Connected vehicles in the UK – filling the gaps

Andy Graham
White Willow Consulting

Chair ITS-UK Connected Vehicles Group
Setting the scene

- UK has many different roads authorities
  - Highways England, Traffic Wales, Traffic Scotland, Roads Service (strategic)
    - 3% by length, 30% of VMT
  - Over 150 Local Authorities for 97% of the road length
    - Transport for London (City) down to the Scilly Isles
  - 400 authorities with parking powers
  - 35 million vehicles

- Connected and autonomous.... Is not one word.
  - National scale technology pilots coordinated by Zenzic
  - But for many local authorities, even connected vehicles are not yet on the radar
    - Autonomy is scary
      - Many other pressures on budgets eg roads maintenance, social care, COVID, Brexit....

- Average UK vehicle age 7.9 years
  - So Connected new cars are not the only target
  - Freight, cycling, etc – connected vehicles
  - Connected vehicles include smartphones, PAYGI, dashcams, fleet management as well as DSRC (ITS-G5)
Examples of pilots to raise the radar return

• Low cost Local Authority led, Nationally funded
  • Tech used to support a well defined problem by an LA
  • Connecting organisations as well as devices

• Solving problems and sharing knowledge
  • In vehicle signs
  • GLOSA (SPaT)
  • Asset management data (Potholes, signposts, road condition)
  • Better signal setting
  • Smarter Parking
• Reinforces VMS
• VMS where you can't install
• More info than a VMS
• In a 7 year old VW Polo using MirrorLink
• GLOSA linked to SCOOT (adaptive signals so a challenge as timing changes continually)
• 14% stop reduction
• Done by cellular
• New projects use speech only
• Pothole data from OBD2 insurance dongle

• Thrown away by data collector as “not of any value”

• $16B of unfilled potholes in the UK

• $6bn a year on roads maintenance

• Annual surveys...
Award-Winning Apps

Giving drivers complete choice and peace of mind across the UK.

- Free Android and iOS app
- UK wide On-Street Parking Bays, Tariffs and Restrictions
- UK wide Off-Street Car Parks, tariffs and hours of operation
- UK wide Petrol Prices and locations
- Including Disabled, Electric, Motorcycle bays.
- Yellow Line Loading Rules
- Match Day and Public Holiday Rules

- Find a space
- Nav to that space
- Park and press pay
- Pay by the minute remotely
- Reduces costs
- Increases revenue
- Happy public
- Happy politicians
- Happy retail

- Post COVID, touchless parking
Using INRIX GPS individual vehicle data to measure delays at signals in 12 cities
- Use FVD instead of loops to set signals
- Work using this in York saved 10% of delay
- Maintenance of loops is ok but if the road they are cut in has gone...
Managing competing demands in (old) York:

- Growth
- Tourism
- Commuting
- Air quality
- Roman Road layout
  - What did they ever do for us?
- Walled city
- Heritage zone (1472)
- Floods
- Not enough money
State of the Nation has more examples

So why aren’t these benefits seen across the UK?

• RAC Foundation saw untapped potential
• Asked me – “what needs to become true for these benefits”?
  • At scale
  • Quickly – can’t wait for autonomy
  • Where they impact most

• All that UK needs to do is....
  • So looked at end to end data chain from feasibility and funding to driver uptake and trust
So?

• Identified gaps and owners in detail
• Identified work arounds and ways to connect bits of the circuit
• Identified common issues

• NOT JUST TECHNOLOGY
• Softer end to end business case and business model
  • Why would drivers want this?
• Focus on outcomes and quick wins
  • GLOSA Saving HGV (truck) operating costs at signals = $1 per stop
  • Improving traffic signals by better monitoring
Quick win: GLOSA for niche applications eg HGV routes

Data needs to be available and of high quality → Highway authority

Data needs to be turned into advice for drivers → Action: Road operators to publish data for key signal sites

Data needs to be transmitted to vehicles → Use existing comms and sat nav service

There needs to be equipment in the vehicle to receive the advice → Action: In vehicle services need to access advice for apps or in-cab fleet management

There needs to be a way to display/speak the message safely and clearly → Action: In vehicle service providers and freight industry to reduce distraction

Drivers react to the displayed message as they trust it → Driver behaviour changes to reduce congestion and emissions

Like your SPaT challenge
What needs to become true....?

• Quality Data easily available into and from vehicles/traffic systems
• User trust in data – think of the driver. Why use this?
• Driver distraction reduced
• Business case and model clear for all
• Skills available and training to keep them up
• Procurement of data and services simplified and aggregated
• Business processes linked to roads business not tech business
• Awareness of opportunity in LAs – confusion with autonomy
• But not just communications tech!
Transferrable messages for the US??

• End to end data chain – one break is all that’s needed for a fail
  • Users are a weak link, so harvesting data us easier than pushing information
• Cellular is good enough for now for non safety critical services
• Think all vehicles not just new cars
• Local Authority people need help
  • Civil engineers like me don’t do cyber security or data schemas
  • What are the benefits?
  • Convince them “It will make your day job easier in the long run”
• Central collection of the story and disseminate results to non adopters
• THINK OF THE DRIVER
• As engineers, we design for Mr Spock
• As drivers we want simplicity like Homer
• User experience is everything
Progress

- Working groups of LAs to share knowledge
  - Smart parking
  - Assets
  - SPaTULA (SpaT for Users, Local Authorities and Automotive)
    - Keen to link to US
- DfT Connected Vehicle Data Strategy coming soon
  - Address softer issues like training and awareness, data access ...
  - Single national plan
- Zenzic roadmap for connected and automated mobility just updated
  - Roadmaps need to start at the origin as well as head for the destination
- Connections of people also helping in Covid
  - And connected vehicle data
  - 107 different data sets
Figure 3 – Overall daily average traffic flow change from baseline

- Start of lockdown
- Lockdown easing announcements
- Easter Bank Holiday
- Early May Bank Holiday
- Lockdown easing announcements
- Spring Bank Holiday
- 25/26th July gyms and other services re-open, summer holidays start.
- 1st June Schools start to re-open
- 15th June non-essential shops re-open
- 4th July pubs and restaurants re-open
- August Bank Holiday
- 14th September pubs, bars and cinemas to close at 10pm and “rule of six” implemented nationally
- Schools in England start to re-open
- 14th October three-tier local lockdown system introduced

Figure 3: Change in national daily average traffic volumes since 01st March across all sources compared to the baseline (first week of February 2020)
Not just new cars....

- 1914 Model T Ford
- Built in the US so has steering wheel on the wrong side .... 😞
- No OBD2 port or USB 😊 (or even 12v supply)
- But with a smartphone giving location and Z axis movement becomes the UK’s oldest connected vehicle (so far)
- GLOSA demo soon...

- Can the US beat this?

- Thanks – Q+A?
Useful links

- **https://www.racfoundation.org/**
  - Funders of this work and many other research projects

- **https://www.ttf.uk.net/**
  - Nationally funded group of local authority practitioners (seems to align well to CAT Coalition and SPaT Challenge)

- **Zenzic https://zenzic.io/**
  - National scale testbeds co-ordinators and holders of UK roadmap

- **CCAV https://www.gov.uk/government/organisations/centre-for-connected-and-autonomous-vehicles**
  - Government transport and industry co-ordination and policy

- **Andy@whitewillow.biz**
  - Please do get in touch with any queries