

# Alternative and Conventional Infrastructure Business Models: Developing a Typology (WP1.3)

John R. Bryson, Rachel Mulhall & Meng Song  
University of Birmingham

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## Garden Bridge, London



Source: TfL, <https://consultations.tfl.gov.uk/rivercrossings/garden-bridge>

**Vision:** Joanna Lumley – improve green space and connections in the city

**Capital Funding:**

£30m Citigroup  
£30 Treasury  
£30 Transport for London  
+ £85 to go

**Asset ownership and management:**  
Garden Bridge Trust registered charity

## Albert hall, London



Source: Visit London, <http://www.visitlondon.com/things-to-do/place/58843-royal-albert-hall>

**Vision:** Prince Albert – promote understanding of arts and sciences

**Capital Funding:** sale of seats on 999 year lease (seats can be sold on as an asset)

**Asset ownership and management:**  
registered charity but in trust for the nation

# Urban Infrastructure in a time of Austerity?

**Cities face a challenge:** reduced growth and increasing population has reduced the public spend on infrastructure development.

Prompted by the need of urban residents to improve the **sense of place** and wellbeing, new business models for infrastructure development have emerged (bottom up and down down).

# Outline

- Business models and infrastructure: new lessons?
- Building a compendium of infrastructure business models
- Typology of business models
- Examples: *District heat Networks* and *Crowdfunded developments*
- What can we learn from alternative infrastructure business models and why does it matter?

# Business Model Concept

- How a firm engages in business activities –  
**‘A narrative combined with a financial model’** (*Bryson et al., 2014*).
- Multiple definitions and uses in the business and economics literature. Centre of understanding the **strategy** that uses inputs and outputs to create economic value in the value chain.

# Key Concepts and Business Models - Towards a typology of infrastructure business models



Value  
Contract  
Governance  
Networks

Asset  
Regulation  
Ownership  
Funding  
Revenue  
Capital  
Service

Finance

# Definitions – Business Models and Infrastructure

“Business model: The organisation’s chosen system of inputs, business activities, outputs and outcomes that aims to create value over the short, medium and long term” (International Integrated Reporting Council, 2013:6)

“...infrastructure as the artefacts and processes of the inter-related systems that enable the movement of resources in order to provide the services that mediate (and ideally enhance) security, health, economic growth and quality of life at a range of scales” (Dawson, 2013: 4)

# The iBuild Definition of an Infrastructure Business Model (IBM)

“The system of physical artefacts, agents, inputs, activities and outcomes that aim to create, deliver and capture economic, social and environmental values over the whole infrastructure lifecycle”

(Bryson *et al.*, 2014:11)

# Business models and infrastructure: new lessons?

- Infrastructure has a lifecycle, lock-in and complex forms of value to providers and users – *multiple stakeholders*.
- Complexity of infrastructure in cities – ‘hidden’ infrastructure & revenue generation over time.
- **Repurposing** of infrastructure in the urban area – new or existing/new purpose – generates layering of different models.

# Approach: Building a compendium of infrastructure business models

1. Compendium of models using a pro-forma.
  - Focus on infrastructure examples
  - Focus on alternative forms
  - Exploring variations of business models
  - Identify cases within the UK and overseas, planned and realised
2. Identify a typology of business models in infrastructure.
  - Identify primary categories and their variations
  - Identify core examples
  - Supplement core examples with secondary examples

# How is Value Created in Infrastructure Business Models?

Business Model Element	Characteristics
Vision	<p>Origins</p> <p>Objective - drivers and opportunity, proposed services and assets, resources</p> <p>Value proposition</p>
Delivery	<p>Value capturing mechanism</p> <p>Management of the value network (actors and governance mechanisms)</p> <p>Scale and temporality</p>
Outcomes	<p>System outcomes (economic, environmental and social)</p> <p>Risks</p> <p>Impact</p>
Relationship with other business models and assets	<p>Identifying temporal and spatial links between infrastructure business models</p>

# Identifying Infrastructure Business Models

Three methods:

1. Bottom up UK approach

Regional Growth Fund bids, LEP infrastructure plans, City Deal ...

2. Top down approach from overseas

Scan at a national level for core examples of infrastructure

3. Infrastructure class for alternatives

Work through media coverage for alternative developments within infrastructure class (energy, water, road, rail, waste, public transport...)

# Current IBM Evidence

Infrastructure type	Number of cases identified	UK	Europe	US	Asia & Pacific
Green Infrastructure	3	1	1	1	
Transport Road	15	9	2	4	
Transport Rail	14	7			7
Public Transport	7	3	3	1	
Public Leisure	9	7	1		1
Communications	2	2			
Energy Generation	16	7	9		
Water Supplies	2			1	1
Waste	3	3			
Public Service	21	18		1	2
<b>Total</b>	<b>92</b>	<b>57</b>	<b>16</b>	<b>8</b>	<b>11</b>

# Process of Developing the IBM Typology

- Iterative process.
- Identified similarities in the business models to develop groups.
- From groups identified variations by working through example cases.
- Testing through working through examples.
- Developed primary categories and secondary variegations.
  - **Primary category** and **2-8 variegations** within each category.
  - **Multiple versions** of the typology based on criteria.

# IBM Ownership Typology (Categories and Variations)

Name	Description	Variations
Public-Private Partnership	Service <b>funded and operated</b> through a partnership between government and private business	<ul style="list-style-type: none"> <li>• Public subsidy to private-led management</li> <li>• Publicly owned asset - SPV management</li> <li>• Public/private development and management of new asset</li> <li>• Private Finance Initiative</li> <li>• Public subsidy, private ownership and management</li> <li>• Performance based partnership</li> <li>• Public Special Purpose Vehicle</li> </ul>
Public	Public <b>finance and management</b> of asset/service	<ul style="list-style-type: none"> <li>• Publicly managed and owned infrastructure (tax)</li> <li>• Public management of community purchase</li> <li>• Funds of funds leverage</li> <li>• National subsidy</li> <li>• User pays charge</li> <li>• Collective management</li> <li>• Fiscal decentralisation</li> <li>• Social equity bonds</li> </ul>
Private	Privately <b>financed and operated</b> asset/service	<ul style="list-style-type: none"> <li>• Toll</li> <li>• Service rental and usage fee</li> <li>• Privately operated with public subsidy</li> </ul>
Co-operative/Community Ownership	Organisation <b>owned and managed</b> by its members. Profits shared with members.	<ul style="list-style-type: none"> <li>• Community share scheme</li> <li>• Community ownership</li> <li>• Community asset transfer</li> </ul>
Third Sector	Third sector <b>ownership of asset</b>	<ul style="list-style-type: none"> <li>• Voluntary</li> <li>• Public-third sector partnership</li> <li>• Third sector asset managed by public sector</li> </ul>
Trust	<b>Independent</b> local group of statutes (no ownership or shareholders) and surplus <b>revenues reinvested</b> in the trust	<ul style="list-style-type: none"> <li>• Trust ports</li> </ul>
Mutual	<b>Employees</b> have role in operation and ownership	<ul style="list-style-type: none"> <li>• Public service mutuals</li> </ul>

# IBM Typology Version 1: Ownership and Management

Category	Description
Public-Private Partnerships (PPP)	Service funded and operated through a partnership between government and private business
Public	Public finance and management of asset/service
Private	Privately financed and operated asset/service
Community Ownership	Organisation owned and managed by its members. Profits shared with members.
Third Sector	Third sector ownership of asset
Trusts	Independent local group of statutes (no ownership or shareholders) and surplus revenues reinvested in the trust
Mutual	Employee has role in operation and ownership

# IBM Typology Version 2:

## Capital Sources: Upfront Financing (often blended)

Category	Description
Tax payer	Government funded (includes grants, borrowing or transfer of asset)
End user	Private sector raise capital for private development
Fiscal decentralisation	Additional capture of local tax income from central government
Community shares	Sale of share to community member in return for service and ownership of asset
Sponsorship	Private sponsor of service
Philanthropic donations	Donations from an individual to support specific infrastructure development.
Differential rent	Value of land increases from proposed development and is sold to a private developer
Crowdfunding	Raising funds from a large number of individuals (both potential users and non-users)
Social impact bond (Sib)	Provide upfront capital from private investors to voluntary organisations to fund initiatives not already provided by the local authority for social benefit. Payment by Results (PBR) supported by government, provide a return to the investor.

# IBM Typology Version 3: Value Creation: Funding Operations (often blended)

Category	Description
User charge and rental	Payment by service user (either one-off or rental charge)
Public subsidy	Ongoing finance to support private operation of infrastructure
Revenue from another asset	Income from another asset used to support service
Revolving loan fund	Revenue from loan repayments
Third sector resource	Capability of organisation to deliver service to community
Revenue streams from additional services	Additional revenue from multiple service provision from single asset
Advertisement revenue	Revenue from advertisement on asset
Collective management	Combined management to reduce operation costs

# Concrete, Community and Lifecycles

- Layers of **accumulated infrastructure** that includes a mix of public, private and community models.
- **Legacy** is built around, and helps construct, a sense of place and society at a particular time (visible and invisible aspects). BUT the physical assets and business models have a **lifecycle**, often 30 years +

# Alternative Urban Infrastructure: Birmingham District Heating Network

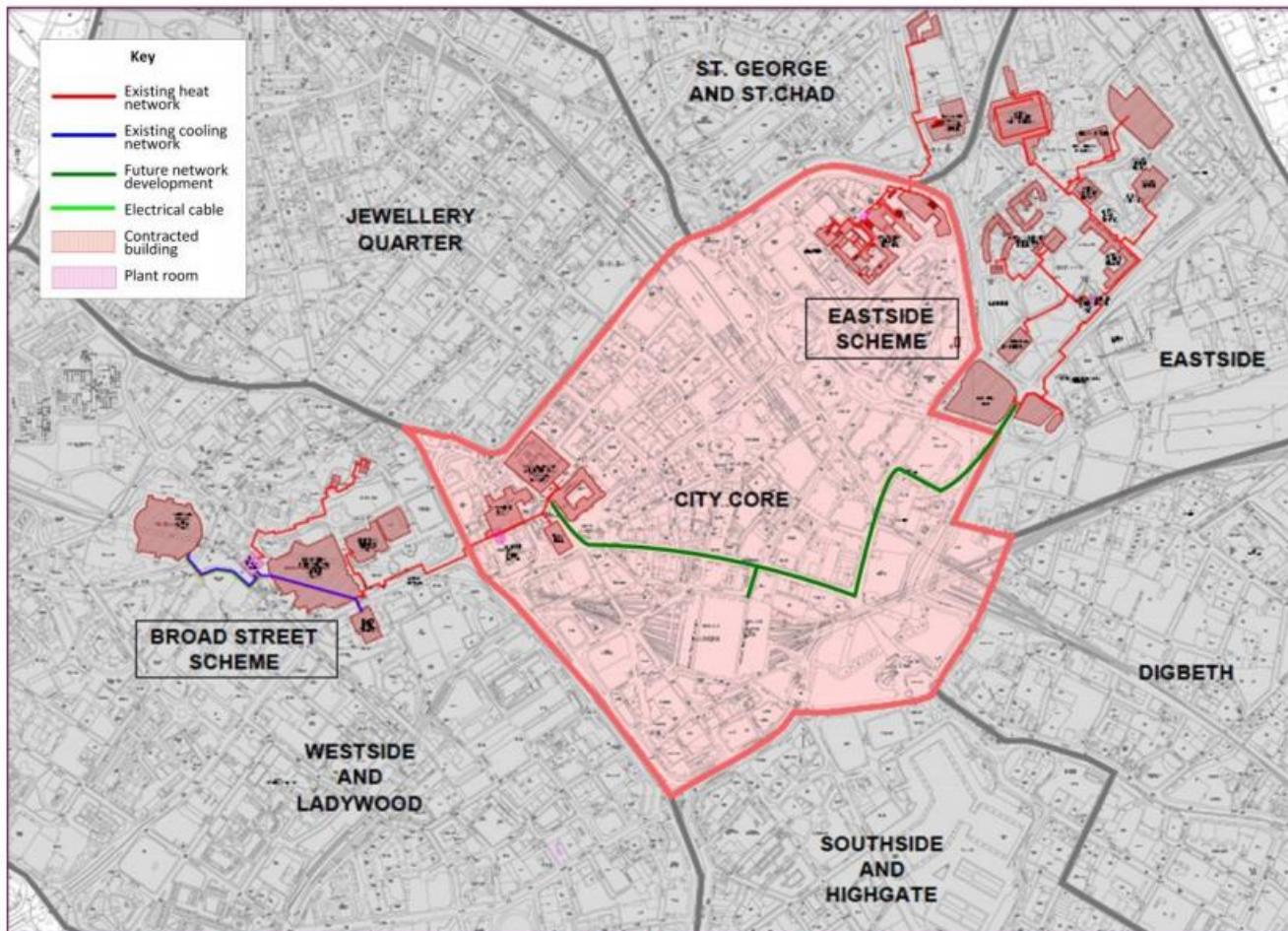


Figure 4: Connection of two district heating networks in Birmingham City Centre

Source: Implementation steps to large scale district heating, SWM, May 2014

# Alternative Urban Infrastructure: Crowdfunded Developments

Lowline, New York City



[http://en.wikipedia.org/wiki/Lowline\\_\(park\)](http://en.wikipedia.org/wiki/Lowline_(park))

<http://thelowline.org>

Luchtsingel Bridge, Netherland



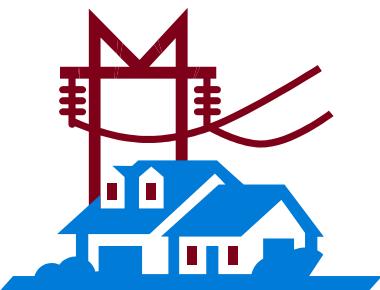
<http://www.luchtsingel.org/en/about-luchtsingel/the-idea/>

# What can we learn from alternative business models?

- Additional stages – lifecycle / repurposing
- Intermediaries – new forms of legal entity and ownership, public-private-third sector- community interaction
- Drivers – often not the public sector
- Alternative forms of value – but tested before public sector involvement because of risk
- Scalar issue – *local infrastructure for local need?*

# Local – National - International

- Infrastructure provision more fragmented.
- Place-based approaches drawing on local resources but also multiple scales.
- Local infrastructure assets used to support national service.
- National infrastructure assets used to facilitate local alternative IBM.



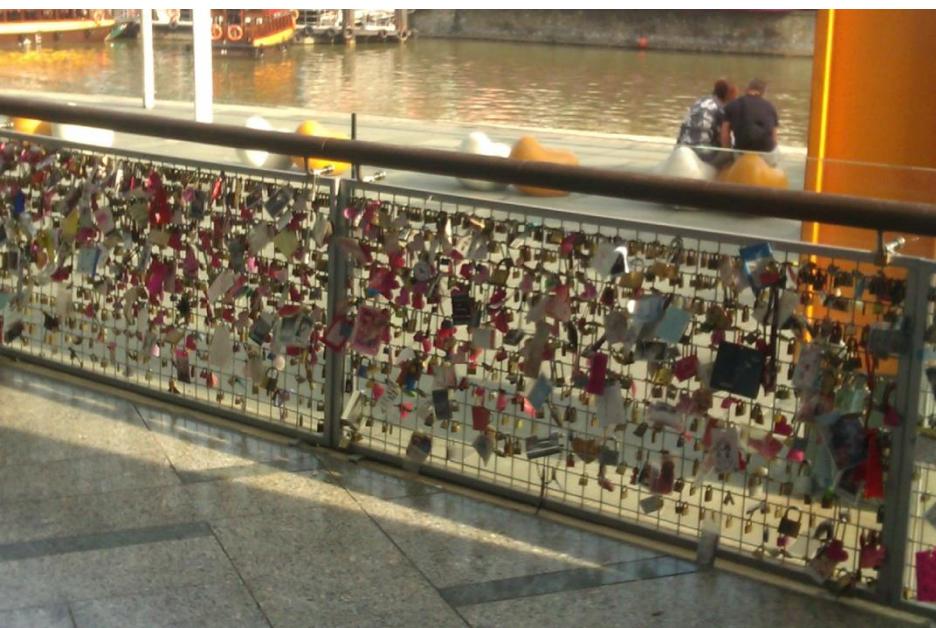
# Implications of business models for infrastructure:

- Infrastructure development lifecycle – different IBM models used at different stages.
- Temporality of models e.g. FIT, has implications for how alternative models can be used.
- Purpose of alternative models – proof of concept, initial investment, specific need.
- Development and flexibility of model – does the model emerge or is it locked-in? Implications for the transformation of place.
- Constraints on alternative IBMs

# Conclusions

- The provision of urban infrastructure is becoming more fragmented as new place-based or local business models emerge. **A return to the past!**
- There is a **tension** between expectations placed on local economies by national governments and local innovation in the provision of infrastructure.
- Infrastructure Business Model (IBM) concept is useful to understand different ways of realising value for/from local infrastructure

# An Alternative Funding Model for Local Infrastructure ?



John R. Bryson  
University of Birmingham  
[j.r.bryson@bham.ac.uk](mailto:j.r.bryson@bham.ac.uk)

Meng Song  
University of Birmingham  
[m.song.1@bham.ac.uk](mailto:m.song.1@bham.ac.uk)

Rachel Mulhall  
University of Birmingham  
[r.a.mulhall@bham.ac.uk](mailto:r.a.mulhall@bham.ac.uk)