Collaborative Research: SaTC: CORE: Small: Privately Collecting and Analyzing V2X Data for Urban Traffic Modeling

Challenge:

- Heterogeneous V2X data protection
- Highly-dimensional and correlated data release with LDP
- Randomization mechanism design for complex data analysis
- MPC protocol and system design for complex data analysis
- Privacy in real CV/V2X systems

[a] https://tomorrow.city/
Improving Traffic Mobility

Scientific Impact:

- Novel LDP schemes
- Novel MPC systems
- Advancing privacy preserving data analysis in CPS
- Provable privacy guarantees
- Designing and implementing real systems for private V2X data collection and analysis

Solution:

- New V2X data encoding schemes
- New randomization mechanisms for sampling the V2X data with LDP
- Interpolating V2X data with ML
- Optimizing the efficiency for MPC protocols for constraints verification
- Emulating experimental platform for vehicles and intelligent transportation systems
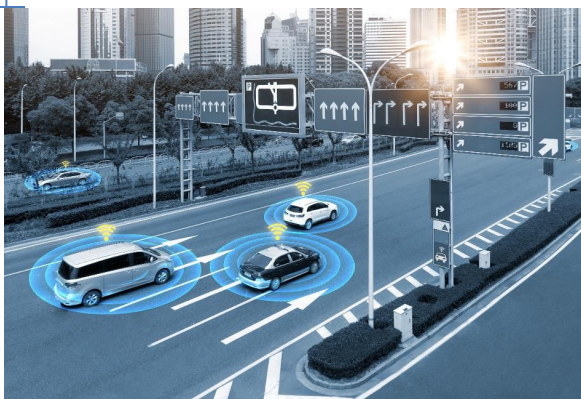
[b] https://echalliance.com/
Improving Vehicle Safety

Broader Impacts:

- Improving urban traffic mobility and vehicle safety
- BPC through programs such as IIT's K-12 outreach activities, IIT STEM Expo, UW's Discovery Day, etc.
- Curriculum development on privacy/security and transportation courses at IIT and UW