Road Weather Management Stakeholder Meeting
7-9 September 2011

AVL/GPS/Telematics Presentation
The Case for a Uniform Telematics Platform

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- Have worked with State, County, Municipal officials for over 30 years

- Telogis, Inc. is a worldwide leader in provider of GPS/AVL/Telematics Services
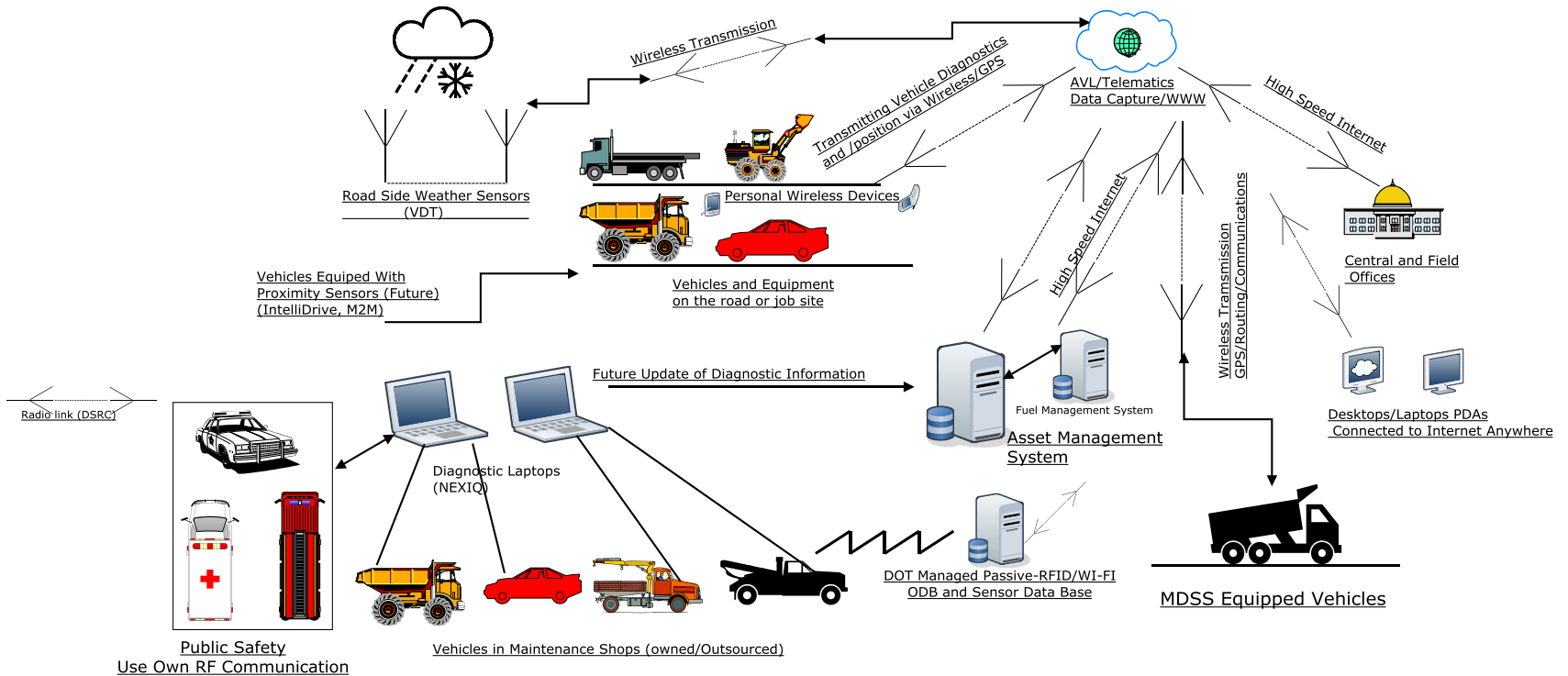
Outline

BIG PICTURE
HW/SW Basics
GPS/Wireless/Telematics Connection
Problems in Current Telematics Offerings
Addressing "Standards"
Suggested Next Step

DOT Information World

Wireless Transmission

Transmitting Vehicle Diagnostics and /position via Wireless/GPS

AVL/Telematics Data Capture/WWW

High Speed Internet

Road Side Weather Sensors (VDT)

Personal Wireless Devices

Vehicles Equiped With Proximity Sensors (Future) (IntelliDrive, M2M)

Vehicles and Equipment on the road or job site

High Speed Internet

Wireless Tramsmission GPS/Routing/Communications

Central and Field Offices

Future Update of Diagnostic Information

Fuel Management System

Asset Management System

Desktops/Laptops PDAs Connected to Internet Anywhere

Radio link (DSRC)

Diagnostic Laptops (NEXIQ)

DOT Managed Passive-RFID/WI-FI ODB and Sensor Data Base

MDSS Equipped Vehicles

Public Safety Use Own RF Communication

Vehicles in Maintenance Shops (owned/Outsourced)

Typical State DOT Equipment Under Management

Data Topology

Data Sources

Equipment

Engine (ODB)
Body
Sensors
GPS/AVL
DSRC (RF)
RFID
Barcode

Fuel Card System

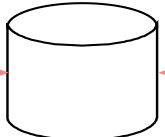**Fuel Dispensing**

Assets
Accounting
Inventory
Etc.

Asset Management

RoadSide Sensors

Weather & Road Conditions
Traffic, Safety
Video
Alerts
Etc.

Data Storage

GPS/AVL Vendor and/or State DOT

GPS/AVL/Sensors

Stored Usually at State DOT

Fuel Dispensing System

Stored Usually at State DOT

Inventory/Work order/HR/
Asset Tracking

Stored by VDT State Police, etc.

RWIS/Video/Etc.

Integration of Data

Partial Data
Integration
AEMP/SAE/
OEM/OBD
Very Little
Sensor data

NO Data
Integration
All Separate
Data
Bases...
Sensors
data, Etc.

Critical Piece

Visualization of Information

Browser
Interface

Standard
Windows
Look and
Feel

Character
Based
....

Use of
Information
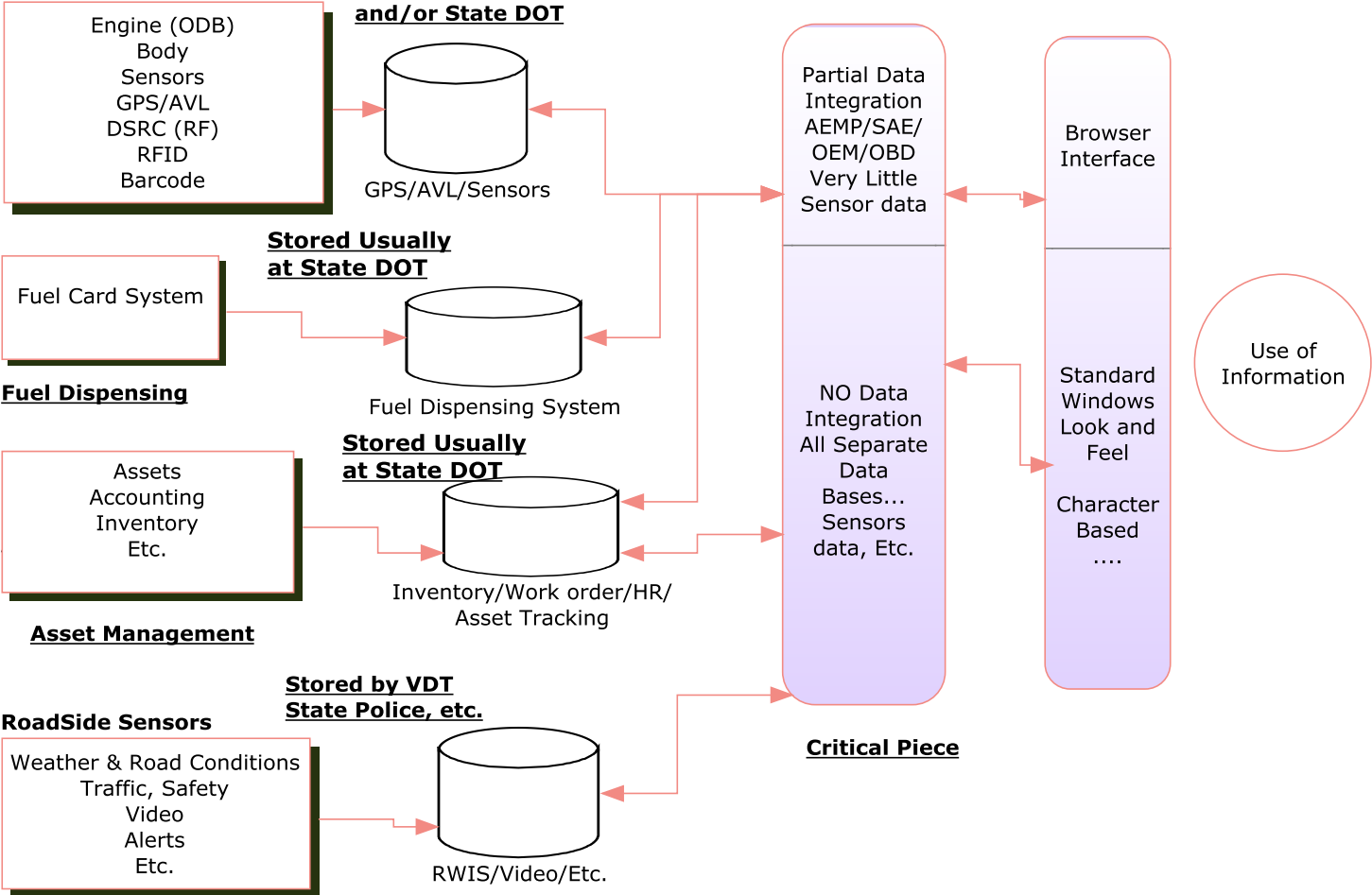
Why YOUR Data Needs are Unique

- Most of Telematics services target long/short haul trucking or service fleets
- Your Need are specialized:
  - You need less AVL data
  - You Need Much More Sensor and Controller Data

Key Benefits

- GSM/GPRS or CDMA 1x cellular configurations

- 10,000 buffered message log

- 32 built in Geo-Zones, any combination of circle or polygon zones, up to 5400 points

- Built-in 3-axis accelerometer for motion sensing, hard braking, crash detection

- 8 Inputs / 8 Outputs / 4 A-to-D

- Two 1-wire* interfaces

- 3 switched power serial ports

- Configurable power save modes

- Automatic, Over-The-Air Unit Download

- Web-Based Device Management diagnostic tools

Competitive Edge

CalAmp's flagship LMU-4200 product has the features, expandability, and flexibility with the intelligence to meet all customer's ever changing needs in fleet management . The LMU-4200 offers a full set of features, comprehensive I/O system and expandable accessories that make it an industry leading value proposition. The LMU-4200 expandability and flexibility lowers the cost of delivering, supporting, and growing fleet management solutions.

Expanded Interface

The LMU-4200 is designed to support customers needing an array of vehicle interfaces. For example, the serial ports supply switchable power at selectable voltages to ease the installation of peripheral data devices. The optional jPOD™ ECU (Engine Control Unit) interface reads and transmits heavy-duty engine condition and performance data such as engine temperature along with the fault codes to provide the best possible real-time picture of vehicle health. In addition, the LMU-4200 offers optional WiFi and Bluetooth capabilities.

Flexibility

The LMU-4200 employs CalAmp's industry leading on-board alert engine, PEG™ (Programmable Event Generator). This advanced engine monitors external conditions and supports customer-defined exception-based rules to help meet the needs of your application. PEG continuously monitors the vehicle environment and responds instantaneously to pre-defined threshold conditions related to time, date, motion, location, geo-zone, input and other event combinations. With PEG, your unique application will meet demanding customer requirements. This behavior can be programmed by CalAmp before shipment, at a customer's facility, or over-the-air once the unit has been fielded.
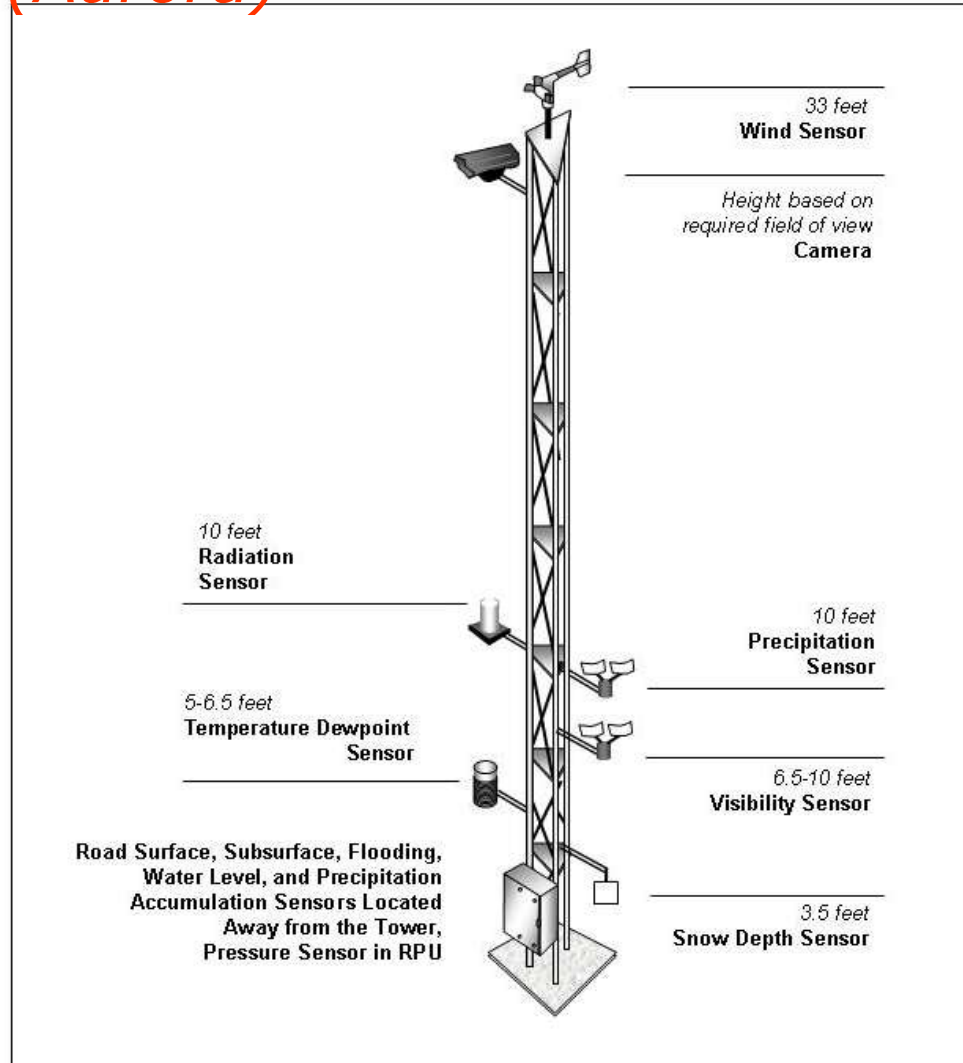
Over-the-Air Serviceability

Road Side Weather Data
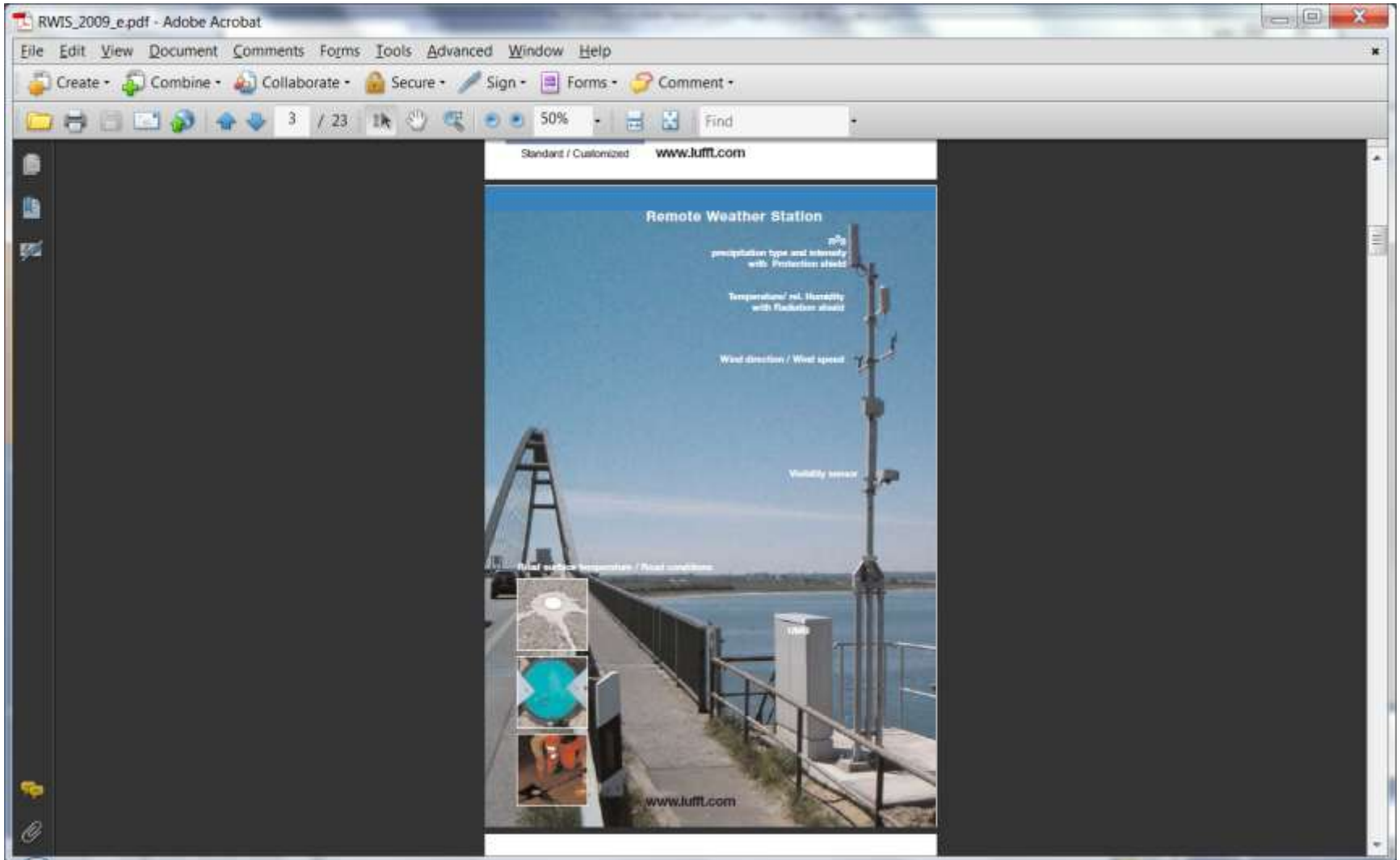
RWIS/ESS Weather Station (Aurora)

33 feet
Wind Sensor

Height based on required field of view
Camera

10 feet
Radiation Sensor

10 feet
Precipitation Sensor

5-6.5 feet
Temperature Dewpoint Sensor

6.5-10 feet
Visibility Sensor

Road Surface, Subsurface, Flooding, Water Level, and Precipitation Accumulation Sensors Located Away from the Tower, Pressure Sensor in RPU

3.5 feet
Snow Depth Sensor

Typical Roadside Weather Sensor

The Freedom ATS (Advanced Tracking System) is the newest component in Certified Power's group of Freedom controls.

Freedom ATS

What Does This Mean to You?

- NOT Much… Unless you can integrate the data in a meaningful way
- All Web Enabled
- ANSI XML Interfaces
- Browser Compatible

What About Standards?

- SAE JBUS Standards – Designed for ODB.. But:
  - Manufacturers interpret code differently and you don't always get the codes you need

- AEMP Telematics Data Standards, Released October 2010
  - Participants: McFadden & Associates, Caterpillar, John Deere, Volvo, … developed a standard format for the transfer of Telematics data from the providers' servers to end users!
  - But… NOT <u>ALL</u> the data that <u>YOU</u> need! Mostly, AVL type data, miles travelled, cumulative operating hours, etc.

- NO standards for sensors, plow up/down, etc!

- The users (YOU) are supposed to get the data and do what you want with it

Current Trend: Collaboration

What is Coming

- Cheaper and Cheaper Hardware: $100 device being tested by FedEx
- Cheaper Wireless Charges: Now $4.00-$7.00 and going down
- Vehicle Manufacturers are Talking to AVL Software Vendors
- Outsourcing of IT Services in Government
  - More use of Internet
  - Less in house IT Staff
  - Govt. IT staff is deployed to manage software vendor applications
- Route Optimization Integrated With Traffic Data

Suggested Committee Standard:
Define What, Where and How you Want it

Proposed AASHTO Data Platform

Data Sources **Data Storage** **Integration of Data** **Visualization of Information**

Equipment

Engine (ODB)
Body
Sensors
GPS/AVL
DSRC (RF)
RFID
Barcode

GPS/AVL Vendor and/or State DOT

GPS/AVL/Sensors

AASHTO Platform

Full Usable Data integration

Browser Interface

Fuel Card System

Stored Usually at State DOT

Fuel Dispensing System

Fuel Dispensing

Stored Usually at State DOT

Assets
Accounting
Inventory
Etc.

Inventory/Work order/HR/ Asset Tracking

Asset Management

Full Usable Data Integration

Standard Windows Look and Feel

Character Based ….

Use of Information

Stored by VDT State Police, etc.

RoadSide Sensors

Weather & Road Conditions
Traffic, Safety
Video
Alerts
Etc.

RWIS/Video/Etc.

AASHTO Data Standard

www.telogis.com