

CPET 565/CPET 499
Mobile Computing Systems
Lecture 4
Vehicle to Vehicle Communications

Fall 2012
A Specialty Course for Purdue University's M.S. in Technology
Graduate Program
Paul I-Hai Lin, Professor
Dept. of Computer, Electrical and Information Technology
Purdue University Fort Wayne Campus

Prof. Paul Lin

1

USDOT Connected Vehicle Technology

- 18th World Congress on Intelligent Transport Systems, Oct. 16-20, 2011,
http://www.itsworldcongress.org/techshowcase_usdot.html
 - V2V Safety System and Vehicle Build for Safety Pilot Project (V2V-SP) use 5.9 GHz Dedicated Short Range Communications (DSRC)
 - Safety Applications
 - Emergency Electronic Brake Lights (EEBL)
 - Forward Collision Warning (FCW)
 - Blind Spot Warning/Lane Change Warning (BSW/LCW)
 - Do Not Pass Warning (DNPW)
 - Intersection Movement Assist (IMA)
 - Left Turn Assist (LTA)

Prof. Paul Lin

2

USDOT Connected Vehicle Research Plan/Program

- USDOT – National Highway Traffic Safety Administration (NHTSA), DOT HS 811 373, October 2011, www.nhtsa.gov/DOT/NHTSA/NVS/Crash%2520Avoidance/Technical%2520Publications/2011/811373.pdf
- **Communication Infrastructures**
 - Vehicle-to-Vehicle (V2V), Vehicle to Infrastructure (V2I), Vehicle-to-Consumer Devices (V2D)
- **Collected and Exchanged Data**
 - Vehicle's latitude, longitude, time, heading angle, speed, lateral acceleration, longitudinal acceleration, yaw rate, throttle position, brake status, steering angle, headlight status, turn signal status, vehicle length, vehicle width, vehicle mass, bumper height, and the number of occupants in the vehicle

Prof. Paul Lin

3

Vehicle to Vehicle Communications (V2V)

- **The U.S. National Highway Traffic Safety Administration (NHTSA) - Intelligent Transportation Systems Joint Program Office, Vehicle-to-Vehicle (V2V) Communications for Safety,**
<http://www.its.dot.gov/factsheets/pdf/JPO-029%20V2V%20SAFETY%20V5.1%20F.pdf>
 - V2V Communications Technologies for Vehicle Safety Applications
 - SAE J2735 Basic Safety Message
 - Standard Communications architecture/platform communicating in the 5.9 GHz band of radio spectrum
 - Large road test news release on Aug. 21, 2012, Ann Arbor, Michigan (3,000 cars),
<http://www.nhtsa.gov/About+NHTSA/Press+Releases/2012/ci.DOT+Launches+Largest-Ever+Road+Test-of+Connected+Vehicle+Crash+Avoidance+Technology.print>

Prof. Paul Lin

4

GM V-2-V Demo



5