Space Technology Solutions for Urban Transport – A Bus Perspective
Or
Buses to the Moon

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USB

Much more awesome if you take it literally.
Agenda

• Vehicle Design
• Fuel Usage
• Driver Management
• Real Time Control
Vehicle Design – Weight and Lifespan

Vehicle weight:
- use of lightweight materials and composites becoming more widespread
- more thorough design to include life testing to reduce 'over engineering' of systems and components
- better system redundancy to improve vehicle 'up time' and reduce failures
- hybrid technology increases weight

Major Unit Lifespan:
- better use of condition monitoring and functional testing to more accurately predict failure and potential failure
- use of telematic systems to monitor critical systems health in 'real time' so early intervention can reduce repair costs and improve vehicle 'up time'
Vehicle Design - Integration

**Vehicle Integration:**

- some development of semi-autonomous technologies within the bus industry to improve vehicle safety such as assisted braking systems and driver alerts
- a long term move to fully autonomous vehicles to further improve safety and reduce costs
- Autonomous buses for the future - Google bus?
Fuel Usage

Ending Fossil Fuel Reliance:
- further development of hybrid systems for both drive and auxiliary systems to improve propulsion efficiency taking place – battery life an issue – high up front cost
- further development of alternative fuel systems including hydrogen and full electric taking place but limited in scale
- Euro VI Diesel engine in 2015 and ratings beyond - come with many complicated systems to reduce emissions
- energy recuperation systems are now available but they affect vehicle driveability which has minimised their widespread uptake
Driver Management

Issues:

• Average management to driver ratio is 1:100
• Remote workers away from base for up to 5.5 hours before a break
• Traditional scheduling based on 1986 agreements
• Traditional form of monitoring through accidents, feedback, random drug and alcohol tests
• Basic Telematics to review but not in real time

Solutions Sought:

• Confidence that driving standards are being maintained
• Live reporting of incidents and issues
• Reassurance around issues of driver fatigue and health – planning and in real time
Real Time Control

Issues:
• Passengers ever more demanding for live travel information
• Supervisors need to be better informed about location of vehicles, traffic information, known delays, likely delays
• Drivers need to be communicated with
• 92% of buses in England have GPS technology fitted

Solutions Sought:
• Arriva App exists for journey planning and live status but lacks integration with other sources such as Local Authority information
Trip Planner

From
Leicester St
Margaret's Bus Station

To
Nuneaton Bus Station

Date
Saturday, 21 March 2015, 14:54

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Real Time Control

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Solutions Sought:
• Arriva App exists for journey planning and live status but lacks integration with other sources such as Local Authority information
• Back office of App allows Supervisors to see where buses are but lacks forward planning capability – live rescheduling
• Safe, legal communication with drivers is very difficult
  • No radio
  • Messaging through ticket machines limited
Conclusion

• Less sexy end of the public transport world but
  • 4.7bn passenger journeys in England in year that ended March 2014
  • 105,000 employees in England
  • 84% of buses in England are accessible
  • 7.7 years average age
  • Over 1500 hybrid buses in use
• Manufacturers are responding to some challenges but operators traditionally risk averse – confusion over which technology is best
• High up front costs are a barrier
• Partnerships outside of industry rare
• The appetite is growing, particularly around vehicle technology