Invited Speaker Series
Transportation Research Center for Livable Communities
Western Michigan University

Sustainable Transportation Systems

- Transit-Oriented Development and Bicycle Environment Monitoring

- **Time: September 8th, Monday, 2014 4:00 pm – 6:00 pm**
- **Location: Room C-124, College of Engineering and Applied Sciences, WMU**
- **Presentations**
  1. **Transit-Orient Development with High-speed Urban Express Railway System,** Keechoo Choi, Ph.D., Director of Transportation Research Center and Professor of Transportation Systems Engineering, Ajou University, Korea
  2. **A Novel Method to Monitor Bicycling Environments**, Cheol Oh, Ph.D., Professor of Transportation and Logistics Engineering, Hanyang University, Korea

Speakers sponsored in part by the Custer Workplace Interiors Lecture Series.

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ABSTRACT

Transit-Orient Development with High-speed Urban Express Railway System

Keechoo Choi, Ph.D.
Director of Transportation Research Center
Professor of Transportation Systems Engineering
Ajou University, Korea

This study presents recent development of high-speed urban railway system in conjunction with the transit-oriented development (TOD) in Korea. The system called GTX (Gyeonggi Train eXpress) will run between a new town and Seoul downtown at a commercial speed of 100 km per hour. Three parameters of TOD, such as density, diversity, and design are dependent on the speed of the GTX system. This study not only addresses design issues associated with the transit-oriented development, but also compare and contrast the TOD system with those of foreign countries. Some limitations and future agenda will be addressed in this presentation.

A Novel Method to Monitor Bicycling Environments

Cheol Oh, Ph.D.
Professor of Transportation and Logistics Engineering
Hanyang University, Korea

A bicycle is a promising human-powered and emission-free transportation mode to address growing transportation and environmental problems. Bike-friendly environments should be constructed to innovatively increase the use of bicycles as a significant transportation mode. From this perspective, the scientific and effective monitoring of bicycling environments is of keen interest. An important technical challenge for monitoring is to evaluate the performance of bicycling environments. This study proposes a novel monitoring method that can be used for evaluating bicycle performance in terms of safety and mobility. An instrumented probe bicycle (IPB), which is equipped with a set of sensors including a global positioning systems (GPS) receiver, accelerometer, and gyro sensor, was used to develop the proposed monitoring method. The IPB provides useful bicycle maneuvering data for identifying longitudinal, lateral, and vertical maneuverings of the bicycle, which are affected by environmental factors such as heavy vehicle volume, surface conditions, grade, crossings, humps, and curbs. Regarding safety monitoring, an index to predict bicyclist's perceived safety and comfort with the predictors derived from the measurements by the IPB was developed. A questionnaire survey was conducted to obtain actual responses from bicyclists for perceived safety and comfort during the field experiment. In addition, a method to evaluate the bicycle mobility using GPS speed data was devised. Then, a fault tree analysis (FTA) technique, which is a well-known technique for risk analysis, was adopted to integrate safety and mobility monitoring. As a result, the bicycling monitoring index (BMI) was proposed. Data obtained from the proposed method will be useful in developing various bicycle-related policies.