



TRANSPORTATION
RESEARCH
BOARD

FINAL PROGRAM



Managing Roadways and Transit Together to Move People into a New Age of Technology

Joint Midyear Conference

September 25–27, 2018

Hilton Bellevue
Bellevue, Washington

*Sponsored by TRB Standing Committees on
Managed Lanes,
Freeway Operations, and
Transit Management and Performance and
Joint Subcommittee on Active Traffic Management*

*Supported by
Washington State Department of Transportation
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THANK YOU!

TRB sincerely appreciates the following organizations for their generous support of the Managing Roadways and Transit Together Joint Midyear Conference 2018

Platinum



Gold



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WELCOME

Welcome to *Managing Roadways and Transit Together to Move People into a New Age of Technology* jointly sponsored by the TRB Standing Committees on Managed Lanes, Freeway Operations, and Transit Management and Performance. We are thrilled to be gathering with you in Bellevue to explore this theme as it is evolving in the Pacific Northwest and nationally.

This conference brings together professionals from across the industry to discuss emerging ideas related to freeway operations, managed lanes, and public transit—with a focus on cross-cutting relationships and knowledge sharing. Conference activities and events include technical sessions, a poster session, technical tours, and a student paper competition. All sponsors sincerely appreciate your participation and the support of the firms and organizations that have helped underwrite the cost of this conference. We look forward to meeting each of you and encourage your engagement in other TRB-related activities.

Casey Emoto, Managed Lanes Committee Co-Chair

Chuck Fuhs, Managed Lanes Committee Co-Chair

Beverly Kuhn, Freeway Operations Committee Chair

Amy Van Doren, Transit Management and Performance Committee Chair

The **Transportation Research Board** is one of seven major programs of the National Academies of Sciences, Engineering, and Medicine. The mission of the Transportation Research Board is to increase the benefits that transportation contributes to society by providing leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal. The Board's varied committees, task forces, and panels annually engage about 7,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The program is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation.

www.TRB.org

CONFERENCE AT A GLANCE

Tuesday, September 25, 2018

8:00 a.m.–9:00 a.m.	Continental Breakfast	Conference Foyer
8:00 a.m.–5:00 p.m.	Registration	Conference Foyer
9:00 a.m.–Noon	Transit Management and Performance Committee (AP010)	Kirkland
9:00 a.m.–1:00 p.m.	Technical Tour: Washington State DOT I-405 Express Lanes and Traffic Management Center	Conference Foyer
1:00 p.m.–2:00 p.m.	Lunch (<i>On Your Own</i>)	
2:00 p.m.–3:30 p.m.	Opening Session: Opportunities and Challenges in the Pacific Northwest	Bellevue Grand Ballroom AB
4:00 p.m.–5:30 p.m.	Technical Session 1: Performance-Based Operations of Managed Lanes Facilities	Bellevue Grand Ballroom AB

Wednesday, September 26, 2018

7:30 a.m.–8:30 a.m.	Continental Breakfast	Conference Foyer
7:30 a.m.–5:00 p.m.	Registration	Conference Foyer
8:30 a.m.–10:00 a.m.	Technical Session 2: Using Managed Lanes to Support Transit	Bellevue Grand Ballroom AB
10:30 a.m.–Noon	Technical Session 3: Technology for the Corridor of the Near Future	Bellevue Grand Ballroom AB
Noon–1:30 p.m.	Lunch and Student Scholarship Awards	Skyview (2 nd Floor)
1:45 p.m.–5:15 p.m.	Concurrent Subcommittee Meetings	
1:45 p.m.–2:45 p.m.	Joint Advanced Traffic Management Subcommittee [AHB20(5)]	Bellevue Grand Ballroom C
	Managed Lanes Outreach Subcommittee [AHB35(1)]	Bellevue Grand Ballroom D
3:00 p.m.–4:00 p.m.	Managed Lanes Research Subcommittee [AHB35(2)]	Bellevue Grand Ballroom C
	Freeway Operations Research Subcommittee [AHB20(3)]	Bellevue Grand Ballroom D
4:15 p.m.–5:15 p.m.	Managed Lanes Events Subcommittee [AHB35(3)]	Bellevue Grand Ballroom C
	Freeway Operations Simulation and CAV Subcommittee [AHB20(2)]	Bellevue Grand Ballroom D

Wednesday, September 26, 2018 (continued)

1:45 p.m.–5:15 p.m.	Technical Tour: Washington Transit Systems	Conference Foyer
5:30 p.m.–7:00 p.m.	Networking Reception and Poster Session	Skyview (2 nd Floor)

Thursday, September 27, 2018

7:00 a.m.–8:00 a.m.	Continental Breakfast	Conference Foyer
8:00 a.m.—10:00 a.m.	Technical Tour: Bellevue Traffic Management Center	Conference Foyer
	Concurrent Committee Meetings	
	Managed Lanes Committee (AHB35)	Bellevue Grand Ballroom C
	Freeway Operations Committee (AHB20)	Bellevue Grand Ballroom D
10:30 a.m.–Noon	Managed Lanes, Freeway Operations, and Transit Management and Performance Committees Joint Meeting	Bellevue Grand Ballroom C
Noon	Adjourn and Boxed Lunch	Skyview (2 nd Floor)

HOT Breaking News!

Bellevue Traffic Management Center Tour—Thursday, September 27

Registration for the Thursday tour will be on site during the conference.

Sign up at the registration desk by Wednesday.

SPEAKERS

Opening Session: Opportunities and Challenges in the Pacific Northwest

Patty Rubstello

Patty Rubstello serves as the assistant secretary for the Office of Urban Mobility and Access (UMA) at Washington State Department of Transportation (Washington State DOT). In that role, Rubstello provides executive direction to three Central Puget Sound divisions within Washington State DOT: Maintenance of Mobility, Toll Division, and Regional Transit Coordination.

The Puget Sound region is facing significant transportation and planning challenges in the coming decade, and the UMA office was created in 2017 to facilitate better collaboration and focus on maintaining mobility for the people and goods that move throughout the area. UMA's three divisions work on near- and long-term transportation planning, including construction impact planning with other transportation agencies over the next 5 to 6 years; ongoing toll operations and opening a new toll facility, the SR 99 tunnel; expanded coordination with Sound Transit as they deliver ST 2 and ST 3 packages; creating partnerships with other local transit agencies on new initiatives; and improving connections between various modes of transportation.

Before leading UMA, Rubstello managed the Washington State DOT Toll Division. She began her career at Washington State DOT in 1990 and has spent most of her career working in the areas of project development, traffic operations, and tolling. She is a licensed engineer and has been a member of the Transportation Research Board's Managed Lane Committee.



Robin Mayhew

As Washington State Department of Transportation's (Washington State DOT) director for the Management of Mobility (MoM) Division, Mayhew oversees short- and long-term transportation system planning for the Central Puget Sound region. Mayhew joined Washington State DOT one year ago and led the start-up of the new MoM Division. This division focuses on planning for efficient and safe travel options for all modes, utilizing state-of-the-art practices and technology.

Mayhew has a long history of transportation planning experience, including a focus on demand management and operations when she worked at FHWA and FTA. Most recently, she led long-range transportation planning at the Puget Sound Regional Council. She has a master's degree in public administration from the University of Delaware.



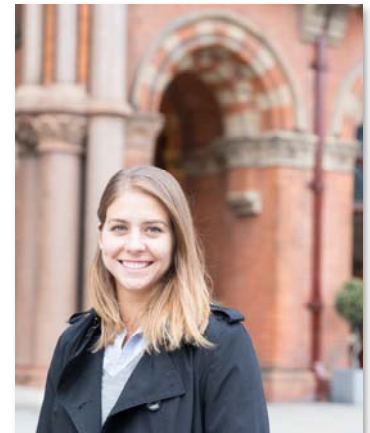
Mike Mason

Mike Mason has held several roles with the Oregon Department of Transportation (Oregon DOT) during his 11-year career at the agency. He currently is senior planner in Oregon DOT's Major Projects Unit, which manages NEPA processes for multimodal projects on the agency's Portland metro area highways. A year ago, he became lead planner for the agency's congestion pricing feasibility analysis and project development team. Prior to his work in the major projects unit, Mason held positions in the agency's Public Affairs and Community Affairs units leading public involvement and media relations work for Oregon DOT activities in the region. Mason was a reporter and editor at several business-focused news organizations prior to joining Oregon DOT.



Rachel VerBoort

Rachel VerBoort is the program manager for Seattle Transportation Benefit District with the Seattle Department of Transportation (Seattle DOT). In this role, VerBoort designs and implements transit service purchase programs, within Seattle DOT; allocates 300,000 annual service hours; leads quantitative service data analysis; and coordinates with King County Metro on investment implementation. She manages a \$50 million annual budget, working with regional partners to implement and fund program components; supervises multidisciplinary teams; and oversees a 6-year contract with King County Metro.



Previously, VerBoort worked at King County Metro focusing in the Strategy and Performance group, focus on project management, performance measurement and management, and technical data analysis.

VerBoort has a master's degree in transportation planning from the Price School of Public Policy at the University of Southern California.

CONFERENCE AGENDA

DAY ONE

Tuesday, September 25

8:00 a.m.–9:00 a.m., *Conference Foyer*

Continental Breakfast

8:00 a.m.–5:00 p.m., *Conference Foyer*

Registration

9:00 a.m.–Noon, *Kirkland*

Transit Management and Performance Committee Meeting (AP010)

Committee Chair: Amy Van Doren, Marin Transit

9:00 a.m.–1:00 p.m., *Conference Foyer*

I-405 Express Lanes and Traffic Management Center Tour

(Sponsored by Freeway Operations and Managed Lanes Committees)

Learn how Washington State DOT is managing traffic to get the most out of its freeways. This tour will include the I-405 Express Lanes, the SR-520 bridge, and the Washington State DOT Traffic Management Center.

10:00 a.m.–10:30 a.m., *Conference Foyer*

Morning Break

1:00 p.m.–2:00 p.m.

Lunch (*On Your Own*)

2:00 p.m.–3:30 p.m., *Bellevue Grand Ballroom AB*

Opening Session

Opportunities and Challenges in the Pacific Northwest

Moderator: Beverly Kuhn, Division Head–Senior Research Engineer, Texas A&M Transportation Institute

Welcome Remarks

Casey Emoto and Chuck Fuhs, *Co-Chairs, Managed Lanes Committee (AHB35)*;
Beverly Kuhn, *Chair, Freeway Operations Committee (AHB20)*; Amy Van Doren, *Chair, Transit Management and Performance Committee (AP010)*

Keynote Address: The Pacific Northwest—Pioneering Innovation

Patty Rubstello, Assistant Secretary, Urban Mobility and Access, Washington State DOT

The Evolution of Managed Lanes in Central Puget Sound

John Nisbet, State Traffic Engineer; and Robin Mayhew, Director of Management of Mobility, Washington State DOT

Oregon Turns to Corridor Tolling for Congestion Management

Mike Mason, Senior Planner, Value Pricing Feasibility Analysis, Oregon DOT

Seattle's Growth—Roadway Management and Mode-Share Changes

Rachel VerBoort, Seattle Transportation Benefit District Program Manager, Seattle DOT

3:30 p.m.–4:00 p.m., *Conference Foyer*

Afternoon Break

4:00 p.m.–5:30 p.m., *Bellevue Grand Ballroom AB*

Technical Session 1

Performance-Based Operations of Managed Lanes Facilities

Moderator: Greg Hulsizer, Vice President-Toll Marketing Practice Leader, HNTB

Panelists:

Brad Larsen, MnPASS Policy and Planning Program Director, Minnesota DOT

Greg McKnight, RapidRide Project Manager, King County Metro

Daniel Papiernik, Associate Vice President, Toll Consulting Services, HNTB

7:30 a.m.–8:30 a.m., *Conference Foyer*
Continental Breakfast

7:30 a.m.–5:00 p.m., *Conference Foyer*
Registration

8:30 a.m.–10:00 a.m., *Bellevue Grand Ballroom AB*

Technical Session 2

Using Managed Lanes to Support Transit

Moderator: Andrew Glass-Hastings, Director of Transit and Mobility, Seattle DOT

Developing Bus Rapid Transit in the I-405 Corridor

Paul Cornish, Project Director, High Capacity Transit Development, Sound Transit

Bus Toll Lanes

Chris Swenson, Principal Consultant, WSP

Toll and Transit Operations in the Atlanta Area

Cris Sanders, Director of Operations, Georgia Regional Transportation Authority

Bus Lane Camera Enforcement

Kevin Keck, Transit Planner, San Francisco Municipal Transportation Authority

10:00 a.m.–10:30 a.m., *Conference Foyer*
Morning Break

10:30 a.m.–Noon, *Bellevue Grand Ballroom AB*

Technical Session 3

Technology for the Corridor of the Near Future

Moderator: Phil Masters, Senior Consultant, ITS, Parsons

San Diego Bus-on-Shoulder Advanced Technology System Integrator Project

Daniel Lukasik, Vice President, ITS Sector, Parsons

Innovate 680 Program

Tim Haile, Deputy Executive Director, Projects, Contra Costa Transportation Authority

Automated Vehicle Occupancy Technology

Paul Steinberg, Chief Business Officer, Carma

Innovative Mobility: Connected Vehicles and Mobility as a Service

Les Jacobson, Vice President, WSP

Volume Estimation Work Through Probes

Stanley Young, Advanced Transportation and Urban Scientist, National Renewable Energy Laboratory

U.S. 23 Active Traffic Management (ATM)/Hard Shoulder Running (Flex Route)

Stephanie Palmer, Traffic Safety and Operations Engineer, Michigan DOT

Noon–1:30 p.m., *Skyview (2nd Floor)*

Lunch and Student Scholarship Awards

STUDENT SCHOLARSHIP AWARD RECIPIENTS

A Framework to Identify Secondary Crashes on Freeways
Angela Kitali and Henrick Haule, Florida International University

Decision Fusion Model for Freeway Traffic Incident Detection
Pranamesh Chakraborty, Bijan Vafaei, and Shefang Wang, Iowa State University

Scholarships for student paper awards provided by Cintra.

1:45 p.m.–5:15 p.m.

Concurrent Subcommittee Meetings

1:45 p.m.–2:45 p.m.	Joint Advanced Traffic Management [AHB20(5)] <i>Daniel Lukasik and Lisa Burgess, Co-Chairs</i>	<i>Bellevue Grand Ballroom C</i>
	Managed Lanes Outreach [AHB35(1)] <i>Tim Haile, Chair</i>	<i>Bellevue Grand Ballroom D</i>
3:00 p.m.–4:00 p.m.	Managed Lanes Research [AHB35(2)] <i>Nick Wood, Chair</i>	<i>Bellevue Grand Ballroom C</i>
	Freeway Operations Research [AHB20(3)] <i>James Colyar, Chair</i>	<i>Bellevue Grand Ballroom D</i>
4:15 p.m.–5:15 p.m.	Managed Lanes Events [AHB35(3)] <i>Lisa Klein and Carlos Campo, Co-Chairs</i>	<i>Bellevue Grand Ballroom C</i>
	Freeway Operations Simulation and CAV [AHB20(2)] <i>Pierre Prevedouros, Chair</i>	<i>Bellevue Grand Ballroom D</i>

1:45 p.m.–5:15 p.m., *Conference Foyer*

Washington Transit System Tour

(Sponsored by Transit Management and Performance Committee)

Explore Seattle's success in managing its transportation system to increase transit ridership. See how joint efforts by Seattle-area local jurisdictions have resulted in arterial improvements that help transit vehicles move faster and more reliably. The tour will also include a visit to the King County Metro Transit Control Center to observe how staff keep RapidRide buses evenly spaced using customer-focused measures and by taking advantage of investments in traffic signal prioritization and bus-only lanes.

2:45 p.m.–3:00 p.m., *Conference Foyer*

Afternoon Break

5:30 p.m.–7:00 p.m., *Skyview (2nd Floor)*

Networking Reception and Poster Session: Active Traffic Management (ATM), Managed Lanes and Freeway Operations, Transit Management and Performance

A Framework to Identify Secondary Crashes on Freeways

Angela Kitali and Henrick Haule, Florida International University

Decision Fusion Model for Freeway Traffic Incident Detection

Pranamesh Chakraborty, Bijan Vafaei, and Shefang Wang, Iowa State University

Analysis of High-Occupancy Vehicle (HOV) Lanes During Active and Inactive Times

Nima Hoseinzadeh and Yuandong Liu, University of Tennessee, Knoxville

Modeling Multimodal Transit Access in Three Major Texas Cities

Christopher Bischak and Mihir Pethe, University of Texas, Austin

SR 99 Tunnel Opening and Tolling Go Live Outreach—"It's a thing!"

Emily Glad, Toll Division Communications Manager, Washington State DOT

I-405 Express Toll Lanes Tolling Algorithm

Eric Knigge, Toll Operations Lead Engineer, Washington State DOT

A National Perspective

James Colyar, ITS/Mobility Engineer, FHWA (invited)

A Systems Approach to Managing Corridor Bus Operations for WMATA: Lessons from a Pilot

Al Himes, Manager, Bus Scheduling, WMATA

U.S. 36 Express Lanes/BRT Project: The Measures of Success

Svetlana Grechka, Deputy Project Manager—Design, RTD

HOV Lane Mode Choice and Impacts Evaluation in Tennessee

Mark McDonald, Professor of Practice, Lipscomb University

7:00 a.m.–8:00 a.m., *Conference Foyer*
Continental Breakfast

8:00 a.m.–10:00 a.m.

Bellevue Traffic Management Center Tour and Concurrent Committee Meetings

Bellevue Traffic Management Center Tour (*Conference Foyer*)
(Sponsored by Transit Management and Performance Committee)

The Traffic Management Center (TMC) is in City Hall near the downtown Transit Center and the future light rail station. The TMC tour will showcase how Bellevue manages the RapidRide B Line TSP with the adaptive signal system (SCATS). The tour will also offer an overview on collaboration with the adjacent Norcom 911 Dispatch Center and other ITS applications. City Hall is an easy 10 minutes walk from the Bellevue Hilton.

Concurrent Committee Meetings

Managed Lanes Committee (AHB35)

Committee Co-Chairs: Chuck Fuhs, Chuck Fuhs, LLC; and Casey Emoto, Santa Clara Valley Transportation Authority

Bellevue Grand Ballroom C

Freeway Operations Committee (AHB20)

Committee Chair: Beverly Kuhn, Texas A&M Transportation Institute

Bellevue Grand Ballroom D

10:00 a.m.–10:30 a.m., *Conference Foyer*
Morning Break

10:30 a.m.–Noon, *Bellevue Grand Ballroom C*

Managed Lanes, Freeway Operations, and Transit Management and Performance Joint Committee Meeting

Noon, *Skyview (2nd Floor)*
Adjourn and Boxed Lunch



Keep this Statement for
your records.

Professional Development Hours Credit Statement for Registrant Records

Many licensure and certification agencies require the demonstration of continuing professional competency. Your attendance at this meeting entitles you to earn Professional Development Hour (PDH) units. This form is for your use in maintaining a record of the PDH units you have earned at this meeting. Complete this form and retain it. **Please do not return it to TRB.**

We recommend that you save this entire Final Program for your records should the licensure or certification agency request information from you. Reporting is done on an honor basis, and members are responsible for maintaining their own records.

The table below shows PDHs that can be earned for the continuing education activities included in the Transportation Research Board **Managing Roadways and Transit Together to Move People into a New Age of Technology—Joint Midyear Conference** held in Bellevue, Washington, September 25–27, 2018.

Ann Brach

Ann M. Brach, PhD, PE
Director, Technical Activities

SEPTEMBER 2018		SESSIONS		
DAY	TIME	TITLE	HOURS	HOURS EARNED
Tuesday, September 25	9:00 a.m.–Noon	Transit Management and Performance Committee	3.00	
	9:00 a.m.–1:00 p.m.	Technical Tour: Washington State DOT I-405/TMC	4.00	
	2:00–3:30 p.m.	Opening Session	1.50	
	4:00–5:30 p.m.	Technical Session 1	1.50	
Wednesday, September 26	8:30–10:00 a.m.	Technical Session 2	1.50	
	10:30 a.m.–Noon	Technical Session 3	1.50	
	1:45–2:45 p.m.	Joint ATM Subcommittee	1.00	
		Managed Lanes Outreach Subcommittee	1.00	
	3:00–4:00 p.m.	Managed Lanes Research Subcommittee	1.00	
		Freeway Operations Research Subcommittee	1.00	
	4:14–5:15 p.m.	Managed Lanes Events Subcommittee	1.00	
		Freeway Operations Simulation and CAV Subcomm.	1.00	
1:45–5:15 p.m.	Technical Tour: Washington Transit Systems	3.50		
5:30–6:30 p.m.	Poster Session	1.00		
Thursday, September 27	8:00–10:00 a.m.	Technical Tour: Bellevue TMC	2.00	
		Managed Lanes Committee	2.00	
		Freeway Operations Committee	2.00	
	10:30 a.m.–Noon	Joint Committees Meeting	1.50	
Total PDH Units:				

Name: _____

Date: _____

TRB turns 100 on November 11, 2020



Help TRB:

- Promote the value of transportation research;
- Recognize, honor, and celebrate the TRB community; and
- Highlight 100 years of accomplishments.

Learn more at

www.TRB.org/Centennial

MOVING IDEAS: ADVANCING SOCIETY—100 YEARS OF TRANSPORTATION RESEARCH

SUPPORT

Help recognize and honor the extraordinary record of achievements accomplished by you—TRB's volunteers, sponsors, affiliates, friends, and staff by contributing to the TRB Centennial Celebration.



CENTURY CLUB

Accepting contributions of \$100 to \$10,000 from individuals

CENTURY PATRON

Accepting contributions of \$3,000 to \$20,000 from public and private organizations

RECOGNITION

In appreciation for your contribution, your name or the logo of your organization will be included:

- In the TRB centennial history book (if contribution is made by September 30, 2019);
- In the 2020 and 2021 Annual Meeting printed programs and luncheon programs;
- On exhibit-hall signage at the 2020 and 2021 Annual Meetings; and
- On the TRB Centennial Website

To learn more or contribute go to

www.TRB.org/Centennial

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