

# **Connected Vehicle Research and Open Source Cloud Microscopic Traffic Simulation - ETFOMM**

**COTA International Conference of Transportation Professionals (CICTP 2017)**

**July 6-9, 2017**

**Jiren Building (济人楼) 309, Tongji University, Shanghai, China**

**1:30PM-6:00PM July 7**

Organizer and Contact: Li Zhang, Ph.D., P.E., F. ASCE, F. ITE

New Global Systems for Intelligent Transportation Management

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## **Abstract**

The workshop is divided into four sessions. In the first session, an open source based connected vehicle communication/hardware in the loop simulation to facilitate future connected vehicle research will be explored. FHWA's connected vehicle research projects utilizing the platform will be presented. The mobility, safety and environmental benefit from ETFOMM will be demonstrated, particular, FHWA's Open-source Surrogate Safety Assessment Model will be introduced.

In the second session, the advanced computing in ETFOMM/SSAM (including cloud computing, parallel computing and distributed computing) will be presented. In addition, examples of ETFOMM car following models will be discussed through trajectory level calibration and verifications.

In the third session, ETFOMM/SSAM's Application Programming Interface will be demonstrated through cross platform (Windows/Mac) programs to control traffic signals and interactively move vehicles on freeways. This session requires some computer programming experience.

In the fourth session, the focus of this workshop shifts to exemplify how to utilize ETFOMM to model real world traffic in research and engineering projects. Examples includes, roundabouts, complicated freeways to freeway interchanges, diamond interchanges,

<https://www.fhwa.dot.gov/publications/research/operations/17028/17028.pdf>

<https://www.fhwa.dot.gov/publications/research/operations/17027/17027.pdf>

## Workshop Session Agenda

### **Introductions (Li Zhang) (13:30-13:45)**

Session I (Li Zhang, Mingzhou Jin) (13:45-14:30)

1. Connected Vehicle Research Hardware/communication in the loop Simulation Platform
2. ETFOMM and Connected Vehicle Research
3. Surrogate Safety Assessment Model

Session II (Mingzhou Jin) (14:30-15:20)

Advanced Computing in ETFOMM/SSAM and Model Validations/Calibrations (Yunlong Zhang)

1. Advanced Computing in ETFOMM/SSAM (Li Zhang, Yunlong Zhang)
2. Model Validations/Calibrations (Yunlong Zhang)

15:20-15:40 Breaks

Sessions III (Li Zhang) (1540-1700)

Hands-on or Demo of ETFOMM/SSAM APIs (

1. Traffic Signal Control
2. Freeway Vehicle Movement
3. SSAM APIs

Session IV (1700-1800) (Li Zhang)

ETFOMM/SSAM Examples

1. Roundabout
2. Simple freeway with ramps
3. Simple freeway with weavings
4. Arterial with Coordination
5. Complicated Freeway to freeway interchanges
6. Diamond Interchanges
7. Diverging Diamond Interchanges