The next frontier: open source in the car

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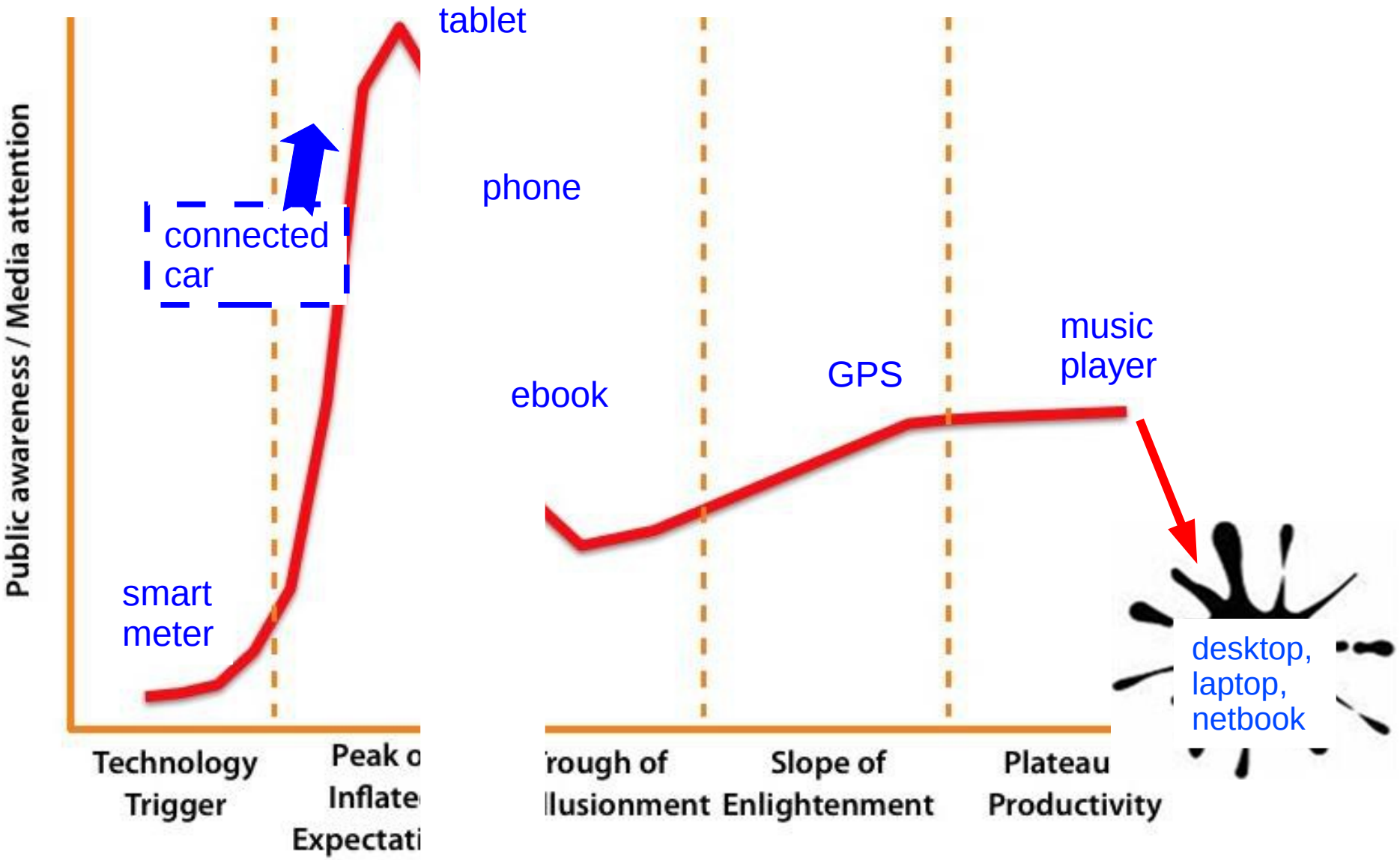
4/11/12

- Who cares?
- Status report
- Opportunities for developers and businesses

Gartner Hype Curve 2012



Ford MyFord Touch Problems Prompt Company To Send Out Software Upgrade

By DEE-ANN DURBIN | 11/ 7/11 06:56 AM ET | AP

HuffPo: http://tinyurl.com/6m4afcl

Status of Automotive Open Source

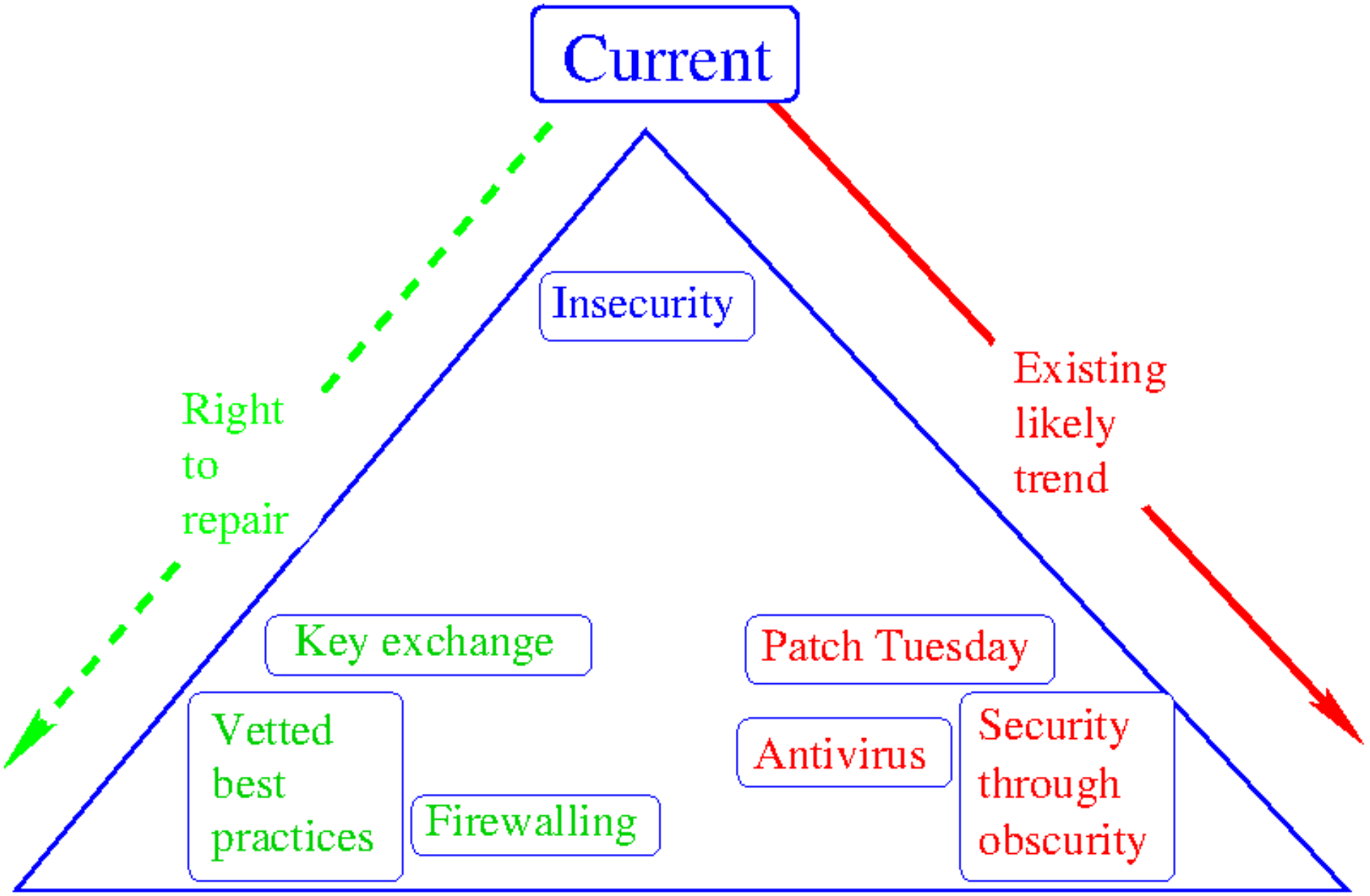
Manufacturer	Confirmed Operating system
Fiat-Chrysler Blue&Me (500, Delta), Kia Uvo, BYD, Nissan Leaf	Microsoft Windows Embedded Automotive
Ford (all?)	MyTouch/Sync-Microsoft; OpenXC-Android
General Motors (new 2012 Cadillacs), Chevy Volt	MontaVista's GNU/Linux
Geely (China); Hawtai (China)	GNU/Linux: Moblin (MeeGo predecessor)
Renault R-Link, Roewe 350	Android
Honda (Accord, Odyssey, Pilot), Audi, BMW (7-series and M models), Chrysler, Daewoo, GM (OnStar), Hyundai, Land Rover, Porsche, Saab (9-3) Renault (SM7)	QNX

Linux Foundation members: Toyota, Pelagicore, Symbio, Tieto.

Automotive Linux Summit 2011 presenters: Toyota, Nissan, BMW.

MeeGo Conference 2011 presenter: Nissan.

Volkswagen has a pilot using Maemo (Linux).


Current
Insecurity
Right to repair
Existing likely trend
Key exchange
Patch Tuesday
Vetted best practices
Antivirus
Security through obscurity
Firewalling

How to get involved

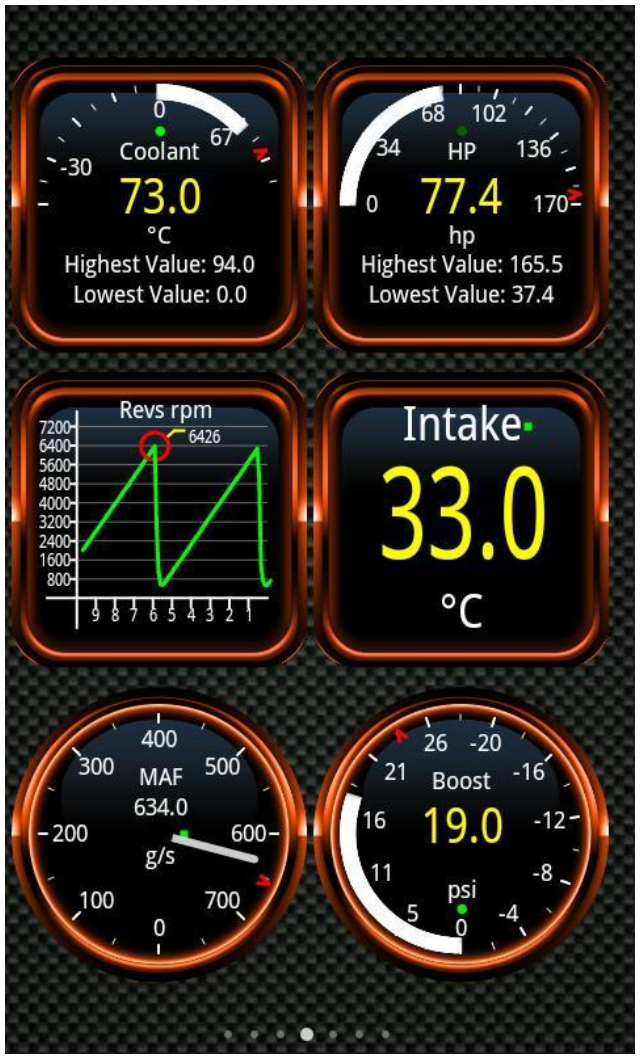
(or at least watch in an informed manner)

- Write apps for automotive platforms.
- Use cheap and readily available HW to interact with car.
- Integrate automotive data with other sets and mine for new purposes.
- Ask auto dealers, “What operating system does this model run?”
- Tell your Congresscritter you support the “Right to Repair” Act.

Car manufacturer developer offerings

- Renault R-Link (Android): no car available in U.S.
- Ford's OpenXC Platform (Android and Arduino-compatible ChipKit32): launching May 2012.
- General Motors Cadillac User Experience: 2Q 2012 launch promised.
- Intel-Samsung (Tizen Linux with X11, HTML5) SDK: beta “preview”.
- Ubuntu IVI Remix available for download now.

Proprietary “Torque” Android Market app and **raw** CAN



Vitaliy

VENDOR - ScanTool

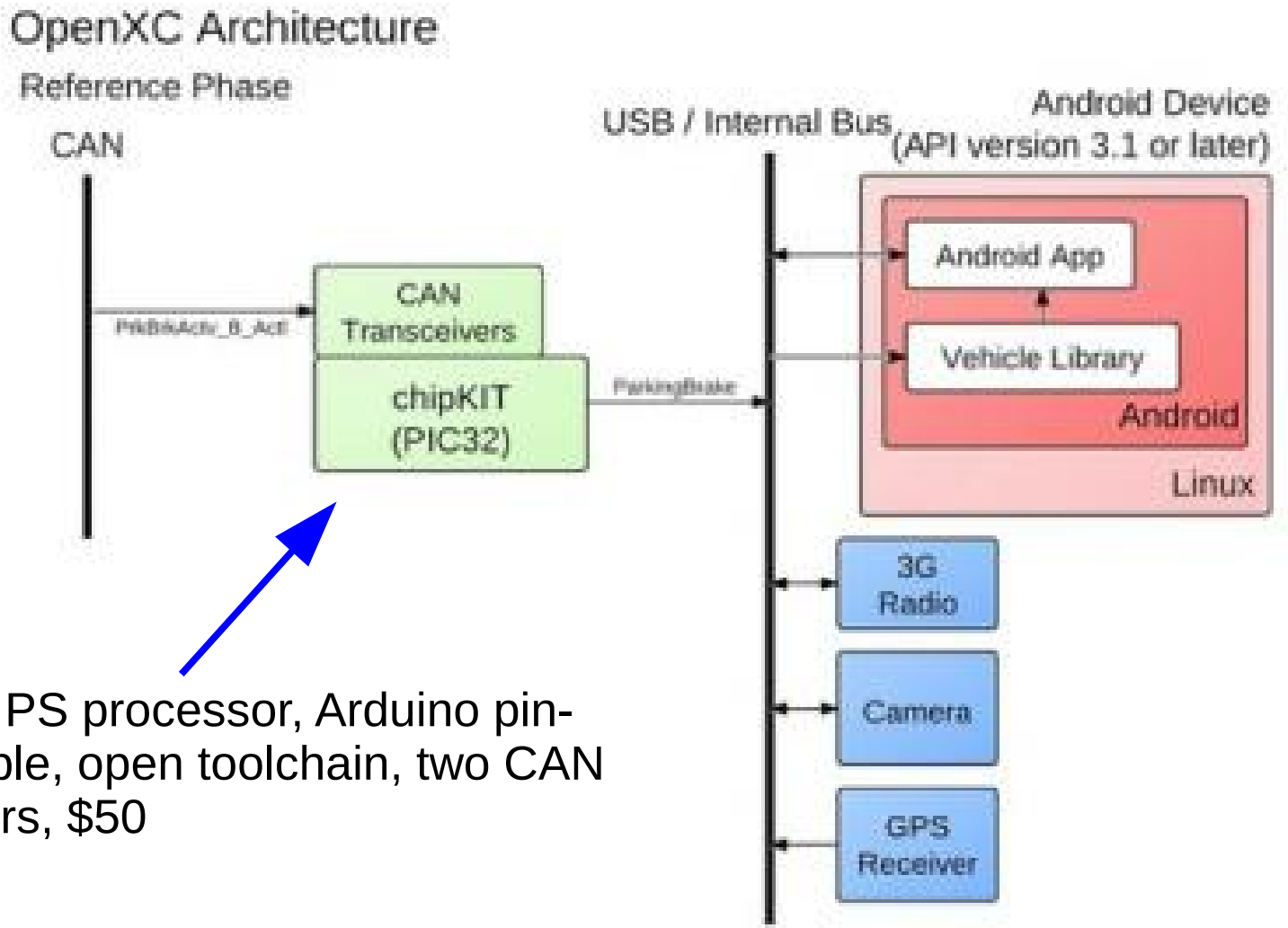
Join Date: Dec 2006
Location: Phoenix, AZ
Posts: 598

> Originally Posted by **FierceElements**
>
> *Unfortunately, I am. =(*
>
> *Just got the adapter today and gave it a try with the Torque app on my Galaxy Tab. It connected and started giving the app ECU data right away. However, after a few car starts suddenly the check engine and traction control disabled lights came on, and the cruise control light started flashing. The latter two indicate those systems (traction control and cruise control) have been disabled. I read the error code with Torque, which came up as U0073 (Control Module Communication Bus "A" Off).*

Source: very valuable mp3car.com forums

Pure OBDII completely safe!

Ford's Android-Based OpenXC Platform



32-bit MIPS processor, Arduino pin-compatible, open toolchain, two CAN controllers, $50

BeagleBone from TI

$89, widely available

CAN “cape” for BeagleBone

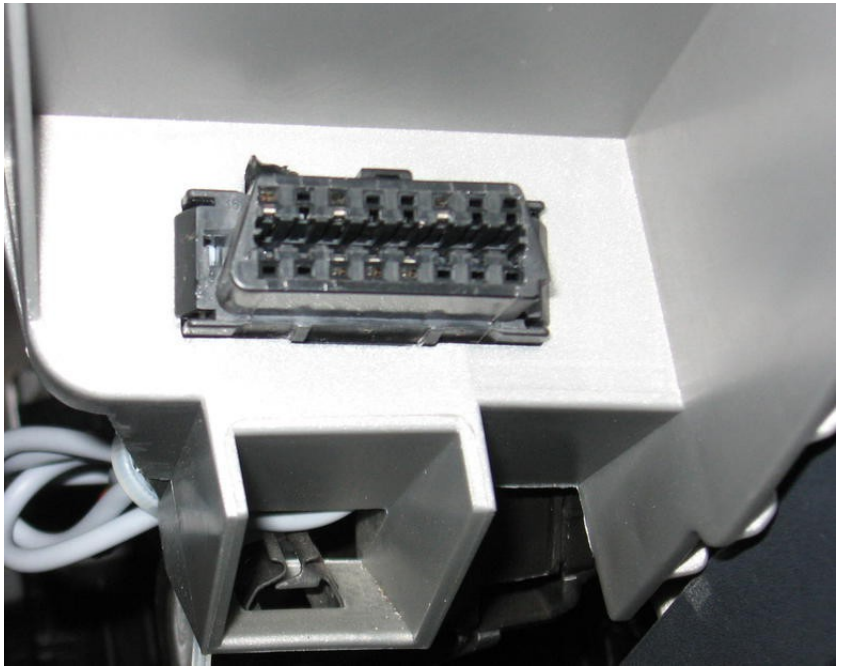
Runs QCanObserver based on Qt

€79, available via mail-order

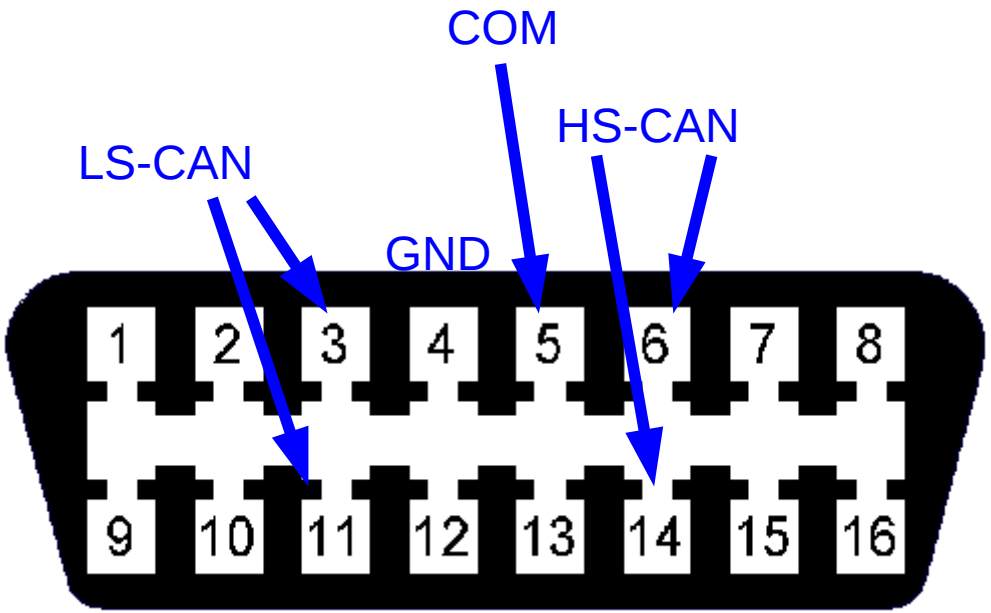
Quality community HW and SW already available

http://tinyurl.com/7wngdsj, http://tinyurl.com/7ttz24h

How to access a car's data



OBDII connector found in every U.S. car since 1996.



2006 Mazda 3

Determine protocols in use by examining populated pins.

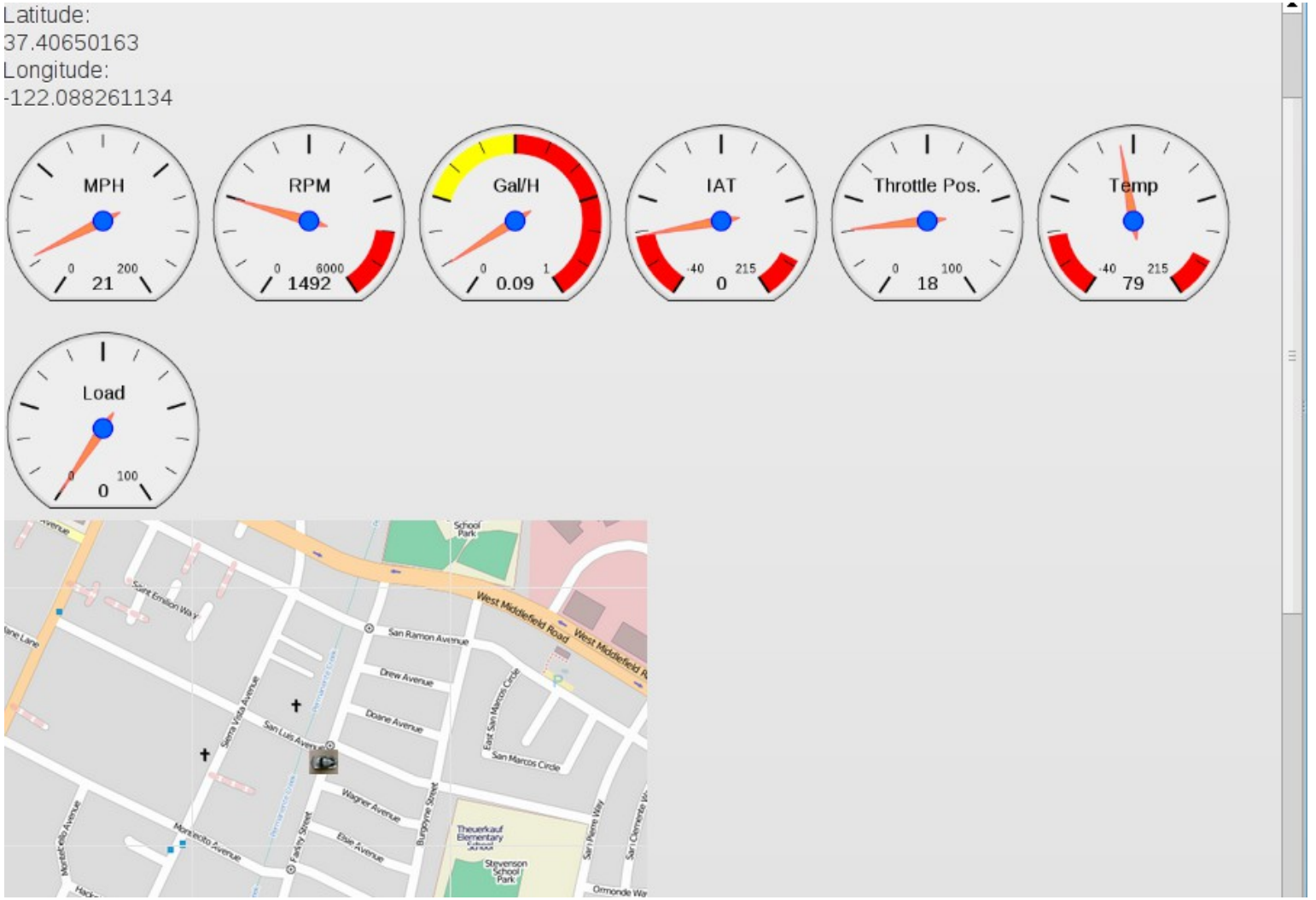
How to select a scantool

- Check which pins are populated in the OBDII connector of your car.
  - Tells you which protocol(s) are supported.
- Need only 4, 5, 6, 14 for OBDII.
- Best choice for novice is USB ELM327:
  - Cheaper (less than $50).
  - Won't drain car battery and won't write to CAN.
  - Easier to connect than Bluetooth.

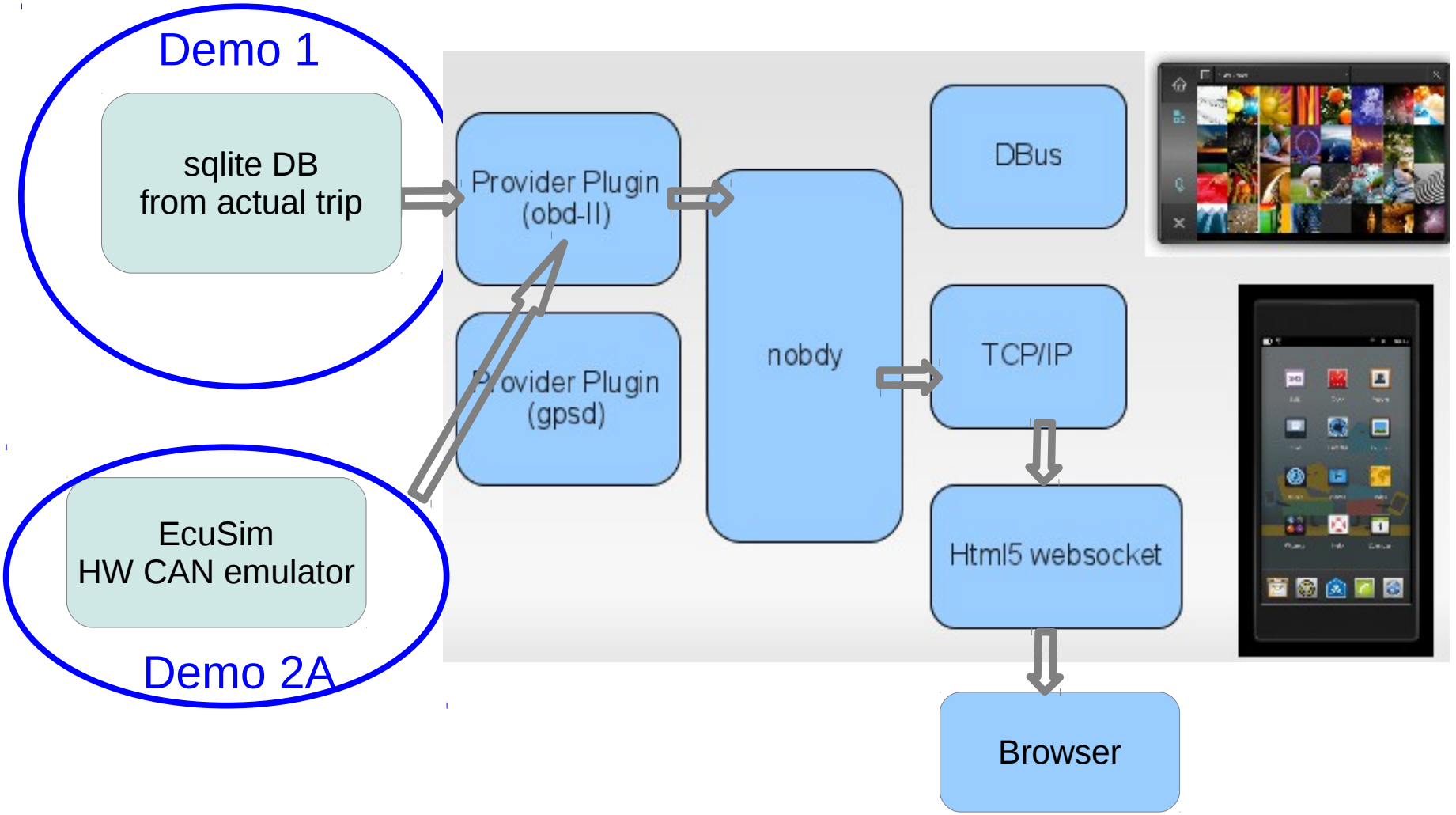
About the OBDLink MX

- Power-user choice.
- STN1110 controller (*not* ELM327), Bluetooth comms.
- Support OBDII *and* non-standard CAN bus
  - Typical “smog test” data *plus*
  - Doors, lights, wipers, key, locks . . .
- Reading OBDII is completely idiot-proof.
- Writing to CAN allows remote door unlock, headlight checking . . . or “bricking” of car!

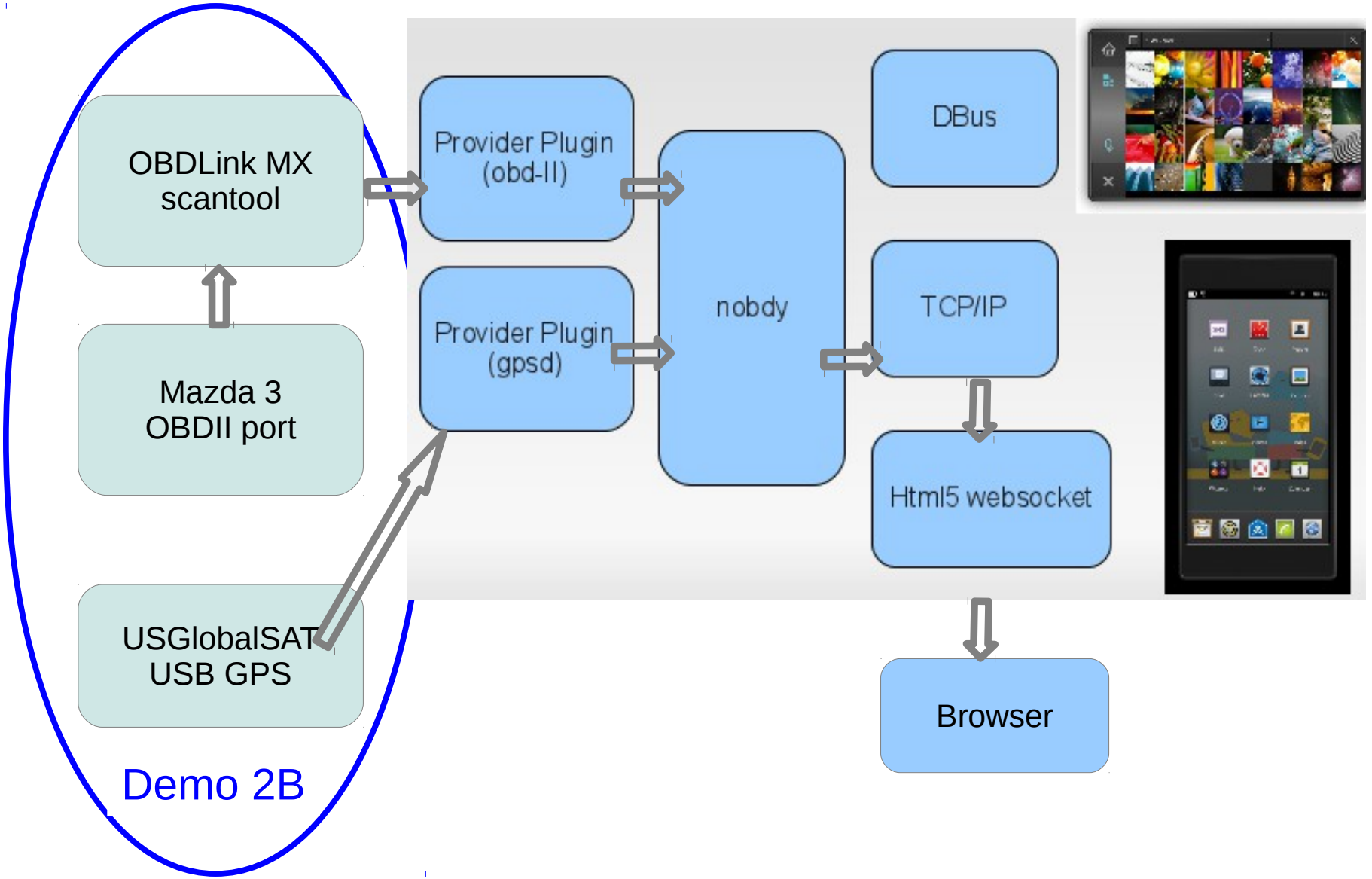
Demo 1: replay of prerecorded trip using nOBDy



Demo 2A: live data demo using nOBDy, OBDLink MX and EcuSim (lunchtime)



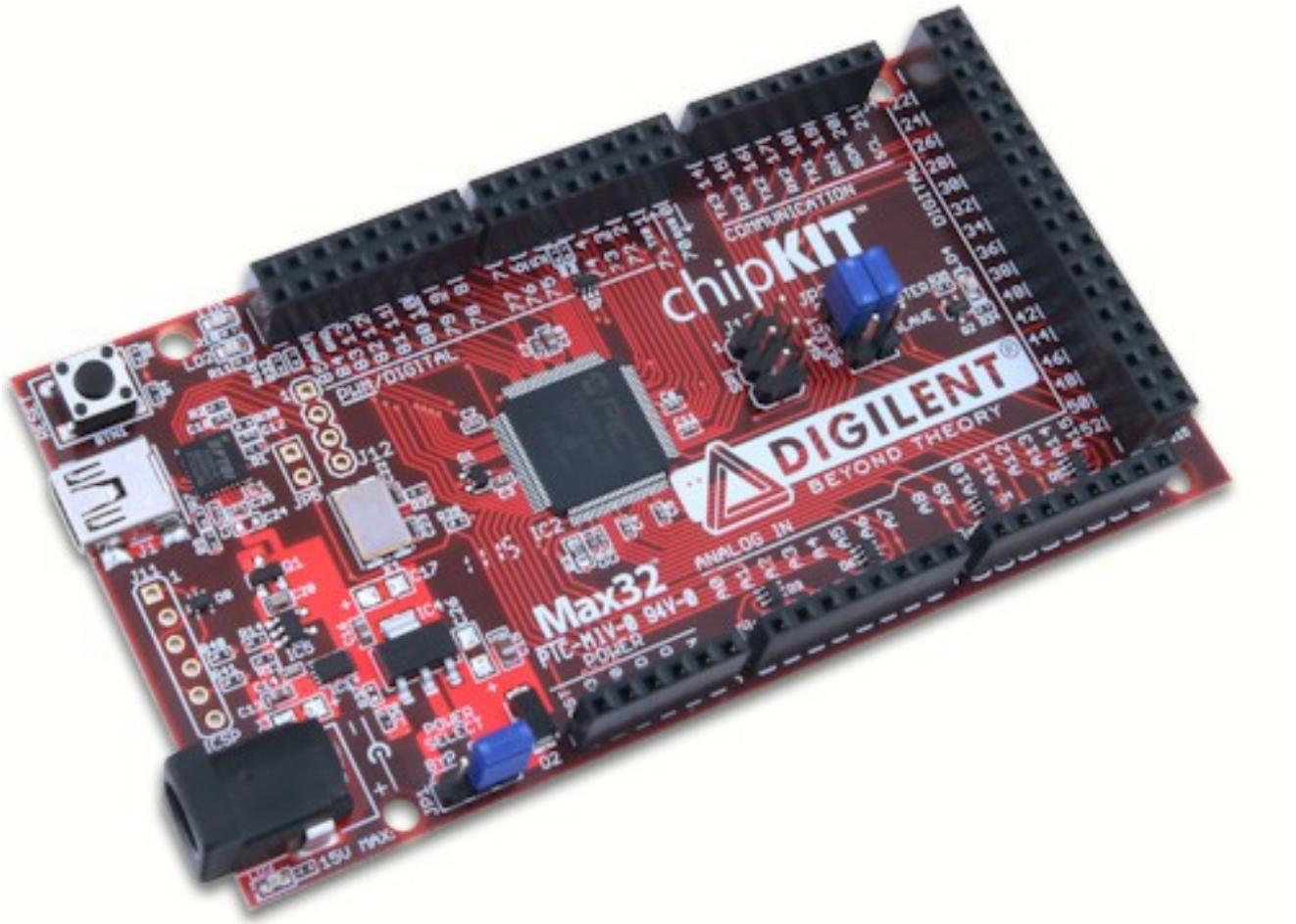
Demo 2B: live data demo using nOBDy, OBDLink MX and Mazda (evening)



Summary

- Automotive open source is at a tipping point
- Opportunities to get involved as business, as hobby, as citizen
- Inexpensive HW and open-source SW solutions abound
- Join the party, or at least speak up for your rights!
- Visit us at openice.org, #linuxice on freenode IRC or mp3car.com

chipKIT Max32™ Prototyping Platform



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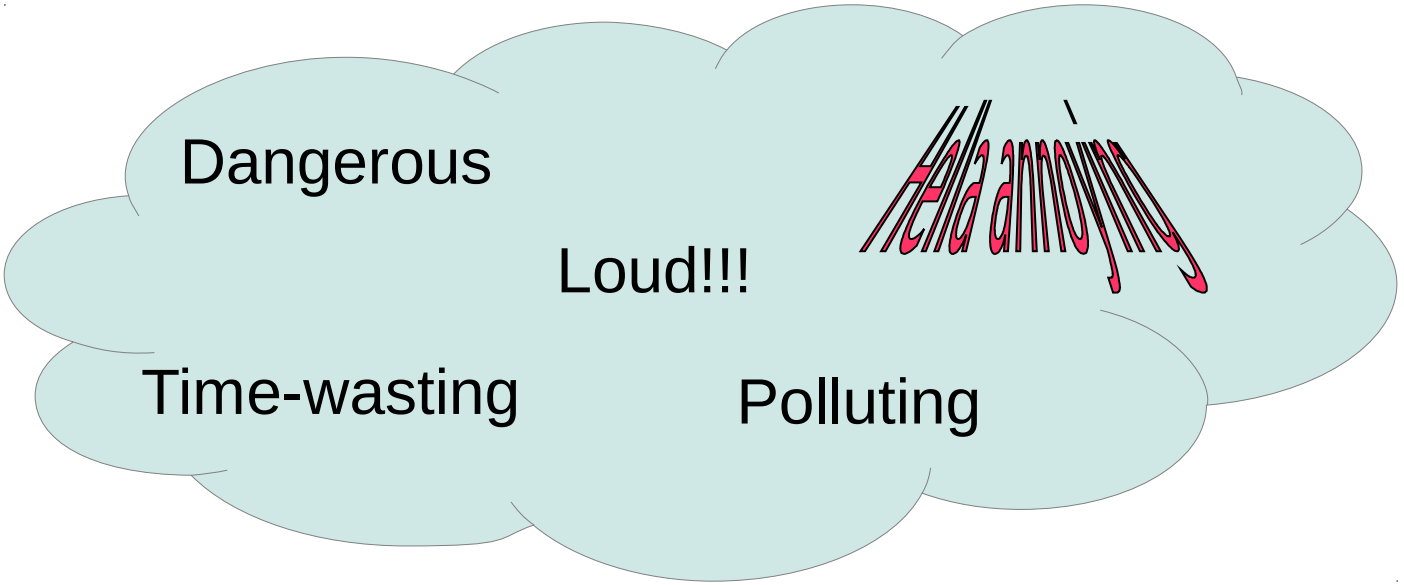
Our transportation system is



because *until now* individuals had little power to change it.