



METRICITY

Exploring New Measures of Urban Density



METRICITY

Exploring new measures of Urban Density

Author:

Paul Clarke

BAhons MA (RCA)

Research carried out at the

Helen Hamlyn Centre

October 2006 – July 2007

Research Consortium:

Arup

Child Graddon Lewis

REID architecture

Sheppard Robson

www.metricity.net

Contents

Foreword By Jeremy Myerson.....	002	
Introduction.....	004	Part One
Generic Metric.....	004	
Research Question.....	005	
What Do We Mean By Density?.....	006	
Site Context: Transport Development Area.....	007	
Research Method.....	008	Part Two
Social Context: Urban Density Principles.....	008	
User-Centred Design.....	009	
Research Findings.....	010	Part Three
Principle 01: Intensity.....	010	
Principle 02: Amenity.....	012	
Principle 03: Autonomy.....	014	
Principle 04: Frequency.....	016	
Conclusions.....	018	Part Four
Research Implications.....	018	
Metric Space.....	020	
Future Research.....	021	



METRICITY

This report provides a summary of a year of research exploring alternative measures for urban density. The study has been led by Paul Clarke, a graduate of the Department of Architecture at the RCA, and has involved a collaboration between the Royal College of Art Helen Hamlyn Centre, the RCA's centre for inclusive design, and a quartet of leading London architectural firms.

If we needed any convincing that how we measure urban density has a major influence on urban planning and design decisions, this study provides conclusive evidence. It is clear that the old metric result in single-minded solutions that restrict the open-mindedness of the city. We badly need urban development that is planned in a more animated and holistic way, especially when dense urban schemes are considered around transport hubs. Only then will the city become more inclusive.

The study proposes four new principles for measuring urban density. Intensity and Amenity are design-oriented measures. Autonomy and Frequency relate more closely to policy. Together they offer a framework for change. I am grateful to Paul Clarke for his energy and vision, to Dr John Smith for his expert supervision, and to the architects from Arup, Child Graddon Lewis, Reid Architecture and Sheppard Robson – our consortium of partners – for their input and ideas throughout a challenging process.

Jeremy Myerson
Professor of Design Studies
Helen Hamlyn Centre
Royal College of Art
October 2007





"Open-mindedness has given way to single-mindedness and in its wake we are witnessing the destruction of the very idea of the inclusive city." (Richard Rogers, 'Cities for a Small Planet', 1997)



Introduction



Dwellings per Hectare
(du/ha)

¹ Statistic: London's Population

According to the figures of the office for national statistics (ONS), London will have an 18.6% population rise (1,378,200) from 7,428,600 to 8,806,800.

² Glossary: Nodes

For the purpose of this research the term node has been used to describe an area of the city surrounding a transport interchange. The research addresses urban development of areas around transport infrastructure rather than the design of transport terminals.

Density: A Generic Metric

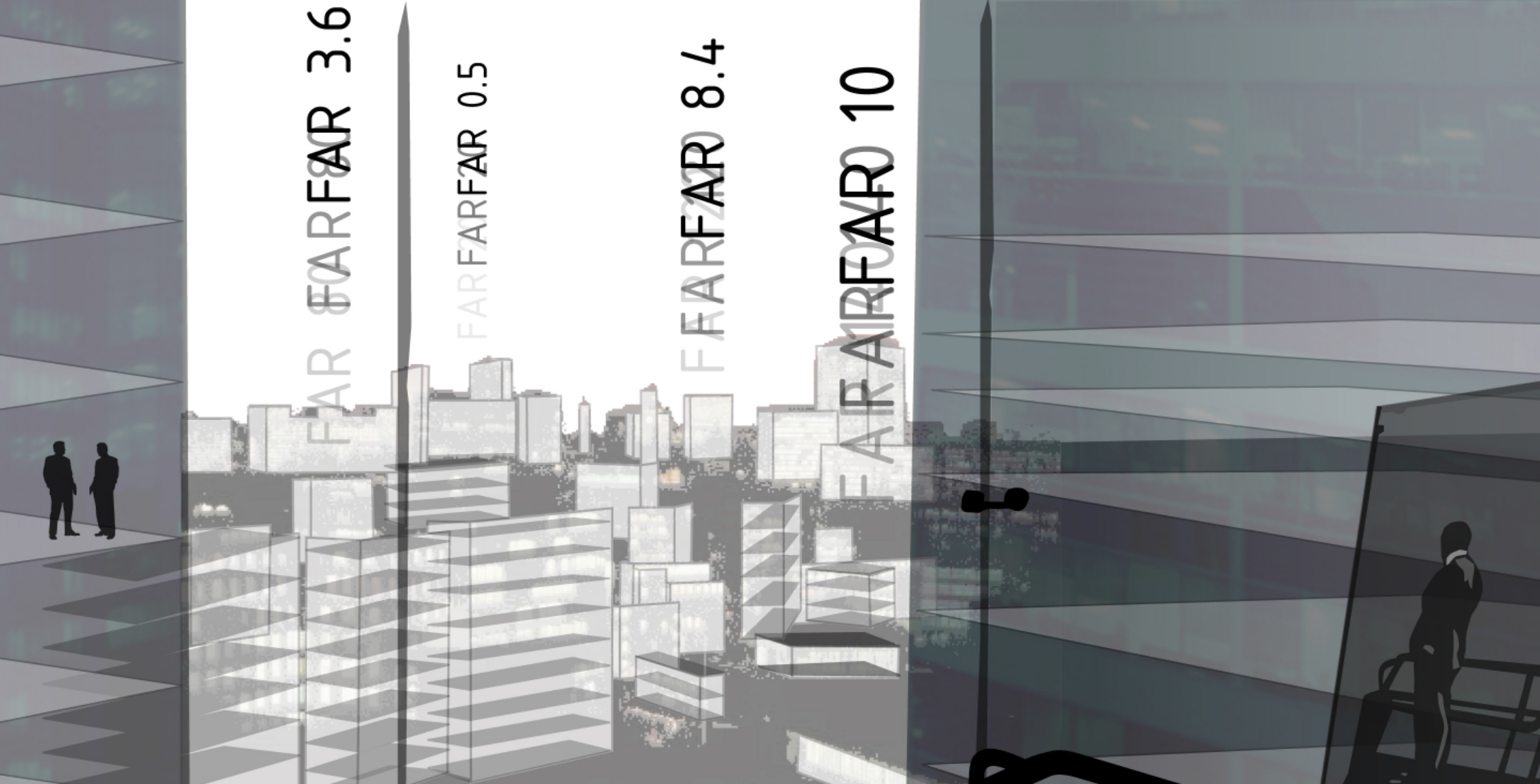
'Dwellings per hectare' (du/ha) is a measurement of housing density that is frequently used to consider the merits of planning applications throughout England. It provides a generic metric of density that encourages a uniform type of housing that consequently fails to recognise the demographic complexity of modern society. *"The definition of density and how it is measured is important, because interpretations can lead to wildly varying design approaches."* (Kucharek, Jan-Carlos, Happiness per hectare, RIBA Journal May 2006)

Other possible measures of density include numbers of habitable rooms or even beds per hectare, but none have succeeded in adequately representing more inclusive characteristics of high-density living that encourage a variety of household sizes or meet the increasingly varied needs of users. A more considered interpretation of the density metric is required that would be representative of both the social and the economic context of a city that is expected to reach a total population of 8.8 million, (an 18.6% rise) by the year 2029¹. The reality is that current planning procedures reliant on 'dwellings per hectare' often lead to static, one-dimensional masterplanning.

The research investigates alternative measures of planning urban density that could positively impact on the design and approval of urban development projects and furthermore consider the effectiveness of current planning legislation. In doing so the research question addresses four key issues relating to possible approaches to urban development around transport nodes²:

- » 01 Can **London's planning system** be more pro-active and encourage greater flexibility and more integrated land-use around transport nodes?
- » 02 How densely should we develop our cities and how might higher densities effect the **urban design** around transport nodes?
- » 03 What is the potential **social impact** in relation to the density of urban developments around transport nodes?
- » 04 Can we hypothesise the **future use** of large areas of city-centre land owned by Rail Estate?





FAR 3.6

FAR 0.5

FAR 8.4

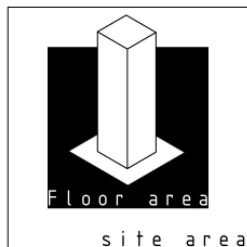
FAR 10

RESEARCH QUESTION:

How can urban planning enhance and 'animate' high density urban environments around transport nodes?



Introduction



FAR – Floor Area Ratios

What do we mean by Density?

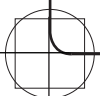
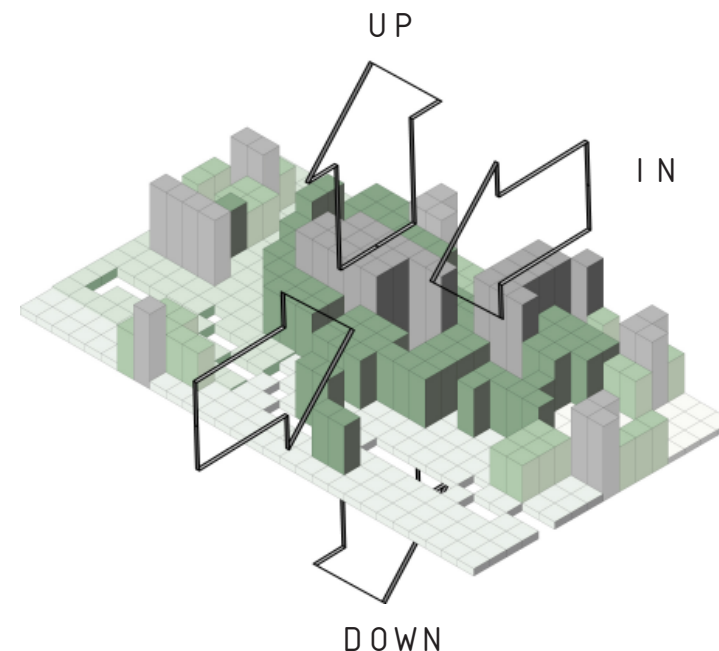
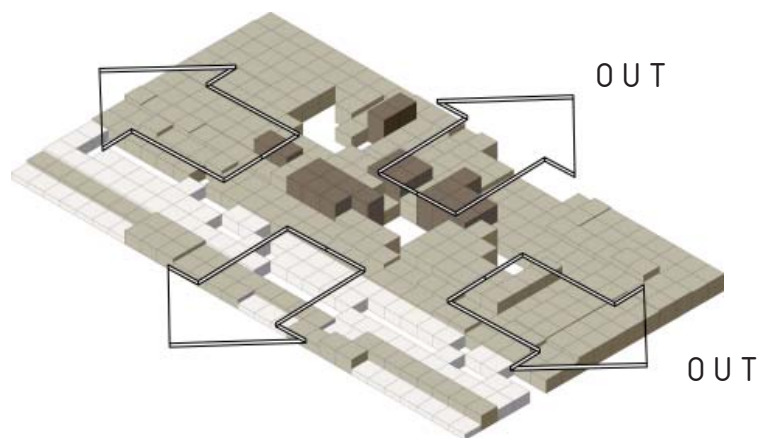
London's spatial planning policy is determined far too often by flat-planning relationships and reliant on the use of net density measurements such as 'dwellings per hectare'. Other measures of density exist, such as measuring the total floor area of a building or the gross or cumulative measure of density that includes the amount of open space in direct proportion to the floor area. This is commonly known as the Floor Area Ratio (FAR) or the plot ratio. It is a measurement that indicates the urban volume of a building as a variable of resultant floor area relative to the site footprint. The FAR provides useful information about a specific site, but does so in isolation of the surrounding area. Thus, relying solely on this type of measurement alone risks the overall development

of an area being neglected. It is a measure, however, that can be used to expand upon a more traditional flat-planning style of urban form, as it considers the volume of urban density and can impose limits to the heights or depths of the resultant buildings.

Legislation currently only goes so far in understanding the effect of more three-dimensional planning, as traditionally the historic growth of a city, such as London, has been dependant on smaller values of FAR due to a surplus of land available for development. With relatively lower land values the outer London suburbs have encouraged growth outwards rather than upwards.

> Spatial planning:

Directions of urban growth shown in the diagram can be directly effected by the policy framework of planning legislation, from flat-planning on the left to a more three-dimensional planning strategy on the right.



Site Context: Kings Cross Central

King's Cross is a major national and international transport node. Its close proximity to London's geographical centre places it at a strategic point in London's development. According to Transport for London, 71.5 million passengers used the King's Cross St. Pancras interchange in 2006 making it the busiest interchange in London. The King's Cross development is a project with a unique site of approximately 67 acres and is jointly owned by London and Continental Railways (LCSP) and Exel Plc. The majority of the land is located in the London Borough of Camden, which has approved the planning for this Transport Development Area (TDA), a crucial development that reinforces the city's monocentric organisation of businesses and services.

The context of King's Cross means that this is not an archetypal transport interchange and there are very site-specific considerations. It does, however, have many typical design and planning issues, albeit demonstrated on a much greater scale. It offers an opportunity to observe the implications of the planning process across a large masterplan. The public relations developed during consultations held with local residents is not a typical process used for all planning applications and a further reason why this development is an interesting case study. Analysis of the much debated and contested planning process, which has spanned over many years, allows significant questions to be identified.

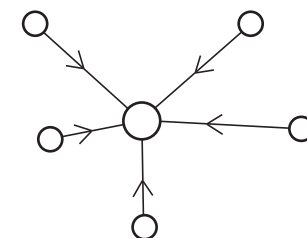
The research uses King's Cross as a case study to develop a series of design scenarios that will investigate alternative principles for urban density. The developer of the King's Cross project, Argent PLC, commented in a publication titled 'Principles for a Human City' that *"high density does not*

automatically equate to 'high rise'". While there has been much stigma attached to high-rise developments and towers, should we not we adopt more integrated vertical use of planning and consider more intermixed uses of buildings, especially for such a well connected location? Furthermore we raised the following questions:

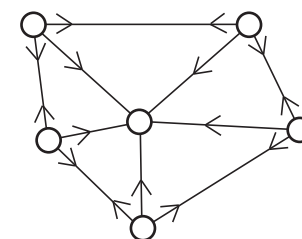
- » 01 Can the status quo of mixed use at ground floor level continuously satisfy the need to provide inclusive city spaces at high density?
- » 02 How do we satisfy the need for a diversity of housing, the local provision of services and open space to accompany such density?
- » 03 Could public consultation on projects of this scale offer clues about how to approach widespread consultation in planning?
- » 04 Should we be only reliant on large transport development areas to provide a centralised agglomeration of jobs and services?



Introduction



Monocentric city centres



Polycentric city centres

Glossary: Abbreviations

TDA - Transport Development Area
CTRL - Channel Tunnel Rail Link
LCSP - London and Continental Railways

< Computer visualization of completed scheme at King's Cross

Social Context: Urban Density Principles

Part of the problem is that the measurement of density is overly prescriptive. It is set by central government as a numeric guideline for local authorities when evaluating potential housing schemes and redevelopment plans. Planning should instead emphasise and tackle the complexities of London's growth and the needs of users that inhabit such density.

The research broadly examined the questions identified, in exploring the King's Cross Transport Development Area, assessing the effectiveness of current planning legislation with respect to the following prescriptive policy issues: use classification, 'dwellings per hectare' metric, zoning, and levels of occupancy. The research investigated these issues by using four scenarios to provide more descriptive detail, working towards establishing alternative principles for governing urban

density. The process was enhanced by user experience and narrative to considered the qualitative effects on users and their relationship to density, or in effect user density.

Quantifying the qualities of urban spaces and acknowledging social needs is often a difficult and intangible process. In attempting to create a more holistic approach to the planning process the research focused on dissecting the changing needs of users. Four types of factor were identified: socioeconomic, social demographic, political, and technological. These have further informed the creation of four urban density principles which are: Intensity, Amenity, Autonomy and Frequency. The research postulates that using these principles to guide the planning process will lead to more diverse, high-quality urban environments that are more responsive to users' needs.

> Research Scales:

The scales illustrated within this diagram explore the relationship of scales in this research project. It demonstrates that the perspective of the user with regards to the application of planning policy is only relevant in the context of the broader scales.

1. Intensity examines:

'use classification'

2. Amenity examines:

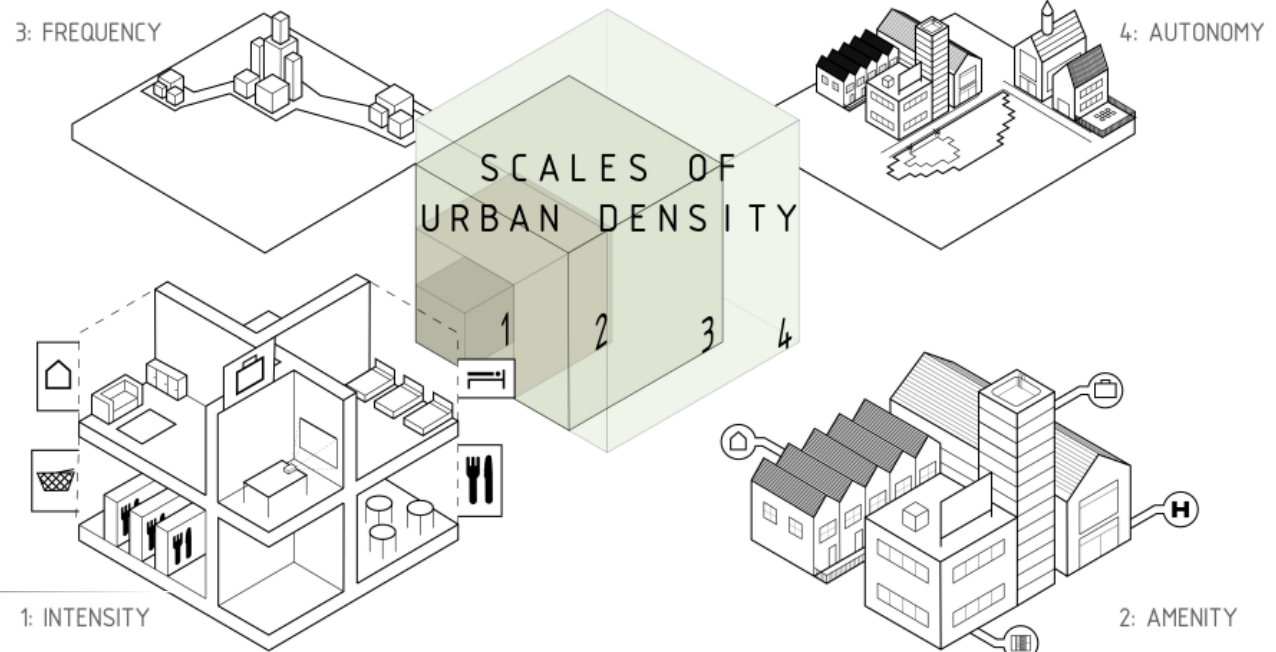
'dwelling per hectare metric'

3. Autonomy examines:

'zoning'

4. Frequency examines:

'occupancy'



User-Centred Design

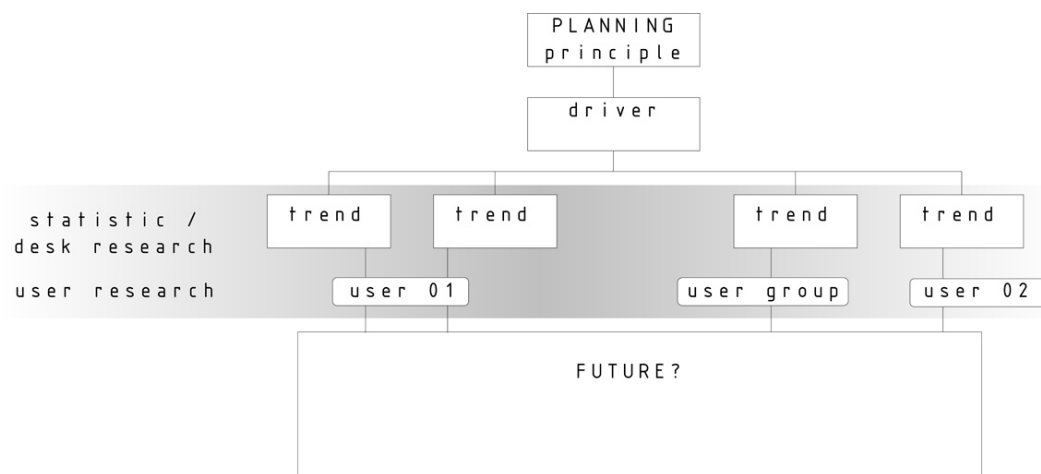
Adopting a user-centred approach involved using an evidence-based process to demonstrate the interactions of the users with their Transport Development Area. The definition of a user is someone who is in any way directly affected by a development. Correlating the user research with statistical trends, planning considerations, architectural proposals, and possible hypothetical outcomes that represent plausible futures or alternative societies has resulted in the development of four scenario-based design outcomes that relate to each of the planning issues. Each of the scenarios encourages us to explore how planning could change and affect our environment and consequently impact on our social behaviour and our attitudes towards working and living.

The built environment leaves a lasting legacy, the results of which have to be lived with for generations to come. Policy

that is prescriptive about the levels of density acceptable for development is at fault, as planners are beginning to acknowledge: *"(On the revised PPS3 housing policy document) ...because we all now know that the markets are changing so quickly, and what we all need is changing so rapidly, why set in a plan that will live for 5-6 years, the exact needs that will become out of date as soon as it is published."*

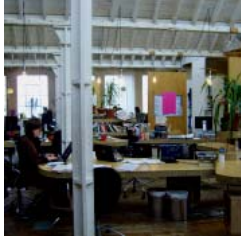
(Nick Tennant, 02.03.07 Policy Reform Officer, Department of Communities and Local Government)

The development of each scenario has been supported by the breadth of desk research and user consultation in order to illustrate more hypothetical questions about the effects of planning policy and to move away from prescriptive measures of the built environment that currently dictate the conception of transport development areas.



< Research Method:
A process diagram exploring the development of the design-based scenarios.

Research Findings



The Hub, shared office facility in Angel



Social entrepreneurial network



Manabu navigates a Transport hub in Tokyo to locate shared space



Rentable living space, Tokyo Mange-Kisa (Cafés)

Principle 01 - INTENSITY

Intensity is a measure of an urban environment's socioeconomic needs.

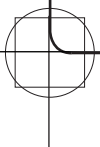
It equates to the adequate provision of employment and services that make a rich and intense city-life experience. Historically, trade has long since been associated with transportation and serves the basis for much public interaction. The economic exchange of goods and services that make cities, in particular at transport hubs, play a significant part in the globalised commerce in today's increasingly urbanised society.

This design scenario looks at solutions/alternatives to the following:

- 001 A prescriptive planning policy of 'Use Classification' that currently equates activity to place (a building or a space).
- 002 A prescriptive planning policy of 'Use Classification' that restricts the appropriate mix and provision of spaces around a transport node (or TDA) that could better suit high density development and the needs of the end user.
- 003 A revised planning policy that could provide a more flexible programme for the buildings and the interrelated spaces of transport nodes (or TDAs), which would proliferate inclusive city development and relate to the continuous change in user needs by day and night.

Transport development areas in cities have the potential to enable the sharing of resources and skills alike depending on the density of people, businesses and the interactivity between these. The interactions and sharing of resources that is possible depends on the architecture typologies of buildings that exist in the area, for example, contrast the public exchange within markets and squares, retail in high streets and malls, business in offices and factories, and so forth. Within some low density developments these significant elements of an urban area can at times be all but forgotten, resulting in inadequate provision for local employment possibilities or local businesses. High density developments built around good transport facilities, on the other hand, face another challenge: being subject to constant organic transformation, with a need to consider alternative arrangements and adapting provisions accordingly.

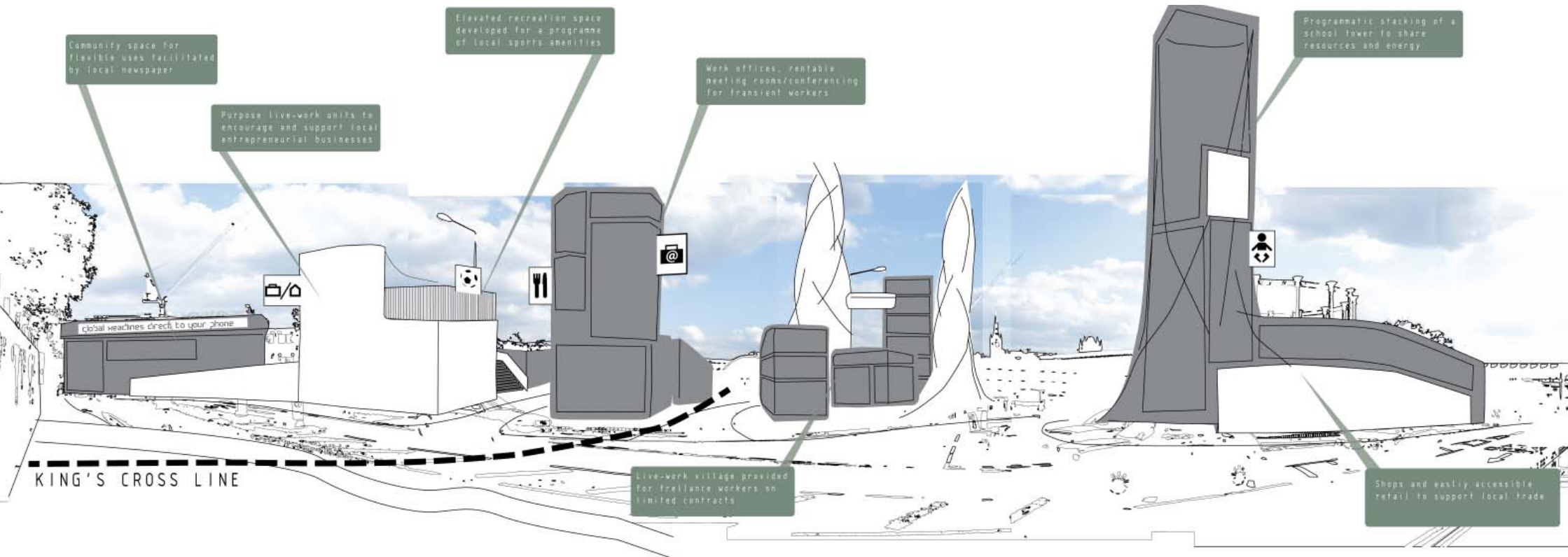
A new typology is required; one that is able to reflect the current conditions of people's behaviour and user needs. Of note is the lack of consideration or encouragement for the vertical use of high-density developments for public access; 'mixed-use' is often confined to the ground floor level. The impact of this is that the development of dense city urban environments is being driven towards meeting the need for residential or office space with little consideration being given to other uses that could be required by a higher density of urban users, such as public space and communal facilities particularly conducive to user interaction. The narrative for urban density principle of Intensity examines how the current planning system might be altered to regulate and differentiate use classification differently in order to achieve an appropriate level of mixed and intense use.



"The Third Place"

The design outcomes challenge current considerations for the effective use of flexible space adapting to the needs of users and reacting to the conditions of use at various times of the day. This type of density developed in and around a transport development area uses, to its benefit, the large transient population that requires the support of a wide range of services that adapts to market forces. The area provides a hub of activity that both supports local development and provides services for a transient work force. Built into this approach to the planning of

density is a need to acquire flexibility in use classification and allow spaces to adapt to current needs as opposed prescriptive uses. This should also be used to encourage sharing overlapping and symbiotic relationships of spaces and uses, creating a varied and mix typology of uses that reacts to user needs much more fluidly. New navigating and ICT technologies will be key to enhance the control and management of spaces to work more efficiently and effectively.



Research Findings



Shinonome Canal Court, Tokyo



Mix of uses and provision of facilities



Mix of uses and provision of facilities



Home office living space

Principle 02 - AMENITY

Amenity is a measure of an urban environment's social demographic needs.

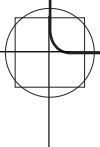
It examines the civility of dense urban living spaces that may be integrated within a site of a transport development area and asks how the current planning framework regards the diversity of household types, the provision of services and facilities, and consider arrangement and numbers in a site.

This design scenario looks at solutions/alternatives to the following:

- 001 A prescriptive planning policy of 'Dwellings Per Hectare', the standardised metric of housing that currently sets a numeric value to the number of households provided at a transport development site with no regard to the diversity of household type or demographic and user needs.
- 002 Planning policy guidelines that suggest a hierarchy of open space yet do not actively enforce the appropriate mix of open-spaces that would better suit high density development and the needs of the end-user.
- 003 A revised policy that London's future growth requires more flexibility and purpose-built homes, particularly around dense urban transport development areas, where housing demand is encouraged by good transportation links, in order to establish communities that represent the changing demographic make-up of households.

The amenity narrative works towards attaining a dedicated living space around an integrated transport infrastructure. Development should work with existing patterns of organic growth and take into account existing traffic flow with access to both public and private open space and services. The 'Home Zone' concept retains the use of access roads for private transport yet acknowledges the importance and the psychology of place when considering streets for pedestrian users over that of cars and transport. Appropriate models of density will need to consider environmental, social, and economic needs that adopt maximisation of natural light and ventilation and acknowledge the need for a hierarchy of open space.

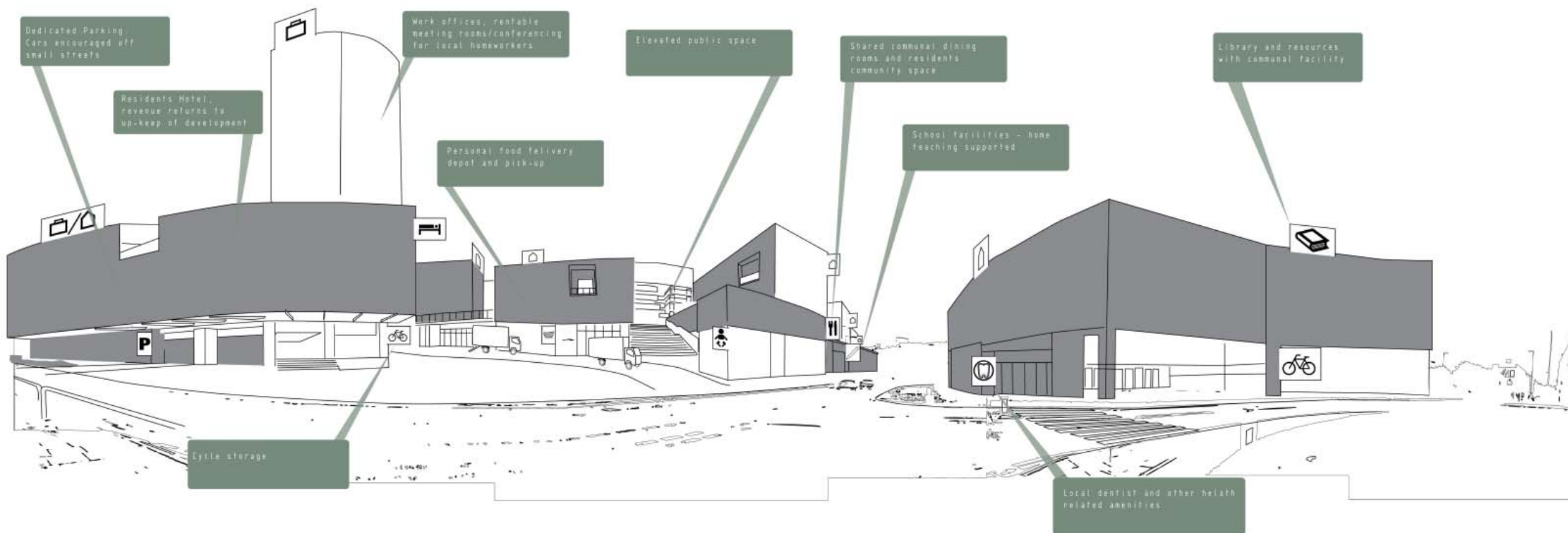
The research involved in-depth study of Shinonome Canal Court that included user consultation of a couple that live and work in the new development. Tanabe San and his partner own a SOHO (small office home office) apartment that overlooks the central pedestrianised street that includes facilities of child care clinics, convenience stores and other locally run businesses, rentable meeting spaces, dentists, general practitioners, and raised terraces for open space. Some of these features have been incorporated into the design proposal of amenity (opposite).



"Domesticity"

The design outcomes challenge current considerations for the effective development and arrangement of amenities to animate and service density. The layout includes cleverly designed corridors that look into adjoining flats insuring an open yet secure environment between the apartments. The treatment of the central 'street' that runs from the length of the development provides an inclusive space that prevents the road and car dominating. This has a direct impact on the street psychology and the noise levels.

Adopting this approach, and diverting traffic and vehicle parking to the perimeter of the development ensures that spaces are dedicated to pedestrian users. Creating a mix of provision of amenities offers the resident user or transient user the convenience of locality and service. Being centred around an internal style courtyard that has a mix of private and public levels provides the development with degree of public accessibility rather than inward looking and gated communities.



Research Findings

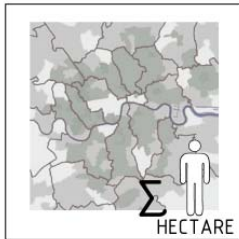
Principle 03 - AUTONOMY

Autonomy is a measure of an urban environment's democratic needs.

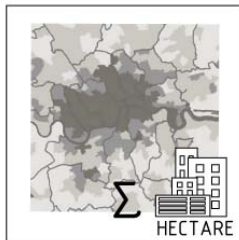
It examines the democracy of urban environments, reflecting the need for public consultation and proactive involvement of users in the design and deliver stages of any development. The urban environment and its effects on our community identity and wellbeing should not be taken for granted.

This design scenario looks at solutions/alternatives to the following:

- 001 A prescriptive planning policy of 'zoning', a strategic method of separating work/employment and living/residential areas of planned city growth to impose strict development in relation to predetermined land use.
- 002 The planning policy guidelines that allow for improved consultation on transport development areas that could directly encourage autonomous development of transport nodes and communities.
- 003 London's future growth requires more user consultation and more effective interaction with the use of a wider media that could avoid the root cause of many delays and disputes for transport development areas. Engagement of users in planning decisions should not be limited to consultation that is in effect tokenism, but instead should be led by local authorities to have impact on design decisions and provision.



Population per 100
Hectare

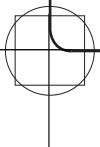


Employment per 100
Hectare

The research has highlighted the inherent need to align user needs with to the local provision of employment and services. This could be achieved by acknowledging the value of user consultation in structuring the development growth of businesses and services around the social and economic diversity. Currently information regarding the distribution of employment and population are gathered by the generic net density metric of population density and employment density.

Population Density is a measurement that can capture more detailed information about the numbers and types of demographic in a given area. But, given that it is a measurement derived from census information gathered infrequently, the data is often out of date and fails to adequately represent emerging trends, such as people living in diverse types of households and moving house far more often. A recent survey conducted by the Daily Mail Ideal Home Show claimed that Londoners could expect to live in 16 addresses in one lifetime.

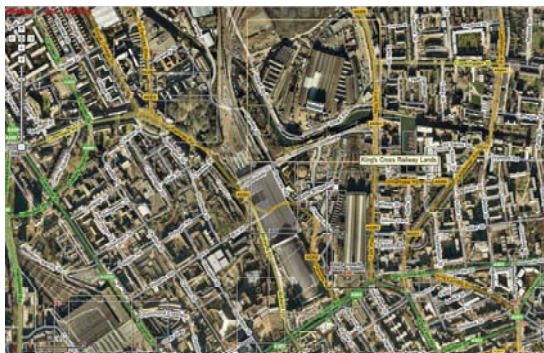
Furthermore, population density does not take into account that people have had to adopt more transient lifestyles, with increasing numbers of people commuting to reach their place of work. Employment density clusters around the city centre. Thus neither population density nor employment density capture sufficient information to provide an accurate representation of an area. The more effective way of knowing the population and understanding its needs is through direct consultation.



"e-Volve"

Some of the key indicators that have driven the autonomy narrative include government and local authority protocol. The Department of Communities and Local Government recognises the need for integrated user consultation within planning procedures and the delivery of larger scheme projects. Furthermore, transport development areas and the design of large transport interchanges require compulsory public consultation both as a process by developers and local authorities. This type of consultation has become more readily available through the recent addition of direct.gov.uk website for local planning authorities, which allows people to receive up-to-date information on planning applications in their local area.

The national and local government already uses websites and e-petitions to engage with voters and community members on issues relating to the built environment. Using an interactive virtual representation of reality could provide another means of consultation with users. Second-Life demonstrates the



potential relationships and influences that people can have with their inhabiting space. Although this is a virtual space one can readily see how it could be a reflection of a real community. The instant nature of the virtual environment in Second-Life together with the ease of use with which participants can creatively influence it raises the question as to what could happen if planners and architects were able to simulate place and environment through a combination of Google Earth and Second Life virtual reality.

Internet forums using the WikiMap shown here has been successful in collecting users' opinion on the future and prospective development for the King's Cross site and the neighbouring environment. Users have used a system of tagging of the map in order to illustrate and identify critical issues with the current existing site and transport infrastructure, dealing with conservation, community identity and user need.

Research Findings



Direct.gov.uk website



Virtual Earth by Microsoft



Web user Geo-tags



Virtual environments

Research Findings



Mase San spends his working week using hotels across Tokyo centre



Mase San uses hotels at transport links to navigate the city



Home-Office worker, Sandra



Sandra attends to her daily duties

Principle 04 - FREQUENCY

Frequency is a measure of an urban environment's dynamic and mobile population.

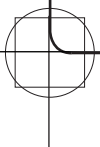
It examines the need for accessible mobility for users of transport development areas and asks how the current planning system might incorporate new technologies to provide the means of tracking and planning for the movements of urban pedestrian flow.

This design scenario looks at solutions/alternatives to the following:

- 001 At a City planning level the continued policy of developing the distribution of employment density towards a central activities zone that encourages travel of a daily workforce and thus works to intensify the centre and encourages a greater need for transport movement.
- 002 The planning policy guidelines that allow for improved Transport Development Management (TDM) of the use of transport around development of transport nodes.
- 003 London's future growth requires more user consultation and ICT management which could better describe the movements of transient workers that facilitate the use of transport development areas in a model of development that encourages distribution of employment and services respective of density.

Integrating suburban and outer city hubs to main central interchanges would offer an opportunity to use the flexible working pattern as a means of ensuring people travel and commute less and use an optimal amount of time and energy on work tasks. A task driven workforce may also change the working habits of typical offices where 'presenteeism' can be a means of ensuring staff stay longer regardless of productivity. Mase San is an office worker in the financial district of Tokyo. He has adopted a transient domestic lifestyle of living in hotels. Whilst he has a permanent address far outside Tokyo, he chooses to move about the city sleeping and working in hotels to suit his daily needs. He enjoys the experience of the facilities and the levels of service that is offered by the hotels in Tokyo. This is not dissimilar to the way in which many apartments in London's economic district of the City are rented out to businessmen from Monday to Friday and are left vacant during the weekend.

The technologies that support the frequent movements of employees and facilitate increased mobility also have a direct impact on those people who are unable to commute long distances to the city centre for employment. Japan has a rising number of home-workers that operate their contractual work from home. BT has recognised the need of some of its employees to be closer to their home as they need to attend to dependents that include children and elderly people. A scheme allowing workers to 'log-on' on from home means that workers spend less energy and time travelling to central offices. BT has over 9,000 home workers and 70% of BT's training is delivered on-line.



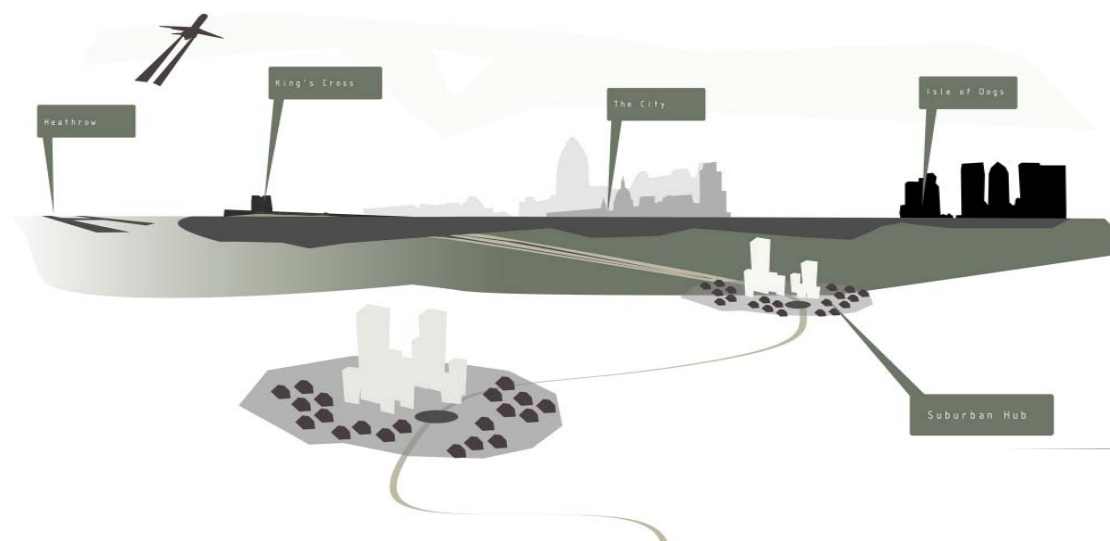
"REAL-TIME CITY"

A suburban hub strategy would develop outer city centre interchanges with flexible and open-ended workspace that would be dedicated to remote and flexible workers. These hubs could encourage mutual exchanges and knowledge sharing, rather than closed-door policies and large HQs. Organising and project managing a workforce on the move requires dedicated technological systems that can be used to provide a digital mapping that represents the frequency of urban flows and distribution of workforce across the city. Mapping of GPS and mobile phone tracking can differentiate the greater frequency of use by the strength of trail that follows the routes taken, research in this area has been undertaken by some institutions, such as the 'Senseable City Laboratory' Project at the MIT by Carlo Ratti, (Image shown).

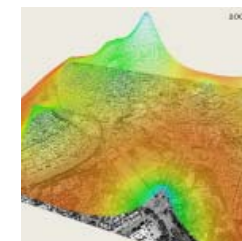
This has led to observations regarding the relationship of centres or transport nodes that provide hubs of commerce, interchange, or even public exchange, which have been progressively developed through the eventual growth of the city. Mapping and understanding the behaviour of users and

the subsequent and resultant city pattern of development has been covered as an area of research produced by Space Syntax that maps the spatial structure of roads and the routes taken by users. Whereas 'bio-mapping' carried out by Softhook works to demonstrate the physiological and psychological effects of place and movement according to a user's experience. This has been carried out using a sensor to determine pulse rate and perspiration that can register a users anxiety or even excitement about an entire route.

Analysis of this type of information can be useful for both planners and users when navigating or planning for the city, as reflected in the work by mysociety.org that organises a travel-time map that superimposes a London map with a colour coded scale. This shows the relative time of travel from one place to another dependent to transport links. It represents average journey times on public transport taken between places and hence the connectivity of certain areas this has been introduced into planning through a similar consideration when calculating density with Public Transport Accessibility Levels (PTAL).



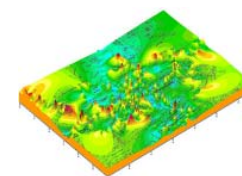
Research Findings



Senseable City Project, Carlo Ratti



Space Syntax, Ben Hillier



Softhook 'bio-mapping'



Mysociety.org Time travel map

Conclusions

> Proactive Planning Process:

A less reactive process could allow for more engagement with users and developers alike to deliver the development of density in a model of considered growth that meets both social and economic needs.

KEY

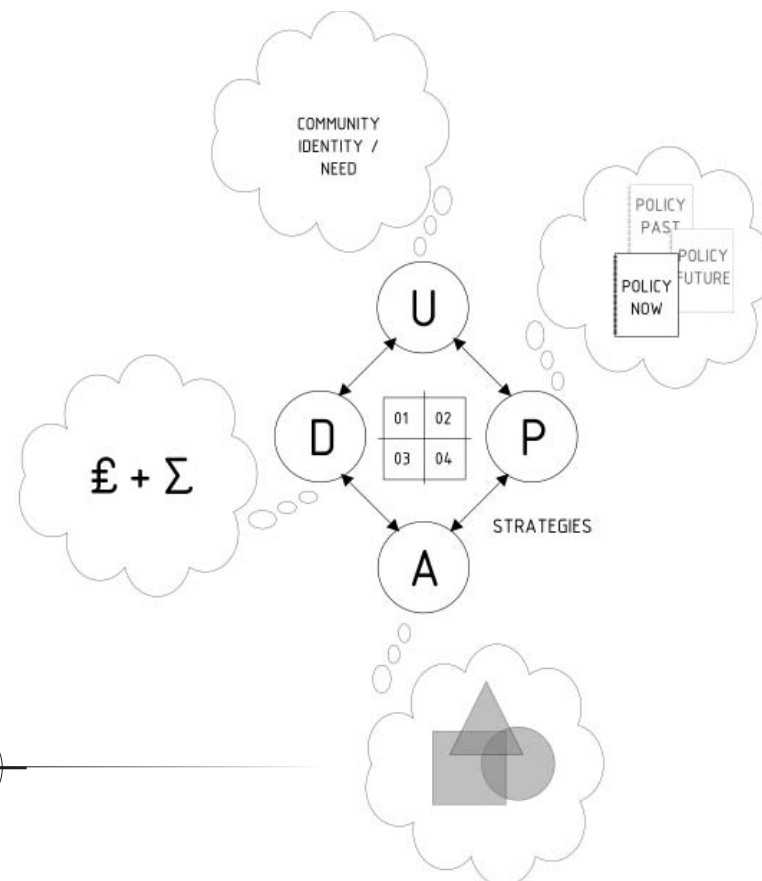


Planning Process

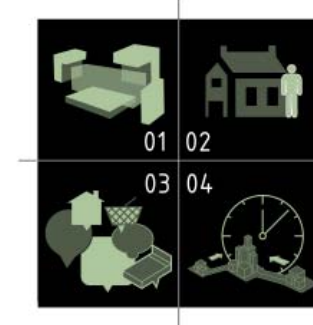
The four principles of urban density developed through the research process have guided the construction of a matrix that provides a new metric space for urban density – the Metricity Formula. Within the metric space there are four quadrants of data, reflecting a more holistic process rather than one individual focus or singular need.

The Metricity Formula incorporates existing measures so as to determine the value of key characteristics in the appraisal of new development sites. What is stressed is that these gross density measurements are considered in

conjunction with input arising from the active involvement of user consultation. Furthermore another dimension is added by assigning each factor a weighting with respect to the overall development of site-specific conditions of place, the relation of user involvement, and the wider city development-needs. This enables the existing one-dimensional metric to be applied simultaneously with the outcome being far more holistic. All these features of the Metricity Formula have been brought together so as to aid the inclusive development of the city around the provision of good transport links.



TOOLKIT – DRIVERS FOR URBAN DENSITY:



01 – INTENSITY
<socioeconomic>

02 – AMENITY
<social-demographic>

03 – AUTONOMY
<political>

04 – FREQUENCY
<technological>

Qualifying and Quantifying

Application of the Metricity Formula to evaluate the diverse merits of a particular planning process should follow the following four steps:

01 CLARIFY EVALUATION CRITERIA

Provides a tool for planners to evaluate the suitability of transport development areas according to the four principle user needs. In order to allow more flexibility in the planning criteria assessed for the development of large master planning with transport infrastructure a series of four charts recognise the individual perspectives that would arise from a application for development (User / Developer / Architect / Planner)

02 APPLY WEIGHTING TO CRITERIA

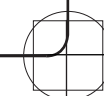
The matrix encourages the evaluation of key quantifiable metric, such as dwellings per hectare, plot ratios, floor area ratios, population density, habitable rooms per hectare, PTAL indexes, etc. Cross referencing these with the four principle user needs allows one to agree and establish what weighting to apply to each of the metric.

03 CONDUCT ANALYSIS OF CRITERIA

Enforces the need for adequate public consultation within the planning process and more implementation of design ideas that relate to user input. The analysis of the development would include speculative scenarios to provide a measure of consideration that relates to future issues or foreseen changes in need that can be accommodated in later contingency plans. This overall approach relates to a adaptive set of strategies for development as opposed to definite or optimized plans.

04 SCORE EACH CRITERIA

On the basis of this criteria a scoring or weighting behind each factor would allow a comparative assessment of the transport development area. The weighting of criteria may relate to the aspirations of users and local concerns as well as the national agendas.

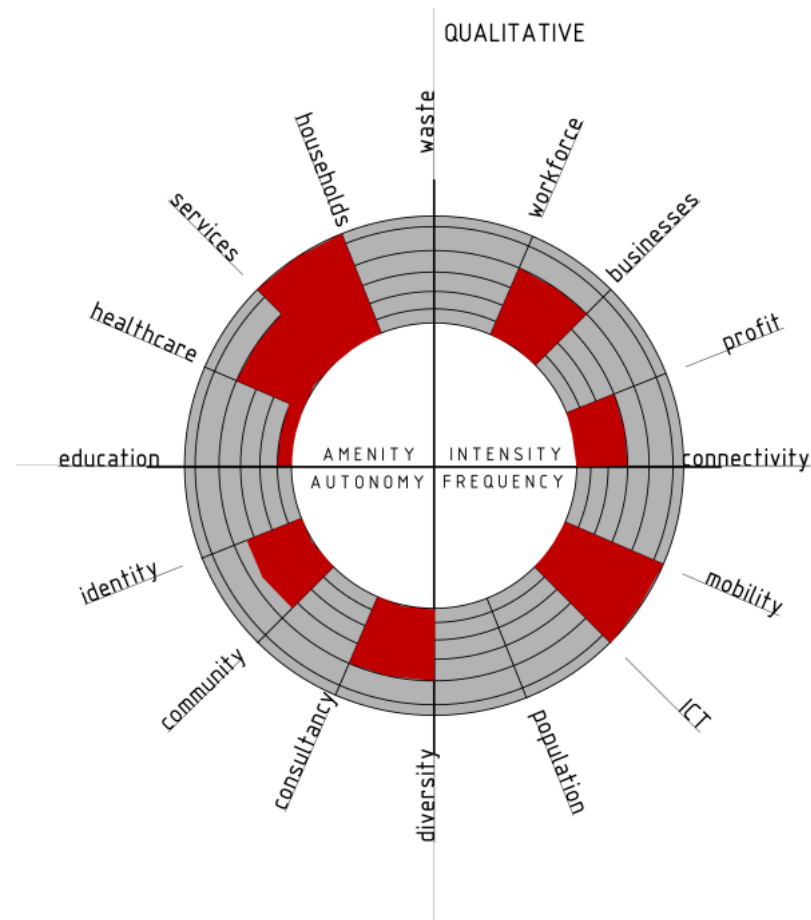


Conclusions

Metric Space

Given that the planning process involves multiple roles (User, Developer, Architect and Planner) the Metricity Formula is constructed to allow the needs/drivers behind each of these different perspectives to be assessed. This is achieved by creating a customised Metric Diagram/Space for each role.

These diagrams encapsulate the different perspectives and allow one to contrast the value each of the roles assigns the different characteristics/factors. Below is an example of User Metric Space.



USER

1. Neighbourhood, amenity and location
2. Mixed communities
3. Design standards
4. Private and communal external space
5. Transport provision and management
6. Lettings and allocations
7. Management and maintenance and community engagement
8. Service charges

> Metric Space:

The proposed matrix offers a toolkit for delivering a user-centred development that relates density to the four urban principles.



Further Research

In order to evaluate and develop the four alternative principles, further testing is required on 'real-life' sites. The immediacy with which we need to creatively reinterpret planning legislation to relate to the four outlined principles is self-evident – one need only look at the extraordinary growth that is expected in London over the forthcoming years.

APPLICATION AND TESTING:

In a second year of Metricity, the four urban density principles would be developed through a consideration of design practice and further analysis. A design-based research study on a new London project, to be identified with the research parties, would be supplemented by further comparative work on King Cross. Design work could become a collaborative objective between members of the research consortium and other colleagues in their respective offices, enhancing the depth of the study and the ability to extract more from the findings.

DELIVERY & DISSEMINATION:

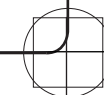
The results of the research can be disseminated in a number of possible ways –

Linking with third parties/consultants to increase the knowledge base from which the metric can be developed, inviting contributions and drawing on the experience of users and experts from across the field of urban development. This could be achieved through the use of workshops, bringing the ideas of policy makers, designers, developers, and users together.

Holding a conference that focuses on the issues of high-density developments.

Publicising and exhibiting the work in order to seek feedback and further research development.

Developing a website to provide a resource of research material for public distribution and for the use of the research partners.





**helen
hamlyn
centre**

The Helen Hamlyn Centre (HHC), based at the Royal College of Art, works to advance a socially inclusive approach to design through practical research and projects in partnership with industry. The HHC works to promote inclusive and user-led design through the projects, research, events, exhibitions and publications. The HHC has jointly commissioned this research project with the following industry partners: Arup, Child Graddon Lewis, Reid Architecture, and Sheppard Robson.

ARUP

Arup is a global firm of designers, engineers, planners and business consultants providing a diverse range of professional services to clients around the world. With this fully integrated approach, Arup are a creative force behind many of the world's most innovative and sustainable designs for the built environment, which include most recently the 'Eco-City' of Dongtan, China. This leading practice has established 60 years of research and has its own Foresight + Innovation + Incubation group.

cgl

Formed in 1992, architects and designers Child Graddon Lewis (CGL) today has more than 50 staff in its Spitalfields offices in London. CGL has an excellent track record in commercial, retail and residential architecture as well as mixed-use projects requiring masterplanning and urban design expertise. Clients include private developers, development companies, registered social landlords and government bodies. CGL is currently working with Transport for London, Genesis Housing Group, Brompton Estate, Royal Borough of Kensington and Chelsea, HSBC and Boots.

SHEPPARD ROBSON

ARCHITECTURE URBAN DESIGN PLANNING INTERIORS

Social conscience, sustainability, technology transfer, efficiency and quality are the key principles of Sheppard Robson. Since its foundation in 1938 the practice has demonstrated excellence in design and innovation with early projects setting a precedent for their design approach. Led by a dedicated group of experts, the practice also actively collaborates on industry research projects. The architecture practice has been able to implement several innovative means of analysing the effectiveness of their buildings for environmental impact, improved social wellbeing, and enhanced economic performance.



Reid Architecture employs a philosophy of knowledge-led architecture in which research provides a fundamental contribution to what is a highly creative international architecture and design practice. The practice boasts its own Research and Development Unit that informs all the projects they undertake to ensure their design is a holistic and a considered response. Their previous research has covered the topics of mixed-use within the context of community, real issues that hamper successful urban design and ultimately the design of urban space within our cities as inclusive places.

Paul Clarke is an architectural designer, researcher and filmmaker with a Masters degree in Architecture from the Royal College of Art. With an avid interest in the extraordinary and unforeseen implications of future technologies, as well as socioeconomic and demographic change, Paul suggests a way of understanding future worlds, the psychology of society and its inhabitants. Narrative futurology a critical design approach provides a creative tool to explore alternative and otherwise unknown horizons. J.G.Ballard once described his process and its outcomes as 'creepy truths' and he has exhibited his work at the Architecture Foundation's 'Best in show' in 2006.

Contact:

t: +44 (0)7789 916137

p.clarke@onlyforwardarchitecture.com

www.metricity.net

www.onlyforwardarchitecture.com