

## **SEMINAR**

# **Co-Sponsored by the University of California Transportation Center (UCTC)**

**Friday, December 7, 2012  
10:00 – 11:00 am**

**Seminar Room 4080 AIR Building**

### **IS TRAFFIC SAFETY RELATED WITH ENVIRONMENTAL IMPACTS? EXPLORING THE RELATIONSHIP BETWEEN CRASH POTENTIAL AND VEHICLE EMISSIONS**

**Dr. Cheol Oh  
Associate Professor  
Department of Transportation and Logistics Engineering  
Hanyang University at Ansan, Korea**

Driving behavior caused by vehicle interactions, such as acceleration, deceleration, and stop-and-go, is highly associated with traffic safety and the environment. The purpose of this study is to investigate whether traffic safety can be linked to environmental conditions, more specifically crash potential and on-road vehicle emissions. Individual vehicle trajectory data obtained from the US-101 freeway, as a part of the Next Generation Simulation (NGSIM) project, was used to investigate the relationship. A probabilistic rear-end crash potential model and a motor vehicle emission simulator (MOVES) were adopted to characterize traffic safety and environmental conditions, respectively. Both the crash potential index (CPI) and the vehicle emission index (VEI) were derived, and then investigated through correlation, regression, and clustering analyses. The findings revealed that the relationship is positively correlated and statistically significant. In addition, the results showed that severely congested traffic conditions, which include frequent stop-and-go situations and the formation of shockwaves, lead to greater crash potential as well as vehicle emissions. In summary, traffic safety and environmental conditions are positively associated. The outcomes of this study are expected to be used as useful fundamentals in developing effective vehicle safety and emission control programs and policies.

*Cheol Oh received the Ph.D. degree in civil engineering-transportation from the University of California, Irvine. He is currently an Associate Professor with the Department of Transportation and Logistics Engineering, Hanyang University at Ansan, Korea. His research interests include traffic operations and control, traffic safety, and intelligent transportation systems (ITS). He is primarily focused on the development and application of information technologies toward safer and more efficient transportation systems. He has authored 94 peer-reviewed journal papers (Korean:66, International:28). Network and Spatial Economics. He is also on the editorial board of Transportation Research Part B, Journal of Intelligent Transportation Systems, and IET Intelligent Transportation Systems Journal.*