The more things change, the more they stay the same?

Sorting the Revolutions from the Hype

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ARE YOU READY FOR THE...
Modern Transport Bill
(UK Queen’s speech 2016)
revolution
/ruh-vee-yuh-nuhn/
noun
1. a forcible overthrow of a government or social order
"the country has had a socialist revolution"
synonyms: rebellion, revolt, insurrection, mutiny, uprising, riot, insurgeny, coup, overthrow; seizure of power, regime change; More
2. an instance of revolving.
"one revolution a second"
synonyms: single turn, turn, rotation, circle, whirl, twirl, spin, wangle, roll, round, cycle, circle
"the prop shaft turns 4.7 times for one revolution of the wheel"
Reason #1: An electric car is **JUST a car**

*Accidents
*Parking pressures
*Road user conflicts
*Congestion
*Mineral extraction
*Energy supply & emissions
*Disposal
*Subsidy

Power for EVs

Metals for EVs

EV TYRES
Reason #2: Automation is **not automatically a good thing**

Reason #3
The MAAS* business model relies on selling more and more mobility\footnote{Mobility As A Service}

<table>
<thead>
<tr>
<th>space required to transport 60 people</th>
</tr>
</thead>
<tbody>
<tr>
<td>car</td>
</tr>
<tr>
<td>electric car</td>
</tr>
<tr>
<td>uber</td>
</tr>
<tr>
<td>autonomous car</td>
</tr>
</tbody>
</table>
Reason #4: Smart Cities are only as good as the policies that govern them

- We don’t do transport governance well now when it’s relatively simple …
- … consider what we think is happening:
  - Transport regulation disrupted (or under attack)
  - Consumers become mobility providers too in the ‘sharing economy’
  - Technology firms are promoting their own vision of change… which is producer interest
Reason #5:
Transport revolutions are not what shape travel

www.parliamentstreet.org
www.agelessvoice.net
www.walesonline.co.uk

Home.38degrees.org.uk
www.mrw.co.uk
www.smilemachine.com

http://www.fleximobility.solutions
Real Revolutions (‘in favour of a new system’)

RR #1 Place-based, not technology-based solutions
RR #2 Connectivity planning, not journey planning
RR #3 Smart policies, not smart cities
RR #4 Small data, and big data
RR #5 Mobility system, not transport system
Place-based, not technology-based solutions

“In our central scenario, around 60% of new car and van sales are a plug-in hybrid or battery electric vehicle by 2030”
(Sectoral Scenarios for the Fifth Carbon Budget (2015))

- Where is this going to happen? Is this the right solution everywhere?
- Are local and city authorities the agents for transformational change?
- How can local decisions be guided among different potential futures?
Technology Diffusion

Percentage of Cars that are Volkswagen Diesels

Legend

<table>
<thead>
<tr>
<th>Range</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0 - 1.6</td>
<td></td>
</tr>
<tr>
<td>1.6 - 2.0</td>
<td></td>
</tr>
<tr>
<td>2.0 - 2.3</td>
<td></td>
</tr>
<tr>
<td>2.3 - 2.6</td>
<td></td>
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<tr>
<td>2.6 - 2.9</td>
<td></td>
</tr>
<tr>
<td>2.9 - 3.1</td>
<td></td>
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<tr>
<td>3.1 - 3.4</td>
<td></td>
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<tr>
<td>3.4 - 3.8</td>
<td></td>
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<tr>
<td>3.8 - 4.3</td>
<td></td>
</tr>
<tr>
<td>4.3 - 12.5</td>
<td></td>
</tr>
</tbody>
</table>

Legend

Electric Vehicles per 1000 Cars

<table>
<thead>
<tr>
<th>Range</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.090 - 0.300</td>
<td></td>
</tr>
<tr>
<td>0.300 - 0.390</td>
<td></td>
</tr>
<tr>
<td>0.390 - 0.490</td>
<td></td>
</tr>
<tr>
<td>0.490 - 0.640</td>
<td></td>
</tr>
<tr>
<td>0.640 - 10.640</td>
<td></td>
</tr>
</tbody>
</table>
Vehicles don’t cause pollution, people do

Data for private cars (class 4/4A vehicles) in each small area (LSOA)

Total energy use more dependent on average mileages than types of vehicles owned

Pollution exposure vs origin

Concentrations of Nitrogen Dioxide (µg/m³ 2011)

- 1.3 - 9.9
- 10.0 - 12.1
- 12.2 - 14.0
- 14.1 - 15.8
- 15.9 - 17.6
- 17.7 - 19.5
- 19.6 - 21.4
- 21.5 - 24.1
- 24.2 - 28.2
- >28.3

Emissions of Nitrogen Oxide from Registered Vehicles (t/y 2011)

- 0.1 - 1.1
- 1.2 - 1.5
- 1.6 - 1.8
- 1.9 - 2.1
- 2.2 - 2.3
- 2.4 - 2.6
- 2.7 - 2.9
- 3.0 - 3.4
- 3.5 - 4.2
- >4.3

Average NOx Emissions per Vehicle (g/y 2011)

- 2,197 - 2,742
- 2,743 - 2,895
- 2,896 - 3,019
- 3,020 - 3,122
- 3,123 - 3,234
- 3,235 - 3,358
- 3,359 - 3,488
- 3,489 - 3,633
- 3,634 - 3,965
- 3,966 - 5,050

Contains National Statistics data © Crown copyright and database right 2012
A spatial index of vulnerability to fuel price increases – England 2011

1. Exposure:
   Cost burden ratio = per household expenditure on fuel / median income

2. Sensitivity
   Median household income

3. Adaptive capacity
   Travel time to 8 key services by public transport / walking

Legend
- Cost burden ratio (quartiles)
  - 0% - 1.7%
  - 1.8% - 3.6%
  - 3.7% - 6.0%
  - 6.1% - 10.3%

Legend
- Median income (£)
  - £156 - £247
  - £248 - £310
  - £311 - £422
  - £423 - £628
  - £629 - £1358

Legend
- PT walk time to services (min.)
  - 45 - 58
  - 59 - 73
  - 74 - 113
  - 113 - 142
  - 143 - 409

(Anonymised DVLA/ DVSA data)
(Experian Median Income data)
(UK Government Accessibility Statistics)
A spatial index of vulnerability to fuel price increases – England 2011

Legend
Vulnerability (index) (quintiles)
-10.5 - 1.5
-1.6 - -0.4
-0.4 - 0.4
0.4 - 1.3
1.2 - 19.4

London
Greater Manchester
West Midlands
Sheffield CR
Local Authority benchmarking and analysis tool for exploring car ownership and use

<table>
<thead>
<tr>
<th>Domain</th>
<th>Variables</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car use</td>
<td>Miles per person per year, Gini coefficient of distribution of vehicle use across MSOA population, high mileage vehicles per person,</td>
<td>MOT project</td>
</tr>
<tr>
<td>Car characteristics</td>
<td>Vehicle age, engine size, % diesel, total particulate emissions, total CO₂ emissions</td>
<td>MOT project</td>
</tr>
<tr>
<td>Car ownership</td>
<td>Cars per person</td>
<td>Census</td>
</tr>
<tr>
<td>Mode share</td>
<td>% car commute mode share, % bike commute mode share</td>
<td>Census</td>
</tr>
<tr>
<td>Accessibility</td>
<td>Total travel time to 8 locations by car and by public transport / walk, total distance to 8 locations</td>
<td>DfT Accessibility statistics</td>
</tr>
<tr>
<td>Morphology and land-use</td>
<td>Distance to work, distance to nearest settlement of: 5000, 25000, 50000, 100000, 250000 and 500000 residents.</td>
<td>Derived from Ordnance Survey, census and UK Borders data</td>
</tr>
<tr>
<td>Social and demographic</td>
<td>% one adult households, % unemployed, % people in non-car owning households, % professional, % Intermediate occupations, % Routine / manual occupations, % work from home, % female, % children, mean income, % of population working over 31 hours per week</td>
<td>Census, Office for National Statistics (ONS)</td>
</tr>
</tbody>
</table>
RR #2: Connectivity planning, not journey planning

- On the face of it, there is more flexibility in journey planning than we account for.
- People do not base their mode choices on *individual journeys*.
  - E.g. the journey TO work is not as important as the journey FROM.
- **RECEIVED WISDOMS (value of time) are breaking down – WE HAVE NO MODELS THAT ACCOUNT FOR ACTIVITY SCHEDULING & TIME PRESSURE.**

<table>
<thead>
<tr>
<th></th>
<th>paid work</th>
<th>voluntary work</th>
<th>shopping</th>
<th>caring</th>
<th>school</th>
<th>Average</th>
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</thead>
<tbody>
<tr>
<td><strong>Mode switch</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very easy</td>
<td>24%</td>
<td>24%</td>
<td>23%</td>
<td>16%</td>
<td>29%</td>
<td>23%</td>
</tr>
<tr>
<td>Very difficult</td>
<td>28%</td>
<td>21%</td>
<td>19%</td>
<td>26%</td>
<td>17%</td>
<td>22%</td>
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<tr>
<td><strong>Time Switch</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Very easy</td>
<td>28%</td>
<td>28%</td>
<td>38%</td>
<td>22%</td>
<td>22%</td>
<td>28%</td>
</tr>
<tr>
<td>Very difficult</td>
<td>29%</td>
<td>24%</td>
<td>7%</td>
<td>16%</td>
<td>36%</td>
<td>23%</td>
</tr>
<tr>
<td><strong>Postpone/ cancel</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very easy</td>
<td>11%</td>
<td>21%</td>
<td>34%</td>
<td>11%</td>
<td>10%</td>
<td>17%</td>
</tr>
<tr>
<td>Very difficult</td>
<td>51%</td>
<td>19%</td>
<td>7%</td>
<td>30%</td>
<td>46%</td>
<td>31%</td>
</tr>
</tbody>
</table>
Work is not the most car intensive activity

Data from 2000 British Time Use Study

RR #3: Smart policy, not smart cities

- We are only at the beginning of the digital revolution for the city
- But can we really have a city run by data?
- How will the benefits and any negative externalities of such a transition be managed?
- How will we ensure the objectives of each ‘revolution’ are aligned?
RR #4:
Small data, and big data

- **What is real time and big data actually enabling?**
  - Do we understand the ‘traditional’ policy impacts of the innovations we foresee? (modal shift, congestion, social polarisation etc)
  - Do we understand how smart mobility will change our demand responses and change our cities, our places, our societies?

- **What are we transforming ourselves into if we really can deliver smart, instant mobility?**

- **We need radical changes in theory, method and data to explain the world as it really is before it is too late**
Commission on Travel Demand (Chair: Greg Marsden)

Trends in trips, distance travelled and time spent travelling: England 2002 to 2015 [NTS0102]

- **Trips** (Index: 2002 = 100)
  - 2002: 1,051 trips
  - 2008: 914 trips, v 13%
  - 2015: ...

- **Distance**
  - 2002: 7,184 miles
  - 2008: ...
  - 2015: ...

- **Time** (368 hours)
  - 2002: 368 hours, v 4%
  - 2008: ...
  - 2015: ...

**Figure 3.4: Traffic growth by scenario (bn miles, all vehicles)**

- Scenario 5
- Scenario 4
- Scenario 3
- Scenario 2
- Scenario 1

DfT (2015)
NEW REPORT: Learning from the LSTF

CASE STUDIES
- Carbon emissions and congestion (2016)
- Travel to strategic employment sites (2016)
- Town centre vitality (2016)
- Tourism and the rural economy (2016)

OUTCOMES MONITORING (12 LARGE PROJECTS)
- Final meta-analysis of 12 Large Projects (2017)
- Interim meta-analysis of 12 Large Projects (November 2015)

ANNUAL OUTPUTS REPORTING (ALL 96 PROJECTS)
- What Works (this report)
- 2014/15 Annual Report
- 2013/14 Annual Report
- 2012/13 Annual Report
- 2011/12 Annual Report
RR #5:
Mobility system, not transport system

Automobility: needs more attention to the systems through which mobility needs are generated

Peak car: cannot rely on the hope that the younger generation will do things differently – what must come together to tip into a post-car mobility system?
## Sustainable Travel Revolutions

<table>
<thead>
<tr>
<th>FALSE?</th>
<th>REAL?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrification</td>
<td>Place-based thinking</td>
</tr>
<tr>
<td>Automation</td>
<td>AAAS</td>
</tr>
<tr>
<td>MAAS</td>
<td>Smart Governance</td>
</tr>
<tr>
<td>Smart Cities</td>
<td>Small Data</td>
</tr>
<tr>
<td>Big Data</td>
<td>Mobility System</td>
</tr>
<tr>
<td>Transport System</td>
<td></td>
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</table>