

Smart Mobility: Next Generation Transportation System

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The goal of any transportation system is to increase safety and efficiency of transportation infrastructure without expanding the current infrastructure. Therefore, Intelligent Transportation System (ITS) was received great effort in recent years targeting at applying well-established technologies in communications, control, electronics, and computer hardware and software to improve surface transportation system performance. In doing so, Traffic Management Systems receive main concerns and focuses among other ITS areas. Such systems consists of: a) Sensing and monitoring traffic in networks, b) Estimating, through the use of traffic models, the current traffic flow and predicting future traffic flow, and c) Optimizing the control strategy of the phase timing for single or series of traffic controller.

Current schemes of traffic management are based on batch/platoon/bulk/aggregated information and statistics for adaptive traffic control. We envision that with the availability of smart vehicles equipped with sensing and communication capabilities, smart infrastructures with sensors, and smart communications between infrastructure and vehicles; transportation systems will be able to: 1) acquire more accurate information and consequently eliminate uncertainty for short period predictions, 2) acquire new type of information and statistics about individual vehicles and trips (personalized information), and 3) predict traffics for longer periods (e.g., hours) with minimal uncertainty. The availability of such accurate and new information will enable us to develop and apply more efficient control strategies aiming at optimizing mobility and satisfying individual passengers. In addition, communicating useful information concerning the multimodal transportation system's conditions to the public in a timely manner will enable drivers to optimize their trips to their satisfaction. We name this envision as Smart Mobility.

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