

**SB 1077 ROAD USAGE CHARGE (RUC) TECHNICAL
ADVISORY COMMITTEE (TAC) –
PRIMER ON AUTOMOTIVE TELEMATICS**

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AUTOMOTIVE TELEMATICS

- Telematics – Introduction
 - ✓ DAS
 - ✓ GPS
- Influence on Automobile
 - ✓ What can be done?
 - Today
 - Tomorrow
 - ✓ Possible Issues
 - Privacy breach
- RUC System High Level Requirements and Goals
 - ✓ Some initial thoughts on system design

TELEMATICS - DEFINITION

- **Telematics**: The science of **Tele**communications and **Informatics*** applied in wireless technologies
- Most narrowly, the term has evolved to refer to the use of such systems within Automotive, in which case the term **Automotive Telematics** may be used.

* the science of processing data for storage and retrieval

DATA ACQUISITION SYSTEMS (DAS)

- Data Acquisition System (DAS): **Data acquisition** is the process of measuring real world physical conditions and conveying to a system for processing. Some of the physical conditions of interest from Automotive perspective are:
 - ✓ **Under the hood conditions in an automobile**
 - ✓ **Within auto environment**
 - ✓ **Outside auto environment**
 - ✓ **Around auto environment, etc.**

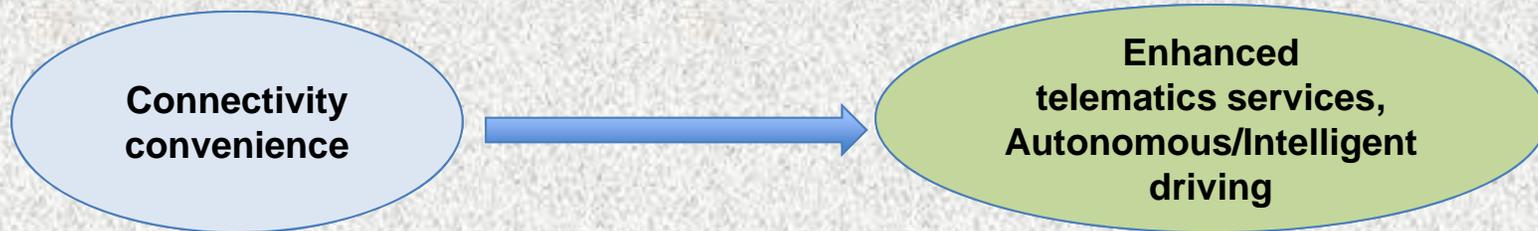
GLOBAL POSITIONING SYSTEMS (GPS)

- The Global Positioning System (GPS*) is a worldwide radio-navigation system formed from a constellation of 24 satellites and their ground stations*.
- GPS uses these as reference points to calculate positions accurate to a matter of meters. In a sense it's like giving every square meter on the planet a unique address.
- Real-world applications of GPS include:
 - ✓ **“Where am I?”**
 - ✓ **“How do I go from point A to point B?”**
 - ✓ **“Where is everything else?”**
 - ✓ **“???”**

* http://www.trimble.com/gps_tutorial/gpswork.aspx

EVOLUTION OF AUTOMOTIVE NEEDS

- Today*:
 - ✓ Connectivity convenience
- Tomorrow:
 - ✓ Enhanced telematics services, location technology
 - ✓ Autonomous/Intelligent driving



* "Dedicated SIM connectivity is a cost driver for automotive infotainment," T.Russell Shields, Chair, ITU-Hosted Collaboration on ITS Communications Standards

AUTOMOTIVE NEEDS - TODAY

- Some of today's automotive needs include*:
 - ✓ **Automatic collision notification**
 - ✓ **Remote door lock/unlock and lights**
 - ✓ **Crisis assistance**
 - ✓ **Sports and news information**
 - ✓ **Destination information and guidance**
 - ✓ **Emergency services**
 - ✓ **Stolen vehicle tracking**
 - ✓ **Vehicle location**
 - ✓ **.....**

*Source: Edmunds, Telematics Chart, <http://www.edmunds.com/car-technology/telematics.html>

AUTOMOTIVE NEEDS - TOMORROW

- Vehicle Safety
 - ✓ Driver assistance information/warning
 - ✓ Electric Vehicles (EV) (High Voltage - Water)
- V2X (Vehicle to anything) Applications
 - ✓ Intersection collision warning specs
 - Sense impending collision in front of car, etc
- Vehicle 2 Infrastructure (V2I/I2V) Communications
 - ✓ Electric vehicle charging spot notification specifications
 - ✓ Support applications (e.g., tire pressure, brakes, O2 level)
 - ✓ EV energy supply using wireless networks
- Vehicular Communications-Applications Specific
- Many needs (Imagination is the limit)

POTENTIAL CONCERNS

Privacy Breach:

- (Collected) Data Security
- Privacy protection
 - ✓ Ensure individual privacy rights
- Connecting cars to the world through the Internet
 - ✓ Hacking/Security



Big Bang Theory Internet success.mp4

For more info" Markey Report Reveals Automobile Security and Privacy Vulnerabilities, February 9, 2015

SOME RUC SYSTEM REQUIREMENTS

High level requirements must address the:

- Data Security
 - ✓ Protecting all personal information
 - ✓ Ease and cost of recording & reporting
 - ✓ Cost of administering
 - ✓ Effective methods of maintaining compliance
 - ✓ Ease re-identifying location when personal information has been deleted
- Privacy protection (when location data is used)
 - ✓ Ensure individual privacy rights

SOME RUC SYSTEM GOALS

Guidelines for design recommendation:

- State of the art design (not just for today but for tomorrow)
 - ✓ Evaluate the applicability of existing technology (Transponder/FasTrak) that is well accepted
- A model for other States
- A model (best practices example) for the world

THANK YOU!