Diversity, Equity, and Inclusion in the Transportation Profession

Addressing Diversity at the State Level

How Two Universities Promote Inclusion and Diversity

Minority Business Development Through Transportation Contracting
The National Academy of Sciences was established in 1863 by an Act of Congress, signed by President Lincoln, as a private, nongovernmental institution to advise the nation on issues related to science and technology. Members are elected by their peers for outstanding contributions to research. Dr. Marcia McNutt is president.

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Clearing the Path to Diversity, Equity, and Inclusion in Transportation
Carol Abel Lewis and Neil J. Pedersen

It is a social change whose time—although overdue—has finally arrived. In this issue of TR News, thought leaders in transportation and diversity examine TRB’s initiatives in diversity, equity, and inclusion, as well as the programs within the larger transportation community that TRB serves.

Addressing Diversity, Equity, and Inclusion at the State Level
Karen Febey

Doing their part to shape the workforce of the future, AASHTO and state departments of transportation are recruiting minority college students into internship programs. The goal of such mentoring is to broaden students’ career options in transportation-related fields while gaining the benefits of their experience and diverse perspectives.

Diversity, Equity, and Inclusion Efforts in TRB’s Technical Activities Division
Tanisha Hall

At TRB, more than 150 standing committees facilitate and share transportation research. They address diversity, equity, and inclusion in as many ways as there are committees: diversifying membership and leadership, implementing inclusive practices, studying environmental justice and other issues, and much more.

Building Diversity and Inclusion in the Transportation Industry
Joy Liang

Through a comprehensive recruitment, outreach, and diversity strategy, FHWA aims to attract and retain a diverse workforce that mirrors the diversity of the U.S. population. The author outlines these strategies and agency activities supporting diversity, which all help create a culture in which all individuals can excel in their careers and contribute to the FHWA mission.

Diversity and Inclusion in Higher Education: Two Case Examples
Tom O’Brien and Andrew Braham

Recognizing that low-income and minority students have traditionally faced barriers in their pursuit of higher education, the authors profile the success of inclusion and diversity programs at two very different universities that share a deep commitment to their diverse student populations.

Promoting Diversity at TRB Through Progressive Programs
Karen Febey

Detailed in this article are some of the TRB programs that help students and emerging professionals build their skills and career networks, as well as increase the breadth of backgrounds represented in transportation practice: the Minority Student Fellows Program; the ACRP Graduate Research Award, University Design, Ambassadors, and Champions programs; and the TCRP Ambassadors Program.

Role Model Influence on Women in STEM: NAE’s EngineerGirl Program
Mary Mathias and Simil Raghavan

Staying on Track with Diversity: How Transit Agencies Are Moving Forward
Stacey Hendler Ross, Paula M. Nash, and Evelyn L. Richards

Strong transit agencies depend on solid diversity, equity, and inclusion values in their practices and policies. The authors show how the Santa Clara Valley Transportation Authority in California, the Metropolitan Atlanta Rapid Transit Authority in Georgia, and the American Public Transportation Association in Washington, D.C., prioritize diversity issues in their workforces and in the communities they serve.

Rosa Parks: She Wouldn’t Give In, and She Wouldn’t Get Up
Cassandra Franklin-Barabajosa

COVER For some Americans, social oppression and obstacles to advancement are part of a racist history they still suffer from today. The transportation sector is making a stand against such inequity through initiatives that bolster its diverse workforce, champion minority students in their career pursuits, and give voice to the public they serve. (Photo: geralt, Pixabay)
Diversity in Transportation Contracting

Karen Febey

Presented in this article are the perspectives and experiences of three business owners who have worked with the U.S. DOT Disadvantaged Business Enterprise Program, a congressionally authorized program that supports the growth and development of businesses owned by people from historically underrepresented groups.

RESEARCH PAYS OFF

Airport Escalator Falls

K. M. Hunter-Zaworski

TRB COVID-19 Resources

Agencies and organizations can use TRB publications and online resources for useful and timely information to help address issues related to the novel coronavirus pandemic. To read about TRB’s current research and activities, and for a list of relevant publications, visit www.nationalacademies.org/trb/blog/transportation-in-the-face-of-communicable-disease.

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Tanisha Hall, Fairpointe Planning, LLC, and Mohamed Abdel-Aty, University of Central Florida

Transportation Influencer

Niloo Parvinashtiani, Institute of Transportation Engineers

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features articles on innovative and timely research and development activities in all modes of transportation. Brief news items of interest to the transportation community are also included, along with profiles of transportation professionals, meeting announcements, summaries of new publications, and news of Transportation Research Board activities.

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Clearing the Path to Diversity, Equity, and Inclusion in Transportation

CAROL ABEL LEWIS AND NEIL J. PEDERSEN

Lewis is a professor and the emeritus executive director of the Center for Transportation, Training, and Research at Texas Southern University in Houston; and Pedersen is the executive director of the Transportation Research Board at the National Academies of Sciences, Engineering, and Medicine in Washington, D.C.

Above: At the 2019 TRB Annual Meeting, Morgan State University graduate student Duwan Morris—a TRB Minority Student Fellow and a former Dwight David Eisenhower Transportation Fellow—presents his research to Karen Febey, TRB Minority Student Fellows program manager. Seven months later, the Montgomery County (Maryland) Department of Transportation hired him as a transportation planning specialist. Such actions support the transportation field’s nationwide initiatives to open doors to diversity.

As the chair of the Transportation Research Board (TRB) Special Committee on Diversity, Equity, and Inclusion (DE&I) and the executive director of TRB, we are pleased to introduce you to this TR News edition focused on diversity, equity, and inclusion.

All around us, society is engaging in increased discussions, outreach, and decision making in pursuit of DE&I. Many individuals feel the energy and enthusiastically embrace the pursuit. Others may wonder, Why all the attention to DE&I? The responses are myriad and may depend on who is asked. In general, there is recognition that historical policies and practices have served not only to limit potential achievements of minorities, but—in some cases—were intended to inhibit advancement. Inferior educational opportunities, lack of finances for college or specialized training, and intentional discrimination against minorities who possess the educational or professional credentials—or both—have resulted in a lack of representation of these groups, especially at higher echelons of many public- and private-sector entities.

Recognizing and addressing historical deficiencies by focusing on increasing DE&I opens the door to optimize the output of the collective whole. In short, society gets better decision making and improved outcomes when more diverse perspectives and ideas are included in ongoing discussions that lead to decisions.

In addition, most people agree with the concept of basic fairness. DE&I questions whether long-experienced and historical educational and income gaps are inherently fair. Moreover, people are typically most comfortable with those like themselves. Almost by definition, DE&I creates the challenge: If everyone involved in an activity or in a decision-making process looks the same, outreach and recruitment likely has been insufficient; circles are too small or biased.

We are pleased that DE&I has been a priority of TRB’s volunteer and staff leadership for several years; it is gratifying to
In this edition of TR News, you will learn about TRB’s initiatives that address DE&I, together with programs within the larger transportation community that TRB serves. Several examples of successful initiatives are highlighted in the issue.

In 2017, the TRB Executive Committee created a task force under the leadership of Nathaniel Ford, CEO of the Jacksonville Transportation Authority, and charged it with developing an Inclusion and Diversity Strategic Plan for TRB. The plan, which was adopted by the TRB Executive Committee in January 2018, included strategies to address diversity among TRB’s volunteers, contractors, and staff; enhance partnerships with minority-serving transportation organizations; and create a more welcoming environment within TRB for minorities, young professionals, and other underrepresented groups.

TRB intensified its attention to diversity-related data and sought to increase transportation-related diversity and inclusion issues in TRB’s programs. In 2020, the strategic plan was modified to include equity-related actions under each of the strategies, and it was readopted as the TRB Diversity, Equity, and Inclusion Strategic Plan. The Special Committee on Diversity, Equity, and Inclusion provides oversight to ensure that the strategies in the plan are implemented. The committee reports TRB’s progress to the Executive Committee twice a year.

TRB has seen a steady increase in the participation of minorities in its committees and research panels since the plan was adopted. It also has seen a greater focus on equity-related issues in its convening and research programs.

In 2019, equity was included as one of the topic areas in the latest edition of TRB’s Critical Issues in Transportation, and an addendum is being developed that focuses on racial equity issues in transportation. As part of the recent strategic realignment of TRB’s standing technical committees, the Committee on Equity and Transportation and the Committee on Contracting Equity were established. TRB continues to maintain committees on both Native American Transportation Issues and Women and Gender in Transportation.

This edition of TR News features several TRB programs that are designed to support and attract diverse students and young professionals to transportation and TRB, including TRB’s Minority Student Fellows Program, the Airport Cooperative Research Program (ACRP) Graduate Research Award Program, the ACRP University Design Program, and the Transit Cooperative Research Program Ambassadors Program.

This TR News issue highlights the considerable attention being given to DE&I initiatives within the broader transportation sector that TRB serves. Transit agencies have taken a leadership role in ensuring that DE&I is a central tenet of their organizations’ culture and that equity is a core consideration in decision-making within their organizations. The American Public Transportation Association’s effort to create a racial equity action plan is featured. Initiatives at two transit agencies—the Metropolitan Atlanta Rapid Transit Authority and the Santa Clara Valley Transportation Authority—are highlighted.

Similarly, state departments of transportation (DOTs) are addressing DE&I issues within their organizations and programs.
The American Association of State Highway and Transportation Officials’ Committee on Civil Rights takes a broad view of diversity, equity, and inclusion issues to ensure that issues related to gender, race and ethnicity, age, and people with different abilities are addressed. The committee works to ensure that civil rights programs in state DOTs across the nation are effective. Internship programs for underrepresented minorities in two state DOTs—Michigan and North Carolina—are featured in the article on state DOTs.

The Federal Highway Administration (FHWA) also has many programs and initiatives intended to address DE&I issues. These include programs that are focused on the FHWA organization, as well as programs to help support and attract a diverse future workforce in transportation.

Articles also feature DE&I programs within universities, as well the U.S. Department of Transportation’s Disadvantaged Business Enterprise (DBE) Program. University programs at the University of Arkansas in Fayetteville and California State University, Long Beach, are highlighted. Owners of three DBE companies—Gloria Bender, co-owner, TransSolutions, LLC; Tanisha Hall, principal and CEO of Fairpointe Planning, LLC; and Donald Williams, CEO of Weatherspoon & Williams, LLC—share their perspectives regarding DBE certification and the importance of DBEs in the transportation sector.

As evidenced by these examples and the many more under way throughout our profession, much progress is being made. But we have much more to do. The goal is cultural change in public and private entities that redress the historical opportunity gaps experienced by minorities.

Cultural change will not occur overnight. It requires strong, persistent, and enduring leadership. We are both committed to providing leadership in changing the culture within TRB. We ask each of you to join us in committing to provide leadership to ensure that diversity, equity, and inclusion culture change takes place within your organization and within the larger transportation sector. Our goal must be to create a fair and equitable society for all. We should settle for nothing less.

The TR News Editorial Board thanks Karen Febey, TRB, for her work assembling and developing this issue.

VOLUNTEER VOICES

In my senior year of college, an elected official in my hometown challenged me to get a graduate degree in transportation science. He said that it was an area of importance to the movement of goods, people, and services. After obtaining my undergraduate degree in construction science and management (along with researching the transportation industry), I accepted the challenge. Although still somewhat unsure about the area, I was accepted into a program and started the following fall. As my studies began, I continued to feel perplexed over my decision. It was not until I took a course about the urbanization of America that it all clicked. My excitement peaked, and I was hooked. What keeps me in this industry is the impact that our work has on the areas in which we work. Transportation is to a community and its economy what blood is to the human body: it keeps things moving. The safe, reliable, timely, and efficient movement of goods, people, and services is the engine of a community and a region’s economic viability. It also is a key mobility element in the quality of life of businesses and residents.

—LISA MARIE GLOVER
Transportation Division Manager
City of Fort Lauderdale, Florida
Addressing Diversity, Equity, and Inclusion at the State Level

KAREN FEBEY

The author is the senior report review officer at the Transportation Research Board, National Academies of Sciences, Engineering, and Medicine in Washington, D.C.

State departments of transportation (DOTs) are committed to diversity, equity, and inclusion efforts in a variety of ways. One way is through their participation in committees within the American Association of State Highway and Transportation Officials (AASHTO). This article provides an overview of some of AASHTO’s efforts and details initiatives at North Carolina DOT and Michigan DOT.

The efforts of these state DOTs center on recruitment and development of a diverse workforce, not only at their own agencies but also in the overall transportation workforce in their state. Although the examples from these state DOTs represent a fraction of the diversity and inclusion initiatives across the country, they provide examples of innovative programs and the practices being employed.

Following her participation in the 2016 TRB Minority Student Fellows Program, Alesha Jackson joined the Michigan DOT staff in 2018. The Fellows program sends minority students from eligible minority-serving institutions to the TRB Annual Meeting, where they have the opportunity to present their research, participate in sessions on a variety of subjects, and network with transportation professionals—encounters that often lead to careers in the field.
AASHTO

The charter of AASHTO’s Committee on Civil Rights states that it is to work cooperatively with its member departments and other committees, agencies, and external organizations to foster uniform and effective application of civil rights programs. This effort includes researching and evaluating the effectiveness of those programs, reporting on issues, and sharing best practices on programs such as Disadvantaged Business Enterprises (DBEs), equal employment opportunity, on-the-job training, nondiscrimination (Title VI), the Americans with Disabilities Act, and supportive services.

AASHTO’s Committee on Civil Rights takes a broad view of diversity, equity, and inclusion issues. Greg Davis, committee chair and director of Minority and Small Business Affairs at the South Carolina DOT, spoke at the committee’s June 2020 business meeting. Considering the social justice protests occurring at the same time following the murder of George Floyd, his remarks looked broadly at civil rights, not just at civil rights as related to transportation. He spoke about racial and economic injustices in the United States arising from an economic pandemic, a health pandemic, and a sociological pandemic. In doing so, Davis cited the effects of those pandemics: the death of Floyd and others who have lost their lives to racial hostility, the number of minorities out of work, and the number of COVID-19 cases.

Davis posed an overarching question to members of the Committee on Civil Rights: “How can we be most effective as civil rights professionals?” He then told committee members that they must help individuals and businesses adapt to a new normal by assisting them in moving from recovery (surviving), to rebounding (recovery, reopening), and then to rising (thriving).

At the June meeting, members discussed the same trio of pandemics. Debra Goss, manager of contract compliance at Connecticut DOT, commented on the importance of civil rights issues across all state DOTs. “Civil rights issues are integrated into every activity and program in transportation,” she stated.

“We must get people to understand that the issue of civil rights does not rest solely in state DOTs’ offices of civil rights. Rather, it’s every state DOT employee’s responsibility to ensure that civil rights rules and regulations are being followed. People need to take ownership and recognize that civil rights work is something we all have to do together.”

One recent committee effort is advising state DOTs on ways to provide technical support for small businesses seeking certification as a DBE. “The certification process can be daunting,” Goss explained, “but if the process were standardized on a national level, more minority- and woman-owned businesses could be supported with state DOT contracts.”

Another committee effort examines how state DOTs move beyond just complying with the Americans with Disabilities Act to actively engaging persons with disabilities in all stages of the transportation decision-making process. Such engagement involves ensuring that all aspects of public meetings, related printed material, and web availability of material are fully accessible to those of different abilities.

Out of the Committee on Civil Rights and other AASHTO committees, the Joint Task Force on Managing the Impacts of Digitalization began as a means to address workforce readiness with digitalization. Goss, also a member of the task force, discussed its white paper, which outlines megatrends they seek to address—all of which touch on diversity and inclusion issues in state DOTs. These megatrends fall under the broad categories of culture, talent management, and data and information. Task force members intend for the white paper and its related tools to serve as guidance for state DOTs as they navigate workforce-readiness issues.

“Culture trends involve an examination of how to adjust to the norms and needs of a new generation entering the workforce as a means to recruit and retain a diverse workforce,” Goss continued. “Ensuring a diverse and inclusive workplace goes beyond addressing only issues related to gender and race/ethnicity. Rather, it involves ensuring that people of all abilities, ages, and needs are able to contribute, feel heard in their workplace, and feel comfortable sharing their expertise and opinions.”

Talent management involves understanding that the workforce is changing and adaptation is necessary for state DOTs to recruit and retain the best workforce possible. Goss discussed how—when
recruiting—it is important to consider intellectual and neural diversity so that qualified candidates are not overlooked during the interview process. Some of the needs and norms of supporting a diverse workforce include providing employees with the ability to telework, offering childcare at the workplace, allowing flexible schedules, and developing training to match where employees are in their careers.

“As agencies are becoming more data-driven, people aren’t always comfortable with using data and learning the technology needed to analyze it,” Goss concluded. “Resources for training and mentors are, therefore, needed to sustain state DOT workforces and create an inclusive environment that allows all to contribute their expertise.”

AASHTO’s Human Resources Committee also has done significant work related to diversity and inclusion. The committee’s strategic plan states that part of its charge is to “collect strategies, tools, and training from member states regarding diversity and inclusion practices to include reflecting diversity in our workforce, developing cultural competence, identifying barriers to employment, and incorporating those into our processes and systems.” Specifically, for future meetings and webinars, the committee plans to incorporate diversity- and inclusion-related themes into AASHTO member webinars that address recruitment and retention issues through unconscious bias training, the use of mentoring to ensure that employees feel valued and included, and training related to anti-bullying and harassment. In addition, the committee uses an online discussion board to share practices such as which state DOTs have diversity and inclusion offices and policies and training for when an employee is gender transitioning.

North Carolina DOT

The North Carolina DOT focuses on the state’s historically Black colleges and universities (HBCUs) and minority-serving institutions (MSIs), with the goal of supporting the long-term success of the institutions and their students. To do so, North Carolina DOT’s Office of HBCU Outreach is charged with creating inclusive opportunities for students of HBCUs/MSIs in the transportation industry. Its vision is to expand and diversify the transportation industry through the power of inclusion and by strengthening the sustainable impact of North Carolina’s HBCUs/MSIs.

The Office of HBCU Outreach developed strategic priorities that considered factors such as research on HBCUs and examined trends in the transportation industry; economic mobility in North Carolina; and the status of science, technology, engineering, and mathematics (STEM) education in the state. Within these priorities are goals that—over the next five years—aim to address the sustainability and long-term success of North Carolina DOT’s HBCU outreach efforts. These strategic priorities are as follows:

- Expand diversity in the transportation industry through employment and contracting,
- Value and promote a culture of diversity and inclusion at North Carolina DOT,
- Establish strategic alliances and advocacy efforts,
- Strengthen the sustainability of North Carolina’s HBCUs/MSIs, and
- Connect HBCUs and minorities with emerging trends in transportation.

To carry out the strategic priorities, the Office of HBCU Outreach has core functions that include providing summer and year-round internships, implementing a transportation scholarship program, administering a fellows program, and expanding the National Summer Transportation Institute (NSTI).
SUMMER AND YEAR-ROUND INTERNSHIPS
The Office of HBCU Outreach's 10-week summer internship and 14-week year-round internships are among its signature efforts. They are designed to provide students attending HBCUs/MSIs with knowledge and expertise that they can use to apply for future positions at North Carolina DOT or elsewhere. In addition, the internships expose students to the inner workings of statewide projects and initiatives. North Carolina DOT hires more than 40 college interns from the state's HBCUs/MSIs to work and train in its headquarters, its 14 divisions across the state, and its Department of Motor Vehicles.

“This internship program is multifaceted,” notes Chief Deputy Secretary David Howard. “Students gain professional work experience, exposure to the world of transportation, and access to transportation career opportunities that make them far more competitive in the workforce.”

“The Office of HBCU Outreach makes advances with diversity and inclusion, in addition to gaining the ingenuity and innovation from this tech-savvy generation,” continues JoAna McCoy, program manager. “As a result of the office’s intentional efforts within the last two years, seven students have been hired at North Carolina DOT.”

TRANSPORTATION SCHOLARSHIP PROGRAM
The North Carolina HBCU/MSI Transportation Scholarship Program provides financial assistance to help cover the cost of college for highly motivated students at North Carolina HBCUs/MSIs who are pursuing their undergraduate and master's degrees in transportation-related majors. Majors represented in the program not only include engineering and aviation but also environmental law, urban studies, and logistics management. This program aims to diversify top talent in the transportation industry and attract the brightest minds to the transportation field. The $2,500 scholarships are available to all juniors, seniors, and master’s degree-level students in all majors attending a North Carolina HBCU/MSI. To date, 49 scholarships have been awarded.

FELLOWS PROGRAM
The HBCU/MSI Fellows Program offers work experience and learning opportunities for recent graduates with a bachelor's or master's degree from a North Carolina HBCU/MSI. Fellows serve a two-year commitment within North Carolina DOT and have access to professional development opportunities; free training, certifications, and work-related travel; and networking opportunities. The program helps develop a pool of qualified individuals for potential permanent positions within North Carolina DOT and the transportation sector.

Twelve fellows are currently working across the agency.

NATIONAL SUMMER TRANSPORTATION INSTITUTE
The Office of HBCU Outreach's NSTI is a key component among the Federal Highway Administration’s educational initiatives. NSTI is a two- to four-week STEM program aimed at exposing students in middle and high school—particularly minority, female, and disadvantaged youth—to transportation careers and encouraging them to consider transportation-related STEM courses.

With eight sites, North Carolina has the largest NSTI program in the country. Hosted for 27 years by the Transportation Institute at North Carolina Agricultural and Technical University in Greensboro, North Carolina’s NSTI also is one of the longest-running programs in the country.

In the summer of 2020, North Carolina was one of only two states to pilot and host a virtual NSTI program. The state DOT hosted five sites, all of which rose above the challenges of the COVID-19 global pandemic to offer a high-quality, free, and engaging STEM program to 95 middle and high school students throughout the state. The North Carolina DOT 2020 Virtual NSTI program partners were North Carolina Agricultural and Technical State University, Elizabeth City State University, Winston-Salem State University, and Roanoke-Chowan Community College.

Michigan DOT
The Transportation Diversity and Recruitment Program (TDRP) is a 10-week summer internship program at the Michigan DOT that offers valuable on-the-job training and mentoring to HBCU undergraduates who are pursuing transportation-related degrees in areas such as civil engineering, structural engineering, environmental engineering, planning, and construction management.

For more information, visit NCDOT.gov and type “HBCU Outreach” in the search field.
TDRP partners with seven of Michigan’s public universities to provide housing and meal support for the students so that the students do not pay for room and board. The program was founded by Greg Johnson, former Michigan DOT chief operating officer, and Paul Ajegba, Michigan DOT director and graduate of Prairie View A&M University, an HBCU in Prairie View, Texas.

Michigan DOT’s TDRP originated in 2013 in partnership with the University of Michigan and the Atlanta University Center Consortium, a group of HBCUs located in southwest Atlanta, Georgia. In its inaugural year, four students from the consortium schools—Morehouse College, Clark Atlanta University, and Spelman College—spent their summer working at Michigan DOT and living at the University of Michigan. In summer 2014, TDRP became a formal sequential internship program recruiting from HBCUs across the country. Now in its eighth year, the 2021 TDRP cohort is expecting more than 50 interns, the largest number since the program’s inception and an increase from the 34 interns it hosted in 2020. After being recruited from 15 to 20 HBCUs around the country, the interns work for Michigan DOT—or for one of its industry partners contracted to work on Michigan DOT projects—in five of the state’s seven regions.

The program allows students to develop professional competence, set long-range career goals, integrate work experiences with academic knowledge, earn income that can assist with college expenses, and establish a professional network, which they begin to build through meeting Michigan DOT engineers and learning about state DOT careers.

Some TDRP student interns (e.g., those from Morehouse, Clark Atlanta, and Spelman) are enrolled in the dual-degree program in engineering or the 3–2 Program. This program allows students to pursue a science major for three years at their college and then transfer to a participating school for two years to study engineering. After completing requirements at both their college and at the engineering school, the student receives a degree from each institution. Since the University of Michigan is one of the participating engineering schools, some interns use their time in TDRP to explore whether they will complete their education at the university. Other students have decided to join the 3–2 Program after completing their TDRP internship.

Student interns benefit in many ways, but so does the Michigan DOT. TDRP bolsters Michigan DOT’s efforts to recruit the best and brightest for permanent positions and ensures that the department has a diverse workforce that reflects the population in the state. Past students from the program have gone on to
accept full-time positions with Michigan DOT and with industry partners. In addition, Michigan DOT has fostered relationships with HBCUs across the country as some request the department to attend their recruiting events. And some HBCU professors refer their students to Michigan DOT careers, even if their school does not participate in TDRP.

Permanent Michigan DOT staff have also benefitted from the program: Not only have the student interns provided a valuable summer workforce to the state, but staff have grown in their ability to mentor emerging transportation professionals and work across generations. Michigan DOT staff also have reported that they have enjoyed the cultural exchanges with students as a number of interns were born outside of the United States.

Michigan DOT leaders realize that they do not have enough slots to offer all student interns a permanent position, and they also realize that not all interns will find a career at Michigan DOT that aligns with their long-term career goals. For that reason, TDRP also has grown to include private consulting firms that are already working on Michigan DOT projects. These firms now can host and employ students for the summer, thus offering students another possible career avenue.

TDRP’s focus is not just on Michigan DOT, but it also is on the state’s workforce and on the collaborations—with state universities, contractors, and HBCUs—it has built on through the program. Most importantly, the student interns receive valuable professional development experience that will aid them no matter where they begin their careers.2

2 For more information about TDRP, visit https://www.michigan.gov/mdot/.

“It is paramount for Michigan DOT and its industry partners to provide resources, experience, and opportunities for knowledge growth to the underrepresented talent pool of minority students in an inviting and supportive environment,” says Transportation Diversity and Recruitment Program Manager James Jackson. “We have the ability and desire to invest in the future workforce while we enhance the lives of the students with quality experiences.”
The 176 standing committees in TRB’s Technical Activities Division (TAD) identify, facilitate, and share research and information related to transportation. TAD carries out activities on behalf of TRB sponsors and the transportation community via its 5,000-plus volunteers who serve on standing committees, subcommittees, councils, and task forces overseen by TRB staff.

These committees address diversity, equity, and inclusion (DE&I) in countless ways, including efforts to diversify their membership and leadership, practices that create a welcoming environment for newcomers, involvement in TRB projects that focus on DE&I-related issues, and engagement with various transportation agencies. Efforts of three of these committees and those of the Young Members Coordinating Council are profiled. These profiles represent a sample of the many actions that committees across TRB are taking to address diversity, equity, and inclusion in their discipline and their committees.

Standing Committee on Equity and Transportation

Chaired by Gloria Jeff and Traceé Strum-Gilliam, the Standing Committee on Equity and Transportation is one of the most diverse TRB standing committees—not only in participation by minorities and women, but also in members’ location, age, ability, and skill set, as well as among practitioners, researchers, and public- and private-sector workers. Jeff and Strum-Gilliam believe this diversity is due to the committee intentionally seeking out diverse members and friends based on their broad TRB network and their philosophy that any friend or member has the opportunity to contribute to committee activities if they are willing to work—not basing member opportunities on previous career experience or accomplishments.

Jeff and Strum-Gilliam believe that the Equity and Transportation Committee is very welcoming, uses its friends a great deal, and provides an entry point to those...
who may not have a natural entry point to other committees.

Originally, the committee was called the Environmental Justice in Transportation Committee and focused on research related to communities and environmental justice (EJ) issues. In 2020, the committee was reconstituted so that it could expand, allowing it to engage with a broader range of concentration areas in the TRB structure. In addition, the committee considers transportation’s impact on peoples’ lives in the past, present, and future and ensures that its research encompasses not only EJ-protected populations but also marginalized and disadvantaged populations as a whole.

As Strum-Gilliam explains, historically, EJ practitioners focused only on EJ in terms of activities, equity analyses, and community impact assessments, and less on the impacts on people’s daily lives.

As a result of several conferences held in the 1990s that targeted transportation research issues related to the African-American community, Jeff has sought to communicate that EJ in transportation is a broader issue that includes effects on targeted populations from transportation investments—like the effects of diesel pollution on disadvantaged neighborhoods when highways are built through those neighborhoods.

Looking forward, committee members are planning Conference on Advancing Transportation Equity in September 2021. Examples of topics that will be considered include the impacts of connected and automated vehicles on communities of color, as well as of the increased truck traffic caused by expanded port facilities. A representative from the Conference of Minority Transportation Officials is involved with the conference planning committee, adds Jeff—an example of outreach the committee has done with organizations that represent minority communities.

One initiative the committee wants to propose at its next meeting is to survey state departments of transportation (DOTs) about how they are responding to social justice questions. As Jeff explains, some DOTs are very thoughtful and have action plans for responding to equity issues. In contrast, others see themselves only as engineering organizations and focus only on Disadvantaged Business Enterprise (DBE) participation. Jeff expresses concern that some DOTs’ commitment to increasing their workforce diversity involves focusing only on entry-level driver positions, not management positions.

A challenge the committee aims to address is finding researchers to study topics related to transportation equity and ensuring they have forums to present their work. The committee also communicates the need to make transportation equity an integrated part of community planning—whether urban, suburban, or rural.

Standing Committee on Women and Gender in Transportation
Formerly the Women’s Issues in Transportation Committee, the Standing Committee on Women and Gender in Transportation illuminates the importance of gender differences in all aspects of transportation.

The committee was born out of a safety and data committee, and over the past four decades has expanded its work beyond gender differences in crash risks to gender differences in travel behavior, travel preferences, and attitudes; crash risks and outcomes; responses to the construction and operation of various transportation and freight vehicles; concerns about safety and personal security (crime and harassment) in all transportation modes; responses to transportation and related public policies; and experiences in the transportation labor force.

Committee members attribute their success in expanding the group’s work in part to a growing and diverse community of members and friends engaged in the
committee’s activities. Their experiences and perspectives help shape the committee’s priorities and transfer knowledge throughout the TRB community and beyond. To create an inclusive environment for its members and friends, the committee has taken the following steps:

- Maintain the philosophy that all are welcome and encouraged to volunteer—the committee doesn’t differentiate between members and friends.
- Dedicate a significant portion of its annual committee meeting agenda to activities that foster connections, especially those that allow participants to connect with and learn from each other and are structured to enable all voices to be heard.
- Ensure that committee membership reflects a variety of voices by including a mix of geographical, gender, education, employment, and age perspectives.
- Have fun! Committee meeting traditions that foster an inviting environment include: ice-breakers, group photos, and covering the table with chocolate treats for everyone to enjoy.

The committee coordinates various activities to engage, inform, and inspire students and practitioners interested in women and gender in transportation. One of the most recent efforts was the May–June 2019 theme issue of *TR News*, “Women and Gender in Transportation.” The committee developed this issue to explore such topics as the negative effects of women’s inequitable transportation access on the global economy; women and transit; a case study from Austria on women’s travel constraints; and the challenges that minority, low-income women face as pedestrians and bicyclists.

In 2019, the committee sponsored the International Conference on Women’s Issues in Transportation. The conference—the sixth in a series that began in 1978—focused on women’s issues related to all aspects of travel and transportation and brought together scholars, practitioners, policy analysts, and public officials from around the globe to explore women’s unique transportation perspectives, challenges, achievements, and opportunities. A group of conference participants subsequently wrote a Transportation Research Circular that summarized conference presentations and discussions. The publication, *Transportation Research Circular E-C268: Insights, Inclusion, and Impact—Framing the Future for Women in Transportation*, is available on TRB’s website.

**Standing Committee on Native American Transportation Issues**

Created in 2001, the Standing Committee on Native American Transportation Issues focuses on research and practice pertaining to transportation issues on or near tribal lands and communities and tribal historical and cultural properties. Tribal transportation issues include all modes moving people and goods from one place to another; relationships and processes at relevant agencies at the tribal, state, federal, regional, and local levels; and the development, planning, administration, coordination, and implementation of transportation laws, policies, plans, programs, and projects.

With such a broad scope of transportation issues, the committee seeks to maintain a balanced membership to reflect tribal, federal, state, and local governments, in addition to members who are Native American and who represent

Members of what is now called the Standing Committee on Women and Gender in Transportation plan the agenda of the 2019 International Conference on Women’s Issues in Transportation. Presentations from that conference later appeared in not only a *Transportation Research Circular* but also in a theme issue of *TR News*.
Preservation in Transportation, the Native American Transportation Issues Committee established a Joint Subcommittee on Native American Historic and Archeological Preservation.

One issue of interest is incorporating the transportation research interests and practices of the international Indigenous community. The impact of colonization on Indigenous people is a global phenomenon, with common trademarks of land and resource deprivation, underdeveloped infrastructure, and socioeconomic disparities. Significant opportunities for research and practice within Indigenous communities are likely to emerge with additional research and collaboration. Although there is no current linkage to the international Indigenous transportation community within TRB, the committee hopes to foster those connections and expand its dialogue to include that community.

Research on the current Native American transportation workforce is another area of high interest. Tribal programs must confront the pending retirement of an aging workforce and adapt to new technologies along with their state and local peers. There is vast diversity within tribal contexts regarding land (owner-
Young Members Coordinating Council
The Young Members Coordinating Council (YMCC) serves transportation professionals ages 35 or younger advancing the national transportation research agenda. Key goals include

- **Involvement.** To provide opportunities for young professionals to get actively involved with TRB.
- **Resources.** To offer targeted resources geared for and by young professionals in the form of technical sessions, events, and guides.
- **Connections.** To facilitate networking opportunities and connect young professionals with TRB committees and with peers from around the world.
- **Representation.** To serve as young professionals’ liaison to and from TRB leadership and the research community to address issues of importance to young members.

DIVERSITY AND INCLUSION FOCUS
Although YMCC was established with the mission of including younger generations of transportation professionals in TRB, the council strives to reflect the diversity it advocates for all of TRB. For instance, since the council’s inception, three out of five chairs have been female, with many subcommittees led by women and representatives of different races and ethnicities.

MENTORING AND INCLUSION INITIATIVES
YMCC has implemented several inclusion initiatives targeting young professionals, focusing on providing a benefit to both the young professionals and TRB standing committees. The council’s subcommittees have been running successful mentoring programs that connect young professionals to seasoned veterans and peers across TRB, offering the following opportunities:

- Two-way knowledge transfer,
- Career growth and guidance,
- Better integration into TRB activities, and
- TRB Annual Meeting navigation.

YMCC has been working with TRB staff and group, section, and committee chairs to encourage the integration of young professionals in TRB activities. This work created dedicated young member slots on standing committees and facilitated young professional engagement in organizing sessions, workshops, and specialty conferences; drafting research needs; administering committee websites; and developing informational resources. The council continues to work with standing committees to ensure that everyone feels welcome to committee and subcommittee meetings to share their expertise and enthusiasm to help committees achieve their goals.

STRATEGIC APPROACH
YMCC actively works with TRB leadership, including those within the Technical Activities Council, Executive Committee, and senior TRB staff, to provide input to TRB’s strategic direction, focusing on initiatives of importance to young professionals and future generations of transportation leaders. Those initiatives often include efforts to continue diversifying the transportation industry workforce and engaging underrepresented groups. With more and more emerging transportation professionals attending TRB’s Annual Meeting and becoming involved in TRB’s committee structure, YMCC will continue to be a crucial link to their involvement and professional development.

Acknowledgments
The author appreciates the assistance of Traceé Strum-Gilliam, Ronald Hall, Dawn Hood, Nikola Ivanov, and Gloria Jeff in preparing this article.
Innovation often arises from the diverse perspectives of individuals in an organization. The Federal Highway Administration (FHWA) strongly values and embraces diversity and inclusion in its workforce and culture to support its mission to enhance the quality of life of all Americans.

A diverse workforce stimulates innovation, offers new approaches, and presents fresh perspectives to help solve complex transportation challenges. FHWA aims to create a culture in which all individuals can prosper, advance in their careers, and contribute to the FHWA mission. It is crucial to attract and retain a diverse workforce that mirrors the diversity of the U.S. population.

Recruitment and outreach activities target all segments of America, as outlined in FHWA’s comprehensive recruitment, outreach, and diversity strategy, which seeks a highly talented and diverse workforce. FHWA promotes various activities to support its employees’ diverse opinions and highlight unique backgrounds.

Recruitment, Outreach, and Diversity Plan
The FHWA Recruitment, Outreach, and Diversity Plan targets and identifies challenging workforce opportunities for diverse candidates in entry-level, mid-career, and hard-to-fill positions. The plan centers on communicating the diverse career opportunities that leverage FHWA as a preferred employer with students, veterans, and mid-career professionals and uses relationships and ongoing education about FHWA’s mission and opportunities.

The recruitment plan emphasizes increasing the number of female applicants in hard-to-fill positions such as structural and civil engineering jobs, while showcasing all of FHWA’s disciplines. The following programs and initiatives highlight FHWA’s efforts to build a more diverse and inclusive workforce.

Interested in a Career at FHWA?
The public can e-mail specific career-related questions to FHWA at FHWACareers@dot.gov. In addition, people who have Schedule A status can send their documentation and resumes with a short statement of career interest to FHWA at the same e-mail address.
FHWA Programs and Initiatives

DIVERSITY MANAGEMENT COMMITTEE
FHWA actively fosters an inclusive workplace in which diversity and individual differences are valued and leveraged to achieve the agency’s vision and mission. A diversity management committee is responsible for championing diversity and inclusion throughout the agency.

The committee aims to:

• Implement practices that encourage employees to build working relationships with diverse individuals (i.e., those of varying occupational, educational, personal, socioeconomic, and cultural backgrounds);
• Foster an inclusive workplace that maximizes the talents of each person;
• Incorporate a variety of perspectives into the development of work products, through early and meaningful involvement of diverse employees;
• Hold individuals accountable for applying practices that embody diversity principles;
• Develop business strategies, plans, policies, and systems to recruit, retain, and develop a diverse workforce throughout the organization; and
• Leverage individual differences in ways that support the mission of the organization and contribute to organizational success.

WOMEN’S FORUM PROGRAM
Open to all employees, the Women’s Forum was developed by the Diversity Management Committee to promote open communication, provide an opportunity for all employees to participate, and identify challenges in the workplace—especially those affecting women.

DIVERSITY AND INCLUSION TRAINING
As a part of FHWA’s effort to promote diversity and inclusion, the agency encourages employees to participate in diversity and inclusion training through the departmental learning management system. The system includes more than 50 diversity-related courses that include leading and managing diversity, global diversity, understanding diversity trends, and inclusion for supervisors. These courses help equip FHWA employees to instill leadership in diversity and inclusion and help them understand and mitigate obstacles to achieving a diversified and inclusive work environment.

VETERANS HIRING PROGRAM
FHWA includes numerous veteran outreach activities in its recruitment program. Veterans may be eligible for a 10-point preference during the competitive hiring process and can be hired directly in an expeditious manner, depending on their eligibility status or disability rating.

A 1962 article in The News in Public Roads magazine celebrates the first female highway engineer at the Bureau of Public Roads (a precursor to FHWA). Beverly Cover of Cumberland, Maryland, had recently graduated from Georgia Institute of Technology with a bachelor’s degree in civil engineering. In that, she also was a pioneer—only the second woman to receive such a degree from Georgia Tech.

SCHEDULE A HIRING PROGRAM
FHWA also actively seeks to hire qualified people with a disability. People who have a disability may be hired noncompetitively, in an expeditious manner, via the Schedule A hiring authority.

FHWA CORPORATE AMBASSADORS PROGRAM
FHWA established its Corporate Ambassadors Program to utilize its greatest resource—enthusiastic and passionate employees—to represent the agency at hiring fairs and outreach events. FHWA has more than 150 ambassadors from across the country and a diverse array of occupational fields.

This program allows FHWA to increase the number of recruitment and outreach events it participates in nationwide. Ambassadors receive training and resources on attracting and identifying strong candidates for FHWA job vacancies and engaging the public in their communities. Ambassadors are also encouraged to develop relationships with universities and affinity groups to further expand the agency’s reach and brand awareness.

Veterans Hiring Program
Qualified veterans seeking federal employment within the U.S. Department of Transportation (DOT) may contact the agency’s veteran employment coordinator at vetemployment@dot.gov.
Employee Resource Groups (ERGs) are voluntary, employee-led groups that provide a forum for workers from various backgrounds to articulate and address concerns related to their experience in the organizational workforce, including their professional development and overall satisfaction.

Across U.S. DOT, more than 20 ERGs are available to all employees and led by multiple agencies. These include Blacks in Government, DEAF DOT, Federal Employed Women, Hispanics in Transportation, and National Asian and Pacific American Association, to name a few.

These groups generally focus on providing support, enhancing career development, and contributing to personal development in the work environment.

FHWA Student and Recent Graduates Programs
FHWA offers opportunities for undergraduate and graduate students to pursue careers in transportation. These programs offer hands-on work experience in a variety of fields and an introduction to the innovations and challenges of transportation.

Summer Transportation Internship Program for Diverse Groups
The Summer Transportation Internship Program for Diverse Groups is a paid summer internship program that offers college students the opportunity to gain professional experience and skills to complement their academic pursuits.

The program mentors and cultivates tomorrow’s transportation leaders by providing hands-on experience and on-the-job training focused on current transportation-related topics and issues. Approximately 100 students participate in the internship program each year.

Pathways Student Internship and Recent Graduates Program
The Pathways Internship program provides students from high school to the graduate level with paid internships in agencies, thus allowing them to explore federal careers while still in school. Students who successfully complete the program may be eligible for conversion to a permanent job in the civil service.

Professional Development Program
FHWA’s Professional Development Program (PDP) is a two-year, entry-level developmental program that supports the agency’s succession planning and workforce pipeline. PDP is for recent graduates or current employees who were Pathways interns or internal merit selectees.

PDP consists of on-the-job training, developmental assignments, and leadership skills development. Each component is designed to facilitate practical learning while maximizing individual talents to prepare participants for a professional career with FHWA. The program directly addresses the agency’s employment needs and retaining talent.

FHWA-Administered Programs
National Summer Transportation Institute
The National Summer Transportation Institute (NSTI) is a transportation-focused career initiative to promote awareness of career opportunities within the transportation industry. NSTI gives grants to state DOTs to help higher education institutions develop programs that promote awareness of career opportunities within the transportation industry. NSTI gives grants to state DOTs to help higher education institutions develop programs that promote awareness.
of science, technology, engineering, and math (STEM) educational and career opportunities among middle- and high-school students nationwide.

NSTI was created to address future transportation workforce needs by ensuring that the transportation industry has a well-trained, qualified, and diversified workforce.

Program objectives are to improve STEM skills; raise awareness among students—particularly minority, female, and disadvantaged youth—about transportation careers; and encourage participants to consider transportation-related fields of study in their higher education pursuits.

Dwight David Eisenhower Transportation Fellowship Program

The mission of the Dwight David Eisenhower Transportation Fellowship Program (DDETFP) is to attract the nation’s brightest minds to the field of transportation and advance transportation workforce development by awarding stipends to students pursuing degrees in transportation-related disciplines. By doing so, the program encourages future transportation professionals in seeking their degrees and brings and retains top talent in the U.S. transportation industry. Students can receive DDETFP awards either through the graduate fellowship or a local competition.

The graduate fellowship is open to graduate students pursuing a full-time program in a transportation-related discipline at accredited institutions of higher education (IHEs) in the United States or its territories. Students apply directly to FHWA through Grants.gov, and the agency's National Selection Panel decides on the awardees. Awards range between $5,000 and $35,500.

The local competition is open to undergraduate and graduate students attending minority-serving institutions or community colleges in the United States or its territories. These IHEs must first submit an application to FHWA through Grants.gov. After being accepted, the IHE can administer its own competition to recommend students to DDETFP for awards, which range between $1,500 and $10,000.

Since 1983, DDETFP has awarded more than $53 million in stipends to students. The funding generally includes expenses for the awardees to attend the TRB Annual Meeting. DDETFP and TRB have enjoyed a nearly 30-year partnership, allowing students to immerse themselves in the transportation community while at the conference.

Garrett A. Morgan Technology and Transportation Education Program

The Garrett A. Morgan Technology and Transportation Education Program (GARRETT A. MORGAN TECHNOLOGY AND TRANSPORTATION EDUCATION PROGRAM) is a national transportation education initiative founded in May 1997 by former Secretary of Transportation Rodney E. Slater. Its purpose is to improve the preparation
of students—particularly women and minorities—in STEM through curriculum development and other activities related to transportation.

Program objectives are

- To build a pipeline between America’s youth and the transportation community;
- To improve the STEM skills of students in grades K–12 via curriculum development, internships, mentoring programs, and other transportation-related activities;
- To facilitate partnerships among government, academia, and the private sector; and
- To increase understanding of the transportation industry and careers and advance transportation workforce development.

The program has provided grants to local and state educational agencies that may partner with IHEs, businesses, and others to implement programs to improve K–12 students’ STEM skills through transportation activities.

Since 2006, the program has funded more than 40 projects.

Moving Forward

The diversity of FHWA’s workforce is a model for the transportation industry as a whole. The transportation industry and FHWA still need to close diversity gaps, however, as detailed in the industry and the civilian labor force index maintained by the U.S. Bureau of Labor Statistics.

The programs and initiatives detailed in this article represent the agency’s efforts to close these diversity gaps and build a pipeline of diverse, qualified talent into FHWA and the transportation industry. By closing diversity gaps and building a more representative workforce, FHWA will better prepare the participants in these programs to take on emerging technologies, an accelerated pace of innovation, and other challenges the nation’s transportation industry will face in the future.

RESOURCES


Since my college days, I have been fascinated by the innovation of Japan’s high-speed rail and wanted to learn more about it. After graduation, transportation continued to attract my attention as an important lifeline for any country—including a developing country like India. That perspective drew me to this profession, and the innovation in technology encourages me to stay in the industry and experience its growth.

—ANINDITA GHOSH
Technical Manager
Urban Mass Transit Company, Ltd., Delhi, India

V O L U N T E E R  V O I C E S
Higher education has taken an active role in pursuing inclusion and diversity. It is well-documented that lower-income and minority students face significant barriers to higher education. It also is well-documented that problem solvers from a diverse and inclusive group are able to come up with higher-quality solutions than those arrived at by a more homogeneous group (1).

Almost all universities, colleges, and technical schools have inclusion and diversity programs, but two universities of different sizes and demographics share a commitment to the success of their diverse student populations. In the center of the country lies the University of Arkansas in Fayetteville (UAF), and on the West Coast is California State University, Long Beach (CSULB). A look at the diversity and inclusion programs at these institutions offers an example of the kinds of programs many universities and colleges have embraced.

Northwest Arkansas includes the city of Fayetteville (population 90,000) and the surrounding rural area (population 535,000). However, outside of any one of the four major cities, the setting becomes very rural. In 2010, Fayetteville itself was more than 80 percent white, and the university reflected a similar lack of diversity. In 2019, approximately 27,000 students (including undergraduate, graduate, and law students) were enrolled at UAF, and more than 20,000—just under 74 percent—identified as white. About 55 percent of the students are from within the state, with a number of out-of-state students drawn from UAF’s reciprocity agreements with neighboring states and Native American tribes.

In Southern California, the city of Long Beach has a population of nearly 479,000 and is home to North America’s second largest maritime trade gateway. The greater Los Angeles area, which includes Long Beach, has a population of approximately 19 million, of which nearly half are Hispanic/Latino.

CSULB—one of the California State University system’s 23 campuses—has...
more than 38,000 enrolled students, 90 percent of whom are from within the state and a vast majority of whom live off campus. CSULB draws the eighth largest applicant pool of all universities in the United States. As part of its mission, the California State University system seeks individuals with collegiate promise and who face numerous barriers to assist them in advancing to the highest educational levels they can reach. CSULB is actively engaged in implementation of the Beach 2030 Strategic Plan, which identifies building a community of diverse students as a strategic priority (2).

CSULB reflects the community it serves: Of its students, 46 percent are Hispanic/Latino; 21 percent are Asian American; 16 percent are white; 7 percent are Black or African-American; and 5 percent are multiracial. Despite the opportunities afforded by the region’s and the state’s diverse economy, poverty remains a barrier to accessing education for many of Long Beach’s residents. Long Beach has an 18 percent poverty rate, a number likely exacerbated by California’s high cost of living.1

As a result of Long Beach’s poverty rate, CSULB has made it a priority to close the achievement gap. In 2008, it helped launch the Long Beach College Promise, which aims to increase college readiness and improve graduation rates among Long Beach students. The Promise is a partnership of Long Beach Unified School District, Long Beach City College (a community college), CSULB, and the city of Long Beach itself. The Promise provides for a guaranteed transfer admission pathway from Long Beach City College to CSULB for students in 10 majors who meet the university’s entrance requirements.

UAF also has purposely pursued programs intended to help underrepresented student populations. The university’s Division of Diversity, Equity, and Inclusion envisions “a world committed to inclusivity, where diversity, equity, access, and civility are valued as a part of our culture, climate, and everyday lives (3)”. In addition, the office urges all community members to be responsible “as engaged citizens to consistently incorporate behaviors and practices that support an inclusive environment on campus, in Arkansas, and everywhere.” This vision and charge are supported with various workshops, programs, and training opportunities offered to students, staff, and faculty.

Every week, the division sponsors many on-campus events that highlight the university’s commitment to inclusion and diversity. For example, disability awareness events, a Native American cultural celebration, and an LGBTQ+ History Month celebration were held virtually—because of COVID-19—the first week of October 2020. At the beginning of the fall 2020 semester, Chancellor Joe Steinmetz stressed the importance of health and safety precautions because of the pandemic. He also emphasized improvement of the campus racial climate, based on nationwide protests sparked by the police killing of George Floyd in May 2020.

The university-level commitment at UAF percolates down to the college level. In 2007, the College of Engineering established the Engineering Career Awareness Program (ECAP) (4). The goal of ECAP is to recruit students who are underrepresented in the field of engineering. A significant part of this goal is achieved by providing the students the support they need to feel comfortable, confident, and ready to succeed.

ECAP involves multiple programs, including an in-residence summer bridge program for new students, renewable scholarships, opportunities for cooperative or internship experiences, peer mentoring, a freshman engineering program, and a living learning community of students who share a common academic interest. A National Science Foundation grant initially supported ECAP, but over the years support has shifted to industry and private donations. Between fall 2014 and fall 2020, the College of Engineering saw a 2.4 percent increase in enrollment of minority students. It is not possible to attribute these changes to any one effort, but university- and college-level initiatives have no doubt helped (A. Braham, personal communication, Nov. 12, 2020). One example of college-level outreach in the community includes engineering summer camps designed to engage children in

1 For statistics on Long Beach, California, visit U.S. Census Bureau Quickfacts at https://www.census.gov/quickfacts/longbeachcitycalifornia.
Cabrillo’s class of 2020 is the first class to complete four years of instruction within the AGL framework. Approximately 800 students have been part of the program over that time. There are no prerequisites, but there is currently a wait list for students at Cabrillo to join the academy. Among students in the program, there was an increase in advanced placement course enrollment from 6 percent in 2016 to 16 percent in 2020 and—over the same period—a decrease from 24 percent to 10 percent which includes program design that links academic curriculum with industry skills and knowledge needed in the workplace.

Cabrillo High School’s close proximity to the Port of Long Beach means that freight traffic has a major presence in this heavily industrial community. AGL creates opportunities for workforce development in the trade and transportation sectors while addressing underlying issues that face residents of West Long Beach: poverty and low educational attainment.

STEM disciplines. These camps are held throughout the state and are available to 2nd through 12th graders (5). CSULB has similar initiatives that target specific students. In addition to The Promise, CSULB recognizes that their goals of diversity and inclusion will be successful only if students in middle school and high school—and their parents and guardians—understand what it means to be college-ready and see the link between college education and employment in the local economy. In response, Long Beach Unified School District partnered with the Port of Long Beach to establish a career pathway academy at Juan Rodriguez Cabrillo High School in West Long Beach. Called the Academy of Global Logistics (AGL), the program—launched in 2016—offers education that is connected to key employment pathways in the community through certificates and degrees from Long Beach City College, as well as CSULB.

What makes AGL different from similar programs is the port’s role: including financial sponsorship as part of its broader educational efforts and its commitment to developing local talent for the future port and logistics workforce. CSULB supports the effort through the College of Professional and International Education and two of its units: the Office of Professional and Workforce Development and the Center for International Trade and Transportation. The university’s role is technical support, which includes program design that links academic curriculum with industry skills and knowledge needed in the workplace.

With a calendar of celebrations that include Gay and Lesbian Pride Month (in June) and Gay and Lesbian History Month (in October), UAF sends a clear message that—within its halls and on its grounds—all are welcome.

At UAF, targeted events such as National Parkinson’s Awareness Month (in April) and Disability Employment Awareness Month (in October) extend the reach of students with disabilities.

With a calendar of celebrations that include Gay and Lesbian Pride Month (in June) and Gay and Lesbian History Month (in October), UAF sends a clear message that—within its halls and on its grounds—all are welcome.

The Port of Long Beach—shown just months before the opening of the new Gerald Desmond Bridge—partnered with the Long Beach Unified School District to create the Academy of Global Logistics. The educational program offers a trade- and transportation-related career pathway to students at Juan Rodriguez Cabrillo High School (located near the port), all with a goal of supporting them through CSULB and other colleges and—eventually—into the port’s workforce.
percent in the number of students identified as chronically absent.

A study that compared graduation rates of Black students to those of the entire CSULB student body from 2003 to 2013 also showed how effective CSULB’s efforts have been: CSULB was one of 51 institutions (out of 232 in the study) that improved the graduation rate of its overall student body (by 11.9 percent), as well as its Black students (by 17 percent) (6).

An important takeaway from the CSULB and UAF diversity and inclusion programs is that they have been built to foster enduring change with an eye toward seeing real benefits five to 10 years down the road. Relying on university funds, industry funds, and private donations, these programs have built and benefited from strong public–private partnerships.

Another key element for success has been to combine for-credit classroom learning with noncredit professional development skill building. An important component to these professional development skills is internships that allow students a glimpse into the professional world and bring the concepts they are learning in the classroom to life.

Finally, it is vital that all students are carefully tracked as they participate in these programs for their entire four-year journey through the university so that they do not fall through the cracks. The combination of academic and professional skill building with internships and sustained support programs significantly increases the probability of success for each student.

Whether in the private or public sector, contributions to such diversity and inclusion initiatives—through time, financial resources, or internships—will make a significant impact on the next generation of transportation professionals.

**REFERENCES**


It is well-documented that problem solvers from a diverse and inclusive group are able to come up with higher-quality solutions than those arrived at by a more homogeneous group.
Along with its commitment to assembling diverse volunteer panels and committees and ensuring that its products reflect many perspectives, TRB has several programs for emerging transportation professionals. The following programs help students and emerging professionals build their skills and professional networks both in TRB and in the transportation profession as a whole: the Minority Student Fellows Program; the Airport Cooperative Research Program (ACRP) Graduate Research Award Program, University Design Program, Ambassadors Program, and Champions Program; and the Transit Cooperative Research Program (TCRP) Ambassadors Program.

Minority Student Fellows Program
The TRB Minority Student Fellows Program promotes minority participation in transportation and in TRB. Managed by Karen Febey, the program just completed its 12th year. Since its inception in 2010, nearly 200 undergraduate and graduate students have participated, representing a variety of transportation disciplines—not only civil engineering and planning but also aviation management, environmental engineering, and geography.

The program funds students from select historically Black colleges and universities, Hispanic-serving institutions, American Indian–serving institutions, and one Native American Pacific Islander–serving institution to attend the TRB Annual Meeting and present a research paper in a poster session, lectern session, or committee meeting. TRB also supports a mentor to accompany the student to the meeting.

For most of the Fellows, the Annual Meeting is the first time they present their research at a professional conference. Angelica Torres, a master’s student in civil engineering from the University of Texas at El Paso (UTEP), reflected on her experience as a Fellow in the 2019–2020 cohort. She recalls the challenge of presenting her research at a meeting of the Non-Binder Components of Asphalt Mixtures Committee because

Above: The 10th cohort of TRB Minority Student Fellows gathered at the 99th TRB Annual Meeting in January 2020. Nearly 200 students have participated in the program since its founding in 2010.
Spanish is her first language, and it was her first-ever conference presentation:

“When I started walking toward the front of the room, I did not want to show any distress, so I pretended to walk very comfortably. But my heart was pounding like a jackhammer. When I was in front of the room, I thought, This is how I am going to die. I opened my presentation up by introducing myself to break the ice. Amidst shaking violently inside, I took a deep breath and started presenting the material. I became so engaged that I forgot I was presenting to an audience for the first time. Time passed very quickly, and I reached my ‘thank you’ slide in no time. At the end of the presentation, people from the audience—and my supervisor—told me that it was a good presentation and that I had done an outstanding job. Today, I am proud to say that I was able to present in front of professionals at a conference. With that experience, I realized the importance of communication and committed myself to further developing those skills.”

Quenton Greggs, a Fellow in the 2019–2020 cohort and an aviation science major from Texas Southern University in Houston, summed up his experience: “The vast knowledge that I gained from visiting the different sessions and the feedback I received from my research presentation was phenomenal. The experience was just overall great.”

ACRP and Aviation Careers

ACRP undertakes research and technical activities related to airports: administration, environment, legal, policy, planning, safety, human resources, design, construction,
maintenance, and operations. To further the program’s mission and ensure the next generation of airport professionals, ACRP administers two programs for students: the Graduate Research Award Program and University Design Competition. Although neither program focuses exclusively on inclusion- and diversity-related goals, participants are indeed diverse in academic discipline, race and ethnicity, gender, and institutional affiliation. Some have carried out research projects aimed at making airports inclusive environments for all users.

**GRADUATE RESEARCH AWARD PROGRAM**

The Graduate Research Award Program seeks to encourage applied research on a wide range of airport and related aviation system issues to foster the next generation of aviation community leaders. The program’s goal is to stimulate thought, discussion, and research by those who may become future airport managers, operators, designers, and aviation policy makers.

A panel of experts selects up to 10 graduate students for the program based on the quality of their proposed research projects, how their research could benefit the aviation community, and how their program participation would contribute to their career goals. Students receive a stipend of $12,000 as they prepare their research. After successfully completing their projects, students receive additional funding to attend the TRB Annual Meeting and present their research. The Graduate Award Program also matches each graduate researcher with a mentor in the aviation profession. Mentors review the research approach and draft research paper and work with each researcher and faculty advisor throughout the program.

Award winner Zhu Qing focused his research on making airports more inclusive environments for all users. Currently a postdoctoral fellow at Georgia Institute of Technology, Qing received a Graduate Research Award when he was completing his Ph.D. in civil engineering at the University of Missouri. His work, “Evaluation of Airport Wayfinding Accessibility with the Use of a Wheelchair Simulator,” sought to make the airport a more inclusive environment for wheelchair users and was motivated by his friend, Joseph Reneker, a wheelchair user and a fellow engineering student at the University of Missouri.

Reneker and Qing wanted to learn about other wheelchair users’ experiences with flying. The pair subsequently interviewed wheelchair users in their community and found that for most, flying was very challenging. As engineers, they wanted to help, so they set out to develop a wheelchair simulator at a virtual airport that they would use to evaluate airport wayfinding accessibility.

To ensure their work would be practice-ready, Qing and Reneker reached out to Angel Ramos, then assistant director and ADA complaint coordinator at St. Louis Lambert International Airport (STL), to learn about implementation and operating costs of wayfinding applications. The insights they learned led to their evaluation of the effects of other assistive technologies that have low implementation costs and can be customizable by passengers.

When he finished the project, Qing reported: “We are considering a follow-up study to validate the wheelchair simulator approach and examine the readiness of existing indoor location technologies. This
mobile wayfinding application has broad prospects for wheelchair users in other noisy, crowded, complex indoor environments, such as malls and hospitals.”

At the conclusion of his research, Qing attended the 2020 TRB Annual Meeting and presented his work as part of a lectern session. He also spent time learning the latest developments, trends, and resources for future research from meetings with his review panel members and the meeting of the Standing Committee on Airport Terminals and Ground Access. Reflecting on his program experience, Qing reported that the constructive feedback he received during his panel members’ meetings kept him on track with his research and provided the valuable connection with Ramos.

By the end of 2020, Qing’s research was published in the Transportation Research Record. The ACRP Graduate Award Program’s financial support allowed him to procure materials to develop the wheelchair simulator—something he would not have otherwise been able to do. Qing expressed a great deal of gratitude for the advice and support provided by his faculty research advisor Carlos Sun and from program panel members Lawrence Goldstein, TRB; Dave Byers, Quadrex Aviation; and Robert Samis and Lillian Miller, Federal Aviation Administration (FAA).

UNIVERSITY DESIGN COMPETITION
The second ACRP student program is the University Design Competition, a national competition for universities that engages individuals and teams of undergraduate and graduate students in airport and National Airspace System issues.

According to Mary Sandy, Virginia Space Grant Consortium, who contractually manages the program for ACRP, 48 teams from 15 universities entered the competition in 2019. Participants select one of four categories in which to enter their projects: Airport Operation and Maintenance, Runway Safety/Runway Incursions/Runway Excursions, Airport Environmental Interactions, and Airport Management and Planning.

First-place winners—selected by a panel of educators, industry experts, and FAA representatives—are invited to Washington, D.C., to present their work at the National Academies of Sciences, Engineering, and Medicine. The winning teams also receive a cash prize and are invited to present their projects at an aviation workshop or conference.

Participants can complete projects as part of a class, independent study, or through a faculty-mentored, college-based student chapter of a professional society. Competition goals include the following:

• Raise awareness of the benefits of ACRP and the importance of airports to National Airspace System infrastructure;
• Increase involvement of the academic community in ACRP, and address airport operation infrastructure issues and needs;
• Engage students in conceptualizing applications, systems, and equipment capable of addressing related challenges; and

1 To view the paper “Evaluation of Airport Wayfinding Accessibility with the Use of a Wheelchair Simulator,” visit https://doi.org/10.1177%2F0361198120980445.
The organization sponsors them to carry out ACRP activities that facilitate development of new skills and knowledge, professional networks, and long-term engagement in the aviation research community. Nearly 50 organizations sponsor champions, including airports, a pilot’s association, a university, and consulting firms.

The Ambassadors Program engages aviation practitioners to access and apply research to solve airport problems, serve as conduits of information between airports and ACRP, and develop the next generation of airport leaders. There are now 14 ambassadors from across the United States.2

TCRP Ambassadors Program

The TCRP Ambassadors Program seeks to broaden, strengthen, and accelerate the introduction and adoption of its research results within the public transportation industry. This program was developed in 1998 as a joint effort of the American

AMBASSADORS AND CHAMPIONS PROGRAMS

ACRP also administers two other programs—the ACRP Ambassadors Program and the ACRP Champions Program—to focus on engagement of aviation professionals in the industry. Although these programs do not focus exclusively on inclusion and diversity, participants represent diverse backgrounds and experiences. The Champions Program helps early- to mid-career airport professionals grow in their careers by becoming an ACRP expert within their organizations.

- Encourage students to consider aviation careers and contribute innovative ideas and solutions to issues facing airports and the National Airspace System.

In 2019, the 1st place design team in the Airport Management and Planning category hailed from the School of Aviation and Transportation Technology at Purdue University in Indiana.

Selected from 15 teams, the winning team included graduate students Linfeng Jin, Yuriy Kuleshov, and Victor Pertel. Their project, Proposal of Mobile Application Design for Aging Travelers in Commercial Airports, focused on making airports more inclusive and comfortable for aging travelers, using a mobile wayfinding app. The wayfinding tool was designed to bring patrons from the terminal curbside to the flight to luggage drop-off, providing assistance with finding various amenities throughout the airport. The research team’s proposed app is unique in that it would work in all airports; no such app exists since all current ones are unique either to airports or airlines.

Jin, Pertel, and Kuleshov completed this project as part of their Aviation and Aerospace Sustainability class, with guidance from instructor Mary Johnson, who served as their faculty mentor along with Anne Lucietto. Johnson explains that she gives her students the option of entering a project in the University Design Competition or writing a journal paper. Both options allow students to apply what they learned in class and explore an application of sustainability to address challenges facing airports.

Most of Johnson’s students choose a Design Competition project because it allows them to work collaboratively while engaging in real-world aviation solutions. Johnson and Lucietto comment that they encourage their students to treat the competition guidelines as if they were responding to a request for proposals—an important skill to have. As a result, students learn to balance creativity with adherence to guidelines.

According to Johnson and Lucietto, the students felt that presenting their project at the National Academies and at an airport consulting conference was a meaningful experience; they felt that their work was valued, and they received constructive feedback on their design.

Johnson and Lucietto note that as the award winners continue in their careers, they will be more sensitive to the airport navigation difficulties faced by older passengers and those with disabilities. They add that the research could have a variety of applications beyond just the airport environment. For instance, anyone older or with a disability could benefit from the app to facilitate navigation in places like malls or grocery stores.

The TCRP Ambassadors attended an orientation training at APTA offices in September 2018: (left to right) Genevieve Bajwa, Rhonda Allen, Eloy Munoz, Rachel Pallister, Christy Haven, Jerome Horne, Lisa Vickery, Jennifer McGrath, and Beverly Neff.

2 For more information about both of these programs, see http://www.trb.org/ACRP/ACRP.aspx.
products in their respective agencies or companies; and
• Serving as a liaison between TCRP, the research community, and public transit agencies by sharing research results by attending industry events and conferences, visiting transit agencies, and attending COMTO- and APTA-sponsored conferences.

One recent Ambassador activity was communicating with COMTO chapter presidents to connect with those chapters to disseminate TCRP’s research at their local venues. Moving forward, COMTO will work with Ambassadors to expand their partnerships to increase outreach opportunities. Chisholm-Smith expressed her gratitude to TCRP Ambassadors: “We appreciate Ambassadors around the country who are promoting TCRP, lending their ideas, their voices, and their time to improve public transportation for all. Their participation in the program makes a significant difference.”

V O L U N T E E R  V O I C E S

The automobile fascinated me from an early age—playing with Hot Wheels and Matchbox cars on the floors of the homes I lived in. Growing up between Germany and the United States, I saw my world through cars, which led me to become an engineer. To paraphrase the Bible verse, “When I was a child, I thought like a child. When I became a man, I put the ways of childhood behind me.” Fortunately, I have not had to and, hopefully, will not have to put those memories away for years to come. My career is just the realization and evolution of a child’s dream.

—MICHAEL BOONE
Manager for Autonomous Vehicles and Computer Vision
NVIDIA, Santa Clara, California
Role Model Influence on Women in STEM

NAE’s EngineerGirl Program

MARY MATHIAS AND SIMIL RAGHAVAN

Mathias is an associate program officer and Raghavan is a senior program officer at the National Academy of Engineering, Washington, D.C.

Research has shown that girls with role models in science, technology, engineering, and math (STEM) show more interest in these subjects and feel more confident in their STEM abilities than girls without such role models.¹ EngineerGirl, a program of the National Academy of Engineering (NAE), is making hundreds of role models visible to girls around the world to demonstrate that any girl can explore engineering and the opportunities it offers.²

Engineering is vital to the future of transportation. NAE and TRB share a goal of encouraging more young people—particularly those with diverse perspectives—to take on the challenge of creating the next generation of transportation systems that will contribute to a safer, more sustainable, and more equitable world.

EngineerGirl brings national attention to opportunities in engineering for girls and women; informs, inspires, and supports girls; and encourages them to consider the rewards of an engineering education and career. Why girls and women? Because, despite an increase in female participation in many traditionally male-dominated professions such as medicine and law, women remain grossly underrepresented in engineering. Diversity of thought is crucial to creativity; by leaving women out of the process of innovation, a key component of diversity is lost, and innovation and progress are stifled.

Website

The EngineerGirl website features information about engineering careers and fields; resources for pursuing a career in engineering; design projects for girls to try; and, most importantly, a Gallery of Women Engineers and an “Ask an Engineer” section.

The Gallery of Women Engineers features engineers from around the world, at many different levels in their careers and


² The EngineerGirl website is available at https://www.engineergirl.org.
representing a wide array of companies.\textsuperscript{3} It dispels stereotypes of engineers and allows students to see the many different paths that may be available to them by hearing from engineers who are similar to them. Those engineers also answer questions submitted by site visitors to the Ask an Engineer section.\textsuperscript{4} Question topics range from types of projects engineers are working on, to which classes to take for a specific field, to how to deal with academic pressure or being the only girl in the room.

**Writing Contest**

The annual EngineerGirl Writing Contest opens every fall with hundreds of submissions from around the world. The contest gives students the opportunity to combine interests in writing and communication with science and technology and learn about engineering’s contributions to the world and the way we live.

**EngineerGirl Ambassadors**

In 2018, EngineerGirl launched the Ambassadors program.\textsuperscript{5} The Ambassadors are high school girls in the United States who design, develop, and implement projects in their communities to encourage younger girls—particularly those with little access to engineering role models—to think about engineering and engineering careers and give them practical experience in engineering design.

Ambassadors also receive an all-expenses-paid trip to receive training in outreach and network with engineers. The training meeting is either in Washington, D.C., at NAE headquarters, or at the annual Society of Women Engineers conference. Since its inception in 2018, 45 girls have participated in the program.

**Learn More**

The EngineerGirl program seeks to expand to more students from underrepresented groups and underresourced areas. Follow EngineerGirl on its social media channels (@EngineerGirlNAE on Twitter, Facebook, and Instagram) or sign up for the EngineerGirl newsletter (https://www.engineergirl.org/126988/Subscribe) and an educator mailing list.

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\textsuperscript{3} For more, visit https://www.engineergirl.org/4447/Engineers-Directory.
\textsuperscript{4} For more, visit https://www.engineergirl.org/366/Answers.
\textsuperscript{5} The NAE website offers information about how to apply to become an EngineerGirl Ambassador. Visit https://www.engineergirl.org/128630/become-an-ambassador.

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“EngineerGirl has really helped me grow as a person and strengthened my passion for outreach. I learned of the importance of reaching out and setting an example for younger girls interested in STEM. Being an ambassador has helped me persevere through one of my most difficult times. I have become more bold and confident as a leader. I learned to embrace my mistakes rather than fretting over them and have trained myself to have a more positive outlook on my decisions.”

—Rachel Chae, 2019–2020 EngineerGirl Ambassador
Hendler Ross is the public information officer for the Santa Clara Valley Transportation Authority in San Jose, California. Nash is the executive director and Richards is the diversity program administrator of the Office of Diversity and Inclusion for the Metropolitan Atlanta Rapid Transit Authority in Georgia.

This is evident in the cases of two transit agencies at opposite ends of the country: Metropolitan Atlanta Rapid Transit Authority (MARTA), which serves the Atlanta, Georgia, metropolitan area, and the Santa Clara Valley Transportation Authority (VTA), which serves California’s Silicon Valley. Their experiences showcase how the two agencies have prioritized diversity issues and taken a number of steps to ensure that their workforces, policies, and practices reflect the community they serve and address the economic and social disparities present in those communities. To this end, the American Public Transportation Association (APTA)—representing more than 1,500 public- and private-sector member agencies that cover all modes of public transit—has undertaken several leadership efforts to assist all agencies in becoming stronger through diversity and inclusion practices.

Americans are once again living in a defining era for civil rights. The movement for equity in the 1960s drove the enactment of life-changing laws, such as the 1964 Civil Rights Act, the Voting Rights Act of 1965, and the Fair Housing Act of 1968. But the current call for equal rights has spread beyond the United States’ borders and throughout communities around the world. As this movement grows globally, people have the chance to truly examine their individual and collective pasts and to usher in bold, broad, and fundamental change.

The transit industry is in a unique position to fulfill its mission in a way that recognizes and works to eradicate the racism that continues to plague America. VTA is continuing to build on previous work to make equity a priority in planning...
and service delivery. The authority also is seeking new ways to abolish old barriers and create opportunity, internally for employees and externally for passengers.

When former General Manager and CEO Nuria Fernandez took the helm of VTA in 2014, she created an office dedicated to diversity and inclusion with an eye on changing how business is done. Now housed within the VTA Office of Civil Rights, the Diversity, Equity, and Inclusion unit coordinates the many programs and events developed to meet the authority’s equity goals. Beyond complying with federal law regarding equal employment opportunity and Title VI (which prohibits discrimination based on race, color, or national origin in federally funded programs and activities), VTA seeks to make the pursuit of equity a key objective throughout the work it does every day.

BUSINESS DIVERSITY

VTA’s Business Diversity program provides opportunities for small and minority businesses to participate in government contracts. The authority has exceeded the level of inclusion that many agencies engage in to reach out to minority-, disabled veteran-, and women-owned small businesses for contracting; it was the first transit authority in the country to include LGBTQ+ business enterprises for locally funded projects. The program includes a proactive approach to identifying minority-owned businesses that can compete for transportation contracts. It also served as a model for the larger Santa Clara County government, assisting with outreach for the billions of dollars in contracts the county offers.

“Outreach” is the operative word in this initiative, and VTA holds biannual events to connect small businesses and the larger contractors with which they may not otherwise have an opportunity to build relationships and to assist those small businesses in the certification process to pursue contracts.

VTA’s Silicon Valley Bay Area Rapid Transit (BART) Extension—a $7 billion project—is an example of this program in action. The first phase, which opened two stations for passengers in June 2020, was a $2.3 billion project in which VTA spent $159 million with 103 Disadvantaged Business Enterprise (DBE) firms and approximately $35 million with 54 Small Business Enterprise (SBE) firms to extend BART heavy rail service to San Jose. In the second phase, scheduled to start in 2022, VTA seeks to use the same processes employed in the first phase to ensure involvement of DBE and SBE firms. This phase—planned for completion in 2030—involves the construction of four more stations and six miles of track that will extend through downtown San Jose and into Santa Clara.

VTA is partnering with the Black-owned Silicon Valley Minority Business Consortium to connect DBEs and other minority-owned small businesses with large contractors in hopes of creating a more diverse work environment. Work is now under way to encourage these businesses to submit requests for project proposals.

WORKFORCE DIVERSITY, EQUITY, AND INCLUSION

VTA’s workforce is highly diverse; nearly 75 percent of its employees are people of color. From its top management positions to entry-level jobs, the authority is continually focused on best practices to promote and protect equitable policies and services. For example, the VTA Joint Workforce Investment program is a collaborative apprenticeship effort with the Amalgamated Transit Union (ATU) Local 265 and Mission College in Santa Clara. This has been cited as a model program and is replicated by transit agencies throughout the United States.

The program is for bus and light rail operators, service mechanics, overhead line workers, and track workers, and its two main components are leadership and mentorship. Apprentices are exposed to lessons and information they would not normally learn in their everyday jobs in the driver’s seat or while performing maintenance. The lessons combine organizational elements with VTA policies and procedures, leadership training, and industry seminars.

Upon completion, apprentices earn 18 college credits. Mentors are matched with apprentices based on common experiences, backgrounds, or interests. The leadership element encourages entry-level workers—many of whom are minorities—to make their way into higher paying or management jobs.

Jamaine Gibson, workforce development coordinator at ATU, is an example
or affected, particularly under emergency circumstances. The impact of COVID-19, especially on communities of color, laid bare the need to ask (as part of an initial analysis), “Who does this policy help, and who does it hurt?” The nine-month GARE training cohort of 13 VTA employees culminated in a commitment to inject the lessons they learned into the framework of everyday decision making.

The cohort was successful in putting their lessons to work when carrying out a virtual public meeting about the future development of a VTA transit center. Their consideration of equity issues in the planning and execution of the meeting and in VTA policies and procedures that governed the meeting likely attracted dozens more interested community members to the event than usual.

For instance, the cohort collaborated with trusted local facilitators to solicit significant stakeholder engagement; held separate meetings in Spanish and English; presented attendees with an equity and inclusion statement on the importance of affordable housing in the area to address homelessness and housing opportunities based on race; a member of the Ohlone people to conduct a land acknowledgment, which recognized the group as the formal stewards of the land where the transit center will be located; polled participants on their race and ethnicity to ensure

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**EQUITY AND KEY DECISION-MAKING**

To drive authority policies and procedures to be more equitable, VTA is also engaged in the Government Alliance on Race and Equity (GARE), a national network of government agencies working to advance racial equity. GARE guides its members in developing tools to challenge structural racism and establishing policies and programs that lead with racial equity.

The COVID-19 pandemic highlighted the need to prioritize equity considerations when services are changed

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To ensure that VTA maintains a culture of nondiscrimination and equitable treatment, as well as celebrates employees’ differences, its Diversity, Equity, and Inclusion Committee is made up of a cross-section of VTA employees representing a variety of jobs, ethnicities, races, and gender identities. The committee is charged with examining current authority practices, making strategic improvement recommendations to the VTA executive team on how to best implement the Diversity and Inclusion Strategic Plan, and serving as a voice for improving inclusion and a sense of belonging within the organization.

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Presenting to the ATU international president and others, Jamaine Gibson—union workforce development coordinator for VTA—shares information about the Joint Workforce Investment program. Gibson, a graduate of the program, has since left VTA to coordinate a similar initiative for ATU.

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of how the program has fostered career growth within VTA’s diverse community. “When I came to VTA, I had no aspirations outside of driving; not on the management side and not on the union side,” he states. “I really wanted to drive light rail because I didn’t need to interact with many people, but the program pulled things out of me that I didn’t know I had.”

Gibson credits most of his growing success to his mentor, Rhonda Knox, who helped him acclimate to the job of bus operator. “I started participating as a mentor because of her,” he continues, “because I wanted to give back.” Gibson went on to work with ATU to manage the program for VTA, then moved to the international union to help develop similar programs around the United States and Canada.

To ensure that VTA maintains a culture of nondiscrimination and equitable treatment, as well as celebrates employees’ differences, its Diversity, Equity, and Inclusion Committee is made up of a cross-section of VTA employees representing a variety of jobs, ethnicities, races, and gender identities. The committee is charged with examining current authority practices, making strategic improvement recommendations to the VTA executive team on how to best implement the Diversity and Inclusion Strategic Plan, and serving as a voice for improving inclusion and a sense of belonging within the organization.
that there was broad representation; and established that the first meeting was a listening (not a telling) exercise. VTA was there to hear from different communities about what infrastructure projects and transit services they need.

Other initiatives within VTA include periodic authority-sponsored employee celebrations of ethnic diversity, including Chinese New Year, International Day, Black History Month, and Hispanic Heritage Month.

Employees at VTA believe in ensuring that all are served with humanity and dignity and that the authority fulfills its mission of providing true access, safety, and security to all community members, internally and externally.

**Metropolitan Atlanta Rapid Transit Authority**

**PAULA M. NASH,** Executive Director, and **EVELYN L. RICHARDS,** Diversity Program Administrator, Office of Diversity and Inclusion, Metropolitan Atlanta Rapid Transit Authority

Diversity, equity, and inclusion (DE&I) are more than just aspirational words at MARTA. DE&I is woven into its fabric. Public transportation is an equalizer and a gateway opportunity for all, and the authority is steadfastly committed to ensuring that all decisions, activities, programs, and services are equitable for all stakeholders.

MARTA’s vast and ever-changing commitment to DE&I involves constantly seeking innovations in processes and striving to stay ahead of evolving and emerging trends. The authority strategically follows a model intended to incorporate DE&I into every aspect of its business through workforce engagement, its Supplier Diversity program, targeted outreach, customer-centric service, and social equality and responsibility.

**WORKFORCE ENGAGEMENT**

MARTA’s programs are designed with inclusivity in mind to ensure that all employees feel a sense of belonging. This means deploying strategic hiring practices to attract the best talent, contributing to employees’ growth through a career development program, promoting from within, and providing cutting-edge learning content through the MARTA Learn platform.

Engaging employees is critical for retaining valuable talent, and it plays a vital part in employee satisfaction. Cultural awareness programs recognizing the contributions of specific communities, cross-cultural mentoring, and highlighting employees’ accomplishments are some of the ways that diversity is recognized within the organization. As a result of robust workforce engagement efforts, MARTA continues to exceed the labor market’s statistics for minority hires and the turnover rate has fallen steadily in the past three years.

**SUPPLIER DIVERSITY PROGRAM**

MARTA has a commitment not only to its employees but also to its suppliers. The Supplier Diversity program supports equal opportunity for minority- and women-owned businesses to compete fairly for MARTA contracts. It consists of three components: the DBE program, the SBE program, and the Small Business Development (SBD) program.

The DBE program is the cornerstone of the Supplier Diversity program. It ensures that some of MARTA’s contract dollars go to socially and economically disadvantaged businesses. MARTA’s current DBE goal is 23 percent. However, in FY2020, MARTA achieved more than 30 percent DBE participation and also spent approximately $100 million with DBE and SBE firms.

The SBE program makes it possible for small businesses to engage in every opportunity to participate in locally and federally funded contracts under $200,000. MARTA’s SBD program—the final component of the Supplier Diversity program—focuses on fostering positive relationships, mentoring, and capacity-building to assist small businesses in developing skills to compete for opportunities at MARTA.

**TARGETED OUTREACH AND STRATEGIC PARTNERSHIPS**

Outreach efforts extend beyond the work environment and into the community through targeted and strategic partnerships. MARTA’s support of and relationships with key organizations and advisories enable the authority to expand its reach within diverse communities in its service area, continuously improve accessibility and other measures, and include differing perspectives into daily business operations.

This approach to outreach has expanded the community’s knowledge of MARTA, which has resulted in relationship-building within underrepresented communities in...
its service area, broadened opportunities for collaborations, and generated many accolades. For example, in February 2020, Stephanie Lee, Supplier Diversity program analyst at MARTA, was invited to speak at the White House's Entrepreneurs and Innovators Summit. And later in the year, MARTA was selected as a finalist for OUT Georgia’s 2020 Corporate LGBTQ+ Ally of the Year.

CUSTOMER-CENTRIC SERVICE
Focusing on the needs of a diverse customer base is imperative to MARTA’s business; their feedback and recommendations are a necessary component for the authority’s sustainability. MARTA regularly hosts town halls, transit enhancement meetings, and public hearings to hear community concerns about service equity issues.

As an example, MARTA knows that engagement and the voice of the disabled community are vital to its business. To address this community’s concerns, the authority created the MARTA Accessibility Committee, an advisory group designed to assist the authority in achieving greater awareness of the transportation needs of seniors and persons with disabilities. The committee—which supports testing and advising on the accessibility aspect of projects such as signage, announcements, escalators and elevators, fare gates, mobile apps, and MARTA’s website—has proven to be invaluable.

SOCIAL EQUALITY AND RESPONSIBILITY
Service to the community also is a crucial component of MARTA’s ability to be successful. Even though community service always has been a major objective, the importance of social equality was emphasized during last summer’s intense protests sparked by the killing of George Floyd, which occurred in the midst of the COVID-19 public health crisis. MARTA undertook a multipronged approach to reaffirm its commitment to a workplace where employees can be their authentic selves. This approach included intensive racial awareness workshops for leadership, as well as unconscious bias training for all employees. It also included engaging in conversations through a Black Lives Matter e-mail inbox to give voice to employees with ideas about what MARTA could do to make a difference.

Invited by then–White House Policy Advisor for Entrepreneurship and Innovation Ashley Bell (standing), Stephanie Lee (left), MARTA Supplier Diversity program analyst, joined other guest panelists at the Entrepreneurs and Innovators Summit in February 2020. The group discussed the expansion of contracting opportunities and the creation of more mentorship programs for minority-owned businesses.
Additionally, with homelessness being a major issue in the metropolitan Atlanta area, MARTA has launched a year-long pilot program with HOPE Atlanta, a nonprofit organization that offers housing, social services, substance abuse counseling, and employment to those in need. Trained outreach teams actively—but sensitively—engage homeless people on MARTA property, on trains, and in rail stations to help them obtain housing.

Since the pandemic, MARTA’s partnership with the counties it serves has allowed the authority to provide access to COVID-19 testing near MARTA stations and engage in a collaboration with Uber to offer rides to the polls to customers impacted by service disruptions.

**FUTURE DE&I INITIATIVES**

Several of MARTA’s DE&I initiatives slated to start later in 2021 include the implementation of employee resource groups and the Inclusion Matters program.

Employee resource groups are designed to promote an inclusive environment, support personal and professional development, and drive positive business results.

Inclusion Matters involves MARTA’s prime contractors and is geared not only at enhancing the use of minority vendors in large contracts, but it highlights equity issues and brings attention to racial and cultural awareness as these prime contractors work jointly with MARTA staff.

MARTA is one of the United States’ 10 largest public transit agencies. As such, it not only is a provider of transportation, but it also is a hub of diversity reflected in employees who represent 50 countries, the range of services it provides, and the variety of its ridership.

**American Public Transportation Association**

Public transit’s contribution to social equity matters now more than ever. The ongoing pandemic and the tragic deaths of George Floyd, Ahmaud Arbery, Breonna Taylor, and so many others have exposed visible and long-standing racial inequities that are deeply ingrained in American society.

Public transportation professionals have a distinct and critical role and responsibility to advance social and racial equity every day; in their organizations, as well as in the communities they serve. Communities that often are underserved by public transit also are the communities most in need of affordable transportation options. In addition, the country’s essential workers—who also are more dependent on public transit than on other forms of transportation—often live in underserved communities.

As we restore and rebuild transit service throughout and beyond this pandemic, we owe it to communities to

- Connect everyone in a community to vital services such as healthcare, grocery stores, jobs, schools, and affordable housing;
- Work with community leaders in a meaningful way to alleviate rather than aggravate economic disparities; and
- Engage with the transit workforce and riders—all of whom reflect the diversity of communities around the country—in a manner that is culturally sensitive, authentic, and responsive.

Transit agencies around the country are taking significant steps to ensure that their commitment to DE&I is elevated as a central tenet of their organizations’ culture in how they serve their communities. They have established transit equity frameworks by which they are making decisions in areas such as public participation, fares and service coverage, policing, contracting, and performance reporting. For their workforces, they are instituting educational programming and platforms for critical conversations on issues related to race and equity.

APTA’s Diversity and Inclusion Council is leading the development of a racial equity action plan. This plan is not only integral, but it is a priority element of APTA’s Diversity and Inclusion Strategic Plan—in place since October 2017. The action plan underscores the inclusion of differences and similarities, regardless of ability, gender, gender identity, sexual orientation, age, ethnicity, race, and geographic origin.

The Racial Equity Action Plan consists of the following five key areas of action:

1. Providing APTA members—in the public and private sector—with a tangible roadmap for advancing racial equity in their own organizations;
2. Offering educational programming, training, technical support, and resources on practices, policies, and programs that support racial justice and equity;
3. Supporting workforce development from a racial equity perspective;
4. Becoming a more influential advocacy force on racial equity and public transit with a specific aim to promote inclusion and diversity in executive leadership at transit agencies, businesses, and their respective board of directors to better articulate transit’s equity impact and potential; and
5. Working in an impactful way with key partners such as the Conference of Minority Transportation Officials, Latinos in Transit, and other organizations dedicated to racial equity.

APTA is steadfast and energized by this action plan—formally approved by the board of directors in April 2021—and will proactively create and maintain a diverse, inclusive, and equitable environment within the association and across the transit industry. This environment can serve as a model for other transportation organizations and those who are committed to racial equity.

**Acknowledgments**

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1 See the Racial Equity Action Plan and the Diversity and Inclusion Strategic Plan at https://www.apta.com/about/diversity-equity-and-inclusion/.
Rosa Parks
She Wouldn’t Give In, and She Wouldn’t Get Up

CASSANDRA FRANKLIN–BARBAJOSA
The author is Editor of TR News at the Transportation Research Board, National Academies of Sciences, Engineering, and Medicine in Washington, D.C.

It was December 1, 1955, and 42-year-old Rosa Parks had just come off a long day at the Montgomery Fair Department Store, the Montgomery, Alabama, retailer where she worked as a seamstress (1). She routinely took the Cleveland Avenue bus home, but she tried to avoid it when James Blake was behind the wheel. Twelve years before, the white driver had gotten rough with her when she refused to follow the Jim Crow segregation rule that demanded Black passengers pay their fare in front, then disembark the bus and re-enter through the rear door. The driver had grown angry at her lack of cooperation and pulled her by the coat sleeve. Rather than give in, Rosa left the bus (2).

In the segregated South, Jim Crow laws were designed to impose a heavy weight of racial oppression on the backs of Black people. In Montgomery, as elsewhere in the South, the law reserved a bus’s first 10 seats for white passengers only; Black passengers were relegated to the 10 seats in the back. The middle seats were for anyone, as long as no white passenger was left standing (1). Another Montgomery code was less clear: One version stated that segregation must be enforced and upheld. The other stated that no person—Black or white—could

At 5 feet, 3 inches, Rosa Parks was a small woman whose large impact on U.S. civil rights history has yet to be fully measured.
(Photograph: GPA Photo Archive, U.S. Department of State)
Blacks and led by 26-year-old Reverend Martin Luther King, Jr. (2, 5). For more than a year, boycotters and organizers endured failed lawsuits, anger, and violence, drawing international attention. The boycott ended on December 20, 1956, when the U.S. Supreme Court’s written order—following the November 13 ruling that bus segregation is unconstitutional—arrived in Montgomery (2).

Although violence continued in the aftermath, including bombings at four Black churches and the homes of Black leaders, King was elevated to the world stage, and Rosa Parks—who, along with her husband, lost her job during the racial strife—came to be known as the Mother of the Civil Rights Movement (2).

Her stand against the dehumanizing order led to her arrest. Although Rosa—a lifelong, highly respected, and vocal freedom fighter—was released on bail that evening, news of her detainment spread quickly (3). Black ministers, leaders, and community activists rallied the next day to mobilize what became the Montgomery Bus Boycott, a nonviolent protest waged by more than 40,000 Montgomery residents, including 36 Black churches.

White drivers largely ignored that version of the law (2). On that Thursday in December, a distracted Rosa boarded the bus without noticing that James Blake was driving. She took a seat in the first row behind the white section (1). The bus became crowded, and one white man was left standing. The driver then demanded that the four Black passengers on both sides of Rosa’s row stand and make the seats available to the man and any other white riders, essentially moving the line back to expand the white section (a custom that drivers followed on a whim, thanks to the contradictory city law that gave them police authority on their buses). Three of the passengers released their seats. Rosa—in an act of determined defiance—did not (3, 4).

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People always say that I didn’t give up my seat because I was tired, but that isn’t true,” she stated in her autobiography. “I was not tired physically. . . No, the only tired I was, was tired of giving in” (6).
A variety of federal, state, and local certification programs provide contractual opportunities for certain types of disadvantaged businesses, such as those owned by minorities, women, and persons with disabilities. These include the federal Disadvantaged Business Enterprise (DBE) Program, the Minority Business Enterprise (MBE) Program, the Female Business Enterprise Program, the Persons with Disabilities Business Enterprise Program, and the Woman-Owned Business Federal Contracting Program.

Broadly, these programs seek to support the growth and development of businesses owned by people from historically underrepresented groups by providing technical assistance, business support services, and standards promoting their participation in contracts with certain government entities.

This article focuses on the DBE program. Administered by the U.S. Department of Transportation (U.S. DOT), the DBE program was designed as an effort “to remedy ongoing discrimination and the continuing effects of past discrimination in federally assisted highway, transit, airport, and highway safety financial assistance transportation contracting markets nationwide.” It offers an opportunity for small disadvantaged businesses to compete for federally funded transportation contracts initiated by state and local governments. The DBE program is authorized by Congress, most recently in the Fixing America’s Surface Transportation (FAST) Act of 2015.¹

The small business owners who are presumed to be socially and economically disadvantaged for the purposes of DBE certification (unless established otherwise through a certification review) are Asian-Pacific American, Hispanic American, Subcontinent Asian American, African-American, Native American, or women.²

Other small business owners, such as persons with disabilities, may qualify for DBE certification based on an individualized showing of social and economic disadvantage.

U.S. DOT has been statutorily directed to spend at least 10 percent of its total budget for highway and transit assistance programs on small disadvantaged businesses.¹

This article profiles owners of three transportation DBE firms. They discuss what DBE certification means to them and how it has helped them to start and grow their businesses. Although their experiences cannot necessarily be generalized to that of all business owners with DBE certification, they highlight how the certification affects the contracts these owners are awarded.

Profiled in this article are Tanisha Hall, principal and CEO of Fairpointe Planning, LLC, a transportation planning firm in Nashville, Tennessee; Gloria Bender, co-owner of TransSolutions, LLC, a planning and operations consulting business; and Donald Williams, CEO and owner of Weatherspoon & Williams, LLC, a manufacturing and distribution company focused on steel products.

Tanisha Hall, Fairpointe Planning, LLC

Tanisha Hall had more than 20 years of experience as a transportation planner when she founded her company providing transportation planning and public engagement services. She began working on her DBE certification in Tennessee as she was developing her business, and she now has certification in six states.

According to Hall, other certifications—as a women’s business enterprise (WBE), small business enterprise (SBE), or an MBE—often are necessary to stay competitive. Like the DBE certification, these often require separate certifications for each state or municipality in which a business wants to participate. Along with its certified DBE status, Hall’s business is also certified as a WBE and MBE in Tennessee.


Gloria Bender, TransSolutions, LLC

Gloria Bender has nearly 40 years of experience as an industrial engineer, including 23 years as the co-owner of TransSolutions, LLC, a 100 percent women-owned consulting business focused on planning design and operations of buildings and transportation infrastructure.

When TransSolutions was founded in 1998, the firm sought DBE status as a...
Donald Williams, Weatherspoon & Williams, LLC

Donald Williams has more than 45 years as a senior-level financial manager, working in business administration, consulting, and leadership with shareholders, executives, and government officials. He is CEO and owner of Weatherspoon & Williams, LLC (WWLLC), a company that focuses on fabricated steel product manufacture, delivery, and distribution, as well as complete material chain management and procurement.

Some examples of the company’s work include providing metal foundations to support highway infrastructure and supplying and maintaining wayfinding signs. WWLLC is a certified DBE, MBE, and SBE.

Williams recalls that in the past, prime contractors, or primes, had to prove that they included a certain percentage of WBEs and MBES as subcontractors. In the 1980s, the program consolidated WBEs and MBEs so that it was then a goal to get a certain percentage of DBEs. And now, he notes,
TRB promotes diversity in contracting both through the contracts it awards in its Cooperative Research Programs (CRP) and through its committee structure in the Technical Activities Division. TRB considers minority participation in a CRP project as providing viewpoint diversity by encouraging certified minority and disadvantaged businesses to compete for TRB contracts and for majority-owned firms to include a minority or disadvantaged firm among their subcontractors. An alternative approach is to look at such factors as the composition of the research team and whether it includes a large minority-owned business or a well-integrated team of researchers.

After TRB’s committee realignment, the Standing Committee on Contracting Equity—the successor to the former DBE Committee—embraced a broader scope that goes beyond the federal DBE program and focuses on methods to achieve equity in transportation contracting at the federal, state, and local levels.

According to committee chair Joanne Lubart, the committee’s critical concern is focusing on past and current structural and institutional barriers and identifying and implementing measures that enable minority and disadvantaged businesses to participate fully in public-sector procurements.

When you have people who have diversity of thought and in culture, the project team is better able to examine impacts on a variety of communities and look at problems from different perspectives.
Escalators often are considered the best way to convey people between levels in space-constrained airports. Escalator equipment designs and layouts consider people, travel speed, and redundancy, but they rarely account for the baggage and mobility devices that airport travelers bring with them. Many airport escalators are not in proximity to elevators, so travelers usually choose to take their baggage and travel companions on easily located escalators instead of looking for elevators. However, such choices can introduce a risk of escalator falls.

Assessing the Problem
Escalator falls are a significant concern for risk management professionals at airports. *ACRP Synthesis 109*, Project 11-03 supports research that demonstrated that human behavior—not the design or operations of the escalator—is the primary cause of escalator falls (1). Airport escalators are a source of passenger-related accidents primarily due to passenger inattention, failure to hold onto the handrail, and carrying strollers or too much baggage onto the escalator. Elevators are the best and safest alternative to the escalator. In some circumstances, factors such as escalator design and operations may specifically contribute to the number of incidents, but in other cases they may reduce the number.

Another problem is that escalator incident data are not reported using consistent reporting systems. This makes it difficult to compare escalator incident data derived from various airports and objective statistical analysis of incident data impossible. It is possible to see some trends in the data, but consistent reporting systems may provide risk management professionals with access to better statistical tools for evaluating airport escalator incidents.

Solving the Problem
Based on our research, solutions could be broadly categorized into four areas: co-locating elevators and escalators,
modifying escalator operation, increasing public awareness, and educating about escalator safety. However, key factors for improving escalator safety not only include co-locating the elevator with the escalator, but also doing so on the path of travel with wayfinding signage to warn of hazards and to clearly guide people with heightened risk of incidents to elevators.

Newer airport terminal designs are implementing a number of changes to reduce escalator-related incidents, including newer, safer, escalator designs; updated lighting; new signage for wayfinding and escalator use; and co-location of elevators. “Homing” an elevator by showing open doors and green lights makes the elevator a more inviting alternative to escalators.

Three main escalator-based mitigations can increase safety:

1. Reduce escalator speed,
2. Provide three flat steps at the top and bottom, and
3. Install wider step width.

Slowing escalator speeds and adding three flat steps at the top and bottom of an escalator—as recommended by the most recent escalator safety code (ASME A 17.1-2016)—eases transitions on and off the escalator. Wider steps make it easier for passengers to hold the hands of small children. The effectiveness of new escalator fall mitigations require additional research. None of the reviewed literature indicated a preferred or best speed for escalators. Two airports cited in the study operate escalators at 80 and 90 feet per minute rather than 100 feet per minute, and the escalator incident data showed a reduction in the number of incidents.

Other mitigations include instituting airport public safety education programs focused on escalators; improving elevator safety signs and wayfinding visibility for all passengers, including those using wheeled mobility devices; and using remote baggage check-in. Most airports use video surveillance systems to cover escalators as a risk management tool. Some airports also use audio messaging and short videos to supplement passive signage in informing and educating travelers.

Applying Solutions

ACRP Synthesis 109 noted a reduction in escalator incidents, but it is difficult to directly attribute the reductions to changes that were made at four of the airports studied. The research findings were concurrently implemented at several U.S. airports. Two airports—Eugene Airport in Oregon and Sarasota Bradenton International Airport in Florida—reduced the speed of the escalators and experienced a reduction in escalator incidents. Minneapolis–St. Paul International Airport in Minnesota is undergoing a significant airport terminal renovation. The terminal design includes elevators on the main path of travel, with the escalators less conspicuous and off to the side. In addition, the elevators are homed with the doors open. As a direct result of a field visit associated with the ACRP project, Eugene Airport installed new overhead signage to improve wayfinding and elevator visibility, particularly for passengers in wheelchairs.

Overall Benefits

The study results will assist airport risk management professionals in developing mitigation programs for escalator incidents. Reducing the operating speed of escalators and upgrading signage for elevators are short-term and low-cost improvements in escalator safety. Other improvements can include installing bollards: short posts that prevent passengers from taking luggage and other large items onto escalators.

For more information, contact K. M. Hunter-Zaworski, K. M. Hunter-Zaworski, LLC, at hunterzaworski@gmail.com.

REFERENCES


Editor’s Note: Appreciation is expressed to Nancy Whiting, TRB, for her efforts in developing this article.
Tanisha Hall’s path to transportation planning was one of discovery. She started as a business administration major at Southern University at New Orleans but soon learned that some of her classmates were not finding jobs. That prompted her to consider a second major. “A degree in transportation logistics required only 18 extra hours, so I signed up,” she explains. “I was fascinated with it! I never thought about how products get from one place to another.”

Business was still Hall’s primary focus when she entered graduate school at the University of Iowa—until she discovered urban planning. “Growing up in New Orleans, I had always been a public transit user,” she continues. “I caught a bus. I caught a ferry sometimes. I caught a streetcar occasionally. I carpooled to get to class because I didn’t own a car until my junior year of undergraduate school. I was a multimodal user and had never thought about all that. From the start, I was ready to take on the world of business. I was all about the power suits and pumps, but something said, ‘Nope! You’re going to be a planner!’ So I earned a master’s degree in urban planning with an emphasis in transportation.”

Hall’s career first took her to Tennessee, where she served two stints as the research and transportation director for the Greater Nashville Regional Council; then to Georgia as senior transportation planner for the Atlanta Regional Commission; and on to the same role for UrbanTrans Consultants, also in Atlanta. In 2012, she returned to Tennessee to become the long-range planning director for the Tennessee Department of Transportation, where she managed the development of the agency’s 25-Year Long Range Transportation Policy plan, which outlined the state’s long-term vision for transportation. Then, in 2018, she established her own management consulting firm, with a focus on transportation planning.

Hall’s firm uses data analysis, research, and public engagement to help a community identify its transportation issues. Then it recommends ways to improve the community’s transportation mobility. “We focus heavily on community engagement,” she states. “That part really motivates me. If you do engagement well, the rest of the project can go well. But if you don’t do it well, that’s when people get quite upset because they don’t feel heard.”

“Intentionality is extremely important when it comes to having a diverse group of people involved in solving problems.”

Hall’s current projects devise mobility plans for communities that are on the cusp of significant development flowing in from urban areas. “Some are rural communities, and some are just outside of urban areas,” she explains. “They see change coming and want to be proactive in how they prepare for it. We’re working with them to determine how people get around. Are there opportunities to include bicycles and walking? Are they looking at electric charging stations for vehicles? Is there a need to connect parks, libraries, or educational institutions in their mobility? All of these elements factor into the big picture.”

Hall keeps her finger on the industry’s pulse through participation in several organizations and projects. She is the Nashville Chapter vice president of the Conference of Minority Transportation Officials and the Middle Tennessee Chapter past president of the Women’s Transportation Seminar. She also has served on the Special Committee on Research and Innovation for the American Association of State Highway Transportation Officials.

Her work with the Transportation Research Board includes serving as a member of the Standing Committee on Economic Development and Land Use. She has chaired two National Cooperative Highway Research Program (NCHRP) project panels and currently serves as a panel member on NCHRP Project 20-113: Research Roadmap—Transformational Technologies (other than CV/AV).

Hall has observed that minorities are not well represented in the transportation planning field and encourages organizations to embrace diversity: “Be intentional about including different people in your organization. Be intentional about including different people in your projects. Intentionality is extremely important when it comes to having a diverse group of people involved in solving problems.”

Diversity also is important to her company’s mission. “Minorities need to be involved in the research process and be recognized as thought leaders in the industry; it benefits the industry and the public,” she declares. “So many times, we aren’t given chances, and our abilities are discounted. I want to provide opportunities and help grow the next generation of transportation planners, but a diverse group who understands the process, has the skill set, and is ready to go. Someone has to commit to that. Why not me?”
A pioneer in real-time safety research and proactive traffic management, transportation safety planning, connected vehicles, and technology implementation, Mohamed Abdel-Aty is the chair of the Department of Civil, Environmental, and Construction Engineering at the University of Central Florida (UCF). He also leads UCF’s top-ranked transportation group and is the founder and director of its Future City Initiative and new master’s degree program in Smart Cities.

During his time as a civil engineering undergraduate student at Alexandria University in Egypt, Aty gravitated toward transportation, even though focusing on areas of study other than structures was somewhat nontraditional at the time. But civil engineering encompasses so much more, Aty notes: “Once the infrastructure has been well-developed—particularly in the United States—it becomes more about maintaining and managing it all.” He completed his master’s degree work in railroad simulation at Alexandria University and came to the United States to attend a Ph.D. program at the University of California (UC), Davis.

Once at UC Davis, Aty began working in travel demand analysis research and, after completing his dissertation, joined the faculty at UCF. As a young assistant professor, it was key that he find a research niche. Aty had taken courses in safety during his Ph.D. studies; though safety was a relatively new branch of traffic engineering, it was well on its way to becoming its own science.

Aty’s research in safety proved productive. Soon, the field of safety analytics began to expand with the growth in sub-disciplines and ever-evolving technologies. Aty and his students started to broaden their research, particularly into how real-time big data—along with artificial intelligence and machine learning—could be leveraged for safety.

“Start from an idea, then persevere and work on it very hard, and it becomes reality,” Aty comments. “When you can prove it, then you can build it and improve on it. Then it becomes a system.”

Among the new concepts Aty has introduced over the past 20 years—that are now well-accepted in practice—are proactive traffic management, real-time safety risk prediction, and transportation safety planning at the macroscopic level. Many have been emulated and implemented throughout the world, and some are to be included in the Highway Safety Manual.

In November 2019, Aty and his student team won the U.S. Department of Transportation (DOT) Solving for Safety Visualization Challenge. Their research on real-time crash risk visualization using integrated tools for traffic safety evaluation and management has been implemented in Florida and now is included in a U.S. DOT funding opportunity to be implemented by other jurisdictions.

“This is the ultimate objective for an engineer,” Aty observes. “Researchers are happy to generate ideas and get excitement, but the ultimate interest of an engineer is to see the difference in reality.”

Aty’s work on innovative intersection designs contributed to Florida’s Manual on Safety Performance for Intersection Control Evaluation. He invented and evaluated a new intersection design to accommodate high traffic volumes while reducing conflicts, as well as extensive work on interchange safety, including diverging diamond interchanges (DDI), supporting the Florida DOT conversion of 35 interchanges throughout the state to DDI. In addition to numerous safety solutions, Aty’s computer vision and machine learning systems are used by Florida DOT in several applications.

Aty has been active on TRB committees since the late 1990s, when he joined what is now the Standing Committee on Safety Performance and Analysis. He chaired the Second Strategic Highway Research Program Expert Task Group on Roadway Measurement System Evaluation. For the past 11 years, he has coauthored the yearly Synthesis Report on Safety-Related Papers. Outside of TRB, Aty chairs the American Society Civil Engineers Transportation Safety Committee and served as editor-in-chief of the journal Accident Analysis and Prevention.

Aty brings his entire research team—around 25 students—to TRB’s Annual Meeting each year, ensuring that they attend meetings and sessions and present their research. Now, many of both his current and former Ph.D. and master’s students are active on various TRB committees. “One of the truly rewarding experiences as a professor is to work with a lot of students and to really see how this work affects them and their careers and how they develop,” Aty muses.

In 2019, Aty’s paper, “Understanding the Highway Safety Benefits of Different Approaches of Connected Vehicles in Reduced Visibility Conditions,” was one of the five most cited papers in the Transportation Research Record. He also received the 2020 Roy W. Crum Distinguished Service Award from TRB.
Niloo Parvinashtiani
Niloo Parvinashtiani is the technical programs manager at the Institute of Transportation Engineers in Washington, D.C. She is the chair of the Young Member Subcommittee of the Safety and Operations Group; a member of the Young Members Coordinating Council; and an active friend of the Standing Committee on Safety Performance and Analysis, the Standing Committee on Freeway Operations, and the Standing Committee on Regional Transportation Systems Management and Operations.

How did you first hear about and become involved with the Transportation Research Board (TRB)?
I first heard about TRB as a graduate student when my advisor announced an opportunity for a limited number of students in the research group to receive travel funding support to the 2016 TRB Annual Meeting. I was one of the few lucky ones to be selected. It was my first annual meeting, so I was amazed—and overwhelmed—by the large number of attendees, numerous sessions and meetings, and all the networking opportunities. Since then, I have been fortunate to attend the annual meeting every year and have gained a deeper understanding of TRB as an organization.

How has TRB influenced your career so far?
As a younger person, learning how TRB works has helped me understand how the transportation industry works. I see TRB as a home for the creation, coordination, and expansion of collaborative activities among transportation leaders, organizations, and key industry groups. This knowledge has given me a clearer vision for my career pathway. I also have been able to enhance my leadership skills by volunteering to organize webinar series, workshops, and other activities through the TRB Young Members Coordinating Council.

What was one of your most memorable TRB Annual Meeting moments?
Even though the TRB Annual Meeting is usually a packed event where five days seem like at least five weeks, I still feel excited to come back every year and see what my takeaways will be. During the opening weekend of the 2019 meeting, the Washington, D.C., area had a heavy snowfall. With the Metro shut down and no ride-hailing option, the commute was very challenging. I had to ask my husband to give me a ride. Not everyone who registered made it to the meeting, but it was memorable for the ones who did.

Let’s Hear From You!
Many of you are familiar with the TR News Centennial Quotes feature borrowed from the musings you posted in the Tell Us Our Story segment of TRB’s website. You’ve had such great things to say, and with TRB’s centennial year officially over, TR News has continued publishing your words in our Volunteer Voices segment. Now, we’re going a step further by introducing our own question-and-answer spinoff, and you’re invited to participate.

In each issue, we will pose a single—and mostly light and fun—transportation-related question. To answer, just e-mail us at TRNews@nas.edu and follow these few simple rules:

- Include “Volunteer Voices: [the question you’re answering]” in the subject line;
- Answer the question thoroughly, but keep it brief (sorry, but we can’t publish the first chapter of your new book); and
- Attach a current high-res (300 dpi and/or 1 MB minimum) headshot of yourself.

That’s it!
When the issue is published, we’ll send you a pdf of the page that features your response. Please note that, like all TR News content, your response will be subject to editing for grammar, length, and TRB style. And we may need to contact you for clarification, so add us to your contact list.

Now that you have the details, here is the question:

If you were a vehicle, which would you be and why?
CONSENSUS REPORT

Options for Reducing Lead Emissions from Piston-Engine Aircraft

TOM MENZIES AND RAY WASSEL

Menzies is the director of the Consensus and Advisory Studies Division, Transportation Research Board, and Wassel is a scholar at the Board on Environmental Studies and Toxicology, Division on Earth and Life Studies, National Academies of Sciences, Engineering, and Medicine, Washington, D.C.

Gasoline-powered, piston-engine aircraft are the single largest emitter of lead in the United States. Lead is added to aviation gasoline (avgas) to raise the octane levels needed by many of these aircraft for safe flight performance. When emitted from aircraft exhaust, lead can be inhaled by people living near and working at airports. Lead exposures can also occur from exhaust deposited on soil and other surfaces, spills and vapor emitted during refueling, and contact with residue left on aircraft engines and other components. Lead is a highly toxic substance that can result in many negative health effects; even at low exposures as measured by blood lead levels, lead has been linked to effects such as decreased cognitive performance in children.

At least one-third of the gasoline-powered aircraft fleet has high-compression piston engines, which require high-octane avgas with lead additives for safe operation. The other share of the fleet could use avgas with lower octane levels and no added lead. Gasoline-powered aircraft are used for most personal and recreational flying. They are also used for transportation in rural and remote regions and for performing critical societal functions such as medical airlifts, aerial firefighting, business transport, pilot training, and search and rescue. Aircraft with high-compression engines perform many of these functions. Therefore, they account for a disproportionately large share of avgas consumption.

Because the total market for avgas is small and fueling infrastructure is limited at most of the country’s airports, leaded avgas is usually the only fuel available to operators of all gasoline-powered aircraft—including operators of the many small aircraft that do not require high-octane fuel. This grade of avgas supplied is designated “100LL,” where “100” refers to the octane level and “LL” stands for “low lead.”

THE STUDY

The Federal Aviation Administration (FAA) Reauthorization Act of 2018 called for the National Academies of Sciences, Engineering, and Medicine to study options for mitigating and reducing lead from aviation, including options for changing fuels and aircraft operations and practices at airports. The National Academies formed a committee of 10 members providing

The congressionally mandated report Options for Reducing Lead Emissions from Piston-Engine Aircraft concludes that federal agencies should coordinate efforts across a range of mitigation pathways to achieve sustained, tangible lead reductions in avgas.

For More Information

This study was sponsored by FAA. Any opinions, findings, conclusions, or recommendations expressed in this publication do not necessarily reflect the views of any organization or agency that provided support for the project. Copies of Consensus Study Report: Options for Reducing Lead Emissions from Piston-Engine Aircraft are available from the Transportation Research Board or https://www.nap.edu/catalog/26050.
expertise in air pollution, airport planning and operations, fuels and emissions regulation, health risk assessment, statistics, and mechanical and aviation engineering.

After examining potential mitigation options, the committee concluded that at present no single option could guarantee lead’s full or near-elimination and that achieving sustained and tangible reductions will require concerted efforts across a range of mitigation pathways.

For nearly a decade, FAA, fuel developers, and the general aviation (GA) industry have collaborated to develop an unleaded “drop-in” fuel that can be used by all gasoline-powered aircraft, including those that require high octane. Formidable technical challenges mean that success has remained elusive, but the committee recommended that those collaborative efforts continue as part of a comprehensive lead mitigation strategy that also includes pathways for making near- and mid-term progress in reducing lead emissions and exposures.

**CHANGES TO AIRPORT OPERATIONS AND PRACTICES**

To ensure that pilots, aircraft owners, airport managers and personnel, and aircraft technicians understand the hazards created by leaded avgas, the committee suggested that FAA partner with prominent GA organizations to initiate an ongoing campaign for education, training, and awareness of aviation lead exposure targeted to pilots, aircraft technicians, and others who work at airports.

Shortly before takeoff, a pilot conducts a “run-up,” briefly bringing the engine of the stationary aircraft up to high power to confirm the engine’s safe operation. Air quality studies at airports have shown that engine run-ups can contribute to significant airborne lead concentrations near run-up areas.

FAA should update its guidance on the location of run-up areas to reflect the results of recent research, including the need to account for both the emissions of engine run-ups and takeoffs when analyzing the geographic distribution of lead emissions at the airport.

**CHANGES TO EXISTING FUELS AND THEIR SUPPLY**

A high-octane grade of avgas that contains less lead than 100LL, known as “100VLL” (very low lead), could be used by all piston-engine aircraft. Fleetwide use of 100VLL could reduce total lead emissions by nearly 20 percent; however, this grade of leaded avgas is not currently being produced. FAA should research quickly implementable public policy options to motivate refiners to produce 100VLL and encourage airports to supply it.

A large portion of the current piston-engine fleet could use lower-octane unleaded avgas, including an existing grade known as “UL94.” If all of these eligible aircraft were to use this fuel, aviation lead emissions could be reduced by about 30 percent. However, this outcome would require investments by airports in additional fuel storage and dispensing capacity.

FAA should research public policy options, including those that may require congressional involvement, to enable and encourage greater use of available unleaded avgas. The options might include providing incentives for airports to supply unleaded avgas and pilots to use it on eligible aircraft.

**PURSUIT OF LEAD-FREE FUELS AND PROPULSION SYSTEMS**

Although technically challenging, the development and deployment of lead-free, high-octane avgas can eliminate lead emissions without requiring changes to aircraft equipment and operations or airport investments in additional fuel storage and dispensing capacity. FAA should keep collaborating with the GA industry, aircraft users, airports, and fuel suppliers to search for and deploy an acceptable and universally usable unleaded replacement fuel.

Tangible success is being demonstrated by aircraft engine makers creating high-performance gasoline engines that can run on existing grades of unleaded avgas. In addition, innovations in lead-free propulsion technologies (such as diesel, electric, and gas turbine) show increasing potential for GA aircraft. Considering these developments, a clear goal should be established that, after a certain point, all newly certified and newly produced gasoline-powered aircraft can operate with at least one unleaded fuel. Congressional action to establish the goal and timeframes would be desirable.

**FEDERALLY COORDINATED EFFORT**

Success in designing and implementing a multipathway lead mitigation strategy will require continued coordination by federal agencies having relevant responsibilities and authorities, such as the U.S. Environmental Protection Agency and the Occupational Safety and Health Administration. It will also require an ongoing commitment to research, data collection, and analysis.
M any recent and upcoming TRB reports, events, and projects tackle the issues of diversity, equity, and inclusion in transportation. Listed here is a sampling of this research, along with links to find out more, if applicable.

**BLOG POSTS**


“Building Socioeconomic Equity Through Transportation Research,” [www.nationalacademies.org/trb/blog/building-socioeconomic-equity-through-transportation-research](www.nationalacademies.org/trb/blog/building-socioeconomic-equity-through-transportation-research)


**PODCASTS**

Transportation Explorers
“Anthony Foxx and Equity” [https://www.nap.edu/trb/podcasts/](https://www.nap.edu/trb/podcasts/)

Racial Equity Addendum to Critical Issues in Transportation (upcoming)

Study on the Feasibility of In-Cabin Wheelchair Restraint Systems (upcoming)

**CONSENSUS AND ADVISORY STUDIES**

COVID-19 Addendum to Critical Issues in Transportation, [www.trb.org/Main/Blurbs/181670.aspx](www.trb.org/Main/Blurbs/181670.aspx)

Racial Equity Addendum to Critical Issues in Transportation (upcoming)

Study on the Feasibility of In-Cabin Wheelchair Restraint Systems (upcoming)

**E-CIRCULARS AND CONFERENCE PROCEEDINGS**


Transportation Research Circular E-C262: TRANSED 2018, the International Conference on Mobility and Transport for Older Adults and People with Disabilities, [www.trb.org/Publications/Blurbs/180616.aspx](www.trb.org/Publications/Blurbs/180616.aspx)

Transportation Research Circular E-C264: Conference on Health and Active Transportation, [www.trb.org/Publications/Blurbs/181036.aspx](www.trb.org/Publications/Blurbs/181036.aspx)


**TRANSPORTATION RESEARCH RECORD**

A special collection of articles by TRB Minority Student Fellows can be found at [https://journals.sagepub.com/topic/collections-trr/trr-1-special_collection_publications/trr](https://journals.sagepub.com/topic/collections-trr/trr-1-special_collection_publications/trr).

Two special collections of articles, on equity and on COVID-19, will be available at [https://journals.sagepub.com/home/trr](https://journals.sagepub.com/home/trr) in late 2021.

**UPCOMING CONFERENCES**

September 2021
Conference on Advancing Transportation Equity. Hosted by the Standing Committee on Equity in Transportation. For more information, visit www.trb.org/Calendar/Blurbs/181501.aspx.

Late 2021 or early 2022
Critical Issues in the Airport Industry: Workshop #9, Issues on Systemic Racism. Part of the Airport Cooperative Research Program’s Insight Series. For more information, visit www.trb.org/ACRP/ACRP-Insight-Events.aspx.

Cooperative Research Programs

AIRPORT COOPERATIVE RESEARCH PROGRAM (ACRP)

NATIONAL HIGHWAY RESEARCH PROGRAM (NCHRP)

TRANSIT COOPERATIVE RESEARCH PROGRAM (TCRP)
TCRP Research Report 214: Equity Analysis in Regional Transportation Planning Processes

UPCOMING COOPERATIVE RESEARCH PROGRAMS REPORTS
ACRP
Assessing Airport Programs for Travelers with Disabilities and Older Adults
NCHRP
Access to Jobs, Economic Opportunities, and Education in Rural Areas NCHRP:
Attracting, Retaining, and Developing the Transportation Workforce: Transportation Planners
Rural Transportation Issues: Research Roadmap
State DOT Contributions to the Study, Investigation, and Interdiction of Human Trafficking
TCRP
Addressing Disproportionate Share of Health, Economic, and Transportation Impacts for Lower-Income Households and Communities of Color
Homelessness: A Guide for Public Transportation
Impact of Transformational Technologies on Underserved Populations
Maintaining Transportation Services for People with Disabilities, Paratransit, and Other Service Needs During a Pandemic
Measuring and Managing Fare Evasion
Racial Equity, Black America, and Public Transportation
Resource Guide for Improving Diversity and Inclusion Programs for the Public Transportation Industry
Tactile Wayfinding in Transportation Settings for Travelers Who Are Blind or Visually Impaired

TRB HIGHLIGHTS
IN MEMORIAM

Martin Wachs
1941–2021

Martin Wachs, Distinguished Professor Emeritus and founder of the University of California, Los Angeles (UCLA), Institute of Transportation Studies, died in April. He was 79.

Along with his status as a preeminent figure in transportation planning, Wachs was a caring and generous teacher and mentor to generations of planners and engineers. A champion of equity in transportation and urban planning, Wachs was one of the first scholars to address transportation’s relationship to social equity, environmental quality, and community values.

After joining the UCLA urban planning faculty in 1971, Wachs served as department chair for three terms. He won many teaching and graduate advising awards over the years from UCLA and from the University of California, Berkeley, where he also taught.

Wachs served on the TRB Executive Committee from 1995 to 2004 and as chair in 2000. He attended more than 55 TRB Annual Meetings during the course of his career, and at the 2010 Annual Meeting, delivered the Thomas B. Deen Distinguished Lecture on “Transportation Policy, Poverty, and Sustainability: History and Future.”

Wachs’ research on the mobility needs of older adults won the TRB Pyke Johnson Award for Outstanding Paper in Transportation Planning in 1976. He won the award again in 2019. He wrote more than 160 articles and five books—as well as several TR News articles—on topics from transportation systems to land use and air quality in transportation planning.

COOPERATIVE RESEARCH PROGRAMS

New Slate of Research

Auburn University has received a $300,000, 30-month contract [National Cooperative Highway Research Program (NCHRP) Project 12-123, FY 2021] to develop a proposed AASHTO guideline for load rating of segmental bridges; propose revisions to the AASHTO Manual for Bridge Evaluation and the AASHTO LRFD Bridge Design Specifications, if necessary; and develop detailed rating examples with supporting training materials to demonstrate the proposed guideline and revisions to AASHTO specifications.

For more information, contact Waseem Dekelbab, 202-334-1409 or wdekelbab@nas.edu.

PROPOSED AASHTO GUIDELINE FOR LOAD RATING OF SEGMENTAL BRIDGES

First built in the United States in the 1970s, segmental bridges are constructed in short sections or segments that are either precast or cast-in-place concrete. The design and construction of the earliest of these bridges differ significantly from current AASHTO load and resistance factor design (LRFD), load factor rating (LFR), and load and resistance factor rating (LFRF) methodologies. A load rating guideline is needed to accurately determine the load rating capacity of segmental bridges to ensure safety and mobility.

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GUIDELINES FOR THE DESIGN OF PRESTRESSED CONCRETE BRIDGE GIRDERS USING FRP AUXILIARY REINFORCEMENT

State departments of transportation (DOTs) have been investigating alternative reinforcement materials such as fiber reinforced polymers (FRPs) to extend the service life of highway structures, especially in aggressively corrosive environments. Current AASHTO FRP guide specifications do not address the design of FRP auxiliary (non-prestressed) reinforcement in...
DYNAMIC CURBSIDE MANAGEMENT: KEEPING PACE WITH NEW AND EMERGING MOBILITY AND TECHNOLOGY IN THE PUBLIC RIGHT OF WAY

The transportation ecosystem is evolving, with a rapidly increasing array of new mobility and delivery options offered by public and private entities. This creates increased demand for space at the curb where passengers are picked up and dropped off, shared and private vehicles are stored, freight and parcels are loaded or delivered, and users transfer between travel modes. More and more, jurisdictions are seeking to better manage curbside activity using dynamic curbside management. These management strategies largely have been the purview of cities, but state DOTs and other regional agencies can be important partners because, in many cases, roadways and other curb zone elements are part of the regional or state network.

Fehr & Peers has received a $299,896 contract [NCHRP Project 20-102(26), FY 2020] to develop a proposed AASHTO guideline for load rating of segmental bridges.

Workers monitor the assembly of a segmental bridge on the High Five—the intersection of I-635 and US-75—in Dallas, Texas. An NCHRP project is underway to develop a proposed AASHTO guideline for load rating of segmental bridges.
News Briefs

North Carolina Department of Transportation Kicks Off Updated Long-Range Plan

After two years, input from 30,000 survey participants, and outreach to more than three million people via community events, stakeholder meetings, social media interactions, and presentations, North Carolina Department of Transportation has launched its updated long-range plan: NC Moves 2050.

The plan—deliberately focused on engaging North Carolinians in transportation-related decisions—provides a blueprint for developing a more responsive, diverse, and inclusive transportation system that will keep people and products moving safely and efficiently throughout the state.

The plan’s main objectives are
1. Provide transportation access for all.
2. Improve transportation through technology.
3. Ensure safety and security.
4. Support a strong economy.
5. Maintain a high-quality system.

NC Moves 2050 includes an interactive online tool that anyone can access to explore the plan processes, survey results, and the steps North Carolina must take to prepare for the decades ahead.

To explore the plan online, visit https://www.ncdot.gov/initiatives-policies/Transportation/nc-2050-plan/Pages/default.aspx.

INTERNATIONAL

For People with Disabilities, Mobility Goes Beyond Infrastructure

A recent UK study looks at more than the availability of typical accessibility measures—such as sidewalk ramps and broad elevators—for people with disabilities. Mobility Justice and Transport Inclusivity is a guidance document that is part of the Healthy Streets Everyday Project, a Mayor of London Air Quality Fund initiative that commits to delivering healthy streets throughout the capital city—with pedestrians as the priority.

The report includes facts such as the following:
• Only 80 of the 270 London Underground stations provide some form of step-free access, and
• In 2017, 65 percent of people with disabilities used public transport at least once a week.

However, a key component of the report are interviews of five Londoners with mobility impairments, who provide their perspectives on the emotional and psychological challenges they experience while navigating the city.

All of the interviewees agreed that they experience a degree of anxiety when they anticipate using public transport or spaces. One participant expressed frustration over the logistics of riding a train, such as the time it takes to plan the journey, the long telephone conversations to book a wheelchair ramp, arriving well in advance of the train departure, and hoping that the right people will be there to assist.

Other concerns expressed include the following:
• Inability to board a bus that is full of baby strollers in the aisle,
• Broken and buckled pavement that result from tree roots,
• Trash cans that block the sidewalks, and
• Fear that such obstructions will cause the wheelchair to flip over into the street and result in serious injury.

Another participant lessens her anxiety by using an online journey planning app that tells her whether a building is accessible.

Although strangers are willing to help, participant Katouche Goll, a 23-year-old mobility scooter user with cerebral palsy, examines how she feels about such assistance. “I am reliant on other people,” she says, “not because I need their help but because I am disempowered by how everything is structured. Immediately, you are putting so much of your personal space and belongings in the possession of other people. It’s a very infantilizing experience.”

Jo Becker, a former Transport of London employee with a recently acquired mobility impairment, concludes: “If you get it right for disabled people, you get it right for the parents with buggies. You get it right for people with luggage. You get it right for anyone with a broken leg, or an injury, or anyone who is older or may be feeling confused.”

To read the report, go to Mobility-Justice-and-Transport-Inclusivity-Healthy-Streets-Everyday-CRP-FINAL.pdf (crossriverpartnership.org).
Mobility on Demand in the Los Angeles Region: Evaluation of the Use and Performance of the MOD Pilot

This report looks at the Los Angeles mobility on demand (MOD) pilot project on two broad levels. First, was the MOD structured to offer a good test of whether ride-hailing expands access for low-income populations and those who do not use banks? Second, is there evidence that MOD improved access for low-income populations and those who do not use banks?

To download a free copy, visit enotrans.org.

Mobility on Demand in the Puget Sound Region: Evaluation of the Use and Performance of the MOD Pilot

This report concentrates on the actual ridership impacts of the Link light rail service: how many people used it, whether they represented all segments of the population living in the study area, and whether the availability of the service for first-mile/last-mile trip-making changed their use of Link.

To download a free copy, visit enotrans.org.

Mobility Lessons Learned: A Summary of the MOD Pilots in the Los Angeles and Puget Sound Regions

This report summarizes the final analysis conducted by research teams in each region. It is framed around the fundamental questions of the pilot: How did the MOD services work? Whom did they serve? Where did this service primarily take place?

To download a free copy, visit enotrans.org.

The titles in this section are not TRB publications. To order, contact the publisher listed.
Guide for Quantitative Approaches to Systemic Safety Analysis
NCHRP Research Report 955
This report provides guidance to state departments of transportation and other transportation agencies on how to apply a systemic safety management approach for identifying safety improvement projects.
2020; 108 pp; TRB affiliates, $58.50; nonaffiliates, $78. Subscriber categories: highways, safety and human factors.

Airport Workforce Programs Supporting Employee Well-Being
ACRP Synthesis 113
This synthesis details the most commonly used well-being program offerings at airports. Benefits of these programs to airports include reduced health care costs, improved productivity, decreased absenteeism, improved employee recruitment and retention, and camaraderie and teamwork among employees.
2020; 72 pp; TRB affiliates, $50.25; nonaffiliates, $67. Subscriber category: aviation.

Understanding Impacts to Airports from Temporary Flight Restrictions
ACRP Research Report 224
This report identifies financial and other ramifications of temporary flight restrictions on airports and aviation-related businesses.
2020; 76 pp; TRB affiliates, $52.50; nonaffiliates, $70. Subscriber category: aviation.

Planning and Design of Airport Terminal Restrooms and Ancillary Spaces
ACRP Research Report 226
This report provides a thoughtful step-by-step process to help airport industry practitioners plan, design, and implement terminal restroom and other ancillary amenity projects.
2021; 120 pp; TRB affiliates, $59.25; nonaffiliates, $79. Subscriber categories: aviation, design, terminals and facilities.

Airport Collaborative Decision Making (ACDM) to Manage Adverse Conditions
ACRP Research Report 229
This report proposes a step-by-step approach to achieve ACDM implementation—supported by templates and a workbook—to involve stakeholders, define common goals and objectives, appoint leadership for the initiative, tailor a vision that serves local needs, and develop a roadmap of successful projects that deliver practical improvements.
2021; 64 pp; TRB affiliates, $48; nonaffiliates, $64. Subscriber categories: aviation, operations and traffic management, safety and human factors.

Maintenance Planning for Rail Asset Management—Current Practices
TCRP Synthesis 151
This synthesis presents the results of a survey and analysis of the response data in an effort to synthesize current practices.

Characteristics and Elements of Nonpunitive Employee Safety Reporting Systems for Public Transportation
TCRP Research Report 218
This report compiles the best practices used in nonpunitive employee safety reporting systems at transit agencies. The importance of safety cannot be overstated and requires continued shifts in the approach to safety management within the public transportation industry.
2020; 276 pp; TRB affiliates, $79.50; nonaffiliates, $106. Subscriber categories: public transportation, safety and human factors.

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SAGE is the publisher of the Transportation Research Record: Journal of the Transportation Research Board (TRR) series. To search for TRR articles, visit http://journals.sagepub.com/home/trr. To subscribe to the TRR, visit https://us.sagepub.com/en-us/nam/transportation-research-record/journal203503#subscribe.

To order the TRB titles described in Bookshelf, visit the TRB online bookstore, www.TRB.org/bookstore, or contact the Business Office at 202-334-3213.
**MEETINGS, WEBINARS, AND WORKSHOPS**

### July

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Details</th>
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<tbody>
<tr>
<td>12–14</td>
<td>International Symposium on Frontiers of Road and Airport Engineering*</td>
<td>Online&lt;br&gt;&lt;br&gt;For more information, contact Nelson Gibson, TRB, 202-334-2953, <a href="mailto:NGibson@nas.edu">NGibson@nas.edu</a>.</td>
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<tr>
<td>12–15</td>
<td>2021 Automated Road Transportation Symposium</td>
<td>Online&lt;br&gt;&lt;br&gt;For more information, contact Richard Cunard, TRB, 202-334-2963, <a href="mailto:RCunard@nas.edu">RCunard@nas.edu</a>.</td>
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<td>12–21</td>
<td>Joint Committee Meeting: TRB Roadside Safety Design and AASHTO Technical Committee on Roadside Safety</td>
<td>Online&lt;br&gt;&lt;br&gt;For more information, contact Nelson Gibson, TRB, 202-334-2953, <a href="mailto:NGibson@nas.edu">NGibson@nas.edu</a>.</td>
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<td>13</td>
<td>How We Move Matters: Exploring the Connections Between New Transportation and Mobility Options and Environmental Health—A Workshop</td>
<td>Online&lt;br&gt;&lt;br&gt;For more information, contact Sarah Harper, TRB, 202-334-3353, <a href="mailto:SHarper@nas.edu">SHarper@nas.edu</a>.</td>
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<td>16</td>
<td>FHWA Long Term Infrastructure Performance (LTIP) Pavements Committee Meeting</td>
<td>Online&lt;br&gt;&lt;br&gt;For more information, contact Michael Covington at 202-334-2265 or <a href="mailto:MCovington@nas.edu">MCovington@nas.edu</a>.</td>
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<td>16</td>
<td>TRB Webinar: Are We All in the Same Boat? Involving Communities in Coastal Resilience</td>
<td>Online&lt;br&gt;&lt;br&gt;For more information, contact Elaine Ferrell, TRB, 202-334-2399, <a href="mailto:Eferrell@nas.edu">Eferrell@nas.edu</a>.</td>
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Please contact TRB for up-to-date information on meeting cancellations or postponements. For Technical Activities meetings, please visit www.TRB.org/calendar or e-mail TRBMeetings@nas.edu. For information on all other events or deadlines, inquire with the listed contact.

*TRB is cosponsor of the meeting.

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**MEMBERS ON THE MOVE**

**Howard Ressel**, a project design engineer at the New York State Department of Transportation, retired at the end of April 2021. He most recently served as panel chair of NCHRP Project 22–37.

**Reggie Gillum**, customer service and marketing associate at the Transportation Research Board, retired on May 28, 2021, after 33 years.

To subscribe to the TRB E-Newsletter and keep up to date on upcoming activities, go to www.trb.org/Publications/PubsTRBENewsletter.aspx and click on “Subscribe.”
INFORMATION FOR CONTRIBUTORS TO TR NEWS

TR News welcomes the submission of articles for possible publication in the categories listed below. All articles submitted are subject to review by the Editorial Board and other reviewers to determine suitability for TR News; authors will be advised of acceptance of articles with or without revision. All articles accepted for publication are subject to editing for conciseness and appropriate language and style. Authors review and approve the edited version of the article before publication. All authors are asked to review our policy to prevent discrimination, harassment, and bullying behavior, available at https://www.nationalacademies.org/about/institutional-policies-and-procedures/policy-of-harrassment.

ARTICLES

FEATURES are timely articles of interest to transportation professionals, including administrators, planners, researchers, and practitioners in government, academia, and industry. Articles are encouraged on innovations and state-of-the-art practices pertaining to transportation research and development in all modes (highways and bridges, public transit, aviation, rail, marine, and others, such as pipelines, bicycles, pedestrians, etc.) and in all subject areas (planning and administration, design, materials and construction, facility maintenance, traffic control, safety, security, logistics, geology, law, environmental concerns, energy, technology, etc.). Manuscripts should be no longer than 3,000 words. Authors also should provide tables and graphics with corresponding captions (see Submission Requirements). Prospective authors are encouraged to submit a summary or outline of a proposed article for preliminary review.

MINIFEATURES are concise feature articles, typically 1,500 words in length. These can accompany feature articles as a supporting or related topic or can address a standalone topic.

SIDEBARS generally are embedded in a feature or minifeature article, going into additional detail on a topic addressed in the main article or highlighting important additional information related to that article. Sidebars are usually up to 750 words in length.

POINT OF VIEW is an occasional series of authored opinions on current transportation issues. Articles (1,000 to 2,000 words) may be submitted with appropriate, high-quality graphics, and are subject to review and editing.

RESEARCH PAYS OFF highlights research projects, studies, demonstrations, and improved methods or processes that provide innovative, cost-effective solutions to important transportation-related problems in all modes. Research Pays Off articles should describe cases in which the application of project findings has resulted in benefits to transportation agencies or to the public, or in which substantial benefits are expected. Articles (approximately 750 to 1,000 words) should delineate the problem, research, and benefits, and be accompanied by the logo of the agency or organization submitting the article, as well as one or two photos or graphics. Research Pays Off topics must be approved by the RPO Task Force; to submit a topic for consideration, contact Nancy Whiting at 202-334-2956 or nwhiting@nas.edu.

OTHER CONTENT

TRB HIGHLIGHTS are short (500- to 750-word) articles about TRB-specific news, initiatives, deliverables, or projects. Cooperative Research Programs project announcements and write-ups are welcomed, as are news from other divisions of the National Academies of Sciences, Engineering, and Medicine.

BOOKSHELF announces publications in the transportation field. Abstracts (100 to 200 words) should include title, author, publisher, address at which publication may be obtained, number of pages, price, Web link, and DOI or ISBN. Publishers are invited to submit copies of new publications for announcement (see contact information below).

SUBMISSION REQUIREMENTS:

› Articles submitted for possible publication in TR News and any correspondence on editorial matters should be sent to the TR News Editor, Transportation Research Board, 500 Fifth Street, NW, Washington, DC 20001, 202-334-2986 or 202-334-2278, and lcamarda@nas.edu or cfranklin-barbajosa@nas.edu.

› Submit graphic elements—photos, illustrations, tables, and figures—to complement the text. Images must be submitted as TIFF or JPEG files and must be at least 3 in. by 5 in. with a resolution of 300 dpi. Large photos (8 in. by 11 in. at 300 dpi) are welcomed for possible use as magazine cover images. A detailed caption must be supplied for each graphic element.

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