

UTC Project Information	
Project Title	MPC-585 – Constrained System-Optimal Route Planning in support of Fleet Route Planning, Ridesourcing, and Ridesharing
University	University of Colorado Denver
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Funding Source(s) and Amounts Provided (by each agency or organization)	USDOT, Research and Innovative Technology Administration \$49,974 Faculty Salary \$49,992
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Brief Description of Research Project	<p>Route (or path) planning is a core optimization problem to address for efficient and intelligent transportation in various transportation systems. While the algorithms designed for efficient and accurate route planning in transportation networks is extensive, to the best of our knowledge all existing solutions focus on planning optimal routes for individual travelers. With this approach, "optimality" is defined based on a criterion that captures best interest(s) of individual travelers rather than those of the transportation network as a whole. Although popular, this definition of optimality is not necessarily aligned with the strategic goals of the USDOT, which demand optimal utilization of the transportation network in terms of performance measures such as overall mobility and environmental sustainability.</p> <p>With our previous MPC project, we addressed this misalignment by introducing system-optimal route planning, an alternative approach to route planning where optimality of the routes is defined based on their impact on overall utilization of the transportation network rather than benefits of individual users. In particular, these solutions leverage two big data methodologies, namely, guaranteed approximation and distributed and parallel computation, to scale up route planning for practical applications.</p> <p>With this proposal, we plan to extend our system-optimal route planning solutions to consider scenarios where certain user constraints ought to be enforced for valid system-optimal route planning. In particular, we intend to develop constrained system-optimal route</p>

	planning solutions for fleet route planning, ridesourcing and ridesharing, and perform an extensive simulation-based comparative analysis to evaluate performance of the proposed solutions versus existing state-of-the-art solutions.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	
Impacts/Benefits of Implementation (actual, not anticipated)	
Web Links <ul style="list-style-type: none">• Reports• Project Website	