

UNIVERSITY of WASHINGTON

CIVIL & ENVIRONMENTAL ENGINEERING



Burges Endowed Visiting Professorship Lecture



Roadway tolling: lessons from artificial intelligence and social equity

Featuring Dr. Stephen Boyles

Associate Professor
Department of Civil, Architectural, and Environmental Engineering
The University of Texas at Austin

Thursday, October 20 | 3:30-4:30pm | [Bagley Hall, Rm. 154](#)

Coffee and cookies will be provided following the lecture

Abstract: Two recent trends in transportation engineering are using artificial intelligence techniques to improve traffic operations, and recognizing that users of transportation systems have distinct opportunities and preferences. This talk examines both of these through ideas through the specific lens of roadway pricing, long proposed by economists as a solution to the problems of congestion. We show how reinforcement learning can yield good policies for determining how dynamic tolls should be set on managed lanes -- but only if specific knowledge of transportation systems is encoded in the objective function, or else perverse behavior is observed where congestion is *intentionally* created in order to yield other benefits later. This is an example of the general principle that artificial intelligence is not a panacea, but must be combined with domain expertise. We also discuss roadway tolls from the standpoint of equity and impacts on different traveler populations. Engineers traditionally (and often unconsciously) approach design problems through a utilitarian lens, but there is a long philosophical tradition exploring the notion of fairness from other perspectives. We will explore a few ways in which these perspectives might inform toll policies, in theory and in practice.

Bio: Steve is a Professor of Civil, Architectural, and Environmental Engineering at The University of Texas at Austin. His research and teaching are related to transportation engineering and operations research, specifically focusing on transportation network analysis, routing and equilibrium traffic assignment, and modeling techniques to plan for emerging vehicle technologies. He is lead author on a new open-access textbook on these topics. His research has been recognized by awards from the Council of University Transportation Centers, Institute of Transportation Engineers, and Transportation Research Board. He also has strong interests in engineering education, having received multiple teaching awards, serving as the education coordinator for the Transportation Research Board's Network Modeling Committee, and redesigning the introductory civil engineering course at UT Austin.

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Questions? please contact Karen Heath at karenh3@uw.edu or Jon Emard at jmemard@uw.edu

This lecture series is open to the public. No RSVP required

THIS EMAIL WAS SENT BY:

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