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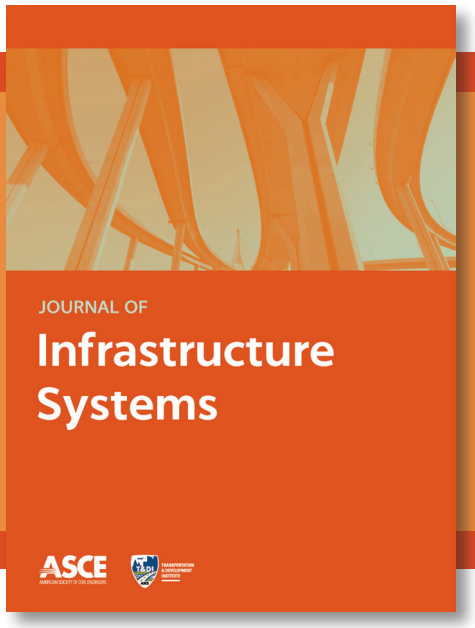
Journal of Infrastructure Systems

Guest Editors:
Samuel Labi, Purdue University
Bryan Adey, ETH Zurich
Eric Donnell, Pennsylvania State University
Mohammad Miralinaghi, Georgia Institute of Technology

Call for Papers

Special Collection on Infrastructure Preparations for the Emerging Era of Transformative Transportation Technologies – Automated, Connected, and Electric



Aims & Scope

Electric, connected, and automated vehicles are becoming more feasible due to rapid advancements in technologies in electric charging, sensing, computing, networking and communications, and other technologies, and therefore continue to attract widespread attention. Electric vehicles are equipped with an on-board electric motor that can be charged using an in-vehicle battery (that use point-charging infrastructure) or out-of-vehicle systems including overhead infrastructure (pantographs) or in-pavement charging systems. Connected vehicles facilitate communication between vehicles, and between vehicles and infrastructure to generate pertinent information on the driving environment. Automated vehicles are capable of full or partial self-navigation using information generated via in-vehicle sensors and connectivity, and an AI-based in-vehicle controller that fuses and interprets the data to make driving decisions. These transformative technologies can prospectively yield unprecedented improvements in mobility, safety, energy use, equity, and environmental quality associated with road transportation infrastructure systems. However, these benefits can be realized fully only if appropriate and adequate infrastructure systems are provided by highway agencies directly or through cooperation with the private sector.

Against this background, it may be prognosticated that certain types of existing infrastructure will likely be rendered obsolete gradually (over the transition period towards full and widespread autonomy, connectedness, and electric propulsion), and may be subsequently retired from the infrastructure inventory. New infrastructure types and changes in freeway cross sections and urban street landscapes may be needed to manage mixed traffic streams. Infrastructure agencies will need to develop methodologies to identify which links in a network are most deserving of dedicated lanes to serve vehicles equipped with these technologies. However, lanes dedicated to any one (or combinations of) these technologies may give rise to equity issues that must be addressed. Infrastructure agencies will also need to assess the prospective benefits that could be earned through sustainability-targeted infrastructure planning. Further, the new technologies are expected impact infrastructure expenditures and revenues, thereby disrupting the efficiency and equity of highway cost allocation across the various user groups (vehicle classes). Therefore, agencies will need to update their user fee structures accordingly, to preserve the adequacy of revenue streams and fairness.

By providing a forum where researchers can discuss these issues, this special collections will feature review articles, technical articles, forums, and case studies that will throw light on the various dimensions of efforts to prepare infrastructure systems to accommodate the emerging era of the three transformative transportation technologies. The special collections will help identify the challenges and research needs related to this topic, and will hopefully encourage cross-disciplinary collaborations related to the special collections theme.

continued on reverse

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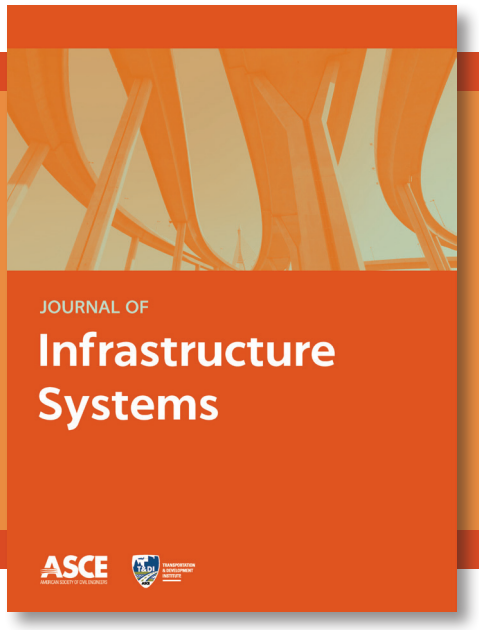

Topics

Topics to be discussed include (but are not limited to) the following:

- Re-design of existing road infrastructure for deployment of the transformative transportation technologies (electric, automated, and connected)
- Innovative designs for new types of road infrastructure to serve the transformative transportation technologies
- Audits of existing road infrastructure to gage preparedness for the transformative transportation technologies
- Social equity aspects of highway infrastructure lane allocation
- Externalities associated with road infrastructure systems re-design and relocation to serve the transformative transportation technologies
- Synergies between and among the sibling technologies (electric, connected and automated).

Timelines

- Recruiting: Start October 31, 2022. End: April 30, 2023.
- Reviewing: Start November 30, 2022. End: August 31, 2023.

Submission Guidelines

Prospective authors are invited to submit a wide range of article types for publication in this special collections: full technical papers, forum articles, technical notes, and case studies. Manuscripts should be submitted electronically through ASCE's Editorial Manager website: https://www.editorialmanager.com/jrniseng/default.aspx

ASCE provides descriptions of article specifications in "Publishing in ASCE Journals: A Guide for Authors" (https://ascelibrary.org/doi/book/10.1061/9780784479018).

In the process of submitting their manuscript, the authors should indicate that their manuscript is being submitted in response to this special collections' Call for Papers and should mention the name of at least one of the special collections editors.

This invitation is to submit papers for peer review and does not guarantee publication acceptance. Acceptance of the manuscripts submitted will depend on the outcomes of the ASCE JIS's peer-review process. All accepted papers submitted through this solicitation will be published in regular issues of the journal as they are accepted, and they will be added to a special online collections and will be indexed for citations like other regular ASCE journal papers. The editors will spare no effort in facilitating a quick review process.

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