

UN URBANFORMHUB PROPOSED ROAD MAP

July 2015

Introduction

The **UN UrbanFormHub** aims to uniquely contribute to the current debate on sustainable development by focusing on the physical form of cities. It reckons that the physical design or urban form of cities has a profound effect on livability and the quality of life of urban citizens, and as such needs to be an integral part of the discourse on the future of cities, their economic and social viability, their ecology, and their transportation and information infrastructure. The Hub's mission is to inventory, analyze, and assess existing urban forms in order to inform both the upgrading of existing communities and the design of the new urban forms that will house the fast-growing population expected to live in cities.

The **UrbanFormHub** stipulates that local authorities who are now faced with explosive urban growth urgently need guidance on how to plan and design new urban extensions and neighborhoods. The Hub's work products will include databases of existing and new urban forms which will offer a range of approaches and examples of sustainable built environments, not only to house the growing middleclass in emerging economies, but also to integrate the large number of rural migrants seeking to live in cities.

Acknowledging the co-dependence between urban form and cultural, social, economic, geographic, ecologic, and climatic forces, members of the **UrbanFormHub** come from a variety of disciplines and areas of expertise to insure that a comprehensive approach to urban form is used. The Hub's main and long-term goal is to link interdisciplinary research to the practice of

urban development, and to provide solutions to the livability of new cities or parts of cities in the developing world.

Purpose

This document follows on the Hub's first meeting held in June 2014. It describes a proposed conceptual and methodological framework which will serve the Hub's future work and outlines a first set of tasks for Hub members to carry out in the near future.

The interdisciplinary and international composition of the Hub demands that we use a common framework to describe, analyze, and develop urban forms to enable and facilitate systematic comparisons. We also need a common framework to ensure that the work can be readily used by those who make decisions about and eventually develop new urban forms. This common framework has two dimensions: a conceptual one that captures the way in which we believe urban form and its elements are described in a comprehensive fashion; and a methodological one that provides common ways to convey information about urban forms.

Conceptual and methodological framework

Urban form encompasses all the elements that constitute the physical reality of the city. Most of the theories about and approaches to the study of urban form come from the field of urban morphology, which first emerged in the 1940s in Germany, England, Italy, and France. While the work of the **UrbanFormHUB** will be grounded in these early theories, it will also advance the field of urban morphology by adapting the methods to the reality of contemporary cities. The core of "classic" studies in urban morphology focused on relatively small and now historical cities located primarily in Europe. Yet today, many cities, especially those in the developing world, cover very large geographic areas and house large numbers of people. They are city-regions. Furthermore, city-regions today are multi-nucleated,

meaning that they no longer have the single city-center, which was the signature of urban areas in the 19th and early 20th century; instead, the historical primate center of city-regions competes with many other centers, which emerged in the latter part of the 20th century and continue to multiply today. Also, multi-nucleated contemporary cities tend to have less defined edges than their traditional precedents because sprawling development has replaced the more defined rural-urban edges of past cities. To address the major changes that took place in cities and city-regions over the past half-century, methods previously used in urban morphological studies must be expanded to consider not only small cities or the historical core of larger cities, but also the regional context of contemporary metropolises. This implies that the “classic” urban form categories used by urban morphologists need to be revised and adapted to reflect current circumstances.

The **UrbanFormHUB** will adopt urban morphology’s three basic elements of the physical city: the land parcel with its attendant buildings and open spaces, the street-block, and the neighborhood (or plan units). These elements constitute three levels (or scales), which are readily used in the analysis or design of parts of cities. However, to conform to the new reality of urban form, it will also introduce elements at three additional levels: the sub-parcel, the city, and the city-region. The sub-parcel level has become important because in many newly developed areas, land parcels have increased in size (through land aggregation) and many such parcels today now contain many individual buildings and even many different land uses. Indeed, contemporary housing projects often consist of a large number of buildings and also contain various types of services, including shops and schools.

The levels and urban form elements to be addressed in future respective studies of Hub members are summarized in Table 1. Elements of the lower levels fit into those of the higher level: sub-parcels fit into parcels, which in turn fit into blocks surrounded by streets; and street-blocks fit into

neighborhoods, which fit into cities, which themselves fit into city-regions. The relationships between levels are “many-to-one” as the elements are moved to a higher level: many sub-parcels make a parcel; many parcels make a block; many street-blocks make a neighborhood; many neighborhoods make a city; and many cities make a city-region. The Table also indicates the common sizes associated with each element. It lists the smallest elements that need to be considered at each level, the physical form and the land uses associated with the elements.

Three tables follow to help specify classes or types of buildings and streets. *Please note that as shown, all Tables are incomplete, and only meant to serve as an initial template for future work.* Table 2 lists building types by the frequency at which they are found in a neighborhood or city (distinguishing Common versus Unique types), and by their functional use (generally defined as Domestic, Commercial, Institutional). Of course, more detailed or more specific classifications can and will be developed as needed. On the x-axis, building can be further defined by their footprint, height, age, construction type, etc.

Table 3 lists street types using a basic hierarchical classification of Superblocks, Collectors, and Local Streets. Table 4 captures the city and city-region level infrastructure of contemporary cities, for which we will develop appropriate typologies.

Table 1: Urban form structure, levels and elements

LEVELS	ELEMENTS	SPATIAL EXTENT (typical area size)	MINIMUM RESOLUTION (smallest element)	ATTRIBUTES	
		British Metric		Physical form	Use
1	Sub-parcel	>10,000 ft ²	Room, building section	Rooms, circulation	
2	Parcel	>20,000 ft ²	building	Indoor/outdoor space, circulation	
3	Street-block	2 - 18 a	Parcels, street segment	Building, open space, streets	
4	Neighborhood (District)	8 - 20 a	Parcels, street network	Building, open space, streets	Residential / non-residential (institution, service, office, manufacturing, recreation)
5	City	10 - 400 mi ²	Neighborhoods, street network	Expressways, neighborhoods, landmarks	
6	City-region	1000 mi ²	Cities, neighborhoods, street network		

Table 2: Building types (template)

TYPES	ATTRIBUTES						
	Footprint	Height	Primary use	Age	Construction	Architectural style	Etc.
Common							
Unique							
Domestic							
Commercial							
Institutional							

Table 3: Street types (template)

TYPES	NETWORK DIMENSION	ATTRIBUTES							
	British Metric	width	# of lanes	sidewalks	Median strip	Bicycle lane	Bus lane	Trees	Etc.
Superblock	>1000 m								
Collector	330 m								
Local	100 m								

Table 4: City-level networks (template)

TYPES	
Roads, rail	
Rivers, waterways, seashores, etc.	
Sewers, water	
Electricity, fiberoptic, cell towers, etc.	

Proposed scope of work

In a first iteration, a core team of the UN **UrbanFormHub** will flesh out the proposed conceptual framework, the product of which will serve as a guide for all the research and practical work done by the different members. The framework will insure the comparability of the urban forms used or generated by the different teams working on future projects. Also, the framework will be updated periodically to insure that it responds to the needs of the work being carried out. Specifically, members of the Hub will:

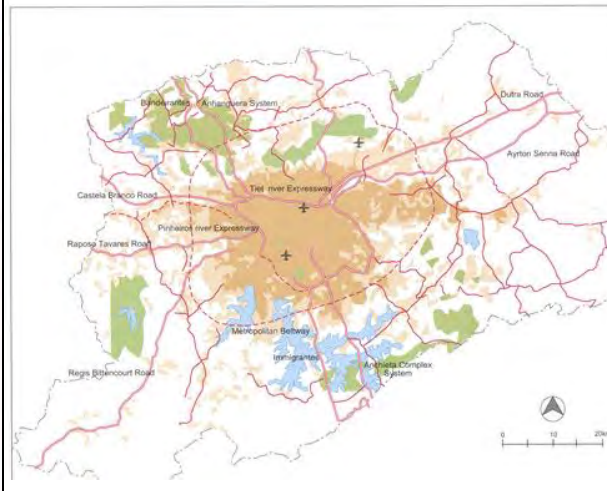
1. Using existing literature, published materials, and personal works documenting urban forms, expand and document urban morphology methods that consider the form of contemporary city-regions, to include multi-use building types, large multi-use development (e.g., housing estates), networks of superblocks and street-blocks within them, and the regional context of multiple jurisdictions sharing regional infrastructure.
2. Using available personal material, document cities or parts of cities in the developing world, which will include both formal and informal settlement patterns and processes. The forms of

informal settlements have thus far not been systematically recorded due to difficulties in collecting the data in situ. However, aerial photography and new digitization methods can now be used to record these settlements accurately. It is important to focus on these settlements since they constitute up to 60% of cities and city-region in parts of the developing world.

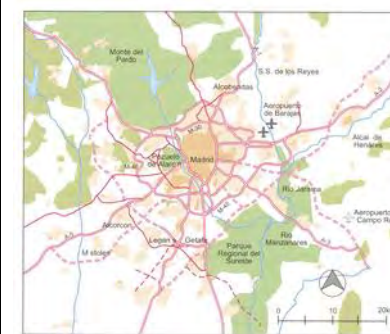
Figures 1 and 2 provide examples of simple schemes and formats that can be used to standardize the research and projects carried out by the Hub team. Figure 1 shows how the urbanized areas of a few contemporary cities (Level 6, the city-region) that have grown geographically over a period of 30 years. Note that the large variation in geographic size of these city-regions is independent from the size of their populations. These comparisons show that development densities vary greatly across countries and cultures. Furthermore, the shape of city-regions is formed by topography and the natural setting and by the transportation infrastructure. However, it is notable that all the city-regions shown have concentric rings roads around their original center. Figure 2 (levels 3 and 4, the street-block and the neighborhood) illustrates different street-block configurations within a 500 by 500 m area. Again, the shapes and sizes of the street-blocks vary greatly reflecting the time at which they were laid out. Building footprints and heights further illustrate the basic forms.



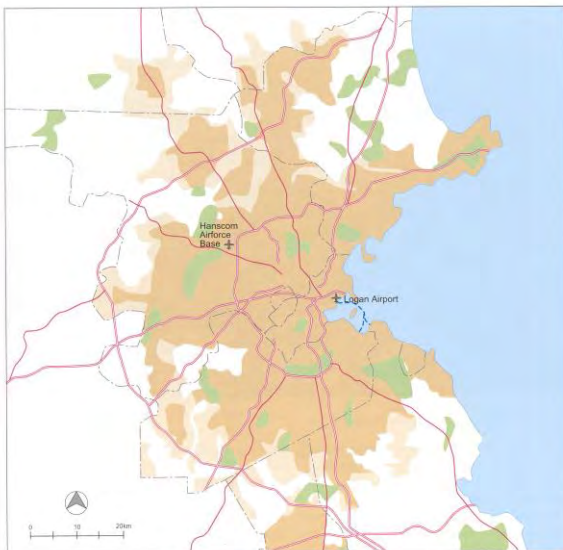
Tokyo



Sao Paulo



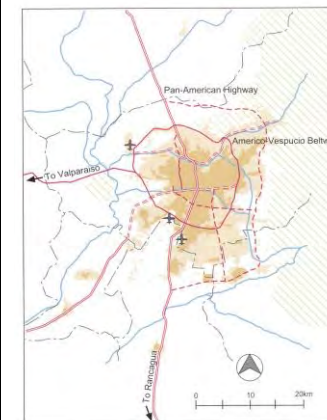
Madrid



Boston



Bangkok



Santiago de Chile

Figure 1: LEVEL 6 CITY-REGION, Comparing the size of urbanized areas 1960-1995 and main road networks (all at the same approximate scale)

Source: Simmonds, R., Hack, G., Eds. (2000). Global city regions: Their emerging forms. London, Spon Press.



Figure 2: LEVELS 3 AND 4, Street-blocks in 500 X 500 m neighborhood (North up)

Source: Kim, K.-J., Sijong, S., Yonguwon, K., Eds. (2003). International urban form study: Development pattern and density of selected world cities. Seoul, Korea, Seoul Development Institute.

Main references

The UN UrbanFormHUB will adopt a number of publications to guide future work. We will start with a small number of general references, which include Cerdà's seminal theory of urbanization (Cerdà 1867); Vance's critical history of Western urban form (Vance 1990); Castex and Panerai's review of the roots of modernist urban forms (Castex, Depaule, & Panerai 1970); and Whitehand's studies of changes in urban form (Whitehand 1987).

Key monographs on the urban form of specific cities include the classic cases of Venice (Muratori 1960), Rome (Muratori 1963), Como (Caniggia 1984), and Alnwick (Conzen 1960), as well as those of Vienna (Bobeck, & Lichtenberger 1966), San Francisco (Moudon 1986), and Versailles (Castex, Celeste, & Panerai 1980). Systematic comparative studies of contemporary urban forms in Asia, North America, and Europe can be found in Kim's et al. (Kim, Sijong, & Yonguwon 2003). Inventories of public spaces are illustrated by the case of Portugal (Dias Coelho 2007). Finally, studies of forms at the city-region level include those of Simmonds and Hack (Simmonds, & Hack 2000), and Angel (Angel, Parent, Civco, & Blei 2010; Angel 2012).

The list of references will be further developed with the aim of including (1) a wider selection of cities worldwide; (2) studies of street-blocks; (3) studies of building and streets types. We will make every effort to have the references available in a digital form and posted on the web.

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- Whitehand, J. W. R. (1987). *The changing face of cities: A study of development cycles and urban form*. Oxford, UK: B. Blackwell.

