October President’s Message

In my youth I was sometimes told to go play in the traffic. After doing just that for a few decades, I have to thank them for the suggested career move. I love Transportation Engineering. I love the people, the challenges, and helping make our system better. There are so many different aspects to the job! Boredom just isn’t a concern.

We don’t get much notoriety, but ITE members bring important skills and make a difference. We conceive and implement solutions to transportation system shortcomings. We work hard to prevent traffic accidents. When a capacity project improves freight moment or improves life quality I get all warm and fuzzy. It’s a month early, but I’ll give thanks to those who led me down the path to the people and principals who are ITE.

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ITE Washington Section and Women’s Transportation Seminar (WTS) presents:

The Roads and Transit Package:
How Will It Affect You?

Speakers Paula Hammond, Interim Secretary of Transportation, WSDOT
Joni Earl, CEO, Sound Transit
Harold Taniguchi, Director, King County DOT

Moderator Rita Brogan, CEO, PRR

Location World Trade Center
Executive Dining Room
2200 Alaskan Way
Seattle, WA 98121
www.wtceseattle.com

Date Tuesday, October 23rd, 2007

Cost Payable by cash or check to “ITE Washington Section”
ITE members: $65
Students: $5

Time Check-In and Technical Poster Display — 5:30 p.m.
Dinner and Presentation — 6:00 p.m.

Menu Please indicate your choice of dinner entree:
Pan Roasted Pacific Cod with Lemon Caper Butter Sauce
Seared Chicken Breast with Creamy Gorgonzola and Toasted Walnuts
Pacific Northwest Wild Mushroom-Stuffed Tortellini with Roasted Garlic and Sun-Dried Tomato Pesto

RSVP By Thursday, October 18 to Iris Cabrera at
ITERegistration@ci.kirkland.wa.us
It's nice to feel needed. But hold on now! I think we're all getting enough of this feeling lately. With the need for mobility improvements so high there is no shortage of projects. The high demand for transportation expertise will continue with or even without the passage of Proposition 1 (vote early and vote often). It seems that now there are now more projects than there are adequately seasoned transportation leaders. Washington will require more and better traffic engineers and the future rolls onward!

Seeing the importance of continuing education and training in light of the greatly increased need for members to be up to speed with technology and trends, and to be better at what we do, ITE has vastly increased the quantity of training opportunities. It helps a lot that technology offers more accessibility to more information. We've had a few local Web Seminars and are getting used to this tool. A newer offering is a continuing series of PowerPoint Web Briefings. There are resources and research data readily available on all sorts of issues. So I'm going to assume that all of us will continue to grow ourselves through the many resources available through our organization. Check out our web site, http://www.westernite.org/Sections/washington/index.htm, for locally-accessible training opportunities. From there, you can easily link to the District 6 site or ITE National site for even more opportunities to improve your skills and knowledge.

Even if we all make ourselves better able to help our goals of moving people and goods safely and efficiently, we are going to need to find and develop more talent into our profession. The District 6 and Washington Section have been working to energize our student chapters. This effort is succeeding. Student participation is increasing. There is a new generation of transportation professionals beginning to take shape. Three cheers! Thank you to our Student Committee and those who have helped in the past!

Now what? We all know that to succeed, we require teamwork, resources, innovation, experience, and quite a dose of patience and understanding. Education is also essential, but there are all sorts of skills necessary that they didn’t teach you in school. Our young engineers are well educated, but their abilities would be greatly enhanced from the experiences they would gain from mentors. The concept is not new, but I sense a renewed acknowledgement of the benefits, and new energy into mentoring programs.

I became aware of a great local mentoring program this year when my son joined the Architecture, Construction, and Engineering (ACE) Mentor Program of Seattle. ACE is a non-profit organization dedicated to introducing students to these disciplines with the hope of increasing the supply of candidates in the design and construction industry. ACE pairs high school students interested in these fields with local professional mentors. The program has had great success. While it began in 2001 with 8 mentors overseeing just 11 students, more than 80 mentors guided 120 students through the 2006-2007 program.

Many ITE members understand that mentoring:
- Provides an opportunity to “give back” to the community
- Enhances your company’s image, within the industry and also in the community
- Provides networking opportunities with other mentors
- Provides community service hours to interns for licensing requirements
- May provide a connection for your firm to talented and motivated students, and potential future full-time employees

If you are curious for additional information, want to help with a one-time effort to host a seminar or lead a field trip, or help one of the five Seattle chapters, please reference the ACE FAQ for Mentors we’ve posted on our web site.

Sincerely,
David Alm,
President, ITE Washington Section
To submit your business card, please send a jpg or tif file of the desired ad to James Bloodgood at jim.bloodgood@co.snohomish.wa.us

Also send a check for $100 (covers through December 2008) to James Bloodgood
Snohomish County
3000 Rockefeller Avenue
Everett, WA 98201
425.388.6419
As certain as flipping a light switch and almost as fast, the start of the new school year brought on congestion that we had forgotten about through the summer. Moms and dads alter their work schedule to ensure their little ones are safely chauffeured to their schools or even their bus stops. It may bring a tear to many eyes to see them off, but a rise in blood pressure as they rejoin the rest of the commuters; all of them; at exactly 8:25am.

The experience provided just the right footing to start this year’s ITE Washington Section’s first meeting under new leadership with a presentation entitled: Exploring Congestion Relief Using HOT lanes and Tolling in the Central Puget Sound Region. Don Samdal, Mirai Associates, and Shuming Yan, Washington State Department of Transportation, would alternate presenting on the topic.

Convening in the cozy room with a great view and great food of Salty’s on Alki Beach, this year’s section president, Dave Alm, recapped last year’s activities and introduced officers and committee members for this year. For those of you with short memories like me, you can find a listing of officers and committee members online (www.westernite.org/Sections/washington/).

Mr. Alm continued by providing an overview of what to expect for this year as well as self introductions from the 60 members in attendance. Following additional announcements, Jim Bloodgood, section secretary, transitioned the meeting to the key presentation. Don Samdal began with an overview of the challenges that lay before the region with rising congestion and some of the general methods to answer the challenge. Shuming Yan continued with shortcomings of the presented methods. Even with adding lanes and improving transit at the cost of over $100B, we would only be able to sustain current levels of service for regional mobility. As demand exceeds capacity, the throughput decreases. To sustain the benefits of capacity and efficiency improvements, demand management must be incorporated.

An example of demand management that is being explored is congestion pricing in the form of high occupancy toll (HOT) lanes. Initially the HOT lanes will be converted high occupancy lanes (HOV) that allow free transit and carpool use with a toll for single occupant vehicles (SOV.) The HOV lanes require 45 mph 95% of the time to maintain reliability. The designation for carpool of 2+ or 3+ may change depending on how many carpools are pushed into the general purpose (GP) lanes and how many SOV pay to use the HOT lane.

Future projects may convert a GP lane into a HOT lane (HOT 1 option) or build a HOT lane to work in addition with a converted HOV, HOT lane (HOT 2 option.) The former is accompanied with a price tag of $430M and the latter at $22B. The HOT 1 option would provide improvements in travel time and reliability with a small improvement in delay. This may benefit individual trips such as to the airport. However, the HOT 2 option with its higher number of flowing lanes would obviously provide more benefits but at a significant cost.

In conclusion, system-wide toll scenarios are very effective in reducing total delay. Pricing causes people to drive less, shift travel to less congested time periods and to other modes as well as make shorter trips to the closer destinations. Picking the toll scheme that works for all roads and at all times will be challenging. In addition, the study did not assess social equity, economic impact and public acceptance. These issues need to be carefully studied before implementing region wide value pricing.
Super-Sized Synchro Network

By Carter Danne, PE, PTOE, Parametrix, Bellevue, WA
Stephen Rolle, PE, PB, Seattle, WA
Anthony Lo, PE, PB, Seattle, WA

The Alaskan Way Viaduct (AWV), or Washington State Route (SR) 99, is a limited-access highway that carries up to 110,000 vehicles per day through downtown Seattle. The viaduct and adjacent seawall are aging and are considered seismically vulnerable. Three agencies—the Washington State Department of Transportation (WSDOT), the City of Seattle, and the Federal Highway Administration (FHWA)—led an integrated team of agency and consultant staff to study replacement options for these facilities.

Alternatives for replacing the viaduct would require partial to full closure of the highway during construction, displacing trips to alternate routes and modes. To address potential construction impacts related to traffic capacity, circulation, and congestion, a large-scale traffic analysis model was developed to gauge traffic operating conditions on parallel arterial routes, identify the locations of capacity or operational deficiencies, and test a varied array of traffic management strategies. This paper discusses the development process for this model and highlights specific complexities related to building and maintaining such a large analysis network.

Study Area
The study area consists of over 400 intersections from the street network extending from north of downtown Seattle in the Lake Union area to the south city limits (see Figure 1). The study area was identified using a screening process that considered the project limits, potential alternate travel routes, existing transit service, and freight operations. As a result, many strings of intersections that formed arterial segments were selected for analysis.

The street grid paralleling SR 99 offers north-south arterials onto which traffic may shift during construction. The grid would also accommodate changes in east-west traffic patterns as more vehicles access I-5 instead of SR 99 during the construction period. Given these anticipated shifts, nearly the entire downtown street grid between the existing SR 99 facility and I-5 was included in the analysis network.

Figure 1. Study Area Intersections

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Collaboration with Public Agencies

The consultant tandem of PB and Parametrix worked as part of an integrated project team with WSDOT and the Seattle Department of Transportation (SDOT) to develop the networks. Both agencies provided information from their databases of peak period traffic counts, signal control data, and lane geometry data to aid the network development. Having an integrated team facilitated the flow of information needed for the Synchro network development.

The project team also initiated technical subcommittees consisting of staff from a broader range of agencies to help inform the model development process and evaluate analysis results. These stakeholders participated in the model development process by providing additional data; giving insight into transit, freight, and emergency responder operations; and reviewing analysis results.

Application of the Model

The team prepared Synchro networks for the weekday AM peak hour and weekday PM peak hour. Table 1 shows the various measures of effectiveness that Synchro provided for the traffic assessment and screening process.

<table>
<thead>
<tr>
<th>Available Measures of Effectiveness</th>
<th>How Measures Were Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arterial Segment Level of Service</td>
<td>Directly, shown on maps and in tables.</td>
</tr>
<tr>
<td>Arterial Travel Times</td>
<td>Directly, shown on maps and in tables.</td>
</tr>
<tr>
<td>Arterial Speed</td>
<td>Directly, shown in tables and combined with travel times from other tools (CORSIM, EMME/2) to estimate point-to-point travel times.</td>
</tr>
<tr>
<td>Intersection Level of Service</td>
<td>Directly, shown on maps.</td>
</tr>
<tr>
<td>Intersection Delay</td>
<td>Indirectly, factored into arterial travel times at nodes.</td>
</tr>
<tr>
<td>Unserved Vehicles (number of vehicles in excess of capacity)</td>
<td>Summed up total unserved vehicles at intersections and shown on a map using graduated circle sizes.</td>
</tr>
</tbody>
</table>

Traffic operations results were largely reported on an arterial segment basis for select corridors and routes through the study area. This allowed for straight-forward comparison of travel conditions on primary alternate corridors, as well as transit and freight routes. Individual intersection results were evaluated as well to identify specific movements that posed capacity constraints under the expected conditions. Both movement delay and entering volume of unserved vehicles at intersections were used to identify locations where significant impacts could be expected.

Challenges and Lessons Learned

The project team learned a number of lessons from the process of developing and applying a large-scale macroscopic traffic operations model:

- Data management for more than 400 intersections is challenging, and Synchro proved a very good database for maintaining geometric, signal control, and traffic data.
- Even more challenging was the process of managing dynamic data, such as forecast traffic volumes for different scenarios. These data had to be prepared manually for each scenario.
- An advantage of a macroscopic analytical model such as Synchro over microscopic simulation models for such large networks is that minor intersections could easily be omitted without consequence, whereas a simulation network would generally need data for all roadway features and arterial crossing points for roadway segments in the study area. In addition, macroscopic tools do not require the same level of model calibration which can be time consuming for evaluating large networks.
- Bus and/or high-occupancy vehicle (HOV) lane treatments on arterials cannot be specifically modeled using Synchro. However, in many cases reasonable work-around methods can be employed to approximate travel conditions for these types of facilities.
Conclusion

The project team found Synchro to be generally well-suited to analyze a large-scale street network. In particular, the network layout, signal timing/optimization, and data management features of the software package proved to be both efficient and effective for the purposes of the project. With respect to analysis reporting, the team found that aggregated results at the arterial segment level were generally more useful and appealing than results for individual intersections because it better communicates the driver experience and provides a more meaningful context. Translating travel forecasting information into the operations model environment proved to be challenging, but otherwise management of such a large volume of data was possible in this modeling environment.

The Canadian Institute of Transportation Engineers (CITE) invites you to submit an abstract of a paper for presentation at the CITE District Annual Meeting and QUAD Conference 2008 to be held in Victoria BC April 26 to April 30, 2008. Visit our website at www.citebc.ca for details.

The overall conference theme, Bridging the Gap, reflects CITE’s interest in exploring new ideas, and educating professionals, in the transportation field on the inter-relationship and overlap of core functional areas such as:

- Transportation engineering
- Transportation planning
- Road safety
- Sustainability
- Green transportation and climate change
- Commercial vehicles and goods movement
- Intelligent transportation systems
- Training and education

The deadline for submission of abstracts November 2, 2007
This summer we sent six students from the University of Washington and Seattle University to the ITE District 6 Meeting in Portland, OR. They competed in the James H. Kell Student Competition to design a bridge out of newspaper, string and masking tape. Five of the students were on winning teams for either the strength or aesthetics of their design. All of the students were excited to attend the conference and enjoyed the technical sessions and tour of the streetcar and aerial tram. Overall the trip was a great success.

Our thanks go out to the City of Bothell for letting us use a traffic calming project for the Student Night this last spring. The students did a great job in developing a concept plan for the neighborhood, and we received positive feedback from the professionals who attended. We are hoping to use another demonstration project again for this year’s Students Night and are looking for ideas from the cities and counties within the region. If you have a project going on in your jurisdiction that you think would be interesting for the Student Night, please contact either Scott Lee or Meagan Powers.

Student Activities Committee Co-Chairs:
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Meagan Powers, DKS Associates – (206)382-9800 or mcp@dksassociates.com

How to become a Member of ITE:
"When becoming a first time local member of the Washington State Section of ITE, fill out the application online at http://www.westernite.org/Sections/washington/index.htm (Click on the "Membership" link) and send a check for the annual dues to the Membership Chair. Once the Membership Chair receives the application and annual dues, he/she will forward this information to the ITE National Headquarters in Washington, DC. For subsequent years, each member will be billed for his/her annual local dues by the ITE National Headquarters. If you are interested in becoming a National and District member as well, contact ITE National directly to fill out an application form (http://www.ite.org/)."
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