

From Data to Solution: Integrating Performance Evaluation into Traffic Signal Timing and System Management

| Aobo Wang PhD

| More Hall 234, UW

| Thursday, May 14, 2026
FROM 3:00 - 4:20 PM PT

Abstract

Traffic signal performance issues are often diagnosed in isolation, outdated timing plans get blamed when hardware faults are the true cause, or vice versa. Maximizing the return on existing signal infrastructure requires moving beyond this siloed approach toward integrated and systematic management that unifies data, signal control, and hardware functions. Such integration is essential for performance preservation and improvement across all intersection and corridor users, achieving diverse traffic operational and multimodal objectives.

This presentation bridges performance evaluation and traffic signal system management through several practical applications: using high-resolution vehicle trajectory data to evaluate regional signal performance, justifying the deployment of advanced control features such as phase reservice, leveraging controller log data to inform logic programming for more robust detection, and applying transit and multimodal trajectory data to calibrate progression design speeds, preemption settings, and transition methodologies. Together, these examples illustrate how data-driven evaluation can directly inform timing decisions and system-level management, turning observation into actionable solutions.



About the Speaker

Dr. Aobo "Albert" Wang is an Assistant Professor at Oregon State University. Before joining OSU, he was a Research Scientist at the University of Nevada, Reno.

His research focuses on traffic signal timing and performance analysis, with an emphasis on improving signal control monitoring, diagnosis, evaluation, and reporting through multi-source data. His broader interests include traffic operations and safety analysis using high-resolution, large-scale vehicle trajectories; connected intersections and infrastructure; the development and testing of traffic control device hardware and software; and traffic simulation and digital-twin applications. His work is sponsored by the U.S. Department of Transportation, the Nevada Department of Transportation, Caltrans, and many local agencies.

He is a member of the ACF 14 TRB Committee on Local and Arterial Roadway Management, also serving as a paper review coordinator. He has authored over 30 publications.

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