

**INFORMED CITIES**

**unpacking urban information ecosystems**

Research and Methodology Brief

May 2017

## About the Lab



The **UCL City Leadership Laboratory** brings together world-class academic scholarship, public authorities, international organisations, the private sector and local SMEs to create a unique environment for urban experimentation, research, teaching and – most importantly – action.

The Lab builds on three years of projects, grants and activities of the City Leadership Initiative, a joint effort of the World Bank Group and United Nations Human Settlements Programme (UN-Habitat), with funding from the UK Government's Economic and Social Research (ESRC) and Engineering and Physical Sciences (EPSRC) Research Councils. While the aim of the Lab is to tackle globally relevant city challenges, the projects undertaken are *practically oriented* and often *locally focused*.

The Lab sits within UCL's policy-focused **Department of Science, Technology, Engineering and Public Policy** (UCL STEaPP) and has links across UCL's network of urban research and practice.

## Project Overview

The scale of data sharing and knowledge production within cities is enormous. With cities increasingly called upon to deliver data- and

evidence-driven policies, flows of data, information and knowledge within cities will continue to grow. The purpose of this research is to investigate the knowledge ecosystems within cities – both the process by and actors through which local governments are managing data, information and knowledge.

### Aim

To investigate the structures through which local governments are managing knowledge at the basis of their policies.

Papers detailing the findings of this research have been submitted for academic publications.

## Project Method

In order to address the overarching aim, a comparative study approach of ten case studies was adopted and supported by a systematic analytical framework of knowledge ecosystems of local governments. The ten selected case studies were: Barcelona, Bogotá, Chicago, London, Medellín, Melbourne, Mexico City, Mumbai, Seoul and Warsaw (see Figure 1). Case study selection was based on geographic spread to include both global North and South cities, and availability of data and information on knowledge management within cities. The latter is likely to have caused a slight skew towards cities with more transparent and developed cities.

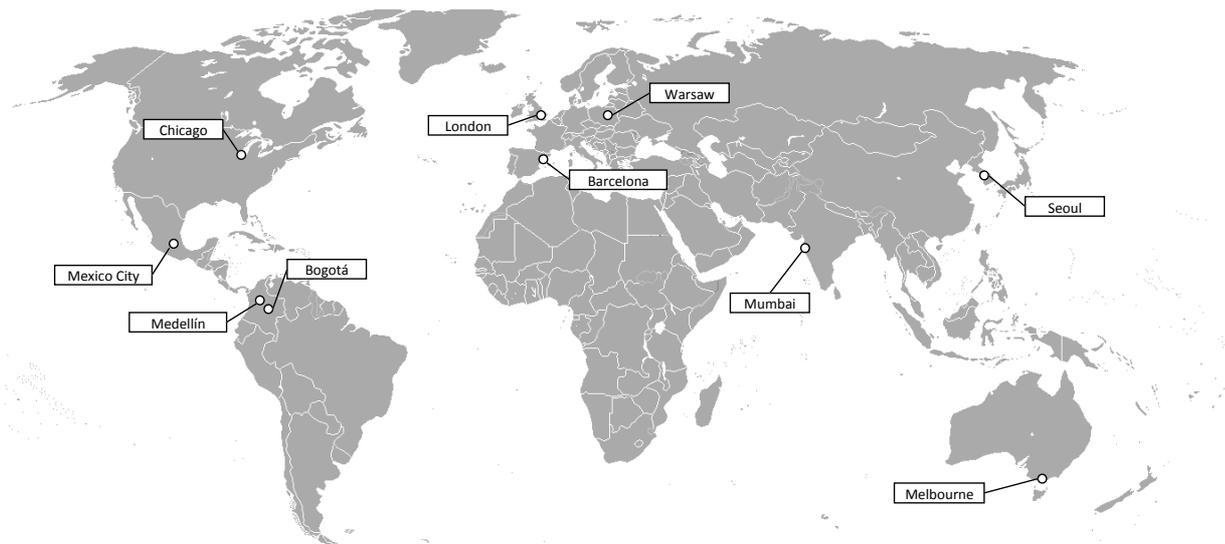


Figure 1. Overview of selected case studies.

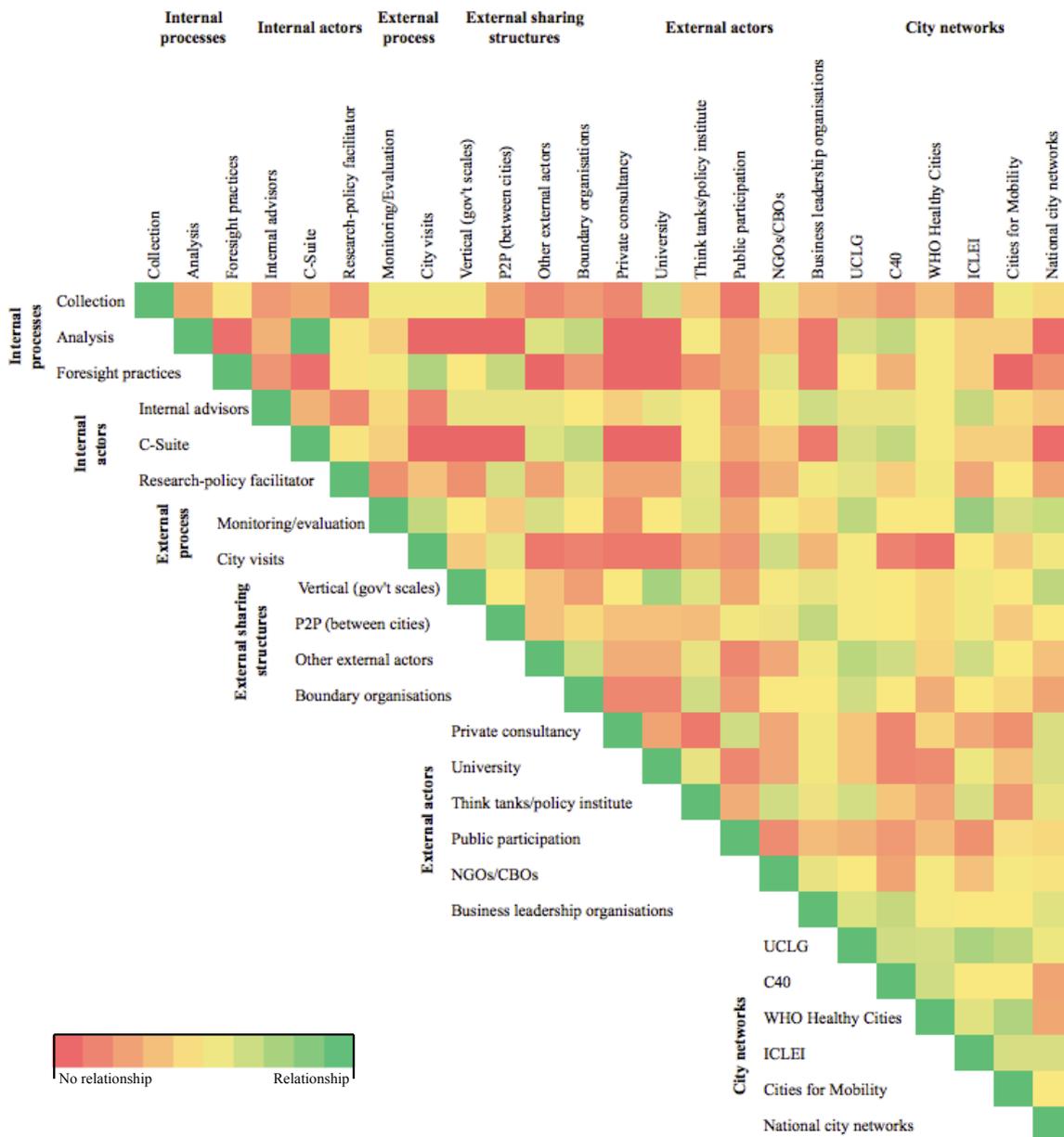


Figure 2. Results of mutual information computation for framework queries, where the scale is red illustrating no relationship between the variables (i.e. one query tells us nothing about the other query) to green illustrating a relationship.

An analytical framework was developed inductively through a reiterative process to facilitate investigation and comparison of the case studies. This framework comprises a set of queries, for which responses were coded. Desk-based research, based primarily on knowledge provided on city government websites, was undertaken in the summer of 2015 to answer the queries. The responses were allocated a code of 0, 1 or 2 - 0 indicated there was no evidence, 1 some evidence, and 2 substantial evidence.

Once query responses were collected and coded, mutual information for the variables was computed. The outcomes for this computation are presented in Figure 2. Mutual information is part of probability theory and information

theory, and quantifies how much responses to one query tell us about another query. It thus identifies where to look for rules, which are then qualitatively sense-checked. These rules are not generalizable, but instead provide insight into trends across the selected cities

## Findings

### Knowledge management process

Across all cities there was evidence of an established system of information-sharing. Common practices across the case studies were: (1) collection, (2) analysis, (3) dissemination, and (4) use of knowledge.

For all examined local governments, there is evidence that city governments have processes for collecting their own data. Different methods are used, varying from technology-intensive methods using data sensors to conducting surveys or collecting census data.

Some of the collected data is shared externally as raw or clean data using open data portals. Data is often also shared within local governments through internally accessible software solutions called municipal dashboards.

Regardless of whether the data is shared, the data is not always analysed. Only just over half of the examined cities have an in-house data analysis.

### *Use of knowledge*

Knowledge is used to inform solutions. Three common uses of information-enabled solutions: (1) daily operations, (2) monitoring and evaluation, and (3) city applications. In daily operations, data may be used to support modelling activities. For example, in London information has helped determine the number of trains that should be operating. Data and information can also support monitoring and evaluation by comparing performance data to goals. The most common use of knowledge observed across the case studies is in city applications. These applications are often journey planners with live public transport information, but often also address other purposes including access to culture, civic activism, health and schooling.

### *Facilitating actors*

Various actors facilitate the knowledge management process at different stages. Across all the examined cities, there are dedicated, internal departments to conduct and apply science-related research into public efforts, but these departments vary in terms of their level of autonomy, within the government hierarchy and type of knowledge created.

In addition to internal actors, there is much evidence of external actors to city governments collaborating with the city government for knowledge management purposes. These external actors are often private consultancies, civil society or universities. There however remain many opportunities to increase involvement by external actors – particularly think tanks and non-governmental organisations. This can be facilitated by boundary-spanning organisations.

Boundary-spanning organisations are hybrid structures providing a platform to link internal networks of the city government with external actors, and in particular focus on engaging various types of stakeholders. Boundary-spanning organisations can thus increase the permeability of cities by facilitating knowledge exchange between city governments and external actors.

Three types of boundary-spanning organisations were identified across the case studies: living labs, innovation districts and sector-oriented boundary-spanning organisations. All three engage both internal and a variety of external actors to their respective municipal governments. The distinctions are that in general living labs create data, innovation districts use information, and sector-oriented boundary-spanning organisations transfer knowledge, but all three can still create and use the others too. Boundary-spanning organisations are still emerging and developing in cities, and so need to be further and systematically assessed.

### Challenges

The increased scale of knowledge management comes hand-in-hand with privacy, security monitoring and evaluation concerns. There are privacy and ethical implications as a result of the current forms of data collected. Monitoring and evaluation concerns are related to the need for more evidence, beyond anecdotal evidence, to underpin the value and cost-effectiveness of data-driven solutions beyond.

### Further research

Further research is needed into the knowledge management process in other city governments, particularly within the African context. Some of this research should focus on some of the particular areas identified above in relation to boundary-spanning organisations and challenges.

## Project team

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