Big Data in Transportation Summary

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Prophesized Summary

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Three ‘Facts’

Eight Issues

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Fact 1: The Big Data Era is here

- **New technologies for collecting spatial data**
- **New sources of data (social media etc)**
- **VGI (people, cars etc as sensors)**

Number of companies in exhibition hall with Big Data as a selling point e.g. Otto

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BUT

Just wait 10 years…

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Fact 2: Everything is becoming 'Smart'

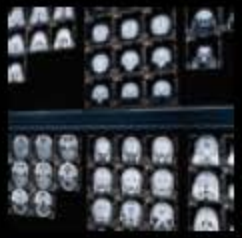
Smart implies 'monitored' and 'connected'

Everything is now connected and *smart*


Smart transportation


Smart oil fields


Smart food systems


Smart healthcare

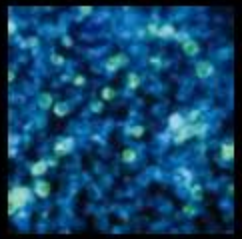

Smart energy grids


Smart retail


Smart water management


Smart supply chains


Smart countries


Smart weather


Smart regions


Smart cities

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One consequence of smart systems is that we increase our ability to charge for individual usage rather than average usage

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- **Electricity**
- **Water**
- **Sewage**
- **Road usage (user fee, differential pricing by time of day, day of the week)?**

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Fact 3: We have increasing capability of monitoring systems in real time (or at least quickly)

e.g. road use

population distribution

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Issue 1: Privacy

We have the ability to track people 24/7. How do we weigh the pros vs the cons of this? How much surveillance are individuals willing to put up with?

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Issue 2: Representativeness

Social media data is NOT representative of general population

Cell phone data is NOT representative (provider coverage; demographics)

Other data are: monitors; satellite data

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Issue 3: Insight vs Data Volume

Does more data always equal better insight?

Can data confuse rather than clarify?

Using large, hyper-dimensional data sets to make *more informed decisions* is the real challenge

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Issue 4: Data Quality

How do we ensure we get good quality data from 'unregulated' sensors?

e.g. openstreetmap vs National Mapping Agencies

cf Wikipedia

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Issue 5: Moving from Deductive Reasoning to Inductive Reasoning

Data-driven analysis is now becoming the 'norm' and theory is taking a back seat – good or bad?

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Issue 6: Just because you identify a problem, doesn't mean you solve it

e.g. traffic congestion – how do you get people to modify their behavior?

And then what happens if everyone does?

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Issue 7: There will be winners and losers in the Big Data Era

Winners: those who take advantage of new technology and data e.g. Taxis – Uber; Delivery services; tourist ind.

Losers: Those who are currently gatekeepers to data / information /knowledge

e.g. Travel agents;

Retailers

National mapping agencies

GPs

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Issue 8: How do we ensure BIG DATA is a force for GOOD?

Given most data relate to locations, we are entering Big Brother Era

Some surveillance is good; some is bad

How do we decide limits? Who decides?

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30 Word Summary

Big Data in transportation typically involves knowing where things and/or people are. Knowing where things are is fairly uncontroversial; knowing where people are isn't. There is a need for further research