We may have all come on different ships, but we’re in the same boat now.

— Martin Luther King, Jr.
As the leader in one-stop-shop traffic management solutions, Econolite offers the most comprehensive portfolio of ITS products and services, from system planning, CAV consulting, design, and integration, to traffic operations, field maintenance, Centracs Mobility, the best-in-class mobility management software platform, sensors, cabinets, and the industry’s most reliable and sophisticated traffic signal controller and software — Cobalt with EOS.

To learn more, visit www.econolite.com.
SIDRA INTERSECTION 9

Easily set up diverse design configurations using our library of SITE and NETWORK Templates

SIDRA INTERSECTION is world leading micro-analytical traffic engineering software – A variety of useful SITE and NETWORK Templates in Version 9 have been prepared to make setting up diverse intersection and interchange designs simpler and less time consuming.

To learn more, visit sidrasolutions.com/si-9
Equity – ITE as a Community

One of the more common questions I’m asked following a presentation on transportation equity is why? Why is a professional society like ITE dealing with this topic? In my opinion, a transportation system is not successful unless it provides access for everyone to employment, education, and healthcare. However, I also believe there’s more: fulfillment, funding, and trust.

In addition to simply being the right thing to do, an equitable design can be more creative and more fulfilling for the professional. To paraphrase a Jesuit teaching, find people where they are and walk with them. As a traffic engineer, earlier in my career I was asked by the Principal of Quannah McCall Elementary School to examine their crossing location. McCall is in an older school in an established neighborhood, and the crosswalk they wanted was within a few hundred feet of a traffic signal. My first recommendation was to realign access to the traffic signal, but then I met the parents. Following a spirited conversation, our final design defined a gathering space; allowed nearby parking but protected the crossing; added new features to an aging roadway; and was far more appreciated, usable, and valuable.

There is a finite amount of public money, and it’s all the same money regardless of the colors we paint it. When it goes unused in one place, it gets used in another. It speaks to our values; we can deliver opportunity now or charity later. Paratransit is a good example. If there are infrastructure-related path of travel limitations for a transit rider who is otherwise able to use fixed route services, paratransit services must be provided. In short, we can spend money on accessible design now, or spend money on heavily subsidized paratransit services forever.

Projects established on trust are easier to construct. Vera Keller, associate professor of history at the University of Oregon, said in an article on progress in the MIT Technology Review, “Transparency about our ignorance makes the knowledge we communicate more trustworthy and extends a hand to others.” It’s a trite example, but before I moved to Nevada, USA, I thought every single-family home came with a basement. Had I not learned that it is exceptionally hard to dig a hole in caliche, I could have assumed that a majority of the homes in the Las Vegas Valley were poorly built or inferior. Humility in transportation design means being willing to learn from our mistakes; it’s transparently trustworthiness. We can learn from the past, but the present is more valuable. "Transparency about our ignorance makes the knowledge we communicate more trustworthy and tends to extend a hand to others."

Technological advancements have allowed nearby parking but protected the crossing; added new features to an aging roadway; and was far more appreciated, usable.

In my career I was asked by the Principal of Quannah McCall Elementary School to examine their crossing location. McCall is in an older school in an established neighborhood, and the crosswalk they wanted was within a few hundred feet of a traffic signal. My first recommendation was to realign access to the traffic signal, but then I met the parents. Following a spirited conversation, our final design defined a gathering space; allowed nearby parking but protected the crossing; added new features to an aging roadway; and was far more appreciated, usable, and usable.

There is a finite amount of public money, and it’s all the same money regardless of the colors we paint it. When it goes unused in one place, it gets used in another. It speaks to our values; we can deliver opportunity now or charity later. Paratransit is a good example. If there are infrastructure-related path of travel limitations for a transit rider who is otherwise able to use fixed route services, paratransit services must be provided. In short, we can spend money on accessible design now, or spend money on heavily subsidized paratransit services forever.

Projects established on trust are easier to construct. Vera Keller, associate professor of history at the University of Oregon, said in an article on progress in the MIT Technology Review, “Transparency about our ignorance makes the knowledge we communicate more trustworthy and extends a hand to others.” It’s a trite example, but before I moved to Nevada, USA, I thought every single-family home came with a basement. Had I not learned that it is exceptionally hard to dig a hole in caliche, I could have assumed that a majority of the homes in the Las Vegas Valley were poorly built or inferior. Humility in transportation design means understanding your own lived experience is unique and not necessarily transferable to others. I’ll be the first to admit that I don’t always approach a situation with an open mind as the McCall crosswalk illustrates. Rather, it requires repetition; transportation is a practice. We can practice transparency by sharing knowledge gaps and learning the adjacent community’s travel and destination preferences and key safety concerns. Initially sharing that humility builds trust in the technical solution, and we need trust to move forward.

ITE is a community, and a community is most successful when all members feel like they belong. Accordingly, ITE has established an internal Diversity & Inclusion Committee chaired by Shilpa Mallem, P.E., PTOE (M) and Jeff Riegner, P.E., PTOE, AICP (F). You can still attend the two remaining Equity Listening Sessions hosted by ITE on May 27 and June 30, 2021, and we need your input. Please find the session most convenient for you at www.ite.org/technical-resources/equity-listening-sessions and join us.

Alyssa A. Rodriguez, P.E., PTOE (F)
ITE International President

Alyssa A. Rodriguez, P.E., PTOE (F)
ITE International President
contents

MAY 2021
volume 91 • number 5

Equity

26 Creating a More Equitable Transportation System through Diversity and Inclusion
By Freddie Fuller

31 Assessing the Equity of Portland’s Traffic Signal Maintenance
By Alison Tanaka, P.E. (M), Peter Koonce, P.E. (M), Phil Armand (M), and Joe Neilson

38 Why Attention to Complete Streets Implementation Is So Important in Serving Historically Disadvantaged Communities
By Lawrence Marcus (M), Paula Flores (F), Jamie Roberts, PTP (M), and Abigail Johnson

44 Accessibility: From Ivory Tower to Practice
By Eric Sundquist and Chris McCahill

inside ite

8 People in the Profession
9 ITE News
11 Calendar
11 Where in the World?
12 Committed to the Cause
16 Best Practices in Selecting Transportation Consultants – An ITE Informational Report

inside the industry

18 Incorporating Equity through Community Engagement: Durham, NC, USA
21 Equity as a Priority Policy: Metropolitan Washington Council of Governments
24 Innovative Color Guidance Lane System in South Korea to Enhance Road Safety and Efficiency

advertisers

2 Econolite 17 Career Center
3 SIDRA SOLUTIONS 30 ITE Learning Hub
7 McCain 37 Miovision
9 Matson and Hammond Mentoring Program 43 Iteris
11 ITE Professional Development Record Keeping System (PDRKS) 46 ITE Membership
15 ITE International Virtual Annual Meeting 50 ITE Video Challenge
17 ITE Bookshelf 51 ITE Plus, Inc.
52 ITS Plus, Inc.

1627 Eye Street, NW, Suite 600, Washington, DC 20006 USA • Telephone: +1 202-785-0060 • Fax: +1 202-785-0609 • www.ite.org
The ITE Annual Meeting Goes Virtual, Again

Hopefully by now, you are well aware that our 2021 ITE Annual Meeting in conjunction with the Mountain and Western Districts will be held virtually. The Technical Program will take place Tuesday through Thursday during the weeks of July 20 and July 27, 2021, and our Councils and Committees will meet during the week of August 3. While it was disappointing to have to shift from the planned in-person meeting in Portland, OR, USA to a remote delivery, given the conditions on the ground in Portland and the uncertainty and hesitancy regarding the ability for our members to travel this summer, this was clearly the right choice come decision-time.

The good news is that you can access the ITE Annual Meeting from the comfort of your home or office. Having successfully delivered last year’s Annual Meeting to more than 1,800 participants and our spring Technical Conference to more than 1,000, we are confident we will create a high-quality, engaging professional development experience for our members.

The theme for this year’s meeting is Navigating a New Future. As we emerge from more than a year in the grips of COVID-19, it is clear that the world has changed. Travel patterns, work and home life, workplaces, retail and restaurants, and much more have been altered. Some temporarily, some permanently. At the Annual Meeting, we will bring you the insights, knowledge, and tools you will need to navigate this new future successfully.

The Annual Meeting agenda will include many of the same strong elements you have come to expect, with three Plenary Sessions featuring ITE and industry leaders discussing today’s most critical issues, more than 40 technical sessions covering the breadth of our profession with a focus on innovation and change, 75+ poster presentations allowing engagement with presenters, six workshops providing a deeper dive, and a series of student and professional competitions including the ITE Traffic Bowl Grand Championship, the National Center of Operations Technology Tournament, the Vision Zero Sandbox Competition, and the Transportation Transforms Community Video Competition.

Across the meeting will we intersperse a series of interactive social and networking opportunities so you can connect with peers in less formal settings. Since last year, we have identified new ways to provide these types of interactions and will employ new technologies, allowing you to meet up with old friends and find those with common interests.

As with our other virtual events, all of the technical content will be recorded and available through the end of September, giving you the option of engaging live or listening in at a later date. In total more than 60 PDHs will be available, providing great value for the low registration price. See page 15 for more in-depth information.

I am also pleased to announce our reconfigured upcoming line-up of Annual Meetings and Exhibitions. We will get to enjoy the unique sights and sounds of New Orleans, LA, USA, July 31-August 3, 2022, and we will finally get to be in the Rose City in 2023 as we hold the Annual Meeting with the Western District in Portland. In 2024, we will journey back east to the birthplace of our Nation in Philadelphia, PA, USA, meeting jointly with the Mid-Colonial District. I look forward to seeing you virtually this summer and in-person soon. As always, you can reach me on the ITE e-Community or on Twitter: @JFpaniatiITE.

Jeffrey F. Paniati, P.E. (F)
Executive Director and Chief Executive Officer
Our patented SWARCO technology has resulted in the highest visibility combined with the lowest operational costs in the transportation industry. Variable Message Signs, Variable Speed Limit Signs, Lane Control Signs, Blank Out Signs, Changeable Message Signs, Parking Guidance or Wayfinding Signs – We will get you noticed!
New Members
ITE welcomes the following new members who recently joined our community of transportation professionals.

**Canadian**
- Stefan Engleder
- Kyle Evjen
- Kara L. Jefford
- Sunil Kumar
- Ellen McLaughlin
- Katia Merand
- Mark Motiuk
- Jeffrey Orr, C.E.T.
- Caitlyn Quach
- Ioana Rontu
- Hana Marissa Sze Stoer

**Florida Puerto Rico**
- Rodrikas Jones
- Nicholas Mathie
- Samia Rubaiat
- Steve Sedwick
- Janette Simpson
- Bryan Chamberlain

**Global**
- Subba Reddy Munagala, PTP

**Great Lakes**
- Muhyadin Artan
- Mohamed Benhasan
- Mandy K. Bishop

**Mid-Colonial**
- Maria Cantrell
- Michael Folkening, P.E., PTOE
- Eric Foytik
- Katharine Griffin
- Brandon Hayes
- Charles Thomas Keller
- Charles P. Smith, P.E.
- Matthew W. Taylor
- Sara-Phuong Ton
- Jordan Zamary

**Missouri Valley**
- Rebecca A. Abecassis
- Caroline Awua-Mensah
- Shawn D. Beavon
- Hyun Cho, EIT
- Mary K. Eades
- Jeffrey L. Fitz
- Grace Foley
- Alison Boykins Frazier
- Michael Cleveland-Holden
- James H. Holt
- Jungwook Jun, P.E.
- Brian C. Knapp
- Kunal Kothawade, EIT
- John R. Lee, P.E.
- Michael John Miller, P.E.
- David C. Morris, P.E.
- Jeremy Mullins, P.E.
- Kamal Munawar, P.E.
- Emmett Newton

**Mountain**
- Carla Gorman Morrison
- Vasilia Yakumithis, AICP

**Northeastern**
- Brian C. Gibson
- Christa Lucas
- Matthew Reiser

**Southern**
- Maria Cantrell
- Michael Folkening, P.E., PTOE
- Eric Foytik
- Katharine Griffin
- Brandon Hayes
- Charles Thomas Keller
- Charles P. Smith, P.E.
- Matthew W. Taylor
- Sara-Phuong Ton
- Jordan Zamary

**Mid-Colonial**
- Pil Jin Chun
- Rebecca C. Haataja
- Robert Patrick Johnson
- Joseph Spadaro, P.E.
- Jeffrey R. Sturtevant, P.E., PTOE

**Missouri Valley**
- Alexandra Goff
- Kendra Rogers

**Mountain**
- Caleb Feaver
- Dan Franz
- Risa Gutierrez
- Alex Lemka
- Keith Morphis

**Texas**
- Yousef Abuhamdeh
- Britanny Darrah
- Mahmoud Dibas
- Randel G. Lenz
- Ricardo Ramos
- Michael Ver Hoef

**Western**
- Camille Alexander
- Britanny Barker, P.E.
- Jaspinderjit S. Bhullar, P.E.
- Angel Dziedzic
- Nader Heydari, P.E.
- Eric Hu
- Po Leung

Letters in parentheses after individuals’ names indicate ITE membership status: S - Student Member; IA - Institute; M- Member; F - Fellow; R - Retired Member; and H - Honorary Member. Information reported here is based on news releases, and other sources. If you have news of yourself or the profession that you would like considered for publication, please send it to Holly Stowell, hstowell@ite.org.

ITE Talks Transportation Podcast

New from the Thought Leadership Series

**Ryan Russo, OakDOT Director – Lessons Learned from the Slow Streets Program**

Ryan Russo, director at the Oakland Department of Transportation in California, USA, discusses the city’s Slow Streets program and the challenges of meeting the community’s transportation needs during COVID-19. He also highlights the department’s strategic plan, including the establishment of a Racial Equity team that works to address inequities, build trust within the community, and make transportation more accessible for all. Russo was the keynote speaker at ITE’s Virtual Technical Conference in March.

All episodes available at www.ite.org/learninghub/podcast.asp | Subscribe for free via iTunes at http://apple.co/2hOUz8t
ITE NEWS

ITE Launches Resource Center for DSC Leadership

As part of the ONE ITE effort over the past two years, a District-Section-Chapter (DSC) Resource Center has been developed to serve as a “living” resource to help you succeed in ITE leadership. This resource center outlines areas where ITE staff and fellow members are available to support you. There are numerous resources available, and this self-guided outline is here to show you how to access them. Over the years, we have found DSC leadership involves several functional areas in serving membership. This resource center includes some best practices, lessons learned, and ideas that you may find appropriate and able to put to use in your leadership role. The ONE ITE Committee is dedicated to continuously adding resources that you might find helpful throughout the year. To access the Resource Center, visit www.ite.org/dsc-resources.

Go Green with ITE Journal

Not in the office to get your mail, or would you like to be more “green”? You can choose to stop the mailed delivery of ITE Journal by filling out a quick online survey at http://bit.ly/ITEJGoGreen. You will still get the emailed version of ITE Journal that goes out on the first or second of each month and have full access to the digital edition. itej

Sign Up Today for the Matson and Hammond Mentoring Program

During the month of May, ITE is focused on celebrating mentoring. Visit www.ite.org and watch your inbox for more details!

“I enjoy serving as a mentor, whether it’s through ITE’s Matson and Hammond Mentoring Program, or at work with my staff. I was fortunate to have many mentors support my career, so now it’s time to pass that support onto the next generations of transportation professionals and help them succeed.”

Jenny Grote, P.E., PTOE, PTP
ITE Past President

“Wow, all had helped along the way to get to where we are at and I have had a lot of help from some pretty tremendous mentors. It is my honor to repay that debt by mentoring the next generation of transportation professionals. Working together we can achieve great things for our profession and our communities.”

Shawn Leight, P.E., PTOE, PTP
Vice President/COO
CBB Transportation Engineers + Planners

Learn from the Experience of Others
& Share Your Experience with Others

Get involved: https://community.ite.org/mentoring/mentoring (ITE membership log-in required)
ITE JOURNAL: How has the transportation planning profession evolved during your time in the industry? What advancements have been particularly beneficial, and what core elements remain the same?

CAPERS: I believe the most significant change in the transportation planning industry has been the shift away from prioritizing vehicular mobility in concept as a principal in system planning and design. In part, this evolution has developed due to the shift in land use patterns where most suburban areas over the years have altered their land use practices to include suburban activity centers that involve the mix of uses on a single site or small planning area. This advancement in land use development has been beneficial to all travelers of all abilities, where “accessibility” is now the focus of transportation system planning and design. This has been depicted in many ways, such as emphasizing multimodal solutions in transportation comprehensive planning goals, the retrofitting of large roadways facilities that now provide access for all modes of travel, or even technological advances that bring users out of cars and allow access to multiple travel modes.

ITE JOURNAL: As you work in urban transportation planning, do you see an active push for more equity-driven solutions, and what other trends are you observing in this space?

CAPERS: In my current role as director of Planning and Community Development with the Town of Dumfries, VA, USA, my department strives to incorporate equity in all of our planning efforts to ensure that there is a fair distribution of benefits, programs, and services for all community members, despite income and/or social differences. Most recently, equity considerations played an important role in the town’s Comprehensive Plan update, where we planned for the Town of Dumfries’ Historic Downtown Main Street district. We opened the visioning to all town residents to incorporate new policy objectives that ensured that the benefits of the plan amendments impacted everyone.

I believe there is an active push for more equity-driven solutions in transportation planning, particularly identifying historically underprivileged communities that have a greater reliance on public transit and pedestrian/bicycle facilities. For instance, in my role with ITE’s Transportation Planning Council, we are currently looking at how we can develop equity as a quantifiable variable in the assessment of site development and transportation impact studies. We hope to find solutions for how equity can be a consideration in site development.

ITE JOURNAL: You have your Professional Transportation Planner (PTP) certification and are active within ITE. How have both your involvement with the organization and holding a professional certification impacted your career?

CAPERS: As with many in the industry, ITE has been pivotal in advancing my career. When I started out as a member a few years ago, ITE was very influential in helping me establish a network of transportation professionals around the world, with whom I continue to exchange ideas and receive guidance regarding challenges that I face day to day. My certification as a PTP, as well as my experience as an executive member of ITE’s Transportation Planning Council and a contributor on technical panel discussions, has furthered my development as a subject matter expert in the field, giving me the expertise and credibility necessary to be successful in my professional role.
2021 EVENTS

NORTHEASTERN DISTRICT ANNUAL MEETING
May 12–14 | Virtual Meeting

INTERMOUNTAIN SECTION ANNUAL MEETING
May 13–15 | Jackson, WY, USA

CITE ANNUAL CONFERENCE
June 8–10 | Virtual Meeting

FLORIDA PUERTO RICO SUMMER MEETING
June 23–25 | Fort Lauderdale Beach, FL, USA

ITE INTERNATIONAL VIRTUAL ANNUAL MEETING
July 2021 | In conjunction with the Mountain and Western Districts. See page 15 for more information.

GREAT LAKES DISTRICT ANNUAL MEETING
August 30–31 | Columbus, OH, USA

TRANSPO (ITE AND ITS FLORIDA EVENT)
September 27–29 | Bonita Springs, FL, USA

WHERE IN THE WORLD?

Can you guess the location of the “Where in the World?” photo in this issue? The answer is on page 50. Feel free to send in your own photos to hstowell@ite.org. Good luck! itej

ITE’s Professional Development Record Keeping System Helps You Track Your Educational Credits

A BENEFIT OF BEING AN ITE MEMBER, the ITE Professional Development Record Keeping System (PDRKS) is an important tool to keep track of credits you have earned. It is the perfect way to maintain an ongoing record of your professional development activity to support licensure and certification renewal.

• Units of activities entered in a log will be converted into Professional Development Hours (PDHs).
• PDRKS now accepts uploaded PDFs to each record. You can include certificates you receive in your PDRKS account.

The log created by the ITE Professional Development Record Keeping System conforms to the guidelines set forth by the National Council of Examiners for Engineering and Surveying (NCEES).

www.ite.org/PDRKS
Committed to the Cause

When it comes to the issues that matter most to its membership and the transportation profession, the Oregon Section of ITE doesn’t just talk the talk—the Section is truly “walking the walk.” With focused member efforts and committee-based work in areas like equity, sustainability, advocacy, and student efforts, Oregon ITE is a prime example of how local ITE initiatives and activities reflect the mission of ITE International as a whole.

One example is how the Oregon Section has been instrumental in helping organize the recent Diversity and Inclusion webinar series with the Western District. Originally, the idea was to undertake joint virtual meetings on topics of high interest among members spanning traditional Section boundaries. Because equity is an ITE International focus area in 2021, the Diversity and Inclusion Series became a way to kick-off the discussions within the Western District and share the conversations across ITE through a webinar format. Because the Section was originally scheduled to host the 2021 ITE Annual Meeting in Portland, OR, the series was designed as one more way to prepare attendees for coming to the state. Throughout the webinars, thought leaders, businesses, agencies, professional organizations, and students spoke on a variety of diversity and inclusion-related topics from various perspectives. In addition to promoting further awareness and understanding of these issues, the Section and District hopes that webinar participants come away with actionable next-steps for moving forward.

The Oregon Section also has a Legislative Committee focusing on diversity and inclusion efforts chaired by Kevin Haas, P.E. (M), Oregon Department of Transportation (ODOT) state traffic standards engineer and unit manager. His office at ODOT is plugged into all of the legislative issues each session at the state legislature. As the committee chair, he brings his expertise on legislative issues and keeps track of what may be of interest to other Oregon ITE members and transportation professionals. The Oregon ITE website maintains a page and posts annual updates on these issues for easy access.

Oregon ITE also appoints one member to represent the private sector on the Oregon Traffic Control Devices Committee (OTCDC). OTCOD is a committee that advises ODOT on traffic control devices standards for Oregon. The current ITE representative, Patrick Marnell (M), keeps apprised of legislative issues when ODOT staff give regular reports on legislative topics of interest at OTCDC meetings. ITE representation at OTCDC provides professionals with diverse backgrounds to exchange information and discuss proper application of traffic control devices in Oregon across all facilities.

Recognizing diversity, equity, and inclusion as integral parts of the profession and society at-large, Oregon ITE initiated a Diversity, Equity, and Inclusion Subcommittee as part of the Section Board in 2020. Subcommittee Chair Shilpa Mallem, P.E., PTOE (M) organized a panel discussion at the Section’s 2021 Annual Winter Workshop focused on transportation equity in the local area and how it relates to diversity and inclusion. A majority of the sessions at the Winter Workshop were either directly related to

D&I Webinar Series
The Diversity and Inclusion webinar series from the Western District and Oregon Section is available to view on YouTube at the links below through May 31, 2021.

Session 1: Voices of Thought Leaders
http://bit.ly/diversityITE_session1

Session 2: Business Voices in Transportation

Session 3: Agency Voices in Transportation

Session 4: Voices of Professional Societies
http://bit.ly/diversityITE_session4
transportation equity in the Oregon region, or looked at projects through an equity lens. The panel consisted of representatives from ODOT, Portland Bureau of Transportation, and Portland State University. The subcommittee plans to coordinate with the ITE International Diversity & Inclusion Committee to bring similar sessions and workshops at the upcoming virtual ITE Annual Meeting.

Another issue the Section prioritizes is sustainability, and established its Sustainability Subcommittee in 2019. Its mission statement is to provide transportation professionals and the public with the tools and education to facilitate a safer and more inclusive sustainable transportation system. To support this mission, Oregon ITE first partnered with Greenroads International to join the global community on sustainability. The Section also partnered with the ITE Sustainability Standing Committee in its efforts to facilitate transportation solutions that incorporate economic, social, and environmental sustainability, as these topics span the range of ITE member interests.

With these efforts in mind, Oregon ITE has been developing a fundraiser event to raise money for scholarships for students interested in sustainability, as well as working toward social events and a workshop that will improve networking and increase education on the subject. The Section also held a luncheon on the Greenroads Rating System and helped organize a recent ITE webinar, “Tools and Resources for Integrating Sustainability and Health into Transportation.” Subcommittee members Robert DeVassie P.E., PMP, STP (F), Krista Purser (M), and Kelly Rodgers (M) spoke at the 2021 ITE International Virtual Student Leadership Summit on the panel “Incorporating Sustainability in Transportation Infrastructure and Planning.” Through these and other efforts, the Section’s vision is to advance equitable, economical, and environmental transportation across the state through

---

**Oregon Section of ITE**

**Western District**

**Membership**
Approximately 380 members

**Leadership**
President – Dongmei Lin, Ph.D., P.E., T.E., PTOE (M)
Vice President – Carl Olson, P.E., ASEP (M)
Secretary-Treasurer – Molly McCormick (M)
Past President – Julie Kentosh, P.E., PTOE (M)

**Greater Oregon Representatives**
Southern Oregon – Dan Dorrell, P.E. (M)
Willamette Valley – David Covey, P.E. (M)

**Committees**
Communications Chair – Krista Purser, P.E. (M)
Communication Liaison – Clive Lara (M)
Webmaster – Sara Parks (M)
Scribe – Richard Gamble, P.E. (M)
Sponsorship Chair – Jennifer Danziger, P.E. (M)
Legislation Chair – Kevin Haas, P.E. (M)
Membership Chair – Michael Ruiz-Leon (M)
Diversity and Inclusion Chair – Shilpa Mallem, P.E., PTOE (M)

**Oregon Traffic Control Devices Committee Liaison**
Patrick Marnell, P.E. (M)

**Technical Subcommittees**
SimCap Subcommittee Co-chairs – Randy Johnson, P.E., PTOE (M), Kate Petak, P.E., PTOE (M)
ITS Subcommittee Co-chairs – Anasatia Roeszler, P.E. (M), Joana Cosma, P.E. (M)

**ITE Traffic Bowl Origins**
The Oregon Section was the creator of the much beloved traffic bowl, and hosted the first “ITE Traffic Bowl” in 1993 at the Sweetbrier Inn in Tualatin, OR. The event was such a success that the Section further conceptualized the application of a similar event as a unique “add-on” to the Western District Annual Meeting in July 1994 for professional networking. The success at the Western District meeting led to nearly three decades of ongoing student and professional events. Following a Western District Board member promotion, ITE established the first International Traffic Bowl for Students in 2009 which continues today. Because of the pandemic, last year the 29th Annual Bill Kloos Traffic Bowl was held remotely via Zoom. Utilizing break-out rooms for the 50 participants, student teams from Portland State University, Oregon State University, and the Oregon Institute of Technology competed against each other, as well as seven other teams consisting of students and professionals, in an online trivia event.

**Members of Note**
Oregon has had three International ITE Presidents:

**Special Awards Named for Members**
Bill Kloos Scholarship
Traffic Bowl was renamed to Bill Kloos Traffic Bowl in 2009
both transfer of knowledge, and support of individuals, organizations, and projects.

In addition to student-focused initiatives (like scholarships, student funding for Requests for Proposals, and the Traffic Bowl), Oregon ITE also engages with local universities to keep members informed about new transportation-related research. University professors, researchers, and other staff add diversity to Oregon ITE presentations and expose its members to new developments in transportation research. Presenters have included Dr. David Hurwitz (F) – Oregon State University (OSU), Katharine Hunter-Zaworski – OSU, Casey Bergh – OSU-Cascades, Roger Lindgren, P.Eng. (M) – Oregon Institute of Technology, Chris Monsere – Portland State University (PSU), Sirisha Kothuri – PSU, Aaron Golub (PSU), Amanda Howell – University of Oregon (UO), and Becky Steckler – UO.

Oregon State University’s Dr. David Hurwitz has been one of the Oregon Section’s closest partners. David is currently the OSU Student Chapter Advisor, and previously served as Oregon ITE webmaster and secretary/treasurer for Greater Oregon ITE (which subsequently merged into the Oregon ITE Section). David and his research group have led tours of the OSU Driving and Bicycling Simulator for many Section members, and with the Section, co-hosted a 2020 webinar on Passive Pedestrian Detection that presented results from an evaluation of data collection from two sensor technologies in Washington County, OR.

With representation from the OSU Student Chapter invited to Section Board meetings (as well as representatives from other local chapters at Portland State University and the Oregon Institute of Transportation), Oregon ITE is able to stay connected and knowledgeable of ongoing events and offer help and collaborate as needed. For example, in 2020 the Oregon State University Student Chapter requested mentor volunteers from Oregon ITE be paired with current students to help and guide students through a variety of items such as career path discussions, resume assistance, and navigating life during the pandemic. Numerous Oregon ITE members (including from the board) were keen to participate, and continue to provide mentorship to many Oregon State University students.  

### Technical Subcommittees

Two additional subcommittees in the Oregon Section cover technical topics. The Simulation and Capacity Analysis User Group (SimCap) was created to improve the application and understanding of traffic simulation and capacity analysis. It was rebranded from the Oregon Simulation Roundtable to align with the ITE International SimCap and open to all persons with interest or experience in these and related practice areas. The ITS Subcommittee (Intelligent Transportation Systems) is designed to support members with a focus on transportation technology. It connects the vendors and transportation practitioners so that Oregon professionals are kept informed of the latest and greatest technology to benefit the community.

### Networking – Got Golf?

Oregon ITE includes a networking element in all of its technical meetings, and also hosts social events where members come together in a more casual atmosphere. These include happy hours, the Annual Bill Kloss Traffic Bowl, and Golf for People who Don’t Golf (disc-golf, foot-golf, topgolf, par-3 golf, mini-golf, etc).
Navigating a New Future

The 2021 ITE Annual Meeting (#ITE2021) is now virtual!

(Technical Program: July 20-24; 27-29; ITE Council and Committee Meetings: August 2–5)

July 20–August 5

Same great content and networking opportunities will be available online.

Registration is now open.

More information – www.iteannualmeeting.org

2021 Annual Meeting
Best Practices in Selecting Transportation Consultants – An ITE Informational Report

By Gene Chartier, P.Eng. (F), Paradigm Transportation Solutions Limited

Public agencies require external services and advice from time to time when their own staff are either unavailable or lack the required skills or expertise. Most agencies meet this need by hiring a consultant to undertake the specific project or task.

Selecting the best-suited and most qualified consultant improves the likelihood of delivering a useful, high-quality product on time and within budget. This choice is one the agency must make not only with a clear and complete understanding and knowledge of the project requirements, but also through the application of an effective consultant selection process.

With this objective in mind, the ITE Public Agency and Consultants Councils have recently completed an informational report, Best Practices in Selecting Transportation Consultants. The report focuses on the selection of consultants in the disciplines traditionally described as transportation or traffic engineering and transportation planning performing work for local governments (i.e., towns, cities, counties). Objectives of the report include:

• Providing information on the use of consulting services, including explaining how and when agencies retain transportation consultants, the steps involved in developing and administering an effective consultant selection process, and how the consultant prepares its response; and
• Describing the principles and different methods of selecting a transportation consultant, highlighting the long-term benefits of using a Qualifications-Based Selection (QBS) process.

The Consultant Selection Challenge

Best Practices in Selecting Transportation Consultants explains the inherent difficulties presented by the consultant selection process. From the agency’s perspective, typical challenges include:

• Understanding Project Complexity: The agency may not fully appreciate the level of effort and type of resources required by the consultant and its own staff to carry out the assignment.

• Setting a Reasonable Scope Matched to Budget: Developing a project scope that clearly specifies the expected outcomes and aligns with available financing can prove challenging if the agency is not familiar with the work.

• Determining the Preferred Consultant Selection Methodology: A range of different methods exist, each with distinct advantages and disadvantages.

• Coordinating with Procurement Staff: Although responsible for the process, procurement staff may not fully understand or appreciate the technical nuances of the project or how certain elements will benefit the agency.

• Choosing the Right Selection Committee: Members need to have pertinent technical expertise, a broad understanding of the project, basic knowledge of how consulting works, and a clear grasp of the procurement process requirements.

Consultants also encounter challenges through the process including:

• Incurring Costs in Preparing the Response: Better understanding cost implications can help agencies appropriately align requirements and use tools like interviews and shortlists more strategically.

• Responding to Generic Scopes of Work: Where possible, clearly defining
the project scope upfront enables the consultant to produce a succinct, compelling submission.

- **Clarifying Agency Expectations:** While leveling the playing field, the absence of direct communication with key staff in preparing the response makes it more difficult for the consultant to present a tailored submission addressing the agency’s needs.

- **Competing Against an Incumbent:** With the time and resources needed to prepare a meaningful submission, consultants can be reluctant to respond to procurements perceived as being “wired” to a certain firm.

- **Meeting Contract Requirements:** In some instances, contract terms and conditions — particularly indemnification and insurance clauses — appearing inappropriate or excessive for the perceived level of risk exposure can deter a consultant from responding.

- **Avoiding the “Race to the Bottom:”** Heightening competition between consultants based solely on price can result in sacrifices in product quality to gain a competitive advantage.

### Why Use Qualifications-Based Selection?

QBS is frequently cited as the preferred practice for selecting transportation consultants. The method facilitates best value selection based on qualifications (including technical competence, relevant experience, availability, methodology, local knowledge, and past performance) and the subsequent determination of a fair and reasonable price, all relative to the project scope and agency expectations. Selecting consultants based on the quality of their submission and not solely cost to perform the work helps ensure the agency engages a qualified service provider, promotes thorough and thoughtful proposals, and avoids firms engaging in a “race to the bottom.”

Adopting this practice meets most, if not all, principles of consultant selection and helps to overcome the inherent challenges discussed above.

It is ultimately up to the agency to establish the consultant selection process it believes will deliver the best results and for the consultant to produce a concise, compelling submission meeting the agency’s requirements. Selecting consultants based on the quality of their

### Check Out ITE’s New Career Center!

The ITE Career Center is more than a webpage to find new employment opportunities or recruit new talent. It has numerous resources for everyone at all stages of their career, including

- Certification;
- Mentoring;
- Webinars, videos, and podcasts; plus
- Advice and tips on resume writing, networking, interviewing, and maximizing your presence on social media.
Incorporating Equity through Community Engagement: Durham, NC, USA

By Anne Phillips, Ph.D., Principal Planner, Durham-Chapel Hill-Carrboro Metropolitan Planning Organization

In August 2018, the Durham City Council directed staff to create an Equitable Community Engagement Blueprint to guide future engagement for the Durham Belt Line Trail, a 1.7-mile trail that will connect north Durham to downtown and the East Coast Greenway once complete. The City Council issued this directive in response to concerns that residents had not been adequately informed about the project and that the project would lead to green gentrification, a process where amenities such as parks and trails lead to “increases in housing prices and the influx of new, wealthier and often white residents in low-income communities of color.”

Transportation staff see this directive as a turning point in Durham’s approach to equity. Although the city was no stranger to equity concerns, the Blueprint, created by the Neighborhood Improvement Services Department with input from other departments, pushed staff to think about how to better include community members—especially those being excluded by existing practices—into the planning process. Transportation staff has learned a great deal about how to center equity since the development of the Blueprint, and successfully adapted existing strategies to continue to center equity during the COVID-19 pandemic.

Data, particularly demographic data, are the cornerstone of Durham’s equity strategy. The first step that staff and consultants took was to develop demographic profiles of the project corridors for two ongoing projects: the Better Bus Project, designed to provide safe access to bus stops and improve bus service, and the Sidewalk Assessment and Inventory Study. There are two benefits to starting with a demographic profile, according to Jackie Turner, principal at J. Turner Consulting, an engagement consultant on the Better Bus Project. The profile provides a target for outreach, and helps the project team determine what outreach methods will be most effective in reaching the community.

Thinking about who lives on a corridor is important because “for people living in the neighborhood, experiences are hyperlocal,” Turner says. Thinking about the hyperlocal experiences of residents led Turner to spend a Saturday having informal community conversations with bus riders at stops on Fayetteville Street before formal engagement for the Better Bus Project began. Talking to residents in an informal and local setting was pivotal to helping Turner understand resident perspectives on what it is like to wait for and ride the bus.

Following guidance in the Blueprint, city staff and consultants collect demographic data for engagement activities. These data help the project team to determine whether they are reaching the residents most affected by a particular project.

Aidil Ortiz, principal at Aidilisms and a local consultant working on the Sidewalk Study, also began work with a demographic profile. Starting with residents that have been traditionally excluded by the planning process is a more realistic approach to equitable engagement, according to Ortiz. “As a project goes on, your attention, energy, and resources go down over time,” she says. For the Sidewalk Study, Ortiz first focused on strategies targeted towards historically excluded communities, then followed up with a broader strategy through the city’s public affairs office. This allowed her to use limited resources to reach residents she knew would be harder to engage when the project team had the time and funding resources available to do so.

Durham’s Shared Streets Program, a response to the COVID-19 pandemic, highlighted how transpor-
tation staff has used data and an equity-first approach to project planning and implementation. To identify potential corridors for the Shared Streets program, the project team looked at seven routes that had been identified for a neighborhood bike routes program—an equity analysis of bicycle and pedestrian crashes—and streets that had been turned down for speed humps through the city’s speed hump program because they were on emergency response routes. “Shared Streets gave us alternative ways of trying to address needs, and we still had access to the volume and speed counts that had been done on the streets,” says Project Manager and Bicycle And Pedestrian coordinator Dale McKeel.

Looking at existing data allowed staff members to identify streets where residents had the most need for safe spaces to bike and walk. They used door hang- ers and made phone calls to reach out to community members on candidate streets. Several residents stated that they did not want to participate in the program. Ultimately, streets were selected where data supported a need for safer spaces to bike and walk, and where residents said they were enthusiastic about the project.

Conversations with the community continued after street selection. Staff worked with Ortiz to hold socially-distanced, outdoor community meetings on selected streets before implementing the program. These meetings allowed the team to identify treatments that they had not initially considered. For example, staff members thought they would use barricades and signs to implement the program as other cities had done. After conversations with residents, they learned that barricades alone were not aesthetically appealing to residents. They also realized that barricades and signs were not enough to address conditions like speeding that made the selected streets less safe for walking and biking.

A grant from the National Association of Transportation Officials (NACTO) allowed the city to include traffic calming (i.e., temporary pavement markings and flexible posts around painted traffic circles) and placemaking elements in the program. “I don’t think we would have discovered [these solutions] without proactive conversations with the community,” says transportation planner Evan Tenenbaum, a member of the project team.

In the early days of the pandemic, the team fielded social media requests from residents to quickly implement a Shared Streets program. Their decision to take the time to consider available data and residents’ wishes allowed them to focus efforts where most needed. “The people we were hearing from on Twitter…were not an equitable representation of the community. Had we responded at that time, we likely would have ended up with a program that did Shared Streets in communities that didn’t have the greatest need, [communities] that had traffic calming and other features over the years. Waiting and thinking through the process allowed us to focus on where our more vulnerable users were, rather than who is asking for it,” says Assistant Transportation Director Bill Judge.
In addition to responding to the pandemic with the Shared Streets program, staff adapted pre-pandemic equity strategies to continue work on larger-scale projects such as the Durham Transit Plan. For Aidil Ortiz, “connecting with people who have primary relationships with a community” is an essential component of a strong engagement strategy. Durham’s Engagement Ambassadors program, which offers residents training and stipend to help city staff reach communities that are often excluded from the planning process, helped the city to leverage relationships to reach historically marginalized communities during the height of the pandemic.

In 2019, the city launched the Engagement Ambassadors program to support updates to the Comprehensive Plan and Transit Plan. Before the pandemic, Ambassadors hosted events in their homes to solicit feedback on the city’s behalf. During the pandemic, staff contracted with Ortiz to manage the Ambassador program and supported her efforts to shift the program online.

Although there were concerns about whether the program would work in a virtual space, Ortiz and city staff were pleased that Ambassadors were still able to connect with their networks virtually. During the most recent round of engagement for the Transit Plan, 36 Ambassadors held virtual events and conversations where they solicited feedback from more than 170 residents.

The residents that Ambassadors spoke to were different from residents who took a widely promoted online survey for the Transit Plan. While only nine percent of those who took the online survey self-described as having a disability, 20 percent of residents reached by Ambassadors reported having a disability. Further, while 68 percent of online survey participants identified as white, 71 percent of residents reached by Ambassadors identified as Black/African American. Residents engaged by Ambassadors were much more representative of existing transit riders—67 percent of whom identify as Black/African American—than those who took the online survey.

Differences in feedback from the online survey and the Ambassadors sessions drive home the importance of making sure that engagement effectively reaches those who are most affected by a project. Online survey participants supported priorities such as a proposed commuter rail project and improving regional transit access, while those engaged by Ambassadors supported prioritizing paratransit, improved local bus service, and better access to bus stops. Work on the Transit Plan is still underway, but the project team hopes that a commitment to equitable engagement throughout the planning process and listening to the needs of traditionally marginalized residents will lead to a more equitable final plan.

Staff is forthcoming about the challenges of incorporating equity into project planning and implementation. “There is no magic system or process… it really is building those relationships,” Judge says. Yet planners, engineers, and consultants maintained that Durham’s emphasis on equity has resulted in better projects in recent years. “There have been challenging situations through the years, but they have made our designs better. They have made the way we think about our process better,” says Senior Engineering Manager Pete Nicholas. Staff knows that Durham still has a long way to go to ensure that outcomes, as well as processes, are equitable. Yet, the city’s work during the pandemic has shown that a focus on equity is not only possible during difficult circumstances, but crucial to better serving the residents who are most affected by our work as transportation planners and engineers.
Advancing equity among traditionally underserved communities is a key principle for many of us working in local and regional transportation planning. While identifying small geographic areas with concentrations of disadvantaged populations is a common practice in project- and planning-level Environmental Justice (EJ) analyses, the National Capital Region Transportation Planning Board (TPB) housed at and staffed by the Metropolitan Washington Council of Governments (COG) presents a way of leveraging this work to support equity considerations at the regional level that is also applicable across levels of government and planning fields and provides lessons learned.

The TPB is the federally designated metropolitan planning organization (MPO) for metropolitan Washington, serving 44 members, 3,500 square miles (5,633 kilometers), and more than 5 million people and 3 million jobs. The TPB ensures compliance with federal laws and requirements, provides a regional policy framework and forum for coordination, and provides technical resources for decision-making.

Equity has been an important policy priority for the TPB since its founding. The TPB’s 1998 Vision statement embraced equity as a key principle. Its long-range transportation plan, Visualize 2045, emphasizes the need for multimodal, affordable, and safe mobility options to promote prosperity, accessibility, livability, and sustainability throughout and for all residents in the entire region. In July 2020, the TPB adopted a resolution committing itself to be anti-racist in its work and seeking to advance equity. It affirmed equity as a founding principle to be integrated throughout all activities and recognized that past actions have been exclusionary or have had a disparate impact on people of color and marginalized communities.2 The TPB is committed to correcting such inequities in all programs and policies.

When it comes to public transportation in the Washington, DC, USA region, the National Capital Region Transportation Planning Board has identified equity as an important policy priority.
One way that the TPB considers equity relates to efforts that respond to the federally prescribed Environmental Justice (EJ) requirements for MPOs. Under guidance and resources stemming from the 1994 Executive Order #12898, the TPB conducts an analysis of its long-range metropolitan transportation plan, Visualize 2045, to identify and address disproportionately high and significantly adverse impacts on minority and low-income populations.

During the development of the latest EJ analysis, the TPB approved a methodology identifying a set of geographically defined places with high concentrations of minority and low-income populations and called them “Equity Emphasis Areas” (EEAs). EEAs use a region-specific index of U.S. Census tract-level data to identify areas (see Table 1). EEAs are identified by calculating a tract concentration ratio for each population group by comparing the tract-level share of population to its respective regional average. A tract-level population group index score is applied to each groups’ concentration ratio and totaled to identify a EEA index score for applying a score threshold. The EEA indexing process identifies areas as having:

1. A high concentration of low-income population*
2. A high concentration of two or more minority populations**
3. Tracts with high concentrations of one minority population that also meet a secondary low-income threshold which is at or above the regional average for low-income.

* For the purposes of identifying EEAs, a person is considered low-income if their household income is less than one-and-a-half times the federal government’s official poverty threshold dependent on household size.

** For the purposes of identifying EEAs, racial and ethnic minority populations include African American, Asian, and Hispanic/Latino of all races.

While many MPOs have adopted the practice of identifying small, specific geographic areas for EJ considerations, the TPB led a unique approach based on consensus and interdisciplinary engagement. TPB staff worked in coordination with key audiences, including its members, its public-based advisory committees, staff within the region’s largest member jurisdictions, and the TPB’s public-based advisory committees, among others. This approach generated stakeholder buy-in, created awareness of the tool, and provided TPB staff with important feedback on tailoring the index-based methodology to the region. As a result, EEA geographies initially intended to meet EJ requirements for MPOs’ evolved into a tool with applicability in public sector fields where the location of concentration of traditionally disadvantaged communities are important considerations.

The TPB’s EEAs have been applied to advance equity considerations within transportation policy, planning, and programming, and in other public sector fields. TPB staff use EEAs to analyze policy priorities when developing its long-range transportation plan and efforts to better understand transportation safety. EEAs have been included in regional project selection programs’ evaluation criteria. TPB member jurisdictions have begun using EEAs as a consideration in transit planning, when analyzing the impacts of COVID-19 and planning for recovery, as well as locating mobile health food programs. COG is also considering EEAs in environmental vulnerability analysis and housing affordability evaluations.

The TPB’s process for identifying small geographic areas with concentrations of traditionally disadvantaged population groups can provide lessons learned to others engaged in similar efforts:

1. **Create trust through consensus building.** From the onset, engaging stakeholders from various backgrounds and disciplines ensures the method is sounder and more accurate. Consider adjusting how areas are identified with the specific demographic characteristics of your region, either through complex indexes or simple thresholds, and allocate time to hone your product.

2. **Update data over time.** While often incremental, people and places change over time resulting in differences between when demographic data are collected, analyzed, and implemented in policy, planning, and programming. Consider committing to a process of updating demographic data on a prescribed schedule that considers

### Table 1.

<table>
<thead>
<tr>
<th>Concentration compared to the regional average</th>
<th>Equity Emphasis Area Index Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-Income</td>
<td>African American</td>
</tr>
<tr>
<td>Less than 1.0</td>
<td>0</td>
</tr>
<tr>
<td>Between 1.0 – 1.49</td>
<td>1.0 - 1.49</td>
</tr>
<tr>
<td>Between 1.5 – 3.0</td>
<td>4.5 - 9.0</td>
</tr>
<tr>
<td>Greater than 3.0</td>
<td>9.0</td>
</tr>
<tr>
<td>Total Index Score</td>
<td>Greater than or equal to 4.00 is an Equity Emphasis Area</td>
</tr>
</tbody>
</table>
these changes and provides for enough update to the source demographic data.

3. **Promote and make data available to give them life.** Plan to make data available to interested audiences, and provide resources like mapping, summary data tables, and examples of applicability.

The TPB also urges considerations of the following enhancements and limitations:

1. **Data are one of many ways to consider equity.** Efforts like EEAs and region-scale Environmental Justice analysis are enhanced with comprehensive stakeholder outreach and engagement. Qualitative research provides a greater richness and depth, especially on understanding the needs and challenges of disadvantaged populations, to what one may ascertain strictly through quantitative analysis.

2. **Concentration and thresholds have their limitations.** While thresholds have use in region-wide environmental justice and other geospatial analyses, by design they do not consider the location of all individuals that identify in that transportation disadvantaged population group and should not be used to assume impacts for all individuals in that group.

Equity has been an important policy priority for the TPB since its founding, recognizing that past actions have been exclusionary or have had a disparate impact on people of color and marginalized communities. MPOs and similar-type transportation agencies looking to advance and improve region-specific equity considerations throughout their policy, planning, and programming responsibilities can consider implementing Equity Emphasis Areas, a transferable strategy. For additional information visit www.mwcog.org/equityemphasisareas.

**References**

1. Transportation Planning Board. July 22, 2020. “Resolution R1-2021 - Resolution to Establish Equity as a Fundamental Value and Integral Part of all Transportation Planning Board’s Work Activities.”
This paper examines a unique system—color guidance lane—to see how it enhances safety and even the efficiency of vehicles on roads. Korea Expressway Corporation (KEC), which designs, constructs, and manages almost all expressways in the country, developed an innovative and unique color guidance lane system (referred to in this article as “the system”).

The system was initially proposed by a KEC employee in 2012 and then adopted nationally in 2017. To the best of the author’s knowledge, it is the first such system in the world implemented for expressways, as shown in Figure 1.

At first, the police agreed to a pilot project in the Ansan junction area in 2012, which had an average of 25 crashes per year. After the demarcation of the color guidance lane there, the number of crashes annually saw a significant drop, decreasing to just three, which happened during the rainy season. Soon, more pilot projects were carried out, and a comparison between the data of 2011 and 2015 showed a 27 percent decrease in crashes on average. In 2017, the system was implemented nationwide for Korea’s expressways. The Ministry of Land, Infrastructure, and Transport (MOLIT) even developed and distributed the color guidance lane manual (hereafter “the manual”).

According to the manual, pink is used for single destination guidance. Light green with pink is used when there is a need to guide two directions, as shown in Figure 2. Natural green is also acceptable when the color of the road surface is right, ensuring adequate visibility.
Figure 3 presents the range of color space coordinates for the three colors mentioned above. When demarcating the lane, the chromaticity should be in this range, as shown in the manual. Once installed, the colors should keep a certain level of retroreflectivity, just like regular lane markings.

<table>
<thead>
<tr>
<th>Color</th>
<th>Range of color space Cord.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pink</td>
<td>X</td>
<td>0.415</td>
<td>0.435</td>
<td>0.465</td>
<td>0.485</td>
</tr>
<tr>
<td></td>
<td>Y</td>
<td>0.270</td>
<td>0.245</td>
<td>0.315</td>
<td>0.290</td>
</tr>
<tr>
<td>Light green</td>
<td>X</td>
<td>0.360</td>
<td>0.340</td>
<td>0.375</td>
<td>0.410</td>
</tr>
<tr>
<td></td>
<td>Y</td>
<td>0.635</td>
<td>0.590</td>
<td>0.550</td>
<td>0.585</td>
</tr>
<tr>
<td>Natural green</td>
<td>X</td>
<td>0.250</td>
<td>0.265</td>
<td>0.020</td>
<td>na</td>
</tr>
<tr>
<td></td>
<td>Y</td>
<td>0.740</td>
<td>0.620</td>
<td>0.770</td>
<td>na</td>
</tr>
</tbody>
</table>

Right after the development of the manual in 2017, the KEC decided to extend the system to all expressways in Korea at all junctions, and some interchanges that could cause confusion while changing direction on the expressway. Seoul’s metropolitan government had adopted the system, through three pilot projects in 2016 and 20 additional ones in 2017. In 2018, it increased the number of projects to 48 in the Seoul metropolitan area. The system’s impact was reported numerously—a 31 percent decrease in expressway crashes. In Seoul, lane changing at crossroads had decreased by 21 percent after the three pilot projects in 2016, and by 50 percent after the 20 additional projects the following year, showing favorable traffic safety improvement conditions.

A crucial lesson that can be learned from the system concerns the role of policymakers. They should examine an innovative idea with an open mind for the opportunity to save even a single life on the road. As such, the author hopes that the system is replicated in many countries to enhance traffic safety. Furthermore, the system could be helpful to be served to guide automated vehicles with the color in the future.

References
Creating a More Equitable Transportation System through Diversity and Inclusion

By Freddie Fuller

I want to thank ITE for the opportunity to share my perspectives on equity in transportation. I provide a bird’s-eye view of my public transportation industry observations, which are more anecdotal in nature, as I’m not currently responsible for delivering transit services daily. Much of what I have observed comes from my peers I engage with through the Conference of Minority Transportation Officials (COMTO) and the American Public Transportation Association (APTA). I’m also privy to many reports and legislative updates as we position our respective organizations to provide value to our members.
My perspectives on equity are also generated from working at Jacobs, a diverse global firm with more than 55,000 employees globally, providing professional services including consulting, technical, and scientific, and project delivery for the government and private sector. Equity is a daily consideration as we engage with and serve our diverse clientele globally. Many of the equity challenges within the workplace, as well as the communities we serve, play out in how we treat our employees. As organizations and transportation professionals create and focus on inclusion and diversity efforts, we must be mindful of promoting a positive workplace culture where all employees feel seen and heard. Finally, diversity within an organization’s leadership should be a key consideration in ultimately creating more equitable and inclusive transportation plans, policies, and projects.

**COVID-19’s Impact on Equity in Transit**

Prior to COVID-19, U.S. transit ridership was already trending downward, and the pandemic contributed to further erosion of ridership. As agencies scrambled to reduce service, eliminate routes, and in some cases, reduce staff; some even eliminated fares altogether in an effort to encourage ridership. In addition, safety measures like adding protective shields, mask wearing by employees and customers, and more stringent and frequent cleaning methods were implemented.

As the pandemic impacted our daily routines and employers implemented remote work policies, the nation began to see less commuters utilize commuter bus and rail services while many essential workers relied on core bus services to get to their places of employment. However, many essential workers were not able to work from home, and their contributions are essential to making our daily lives easier. Throughout the pandemic, it became clear that transit agencies took a less equitable approach when investing in particular services. Prior to the pandemic, several agencies placed significant focus, investments, and resources on areas that are experiencing the most significant reductions in ridership—like commuter bus and rail services—all while neglecting their core bus services that many essential workers utilize more frequently.

Today, transit agencies are faced with reduced ridership, reduced revenues (until the CARES Act funding kicked into place and the passing of the American Rescue Plan) and a focus on restructuring routes and modifying services. This is all to accommodate customers that rely heavily on core transit services for access to work to make ends meet for their families, vital healthcare (at a time when health concerns are at an all-time high), and healthy foods to maintain a balanced diet.

The lack of investment in core transit services is impacted by policies focused on investments in services that are less vital and important in this post-COVID era. Granted there are many regions around the country that continue to rely on commuter bus and rail services to maintain mobility within their region, some transportation policies were shortsighted when it came to investing in core services that offer mobility for historically disadvantaged communities and essential workers.

Policymakers that serve on the boards of these transit agencies are often at the core of decision making that results in the prioritization of one service over the other. A discussion centered around transportation equity requires the reader to understand just how deep racial inequities in our country impact everything that we do. When decision makers in a room don’t look like or can’t relate to the people they are planning for and making infrastructure decisions for, this naturally results in disparities in the process. For decades, homogenous groups of leaders have made decisions for the masses, not considering the negative impacts and consequences that result from the decisions they routinely make. On many occasions, boardrooms lack diversity in their composition, and members may view issues from the same angle as everyone else. With a lack of progress in diversifying key leadership roles, policymakers cannot bring the variety of perspectives on issues facing their communities that a diverse leadership team could.

**Workplace Diversity and Inclusion Opportunities**

The combination of the pandemic and the murder of George Floyd created a space for dialogue about racial inequities in our country. Over the last year, I have discussed racial inequities at work more than I ever have in my career. Race is difficult to discuss in general, especially as it relates to racial inequities in the workplace, so this newfound change is refreshing—and it’s about time.

For years, we have avoided the topic that has plagued this country for far too long, and racial inequities stretch into every aspect of our daily lives. Much of our unconscious bias is rooted in how we feel about race. Certainly, there are other factors that contribute to unconscious bias, but I’m intentionally focusing on race in this discussion. Race is an uneasy topic that people tend to shy away from instead of facing the realities of our society. We have to be intentional and start having dialogue about racial inequities. Although these conversations can be uncomfortable, we have to get comfortable with the uncomfortable.

I believe that most organizations face the challenge of racial inequity, and many are still trying to figure how to initiate conversations and decide whether to institute more formal inclusion and diversity (I&D) initiatives. I’m fortunate to work for a firm that has taken an approach to address racial inequities head-on. We believe that representation matters, and are creating a workplace culture where diversity is embraced at all levels of an organization, starting with our board of directors through senior leadership and into our rank-and-file employees.

Jacobs established formal Employee Network Groups to create an inclusive environment that focuses on specific populations
within our firm including: Black employees, Hispanic employees, Women, LGBTQ Community, Veterans, Physical and Cognitive Challenged, Global Ethnicities, and Career Diversity.

The firm also recently developed an Action Plan for Advancing Justice and Equality, accelerating actions that were well underway at Jacobs (for more visit www.jacobs.com/equality). If anything, the events of 2020 were the catalyst to reemphasize discussions and initiatives that were already taking place. This plan was introduced during a series of “courageous conversations” that took place globally. Over a six to eight month period, Jacobs estimates that we had more than 200 calls in various regions of our organization to discuss the racial inequities in society and in the workplace. These conversations were extremely transparent, allowing employees to share their stories, speak from varying perspectives, and express themselves in a way that many have never had the opportunity to do before. These conversations created a “safe place” to share, and for others to listen and learn. As a result, many points of view have changed after hearing the impact that racial inequities have on the everyday life of their coworkers.

These I&D efforts create an inclusive environment and culture that transcends how we conduct business, compose project teams, recruit new employees, and retain employees. We are creating a workplace where diverse employees feel included, feel heard, and are advanced into leadership roles not traditionally fulfilled by diverse candidates, which can be an example for other firms and organizations looking to do the same.

Representation Matters
As your organization considers implementing I&D initiatives there will be challenges along the way. As you create employee resource groups, I&D councils, or even appoint a I&D leader, consider the following:

- Include employees from all levels within your organization. Beyond ensuring racial diversity, be inclusive of gender, disability, and other unique qualities.
- Some employees may feel left out of the process. Develop platforms that allow all employees the option to contribute if they desire to participate.
- Most organizations have struggled with I&D efforts and many are implementing I&D teams successfully. We have to remember that I&D is not about a moment in time or a passing initiative. I believe organizations that are successful in the I&D space are the ones that recognize that a significant culture change is required within the workplace. Companies that are successful in I&D have likely prioritized it very similarly to how they prioritize their safety culture. Safety is ingrained in every aspect of how many organizations conduct their business, and I&D has to be treated in the same way. Every aspect of our work should take I&D into consideration. Here are some suggested steps that could help increase the visibility of your I&D efforts:
  - Open meetings with a “culture of caring moment” as opposed to a “safety” moment
  - Align I&D goals with employee performance, especially at the leadership and management levels
  - Be intentional about addressing groups that have been historically disadvantaged within the organization
  - Do not be afraid to talk about race

From the Top, Down
Addressing concerns with equity, both on boards and within organizational leadership, can ultimately influence how transportation services are developed and delivered. I have the pleasure of serving on two industry boards where we talk about this relationship, giving me firsthand experience in addressing concerns about the composition of the leadership of the organization. These efforts have led to leadership becoming more reflective of the membership that the organization serves, and—ultimately—the community its agency members serve.

Both the Conference of Minority Transportation Officials (COMTO) and the American Public Transportation Association (APTA) are continuing to take steps to ensure that transportation organizations around the country are more reflective of their communities at all levels—from boardrooms to C-suites, all the way to the frontline employees serving their customers daily.

COMTO. Founded in 1971 at Howard University, COMTO is celebrating 50 years of fighting for diverse leadership in transportation, and we continue to create opportunities for people of color to network and interact with leaders that look like them. COMTO offers training and professional development to ensure that minority transportation leaders understand the latest
industry best practices. The organization creates an environment of support where leaders can discuss the challenges that they face in the workplace and learn from their peers how to address these challenges. An internship program running 17 years-strong and our scholarship program are designed to create a pipeline of future minority leaders.

Our membership is also comprised of minority business that offer services and solutions in the transportation industry. COMTO also advocates for federal legislation supporting minority representation at all levels within the transportation industry, and creates an inclusive business environment for historically underutilized businesses (HUBs). Finally, COMTO’s membership is comprised of people of diverse backgrounds and is a community of leaders focused on changing the narrative that leaders of color or firms of color don’t exist when leadership and business opportunities arise.

APTA. APTA’s board of directors approved the APTA Racial Equity and Action Plan (REAP) on April 1, 2021. APTA chose to create and adopt this plan to acknowledge that we can and must do more as an association and an industry to promote racial equity. This plan will serve APTA members as a resource document to address racial inequities at the board, staff, and service planning and delivery levels. In addition, components of the plan include best practices for addressing workplace inequities. This plan was developed and supported by APTA’s longstanding Diversity and Inclusion Council, chaired by the immediate past APTA board chair. APTA is intentional about leadership diversity within the board of directors as well as the association’s leadership team. This recent plan adoption is one of many ways APTA is addressing inequities in the public transportation industry head-on.

For communities underserved by public transportation, the impact of inequities in our system are dire. But we can make a difference through bold leadership, sparking conversations at the employee level and among practitioners, and by incorporating intentional, institutionalized I&D efforts. I encourage ITE members to reach out to COMTO and APTA as resources and partners to address the ongoing challenges of racial inequities, diversity in the workplace, and the reality that we can do better in addressing diversity in our leadership ranks and the teams that serve our communities. I recognize that conversations may be uncomfortable or deemed unnecessary. However, as James Baldwin memorably observed, “Not everything that is faced can be changed—but nothing can be changed until it is faced.”

Freddie Fuller, a proven leader and a true public servant, has spent his entire professional career in the public transportation industry. For more than 24 years Freddie has utilized his education, expertise, and relationships to develop transportation policies and procedures to enhance the delivery of transit services. He is currently a vice president and geographic sales manager (GSM) for the Mid-Atlantic at Jacobs. A private sector consultant and public servant, Freddie serves on boards as the national chair of the Conference of Minority Transportation Officials (COMTO) and as Secretary/Treasurer of the American Public Transportation Association (APTA). He was named the APTA 2020 Outstanding Public Transportation Business Member of the Year. Freddie earned an undergraduate degree in Urban Studies from Virginia Commonwealth University, and two Masters degrees from Georgia Tech in City Planning and Civil Engineering. He also completed coursework towards a Ph.D. at Virginia Tech in Planning, Governance and Globalization. He and his wife, Tasha reside in Woodbridge, VA, USA and are the proud parents of four children. Freddie loves to workout regularly and is an avid runner.
Road Safety Fundamentals Webinar Series — Now Available On-Demand

Developed by the ITE Safety Council

This 10-part webinar series highlights various aspects of road safety as part of ITE’s continued focus on Vision Zero and the goal to reduce and eventually eliminate fatalities. The live webinars have concluded and are now available on-demand.

Individuals may sign up for individual webinars or for the entire series at a discount.
- Safety for All Road Users
- Partnerships that Create a Lasting Safety Culture
- Safety Analysis Tools
- Basic Statistics and Predictive Safety
- ITS, TSMO, and Safety in Operations
- Human Factors
- Road Geometry and Roadside Safety
- Systemic Safety and Network Screening
- Safety Considerations in Transportation Planning
- Road Safety Audits

Courses Offered as Part of ITE’s Partnership with the Consortium for Innovative Transportation Education at the University of Maryland

ITE members receive a 20% discount by registering through ITE.

Managing a Corridor
Thursday, May 13 - June 27

In this course you will learn about innovative corridor management strategies for recurring and non-recurring congestion. This course will also help you understand how different technologies can support corridor operations.

Instructor: Lisa Burgess | Kimley-Horn and Associates

ITE Member Discounted Fee: $160.00
Non-member: $199.00
This fee includes access to three interactive conference calls and two workshops. The full course syllabus is available in the Learning Hub.
Assessing the Equity of Portland’s Traffic Signal Maintenance

By Alison Tanaka, P.E. (M), Peter Koonce, P.E. (M), Phil Armand (M), and Joe Neilson
Traffic signals are critical to our transportation network and are installed to give roadway users an opportunity to cross safely. They are a critical piece of creating a transportation system that promises freedom, access, and connection. We recognize that past policies disproportionately harmed particular users of our transportation system, including people of color and people with disabilities, and we are committed to taking steps to address the disparities that exist as a result of those policies.

The SSL Division relies on public information to help identify issues with traffic signals and prioritize maintenance efforts. We use this public notice and technology that we have deployed to identify equipment that is malfunctioning, signal timing that needs to be updated, new technologies that need to be installed, among many other activities. We acknowledge that people who have historically been ignored or not actively considered in our transportation policies may not trust that our agency will serve them now, and the burden of correcting those past injustices should not fall on those communities.

As an initial step in advancing equity, the SSL Division reviewed the requests we received and visits we made to traffic signals over the past two years to help us identify areas of Portland where we need to focus community outreach efforts, staff resources, and funding priorities.

**Methodology**

PBOT currently uses several tracking systems to record 1) traffic signal requests; 2) maintenance visits completed to address those requests; and 3) inspections completed proactively on an annual basis. By comparing requests and visits made between July 2018 and May 2020 to the number of traffic signals in different areas of Portland, defined using equity scores, we wanted to answer the following questions:

- Are different areas of Portland under or over-represented for traffic signal maintenance?
- If so, do these areas also correspond with historic patterns of inequity?

Advancing equity can have many definitions, but a widely accepted core concept is to ensure that traditionally underserved or marginalized populations are well-served with city services and infrastructure. PBOT designed a simplified Equity Matrix to promote an institutional approach to transportation justice. Based on national best practice and recommendations from the city’s Office of Equity and Human Rights, the Equity Matrix is...
based on three demographic variables: race, income, and limited English proficiency (LEP). While PBOT recognizes the disparities that also exist for people with disabilities, available information about disabilities was not a large enough data set to include directly. However, the selected demographic variables were chosen to maintain intersectionality with people with disabilities.

The Equity Matrix data is sourced from the Census, specifically the 2011-2015 American Community Survey (ACS) five-year estimates. More points are assigned to a census block that has a higher than citywide average concentration of people of color and/or people with LEP and/or people below the average for total household income.

The methodology uses a quintile system where the middle variable (i.e., value of 3) indicates the citywide average. The “conglomerate score” used throughout this report is the sum of points assigned in the race and income categories. Scores for each category can range from 1 to 5, so the conglomerate score can range from 2 to 10. Some traffic signals located in industrial areas, where a census tract is not identified, are shown under an equity score of zero (0).

Figure 1 illustrates how the equity scores translate to the traffic signals. For much of our evaluation, we divide the traffic signals into higher (7-10) and lower (0-6) equity scores. Fifty-seven percent of traffic signals are in areas with the higher equity scores and 43 percent are in areas with lower equity scores. There is a high density of traffic signals in downtown, which is an area with higher equity scores, but is recognized as a different environment than other areas of the city.

Figure 2. Public and Agency Requests
Requests
PBOT logs issues reported by members of the public and agency staff. For this evaluation, agency staff include SSL engineers and electricians; other PBOT staff; other City of Portland bureaus, including the Portland Bureau of Emergency Management (BEM), Portland Fire and Rescue (PF&R), Portland Parks and Recreation (PP&R), Portland Police Bureau (PPB), Portland Streetcar, and the Portland Water Bureau; and other agencies including Clackamas County, Metro, Multnomah County, Oregon Department of Transportation (ODOT), Oregon Utility Notification Center (OUNC), Port of Portland, TriMet, railroads, and utilities.

Forty-six percent of traffic signal requests were from agency staff, 37 percent were from the public, and 17 percent were anonymous and could not be assigned to either category. The tracking system may log multiple entries about the same issue, requests were filtered so totals are reflective of individual issues reported. Figure 2 illustrates the geographic distribution of public and agency requests as well as a comparison of those requests against the number of traffic signals in each equity score.

There were consistently more public requests compared to the percentage of traffic signals for areas with lower equity scores (0-6), whereas there were fewer public requests compared to the percentage of traffic signals for areas with higher equity scores (7-10). Agency requests were more evenly distributed between areas with higher and lower equity scores, which resulted in the overall requests matching the distribution of traffic signals more closely.

While traffic signals throughout the city are receiving attention, this evaluation indicates that we may not be addressing the needs of...
each area in our community. There is a need for public outreach in areas with higher equity scores to ensure the issues being addressed are those that are most important to those residents.

Visits
During our evaluation period, 61 percent of visits to traffic signals were maintenance related and 39 percent were inspections. Maintenance visits include those for routine maintenance, damage, modifications, and response repairs, often based on a request made through the tracking system but sometimes made at the request of a contractor. Inspections are conducted on an annual basis and are tracked in a separate system that allows the assignment of infrastructure scores.

Figure 3 illustrates the geographic distribution of maintenance visits and inspections as well as a comparison of those visits against the percentage of traffic signals in each equity score. The distribution of visits was very similar to the distribution of requests. Areas where there were more maintenance visits tended to have fewer inspections and vice versa, so that the percentage of total visits aligned with the percentage of traffic signals.

This analysis presents an opportunity to assess the effectiveness of the maintenance staff and the geographic boundaries used...
to organize these employees. While boundaries are not so specific as to eliminate flexibility, this analysis did identify two districts to further investigate to determine if a change in boundary would help improve the equity of visits within those areas. Overall, staff appear to be responding directly to the requests that are made in their areas, so strategies to cultivate public requests across all equity scores will likely result in an equivalent change in visits.

**Inspection Scores**

One reason that there may be more public requests in one area versus another, resulting in more visits, could be the condition of the traffic signal infrastructure. We hypothesized that more requests would be made in areas with older infrastructure and corresponding lower inspection scores.

Inspections involve an evaluation of the traffic signal cabinets, controllers, poles, signal displays, and span wire/mast arms. Each category is rated on a scale from zero (0) to 20, and then the scores are summed for a total inspection score between zero (0) and 100. Assigning inspection scores has become routine over the past few years, and 86 percent of traffic signals were assigned an inspection score between July 2018 and May 2020.

Figure 4 illustrates the geographic distribution of inspection scores with a box-and-whisker plot that shows the 5th percentile, first quartile, median, third quartile, and 95th percentile inspection scores for each equity score. Summarizing the inspection scores in this way allows a comparison of infrastructure condition between equity scores as well as the spread of inspection scores.

While the median inspection scores are relatively similar for most of the equity scores (in the high 70s or low 80s), the spread of inspection scores is greater for areas with higher equity scores. In particular, the lowest inspection scores are in areas with higher equity scores. Upon further investigation, most of this impact is a result of the downtown traffic signals, which generally have lower inspection scores than other areas.

We know that inspection scores are likely tied to infrastructure age. For example, downtown has some of the lowest inspection scores, but it also has some of the oldest equipment. While downtown has some corridors that were updated in the 2000s, many of the traffic signals have equipment that is more than 30 years old. Figure 5 illustrates the date of the last remodel at each traffic signal with a box-and-whisker plot that shows the 5th percentile, first quartile, median, third quartile, and 95th percentile inspection scores. While this “remodel date” means different things at specific locations, it has led us to consider this label more carefully to improve our asset management practices. This confirms that traffic signals that have been remodeled more recently have higher median inspection scores and a smaller spread of inspection scores.

While the inspection scores align with our expectations related to infrastructure age, they support the previous conclusion that there is a need for more outreach in areas with higher equity scores. We would expect there to be more requests in the areas with lower inspection scores, so infrastructure condition does not explain the lower number of requests in the areas with higher equity scores.

**Conclusions**

This evaluation of traffic signal requests and visits was conducted as a starting point to help PBOT SSL move towards a more just transportation system that considers everyone living in and traveling through our city.

We wanted to identify if and where we need to prioritize:
- Community outreach efforts, which could range from coordinating with the Transportation Justice Committee to work with local leaders to posting our contact information more prominently on traffic signal cabinets and streetlights;
- Regular evaluations to help determine issues before they are reported by the public;
- Funding for equipment that is in poor condition and technology that can help us track issues proactively and remotely;
- Changes to district boundaries to better distribute staff resources and address requests; and
- “Hot spots” that receive a high number of requests and visits.

Our conclusions from this evaluation include:
- Public outreach and/or proactive maintenance (i.e., through automated technology), is needed in areas with higher equity scores, which generally have fewer public requests than the percentage of traffic signals. We need to ensure the issues we are addressing are those that are most important to the people living in those communities.
- Visits are directly tied to requests, so while traffic signals throughout the city are receiving attention, strategies to cultivate public requests will result in visits that address community concerns.
- Some districts should be further investigated to determine if a change in district boundary would help balance visits to those areas.

**References**

Alison Tanaka, P.E. (M) is a senior engineering associate in the Intelligent Transportation Systems (ITS) Section at the Portland Bureau of Transportation. She has worked with traffic signals for the past 10 years and is currently a Member of the Transportation Research Board Traffic Signal Systems Committee. Her most recent publication, NCHRP Report 954: Performance-Based Management of Traffic Signals, focuses on automating data collection at signalized intersections.

Peter Koonce, P.E. (M) manages the City of Portland Bureau of Transportation’s signals, street lighting, intelligent transportation systems, and electrical maintenance division. He has served as an adjunct faculty at Portland State University teaching graduate level course in transportation engineering for the past 15 years. He is a member of the ITE Public Agency Council and serves on the Executive Board of the National Committee on Uniform Traffic Control Devices representing the Association for Pedestrian Bicycle Professionals. Peter completed his B.S. in civil engineering at Oregon State University and his M.S. in transportation engineering at Texas A&M University.

Phil Armand (M) is an engineering technician with the Portland Bureau of Transportation (PBOT) Signals, Street Lighting, and ITS Division, and is a member of the Bureau’s Transportation Justice Steering committee. Prior to working for the city, Phil served the Oregon Department of Transportation Traffic Data Division and the Florida Department of Transportation State Materials Office.

Joe Neilson is a geographic information system (GIS) analyst with the Portland Bureau of Transportation (PBOT) Signals, Street Lighting, and ITS Division. His areas of focus include asset management, online/mobile GIS, and racial equity impact assessment. Joe holds a B.S. in Geography from Portland State University.

Keep A to B hassle-free

Streamline your traffic flow with the detection, real-time visibility, and the data you need to improve driver experience and reduce congestion.

To learn more, visit miovision.com/a-to-b
Why Attention to Complete Streets Implementation Is So Important in Serving Historically Disadvantaged Communities

By Lawrence Marcus (M), Paula Flores (F), Jamie Roberts, PTP (M), and Abigail Johnson

The decisions we make every day as transportation professionals can impact quality of life, access to opportunities, and can result in systemic inequities in our communities. This became very clear as we adapted to new norms throughout the pandemic. The undeniable evidence of disproportionate impacts has been eye-opening. We need to act now and revisit our practices and perspective of success in our profession. We stand at a new crossroads—recognizing the consequences of the past—and must take a new path that radically innovates the way we think, assess, and implement.
**Acknowledging the consequences of prior actions is the first step on the path towards building a transportation system for all users of all abilities, and prioritizing the needs of historically disadvantaged communities.** As transportation planners and engineers, we must acknowledge our part in the mistakes of the past and strive to self-correct those policies, programs, and practices that can greatly address and prevent further inequities in the built environment.

It is important to remind ourselves that transportation is not important for what it is (roads, bridges, trains, and planes). Transportation is important for what it does—it gets people to where they need to go and connects people to community and opportunity. More than ever, how we define transportation, and how we plan, design, operate, and measure its effectiveness in today’s society needs to be revisited by our industry. Thinking about the purpose of transportation and properly incorporating an equity lens on its outcomes to the communities it serves will allow for an intentional refocus on effective strategies moving forward.

So what needs to change? Many of our standard practices need to be reexamined, starting with a transportation department’s organizational structure, as well as reassessing our long-standing processes in transportation from planning through construction management. We need to realign transportation goals with community visions and other jurisdiction-wide goals, such as sustainability, to leverage transportation resources as a tool to help underprivileged communities.

Our comprehensive plans normally align transportation goals with other jurisdictional goals, but the performance measures and strategies often emphasize mobility improvements based on system performance only, without considering safe and reliable community connections to essential services. Safe access to reliable transportation service for residents who cannot afford a private automobile needs to be a higher priority in our industry, and specifically evaluated in our transportation studies and transit operations assessments.

As our industry moves to a more data-driven decision-making process thanks to advances in information technology, we still must apply an “equity lens” throughout our process. Opportunities for such applications include:

- Defining the type of projects that qualify for specific funding sources,
- Developing a region/jurisdiction level transportation network,
- Prioritizing projects for inclusion in the CIP/budget,
- Ensuring transit service operations performance measures include serving communities that access to jobs during off-peak hours,
- Identifying stakeholder outreach milestones in a project as well as outreach methods, and
- Defining a successful transportation project, with measurable performance indicators.

Recent progressive initiatives in our industry such as Vision Zero include equity elements. ITE’s Vision Zero Core Elements include “Equity-Focused Analysis and Programs. Commitment is made to an equitable approach and outcomes, including prioritizing engagement and investments in traditionally under-served communities and adopting equitable traffic enforcement practices.” Cities embracing Vision Zero have generally been advocates for promoting this element of the program, and include our industry “E’s” to encourage collaboration: evaluation, engineering, education, engagement, enforcement, and equity. When implementing Vision Zero Action Plans, many have experienced that police attempts to enforce pedestrian safety in communities are not welcome due to tension with law enforcement. This lesson-learned has emphasized the importance of stakeholder engagement early and often in our processes.

It became all too clear during the pandemic that traditional methods for community engagement needed to be adapted to conditions. There are various sources and documents identifying new methods for outreach and tools. The main thread through these sources was the need to ensure inclusive, equitable, and diverse public outreach and engagement as part of the important decision-making process. The theory isn’t new, but it certainly has been heightened this past year.

However, limited industry guidance exists for comprehensively evaluating transportation service to disadvantaged communities. These communities rely on low-cost, timely, and dependable transportation options to access jobs because of the high cost to own a private automobile.

### How Communities Are Addressing Equity

The Victoria Transport Policy Institute’s research summarizes the challenges and approach: “Many existing evaluation tools focus on a narrow set of impacts on a particular group of people. Transport equity analysis is often ad hoc, based on the concerns and values of the stakeholders involved in a planning process; other, significant impacts may be overlooked or undervalued.” The research continues to summarize the challenge, stating that “Conventional planning tends to evaluate transport based on mobility (physical travel), using indicators such as traffic speed and roadway level-of-service. However, mobility is seldom an end in itself, the ultimate goal of most transport activities is accessibility, which refers to people’s ability to reach desired services and activities.”

The good news is that cities are taking progressive steps to add an “equity lens” to transportation-related efforts. As Oakland Department of Transportation Director (OakDOT) Ryan Russo discussed at the March 2021 ITE Virtual Technical Conference, the City of Oakland, CA, USA has closed more than 20 miles (32.1 kilometers) of streets to regular traffic as part of its Slow Streets program during the pandemic. The program’s goal is to slow or lessen street traffic on certain streets in order to make them safer.
for pedestrians to engage in physically distant walking, biking, or other physical activities.

However, the city recognized the need to evaluate which pedestrians Slow Streets was helping and whom the program might overlook. The program received feedback that many residents, especially essential workers, would benefit more from improved traffic safety at access points to essential services on busier arterial roads rather than physically distant walking corridors on roads that already had less traffic. In response, the city added an “Essential Places” aspect of the program to create temporary traffic infrastructure changes that allow safer access to services such as grocery stores, food distribution sites, and COVID-19 testing sites.

Next, the city paused the addition of new Slow Streets corridors in order to evaluate the impact of the existing sites through an equity lens. The program is using data from OakDOT’s Geographic Equity Toolbox to prioritize reaching out to the most historically and currently overlooked neighborhoods first and to assess the impacts of Slow Streets so that they can adapt the program to better serve the community. Oakland’s Slow Streets program rollout is an important demonstration of how equity work must go hand in hand with the move toward more complete streets.

The City of Baltimore, MD, USA has several transportation initiatives underway to improve service to historically underprivileged communities. Baltimore has addressed project development and delivery through its city council’s Complete Streets Ordinance, which identifies specific elements of the transportation process requiring the application of an equity lens. Key requirements include the inclusion of an equity assessment as part of the project selection/prioritization process, equity policies in stakeholder outreach, and the application of an “equity lens” to the data-driven Complete Streets Annual Report.

Baltimore’s community engagement policies address equity from a number of valuable perspectives: race, gender, culture, income, age, and accessibility. Each of these engagement policies defines the importance of customizing outreach for the sector of the community and recommended outreach strategies to encourage participation.

The city leveraged a Transportation Equity Gap Analysis, funded by the Baltimore Metropolitan Council, to develop a methodology for technically assessing equity in the city using available data and technical tools. This methodology will be applied to the city transportation department’s project prioritization process, and adds an important technical process for connecting equity policy to identifying and improving transportation service to historically disadvantaged communities. The city established a framework/method to measure transportation equity in Baltimore community populations by researching best practices (such as the Victoria Transport Policy Institute’s work) and developing the following products:

1. Identify underprivileged communities based on quantifiable equity indicators
2. Pinpoint employment centers, in proximity to the target historically disadvantaged communities, that possess relevant job opportunities
3. Evaluate the quality of the non-automobile transportation service to the target historically disadvantaged communities, understanding the work shift timeframes
4. Identify deficiencies / gaps in transportation service between the communities and employment centers
5. Engage the identified communities for input and understanding of their transportation service needs
6. Recommend strategies for service improvements collaboration with the communities

The city’s recently released Complete Streets Design Manual details the policies specified by the city’s ordinance, including the section “Addressing Equity in Baltimore.”

Another example of how to incorporate the equity lens in safety projects includes the Hillsborough Metropolitan Planning Organization (MPO) in Tampa, FL, USA, which recently completed a speed management action plan. With communities across the country...
challenged with a safety crisis on their streets, the Hillsborough MPO’s plan considered equity indicators for prioritizing investment on their High Injury Network corridors. These indicators include consideration of the linear frontage of corridors that cut through communities of concern; which corridors cut through a schools two-mile walk shed; which corridors had transit services that create higher pedestrian exposure rates; which corridors had excessive posted/design speeds above national standards for the context; and which corridors had excessive volumes for the context. These indicators were in addition to the standard crash severity rates that are often the only indicator. The simple inclusion of these additional factors completely changed the priority of investment in the corridors that had the highest exposure for non-motorized users that could lead to continued serious and deadly crashes.

Transformative Vernacular

The call to evolve how we plan and design for equity in transportation goes hand in hand with the need to evolve the words and language we use in the transportation industry. When we develop practices that prize efficiency or economic rationality more than effectiveness for human needs, the vocabulary we use to describe those practices perpetuates those ideas. If we do not update our vocabulary, we will not be able to break from previous ways of thinking on how to measure success in transportation planning and engineering. The word cloud in Figure 2 provides examples of terminology and ideas to move towards, while Figure 3 illustrates how we can move from some current terms to a more equitable vernacular.

For example, as transportation professionals working on corridor projects, we often follow design standards based on the street’s functional classification. These functional classifications exist independent of the land-use/community context, and seldom correspond to the modal priority of the street. Fortunately, many cities are embracing a “Street Typology,” which brings together the purpose of the street and the land use context for each street type. Complete Streets manuals, such as Baltimore’s new publication, identify street types reflecting the purpose of the street and land use context. The design standards also take into account the street’s modal priority and curbside needs.

Another critical change in practice involves community engagement. The City of Baltimore’s Equity in Planning Committee states on its website that an equitable Baltimore “meaningfully engages residents through inclusive and collaborative processes to expand access to power and resources.” As the committee suggests, community engagement is not only about information sharing, but about empowering communities and recognizing their input as invaluable to the implementation of an effective and equitable project.

As we develop our new best practices in addressing equity at all points within our transportation industry, it is important for us to identify potentially offensive or exclusive language. This terminology is likely not globally applicable, but tailored to the communities in our regions. Ask the community outreach and equity specialists in your city for advice, as they will know which
terms center their needs the best. As we evolve our practices, we must also evolve our words.

What is ITE Complete Streets Council’s Role?
The ITE Complete Streets Council’s (CSC) efforts to aggregate new guidance on incorporating equity into practice is a timely topic. The CSC’s efforts are a subset of ITE’s larger initiative to improve our industry’s ability to apply an “equity lens” to transportation policies, programs, practices, standards and projects.

This effort will start by collecting examples from communities with existing practices in applying an equity lens. Our goal is to map a path forward, bridging the gap between progressive equity policies to identifying technical analysis tools in addressing inequities in the built environment. The effort will also include guidance on equitable and inclusive community engagement, such as how to address transportation accessibility needs for all users, especially in marginalized communities, to jobs, services, schools, parks and other economic opportunities. The effort will also focus on measuring accessibility as the central performance measure for building this equity assessment methodology. Accessibility and equity indicators will be identified from available demographic datasets and possible new sources.

The collections of various resources should provide a better framework for future equity assessments as well as leveraged to help communities with other opportunities such as economic development and sustainability initiatives.

The mission of this effort is to develop new best practices on the following topics:
- Identify inclusive community engagement practices and tools
- Identify language and terminology evolution needs
- Identify new quantitative and qualitative data needs
- Identify transportation equity indicators and methodology
- Identify how to measure success
- Identify complete street publication updates to reflect the outcome of this initiative

Parting Thought
It’s time to redefine how our industry measures success. This is incredibly important as how we measure success in transportation also shapes how we distribute resources and fiscal investment.

Imagine our transportation network as a spectrum of light. Currently, we have a sector that is visible and devoted to the efficient movement of people in automobiles. As the rest of the network struggles for resources, struggling to be prioritized, and sacrificed for the success of an already thriving auto centric sector. We can continue to look at this system, see the bright light and say, “what a success,” or we can broaden our perspective and see that the network as a whole is burning out. We must embrace the purpose of transportation to create the full, bright spectrum of transportation choices our communities expect and deserve.

Developing an equity lens for success requires new voices, perspectives, and bold ideas. If you have community transportation equity examples, technical expertise, or interest in this effort, the CSC is looking for you. Simply contact Larry Marcus at lmarcus.forward.progress@gmail.com to express your interest or share any resource links.

Acknowledgements
The Baltimore City Council and Department of Transportation have been leaders in addressing equity in our industry. The example work efforts summarized in this article were led by Theo Ngongang, Graham Young, and Tereina Galloway.

Figure 4. Equity Lens Example: Measuring Success.
References


Lawrence Marcus (M), former chair of the ITE Complete Streets Council, is a consultant with Wallace Montgomery and recently founded Forward Progress, LLC. Wallace Montgomery has been supporting the City of Baltimore’s Complete Streets and equity specialists to develop equity assessment tools and publish the city’s first Complete Streets Manual. The manual delivers the innovative approaches outlined in the City Council’s Complete Streets Ordinance: policies for equity in public engagement, equity in project prioritization, and equity in measuring transportation network performance.

Paula Flores (F) is the transportation planning practice leader at Greenman-Pedersen, Inc. in the Tampa, FL, USA office, leading transformative thinking and projects centering on safe, healthy, sustainable, and equitable networks.

Jamie Roberts, PTP (M) is a transportation planner at Foursquare ITP, Washington, DC, USA. She is dedicated to powering equity and sustainability in the field by focusing on innovative transit service planning.

Abigail Johnson is a sophomore at Dartmouth College studying geography and human-centered design. She is passionate about creating equitable outdoor spaces for recreation and transportation.

Vantage Vector

The only detection sensor you will ever need. Period.

iteris.com/vector
Accessibility: From Ivory Tower to Practice

By Eric Sundquist and Chris McCahill

Metropolitan transportation is about providing safe and convenient access to jobs, goods, services, and other social and economic opportunities. In an ideal world we would use quantifiable measures of accessibility to develop the best projects and operational strategies, optimizing return on transportation investments. The good news is that such accessibility measures exist. They allow us to account for many factors that affects destination access—traffic congestion; transit service; proximity of origins and destinations; and accommodations for people who walk, bike or roll—so we can measure how well people can get where they need to go. And, armed with ever-better transportation and land use data, researchers are making great use of these measures. In fact, there are now upwards of 600 studies per year on the subject, up from 200 per year just a decade ago.¹
The bad news is that most practitioners are not exposed to those measures or the methods behind them. Understandably, they tend to base decisions on longstanding, mode-specific measures of speed and level of service (LOS), which imperfectly capture accessibility. The basic principles of accessibility sometimes come into play as a step in conventional travel demand modeling, but rarely as an outcome measure in decision-making.

A new practitioner guide aims to bridge the gap between research and practice. Measuring Accessibility was released in January of this year by the State Smart Transportation Initiative (SSTI) at the University of Wisconsin-Madison. It is downloadable at www.ssti.us/accessibility-analysis.

**Mobility and Accessibility**

While conventional mobility measures have their place, such as in managing traffic friction from driveways or setting standards for appropriate levels of transit service, they are poor indicators of overall system performance. They are modally specific, making comparisons across modes difficult. And by failing to consider proximity, they do not reflect overall travel times. The best-known reaction to these problems, in terms of moving away from conventional metrics, has happened in California, where legislators removed highway LOS from consideration in critical environmental reviews for both transportation and land-use projects, pushing practitioners instead to consider vehicle-miles traveled (VMT) impacts.

In one of the most notable moves toward accessibility in practice, Virginia requires major state-funded transportation-capacity projects to be evaluated based on five to six criteria, including accessibility. In implementing the law, the Virginia Department of Transportation considers both access to jobs by various modes and access to everyday non-work destinations by walking. At the regional level, the Metropolitan Transportation Commission (the Bay Area Metropolitan Planning Organization in San Francisco, CA, USA) prioritizes projects that provide access to jobs in 30 minutes or less by auto or 45 minutes or less by transit.

In all three cases, the move from LOS and the moves toward accessibility required substantial time and resources that most practitioners lack. The resources needed generally go beyond those readily available, such as the U.S. Environmental Protection Agency’s Smart Location Database, the Accessibility Observatory at the University of Minnesota, PeopleForBikes’ Bike Network Analysis tool, and Walk Score. Those are all useful in illustrating the concept of accessibility and considering baseline conditions, but less helpful in evaluating transportation projects and programs for accessibility.

Tools and methods to support such analyses do exist, but there are barriers such as technological challenges (data availability and computing power) and a lack of standards or best practices to rely on. The SSTI guide, based on the authors’ work with transportation agencies around the country, attempts to lower those barriers.

Some key takeaways from the guide are outlined in the following sections.

**The Basics**

With so many methods and countless studies to draw from, practitioners can find it difficult to get started. Fortunately, some of the earliest and simplest approaches are beginning to emerge as standards of practice. For instance, practitioners should feel comfortable reporting the number of jobs reachable in a region from any given location within a certain travel time (often called “cumulative accessibility”) or, taking it one step further, incorporating a travel-time decay function to assign more weight to closer jobs, just like in a gravity-based travel demand model. The former is simpler to measure and report, but the latter avoids issues that arise from choosing an arbitrary hard travel time cutoff. Reporting these weighted values can be as simple as saying, “weighted jobs” or “the number jobs within typical travel times.”

A second emerging practice is to measure local access to important non-work destinations separately from access to jobs. Commuting and other work-related travel accounts for just 19 percent of household trips and 22 percent of household person-miles traveled. Therefore, people’s well-being and travel behavior often depends on access to things like food, schools, parks and other essential services, as well as more discretionary destinations such as restaurants. Walk Score is a successful commercial example of a non-work accessibility score.

There are more complex methods that let analysts measure accessibility, like those based on utility (as in travel-demand models), those that account for competition among different opportunities and destinations, and some that even rely on time-space prisms to measure individuals’ daily accessibility. But the two basic concepts outlined above—regional access to jobs and local access to non-work destinations—are enough to build a strong foundation and drive or inform most decision-making around project development, selection, and operation.

**Technical Considerations**

Before getting started with accessibility analysis, transportation professionals will need the right data and analytical tools. Travel demand models are an option for some, but they typically lack the granularity and detailed transportation networks to capture walking and biking especially well. In addition, running those models for a large number of projects or scenarios can be time-consuming and cost prohibitive. An important consideration is that agency staff should be able to easily input projects or bundles of projects and see the impacts to accessibility without much time or effort. There are now leaner, prepackaged options for doing just that.

---

* California S.B. 375 “California Environmental Quality Act,” 2013
Transportation data must be in a routable format and contain relevant information describing the ease of travel. "Ease" is typically measured in terms of travel speed, which can be based on observed or estimated traffic speeds, transit speed and frequency, and factors that affect the comfort and safety of people walking or biking, including the quality of sidewalks and bike facilities. Agencies that don’t have this information on hand can rely on a number of commercial datasets or crowd-sourced information from OpenStreetMap (OSM), which varies in quality from place to place.

Transit networks, which include both travel times and frequencies, can complicate analyses. Fortunately, most available platforms are designed to rely on data in the General Transit Feed Specification (GTFS) format, which most transit agencies provide so that their systems can be incorporated into common navigational apps.

Finally, the U.S. Census offers key land use data, including jobs and demographic information, based on either the Census Transportation Planning Products (CTPP) or the Longitudinal Employer-Household Dynamics (LEHD) Origin-Destination Employment Statistics (LODES). Other land use data, typically represented as non-work points of interest (POIs), usually must be licensed from a commercial provider like Google, HERE Technologies, Data Axle USA (formerly InfoUSA), SafeGraph or Factual. Depending on the specific need, local public data can sometimes be a good source for information on certain POIs such as community healthcare facilities. As with transportation data, OSM is also an option in some places.

With these data in hand, a savvy analyst can then leverage any number of available routing tools to produce custom analyses. But for more user-friendly applications, the analyst will want to consider a tool designed specifically for measuring accessibility. Through SSTI’s research and technical assistance program, our team has experimented with some of the leading options, including CUBE Access by Bentley, Conveyal, the open-source Accessibility Toolbox for R and ArcGIS by Christopher D. Higgins at the University of Toronto, and a customized TransCAD model used by the Virginia Department of Transportation. Many of the benefits and tradeoffs of these platforms are outlined in our practitioner guide.
Putting Accessibility to Use

The technical issues only matter if accessibility measures will be employed in decision-making to improve transportation outcomes. Two questions are important:

1. **What accessibility-related goals should be pursued?**
   Improving accessibility for accessibility’s sake is a worthwhile objective, but in most places, access by walking, biking, and transit lags far behind access by driving. In fact, road improvements that benefit drivers often degrade or impede access for non-drivers. Accessibility analysis, therefore, provides an opportunity to look for opportunities in every plan or project to help improve non-auto accessibility, relative to driving. A process that considers all modes gives decision-makers a lens for understanding how a project will potentially push the needle on related outcomes like livability, equity, and travel behavior. Equitable access, for example, could be operationalized as access to jobs from low-income households by modes other than driving, or access from the same households to food or healthcare. Accessibility metrics can also help predict how changes to the built environment could affect travel behavior outcomes such as VMT or modal usage, as shown in Figure 2.

2. **How will accessibility live within a program or agency?**
   Planners, project developers and others involved in transportation decision-making might simply appreciate analyzing projects using an accessibility lens, but improving access systematically

---

**Figure 1. Examples of local and regional accessibility measures by mode and trip purpose.**

**AO = Accessibility Observatory**

**SS = SMART SCALE (Virginia DOI)**

**SLD = Smart Location Database (EPA)**

**ATO = Access to Opportunities (WFRC)**

**BNA = Bike Network Analysis (PeopleForBikes)**

**LAS = Local Access Score (MAPC)**

**WS = Walk Score**

**Figure 2. Relationship between transit or walking accessibility and average household VMT in greater Boston, MA, USA.**
Table 1. Various accessibility metrics that can be used to describe the impacts of a transportation project (Alt. 1, bike-ped overpass and traffic calming).

<table>
<thead>
<tr>
<th>Travel time</th>
<th>Walking (non-work)</th>
<th>Biking (jobs in 000s)</th>
<th>Transit (jobs in 000s)</th>
<th>Driving (jobs in 000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>Alt. 1</td>
<td>Baseline</td>
<td>Alt. 1</td>
</tr>
<tr>
<td>10</td>
<td>3.4</td>
<td>3.5</td>
<td>14.4</td>
<td>15.3</td>
</tr>
<tr>
<td>20</td>
<td>18.8</td>
<td>19.3</td>
<td>82.1</td>
<td>83.8</td>
</tr>
<tr>
<td>30</td>
<td>50.8</td>
<td>52.9</td>
<td>160.1</td>
<td>161.4</td>
</tr>
<tr>
<td>40</td>
<td>98.9</td>
<td>101.8</td>
<td>226.4</td>
<td>227.7</td>
</tr>
<tr>
<td>50</td>
<td>150.9</td>
<td>153.0</td>
<td>337.2</td>
<td>339.1</td>
</tr>
<tr>
<td>60</td>
<td>196.0</td>
<td>197.9</td>
<td>533.7</td>
<td>537.2</td>
</tr>
<tr>
<td>Weighted</td>
<td>25.0</td>
<td>25.5</td>
<td>107.5</td>
<td>108.8</td>
</tr>
</tbody>
</table>

Change | 2.3% | 1.2% | 1.0% | 0.0% |

Figure 3. Accessibility impacts of transportation improvements, depicted in terms of walking access to non-work destinations, measured on a 100-point scale.

Table 1. Various accessibility metrics that can be used to describe the impacts of a transportation project (Alt. 1, bike-ped overpass and traffic calming).
Accessibility analysis lets planners and designers assign hard numbers to transportation investments and land use changes so that various options can be assessed separately or against each other. Assume, for instance, that a new bicycle and pedestrian overpass is planned, along with traffic calming in both directions, as shown in Figure 3. We can quantify the impacts in a number of ways. To begin with, a person living at point A on the map can walk to the nearby transit station in 16 minutes instead of 30, or they can bike in 6 minutes instead of 13. That also means that within a 30-minute travel time, they can reach approximately 150,000 jobs by transit instead of 110,000. Repeating this calculation block by block tells us the average household within one mile of the project gains access to 2,000 jobs.

Similarly, if we are not only interested in jobs, we can also use an index of non-work destinations (stores, schools, and other essential services) to measure walking accessibility on a 0-to-100-point scale, similar to the well-known Walk Score. By this measure, a person at point A gains about two accessibility points, which is also the average increase for all households within one mile of the project, also depicted in Figure 3.

Different travel time thresholds can be defined, or jobs and other destinations can be weighted based on how far away are using travel time decay functions, which produces a variety of useful metrics, as shown in Table 1. Any one of these metrics or combinations of different metrics allow for consistent comparisons of existing conditions and project impacts across modes.

requires an agreed-upon process and decision rules built around the concept. Long-range plans are a logical place to present current accessibility levels and set long-term accessibility goals, but—as with any goal—involving appropriate metrics into project prioritization, design, and other downstream decision points is what really gives them impact. *itej*

**References**

Must-Have Publications for Transportation Planners and Those Working on Complete Streets Projects

All titles available through the ITE Bookstore at www.ite.org/bookstore. Fill your bookshelf today!

The complete list:

- Designing Walkable Urban Thoroughfares: A Context Sensitive Approach
- Transit and Traffic Impact Studies - State of the Practice
- Curbside Management Practitioners Guide
- Traffic Calming Fact Sheets
- Designing Walkable Urban Thoroughfares: A Context Sensitive Approach
- Pedestrian and Bicyclist Safety in Parking Facilities
- Recommended Design Guidelines to Accommodate Pedestrians and Bicycles at Interchanges: An ITE Recommended Practice
- What a Transportation Professional Needs to Know about Counts and Studies during a Pandemic
- Sustainable Traffic Signal Development: An Informational Report of the Institute of Transportation Engineers
- Transit and Traffic Impact Studies State of the Practice: An Informational Report of the Institute of Transportation Engineers

Members receive a discount.
ITS Plus products are designed and manufactured in the USA.

BUDGET CUT BY 20% OR MORE?
SAVE UP TO 70% OR MORE ON YOUR VEHICLE DETECTION

Radar* $20K - $30K
Video/Radar Hybrid $16K - $25K
Thermal* $15K - $20K
Single Camera 360 Video* $14K - $18K
Traditional Video* $12K - $16K
ITS Plus Lightning Series $6K - $9K

* PRICING MAY NOT INCLUDE ADVANCED DETECTION.

The ITS Plus 7th Generation Lightning Series of Vehicle Detection products provides the best performance at the best price. The multi-patented design can detect vehicles even in complete white out or glare conditions (like thermal) while simultaneously providing Advanced Detection to 1,000 ft and Vehicle Counts (like radar) and Ethernet at a fraction of the price. Only ITS Plus offers Optical Mask Technology (OMT) and a Dual Algorithm based detection. Clever software replaces expensive hardware to achieve the most cost effective and highest performance vehicle detection system on the market. Find out why everyone is talking about ITS Plus.

ITS Plus Vehicle Detection simultaneously performing Advanced Detection, Stop Bar and Vehicle Counts

www.ITSPLUS3.com