge for attendance.

To provide you with a better understanding of exactly what costs are incurred in conducting a meeting, I am going to detail the charges we had at this year's Annual Meeting and develop a cost analysis to show you the steps we use in arriving at the meeting price.

MEETING LOCATION

The Annual Meeting is the most important Section meeting of the year. Normally we have a guest dignitary from National ITE in attendance to be the keynote speaker at lunch and we generally receive some type of media coverage. Last year it was a Detroit radio station, this year a local newspaper which did a series of articles based upon the presentations made at the meeting. In addition, we conduct the Annual Business meeting and announce the results of the election for new officers. Thus, the Executive Board tries to select a site which has quality meeting and banquet facilities to provide a fitting atmosphere for this important gathering. To encourage the greatest possible attendance, we also try to hold the meeting in the northwest Detroit Metropolitan Area as it is the approximate centroid for our membership. Unfortunately, nice facilities and good location are not inexpensive.

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James H. Kell, President ITE

The 1986 Annual Meeting of the Michigan Section of ITE was held on December 4th at the Plymouth Hilton Inn. The accommodations were excellent and the sumptuous buffet luncheon was something to remember. Again, we would like to thank Ed Smiadak and Zora Lavich from the city of Plymouth for their work in completing arrangements for this meeting.

In spite of the wintry weather, over 70 persons from various governmental agencies, consulting firms, and traffic control equipment companies were present. The technical program was divided into seven sessions (three before lunch and four after), each covering a subject of considerable interest to those associated with transportation.

The first speaker on the program was Donald C. Harris, Market Manager of Traffic Control Materials for 3M Company. Mr. Harris reviewed various studies pertaining to motorists' needs and protection through work zones. Some situations needing special attention, in terms of a safer highway environment, are short duration work activities, accidents involving portable signs and construction barricades, nighttime vision problems, and allowance for vehicle design differences. Three-M is addressing these problems by continuing to improve reflective sheeting, designing greater flexibility into reboundable devices, improving visibility of devices after they have been damaged, improving signs substrates, and increasing the effectiveness of temporary markings.

Bonnie Poindexter, a C.P.A. from the firm of Donovan and Poindexter in Kalamazoo, spoke next about the impact of the new federal income tax law, particularly as it may affect professionals in the transportation field. Bonnie stated that, theoretically, the tax changes will result in a more equitable distribution of

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ROOM RENTAL - \$200.00

As with most places, the Plymouth Hilton did not charge us for the room rental on the banquet room where we ate lunch. However, as with most other facilities, there was a charge for the room in which the Technical Session was conducted. At the Hilton, the room rental charge was \$200.00. Similar hotels in the Detroit area charge from \$150 to \$275 for the use of a meeting room. Thus, this charge was not out of line. At some past Annual Meetings we have tried to reduce the room rental costs by having the meal and the Technical Session in the same room. However, this has not worked well as there is a significant amount of time needed to prepare the room for the meal and then to clear out the dirty dishes. In addition, the round tables used for a meal set-up are not suitable for a technical session as half of the people in attendance would be sitting with their backs to the speaker.

However, we did have a cost savings this year as we did not have concurrent technical sessions in the afternoon as we did last year. The extra room for the second technical session would have been an additional \$100 or approximately \$2.00 more per person.

COFFEE BREAKS - two at 85 cents per person

It has become standard practice to have coffee available during the morning registration and during the break periods. This year, we reduced costs by not having a fresh coffee and soft drink set-up during the afternoon break. This cost would have been an additional 85 cents for the coffee and 75 cents for the soft drinks for each person in attendance.

LUNCH BUFFET - \$12.25 + Tax + Gratuity

In the meal selection, there can be a significant price difference between the bargain meal and the high price spread. Again, the Executive Board feels that since this is our most important event of the year, we should go for a nice compromise between the two extremes. Where available, a buffet set-up is generally less expensive per person because of the reduced staffing the hotel needs to serve the meal and the buffet gives some of our "Techies" the opportunity to eat an adequate amount of food for their lunch. A buffet also provides the benefit of being able to serve additional people who register late or who show up at the door which might not be possible with a sit-down style meal.

This year, we had a choice between a cold buffet (i.e. sandwiches) at \$8.50 per person plus tax and

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MICHIGAN SECTION ITE - TREASURER'S REPORT

Balance: September 26, 1986	\$3,914.15
Receipts:	
Dues	\$ 42.00
Interest	56.32
Meetings	651.00
Michiganite Ads	280.00
	<u>\$1,029.32</u>
Expenses:	
Meetings	\$ 649.03
Michiganite	503.00
Postage	128.07
Printing	89.34
Miscellaneous	21.23
	<u>\$(1,390.67)</u>
Balance: December 3, 1986	<u>\$3,552.80</u>
Treasurer, David C. Bacon, P.E.	

MICHIGANITE

Official Publication of the
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Institute of Transportation Engineers

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Michiganite Editor	
Weldon Borton,	(517) 321-5457

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, Weldon Borton, 1014-B Montevideo, Lansing, Michigan, 48917 (Telephone (517) 321-5457).

1987 MEETING SCHEDULE

<u>Date</u>	<u>Location</u>	<u>Host</u>	<u>Event</u>
February 12	Flint (Bosley's)	Berry	Lunch/Technical Session
March 20	Lansing	Etelamaki	Lunch/Technical Session
April 24	Ann Arbor (Weber's)	Carrier/Henry	Couples Night
May 21	Southfield	Savage/Northrup	Vendor's Day
June 11	Warren Valley	Nustad	Golf/Dinner
July 24/25	Mt. Pleasant	DeWitt	Technical Session/ Family Weekend
Aug. 16-20	New York	Wiertella	National Meeting
September 10	Saskatoon	Meredith	Golf/Dinner
October 8-9	Toledo, Ohio	Ohio Section	District III
October 15	Battle Creek	Ken Tsuchiyama	Lunch/Technical Session
December 3	Metro Area	Kobran	Annual Meeting/Technical Session

PRESIDENT... continued from page 2

gratuity or the three item hot buffet which included Sweet and Sour Chicken, Roast Beef, and Swedish Meatballs at \$12.25 per person plus tax and gratuity. The Executive Board felt the hot buffet was the better selection for this meeting because of the quality of the meal and the fact that it was our annual meeting.

TECHNICAL SESSION - 6 Complimentary Meals = \$98.40

In numerous surveys, you have told us the content and quality of the technical program, not the meeting price, is the most important consideration in determining whether or not you will attend a meeting. In order to put together a high quality and interesting technical program we sometimes invite outside guest speakers to discuss topics of interest. It is board policy that any speaker at a meeting who is a member of the Section should be responsible for paying for their own meals as part of their commitment to the profession. However, when we invite an outside speaker to come in and present to our group, we feel the least we can do is to provide them with a free meal for their efforts. When you consider the amount of time and effort that goes into putting together a presentation, the statement, "There is no such thing as a free lunch" very accurately describes this situation. Altogether at this meeting we had six people that we provided with complimentary meals. The cost of these six meals had to be added into the price of the meeting.

AUDIO - VISUAL EQUIPMENT - \$10.00

We try as much as possible to impose on members to bring the Audio - Visual equipment so that we can reduce costs in this area. A slide projector can rent for as much as \$40, an overhead can go for \$25 and a VCR with monitor can be anywhere from \$25 to \$100. Luckily, we have some outstanding section members who can be convinced to lug the AV equipment around in the trunks of their cars for the meetings. However, a screen is too large to easily carry around and it rents cheap--in this case \$10.00. Other charges we normally incur for the podium and microphone were included for free at this facility.

DETERMINING THE PRICE FOR THE MEETING

In determining the price for the meeting we have the lump sum costs, such as, the room rental, AV equipment and complimentary meals which have to be pro-rated based upon an estimate of expected attendance and the fixed costs which do not vary as long as you meet the

minimum guarantee that the hotel requires to justify renting the space to you.

For this meeting the cost analysis works out as follows:

Individual Costs			
Coffee Breaks (two @ .85)	\$	1.70	
Meal		12.25	
Tax & Gratuity		2.45	
Total for Meal			\$16.40

Fixed Costs			
Room	\$200.00		
Audio - Visual	10.00		
Complimentary Meals	98.40		
Total Fixed Costs		308.40	

For 50 at Meeting			
- Fixed Cost/Person = \$308.40/50	=	\$ 6.17	
For 60 at Meeting			
- Fixed Cost/Person = \$308.40/60	=	\$ 5.14	

Thus, the total cost for each person could range from \$22.57 if 50 people attend to \$21.54 if 60 people attend. Taking the middle ground we established a price of \$22.00. A lot for just a lunch - but I hope you got a lot more out of it than just a lunch.

ALTERNATIVES

There are not too many alternatives available for reducing the cost of this meeting. If we want to continue it as a high class affair we have to pay the price. If we were to downgrade the facility, then we could bring the price down to approximately \$15. The Executive Board does not want to do this, but how do you feel?

Another alternative is to use a pricing policy similar to IMSA's. They charge the same \$20.00 amount for all meetings. This way, the meetings which cost less help to defray the cost for the more expensive meetings. Again, the Executive Board would like your opinion.

THE END HAS COME

With this article, I come to the end of my term as President of the Michigan Section. As I look back on my four years on the Board, I can happily report that I lived up to every campaign promise that I made to get elected. It has been a rewarding experience working with you, the members and with my fellow officers on the Executive Board. I would like to take this opportunity to thank all of you out there who made these last four years so memorable.

Ed Swanson

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FACTS ABOUT PEDESTRIANS

1. The first recorded traffic fatality in the United States occurred in 1899 in New York City - the victim was a pedestrian.
2. Since 1937, when the AAA was developing the Pedestrian Protection Program, pedestrian fatalities have dropped from 15,500 to 8,300 in 1985. This represents a reduction of 46 percent. During this same period, motor vehicle registration increased 483 percent (30 to 175 million); population grew by 87 percent (128 to 239 million); motor vehicle travel jumped 553 percent (271 billion to 1,769 billion miles of travel); and non-pedestrian fatalities have increased 55 percent (24,143 to 37,400).
3. It is estimated that the economic loss resulting from pedestrian accidents exceeds one billion dollars annually.
4. More than one half of all pedestrian traffic fatalities occur during hours of darkness, although pedestrian and vehicle traffic is significantly less at night.
5. The majority of pedestrians killed in traffic violated a traffic law or committed an obviously unsafe act.
6. It is estimated that at least ninety percent of all children injured enroute to or from school were struck at locations where no type of special school crossing protection such as Safety Patrols, Adult Guards, or Police Officers were in use.
7. The total number of pedestrian deaths during 1985 was 8,300. This represents a one percent increase over the 1984 figure. Seventy-three percent of all pedestrian deaths occur in urban areas, while only 29 percent of all non-pedestrian deaths occur in urban areas.
8. Pedestrians below the age of 15 and those over 64 account for 41 percent of all pedestrian fatalities. Twenty percent of all pedestrians killed are under 15, and approximately 40 percent of all pedestrians injured are under 15. Older adults account for approximately 21 percent of all pedestrians killed, and seven percent of all pedestrians injured.
9. Since 1982, when national statistics first became available, more than one-half million pedestrians have died in traffic accidents.
10. The pedestrian death toll exceeds combined air, marine, and rail transport deaths by more than three times.
11. Pedestrian fatalities account for 15 percent of all highway fatalities and four percent of all traffic injuries.
12. Although more than twice as many pedestrians are killed in urban than rural areas, the chance of death compared with injury is much higher in rural areas. Lower vehicle speeds, better and more extensive police traffic enforcement and superior emergency medical services account for the better chance of survival in urban areas.

By Don Wiertella

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Submitted by: William Schram, Coordinator
Statewide Carpool Parking Lot Program
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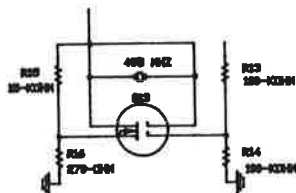
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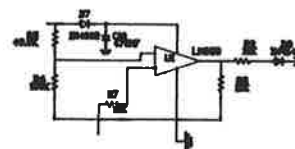
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Left to Right: Don Harris, Bonnie Poindexter, and Sheridan Rhoads.

the tax burden on all taxpayers. The tax law changes are also intended to encourage investment in projects more economically sound, as opposed to endeavors serving merely as tax shelters. She also discussed how the new tax law will operate during the transitional years (1987-88) before it takes full effect, its impact on IRAs, interest deductions, and business expenses.

Current priorities of the Office of Highway Safety Planning was the subject of a talk given by Sheridan L. Rhoads, Deputy Director at OHSP. After showing a short video describing the services provided to the transportation field by OHSP, Mr. Rhoads discussed how funding available through NHTSA and FHWA was applied to specific safety activities. He pointed out that just because a law is passed or success is attained on a certain project, continual follow-up is still required.

(This need is most evident with child restraint systems which are still frequently misused. Also, the new seat belt law is currently experiencing only 45 percent compliance). Some other areas of safety activities in which OHSP is involved include educational programs for teens on the effect of alcohol on drivers, streamlining the judicial process, traffic records, heavy truck operators and equipment, elderly drivers, speed, motorcycles, and the operation of ATVs.

We were particularly honored by the presence of Mr. James H. Kell, International President of the Institute of Transportation Engineers. Immediately following lunch, President Kell reported to those assembled on what has been happening at the international level of ITE. He discussed the various amendments that the membership had recently voted on, the institute's

public relations program relative to urban traffic congestion, and technical council activities. President Kell has visited all of the sections in the United States during his year in office (Michigan was his last stop) which accomplished one of his goals for 1986. He mentioned that he also had the privilege of attending a section meeting in Australia.

Following President Kell's remarks, a short annual business meeting was held. Bob DeCorte was presented with the Outstanding Service Award for dedicated service to the Michigan Section and to Transportation Engineering. Elected by a committee of the three most recent Past Presidents, Bob has been a credit to his profession, a valuable member of the Michigan Section, and a worthy recipient of this award. Also, Don Wiertella, 1987 President Elect, presented 1986 President Rich Cunard with a plaque commemorating his years of service to the Executive Board.

During the first session after lunch, Richard Beaubien, Transportation Engineer for the city of Troy, discussed private financing of public roads. In those areas where transportation needs far exceed public funds available to meet those needs, private financing alternatives must be considered. Dick discussed the following three approaches to such financing: (1) Negotiation with the developer, (2) traffic impact fees developed on the basis of fair share, and (3) by special assessment. Dick's entire presentation on this subject has been reproduced and is found elsewhere in this edition of the Michiganite.

Our next speaker was Andrew Zeigler. A landscape architect and Resource Specialist with MDOT, he spoke on the management of roadside trees. The objective, as pointed out by Mr. Ziegler, is to provide for motorists' safety and, at the same time, preserve as many trees as possible that contribute to the beauty of the roadside environment. He discussed the development of guidelines based on a vehicle-vs-tree accident study

made in the late 1970s. Since many factors are involved, it is difficult to specify precise rules such as elimination of all trees within a certain distance from the roadway. Roadway characteristics such as alignment, surface, grades, and locale are but a few of the considerations in determining whether or not a proper balance between safety and the preservation of trees has been achieved. Various measures such as protective plantings, roadside resloping, pavement markings, and so on can sometimes contribute to improved safety while still preserving roadside beautification.

Dave Morena, Safety and Traffic Operations Engineer with the FHWA, discussed guardrail design standards in general with particular emphasis on the local road system. He outlined three methods of determining if guardrail is warranted: (1) whenever a collision with the guardrail would be less hazardous than a collision with the roadside appurtenance that is being protected (Dave considers this method the "rich" way), (2) on a cost effective basis (the "thinking" way), and (3)

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Bob DeCorte receives Outstanding Service Award from Dick Beaubien.



Left to Right: Dick Beaubien, Andrew Ziegler, and Dave Morena.

on past accident experience (the "lazy" way). When dealing with lower ADTs, the FHWA does not demand guardrail in all circumstances. Whenever the decision is made to use guardrail, careful attention should be given to installation so that post snagging will be minimized, enough room will be allowed for deflection, and appropriate runout length will be provided.

Our final speakers, William Lebel, MDOT, and Thomas Maleck, MSU, reviewed the relationship between driver age and accidents. The problem, explained by Bill, is that at one end of the spectrum we have the young driver who feels invincible, while at the other end we have the older driver who has reduced ability to perceive speeds, trouble seeing at night, may be confused by a multiplicity of signs, or may just be overwhelmed by high traffic densities. This is a very "sensitive" issue politically, and no one wants to suggest restrictions on the older driver. The first thing that must be done, however, is to define the problem more precisely. Tom stated that most research does not tell us what the norms are for older drivers. In his review of this subject, Tom noted that different types of accidents involving older drivers show different patterns. In his opinion there may be some situations correctable by engineering methods. Some possibilities that come to mind include brighter signs, signals, and markings. We might also find it helpful to test older drivers oftener and, perhaps, even develop appropriate physical fitness programs.



Bill Lebel and Tom Maleck.

Special thanks should be given to Don Wiertella and Tom Maleck for putting together an interesting technical session, and to all the speakers who contributed their time and expertise in making the Annual Meeting the success that it was.

By Weldon Borton



ELECTED LEADERSHIP



International President James Kell with District 3 Executive Director Richard Beaubien and Michigan Section President Don Wiertella.



Rich Cunard, 1986 Section President, receives recognition for his contributions to the Executive Board from 1987 President Don Wiertella.



1987 Executive Board: Left to Right — R. Cunard, T. Maleck, R. Walther, J. Marson, D. Bacon, D. Wiertella. Not pictured — G. Endres.

INSTITUTE MEMBERSHIP INCREASES FINANCES IMPROVE

The total membership of the Institute of Transportation Engineers has exceeded 8,300, according to the November 1986 report of Executive Director Thomas Brahm. During the one year period ending November 6, 1986, the Institute experienced a 3.8 percent growth in voting membership. This increase in membership, along with increased income from publication sales and professional development programs, has had a positive impact on the Institute's financial status. It appears that the income from publications, advertising, professional development programs, and specialty conferences will be above our original expectations for 1986.

There are now 401 voting members in District 3 - 67 in the Indiana Section, 151 in the Michigan Section, and 183 in the Ohio Section. You probably know several engineers in your area who would benefit from membership in the Institute. Why not invite them to become members?

Listed below is the "Best Seller" list for Institute of Transportation Engineers publications in 1986:

1. 1985 Highway Capacity Manual
2. Parking Generation, First Edition
3. Trip Generation, Third Edition
4. Towards a Policy for Suburban Mobility
5. Driveway Design and Location
6. Site Impact Traffic Evaluation
7. Transportation and Traffic Engineering Handbook, Second Edition
8. Highway Capacity Manual - An Executive Overview
9. Guidelines for Urban Major Street Design, Revised
10. Recommended Guidelines for Subdivision Streets

The 1986 Professional Development Program appears to have hit a responsive chord in our membership. Thirteen one-day seminars were conducted in 1986, and the total attendance was 667. The seminars included in the 1986 program were: Traffic Improvements - Legal Aspects and Liabilities; The Transportation Profession and the Media; Site Impact Traffic Evaluation; and The 1985 Highway Capacity Manual Overview and Signalized Intersection Capacity. Two new professional development seminars will be offered in 1987: (1) Analysis of Signalized Intersection Capacity Using Microcomputers and (2) Residential Street Design and Traffic Control.

Please feel free to contact me if you have any suggestions for improving the Institute's programs or services.

Richard F. Beaubien, P.E.
District 3 Director

TEXAS IS A NEW ITE DISTRICT

The ITE International Board of Direction, meeting in Indianapolis, Indiana, prior to the September Annual Meeting, voted to create a new ITE District, encompassing the state of Texas. This new ITE District will be taken from the existing District 5, which was previously composed of the Florida Section, the Southern Section, the Texas Section, and the Virginia Section. This action was taken, in part, in response to a concern that the previous District 5 with 1373 members (21 percent of the voting membership) was not adequately represented on the International Board of Direction. By comparison, District 3 has 396 voting members (six percent of the voting membership). The impacts of this action on the remainder of District 5 are to be worked out and presented to the International Board of Direction at their meeting in January, 1987. The effective date of the new district for Texas is February 1, 1987.

Other action taken by the International Board in September was to designate the projects to be funded by voluntary contributions during the next year. During 1987, voluntary contributions will go to support a Positions Available Service which can be accessed by telephone or personal computer. A second project to be funded by voluntary contributions will be the development of Career Guidance Materials, which can be used to explain the importance of the transportation engineer to those in school who are still making a career selection. This material could also be used to explain the role of the transportation engineer to civic groups.

Finances of the Institute are in much better condition than they were five years ago. Income for 1986 will be above expectation because of increased membership and very positive publication sales income. Advertising income for the year is above expectations, and income from seminars is also above original expectations. In adopting a 1987 budget, the International Board concluded that no dues increase would be necessary. An additional clerk will be added to Headquarters staff in late 1986 to help with the additional workload.

By Richard F. Beaubien, P.E., District 3 Director

TRAFFIC FATALITIES INCREASE SLIGHTLY IN 1986

Michigan State Police accident records for 1986 indicate that traffic deaths have increased slightly over the same period in 1985. As of November 17, 1986, police records show 1,363 persons have been killed compared with 1,354 in 1985. Year end data will be available in the spring edition of the Michiganite. ■



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NEW POLICE PROCEDURE TO DETECT DRUGGED DRIVERS

Secretary of Transportation Elizabeth Hanford Dole has hailed a potential breakthrough in the detection and prosecution of drug-impaired drivers.

In a drug detection program developed by the Los Angeles Police Department (L.A.P.D.) within the last year, officers who have been specially trained in drug recognition examined and rated suspects brought to the police station. The program has been credited with the successful prosecution of California drivers charged with driving under the influence of drugs.

"The Los Angeles Police Department's program is an important first step in overcoming the obstacles that have hindered the ability of the police to detect, arrest and obtain convictions for drugged drivers," Dole said.

Dole added that trained police officers are able to identify many drivers who have taken moderate to large doses of drugs, as well as identify the drug involved with an extremely high degree of accuracy.

The National Highway Traffic Safety Administration (NHTSA) and the National Institute on Drug Abuse (NIDA) jointly sponsored a laboratory evaluation of the L.A.P.D.'s drug detection procedures. During the study, conducted at John Hopkins University, specific drugs or placebos were administered in varying dosages to volunteers who were then rated independently by each of four L.A.P.D. drug recognition experts.

The results showed that the L.A.P.D. officers were over 98 percent accurate when they identified a subject as having taken a drug. In 92 percent of these cases, the officers correctly identified the class of drug administered.

A follow-up field evaluation confirmed the laboratory findings and showed the effectiveness of L.A.P.D. procedures in accurately recognizing drug use by drivers.

Police across the country widely use breath-testing devices to confirm that a driver is under the influence of alcohol, but no such device currently exists for detecting the use of other drugs.

In the L.A.P.D. drug detection procedure, a number of components are involved, including an interview concerning the suspect's medical and drug use history; an evaluation of the suspect's alertness and responsiveness; a measurement of certain physiological symptoms, including pulse rate, blood pressure, oral temperature, pupil size and skin signs of substance abuse; and a battery of behavioral tests similar to those used by police to test for alcohol impairment.

Summary reports of both laboratory and field evaluations are available in the form of research notes. Requests for the research notes should be addressed to the Office of Driver and Pedestrian Research, NRD-42, NHTSA, Washington, D.C. 20590. A self-addressed mailing label should accompany the request.

Reprinted from TSA Newsletter

Did you know . . .

--Vanpools are one of the most energy-efficient forms of commuting. Each vanpool saves about 4,200 gallons of gasoline each year and eliminates 2.3 tons of pollutants from the air annually.

--The first permanent roadside picnic table in the country was set up on old US-16 in Ionia County in 1929. Michigan also had the first roadside park, developed along US-2 in Iron County in 1919.

--A freight train with 150 cars traveling 30 miles per hour requires two-thirds of one mile to stop.



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Jonathan R. Crane

WASHINGTON STATE FLASHING YELLOW PROTECTED/PERMISSIVE SIGNAL EVALUATION

More than 50 Washington State Traffic Engineers have completed evaluating the safety of protected/permissive turn signals since 1978. The conclusive findings show flashing yellow permissive turn signals are safer. Washington Traffic Engineers are included in the National Standards for control of protected/permissive turn signals based on their findings. What is a protected/permissive turn signal?

A protected-only turn signal controls traffic with a green arrow for the turning traffic. All opposing traffic is held with a red signal while the turning traffic proceeds with a green arrow; the turning traffic is "protected" with the right-of-way. A permissive-only turn signal shows a green ball to the turning traffic requiring the turning vehicle to yield to opposing vehicles and pedestrians.

A protected/permissive turn signal has a green arrow so turning traffic is guaranteed a turning time AND changes to a permissive indication so vehicles can turn after yielding. The advantage is for the vehicle that missed the green arrow, a turn can be made if there are gaps in opposing traffic without waiting through the full signal cycle for the next green arrow. Other studies of protected/permissive signals show that each one saves about \$10,000 per year in reduced fuel consumption.

The National Standard allows various versions of protected/permissive signals, but all with green balls for the permissive signal indication. Washington Engineers felt that accidents occurring between left-turning and opposing traffic at protected/permissive signals was partially attributable to the turning driver mistaking the green ball (where yielding is required) for the green arrow (where turning traffic has the right-of-way).

Washington Traffic Engineers began an experimental study in 1978 of protected/permissive turn signals, obtaining federal approval to evaluate flashing yellow. The work is reported in the Washington Section of the Institute of Transportation Engineers' Flashing Yellow Protected-Permissive Signal Evaluation. The report documents the conflict studies, comparison collision rate studies, and two separate motorist opinion polls of almost 1000 Washington drivers.

Conflict studies recorded when a permissive left turn or opposing through vehicle "slammed" on the brakes or swerved to avoid colliding. A total of 23 intersections were studied, 14 with flashing yellow and nine with green ball permissive indications. The average number of conflicts per intersection was:

5.00 Green Ball

3.14 Flashing Yellow (37 percent decrease)

Before and after collisions of left turning traffic were collected for comparable time periods at 20 intersections. The 20 intersections were converted from green arrow/permissive green ball to green arrow/flashing yellow permissive. The total number of left turn collisions:

195 Before

128 After (34 percent decrease)

Motorists driving through green ball and flashing yellow protected/permissive signals in Everett, Longview, Juanita, and Tacoma were stopped and asked to return a questionnaire. In Yakima, where there are NO protected permissive signals, bus drivers and governmental employees were asked to return the questionnaires. The results show that 66 percent felt the

flashing yellow was safer compared to the green ball. Nineteen percent felt the green ball was safer and 15 percent felt there was no difference.

Drivers waiting to take their driver's exam were asked to complete another questionnaire. Seattle, Olympia, Bellevue, Everett, and Yakima Driver Test Stations were used. The results showed the driver test individuals felt the flashing yellow was safer. The results also showed the tendency to confuse the permissive green ball for the protected green arrow.

The report has been submitted to the Federal Highway Administration for consideration of including the flashing yellow as a nationally recognized device. If it is not, the green ball will remain as the National Standard.

The protected/permissive signals save substantial delay and fuel for motorists. The Washington study shows the flashing yellow as a safer means than the green ball because of its yellow color warning motorists that the right-of-way has been changed, and the flashing operation to clearly distinguish it from the green arrow.

Reprinted from Westernite

TOP TEN ERRORS

The ten most common errors people make when they speak and write.

"Between you and I." It should be "between you and me." "Me" is the object of the preposition "between," and must be in the objective case.

"Here's several ways to. . ." If the sentence opening was recast without the contraction, it would read, "Here is several ways to. . ."

"Revert back." "Revert" means "to go back or return." Eliminate "back."

"I could care less," when the speaker means, "I couldn't care less." Think about it.

"New innovation." An innovation is a "new" method, idea, or device. Drop "new."

"The principle reason." Despite the efforts of our best teachers, people still misuse "principle" and "principal." In this context, the word should be "principal," which means "the most important" when used as an adjective.

"Irregardless." A substandard word that should never be used. The accepted word is "regardless."

"8 p.m. tonight." A redundant term, often seen in newspaper stories. Make it "8 o'clock tonight" or "8 p.m. today." Also avoid "7 a.m. in the morning."

"This will effect my job status." The word should be "affect," which means to "influence" or "to produce an effect upon." "Effect," when used as a verb, means "to bring about."

"The company issued it's report." "It's" stands for "it is," or "it has." The word should be "its," which means "belonging to it."

And here is our list of the ten words most frequently misspelled by people in business: accommodate, a lot (two words), commitment, develop, embarrass, inadvertent, incompatible, occasion, separate, and supersede. ■

International Municipal Signal Association Michigan Section — 1986 Annual Conference Cadillac, Michigan

The Second Annual IMSA Michigan Section Conference was held during the month of October in Cadillac, Michigan. This annual event again drew large numbers of participants, from governmental agencies as well as industry suppliers.

Spanning three days, the conference operated with an intensive schedule which allowed participants to choose between two separate educational formats. Those that chose the signal portion of the program were led by Mr. Dave Bacon, P.E., of Carrier and Gable, Inc. This program involved all aspects of Eagle Signal EF140 controllers and terminal facilities. Also included was hands-on experience in applications and trouble shooting.



Dave Bacon of Carrier & Gable addresses IMSA Annual Meeting participants.

The Signs and Marking portion of the conference involved excellent vendor participation as well as informative subjects. The program covered litigation and liabilities of governmental organizations, changes in the Michigan Manual of Uniform Traffic Control Devices, MDOT Inspector's Course covering pavement, markings, Police Traffic Radar and a Michigan State Police discussion of sobriety check lanes, seat belt compliance and PST testing.

Although it may sound like three full days of hard work, this was hardly the case. Supplier participation was not limited to classroom lectures only. Outside, on-site demonstrations covered hydraulic tools and equipment, pavement marking applications (preformed, liquid, and raised markers), sign support systems, arrow boards, computerized sign marking, and reflective safety wear. In addition, actual crash testing of plastic reboundable products was conducted with barricades, barrels, flexible posts and delineators.

Other aspects of the program included a three mile bus tour, both in daylight and at night, to observe a wide variety of reflective products and application under actual "on road" conditions. Participants were able to judge for themselves the benefits of increased brightness and visibility of the latest products on the market today.

Do not be lulled into thinking that lectures and presentations were the only order of business to be conducted at the conference. The meeting participants

were also treated to many fine meals including a seafood buffet and steak fry. It was not hard to understand why many of us added a pound or two.

It took a lot of hard work by many people to successfully complete this conference. It included everyone from Michigan Section IMSA members to suppliers and manufacturers who supported the efforts through presentations, literature, and donations to the organization membership.

We, the Board of Directors, wish to thank the following for their support:

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Prismo Safety Corporation
Rathco Safety Supply
Reflexite Corporation
Stimsonite Products
3M Company
Unistrut
Walker Brothers
Work Safe Supply, Inc.

Now that the Conference is completed, the Board of Directors is busy planning the Third Annual Conference. It should prove to be an interesting challenge, considering the success experienced in 1986!

By Tim DeWitt

HIGHWAY FUNDING SYSTEM OUTDATED?

A report by the General Accounting Office maintains many factors used to distribute federal highway funds are outdated and should be changed. The report, Highway Funding - Federal Distribution Formulas Should be Changed, states that the formulas used to apportion funds for the primary, secondary, and urban highway programs - based upon land area, population, and postal mileage - do not relate to today's highway system.

According to GAO, the factors were chosen between 40 and 70 years ago, and new factors that better reflect highway activity are now available. The land area factor has resulted in large, sparsely populated states receiving larger apportionments than they would otherwise, according to the report. The population approach was also criticized because it is based on census figures that are updated only once every ten years.

Among GAO's recommendations for alternative methods of computing apportionments are: Use of land-miles as a direct measure of the size of the road network to be preserved; and highway use, measured either by vehicle miles of travel, by motor fuel consumption, or a combination. The report does not advocate specific formula changes.

Reprinted from Highway and Heavy Construction
August 1986

PRIVATE FINANCING OF PUBLIC ROADS

Traffic congestion in our urban areas is increasing. The frustration of motorists is also increasing, and local elected officials are becoming aware of traffic congestion as perhaps the most important problem facing our urban areas. However, the public financing needed to address this problem is not currently available. Federal-aid highway funding to address problems on urban system streets is at the same level that it was in the mid-1970's, and it appears that the United States Congress is unlikely to allocate more funding for urban system problems. Faced with increased travel demand and increased public expectations, local officials have turned to the private sector, asking that developers pay their "fair share" of road improvements needed to accommodate new development. In turn, most developers recognize that a good transportation system is vital to the success of their development, and they are willing to contribute to road improvements.

Three funding mechanisms for incorporating private financing into the public street system are currently being considered in Oakland County, Michigan. Two of these methods are currently available for use by Michigan municipalities, and a third is being considered but will probably require State enabling legislation before it can be applied. The three methods are negotiation, traffic impact fees, and special assessment.

Negotiation

During the review of a site plan for a new development, it is not unusual for Michigan municipalities to specify road improvements required to accommodate the development. The City of Troy uses a contract for municipal improvements, sometimes referred to as a "private agreement", to formalize the developer's commitment to provide certain transportation improvements in conjunction with site development. These improvements may range from simple turning and passing lanes on 2-lane highways to the construction of a new multi-lane road. The execution of a "private agreement" with suitable financial guarantees (cash deposit, certificate of deposit, or letter of credit) must precede the issuance of a building permit for the new development. This method of financing has been used to facilitate improvements on both City streets and County primary highways within the City of Troy.

Traffic Impact Fees

Traffic impact fees have been employed in Florida, California, and other parts of the United States. These fees are similar to fees paid for water or sewer taps. You pay a fixed fee depending on the size of your development for access to the transportation system. The consensus of legal opinion in Oakland County, Michigan appears to be that State enabling legislation will be required to permit the use of traffic impact fees. Traffic impact fees are an exercise of police power. They can be used to finance a development's fair share of improvements which benefit the total community, and they can be used to provide for a variety of on-site or off-site improvements. Fees are paid at the time of building permit issuance, and they are fixed rather than negotiated. These fees can apply to already platted or non-platted parcels. They are an alternative or supplement to dedications.

Some of the issues involved in establishing a traffic impact fee ordinance for a community are the linkage with the comprehensive planning in the area, definition of service areas, evaluation of facility adequacy, the measurement of unit impacts, the pricing of unit impacts, the administration of revenues (trust funds) and the administration of expenditures. Impact fees and other revenues should not exceed 100% of the facility improvement cost. Considerable effort should be made to assure that the developer is paying only his "fair share" of the total improvement.

Special Assessment

A third method of private financing for public road improvements is the special assessment district. This funding mechanism is not new in municipal practice, but a unique application of this method has recently been initiated in Troy, Michigan.

Northfield Hills Corporate Center is a 394 acre master planned office/research center in Troy, Michigan. The area offers direct highway access to downtown Detroit (25 minutes driving time), Southfield (25 minutes driving time), and Detroit Metropolitan Airport (45 minutes driving time). The area currently has office or research buildings totaling 885,000 square feet of gross floor area, and another 742,000 square feet are under construction. When the development is complete, it is expected that the building area will total 5.7 million square feet and support more than 25,000 employees. This development will, of course, have significant traffic impact, particularly during peak traffic periods.

Although the site has access to Interstate 75, the existing roadway system in the area is inadequate to handle neither existing nor future traffic demand. The north-south arterial street serving the site is Crooks Road, which is 2 lanes wide except for a 4 lane section immediately adjacent to Interstate 75 ramp. The east-west arterial street serving the site is Long Lake Road, which is 2 lanes wide, except for a center left turn lane at the Crooks/Long Lake intersection. The traffic impact study for the site recommended the following improvements:

1. Widen Crooks Road to a 6 lane cross section.
2. Widen Long Lake Road to a 6 lane cross section.
3. Widen the Crooks Road bridge over I-75.
4. Provide additional ramp capacity for access to and from I-75.
5. Construct Tower Drive to a 5 lane cross section to provide local circulation in the area east of Crooks.
6. Construct Corporate Drive, west of Crooks, to a 5 lane cross section to form a circulation loop road with direct access to the I-75 ramp, one-half mile north of Long Lake.

To provide for the roadway needs in this area, a co-operative effort of state government, local government, and developer participation was needed. The Michigan Department of Transportation agreed to widen the Crooks Road bridge over I-75 from its existing 2 lane cross section to a minimum 4 lane configuration. Although all of the roadway improvements in this area would qualify for Federal-Aid Urban System funds, there was not sufficient Federal funding available to finance this level of investment in roadway infrastructure. Long Lake Road and Crooks Road are under the jurisdiction of the Oakland County Road Commission, but the Road Commission had no funding available to finance road widening in this area.

The dilemma of significant roadway needs and inadequate public funding for roads in this area led the City of Troy to develop a special assessment district to meet the needs in this area. This financing mechanism will provide road improvements, street lighting, sidewalks, and storm drains at a total estimated cost of \$13,740,000. The City share of this project will be \$2,700,000. This is the cost estimated to replace the existing pavement. The cost of providing additional lanes of pavement, sidewalks, street lighting, and storm drains will be borne by private property owners in the area. This cost will be assessed over the life of the improvements, an estimated 15 years, and construction is expected in 1987.

The special assessment method of financing was chosen for the following reasons:

A. This method of financing is currently available under Michigan State Law whereas other methods, such as Traffic Impact Fees, are not.

B. Cost may be more equitably distributed among property owners and the general public.

C. A more unified, consistent and rational system of roads, drains, sidewalks, and street lights will be possible.

D. Future benefits (special assessments) are more

easily and equitably assigned to all parcels. The total system is built under one program than to follow the practice of a "patchwork quilt" approach through negotiated agreements for turning and passing lanes added to the existing roadway system.

The use of special assessment districts to finance road improvements is not unique. However, the Northfield Hills Corporate Center project represents a unique application of an existing finance technique. It is unique because of the magnitude of the proposed improvements, and it is unique because assessment of local properties in a municipality will be used to widen county arterial streets. It is also unique because it will allow the roadway system to be built in advance of need. The roadway system to be constructed will be expected to handle traffic when all the office and research space is in place and when all 25,000 employees are working in the area. In October 1986 the existing building area was 885,000 square feet and employment was approximately 4,000. Having the future roadway system in place will be an obvious marketing advantage for developers hoping to lease office and research space in the Northfield Hills Corporate Center.

Conclusion

Private financing is a new source of funding for public road improvements. However, it is not the total answer to addressing the needs for reducing traffic congestion in our urban areas. Additional public support will also be needed. However, before this support can be obtained from the public, there must be a perception that the new development is paying its "fair share" to improve the roadway system. Three of the mechanisms which can be used to incorporate private financing into the public road system are negotiated agreements, traffic impact fees, and special assessments.

By Richard F. Beaubien, P.E.

RURAL STATES CONSIDER DANGERS OF RIGID ROADSIDE MAILBOXES

Oklahoma, along with a number of rural states, is considering new regulations that could eliminate unyielding roadside mailboxes in favor of the erection of breakaway types that prevent deaths and injuries to motorists.

Rigid roadside mailboxes account for at least 200 deaths annually and many more injuries and property damage, the Federal Highway Administration (FHWA) says. (See Status Report, Vol. 15, No. 3, Feb. 19, 1980.) Often attached to rigid posts sunk into concrete footings, the mailboxes are mounted at easily accessible window levels for motorized mail carriers - but a dangerous height for errant passenger cars.

Many boxes mounted on sturdy planks can act as battering rams, delivering the mail - and box - all the way to the back seat when struck by a car.

Following extensive crash testing of typical mailbox configurations and improved breakaway designs by the Texas Transportation Institute, the Association of Americal Highway and Transportation Officials (AASHTO) revised its official guidelines for mailboxes in 1984. In October 1985, the Federal Highway Administration (FHWA) issued a notice approving the AASHTO guide, and the Postal Service agreed to cooperate. Since then, officials say, Arkansas, Iowa, and Nebraska in addition to Oklahoma, are considering revising their policies, in part because states, like the box owners, may be sued for deaths and injuries attributable to known hazards.

For states willing to follow the lead of Texas - which acted quickly to solve the problem on state-maintained highways in the early '80s - federal assistance is available. Federal funds designated for the removal of hazards may be used on any public road, a staff member of the House Public Works Subcommittee on Transportation says.

PRESS EXPRESS SOLVES TRANSPORTATION DILEMMA

General Motors Corporation is in the process of expansion and modernization of their stamping plant operations throughout Michigan, Ohio, and Indiana. Within Michigan they are expanding at this time in Grand Rapids, Kalamazoo, and Grand Blanc. With this expansion they are placing large stamping presses at their facilities. These presses are broken down to their smallest components and delivered to the plant site where final assembly is completed.

These press components are being transported by Press Express, Inc. out of Chicago, Illinois. They are using a truck tractor, semi-trailer, and dolly system of 18 axles and a total of 70 tires (see picture). The total length is 148 feet with a rear steerable dolly.



Transporter for press components.

Some of the components (press beds and press crowns) have a weight up to 340,000 lbs. and a gross weight up to 500,000 lbs., widths up to 20 feet and heights up to 16 feet. These components are being transported from the docks in Muskegon to Grand Rapids and Kalamazoo. All shipments over 16 feet in width are being transported from midnight to 6:00 a.m. Each shipment is escorted by the transporter, the Michigan State Police (Motor Carrier Division), and the Michigan Department of Transportation (MDOT). Evaluation for the movement of the gross weight loads from 294,000 lbs. to 500,000 lbs. was done by the MDOT Design Division and the following was determined. All shipments with a gross weight of 439,000 lbs. require a full stop at all structures before proceeding at a speed not to exceed five mph. Approximately 15 loads have been moved to Grand Rapids with this equipment with very successful results.

By Jim Dorin

Under a new highway authorization bill reported by the House Public Works Committee, H.R. 3129, the term "construction" is defined so that federal funds could be used to eliminate hazardous mailboxes on secondary roads, the staff member says. The subcommittee says that mailboxes can constitute a "clear hazard" to the motoring public, particularly the multiple boxes known as neighborhood delivery and collection box units. These large mailbox centers have been identified as particularly hazardous in crash tests conducted by the Texas Highway Department.

Reprinted from the August IIHS Status Report

NEW STUDY SUPPORTS BENEFITS OF SAFETY BELT LAW

A study of auto accident claims for the first six months of Michigan's safety belt use law found a combined 39 percent drop in severe and fatal injuries from the year-earlier period prior to the law.

The study by League General Insurance Company covered accident claims submitted in Michigan. The results cover injuries to drivers and front seat passengers.

The study, which will examine the first full year of the law when it is completed, is being conducted by James Saalberg, Director of Special Projects of the League General Insurance Company, Southfield. Dr. Alexander Wagenaar, of the University of Michigan's Transportation Research Institute, assisted with the study. League General insures more than 60,000 vehicles in Michigan.

"The study adds to the considerable evidence that safety belt use laws are one of the greatest steps forward in the history of traffic safety," said Robert E. Vanderbeek, president of League General. "The entire insurance industry--life and health as well as auto insurers--should join together in the public interest to promote safety belt laws and universal belt use."

The initial results reflect Michigan claims for injuries in auto accidents beginning with the effective date of the state's law, July 1, 1985 through December 31, 1985, compared with claims for the similar period in 1984. More than 1,300 injury claims were studied.

"The beneficial effect of the safety belt law is most apparent for the more serious claims," Saalberg said. "While our company's overall exposure in terms of average number of vehicles insured went up almost ten percent in that period, total severe and fatal injuries went down from 54 to 33, or a reduction of 39 percent. There appears to be no factors other than the belt law which would account for this decline."

The study also shows a drop in death claims from six to four, but the numbers involved are too small to be statistically significant, Saalberg said.

League General's findings are consistent with a similar study conducted in New York and New Jersey by the Highway Loss Data Institute (HLDI). The HLDI study, released in May 1986, showed that insurance injury claims from 1983-85 model year vehicle occupants in New York and New Jersey were less frequent following implementation of those states' safety belt use laws when compared to the corresponding pre-law periods one year earlier. The decline in injury claim frequencies of collision claims were essentially the same before and after safety belt use laws were enacted in each state.

In the League Insurance study, injury claims are broken down into five severity categories--minor, moderate, serious, severe, and fatal. "Severe" injuries, for purposes of the study, are defined as those involving five or more days of hospitalization, two or more months out of work, more than \$5,000 in payments by League General for medical costs and lost wages, or such physical damage as multiple major broken bones, internal injuries or head injuries.

For the period in the study, the overall injury rate remained generally unchanged. Total claims for injuries in Michigan rose in line with the increase in vehicles insured.

"The results so far show belt use associated with a significant shift away from the most serious injuries, even at present moderate levels of belt use," Saalberg said. "Hopefully, this kind of evidence will convince more people to buckle up."

The study is being funded by a grant from Traffic Safety Now, Inc. as part of continuing research on the effects of safety belt laws and belt use. Results for the full 12-month study should be available early next year.

"The accident data being developed by the League General study provides important evidence of the effectiveness, in human terms, of state safety belt use laws," said Charles L. Spilman, president of Traffic Safety Now. "While much public attention has been focused on fatality reduction, it is also important to note that the reduction in the severity of accidents is also a vitally important benefit of safety belt use."

League General provides a 20 percent premium reduction on its personal injury coverage in Michigan and Minnesota to those pledging to use safety belts and to encourage use by all passengers in vehicles they drive. Since 1979, in these states, the company has also provided child restraint seats free of additional charge as a benefit under its auto insurance policies to policyholders who have children born or adopted while their League General policy is in effect.

League General is a subsidiary of the CUNA Mutual Insurance Group, Madison, Wisconsin. The company provides auto insurance to credit union members in the states of Michigan, Minnesota, and Oregon.

For more information, contact James Saalberg, Director of Special Projects, League Insurance Companies, 15600 Providence Drive, Southfield, Michigan 48075 or Mary Ann Robb, Account Supervisor, Casy Communications Management, Inc., 17117 West Nine Mile Road, Suite 700, Southfield, Michigan 48075 at (313) 423-4600.

Reprinted from TSA Newsletter

SAFETY SYSTEM FOR SMALL WORK SITE OR EMERGENCY SITUATION

HIT AND RUN SAFETY SYSTEMS are designed for use by workers that are at a small work site or in an emergency situation such as a personal injury accident or the scene of a fire.

This model has two 30-foot cables and eight cones which is enough to block off a two lane road if necessary. The cable is attached to one or both of the accident detector* devices. If an out of control vehicle hits the cones or cable a siren is activated to warn the workers of danger. This system is run by a 12 volt gel cell battery that can be used even if the system is laying down. There is a self-contained battery charger that takes two hours of being plugged into a 110 volt outlet to recharge the battery for 12 hours of use. There is a 110 volt outlet on the system and a ten-foot extension cord included. There is a strobe light recessed in the system, red for fire or accident and yellow for construction or utility workers. It is made of rugged, durable diamond plate and weighs 71 pounds.

This safety system is designed to warn of an accident, not to prevent one.

Further details concerning this system can be obtained by contacting HIT AND RUN SAFETY SYSTEMS, Rt. 2, Box 405, Schuss Mountain Road, Bellaire, Michigan 49615, telephone (616) 533-6472.

*Patent applied for



PEOPLE in the news

COX RETIRES FROM TSA

W. Howard "Bud" Cox, executive director for Detroit Operations of the Traffic Safety Association (TSA) officially retired from that position on December 31st. Howard's contributions to traffic safety and the Michigan Section of the ITE go back nearly 40 years during the course of his career with TSA.

In 1984, he received the Past President's Award from the Michigan Section for his outstanding service to ITE. For several years, Howard also served as the editor of the Michiganite newsletter as many members will recall.

During his tenure with TSA, he was involved in a number of projects and activities such as the establishment of progressive signalization and right-turn-on-red in the city of Detroit, his hometown. In 1948, he initiated what was undoubtedly the first traffic safety radio show on WJR entitled "It Could Be You. . ." It ran for 13 weeks. Then, in the 1950's, he produced another radio show called, "Listen & Live" which was the forerunner of the Detroit Traffic Central Project. Michigan Emergency Patrol (MEP) provides this service to Detroit area motorists today. For 12 years, Howard taught a course in traffic control at Wayne State University and also lectured at Michigan State.

Howard's Detroit address is 18310 Sunderland, Detroit, Michigan 48219. Best wishes from ITE on your retirement, Howard. ■

BOB MAKI LEAVES MDOT

Bob Maki has been promoted from his position as Technical Services Engineer with the MDOT to Physical Plant Manager for the Department of Management and Budget. Bob's new responsibilities involve management of the physical plants at the state's Capitol and Secondary Complexes. These responsibilities involve heating, air conditioning, lighting, landscaping and building maintenance inside as well as outside. The Michigan Section appreciated Bob's contributions to our technical programs and we wish him success in his new career. ■

NRC Study on Trucks

Twin trailer trucks accelerate pavement wear and will increase road maintenance costs by \$50 million annually, a National Research Council study shows, but the twins will save shippers and truckers about half a billion a year through greater flexibility and efficiency. They appear to have little effect on highway safety, which could mainly be improved through driver training and regulation and better equipment design, the survey alleged.

Twins are mostly used by common carriers and have not diverted much traffic from railroads. They will account for about 11 percent of miles traveled by combination trucks by 1990. Use has nearly doubled in the three years they have been nationwide.

Reprinted from Highway and Heavy Construction
August 1986

NEW MEMBERS

We welcome the following new members into the Michigan Section of ITE:

Dawn Miller, Oakland County Road Commission
Steve Warren, West Michigan Regional Planning Commission
John Dranginis, Chrysler Learning LifTech
Ronald Burroughs, Chrysler Learning Liftech
Greg Gierlack, Wayne County Office of Public Services

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Send resume to: Personnel Director, Edwards and Kelcey, Inc., 70 South Orange Avenue, Livingston, N.J. 07039

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AAA-Michigan Public Relations Department is seeking a traffic engineer to work with local and state agencies to provide an efficient, safe traffic environment. Activities include field and research projects. The position requires a degree in civil engineering, traffic engineering, or related field, knowledge of Michigan traffic laws, and effective written and oral communication skills including technical and statistical report writing. The preferred candidate will have skills including the organization, planning, and coordination of major projects.

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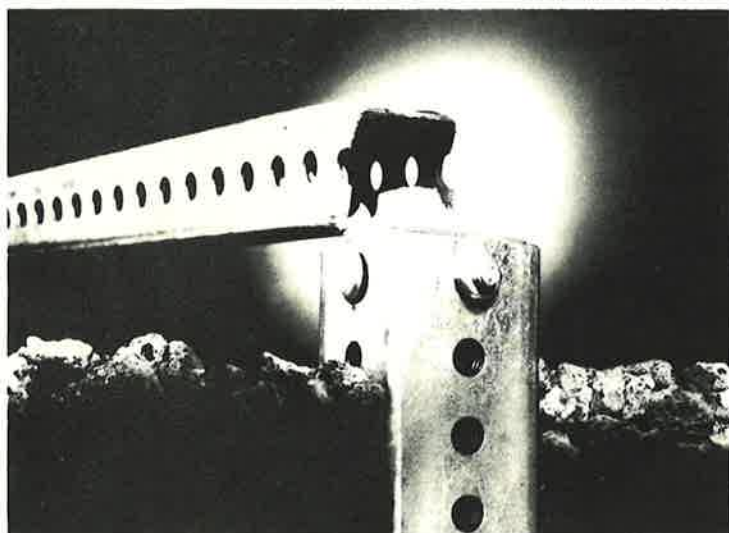
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