
Smart Cities/Smart Buildings

..... A Tale of Two Scales

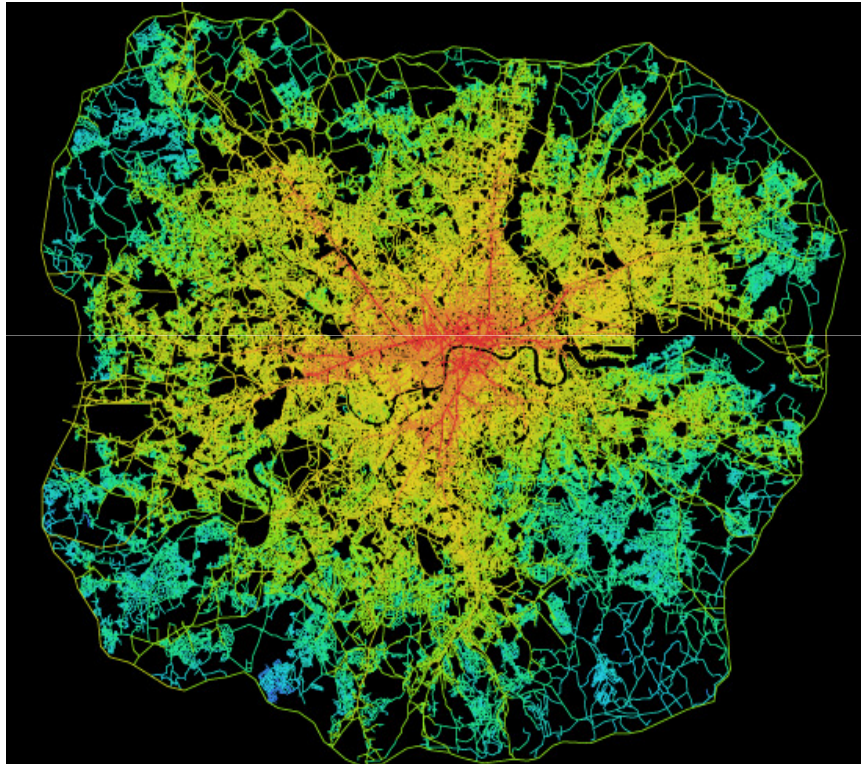
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Geospatial/UNECE
Lisbon 2015

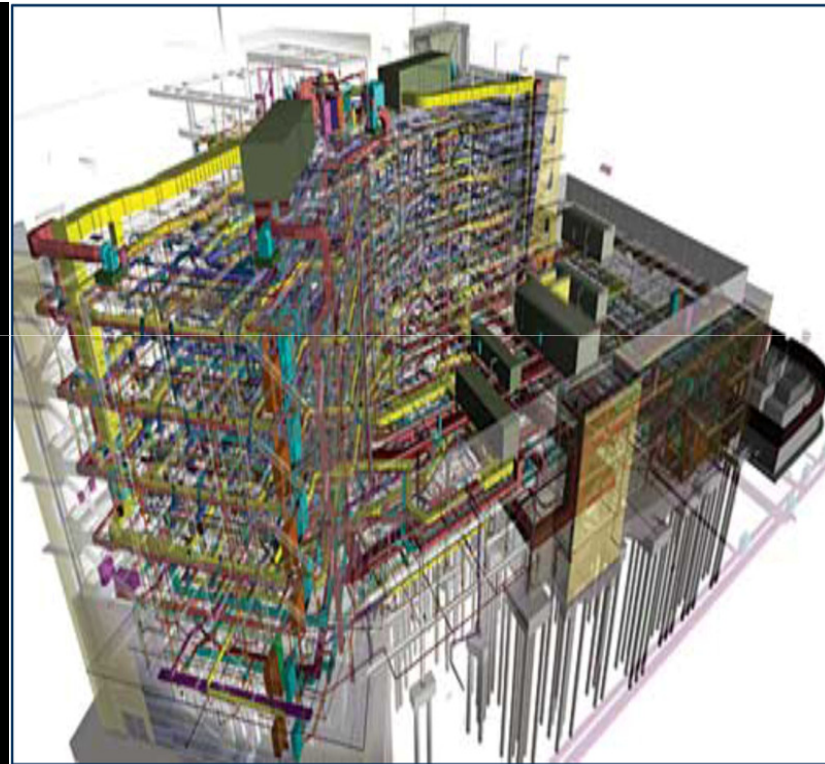


Smart

City (Space syntax UCL)



Building (Ghafari/AR)



Ensuring the two are talking to each other


- ❑ Citywide project
- ❑ Site based project
- ❑ Different motivations
- ❑ Different governance structures
- ❑ Different technical platforms

The business end of 'smart'



Smart Cities

PD 8101:2014




BSI Standards Publication

Smart cities – Guide to the role of the planning and development process

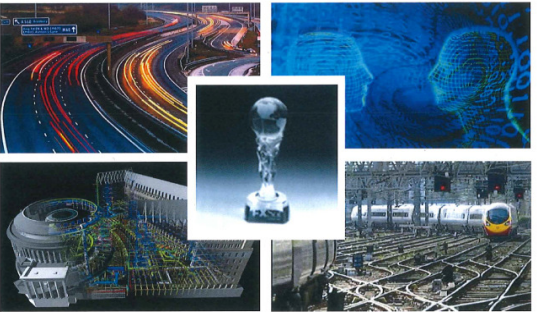
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Smart Building



 HM Government

Digital Built Britain

Level 3 Building Information Modelling - Strategic Plan



February 2015

Economic drivers

Global market estimate £400 billion by 2020

UK market estimate £40 billion by 2025

- Transport
- Energy
- Health care
- Water
- Waste
- Telecoms

Economic drivers

Procure, deliver and operate the built environment

- ❑ UK construction employs over 3 million people
- ❑ Delivers £107 Billion output (2010)
- ❑ Key contributor to UK growth
- ❑ Critical in meeting UK Climate Change Targets
- ❑ Growing Facility/Asset Management sector
- ❑ Level 2 BIM case studies secured 20% capital savings against 2009/10 benchmarks
- ❑ Global construction forecast to grow by over 70% by 2025

5 Key Areas to Support Smart City Aspirations

1. Build the partnerships to deliver holistic solutions
2. Build the foundation for widespread exploitation of data
3. Use digital modelling to deliver a people-centred physical environment
4. Put in place an enabling digital and communications infrastructure
5. Develop and test new business models and processes

Smart Cities Challenge



Build foundation for widespread exploitation of data

- ❑ Additional costs
- ❑ Data security and privacy
- ❑ Workable commercial arrangements
- ❑ Data capture issues

Use digital modelling to deliver people-centred physical environment

- ❑ Identification of useful data
- ❑ Good practice often ignored
- ❑ Lack of software tools
- ❑ Lack of application of the potential of digital design

Social & Economic infrastructure mature

- ❑ Extensive renewal, modification and expansion required
- ❑ Limited resources after financial crisis
- ❑ Strong opposition to new projects on environmental impact or disruption grounds

- ❑ Transactional, tactical approach to designing and building infrastructure sub-optimal
- ❑ Price volatility during periods of growth shows construction being inefficient compared to other capital delivery industries
- ❑ Capital cost of building roads, railways and other economic infrastructure is as much as 40% more in the UK than in comparable European economies

New Government Funding



Key measures

1. Create new international 'Open Data' standards
2. Establish new contractual framework for projects procured with BIM
3. Create a cultural environment which is co-operative, learning and sharing
4. Training public sector client in use of BIM techniques
5. Driving domestic and international growth and jobs in technology and construction

Glasgow, UK

- ❑ Awarded £24 million
- ❑ Integrate transport, communications and other infrastructure
- ❑ To improve city's economy and quality of life
- ❑ Reduce environmental impact



Bristol, UK 'Bristol is Open'

- ❑ Test-bed – programmable city
- ❑ Conversion of old cable television network to superfast fibre
- ❑ JV University of Bristol, Bristol City Council, NEC - £75m



Leeds City - self funding



Three layer model

- Foundation layer – operational foundation providing inter-operability for digital assets
- Differentiation layer – defines cities unique priorities based on skills and knowledge of people
- Innovation Layer – development of global leading projects that exploit Information, Human Capabilities and Digital technology

Leeds Data Mill



Open Data

Data →
Information →
Knowledge →
Wisdom



Leeds City Council report



Report author: Dylan Roberts
Tel: 07891 272272

Report of the Deputy Chief Executive

Report to the Executive Board

Date: 17th December 2014

Subject: Smart Cities: Delivering a sustainable City in the Digital Age

Are specific electoral Wards affected?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
If relevant, name(s) of Ward(s):		
Are there implications for equality and diversity and cohesion and integration?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Is the decision eligible for Call-In?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Does the report contain confidential or exempt information?	Yes	<input checked="" type="checkbox"/> No
If relevant, Access to Information Procedure Rule number:		
Appendix number:		

1. Summary of main issues

- 1.1. The world's most successful cities have Smart programmes where citizens, voluntary, public and private sectors co-operate to achieve sustainable city outcomes and increase economic competitiveness. The ability to share and exchange information across a whole city system will both contribute to better lives and outcomes for Leeds.
- 1.2. A Smart City is somewhere that maximises the potential of all of its assets: people (skills, endeavour), information (from all parts of the City), businesses and things (devices, technology) that when **combined** are more than the sum of its parts.
- 1.3. The Leeds Smart City approach operates within a 3 layer model of delivery comprising:
 - o The **Foundation Layer** that provides the operational foundation which is the means by which all digital assets across the City interoperate with each other and provide combined information from which we can gain new value and insight. We will build this incrementally by considering and incorporating "Digital by Design" in all new projects that we carry out across the City.

- o The **Differentiation Layer** defines the City's unique priorities, strengths and areas of distinctive opportunity based on the skills and knowledge of people. In Leeds these areas are Health and Wellbeing, Data and Co-Production.
- o The **Innovation Layer** in the Smart City is the development of global leading projects that exploits the City's differentiators through a unique combination of Information, Human Capabilities and Digital technology to deliver city outcomes in a uniquely innovative way that can then be applied in other cities.

- 1.4. This paper describes the need for a coordinated and supported approach to Smart Cities and recommends actions to move this forward including the formalisation of the temporary arrangements around the Smart Cities team.

2. Recommendations

- Endorse the Smart Cities approach and direction detailed in the report
- Support the formalising of the Smart City Team from existing resources under the leadership of the Chief Information Officer.
- Support the creation of a Capital Innovation Fund of £150K that can be used to support "Civic Enterprise" type prototypes as a basis for informing wider business cases. Spend against this to be recommended by the Smart Cities lead with sign off from Chief Information Officer and Executive Member for Digital & Creative Technologies, Culture & Skills.
- Support the direction to all managers and services to commit to make all non-person sensitive data open and published on the Leeds Data Mill.

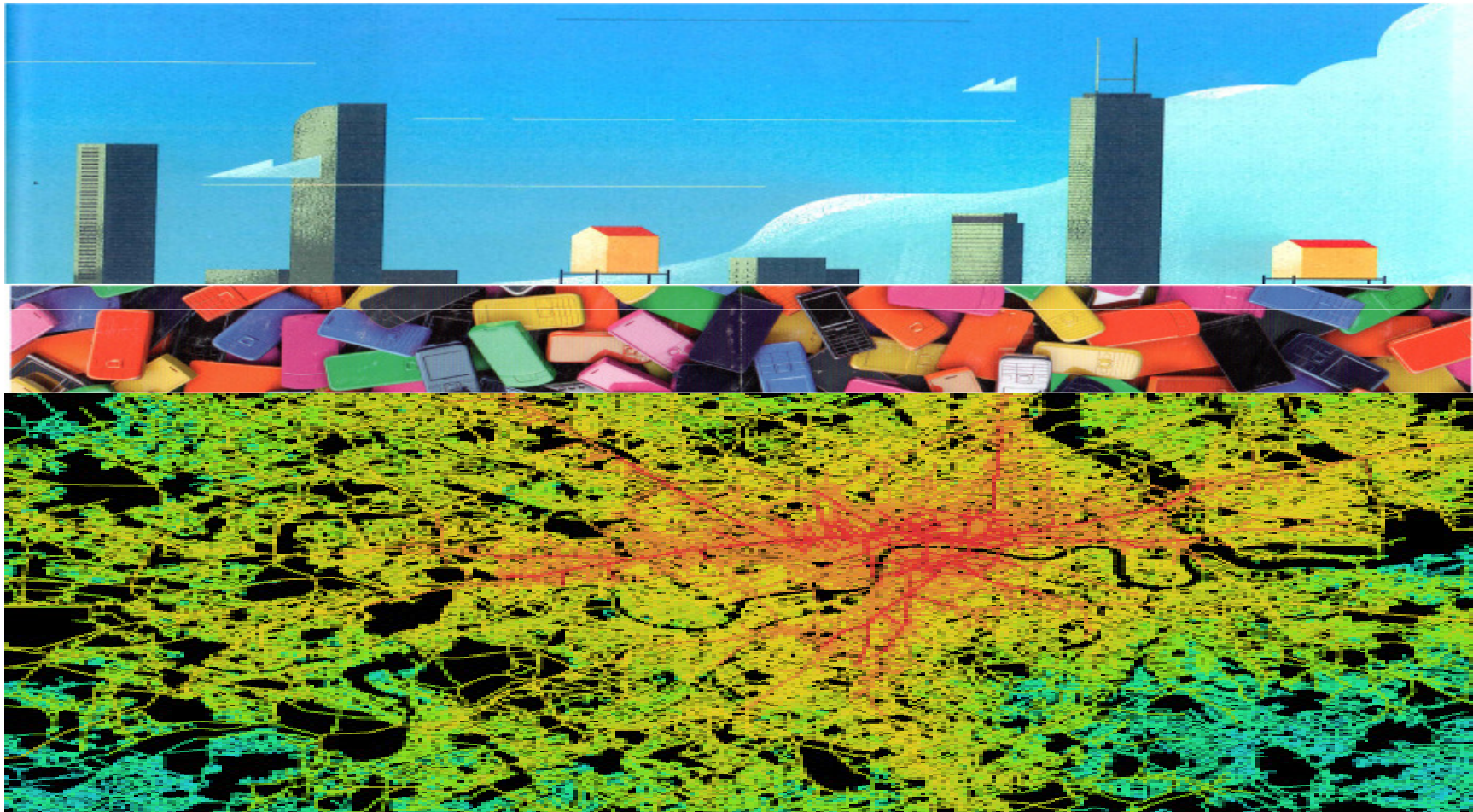
Sharing building/city information

- Above Ground/Below Ground
- 2D and 3D interacting
- Location of underground services - expensive information not being harnessed
- Facilities management over life span of building – capacity to inform city planning and development in real time

City Information Modelling (CIM)



Seamless connection ?



Thank you!

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