A powerful new urban network analysis

Maps that analyse and clarify urban complexity

Tests the impact of planning and design decisions
MULTI CENTRALITY ASSESSMENT

Multi Centrality Assessment (MCA) research uses up-to-date network analysis methodologies designed for geographic, biological and sociological studies. These methodologies have been further developed for use in urban planning. The MCA tool used by Place Logic results from several years of research by the University of Strathclyde, École Polytechnique Fédérale de Lausanne, and the Italian National Institute of Nuclear Physics. The methodology has been widely tested and results published in recognised research papers.

The MCA’s algorithms calculate which places and routes have the best connections with other places and routes. The results are presented as maps at a scale and level of detail that can be varied to meet different requirements.

PLACE LOGIC

Place Logic sees the integration of the MCA tool into existing expert urban planning techniques to provide:

- a powerful representation of urban functions that can be tested for different conditions to promote understanding and improve decision making
- data-rich maps that can be used at workshops to present options, evaluate ideas dynamically and inform debate

Place Logic offers the rapid delivery of expert advice in an economic manner optimising the performance of urban plans.

Mapping

Routes are graded according to their levels of connectivity and activity by means of a colour ramp. High levels are shown as red fading to low levels in blue.

Analysis

Two parameters are analysed:

- Place Connectivity
- Street Activity

Place Connectivity

- The maps indicate which part or parts of an area are better connected than others
- The MCA measures grades from more connected places (red) to less connected places (blue)
- Areas can be measured at a variety of scales, from a region to a neighbourhood

Street Activity

- Active routes are routes through which most people are likely to pass:
- The MCA measures on a scale from more active routes (red) to less active routes (blue)
- Areas can be measured at a variety of levels, from a region down to a neighbourhood
ADAM Urbanism is master planner and architectural consultant for Grainger Plc’s new development on redundant military land at Aldershot, Hampshire. The scheme provides for:

- a new mixed use settlement of 4,000 homes
- community and leisure facilities, schools and a local centre
- the restoration and conservation of several historic buildings, including the Cambridge Military Hospital

In the early stages of design we wanted to ensure that the development would achieve the necessary level of integration with Aldershot and the surrounding areas. A Place Logic study was run to:

- assess the constraints of the existing street pattern
- test different network options
- confirm the optimal solution

The analysis informed the development of the masterplan and reassured stakeholders. The maps show that:

**The existing site layout was:**

- disconnected
- difficult to traverse due to its lack of connectivity

**The masterplan for the development:**

- significantly improved movement through the site
- provided effective connectivity with the town centre and the surrounding areas (red routes)
- placed the new commercial centre at the heart of the predicted movement activity
Case Study
NANSLEDAN, NEWQUAY

ADAM Urbanism is master planner for Nansledan, a new mixed use urban extension to Newquay, Cornwall. The majority of the Nansledan site is owned by the Duchy of Cornwall and will provide 3,750 new homes and a similar number of employment spaces. The objective is to create an exemplary mixed-use, sustainable extension to regenerate the local economy.

The existing north-south street pattern is restricted by a level crossing over the railway, causing significant network congestion. A primary objective is to provide a new north-south bridge over the railway so removing the level crossing, alleviating congestion and providing a more direct link east to the expanding Newquay airport.

Place Logic was used to test alternative routing options to identify a solution that:
- met the primary objective
- maximised the collateral benefits to Nansledan and the whole Newquay area

Results
The Place Logic Street Activity maps show that:
- there is a primary network which informs opportunities for mixed use development
- the masterplan enables the exploration of opportunities for connections to the existing network to improve links to the town centre, the airport and surrounding area

The Place Logic Place Connectivity maps confirms that:
- the new district centre is located at the intersection of the proposed south-west to north-east and north-south routes
- the masterplan provides an internally well-connected development

Place Logic tests the impact of planning and design decisions
**Case Study**
**GABON, ANGONDJE, AFRICA**

**WSP’s Approach**

WSP use Place Logic to facilitate a range of studies including local policy making, masterplanning and understanding the effects of significant alterations to networks. Place Logic complements the transport modelling process, by providing an excellent precursor to a full blown transport model.

**Angondje, Gabon**

Angondje is a new urban extension on the northern edge of Libreville. With a proposed population well in excess of 100,000, it will be the largest single population growth area in Gabon, where it is seen as an opportunity to create a new district representing everything that Gabon aspires to become.

**Place Logic Analysis**

Our client challenged WSP to identify how the framework masterplan could best connect and engage communities by ensuring that:

- Angondje was well integrated with the rest of Libreville’s existing infrastructure, and
- the centre of each community within the masterplan area was directly linked to the other with a main street.

WSP generated Street Activity maps of the initial concept framework (Map 2) to analyse and clarify its position within the wider urban complexity. These were used for briefing purposes and it was decided that modifications were necessary.

The network was refined and the east-west grid extended (Map 3). Two additional links were created (A & B) to better integrate the network with the existing settlements and to spread the load on links with Libreville.

At this stage it is not possible to run a Place Connectivity analysis as the individual localities within the 30 sq km masterplan area have yet to be planned in any detail.

Planning is still at an early stage, but WSP’s report seems to be having a positive influence on the Gabon government.
Case Study
LONDON RIVER CROSSINGS

Street Activity - 1746
1 - London Bridge - AD 50
2 - Westminster Bridge - 1738
3 - Blackfriars Bridge - 1760
4 - Vauxhall Bridge - 1809
5 - Hungerford Bridge - 1841
6 - Lambeth Bridge - 1860
7 - Tower Bridge - 1886
8 - Southwark Bridge - 1913
9 - Waterloo Bridge - 1938
10 - Millennium Bridge - 1998

Street Activity - 1882

Street Activity - 2014

Place Connectivity - 1746

Place Connectivity - 1882

Place Connectivity - 2014
Case Study

NINE ELMS STUDY

Place Logic Analysis of Nine Elms

Bridge Alignment Study - Transport For London

Pre-construction of the pedestrian bridge

Pre-construction of the pedestrian bridge (1998)

Precedent Study - Millennium pedestrian bridge alignment

Comparative Study - Pimlico pedestrian bridge alignment

TFL Option 1 - Bridge connecting US Embassy, Nine Elms to Pimlico Gardens

TFL Option 2 - Bridge connecting Nine Elms Riverside to Pimlico (Dolphin Square)

TFL Option 3 - Bridge connecting Nine Elms Pier to Grosvenor Road/Churchill Gardens

TFL Option 4 - Bridge connecting Battersea Power Station to Grosvenor Road

TFL Option 4 - Bridge connecting Battersea Power Station to Grosvenor Road

Location plan of Millennium bridge

Location plan of Pimlico bridge options
A powerful new urban network analysis

ROBERT ADAM
DIPL ARCH(PCL) RIBA FRSA
Director

HUGH PETTER
BAHONS DIPL ARCH RIBA FRSA
Director

DR SERGIO PORTA
Qualified Architect
Professor of Urban Design, Head of Department of Architecture and Director of Urban Design Studies, University of Strathclyde

PAUL SPEIRS
B.Eng (Hons)
Technical Director, WSP

Robert Adam, a Director of ADAM Urbanism and a visiting professor at the University of Strathclyde, has worked closely with Professor Sergio Porta, to develop the business potential of the Multiple Centrality Assessment (MCA), the scientific basis of Place Logic.

He is well-known in the UK and internationally as a major figure in the development of traditional and classical architecture, as a pioneer of contextual urban design, and as an author and a scholar. He has 20 years’ experience in masterplanning, speculative housing and has pioneered objective coding.

Robert co-founded ADAM Architecture, the sister company of ADAM Urbanism in 1986. His work is widely published, broadcast and exhibited, and he lectures in the UK and abroad.

Hugh Petter, a Director of ADAM Urbanism, enjoys a large and varied portfolio of urban design projects across the UK, working as the master-planner and/or the coordinating architect. He also works as design architect or design consultant on other commercial housing projects. His projects include Nansledan at Newquay for The Duchy of Cornwall, an urban extension of 4000 homes which went on site in 2012 and is enjoying strong sales. He lectures and writes about aspects of urban design and architecture and his work has won numerous awards.


Sergio Porta, an Italian by birth, is an accredited Architect, holding a PhD in Urban Planning. Initially, he worked for 12 years in the private sector as consultant in architectural and urban design, becoming senior partner at CAIRE - Cooperativa Architetti e Ingegneri Reggio Emilia. Sergio returned to academia and in 2002, on completion of his doctoral and postdoctoral studies, was appointed Lecturer at Politecnico of Milan. In 2009 he was appointed Professor of Urban Design at the Department of Architecture, University of Strathclyde.

His research is mainly orientated to sustainable urban design and radical community-based architecture. Ranging from GIS-based space analysis to community design and self-help building, his interests also include mobility planning, traffic calming and strategies for safety and livability in the public space. He is particularly interested in the link between urban morphology and collective behaviors, which touches the co-evolution of both.

Paul Speirs is a transport modeller of 20 years in practice and heads up WSP’s UK transport modelling capability. Grounded in the art of transport demand modelling, Paul was at the heart of the UK’s transport micro-simulation revolution in the late 1990’s introducing the approach to Heathrow Terminal 5’s detailed design. He now oversees all forms of modelling from land use applied at the regional/national scale to pedestrian flow analysis at the local scale.

Paul is part of WSP’s Technical Strategy Group that drives forward technical innovation, which is where he put the MCA platform through a market testing exercise.

Paul is a regular speaker at international conferences pushing the boundaries of transport modelling technologies by putting a strong emphasis on a fresh approach to enhance traditional and well-tried methods.

WSP is a leading professional services firm in the UK providing consultancy services to all aspects of the built and natural environment working with governments, planners, developers and architects. The firm has been involved in many high profile UK projects including the Shard, Crossrail, New South Glasgow Hospital, the Bullring shopping centre in Birmingham and the re-development of London Bridge station.

With approximately 15,000 employees in 30 countries, 5 continents, and around 2,400 people in the UK mainly engineers, technicians, scientists, architects, planners, surveyors as well as various environmental experts and design professionals, WSP is ranked in the world’s top 10 professional consultancies.

WSP’s transport planning and modelling techniques are highly developed, thorough and well-practiced; Place Logic blending in to provide an innovative, rapid study of networks to support masterplanning, policy making, strategy testing and spatial analysis.

The UDSU is a research unit at the Department of Architecture at the University of Strathclyde. Founded in 1989 by Professor Hildebrand Frey, the Unit conducts research and teaching in the areas of masterplanning, community design and spatial analysis at a national and international level. UDSU is currently led by Professor Sergio Porta and Dr. Ombretta Romice; it consists of a group of about 10 researchers and a remarkable international network of collaborators and partners.

Since Professor Sergio Porta took over the directorship of the Unit in 2009, the link has been reinforced with the science of urbanism at the interface between urban morphology and the physics of complex networks.

The Unit has published extensively in the last decade papers on interdisciplinary research about various aspects of the way cities work and develop over time, utilizing the Multiple Centrality Assessment model horizontally as a means for informing our understanding of the origin and nature of cities in evolution.
A powerful new urban network analysis