Smart Pavement Markers in AVI

Al King, PE, CEO, Evolutionary Markings, Inc.
Ahmed Abdel-Rahim, PhD, PE, Director, NIATT, University of Idaho
Randy Wesselman, Transportation Engineering and Planning Manager, City of Olympia
See Page 14

2017-2018 ITE Washington Kick Off Meeting

TOPIC: KITSAP TRANSIT HIGH SPEED FERRY SERVICE
DATE: TUESDAY, SEPTEMBER 12
TIME: 11:00 am – 2:00 pm
LOCATION: Salty’s on Alki Beach; Seattle
REGISTER ONLINE: https://ite_wa_september.eventbrite.com

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One of my favorite phrases is that we stand on the shoulders of giants. That is true for both our ITE chapter and our industry. I have the great honor of following in the footsteps of Paul, Carter, Dongho, and so many others.

This year, we are beginning from a great position. We have rebuilt our website due to the efforts of Sherief Elbassuoni of DKS and James Le of Seattle DOT. We have a new reservation system based off of Eventbrite to pay and check in to meetings quicker and easier. This effort was led by Daniel Lai, our Vice President. And, we have had successful meetings nearly every month. This has been a collective effort of the previous board, the membership, the speakers, and our sponsors. Without any of these people, we would not be able to have the solid organization we have today.

So, as we embark on this year, we are planning on doing additional items. Some are the dull necessity of an operating organization while others will be visible to our members. First, as our local members have seen, our dues have increased $2. This brings the yearly dues to $22. For those paying international dues, this will be reflected in January’s invoices. We did this to accommodate the increasing cost of doing business. We intend to break even with our meeting costs, so other costs such as projectors, fees for Eventbrite, and tablets for credit cards need to come from other sources. In this case, these come out of our membership costs.

Second, as you will see in this newsletter, ITE-WA has an organization chart. This is intended to allow our committee chairs to directly find the board member to assist with your needs. In addition, it allows our membership to find the person to answer a question or two about our organization. This is by no means meant to prevent anyone from contacting any board member about any issue. We remain open and committed to hearing your thoughts, ideas, and concerns about ITE.

Third, we are hitting the high seas of taxes and non-profit status. Recent changes in IRS laws require organizations to file taxes. In our case, this means notifying the IRS that we exist and that we make a certain amount of income. We do not expect to be required to pay taxes, however. This has been a direction from the Western District and we intend to complete this initial process by the end of the year. Along these same lines, we are looking to become a non-profit organization. We expect this to be a considerable effort and would like to hear from those who are interested in helping. While this isn’t an all-hands-on-deck situation, more able bodies are appreciated!

With that, I will conclude this message by saying, I hope to see you at Salty’s on September 12 where we will hear about Kitsap Transit’s fast ferry service. To get into the mood, I hope to see some of you on the Water Taxi over the bay where I may indulge in one or more nautical colloquialisms!

Mike Hendrix, PE PTOE
ITE Washington President
Treasure Chest

The Treasurer’s Report will be published in an upcoming ITE Newsletter.

Daniel Lai, PE
Vice-President/Treasurer

Greetings ITE membership! We already have a great start to our 2017-2018 year. We had a ITE Board kick-off meeting July 20th and a Chair’s meeting in August 17th. As your secretary I’ve been preparing agendas, notes, and action items. We have a lot going on and we will have a very productive year! The Board is thrilled that so many of the chair positions are continuing their roles in to the 2017-2018 year. We may create a new position that would be a “Sponsorship” Chair position. This position would coordinate the various sponsorships received for ITE events as well as assist with solicitation of sponsorships. Currently ITE Washington receives sponsorships for ITE/IMSA (solicited by the committee), Student Night and the Scholarship, the Annual Meeting, Newsletter, the Golf Tournament, and the Quad meeting when in Washington. Many thanks to all our sponsors! In addition to a potential new chair position, committee roles are open. ITE/IMSA, the Annual Meeting, and the Quad Meeting could use additional committee members for their robust agendas. We hope you’ll join our team!

Claudia S. Hirschey, P.E.
ITE Secretary
ITE Washington Annual Meeting

JUNE 22, 2017
By Darcy Akers

The 2016-2017 year came to an end with a successful Annual Meeting for the ITE Washington Chapter. This year’s meeting was held at the Embassy Suites in Bellevue and featured a full agenda of presentations, delicious lunch and yearly awards.

President Paul Cho kicked off his final meeting as president by introducing the opening keynote address speaker, Washington’s Secretary of Transportation Roger Millar. Secretary Millar described the “opportunities” that lay ahead for WSDOT – freight network resilience, congestion, and first-last mile connections. The amount of congestion on the region’s major freeways has dramatically increased since 2013 as the economy has also improved. Secretary Millar also pointed out that congestion is a symptom of the disparity of jobs and housing, since lack of affordable housing near job centers is pushing people out to farther and farther commutes. This underlined the importance of strengthening the communications lines between land use and transportation. He also reflected internally on WSDOT’s way of doing business – from the new practical solutions approach to staff retention to the importance of celebrating maintenance work. WSDOT has been doing some massive pavement maintenance work along 1-5 that dramatically improves the drivers experience and Millar pointed out that this deserves as much of a ribbon-cutting ceremony as the new roadway projects. And to wrap things up, Secretary Millar reiterated the importance of communication, coordination and partnerships to keep people moving.

Morning sessions offered attendees two tracks to explore: Tolling and Road User Charge or Latest and Greatest in ADA Practices. The tolling session touched on Good to Go! Tolling program that has been implemented in the region and the current developments undertaken by WSDOT to deploy a new back-end tolling system to improve user experience. Conversations also included discussions around where tolling is heading nationwide with a greater need for toll tag standardization and tolling as a new means to pay for infrastructure as incomes from gas taxes decrease. In the ADA session, a panel of spoke about the different elements of creating an ADA program including compliance laws, public outreach, data collection, creating a transition plan and finally design. One interesting point was to make sure your public outreach is accessible to those with hearing or vision impairment, since those are your target audience.

The second morning sessions were Signal Design and Vision Zero. The panelist in the signal design session discussed best practices in signal design. Examples of guidance shared by the panelists include: ways to prepare for future technologies, how to become familiar with standard and guidelines, how to learn from new concepts such as SDOT’s half signal and bike signals, and ensuring a multidisciplinary review. Seattle explained the three E’s of their Vision Zero plan: engineering, enforcement and education. They also discussed the methods they used to reach out to the public like ad campaigns, targeted DUI patrols and hands on educational material.

While attendees enjoyed their lunch, James Colyar from the Federal Highway Administration provided the lunch keynote address. In his presentation, Colyar touched on some of the trends in transportation. This included the shift on focusing just on demand and supply management to first thinking of operational efficiency as a way to manage congestion. He touched on some of the challenges of operating in a transportation system including the “Reaction Challenge” and “Stovepipes”. Reacting presents a problem in that you are always behind and trying to catch up to a quickly changing system. Stovepipes are an analogy for the lack of integration and communications across agencies. Colyar emphasized that an Active,

~ See scribe’s report continued on next page
Integrated and Organized system is the ultimate goal for operating efficiently. He also touched on the resources available from the FHWA to assess your current system using a maturity model. And of course since he was talking of future trends, he did say “Autonomous Vehicles” at least once.

The lunch hour also included the annual membership meeting to recognize volunteers, give out awards and swear in the new officers. President Paul Cho emphasized how important the volunteer help is to not only put on the great annual meetings but the small lunch technical presentations throughout the year. In front of the membership, the new officers were sworn in: President Mike Hendrix, Vice President/Treasurer Daniel Lai, and newly elected Secretary Claudia Hirschey.

The annual ITE conference also recognized two outstanding engineers in the region. The Outstanding Young Professional Award was awarded to Sherief Elbassuoni. Sherief is a Transportation Engineer with DKS Associates and also is webmaster for ITE WA, helping revamp the chapter’s web page this year. The Outstanding Service Award went to Erin Ehlinger. Erin served as ITE WA President in the past and is recognized in the region for her work. Erin pointed out that although she might not fit the mold of a typical engineer, this helped her bring a unique perspective to the table and see things that others may not. She shared “ITE taught me that serving is leading”. This award recognizes her continued leadership in transportation through both her work and participation in ITE.

Technical presentation continued in the afternoon session – first with a track on Traffic Safety and one of Adaptive Signal Control and ITS. The Traffic Safety session included collision investigation, Washington’s Highway Safety Plan and discussion of the recent trends in railroad crossing safety. In the other track, City of Seattle and Lynnwood both discussed the results and lessons learned of their recently deployed adaptive systems and King County shared their goals of innovation through shared mobility, a different way of looking at providing new mode choices for travelers.

The final two sessions were a continuation of Traffic Safety and also PacTrans Student presentations. The safety topics included Bellevue’s performance monitoring of flashing yellow arrows, discussion of including safety in demand modeling and how Cowlitz County developed a road safety plan. New this year, several students were invited to showcase the latest in transportation technology research from the University of Washington. Students shared their work on Connected Vehicle technologies, data management platforms, and Bluetooth-
Wifi technologies. This was a great opportunity to continue building on the partnership between PacTrans and ITE as well as the shared interest in improving regional mobility and safety.

Thank you to everyone who attended this year’s event and the volunteers who made it all possible! Have a great summer and stay safe!

Darcy

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2017-2018 ITE WASHINGTON SECTION BOARD

[L-R] Paul Cho, Past President, Mike Hendricks, President; Daniel Lai, Treasurer and newly elected Claudia Hirschey, Secretary

Outstanding Young Professional

Paul Cho [L], Section President, presents Sherief Elbassuoni [R], Transportation Engineer, DKS

---

ITE Hospitality Service Award

Carla Nasar, Traffic Data Gathering [L] and ITE Section Hospitality Coordinator is presented by Paul Cho [R] Section President

ITE Scribe Service Award

Paul Cho [L], Section President, presents to Darcy Akers, City of Bellevue and ITE Section Scribe

2017 ITE Washington Annual Meeting

Balcony View

Embassy Suites ~Bellevue, Washington

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6 SEPTEMBER 2017  ite washington newsletter
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ITE Terry Gibson Golf Classic

ITE Golf Classic #29
Oakbrook Golf Club – Lakewood, WA
Wednesday, June 14th, 2016, 9:00am Shotgun Start
Mark Poch & Darcy Akers – Golf Co-Chairs

Tournament Recap

We had a pleasant day and a very nice golf course for our 29th Annual Gibson Golf Classic. This year’s turnout was the best in recent memory, with 78 golfers and 20 teams enjoying the mild weather – unlike last year, the only lightning experienced was on the extremely quick and smooth greens!

The morning started with the traditional warm ups at the range and practice green along with a heavy dose of visiting with friends and colleagues. Just before the annual group photo, all participants were invited to the 18th green for a new activity – a “speed” putting contest where everyone stands at the edge of the green and putts to the hole all at the same time – after the golf ball collisions and laughter, Wintana Miller’s ball ended up in the hole and she along with the next two closest shots, Kyle Campbell and Aaron Null, received prizes from Sea-Tac Lighting. Speed putting was so fun we almost forgot our group photo! After the photo we started the cart parade and began the tournament. The course was in fantastic shape framed by beautiful stately Oak trees, fantastic turf, and top notch greens. The field was in great shape too – completing the round in about 4 ½ - 5 hours – by far the best pace in quite a while. The field then retreated to the elegant dining room (Oakbrook is a former private club) for the annual lunch and awards banquet which featured recognition, hole and team prizes, and the annual raffle.

For the second year in a row, the City of Bellevue team took 1st place and grabbed the Gibson Classic traveling trophy. Congrats to Mark Poch, Greg Lucas, Tom Brandes and Darcy Akers!
Second place went to the hybrid Des Moines/KGP team of Len Madsen, Mike Bowen, John Blackburn, and George Hilen. Third place was awarded to the always tough and persistent City of Redmond team of Don Cairns, Bill Campbell, Jeff Thompson, and Mike Haley. The coveted last place award went to the DKS team

See ‘ITE Terry Gibson Classic - Next Page
ITE Terry Gibson Classic-continued

of Richard Hutchinson, Wintana “I cleaned up at this event” Miller, Rick Perez, and Adiam Emery.

Competition hole winners included Claudia Henry, Greg Lucas, and George Hilen for their longest drives, and Tom Brandes, Ron Desmet, Dan Abernathy, and Mark Poch for closest to the pin awards.

The Terry Gibson Classic is important because it gets professionals together to not only enjoy a great day of golf, but also get some well needed face time with friends and colleagues. This great day would not be possible without the help and support from our sponsors.

Please thank these terrific people and companies:

- IDAX Traffic Solutions – Mark Skaggs
- All Traffic Data – Eric Boivin
- Advance Traffic Products – Mike Singson
- Prime Electric – Bob Bracco
- SeaTac Lighting – Ed Aristo
- Western Systems – Robert Nims
- TransCore ITS – Nick Patil
- Zumar – Tom Brandes

Second place went to the hybrid Des Moines/KGP team of Len Madsen, Mike Bowen, John Blackburn, and George Hilen.

Warming up for the Speed Putt Contest

Third place was awarded to the always tough and persistent City of Redmond team of Don Cairns, Bill Campbell, Jeff Thompson, and Mike Haley.

Ready, Set, GO!!! Speed Putt Contest had 78 golfers putting at the same time. First three in or closest to the hole won prizes. Wintana Miller aced the cup and the next two closest shots were by Kyle Campbell and Aaron Null.

Thanks everyone for another great ITE Gibson Classic – we are looking forward to our 30th anniversary of the Classic next year!

Mark Poch & Darcy Akers – ITE Golf Co-Chairs
Terry Gibson
ITE Washington Golf Foundation
By Mark Poch, ITE Golf Co-Chair

Founder of the ITE Terry Gibson Classic 29 years ago, Terry Gibson was the founding President of Gibson Traffic Consultants and past president of the Washington Section of ITE. Always involved in ITE, Terry not only founded the annual golf tournament, but was also chair of Student Night for several terms. Terry received the Outstanding Service Award from the Washington Section before his passing and also the Western District Award in 2007.

Terry’s professional passion was helping smaller jurisdictions and school districts develop safe and efficient transportation operation plans…..mission accomplished.

Special Thank You!

The Annual Washington ITE Golf Tournament happens because of the volunteers and sponsors who make this annual event fun and an excellent contributor to our ITE Student Foundation.

A special Thank You goes out to Mark Poch and Darcy Akers, ITE Golf Co-Chairs. They spend many hours working to make this event fun, unique, special and honoring Terry Gibson for his contributions.
This year’s ITE annual conference was held in Toronto, Canada and a great venue it was, as a City that operates a robust transportation system with over 2.7 million daily boardings on transit, 5600 centerline kilometers of road, 400 kilometers of bike facilities, and over 2100 traffic signals. Visitors to the conference travelled from around the world and arrived at the conference using a variety of modes including subway, bus, streetcar, car-share, taxi, passenger cars, and the new Union-Pacific Express Rail from the airport to downtown.

Attendees had a chance to appreciate all the modes that Toronto had to offer.

This year’s conference offered the latest information on a few key themes that were central to the discussions around the conference: Achieving Vision Zero, Planning for Autonomous Vehicles, Transportation Performance Monitoring, Building Smarter Communities.

This year’s conference was well represented from our very own Washington ITE Section. Washington ITE members participated in presentations, poster sessions and awards ceremony with a few highlights shown here:

Technical Presentation on **Separated Bikeways: Improving Safety and Operations through Design** from Dongho Chang (SDOT) [No Photo]

Poster Sessions on **Keeping People Moving during Transformative Change** and **Mercer Street Advanced Traffic Management System** by Band Sittikariya (SDOT), Zach Hoiting (Western Systems), Paul Sharman (Transpo Group), and Karl Typolt (Transpo Group)
Student Scholarships Available

ITE Washington offers several opportunities for Students to participate with transportation professionals and earn Scholarships.

Sponsorships Welcomed.

Contact Pablo Para to participate.

SAVE THE DATE
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on NORTH LAKE UNION

ITE Washington Organizational Chart

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<th>Name</th>
<th>Company</th>
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<td>President</td>
<td>Mike Hendrix (PE, PTOE)</td>
<td>City of Bellevue</td>
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<td>Vice-President/Treasurer</td>
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<td>Traffic Roundtable</td>
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<td>Student Activities</td>
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<td>Aaron Knight</td>
<td>KPG, Inc</td>
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<td>Annual Meeting</td>
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<td>Bill Love (PE, PTOE)</td>
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<td>Golf Tournament</td>
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<td>Yinshu Wang (EIT)</td>
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<td>Claudia Hirschey (PE)</td>
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Paul Cho (PE, PTOE)
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2017 - 2018
ITE-WA Organization Chart
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Al King, PE, CEO, Evolutionary Markings, Inc.
Ahmed Abdel-Rahim, PhD, PE, Director, NIATT, University of Idaho
Randy Wesselman, Transportation Engineering and Planning Manager, City of Olympia, (contributed to article)

What is AVI?

Most everyone knows what Automated (Connected) Vehicles (AV) are, though there is not a clear common understanding of just what that means. AVs range from vehicles that have multiple automated safety features built in, to fully autonomous vehicles that “drive” themselves with no human intervention. The first is here now, many are operational on the road. We have seen many advances in safety features over the past twenty years, with some of the more popular currently available being lane departure warnings and assisted stop systems. Fully autonomous is what many would like to see achieved, but it is a bit further down the road.

Some already know about AVI, but there is very little that is in implementation stages. AVI is the acronym for Automated Vehicle Infrastructure (aka V2I-Vehicle to Infrastructure), those devices and systems that will be installed along the roadway to assist Automated Vehicles achieve autonomous operation. Wait! you say, don’t or won’t those vehicles be able to operate on their own? In a word, no. At least not in the near future. Read on.

AVI includes roadside or embedded guidance information systems that have real-time communication and data exchange. They will communicate from vehicle to infrastructure, from infrastructure to vehicle, and from vehicle to vehicle.

Why is AVI Important?

I’ll acknowledge that Automated Vehicles are here – now, but they are still in relatively early stages of development. And, what will become problematic, each with their own approaches and protocols, with no common standards. A 2015 GAO (federal Government Accountability Office) report stated:

“To communicate in a connected vehicle environment, vehicles and infrastructure must be equipped with dedicated short-range communications (DSRC), as DSRC is the designated communication technology for communication based active safety systems research.”

Our company met about a year ago with the Idaho National Laboratory (INL) folks in Idaho Falls. INL has been involved in the development of AVI on behalf of the federal government. We spent the better part of the day with some of their very smart technology people, discussing what our approach was, and how we might advance AVI.

Quite surprising to us, at the end of the day the INL answer was “We are working on them, but we do not yet have standards developed.” and “We can’t be of much help to you right now, you are ahead of us.” The standards issue was one which we were most interested in. Clearly, to operate cooperatively, there must ultimately be developed a set of standards and communications protocols that all can access to effectively communicate between vehicles and the infrastructure. A recent GAO (federal Government Accountability Office) stated:

Let’s continue with a few quotes from experts in the field, and companies currently working on the technology.

- Wired - March 16, 2016: “At Baidu, we plan to put commercial, self-driving cars on the roads by 2018.”

~ See Smart Pavement Markers Next Page
**Smart Pavement Markers - Continued**

- Audi: “January 2015 - 570 Miles, Palo Alto to Las Vegas Requires Driver Control in Urban Areas”
- Mercedes Benz: “The car is growing beyond its role as a mere means of transport and it will ultimately become a mobile living space.”
- Nissan: “Nissan and NASA just announced a five-year research and development partnership…” based on the Nissan Leaf “…before the end of the decade, the company says its vehicles will be able to negotiate city crossroads without driver intervention.”
- Bosch: a parts manufacturer. “fully automated vehicle is a long way off … beyond the 2025 time frame.”
- Delphi Automotive: a parts manufacturer “Our cars were able to handle a variety of urban driving scenarios…” and “These cars are very costly, and the technology needs to be fail proof…”
- Google: “There are no plans to bring these vehicles to market – they’re just for learning. But if the technology proves successful, the company hopes to work with partners…”

“Before the end of the decade”, “fully automated vehicle is a long way off” and a variety of urban driving scenarios…” are not positive signs that we will be riding in fully autonomous vehicles in the next few years. Delphi says it most succinctly, “These cars are very costly, and the technology needs to be fail proof…” While inflation continues to drive everything up, I’m reasonably sure that most of us will not be buying $100,000 plus cars in the next few years. But then again, some are predicting that individually owned vehicles may gradually be replaced by driver service companies (such as UBER) using fully automated vehicles. This prediction has not escaped UBER, as it is reputedly testing connected vehicles for this purpose.

**Are Automated Vehicles Ready for Prime Time?**

Tesla might argue they are there, but like Bosch, I would suggest that we have a way to go. Automated Vehicles currently depend on vehicle guidance systems only, cameras and sensors.

While those systems are good, what happens when AV’s can’t “see”? Conditions commonly encountered where this is a problem include heavy fog, snow covering, Snoopy’s famous “dark rainy night”, roads without striping or curbs, and perhaps top of the list, gravel driveways, alleys and roads with poorly defined boundaries. All those conditions, at least in the near future, will almost certainly require some type of on the road systems to help keep the AV’s where they belong, on the road.

The 2015 GAO Report to Congress stated that “V2I equipment may vary depending on the location and the type of application being used, although in general, V2I components in the connected vehicle environment include an array of roadside equipment (RSE) that transmits and receives messages with vehicles for the purpose of supporting V2I applications. For example, a V2I-equipped intersection would include:

- Roadside units (RSU)—a device that operates from a fixed position and transmits data to vehicles. This typically refers to a DSRC radio, which is used for safety-critical applications that cannot tolerate interruption, although (US)DOT has noted that other technologies may be used for non-safety-critical applications.

- A traffic signal controller that generates the Signal Phase and Timing (SPaT) message, which includes the signal phase (green, yellow, and red) and the minimum and maximum allowable time remaining for the phase for each approach lane to an intersection. The controller transfers that information to the RSU, which broadcasts the message to vehicles.

- A local or state back office, private operator, or traffic management center that collects and processes aggregated data
from the roads and vehicles. As previously noted, these traffic management centers may use aggregated data that is collected from vehicles (speed, location, and trajectory) and stripped of identifying information to gain insights into congestion and road conditions as well.

- Communications links (such as fiber optic cables or wireless technologies) between roadside equipment and the local or state back office, private operator, or traffic management center. This is typically referred to as the “backhaul network.”
- Support functions, such as underlying technologies and processes to ensure that the data being transmitted are secure.

Given that, where is AVI technology today? It is currently VERY limited. There are no significant systems developed and installed in the US today. They will be costly, and are untested and generally unavailable. But of course, costly isn’t a problem for transportation agencies, they all have “flush budgets” and can just buy and install what’s necessary! Well, with nearly 50 years in transportation, I think I can say that would have to be the most shot down statement among those agencies ever. Most, if not all, are struggling to keep their current systems functional and in safe condition. Some agencies are failing in that, so adding new expensive systems is not something that is going to happen quickly.

Bottom line, with the lack of standards, current state of AV technology, and the need for costly on road systems, we are unlikely to be seeing large numbers of fully functional AV’s for some time.

What Will AVI Look Like?

Let’s take a quick view at what some of the AVI systems are likely to look like. We surmise that agencies will first want to use proven protocols and systems common to traffic systems in use today. The National Transportation Communications for ITS Protocol likely tops that list. AV devices and vehicles will need to comply with those protocols in order to interface with existing systems and traffic devices, much like shown in this graphic.

Example Applications

EMI is looking at a variety of probable applications that have seen significant interest. Consider a complex intersection, where drivers are challenged to figure out just where and when they should proceed. These exist around the country; those that have “grown there” and have not for a variety of reasons not been upgraded; high traffic multilane intersections such as Single Point Urban Interchanges, perhaps with a high vertical cure drivers can’t see over, are but two examples.

~ See Smart Pavement Markers Next Page
Add in impaired, inexperienced, or mature drivers and the problem increases. Using a Lighted Raised Pavement Marker (LRPM) can significantly assist in alignment but still doesn’t tell the driver when they can go. By integrating a “Smart” LRMPM with the signal systems, and turning them off and on with the signals, we can achieve potential safety improvements at signalized intersection approaches, with improved night visibility. By using wireless systems, we can keep costs lower and versatility and reliability at relatively high levels.

In another example, most of us in transportation for any length of time have dealt with run off the road crashes due to excessive speed at horizontal curves, particularly in rural areas. This doesn’t speak to any specific driver group, though impairment, fatigue and the sleepiness effect certainly contribute. In these instances, advisory speed warning signs not effective. By incorporating Smart LRPMs into the infrastructure we accomplish two things. First, in the interim as AVI develops and standards allow AVs to communicate with that infrastructure

**Current LRPM Use**

So where is the technology today? There are a variety of LRPMs currently on the market. Multiple tests have been run, with mixed results. Several competitors have dropped out of sight as their technology couldn’t provide consistent results, structurally or functionally. Solar remains a challenge, and hard wire remains expensive and relatively unreliable. However, as the WSDOT test on Snoqualmie Pass I-90 clearly showed, there is great interest as well as broad positive public response to them. In addition, they are unquestionably a precursor to AVI LRPMs. At the same time, the first generation of AVI LRPMs is under development and tests are expected to be placed within the next 6 to 12 months.

Solar LRPMs clearly improve roadway delineation at night over standard reflectorized RPMs, with additional positive guidance to drivers. They promise to be a functionally and cost effective countermeasure to reduce horizontal curve run-off collisions. The newest generation, due to being fully self-contained and installed in the same manner as standard RPMs, could be less expensive to install compared to speed warning signs or beacons.

Preliminary results from a University of Idaho monitored test bed on Capital Boulevard in Olympia, Washington showed very encouraging results. Positioning in the lanes improved by a remarkable 26.5%, indicating a significantly decreased probability

~ See *Smart Pavement Markers Next Page*
of run off the road crashes. Notably, speeds increased by nearly 13%. While this may be somewhat counterintuitive, it suggests a higher level of driver comfort and confidence, which could also translate into reduced crashes. Longer term results will give us a better picture.

AVI Upcoming Developments

Further wireless LRPM technology is currently being developed for a real-time wrong way entry active warning system to improve the safety of traffic operations at freeway exit ramps and other one-way high-speed highways. In addition, the University of Idaho is concurrently developing a real-time excess speed approach warning system using smart wireless LRPMs for dangerous intersections involving high speed crashes under a recent ITD grant project. Prototypes of these improved LRPM safety technologies are expected to be operational this fall.

Automated Vehicles are here, and AVI will follow. AV and AVI vehicles and systems remain limited, and improvements will take time and money, though as in all technology, it undoubtedly will accelerate as the systems mature. AVI applications clearly will have positive use at complex intersections, for hazard warnings, and for AV guidance in challenging roadway conditions. We have only begun to touch on AVI systems, but it is also clear that LRPMs are leading the way.

spotlight

Smart Pavement Markers-Continued

SpotLight is a new series highlighting ITE Washington Member Projects. Each ITE Newsletter Edition will present selected submissions

Mission Statement explaining the projects objective.

Project Narrative to explain the proposed activities for the project.

Abstract describing the crucial aspects of the project

Summary on the accomplishment and benefits to the public

Submit all articles to Newsletter Editor itewaeditor@gmail.com. All articles will be reviewed and selected for publishing by the ITE Washington Board of Directors. The author is responsible and assumes all liability in obtaining permissions for publishing the content, photos, names, etc.
2017-18 ITE Washington

Dates are subject to change. Check https://wa-ite.org for current information and updates.

TUESDAY, SEPTEMBER 12, KICKOFF LUNCHEON MEETING

KITSAP TRANSIT HIGH SPEED FERRY SERVICE

https://ite_wa_september.eventbrite.com

Please join ITE Washington for our September 2018 Kick-Off at Salty’s where Carla Sawyer (Kitsap Transit Project Manager) and Mike Anderson (KPFF Marine Transit Consulting Group Project Lead) will be highlighting the latest updates on the Kitsap Transit High Speed Ferry service between Seattle and Bremerton.

Project Description

Washington State Ferries high-speed passenger only service between Bremerton and downtown Seattle, operating from 1985-2003, was very popular and created a stimulus to growth in Kitsap County. WSF discontinued the service after being ordered to slow the vessels to prevent vessel wake damage to the shoreline along Rich Passage between South Kitsap and Bainbridge Island. Then began a ten plus year research project to understand the natural and vessel created forces on the beaches of Rich Passage and to design, built and test a prototype vessel capable of operating at high speeds without impacting the beaches. Four months of test operations in 2013 proved that the prototype vessel, Rich Passage 1, could operate at high speeds through Rich Passage without impact to the beaches. Shortly thereafter, in 2014, Kitsap transit launched a comprehensive planning process to evaluate the feasibility and develop a business and long range financial plan for fast ferry services from ports in Kitsap County to downtown Seattle. Last November the voters of Kitsap County approved a sales tax measure to support fast ferry service and Kitsap Transit began work to launch service on the first route and begin acquiring the capital infrastructure to fully build out the program. The first route between Bremerton and Seattle began service on July 10th. Kitsap Transit plans to launch two additional fast ferry routes from Kingston in the summer of 2018 and Southworth in the summer of 2020.

Please RSVP by purchasing your ticket on Eventbrite by Friday September 8, 2017 at 5:00PM.

Salty’s on Alki Beach   1936 Harbor Ave SW; Seattle, WA 98126   [Free Parking]

Cost: $25-$60

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<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tr>
<td>OCT 06</td>
<td>Potential to join meeting with Pac Trans, Region 10 Conference.</td>
<td>University of Washington</td>
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<td>NOV 13</td>
<td>Potential meeting ........................................................................</td>
<td>SeaTac Airport</td>
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<td>DEC 12</td>
<td>Annual Training Session with Gary Norris, Safety Chair</td>
<td>TBD</td>
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<tr>
<td>JAN</td>
<td>No Meeting. Look for possible Membership Social Events</td>
<td>TBD</td>
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<tr>
<td>FEB</td>
<td>ITE/IMSA Conference and Exhibit Trade Show</td>
<td>New Date &amp; Day TBD</td>
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<tr>
<td>APR/MAY</td>
<td>2017 Oregon Quad Meeting -TBD</td>
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<td>MAY 08</td>
<td>Student Night</td>
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<tr>
<td>JUN 12</td>
<td>Washington State Section ITE Annual Meeting</td>
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### 2017 ITE Washington Partner Events

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<tr>
<td>OCT 03-06</td>
<td>Washington American Public Works Association Fall Conference</td>
<td>Kennewick, Washington</td>
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<tr>
<td>OCT 17-20</td>
<td>Oregon American Public Works Association Fall Conference</td>
<td>Pendleton, Oregon</td>
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### 2018 ITE Washington Partner Events

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<th>Topic</th>
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<tr>
<td>APR 02-05</td>
<td>Oregon American Public Works Association Spring Conference</td>
<td>Eugene, Oregon</td>
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<td>JUN 24-27</td>
<td>Western ITE Annual Conference</td>
<td>Keystone, Colorado</td>
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<tr>
<td>AUG 20-23</td>
<td>ITE International Annual Meeting and Exhibit</td>
<td>Minneapolis, Minnesota</td>
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<tr>
<td>OCT 16-19</td>
<td>Oregon American Public Works Association Fall Conference</td>
<td>Canyonville, Oregon</td>
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**Keystone 18**

ITE 2018 Annual Meeting and Exhibit  
June 20-23, 2018  
Keystone, Colorado

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**ITE 2018 Annual Meeting and Exhibit**  
August 20–23, 2018  
Hilton Minneapolis  
Minneapolis, MN, USA
Sound Transit’s mass transportation system has some of its roots in Tacoma’s trolley systems of the 1890s. The Tacoma and Steilacoom Railway Company started in 1890. The company used steam engines to shuttle Tacomans to the bustling town of Steilacoom, located on Puget Sound just south of Tacoma. Then horse-drawn trolleys replaced those steam engines. After just a year, electrical cars replaced the horse-drawn trolleys. The train company was the world’s first interurban streetcar system. It was at that time the longest electric line in the world. It ran 12 miles, from downtown Tacoma to Steilacoom, by running through present-day University Place and down Chambers Creek.

The lights in the soda shop, which is still in operation, would flicker as the train drained electricity from the lines as it climbed Lafayette Street.

Tacoma Trolleys, 1890-1930
By Steve Dunkelberger | Posted 1/26/2004 | HistoryLink.org Essay 5640

Tacoma and Steilacoom Railway Co., ca. 1900

To Dinner in Steilacoom
Tacomans would shuttle to Steilacoom for a fancy dinner or for a relaxing weekend getaway at one of the posh hotels of the day. Travelers would sit and have a sundae or soda in the Bair store while they waited for the train. The lights in the soda shop, which is still in operation, would flicker as the train drained electricity from the lines as it climbed Lafayette Street. The flicker would warn the travelers that their train was near the station. The company later shifted the route to run along Steilacoom Boulevard, so it could service the mental hospital (then called Washington State Hospital for the Insane, now Western State Hospital) on its way to town.

Other small, passenger trolley companies sprang up around the turn of the century. Their tracks shuttled residents around Tacoma and the outlining areas, including many stops in Lakewood, just south of Tacoma. One route went from Tacoma and ran along South Tacoma Way. Another track darted from Tacoma, across the prairie, to what is now Mountain View Cemetery. The tracks continued to the Lakewood Colonial Center.

American Traction Line went to Manitou and Lake City. The Tacoma Rail and Power had a station near what is now Park Lodge School. The business viability of so many companies operating was short lived. Companies shut down or merged shortly after they opened.

From Old Light Rail to New Light Rail
By 1928, the city directory shows only three companies left. The directory shows that the Pacific Traction Company, which ran tracks to American Lake; the Tacoma Railway and Power Company, which ran to Steilacoom; and the Puget Sound Electric Railway, which ran lines to Kent and Seattle, were run from the same office.

The whole system died out by the mid-1930s, only to restart with the Sound Transit vote of 1996, which approved a tax that would establish yet another light rail line. The Tacoma Link that runs from the Tacoma Dome Station to the city’s Theater District went live in mid-2003, marking the return of commuter rail to Puget Sound after an absence of more than 70 years.

Sources: Jack Sage, “The Tacoma and Steilacoom Railway Co,” the Steilacoom Historical Museum Association Research Library.

This essay made possible by:
Tacoma Community Foundation
Traffic Data Gathering (TDG) is a sole proprietor firm specializing in the collection, reduction and graphical presentation of traffic/transit data for use in traffic studies and planning.

Carla Nasr - President
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The Washington Transportation Professionals Forum (WTPF) is a member-owned group of local agency traffic, transportation, and public works engineers, planners, technicians, supervisors, managers, directors, mayors, clerks, council members, and related professionals. Partners of local agencies such as other organizations, consultants, and vendors are also members of the group. Members share information and discuss ideas about traffic-and transportation-related issues at free meetings, through a free email distribution list, and through strong resulting connections in the professional community.

WTPF holds free meetings that are organized and led by WSDOT Local Programs, with help from local agencies. Meetings are held live on both sides of the state and are available by live webinar to allow an exchange of ideas across Washington.

http://www.wsdot.wa.gov/LocalPrograms/Traffic/WTPF.htm

Washington State Dept. of Transportation’s Local Technical Assistance Program (LTAP)

LTAP Training Program provides local agencies access to relevant training opportunities. LTAP sponsors its own courses, directly targeting the training needs of local agencies receiving Federal funding, as well as gathering information about other valuable training.

Courses that are conducted by LTAP are specifically designed to help educate Washington State local agencies working with the Local Programs office and who are receiving Federal funds.

http://www.wsdot.wa.gov/LocalPrograms/Training

Network within our ITE Professional Membership any career opportunities for your firm.
Send information to the ITE Newsletter Editor, Ed Aristo, earisto@seataclighting.com

Sign of the Times
Think before running this red light. SERIOUSLY!

Located in Kuwait City. The helpful warning: If you don’t die, you’ll go to prison for running the red signal!

Contributed by Timothy Miller, PE
City of Everett
City Traffic Engineer
Network within our ITE Professional Membership any career opportunities for your firm.
Send information to the ITE Newsletter Editor

Senior Engineering Technician
Public Works-Traffic Operations
City of Redmond, Washington

The main duties of this position include:

- Signs and marking coordination
- Review and approval of temporary work zone traffic control, and collision analysis and development of mitigation options
- Responds to traffic operation concerns from residents and business owners
- Works with the Fire Department on street name issues
- Reviews and approves applications and traffic control plans for special events
- Maintains the City's Work Zone Traffic Control Manual

www.redmond.gov/jobs

Closes September 24, 2017; 11:59pm

Engineering Assistant III-Transportation Ops.
City of Renton

The City of Renton has an opening for the position of Engineering Specialist III – Transportation Operations. Essential duties and responsibilities include:

- Project Engineering
- Traffic Engineering Design
- Street Lighting
- Traffic Engineering Inquiries/Concerns
- Traffic Standards and Guidelines

www.governmentjobs.com/careers/rentonwa?page=1

Assistant Traffic Engineer
City of Kennewick, WA

The City of Kennewick has an opening for the position of Assistant Traffic Engineer. Essential duties will include:

- Traffic Signal System Management
- Transportation Development Review & Planning
- Traffic Studies & Analysis
- Management of Transportation Projects
- Maintenance of City Traffic Division Standards and Specifications

https://www.governmentjobs.com/careers/kennewick/jobs/1626382/assistant-traffic-engineer

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Network within our ITE Professional Membership any career opportunities for your firm. 
Send information to the ITE Newsletter Editor

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Perteet
Perteet is an experienced and award-winning infrastructure consulting firm dedicated to enhancing the quality of life in our communities. For over 28 years, we've been partnering with public agencies to help keep cities and towns moving forward in Washington State and beyond.
http://www.perteet.com/current-opportunities

Multiple Positions - Seattle
DKS Associates
DKS is looking for a Transportation Professionals IN Seattle and other locations.
https://www.dksassociates.com/careers

Administration Assistant - Seattle
Multiple Positions - Other Locations
Fehr and Peers
If you are interested in pursuing a career with Fehr and Peers, please select a job position below for more information. http://www.fehrandpeers.com/careers

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http://grayandosborne.net/current_employment.php

Multiple Positions – Seattle/Everett/Bellevue
DCI Engineers, Inc.
http://www.dci-engineers.com/location/seattle-washington

Wise Tales:
“It's not an accident that musicians become musicians and engineers become engineers: it's what they're born to do. If you can tune into your purpose and really align with it, setting goals so that your vision is an expression of that purpose, then life flows much more easily.”

Jack Canfield
Co-Author – Chicken Soup for the Soul
Manchester Storm Water Park
Kitsap County
Pt. Townsend