The pricing strategies on managed lanes (ML) are inspired by the congestion-pricing concept borrowed from the economics literature. This concept has been thoroughly adapted to the case of traffic flow for static user optimum and system optimum. However, little has been done in the dynamic case, where travel time delays due to congestion may change rapidly. For example, we know that the marginal cost of an alternative is a decreasing function of time and that pricing according to marginal cost does not lead to minimum system cost. These results have not been transferred to practice, which is unfortunate because existing real-time pricing strategies based on the static assumption will not lead to the desired result and in some cases (as our initial result suggests) may lead to significantly worse system performance compared to time-of-day pricing.

The objective of this research is to investigate the performance of different dynamic pricing strategies for ML facilities. The focus will be on the dynamic equilibria resulting from each pricing strategy and the benefits and costs thereof. The problem will be analyzed from three perspectives: the tolling authority, the users, and society. The following pricing strategies will be analyzed: i) time-of-day pricing based on historical traffic data, ii) real-time pricing based on traffic conditions on the ML, iii) real-time pricing based on traffic conditions on the ML and general-purpose lanes, iv) real-time pricing based on travel-time prediction uncertainty, and v) a combination of these.

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Sponsor Organization
University of Florida
Southeastern Transportation Research, Innovation, Development, and Education Center
512 Weil Hall
Gainesville, FL 32611

Performing Organization
University of Alabama, Tuscaloosa
Department of Civil, Construction, and Environmental Engineering
Box 870205
Tuscaloosa, AL 35487

Project Manager
Aviles-Spadoni, Ines
Email: iaviles@ce.ufl.edu

Principal Investigator
Lou, Yingyan
Phone: (205) 348-5859
Fax: (205) 348-6862
Email: ylou@eng.ua.edu

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