MEASURING TRAFFIC PERFORMANCE USING PASSIVE SENSING TECHNOLOGIES ON SIGNALIZED ARTERIALS

Project PIs
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Abstract:
Among other sensing technologies, the wireless Wi-Fi based solution to estimating travel time along arterials seems promising. Similar with the Bluetooth-based solution, a roadside virtual Wi-Fi “hotspot” will capture the unique Wi-Fi MAC address in passing vehicles and then match them at different locations. Nonetheless, the major difference between Bluetooth-based solution and Wi-Fi-based solution is that whenever in-vehicle Wi-Fi MAC addresses are captured, virtual Wi-Fi “hotspot” can immediately record its timestamp. In contrast, the road-side Bluetooth sniffers stamp all captured Bluetooth MAC addresses with the same time only when a complete scan of all possible Bluetooth sub-frequencies is finished.

The objective of this project is to extensively test this new solution at different locations in various operational scenarios. The tentative research findings out of this new solution will include but are not limited to: (1) comparison of travel time sample capture rates (valid Wi-Fi-based travel time samples, Bluetooth-based travel time samples, total number of vehicles identified, etc.); (2) estimation of positioning errors and timing errors in Wi-Fi and Bluetooth measurements under various configurations and (3) accuracy of identifying vehicle arriving patterns at signalized intersections.