



# Westernite

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## Feature Article



### Las Vegas Saturation Flow Rates and Left Turn Factors for Single, Dual and Triple Left Turn Lanes

**Kenneth W. Ackeret, P.E., Ph.D., PTOE**  
Kimley-Horn and Associates

Ideal saturation flow rates and left-turn adjustment factors are key elements used within the Highway Capacity Manual in its methodology to determine intersection level of service. This article documents field observations conducted to gain a better understanding of the operational characteristics of single, dual, and triple left turn lanes as compared to adjacent through lanes on the same intersection approach.

The field study observed a study area that consisted of approximately 75 square miles within the central core of the Las Vegas Valley street network. This area of Las Vegas has many locations with high traffic demand and sustained intersection saturation flows. The field observations were made at 62 signalized intersection approaches. The observations represented 23 single, 36 dual left and 3 triple left turn lanes as well as the adjacent through lanes. Saturation flow data collected contained a total of 3,662 time observations of headways between the 4<sup>th</sup> and 8<sup>th</sup> vehicles, representing a total of 14,648 individual passenger vehicles. The saturation flow measurement procedures used to collect the field headway data were consistent with the procedures presented in the Highway Capacity Manual.

The intersection approaches selected for observation provided

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## President's Message

I hope that all of you had a great holiday season. As the new year begins, the District is preparing for the Mid-Year Board meeting. This year's meeting will be held at the Airport Hotel in Sacramento on February 7, 2003.



Substantial improvements to the new District 6 website are nearing completion. Jon Pascal, the District web master, has been developing a new look for the District's web site in addition to adding many new features. These new amenities are scheduled to debut at the Mid-Year Board meeting. The site should be on line by the end of February, if not before. Thanks to Jon and the entire web site committee for all of their efforts in improving the District's web site.

Deadlines for both the Student Chapter reports and the Section/Chapter reports are approaching rapidly. In order to be eligible for the annual District 6 award and a chance to compete on the International level, all Student Chapter or Section/Chapter reports must be received by the appropriate committee chair prior to April 1, 2003. All Student Chapters will receive \$100 just for submitting a report! In addition, as part of the student initiatives program, the District will issue one \$150 voucher for the facility advisor of each Student Chapters that submits a report to utilize as payment of their following year's International dues.

Two new appointments have been made. John Kerenyi, the new WesternITE Managing Editor, has recently appointed Peter Koonce of Portland, Oregon as the new WesternITE Technical Editor. The Career Guidance Chair, Jennifer Rosales, recently appointed Craig Grandstrom of Bellevue, Washington to head the Career Guidance Newsletter. On behalf of District 6, I would like to welcome both of you!

*Julie Townsend*

*District 6 President*

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### Call for Papers

The Intermountain Section's meeting will be in Jackson, Wyoming on May 16 and 17, 2003. The deadline for submitting abstracts is March 1, 2003. Those interested in submitting a paper may contact David Kinnecom, P.E., PTOE, Intermountain Section First Vice President at [dkinnecom@utah.gov](mailto:dkinnecom@utah.gov) or (801) 887-3707.

# Director's Report



## November International Board of Directors' Meeting Summary

**Ray Davis, P.E., PTOE, City of Belmont**

The International Board of Directors met in Washington, D.C. on November 1<sup>st</sup> and 2<sup>nd</sup>. The following are the highlights of the meeting:

### Strategic Planning Workshop

The International Board spent one half day reviewing and refining the Draft Goals, Objectives and Actions for the Strategic Plan-2002 and how they relate to the Vision and Mission of the Institute. The Goals define what ITE wants to achieve in the next 5-10 years. The Objectives are specific outcomes the Institute intends to accomplish in the next 1-2 years and the Actions are what the Institute staff expects to do to accomplish the objectives. The Draft Goals, Objectives and Actions have been distributed to all the District, Section and Chapter presidents. Please contact your local officer for any additional information you may have on the Strategic Plan-2002. ITE wants to be the international organization of choice for individual transportation professionals.

### Membership

The total membership of the Institute grew at a 7% rate. However, the biggest decrease in membership grade was in Fellows (10 % reduction). If you are a Member with 10 years in ITE you should consider upgrading you status to Fellow. Your dues will be the same and you will have increased stature within the organization.

District 6 membership is approximately 27% of the total voting membership in the Institute. There are currently 252 delinquent members in District 6. Make sure you renew your membership!

### Online Learning Gateway Status

ITE has four Online Learning Gateway programs, all highly rated by individuals who have used them. These programs are excellent for training staff in-house, and you will get a lot of "bang" for your buck. The cost of each training program is \$200. The programs available are:

- Safety Analysis: Signalized Intersections
- Capacity Analysis: Signalized Intersections
- Transportation Planning: Site Impact Analysis
- Control Devices: Signal Need Determination

The FHWA has purchased several hundred of the programs licenses and has distributed four licenses to each of their Tech Transfer Centers.

### Professional Traffic Operations Engineers (PTOE) Status

The PTOE program is going strong and is near reaching financial sustainability. The October exam was administered to 100 individuals. There are now approximately 900 PTOEs. One of the keys to this program being successful is for existing PTOEs to renew their certificates. The renewal rate is currently 73%. One of the biggest problems individuals had with renewal was certifying their PDFs. The easiest way to keep track is using the on-line system through ITE. Don't forget to renew!

### Status of 2002 Start-up Projects

*It's Your Street- Making Traffic Improvements in Your Neighborhood:* The Website is up and available through ITE. A library is being built on agency practices and policies.

*Traffic Signal Timing Issues:* The goal is to create an informational report what will include the existing standards of practice for traffic signal timing. This is not a Best Practices Report but a report to understand all of the practices and methodologies that are used for signal timing without making a judgment regarding merits of individual approaches. Much discussion pointed to a need for a Best Practices document.

*Transportation Safety and Security:* A timely topic. As there is no way to predict terrorist activities, one of the closest natural disasters to a terrorist attack is an earthquake. Individuals who have specific experience in dealing with earthquakes are needed on this committee.

*Geometric Design Handbooks:* ITE has been contracted to prepare the Urban Streets and Freeway Sections of the AASHTO policy book. The Urban Streets section should be completed in two years and the Freeway Section should be completed in 18 months.

*Section/Chapter Website Hosting:* ITE International will host your local Section or Chapter Website. Contact Zach Pleasant at ITE headquarters for more information.

*Walk to School Day Activities:* Over 26 countries participated in Walk to School Day. The website for this program is [www.walktoschool.com](http://www.walktoschool.com).

Two Strike Forces need volunteers: the Red Light Running Strike Force, and the ADA Concerns Strike Force. Please contact your International Director or ITE Headquarters if you are interested in volunteering for either of these two strike forces.

### Election Process

The International Board approved a motion to make a Constitutional amendment to change the nomination and petition process for individuals seeking the office of International Vice President. The District 6 Directors voted against the proposed

changes to the petition process because it will make the petition process much more difficult for any candidate. The process requires notification to the membership of a Constitutional Amendment at the next International ITE Business Meeting, and then a ballot to the membership.

## 2004 Candidates for ITE International Office

The ITE Nominating Committee has nominated the following candidates for the offices of International President and International Vice President for 2004:

- Steven D. Hofener, P.E., PTOE—International President
- Don M. Henderson, P.Eng., PTOE—International Vice President
- Timothy P. Harpst, P.E., PTOE—International Vice President

Tim Harpst, of course, is a District 6 member and will need our membership's support, so please vote when you receive your ballot this spring!

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### Financial Status

The International budget is in good shape. A \$261,000 budget deficit was originally forecast as a result of unrealized investment losses and having a higher than normal number of delinquent members. It is estimated that the budget deficit will be reduced to \$100,000 by the end of the fiscal year.

### Professional Development Program Fund

The Professional Development Program Fund has been established for members to assist ITE in expanding course offerings of affordable and accessible professional development opportunities. The need to develop ongoing, significant professional development programs that meet the needs of transportation professionals is great. You can be an integral part of providing this service. The Fund has raised \$4,201 to date.

### 2002 Member Satisfaction Survey Summary of Results

ITE conducted a survey of our members and compared the results to other engineering and scientific societies of similar size. The survey results were generally positive with ITE scoring higher in most categories than the median scores for other engineering societies of similar size. ITE was judged better than the median in the areas of relevance of publications, accessibility, use of electronic communications, forum for exchange, conference themes and organization of conferences. ITE was slightly below the median in the areas of quality of publications and customer service.

### Reauthorization of TEA-21

ITE has developed a summary of recommendations for the Transportation Industry TEA-21 Reauthorization. Please contact Aliyah Horton at [ahorton@ite.org](mailto:ahorton@ite.org) or (202) 289-0222 ext. 137 if you have any questions or need additional information.

### Future ITE Annual Meetings and Spring Conference Dates and Locations:

#### Annual Meetings

- Seattle, August 24 - 27, 2003
- Disney's Coronado Springs Resort, Florida Aug. 1-4, 2004
- Melbourne, Australia, August 7-10, 2005
- Milwaukee, Wisconsin, August 6-9, 2006
- Pittsburgh, Pennsylvania, August 5-8, 2007
- Anaheim, California, August 17-20, 2008
- San Antonio, Texas, August 9-12, 2009
- Vancouver, British Columbia, Canada, August 8-11, 2010

#### Spring Conferences

- Wyndham Bonaventure Resort, Ft. Lauderdale, Florida, March 23-26, 2003
- Hyatt Regency Irvine, Irvine, California, March 28-31, 2004

Thank you to Patti Boekamp for her three years of outstanding service to the International Board of Directors. Special thanks to Jenny Grote who, as International President, brought that special District 6 sense of family to the International Board.



## 2002 District 6 Section Activity Annual Reports Due!

Thanks to everyone's help, last year was our best year ever in receiving Section Activity Reports from throughout our District. At our annual Palm Desert meeting last July, our District 6 Board had detailed membership activity information from 13 of our 15 sections. Upon compiling the submittal information, some very interesting facts were learned about what goes on in our district. For example, did you know:

- Over \$157,000 was spent in 2001 by our local sections and chapters on membership activities, technical projects and student support.
- Our sections and chapters typically hold eight meetings a year with an average attendance of 46 people at each meeting. This equates to a reported total of 116 local membership meetings in 2001 with an attendance of over 5,000 ITE members.

Just these few activity totals are amazing to comprehend and shows the strength of ITE throughout the 13 western states that make up District 6.

With everyone's help this year, we can have all of our chapters and sections in District 6 submitting 2002 activity reports prior to the April 1<sup>st</sup> deadline for our annual meeting in Seattle. Please take time to help your local elected officers complete your activity report. If you have any questions concerning your chapter or section activity report submittal, please call me at 702-862-3601 or email me at [ken.ackeret@kimley-horn.com](mailto:ken.ackeret@kimley-horn.com). I look forward to seeing all of the activity reports soon!

*Ken Ackeret, P.E., Ph.D., PTOE, District 6 Technical Chair*

## Saturation flow rates for left turns

**Ken Ackeret, P.E., Ph. D., PTOE**  
Kimley-Horn and Associates, Inc.

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a direct comparison with each other for geometrics and operational conditions, as well as driver behavior. In an attempt to observe ideal saturation flow rates, the following guidelines were used for the selection of intersection observation sites and data acquisition for the study:

- Observe only during peak traffic period conditions.
- Observe only during dry pavement and good weather conditions.
- Observe only at locations with intersection angles of approximately 90 degrees.
- Observe only at intersections with relatively flat approach and departure grades on the order of 2 percent or less.
- To the extent possible, observe only at intersections with 11 to 12-foot wide approach travel lanes.
- Observe only where street parking is prohibited adjacent to approach and departure travel lane(s) within 250 feet of the intersection.

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### Saturation flow rates for left turns

Ken Ackeret, P.E., Ph. D., PTOE  
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- Observe conditions without heavy vehicles in the traffic stream.
- Observe only at intersections where and when cycle lengths are approximately 120 to 160 seconds (the peak period cycle times used for progression within the Las Vegas street network).
- Observe only at intersections with posted roadway speeds of 35 to 45 miles per hour.
- Observe comparable exclusive left-turn intersection signalization facilities for similar driver comprehension.

To determine the number of headway observations needed on each approach lane, a statistical analysis of minimum sample size for a 95 percent confidence level was conducted for the expected headway field times. This evaluation determined a minimum sample size for each lane observation of 16 saturated headways. Due to possible variations in the headway time estimates used in selecting the minimum sample size, 20 observations per approach lane were obtained for each selected and observed intersection approach.

Potential intersection approaches for study were selected after a general field review was conducted of the Las Vegas Valley arterial street network. The field review identified approximately 310 signalized intersection approaches. However, due to intersection geometry, potential pedestrian conflicts and/or signal phasing, only 75 of these signalized intersection approaches were identified to be appropriate for the field study.

The study findings confirmed that the HCM recommended ideal saturation flow rate of 1900 pcphgpl for through travel lanes is appropriate for use at signalized intersections in Las Vegas. The field data was also evaluated as nine lane groups. **Table 1** summarizes the lane group subpopulations statistically tested. A one-way Analysis of Variance was conducted between the nine lane groups. The evaluation determined that the lane groups were statistically different from each other. Subsequent pairwise comparisons between the lane groups determined the following significant findings:

- The through travel lane groups 2 and 5 are similar, but through lane group 9 adjacent to the triple left-turn lanes was found to be significantly different. This difference was

**TABLE 1: LANE GROUP SUBPOPULATIONS**

Lane Group	Lane Group (Approach)	Mean (seconds)	$\sigma$	Observations (n)
1	Single left	7.5997	0.9181	516
2	Single left through	7.6712	0.9935	511
3	Dual left inside	7.7047	1.0156	784
4	Dual left outside	7.7132	0.9736	782
5	Dual left through	7.5647	1.0002	795
6	Triple left inside	7.8892	0.7549	63
7	Triple left middle	7.9603	0.9401	69
8	Triple left outside	8.1192	1.0583	72
9	Triple left through	8.2027	1.0248	70
	Entire population	7.6823	0.9894	3662

**TABLE 2: SUMMARY OF LANE GROUP SATURATION FLOW RATES (pcphgpl)**

Lane Group	Lane Approach	95% Confidence Interval		
		Lower Bound	Mean	Upper Bound
1	Single left	1874	1895	1916
2	Single left through	1856	1877	1898
3	Dual left inside	1852	1869	1886
4	Dual left outside	1850	1867	1884
5	Dual left through	1886	1904	1921
6	Triple left inside	1771	1825	1883
7	Triple left middle	1758	1809	1863
8	Triple left outside	1725	1774	1825
9	Triple left through	1708	1756	1806

Results based on saturation headways measured between the 4th and 8th vehicles in a queue.

explained by unusual through lane characteristics at triple left-turn lane approaches, and the lower number of approach observations studied at the triple left-turn lane

**TABLE 3: SUMMARY OF FINDINGS**  
**Saturation Flow (vphgpl) and Left-Turn Factors**

Through Lane	Exclusive Single Left Turn	Dual Left Turn			Triple Left Turn				
		Inside	Outside	Average	Inside	Middle	Outside	Average	
1900(1)	1.00	0.98	0.98	0.98	0.96	0.95	0.93	0.95	Left-Turn Factor fLT Based on 1900 pcphgpl
1894(2)	1895	1869	1867	1868	1825	1809	1774	1803	Study of 62 approaches 23 Single 36 Dual 3 Triple Las Vegas Metropolitan Area
	1.00	0.99	0.99	0.99	0.96	0.96	0.94	0.95	fLT based on observed through lane 1894 pcphgpl

facilities (70) when compared to the single (500) and dual (780) left-turn lane approaches.

- The triple left-turn lane approaches comprising lane groups 6, 7, 8 and 9 are all significantly similar to each other.
- Lane group 1 for single left-turn movements is significantly similar to the adjacent through movement lane groups 2 and 5. This finding suggests a left-turn factor of 1.0.
- Inside and outside dual left-turn lane groups 3 and 4 are significantly similar to each other. This suggests that there is no significant difference between dual left inside and outside left-turn lane performance.

An examination of the left turn lane groups shown in **Table 2** (groups 1, 3 and 4) numerically confirms that the left-turn lane saturation flow rates were higher than expected when compared to those recommended in the HCM. The findings of the study support a single left-turn saturation flow rate value of 1900 pcphgpl, and a dual left-turn lane saturation flow rate on the order of 1870 pcphgpl. These findings strongly suggest that the HCM exclusive (case 1) left-turn factor of 0.95 is not applicable to the Las Vegas area. Thus, the left-turn factor for single left-turn lanes with protected left-turn signal phasing should be 1.0 and dual left-turn lanes should be a minimum of 0.98 per lane.

The mean saturation flow rate values and the left-turn factors observed in Las Vegas are summarized in **Table 3**. The reported saturation flow rates and resulting left-turn factors support findings of ITE Technical Committee 5P-5 and 5P-5A (ITE 1993, ITE 1995) that reported left-turn saturation flow rates greater than the HCM value of 1805 pcphgpl (0.95 x 1900 pcphgpl) and a suggested left-turn factor of 1.0. However, the Las Vegas area data collected from three triple left-turn lane sites were found to have a lower capacity, and therefore did not compare favorably with the triple left-turn saturation flow rate values observed by Leonard (1994) for five sites in Orange County, California.

It is hoped that sharing these findings for the Las Vegas street network will be useful to other individuals evaluating intersection saturation flow rates and left turn factors.

## Registration News

### Traffic Engineers Recommended to Practice in California

by Walter Okitsu, President, Katz, Okitsu and Associates and Chair, ITE District 6 California Traffic Engineering Registration Committee

A State-commissioned study recommended that California upgrade the status of ten engineering disciplines, including traffic engineering, from title-protection status to regulated practices. California State University Sacramento's Institute for Social Research was hired by the state's Department of Consumer Affairs, as required under Senate Bill 2030, to review the existing title-protected engineering disciplines. The study, dated November 2002, was posted on the Department's web site in late December 2002, at:

### Attention Students!

It's that time of year again to plan for the Student paper and chapter competitions. The deadline for the Student paper and Student Chapter Competitions is April 1, 2003. Please send all submittals to Jennifer Rosales, the ITE District 6 Career Guidance Chair. The Fall ITE student newsletter, College Happenings ITE, has additional information about the competitions. If you have any questions, then please email or call:

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[http://www.dca.ca.gov/engineering\\_title\\_act.htm](http://www.dca.ca.gov/engineering_title_act.htm).

### Background

California currently regulates the practice of only three engineering disciplines: civil, electrical, and mechanical. The scope of these three disciplines is defined in state statute. Engineers must possess a license to practice within each of these disciplines, and with one key exception, must hold multiple licenses in order to practice within more than one field. The exception is that a registered civil engineer may practice electrical engineering or mechanical engineering if in connection with or supplementary to civil engineering studies or activities. In other words, overlap among the three fields is recognized only for civil engineers entering other fields, and not vice versa. California does not follow the "generic" licensing used in most other states, where a professional engineer's specialty discipline is not depicted on the engineering stamp, and overlap between disciplines is acknowledged.

California also registers ten other engineering disciplines: agricultural, chemical, control system, fire protection, industrial, manufacturing, metallurgical, nuclear, petroleum, and traffic. Registered engineers in these fields have their titles protected. For instance, only a Registered Traffic Engineer in California can advertise services as a traffic engineer, or hold the position of "City Traffic Engineer." However, the state does not regulate the practice within these disciplines. Holders of registration in these "title act" disciplines are not enabled to perform anything more than a non-professional engineer, and are prohibited from performing civil, electrical, and mechanical engineering. The result is that in California, the registration as a Traffic Engineer is somewhat similar to certification, like the Professional Traffic Operations Engineer (PTOE), rather than to licensing.

Various attempts have been made in the past to alter the distinction among the three practices and ten titles. In 1997, the traffic engineering registration was almost eliminated, but was retained through the efforts of ITE members. A few years ago, a bill failed in the legislature to convert California to the generic engineering registration used in most other states. In 2000, through the efforts of a coalition of various engineering organizations other than civil engineers, Senate Bill 2030 was passed requiring the state to hire a consultant to study the issue.

### The Recommendations

The state hired the Institute of Social Research, which prepared its study in 2002. The key recommendations that affect traffic engineers are:

- "Remove all prohibitions against overlapping practice between engineering disciplines."

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# Section Reports

## San Francisco Bay Area

### November meeting

The Blue and Gold Ferry "Oski" at San Francisco's Pier 39 was the floating site for the Section's November 21 luncheon meeting. This venue was most appropriate for the featured topic, "A Strategy to Improve Public Transit with an Environmentally Friendly Ferry Service", presented by Thomas Bertken, CEO of the Bay Area Water Transit Authority. Mr. Bertken provided the 40 attendees with an overview of the Implementation and Operations Plan, which provides answers to key questions posed by the State Legislature in authorizing preparation of the plan. The proposed new ferry system specifies both new routes and expansion of existing service; additional potential routes and terminal sites are designated for future study. The system would add 31 boats by 2015, bringing the total to 44 vessels, and serve an additional 8 million passengers by 2025, bringing the total to 12 million. The selection process for this system identified routes based on projected ridership using a market-based model, checked for cost-effectiveness, and screened for fatal environmental flaws. Total cost for the new system would be \$646 million over the first ten years, consisting of capital costs of \$396 million (\$166 million for terminals, \$230 for vessels), and net operating costs growing to \$46 million per year by 2015. The plan judges this system to be a good investment, based on: cost effectiveness, with existing ferries achieving 60-70% farebox recovery ratios; reduction of vehicle-miles traveled and NOx and PM emissions; provision of transportation options for emergencies; and creation of a catalyst for "smart growth" around terminals. Potential new sources are identified for funding the system, with a requested bridge toll increase specified to fund about half of the capital costs and most of the operating subsidy. Assessment of potential environmental impacts includes marine wildlife, wake analysis, dredging, and air quality. The proposed boats are described as cleaner than the EPA 2007 emission standards and ten times cleaner than the existing fleet; the boats were selected after 39 alternative technologies were studied. If the State Legislature approves the plan next year, the most important next step will be to secure funding from the new sources, especially pursuing the bridge toll increase and Federal funds.

*Submitted by Rich Haygood, Section Co-Scribe*

## Colorado/Wyoming

### October meeting

A luncheon meeting of the Colorado/Wyoming Section of ITE was held on October 25, 2002 at the Antlers Hotel in Colorado Springs, Colorado. Section President, Alex Arinello, presided over the meeting that was attended by 61 members and guests. Alex thanked everyone for coming

south of Denver for the meeting and expressed interest and commitment to holding Section Meetings north and south of Denver. After committee reports, Dan Centa from the City of Pueblo Colorado was introduced to discuss the hot topic of access accommodations introduced in Washington, DC.

Dan composed a comment letter addressing recommendations being proposed for federal rulemaking which would mandate a number of major changes to the MUTCD with serious and very costly implications. Items such as strict requirements for audible pedestrian signals and mandatory pedestrian traffic signals on all approaches to roundabouts were discussed.

A vote was taken after some discussion and additions to the letter. Those present voted unanimously to support the letter Dan had written critiquing the new rules proposed. International ITE as well as the National Committee on Uniform Traffic Control Devices will be meeting to discuss and take positions on the proposed rule changes.

Doug Eberhart introduced the luncheon program speaker Bob Swearingen from the Transportation Technology Center, Inc. The center is located 22 miles northeast of Pueblo Colorado, which is southeast of Colorado Springs. Mr. Swearingen started working at the facility in 1973. The facility site was selected in 1968 and was once owned by the US Department of Transportation. It is now owned by the Association of American Railroads, as has been the case since 1998.

An interesting power point presentation showed highlights of the history and on going research and testing of transportation vehicles conducted at the facility. Much of the research involves railroad and passenger train vehicles and track but includes more unusual linear induction vehicles, high-speed trains and other transportation systems. Many systems such as Japanese high-speed trains are tested at the facility, which covers some 52 square miles and has 48 miles of tracks.

A successful ITE Fall Golf Tournament was held at the City of Loveland's Olde Course in Loveland Colorado. The weather was beautiful and everyone had a good time. Prizes were awarded thanks to the sponsors of the tournament. Please make plans to golf in the spring tournament scheduled for June 2003.

The Colorado/Wyoming Section contact is Alex Arinello at LSC Transportation Consultants, Inc., 303-333-1105; [aja@lscden.com](mailto:aja@lscden.com). Also, please visit our section's website at [www.cowyite.org](http://www.cowyite.org).

*Submitted by William A. Hange, Jr. PE - Scribe*

## Border

### July meeting

The month of July offered wonderful activities for the California Border Section.

We recently enjoyed an excellent District 6 Meeting in Palm Desert. The California Border Section competed in the Traffic



Bowl and won 3<sup>rd</sup> place of nine teams competing, winning \$200 for our efforts. The California Border Section's Summer Social, organized by Past President Mike Kenney of Rick Engineering, was held on the beautiful island of Coronado. A cookout followed by a Concert in the Park guaranteed a good time for all.

#### *September meeting*

Our September meeting was held at our most frequent gathering place: The Handlery Hotel in Mission Valley. Justin "Jay" Rennilson, President of Rennilson Consulting Services and owner of Advanced Retro Technology, Inc., gave a talk entitled "ITE's Interest in the International Standards Organization, CIE, and dealing with lighting and retroreflection in Transport." International standards in lighting such as roadway, tunnel and traffic control are the responsibility of the Commission Internationale de Eclairage (CIE), or, in English, the International Commission on Illumination. ITE, as an international professional organization of transportation engineers, has a vital interest in seeing that the recommendations and standards developed by CIE's technical committees are reasonable and prudent. Careful review of these CIE drafts and our input is what makes the system work. A description of the CIE organization, the National Committees, and the close cooperation with ISO, CEN and IEC were presented together with a list of publications of direct interest to ITE.

Mark Kramer, a freshman at St. Augustine High School, received an award for his studies regarding red light running. Mark observed red light running at various intersections in Oceanside and won an award in the Greater San Diego Engineering and Science Fair. Winners of this award go on to compete statewide.

#### *October meeting*

The luncheon topic presented was the San Diego Association of Government's (SANDAG's) Draft Mobility 2030 plan, presented by Eric Pahlke, P.E., Director of Transportation, SANDAG. Over the next 20 years, vehicle trips are forecast to grow by 34 percent, and transit trips are projected to double. During the next 30 years, it is anticipated that the San Diego region's population will grow by one million people. The Mobility 2030 plan is SANDAG's long-range, regional transportation plan, whose broad goals are to improve, or promote, mobility, accessibility, reliability, efficiency, livability, sustainability, and equity.

#### *November meeting*

Our November luncheon meeting began with a technical panel discussion on the much studied and debated topic of yellow interval signal timing. This topic has become of particular interest to the City of San Diego as it is about to re-implement their Red Light Photo Enforcement Program. Panelists included Allen Holden, Deputy Director of Traffic Engineering, City of San Diego; Julio Fuentes, Senior Traffic Engineer, City of San Diego; Cindee Feaver, Caltrans District 11; and, Bill Darnell, President, Darnell & Associates, Inc.

Ed Krulikowki, P.E., City Traffic Engineer, City of El Cajon, delivered a fascinating presentation on the City of El Cajon's red light photo enforcement program. The City of El Cajon, located about 15 miles east of The City of San Diego and having a population of almost 100,000, has traffic conditions similar to a large urban area. The City of El Cajon's program was among the first red light photo enforcement programs implemented in the state of California and has been in effect since December 1996. The City's new system, which started operation in June, takes three digital photos and a video clip.

We are looking forward to our joint meet with the Southern Cali-

fornia Section scheduled for Friday, March 21, 2003, which will include a workshop on the new Caltrans' supplement. We encourage all to attend what should be an informative and fun meeting.

*Submitted by Victoria A. Cole, P.E., Border Section Secretary*

## **San Bernardino**

#### *November meeting*

The Riverside-San Bernardino Section monthly meeting was held jointly with the Southern California Section on Thursday, November 21, 2002 at the Kellogg West meeting rooms on the Cal Poly Pomona campus.

Four members of the Cal Poly Pomona student chapter enthusiastically presented their recent trip to Australia to attend an ITE Australia conference. Some of the highlights of their trip included walking across "Sidney's Harbor Bridge Climb," touring Melbourne's traffic management center (TMC), visiting several transportation facilities in Melbourne and Sidney, and an array of night club/beer/restaurant/extracurricular activities/tourist attractions/Australian slang Power Point slides.

Nazir Lalani, from the County of Ventura, presented his "FHWA Scanning Tour of Europe." The tour included visits to Sweden, Germany, Netherlands and the United Kingdom. The key general points to his presentation is that Europe is committed to safety, (with a particular emphasis on pedestrian/bicyclist safety), heavily rely on automated violation enforcement, control speeds through geometric design, and prefer roundabouts over signals. Other highlights from particular countries include:

#### *Germany*

- Major through route signs
- Stop signs at signalized intersections
- Audible pedestrian signals
- Diagonal vehicle detection loops

#### *Netherlands*

- Dynamic speed warning signs
- Bike turning lanes
- Bike crossings at roundabouts
- Speed humps and cameras at signals

#### *Sweden*

- "Vision Zero" reducing fatalities by 50% from 1997 to 2007
- Separate pedestrian and bicycle indications
- Pedestrian pushbuttons with Braille
- Bus priority indications

#### *United Kingdom*

- Signalized roundabouts
- Puffin crossings
- "New Traffic Signal Ahead" signs
- Intersection turning guidance

*Submitted by Gilbert Hernandez, RBF Consulting*

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## Alaska

### December meeting

Our luncheon speakers were from the Municipality of Anchorage (MOA), their topic, "Street Maintenance Pet Peeves." Dan Southard and Devin Branham each have over thirteen years experience in Street and Park Maintenance Operations. Their division currently has 106 operators/personnel. They maintain and repair 1248 lane miles of road, 191 parks and over 10,000 acres of land. Their summer responsibilities include asphalt and concrete repair, drainage repair and structure cleaning (including 155 oil/grit separators), sweeping, gravel road and RAP repair, parks and playgrounds and sports fields and trails. They sweep three times a year and collected over 6,000 cubic yards of debris last year. Their winter responsibilities are to clear the 1248 lane miles of road within 72 hours of snowfall with the clearing of the Central Business District (CBD) being their first priority. They also clear snow from sidewalks, trails and ice rinks. The responsibilities can be broken down into the following categories: Right-of-way enhancement, sidewalk improvements, traffic control and calming, drainage, and the lowering of high utilities.

**Right-of-way enhancement:** These responsibilities include mowing and snow removal. Maintenance problems in this category are roof/sidewalk drainage, mature trees overhanging into driving lanes, landscaping that hinders their job (narrow landscape strips which require hand mowing, rocks beds between the road and the sidewalk), and maintaining sight distance. Trees, buildings, utility poles and electrical panels often limit sight distance.

**Sidewalk improvements:** Responsibilities include sweeping, snow removal, and maintaining, repairing, and retrofitting ADA accessibility. Problems here arise from narrow sidewalks, small turning radii and utility locations.

**Traffic control:** Functionality is the biggest issue. Narrow medians are hard to find in heavy snowfall and make snow removal difficult. Turning radii and lack of snow storage areas along roadways cause problems as well. The graders have 14' blades and are 35' long and need much room to maneuver. Speed bumps are also an issue here.

**Traffic calming:** The biggest issue with traffic calming is that it promotes cut-through traffic in alleys, which then require more frequent and more extensive maintenance. Possible solutions include paving the alleyways or blocking them off.

**Drainage:** Street Maintenance's biggest challenges come from drainage problems. They ask that we design for maximum future capacity and that we look at undeveloped land. Future capacity has been an issue when designs (like sedimentation ponds) are adequate for phase 1 but not for the phases that follow. Trace the route storm water runoff travels, to the very end. Damming has occurred in places where the storm water runoff was not followed to its end. Place storm drain/drainage easements in the ROW when possible. Situations have occurred where easements are running between houses, or are rendered useless by adjacent development. Access to oil/grit separators (OGS) is also an issue. The trucks used to clean them weigh upwards of 90,000 pounds and are 35' long.

**High utilities:** High utilities (manholes and valve boxes) causes employee injuries and equipment damages. It is very important that these utilities be below grade! There are several ways to



lower high utilities, but thought needs to be put forth on how to prevent manholes and such from jacking up during our winters (thus avoiding the need to lower them). Street Maintenance has spent in excess of two million dollars lowering 5357 manholes and 1339 valves since 1999.

Submitted by *Melissa A. Mormilo, EIT*

## Southern California

### October meeting

The meeting was held on Wednesday, October 16, 2002 at the Monterey Hill Restaurant in Monterey Park and was attended by approximately 75 members, student members, and members of the law enforcement community.



Mr. Emery Dyer from ForTel Traffic, Inc. presented his company's VCal™ Sign. This "vehicle calming sign" is an LED variable message sign which displays not only the roadway speed limit, but can also display the actual speed of motorists detected exceeding the speed limit. This feature is achieved through the use of a built-in radar unit, and logic internal to the sign which will only display the speed of motorists exceeding the speed limit. Additional information on the sign can be obtained by contacting Mr. Dyer at (831) 636-7800 or visiting [www.forteltraffic.com](http://www.forteltraffic.com).

The City of Los Angeles' Automated Red Light Running Program was presented jointly by Mr. Glenn Ogura (LADOT) and Sgt. Steven Foster (LAPD-Uniform Service Division). The red light running program began in 1998 with the goal of making intersections safer. Enforcement cameras have been installed in 15 of the 16 intersections planned for implementation. This system, which uses wet film to take pictures of motorists who violate a red traffic signal indication, has contributed to a reduction in the number of collisions at the project intersections.

Two inductive loops are installed in each through lane, a minimum of 5 ft. upstream of the limit line (or cross walk). When the traffic signal turns red, the loops detect a motorist crossing the loops, and determine the speed of the motorist. If the system determines that the motorist will pass the limit line, based on the motorist's speed, then the camera takes a picture of the motorist before it enters the intersection, while the red signal aspect is illuminated. The system then takes a second picture of the motorist in the intersection as it runs through the red light. From the second picture, a close up of the front license plate and a close up of the driver is obtained.

The vendor who operates the system, Affiliated Computer Services (formerly Lockheed Martin INS) retrieves the film from the cameras every other day, and at that time conducts a diagnostic check of the system. The vendor prepares a citation to be mailed to the registered owner of the vehicle. All citations are reviewed by LAPD officers

assigned to this program. If the LAPD officer agrees with the citation based on the pictures, then he/she approves the citation and returns it to the vendor, who mails out the \$271 citation.

If the registered owner of the vehicle was not driving the vehicle at the time of the infraction, the owner can identify on the citation the person who was driving the vehicle. The vendor will then re-issue the citation to the correct person.

The location of the field hardware, the installation of the photo enforcement cameras and the installation of the associated hardware (including the loops) were completed by the City of Los Angeles Department of Transportation's own forces. This allowed the City to have greater control of the design and installation of the devices. LADOT and the LAPD have a great deal of oversight on the process, continuously evaluating the vendor's performance and auditing the citations mailed. They emphasized that their hands-on involvement, by both the City's engineering and police department side is key to the success of such a program.

As previously stated, the program has been successful in achieving its goal of improving safety at intersections. As other agencies look at installing red light running photo enforcement, they can learn much from the City of Los Angeles' Program and would be advised to take advantage of the four years of Los Angeles experience and lessons learned.

#### *November meeting*

The Southern California Section Monthly Meeting was held jointly with the Riverside/San Bernardino ITE Section. It was held on Thursday, November 21, 2002 at the Kellogg West Restaurant on the campus of Cal Poly Pomona. The meeting was attended by 86 members, about 12 of which were students.

The Cal Poly Student Chapter (represented by Eric Maya, Vince Ramos, Freddy Monge, and Pablo Para) presented a lively overview of their chapter's trip to the recent ITE conference in Australia. They shared examples of transportation and civil roadway and bridge facilities unique to the region. Beyond these technical highlights, they also enlightened the group about some of the "cultural" and social experiences they had during their visit.

The technical presentation was entitled "Federal Highway Administration (FHWA) Scanning Tour of Europe", presented by Mr. Nazir Lalani, Principal Engineer, County of Ventura Transportation Department.

Mr. Lalani started

the presentation with some overall intersection safety and the fatality rate statistics in Europe for the year 2000. A total of 41,000 deaths and 3,000,000 injuries occurred in that year, where 21% occurred within intersections. Key to the European philosophy is that the Europeans value safety as the highest priority versus capacity. Urban areas were responsible for approximately 80% of these fatalities, of which 44% and 56% occurred in signalized and unsignalized intersections, respectively. Specific focus areas were developed to minimize these fatalities, including the design and operation of innovative traffic control devices, innovative geometric design, identification of issues and selection of counter-measures, development of low-cost improvements, and research projects.

To accomplish the safety goal, Sweden developed a "Vision Zero" policy; Germany's safety commissions set safety priorities and identified potential solutions; the Netherlands developed "National Sustainable Safety Goals;" and the United Kingdom is working to balance safety versus the need for mobility.

European transportation experts also place a high priority on the design and dedication of pedestrian and bicycle crossings and pathways. Separate pedestrian and bicycle signal indications are widely used in Sweden. Germany extensively uses pavement markings to delineate bike-ways, while the United Kingdom applies detector technology to improve the safety and operations of pedestrian and bicycle crossings.

European transportation professionals also strongly support the use of automated enforcement for both red-light-running and speeding. They use red-light-running and speed enforcement cameras extensively to reduce the number of accidents and improve safety. They also modify geometric designs to control travel speeds on roadways. Additionally, they widely utilize roundabouts versus traffic signals for many intersections. The Netherlands has converted signalized intersections into roundabouts, especially in rural areas.

Mr. Lalani suggested that pilot projects that control travel speeds through intersections should be developed in the United States. Such projects can enhance pedestrian and bicycle crossings by using a combination of practices implemented in Europe. (Mr. Lalani also referred those present to recent ITE publications in the area of alternative pedestrian and bicycle treatments, which he was heavily involved in developing.) A model photo-enforcement program could also be developed based upon European experience. Additionally, the application of single-lane roundabouts should be considered as a viable alternative to signalized intersections whenever feasible in the United States. In summary, the presentations were very enlightening and helped to broaden the perspective of those in attendance.

*Submitted by Sunil Rajpal and Joaquin T. Siques*

### **Attention Scribes: Publication Deadline**

The deadline for submitting Scribe reports is the 25th of the odd-numbered month prior to the date of the issue. For example, Scribe reports are due by March 25th for publication in the May-June issue.

**Traffic Engineers Recommended to Practice in California by Walter Okitsu, P.E., Katz, Okitsu and Associates**

*(Continued from page 5)*

- "Eliminate title protection and offer practice protection to all regulated disciplines."

The combination of the above two recommendations effectively promotes registered traffic engineers into practicing engineers. This would allow a traffic engineer to practice what is currently reserved for licensed civil and electrical engineers: traffic signal design and design of fixed roadway features. However, the consultant's report does not state whether the regulation of engineering should be broadened to include traffic studies, which are regulated in Oregon.

- "Accept as new regulated disciplines those with an NCEES or California-developed examination . . ."

Although the above recommendation does not apply to traffic engineering, since it is already a regulated discipline, the key wording is "California-developed" examination. Currently traffic engineering is the only title discipline in California that does not have a nationally prepared NCEES examination. The state prepares the traffic engineering exam in-house. The consultant's recommendation acknowledges that an NCEES exam need not be a requirement for regulation.

*Traffic Engineers' Position*

In a poll of its membership taken in 1997 by ITE's District 6, the great majority of members in California favor the conversion of traffic engineering registration from mere title-protection to a regulated practice. District 6 has a committee on California Traffic Engineering Registration tracking the activities within the state's legislature and Board of Engineering.

In addition, a new organization called the Registered Traffic Engineers of America (RTEA) was formed for the purpose of lobbying on behalf of traffic engineering registration. The

RTEA is separate from ITE, to avoid jeopardizing ITE's tax-deductible, non-profit status. Information on the RTEA can be found at:

<http://home.earthlink.net/~wokitsu/RTEA.html>.

*(Note: the address is case-sensitive, so capitalize at appropriate places.)*

The RTEA has joined a coalition called the California Legislative Council for Professional Engineers (CLCPE), which includes organizations representing electrical, chemical, fire protection, mechanical, control systems, and manufacturing engineers, as well as the NSPE's California branch. The CLCPE and the RTEA are pleased with the recommendations presented by the state's consultant.

*What Next?*

No change will occur until the state passes legislation, and this issue is probably too small to be made into a stand-alone bill. The likely vehicle for converting the consultant's recommendations into law would be a much larger bill, probably one that deals with the fate of the Board of Engineers and Land Surveyors. Because hearings on that issue are expected to be held throughout 2003, no legislation is expected until 2004. Until then, the RTEA proposes no active lobbying activities unless a crisis were to arise. The RTEA would continue using its lobbyist, however, to help keep the consultant's recommendations alive.

**Sign of the Times**



"Just how close together are they again, dad??"

Submitted by Laurie Kozisek, ITE-Alaska Vice President

**Two more movie tickets up for grabs!!**

Congratulations to Alex Ariniello, Vice President of LSC Transportation Consultants, who was the first person to email the correct answer to last month's contest. Alex correctly identified Dr. Jodi Carson (University of Montana ITE Student Chapter Advisor) as the Outstanding Educator of the Year.

**This month's contest:**

Be the first one to email me with the right answer to the following question, and you'll win two movie passes!

Pull out the collage on Page 4 of the September-October 2002 issue. How many times can you find the new WesternITE Managing Editor? Here's a hint: I look like the picture in this box. Email me with your answer. *District and International Board members and their immediate family members are not eligible to participate.*



# Positions Available

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The Construction Program Manager is responsible for managing the construction phase of the Regional Express Capital Projects program, including management of project managers and the work of consultants, WSDOT and contractors. This position works directly with agencies involved in Regional Express projects including WSDOT, local agencies and other transit agencies to manage or perform constructability reviews, construction contracts, and inspections.

### *Program Manager Pre-Construction – Regional Express*

The Pre-Construction Program Manager is responsible for managing and directing the planning, project development, and design phases of the Regional Express Capital Projects program. This position works directly with agencies involved in Regional Express projects including WSDOT, local agencies and other transit agencies to define projects, complete environmental reviews, prepare final construction plans, and advertise projects for construction bids.

To receive full job description and employment application send an e-mail request to [mcleods@soundtransit.org](mailto:mcleods@soundtransit.org). Expressions of interest should include an \*application form, resume, and a cover letter to:

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*Required:*

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- Experience with AutoCad
- EIT Certification (for engineers) or P.E.
- Technical expertise in traffic operations and/or transportation design, such as traffic signal and roadway operations, traffic studies, intersection analysis methodologies, and parking analysis.
- Should be able to work both as a team member and independently.

*Desired:*

- Masters Degree specializing in transportation engineering.
- P.E. in Civil and/or Traffic Engineering.
- Experience with ITS projects, EISs, client meetings, public meetings, simulation tools, proposals and project management.
- Experience working for a consulting firm.

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## City of Campbell

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## RBF

RBF Consulting, an ENR Top 100 civil engineering design firm, has a current staff of over 650 professionals located in offices throughout California, Arizona and Nevada. Founded in 1944, RBF is a leader in the field of Transportation Engineering and Planning and our reputation is founded upon a commitment to quality, professionalism, and continuing innovation.

Opportunities for *Transportation Project*

(Continued on page 12)

## Positions Available Ads:

To place your ad, e-mail your ad to [pkoonce@kittelson.com](mailto:pkoonce@kittelson.com). The deadline is the 28th of the previous odd-numbered month. The cost is \$6.00 per line, with a minimum cost per ad of \$100.00. Ads are also posted on our web site at [www.westernite.org](http://www.westernite.org). More information is available on our Web site.

Engineers are available in several of our locations. The positions require a BSCE, professional registration, and a minimum of 4 years transportation engineering experience. Strong skills utilizing AutoCAD/Softdesk and/or Microstation/InRoads preferred. Lead design and CADD production staff in the development and successful delivery of all technical work products. Responsible for the design of highway and drainage plans, specifications and estimates for city, county and state facilities.

RBF has an opportunity for an *Assistant Transportation Engineer/Planner* in our Irvine, California office. The position requires a BSCE or a Bachelor's degree in Urban and Regional Planning, and 1-5 years of related transportation experience. EIT and Microsoft Office preferred. Responsibilities include preparing traffic impact studies, parking studies, and land use/circulation planning analysis.

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EOE

## ITE HEADQUARTERS

### Call for Applicants for ITE Chief Technical Officer

*A unique opportunity awaits the successful candidate...*

Want to contribute toward advancing our profession and help make ITE an even better organization? Are you eager to roll up your sleeves and help define issues facing our profession and develop programs to address these issues? Do you have excellent people skills and enjoy managing and working with other professionals? Do you have excellent written and public speaking communications skills? Do you have a minimum of 15 years traffic operations and/or ITS experience? If so, read on and consider applying for ITE's Chief Technical Officer position.

#### *Education and Experience Requirements:*

- An undergraduate degree in civil or electrical engineering. A graduate degree in transportation engineering with traffic operations course work is preferred.
- A minimum of 15 years of professional experience to including traffic operations or ITS related assignments. Ideally, the majority of this experience should be with a public sector employer.
- A licensed Professional Engineer. Ideally also a PTOE.
- Demonstrated ability to manage projects and to assume increasing levels of responsibilities.
- Experience coordinating projects and working with outside contractors, agencies, or vendors preferred
- Intermediate-level computer skills in Microsoft Office Suite.
- Demonstrated public speaking and experience in representing your employer before an external organization.
- Pride and ownership of product; includes attention to detail and quality control.
- Volunteer participation in educational and scientific associations, with preference given to participation in ITE.
- Project and budget management.

#### *Personal Characteristics Requirements:*

- Desire to contribute to the advancement of the transportation profession
- Willingness to assume a leadership

role

- Willingness to work as part of a team
- Ability to work independently and meet deadlines
- Good communication, interpersonal and leadership skills
- Ability to multi-task
- Welcome the challenge of additional responsibilities
- Self-motivated

Qualified applicants who fully meet the education, experience and personal characteristic requirements should please send resume and salary history to:

Thomas W. Brahms, Executive Director  
Institute of Transportation Engineers  
Mail: 1099 14th Street, NW, Suite 300 West,  
Washington, DC 20005-3438 USA  
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## Editor's Corner



I'm very pleased to have been selected to be the new Managing Editor of *WesternITE*. Managing Editor is hard work, but what makes it worthwhile is the opportunity to work more closely with the leadership of ITE District 6, who consistently display dedication to the profession, their employers, and their own families, as well as demonstrate daily that traffic engineers are generally more sociable than the average engineer! I look forward to my three-year term as Managing Editor, and hope to continue *WesternITE's* award-winning tradition. Please don't hesitate to contact me if you have any items of interest for this periodical.

John Kerenyi



**Save the date!**

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