ARTISTS

Arterial Streets Towards Sustainability

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D1.2
A First Theoretical Approach to Sustainability Concepts and Assessment Tools

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Preface

The research reported in this document has been conducted by the ARTISTS consortium, funded by the European Commission and is part of Key Action “City of Tomorrow” in the 5th Framework.

The ARTISTS consortium consists of the following contractors;

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University of Westminster, UK
City of Malmoe, Sweden
City of Copenhagen, Denmark
Municipality of Kalamaria, Greece
City of Porto, Portugal
City of Girona,Spain
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This document is written by Ian Plowright, University of Westminster, for the first work-package within the ARTISTS project. It incorporates work by:

- Christine Krämer and Ulrike Huwer of the University of Kaiserslautern who produced appendix 1. based on contributions from all partners; and
- Emmanuel d’Iteren and Sylvaine Morelle of the Université Libre de Bruxelles, authors of appendix 2.

WP1 is led by Ian Plowright at University of Westminster and deals with the design of an Assessment Framework. Besides University of Westminster, specific task contributors to WP1 are and Emmanuel d’Iteren and Sylvaine Morelle at Université Libre de Bruxelles. Beside these major contributors all partners in the ARTISTS consortium contribute to some extent to all deliverables.

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Appendices

1. Introduction

1.1 This paper forms one of the first deliverables of the ARTISTS project. It sets out the early results of the consortium's consideration of issues and concepts relating to arterial streets and sustainability, drawing these together within a proposed theoretical approach to appraising the "performance" of arterial streets. It is the sister paper to D1.1 "*A First Theoretical Approach to Classification of Arterial Streets*". That paper focuses on the concept of sustainability in terms of a "balanced" multifunctional/multiuse arterial street and proposes an approach to classification based on the arterial role and "locale"[1] uses. This paper and its first appendix, give broader consideration to the concept and its applicability at the localised street level in order to then set out a an approach to assess the ARTISTS case study streets in terms of that concept. The link with D1.1 is strengthened via the "review frame" proposed within this paper and given at appendix 2. The "frame" will guide the recording of street attributes influencing street performance. These attributes will also be the basis of "locale" classification as described within D1.1.

1.2 The approach outlined within this paper will next be translated into a "how to guide" describing its practical application at the case study streets. It will then be refined, in an iterative manner via the test application at these case studies.

2. Summary

2.1 This paper sets out a first theoretical approach to the review and assessment of ARTISTS case study streets. The approach has been arrived at through:

- Guidance provided by the "Bellagio"[2] principles of sustainability assessment and the ARTISTS Description of Work;
- Consideration of sustainability and the applicability of the concept at the localised street level;
- Review of current approaches to assessment of street elements and performance, along with associated indicators employed across partner cities/countries;
- Review of national (where provided by partners) and internal indicators of sustainability;
- Consideration of the theoretical approaches adopted amongst sister projects (e.g. TRANSPLUS, PROPOLIS) within the 5th Framework "Land Use and Transport" cluster (LUTR), and their emerging indicator sets; and
- Review of potentially applicable approaches to evaluation.

[1] The second aspect relates to the street's role as an urban space or place, incorporating the use of space for non-through (local) activity, its local urban role (neighbourhood role) and its role as a destination. This aspect is explained in detail within D1.1 where it is referred to as 'locale' role. The term 'locale' signifies the immediate use of the particular locality.

[2] Named after a meeting held in Bellagio (Italy,1996) to establish principles for monitoring progress towards sustainable development.

ARTISTS differs from other LUTR projects in terms of spatial scale of sustainability (e.g. PROPOLIS and TRANSPLUS both developing indicator lists against which to test policy performance at the more strategic level). The proposed ARTIST approach seeks not to replicate the strategic indicator development, but rather derive maximum utility from its differing spatial scale (i.e. its focus at the street level) whilst ensuring some commonality with LUTR and other indicator sets. The ARTISTS theoretical approach proposed here is to employ a limited list of indicators in order to assess street ("system") performance in terms of "Road" and "Locale" roles and "Comprehensive Sustainability". This is allied with a detailed description of street ("system") attributes influencing performance. The ARTISTS level of spatial resolution permits a focus on the issue of "vitality" (cultural, social, and economic). People and street behaviours sit at the heart the proposed ARTISTS approach to the assessment of "street life".

2.2 The approach proposed within this paper seeks to balance tensions within the ARTISTS project. A key tension is that between the need to quickly begin to research and "benchmark" the case study streets, and the need for stakeholders to be a part of the process of indicator selection[3]; development of an evaluation tool[4] and refinement of the concept of sustainability at the case study level. To this end an initial short "working" list of indicators of system performance is proposed, along with a review of street attributes influencing that performance. It is proposed that these act as the first stage within an "off the peg"[5] and transparent approach to the evaluation of the "services" and "benefits" derived from the street by different users, conducted in partnership with stakeholders. This approach will allow us to understand what "matters" and hence:

- what should be being measured;
- the indicators to be used; and
- the weights to be attached,

refining our approach and facilitating the development of an assessment tool based on multicriteria analysis to be employed at the case study streets.

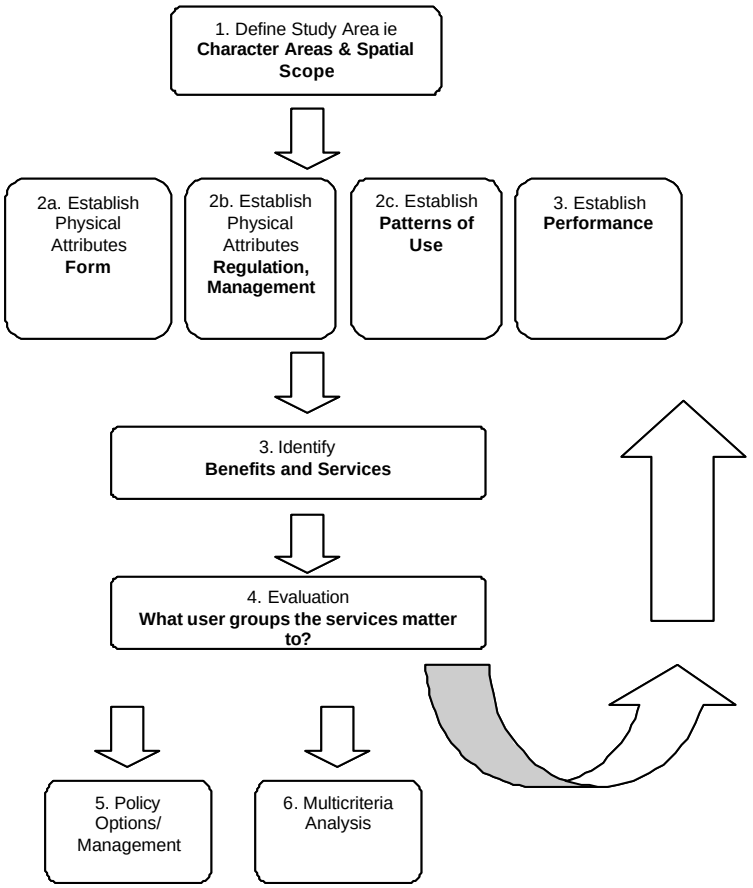
2.3 Core to the proposed theoretical approach is a systematic review of street attributes guided by a framework. This is an extension of currently employed approaches to road condition reviewing[6] and "town centre health checks"[7] etc. Attributes are reviewed under thematic headings "Built Form", "Function, Regulation and Management" and "Patterns of Use"[8]. Whilst each thematic grouping is important, the "Patterns of Use" attributes underlie proposed

[3] A point emphasized within appendix 2.
[4] The consortium is currently of the view that this evaluation tool should be based on multicriteria analysis rather than cost benefit analysis.
[5] The evaluation approach to be adopted is called the "Quality of Life Capital Approach". This approach was developed by UK agencies responsible for environmental management to provide a consistent and integrated way of managing quality of life. Originally termed Environmental Capital it has now been shown that the approach is equally valid for social and economic benefits. The approach is explained in more detail in section 10 of this paper.
[6] E.g. that approach within the UK "Guidelines for Cycle Audit and Cycle Review (IHT, 1998).
[7] E.g. see URBED, 1994
[8] Headings based on the "Form", "Function" and "User Group" foci proposed within the ARTISTS Description of Work.

performance indicators of “people movement” and “vitality”, and allow inferences to be made about street user groups. “Patterns of Use” attributes also potentially require the most resources and effort to observe, record and quantify. The review serves a number of purposes beyond description and quantification. The described attributes will:

- ?? form the basis of our categorisation and classification of street form and street users;
- ?? act as the basis of “level of service” assessment and resultant benchmarking;
- ?? act as a reference point against which to assess long term changes;
- ?? be employed to assess compatibility between vehicle traffic use and other street uses, and the degree to which certain street attributes are compensating for incompatibility;
- ?? act as the first stage in an assessment with stakeholders of the “benefits” and “services” provide to different street users, and the policies and actions required to ensure that the social, economic and environmental benefits are maintained or enhanced;
- ?? inform “movement” and “vitality” related performance indicators;
- ?? allow for the testing of levels of association or correlation between street attributes.

The diagram below illustrates the core of this process and the refinement feedback mechanism.



3. Concepts and Definitions

Starting Point

3.1 We have taken as our methodological guide the ten "Bellagio Principles" for gauging progress towards sustainable development. These principles are addressed in more detail within appendix 2. They have been summarised as:

1. *What is meant by sustainable development should be clearly defined.*
2. *Sustainability should be viewed in a holistic sense, including economic, social and ecological components*
3. *Notions of equity should be included in any perspective of sustainable development. This includes access to resources as well as human rights and other "non-market" activities that contribute to human and social well being.*
4. *Time horizon should span "both human and ecosystem time scales", and the spatial scale should include "not only local but also long distance impacts on people and ecosystems".*
5. *Progress towards sustainable development should be based on the measurement of "a limited number of" indicators based on standardised measurement"*
6. *Methods and data employed for assessment of progress should be open and accessible to all*
7. *Progress should be effectively communicated to all*
8. *Broad participation is required*
9. *Allowance should be made for repeated measurement in order to determine trends and incorporate the results of experience.*
10. *Institutional capacity in order to monitor progress towards sustainable development, needs to be assured.*

(adapted from Hodge and Hardi by Bell and Morse, 1999)

Key guiding points taken for the above are the need for

- a clear definition of sustainability
- a holistic approach
- clarity regarding temporal and spatial scales
- participation

Sustainability

3.2 At appendix 2, we range over the concept of sustainability and its early development within the international agenda. Here we conclude that sustainable development encourages the conservation and preservation of natural resources and of the environment, and the management of energy, waste and access. Sustainable development is development based on patterns of production and consumption that can be pursued into the future without degrading the human or natural environment. It involves the equitable sharing of the benefits of economic activity across all sections of society, to enhance the well-being of humans, protect health and alleviate poverty. If sustainable development is to be successful, the attitudes of individuals as well as governments with regard to our current lifestyles and the impact they have on the environment will need to change.

3.3 We touch on some definitions of sustainable development at appendix 2. However, when attempting to define what is meant by sustainability within ARTISTS, we have an almost innumerable list of existing definitions to work from. The term is used daily and widely and yet there is no consensus as to a concrete definition. This lack of clarity combined with wide spread use may appear contradictory but *"As a destination, sustainability is like truth and justice – concepts not readily captured in concise definitions"* (Schaller, 1993). We propose taking as the foundation of our working definition, that definition formulated by the World (Brundtland) Commission on Environment and Development, the Commission defining sustainable development as –

> *"…… development which meets the needs of the present without compromising the ability of future generations to meet their own needs"*
>
> (WCED, 1987)

Whilst one of the earlier definitions, it is still widely employed and remains frequently used. It places emphasis on the qualitative more the quantitative, emphasising *development* rather than *growth* and *need* rather than *demand*. Working from such a perspective poses a challenge for ARTISTS in terms of assessing the qualitative rather than just the quantitative and identifying needs rather than demands for future policy to balance and meet. Our guiding definition and resultant methodology needs to reflect the evolutionary nature of cities and streets.

> "*Buyers, sellers, administrators, streets, bridges, and buildings are always changing, so that a cities coherence is somehow imposed on a perpetual flux of people and structures. Like the standing wave in front of a rock in a fast-moving stream, a city is a pattern in time*. "
>
> (Holland, 1995).

Our adopted definition may be a refinement of the Brundtland definition along the following lines:

> "*Sustainable development is not a "fixed state of harmony". Rather, it is an ongoing process of evolution in which people take actions leading to development that meets their current needs without compromising the ability of future generations to meet their own needs*".
>
> (Hardi & Zdan, 1997)

However, we conclude at appendix 2, that we must fully develop a clear vision or visions of sustainability at the case study level. Thus our next stage in the development of the concept has to be stakeholder engagement.

The Spatial Dimension of Sustainability

3.4 When we talk of "Arterial Streets Towards Sustainability", to what spatial scale of sustainability are we referring? Are we referring to the street itself being more sustainable or it contributing to a more sustainable city or nation? Niu et al (1993) point out that the difficulty is that these scales are all interlinked. The smaller the scale the harder it is to know where to draw the line. The scale issue is reflected within the LUTR cluster. PROPOLIS for example is considering city level strategies for moving towards sustainability, and indicators by which to assess progress. Many of the policy approaches considered by PROPOLIS are intended to influence travel demand and hence the impacts arising from vehicle use along the city arteries. PROPOLIS is developing tools by which to assess noise, CO_2, NO_2 etc emissions from those arteries. ARTISTS is looking at city sustainability from the "other end of the telescope". Being aware of the spatial scale of sustainability enables us to be clearer about the scope of the ARTISTS methodology and indicators. For example, it is not useful to attempt to quantify emissions of CO_2 from a length of case study street. Such components of sustainability become more meaningful as we approach the city scale.

The Street as a System

3.5 How we conceptualise the street has implications for how we assess performance. What is it we are assessing the performance of? We have briefly considered the evolutionary nature of cities and sustainability; and issues relating to the spatial scale of sustainability that need to be accommodated within our conceptual framework. We also require a conceptual framework that allows for the complex relationship between built structure, space and people that is the street. Here we can learn from Ecology. Ecology is based on understanding "open systems" operating through a web of interdependencies at many different levels, each system incomplete at its own level and interacting with other systems at other scales in order to become a whole system. The street can similarly be considered in system terms, as an open system.

> *"A system is a perceived whole whose elements "hang together" because they continually affect each other over time and operate toward a common purpose. The word descends from the Greek verb sunistánai, which originally meant: to cause to stand together. As this origin suggests, the structure of a system includes the quality of perception with which you, the observer, cause it to stand together."*
>
> (Senge et al, 1994)

Implications for ARTISTS Spatial Scope

3.6 Consideration of the spatial dimension of sustainability, and thinking of the street in system terms, helps us in considering the geographical scope of our case study research. We have already talked of consideration of "patterns of use" within both the public and private realms, suggesting a "fuzzy" rather than "hard" conceptual boundary to the street. The street as an open system is not definable as just the space between two building lines. In each ARTISTS case study, the researcher will have to define the system boundary based on behaviours and land uses relating to the arterial street. The researcher will have to apply a degree of personal judgement whilst employing a standardised approach to

spatial "scoping" to be detailed within the case study "how to guide". Indeed many of our case studies may have to be conceived of systems within (or at least along) the "street" system Hopkins et al offer a word of caution when attempting to assess the street environment and define street boundaries:

> "*Within an urban location the classical image of a shopping street is of a road carriageway flanked by pavements and shop frontages, defined in length by junctions with other major streets. Whilst this image is still a dominant form in many urban centres ……. pedestrians are exposed to many types of traffic and shopping conditions. Even the single street may comprise a number of sections each with different pedestrian and traffic characteristics. This is particularly the case in larger urban centres when the length of a street may be several hundred metres. Indeed it might be questioned whether the street itself is an appropriate unit for determining individuals' perceptions of environmental quality or whether a larger definition (e.g. shopping area) or smaller definition (parades, arcade, precincts) might be the unit on which people judge the environmental quality."*
>
> (Hopkins et al, 1987)

The researcher embarking on the assessment will have to decide upon "sections of character" along the street (to an extent prejudging "cells" and differing "locales" [see D1.1]) and complete separate reviews for such sections. The user will also have to decide upon and justify the distance from the case study street beyond which they do not research "Patterns of Use" etc. For different descriptors, the geographical scope may vary. For example when considering on-street parking provision, that within side streets may have to be included. When considering pedestrian and cycle movement, that within side street and back streets may well have to be included. It also enables us to restrict our consideration of the "form of arterial streets". In one sense the form of the arterial and its resulting function or use is intertwined with city morphology. Its function being derived from its "spatial integration" and "global connectivity" arising from the city morphology (Hillier. B, 1996). Being clear that we are considering the street as an "open system" allows us to focus at the local level, turning our attention away from issues of "global integration", whilst acknowledging the street within the city system.

The Temporal Dimension of Sustainability

3.7 We stated within in the ARTISTS project proposal to the Commission, that we would consider "short and long term" effects. We propose to consider "long term" as a period of thirty years. Such a time scale would encompass land use and built structure changes. It does however help us discount from our scope, consideration of city/area morphology, street patterns and block size as potentially unchanging over generations. Rossi (1982) and other commentators have observed that it is usually the street system that is the most enduring part of the city.

Form, Function and Use

3.8 Within the Description of Work, we make reference to classifying streets by "form", "function" and "user group". We still have to define these terms, although above we have begun some refinement suggesting that within the ARTISTS project, the "form" of an arterial street will relate to the case study level rather than to wider city morphology. The word "function" tends to be used in two ways. Firstly, it relates to something's natural or evolved purpose. In this sense the street has two functions "communication" and "interaction". However, planners and policy makers have assigned "functions" to streets based on some notion of vehicle movement (e.g. access, distribution) which may or may not be reflected in actual use. Thus to aid clarity we suggest distinguishing between "function" and "assigned function" and also "use" (this being the "use" something is actually put to, which will reflect "function" but may or may not reflect "assigned function"). The structure of the proposed approach to the review of street attributes reflects our Description of Work emphasis on "form", "function" and "user group".

Need, Demand and Use

3.9 Just as we have to still to define more clearly "form", "function" and "use", so we have to clearly define "need", "demand" and their relationship to "use". The methodology proposed and outlined later in this paper aims to make explicit and categorise the spectrum of street users through observation and recording of patterns of use/behaviours/activities. These patterns of use and behaviours will reflect not only motivating needs but also demands and desires. Both our evolving working definition of sustainability and the Description of Work, place the emphasis on need rather than demand. Thus we propose attempting to disaggregate user group "needs" from "demands" as part of the assessment of "benefits" and "services" to undertaken with stakeholders. The reliance on observation of current conditions has further limitations particularly when considering issues of need and equity. It provides a poor insight into currently unmet need, and risks excluding potential user groups (e.g. possibly children and people with disabilities). Again it is proposed that these be addressed via the assessment of "benefits" and "services" (e.g. who is benefiting from what services and who might potentially benefit?).

Vitality and Viability

3.10Underlyingrlying the ARTISTS project is the notion of the street as multiuse rather than single use. As we step away from consideration of only the single assigned traffic function, we move into the yet more complex and less ordered world of people activity. Fortunately people themselves can be (and one might say should be) a key indicator of system performance. They are our "indicator species". The numbers of people and their activities should give an indication of response to system attributes and hence system "quality". This has been recognised within the field of Town Centre Management/Performance for a number of years. Here, the assessment emphasis is placed on "vitality". In the UK, vitality is taken as a measure of how busy a town centre is (NPPG8, Scottish Office, 1996). One might easily turn this around and say that how busy a town centre is, is a measure of its vitality. It is related to "viability" which is defined as a measure of a centre's capacity to attract ongoing investment, for maintenance,

improvement and to adapt to changing needs. (NPPG8, Scottish Office, 1996). Various indicators have been proposed and employed to provide an insight into performance of a centre and so offer a framework for assessing vitality and viability e.g.

- Pedestrian flow (footfall)
- Prime rental values
- Space in use for different town centre functions and how it has changed.
- Commercial yield
- Vacancy rate
- Physical structure
- Surveys of consumers
- Crime rates

(Ruston, 1999)

3.11 One of the most influential pieces of UK research in this field was conducted by URBED (1994). They remind us that both "vitality" and "viability" relate to "life" – vitality coming to English in the 16th century from the Latin vitalitas (vita) and viability form the French viable (vie) in the 19th century.

> "*The use of both terms highlights the need to consider whether a centre feels lively ('animation' being one definition of vitality) and whether it has a capacity for long living (to use an accepted definition of viability). Thus vitality is reflected in how busy a centre is at different times and in different parts whilst viability refers to the ability of the centre to attract continuing investment, not only to maintain the fabric, but also to allow for improvement and adaption to changing needs. …..Vitality contributes to achieving viability, through a series of processes, initiatives and actions with economic, environmental, and cultural aspects."*
>
> (URBED, 1994)

URBED emphasise that they found no single indicator that can effectively measure the "health" of a town centre, but the two key indicators they suggest are pedestrian flow (vitality) and "yield" (viability). Yield is -

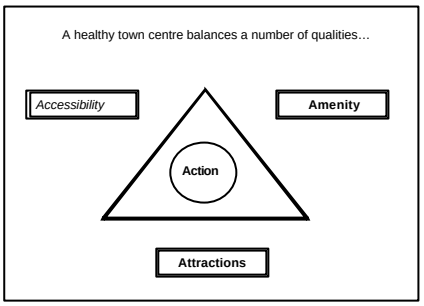
> *"…. the ratio of rental income to capital value and is expressed in terms of the open market rents of a property as a percentage of the capital value. Thus the higher the yield the lower the rental income is valued and vice versa. A high yield is an indication of concern by investors that rental income might grow less rapidly and be less secure than in a property of with a low yield.*"
>
> (URBED, 1994)

URBED considered other useful indicators to include:

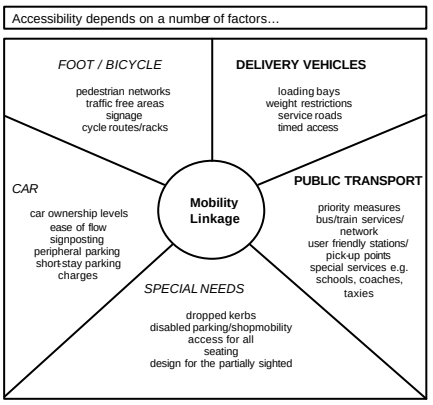
- Demand for property
- Space in use
- Vacancy rates related to the physical structure (e.g. different sections of character),

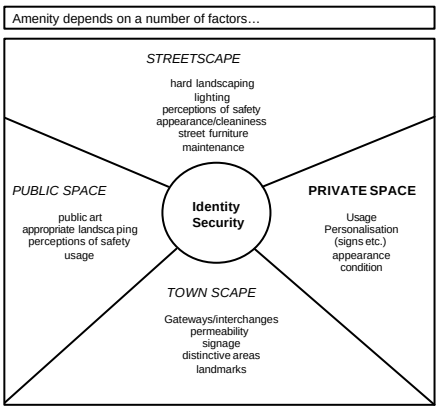
Yield has been built into the proposed initial working list of ARTISTS performance indicators. However, we do have reservations about its use. It may prove difficult to measure at many of the case studies and it is "technical" and hence possibly not meaningful to many stakeholders. Thus we also include "vacancy rates" within the initial ARTISTS indicators, being less "technical", and assessable by observation.

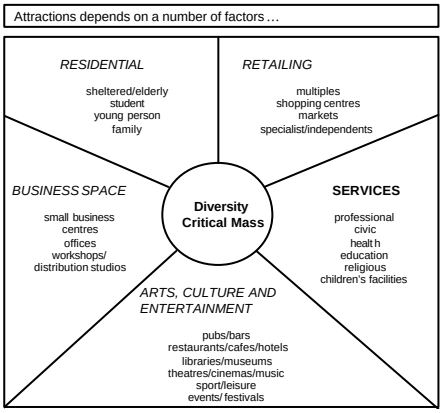
3.13URBED emphasise that while indicators enable the general state of health of a centre to be assessed, they do not explain where the strengths and weaknesses lie or why a centre is performing as it is, health being multidimensional. URBED thus developed an assessment framework based around four basic qualities that underlie the health of a town centre i.e. "attractions", "accessibility", "amenity" and "action".



These essentially subjective concepts are illustrated/summarised by the diagrams below (Taken from the URBED report). "Action" relates to *"organisational capacity"* and reflects the ability of the local authority and all the other "actors" to work together to promote the good of the centre.







3.14 Whilst ultimately URBED's focus was on economic sustainability, the use of people as an indicator is equally valid in terms of social and cultural vitality and viability. The URBED type of holistic approach to reviewing attributes (town centre or street) in order to gain an understanding of resulting performance, is adopted within the proposed approach set out below, as is the focus on people in order to assess vitality. The proposed approach is intended to reflect the fact that:

> " …..*quality of life cannot be evaluated as a single, simple economic/ commercial impact, or and architectural compatibility impact, or traffic impact, or sociological impact or any other special and narrow impact. The reality of a place is the conjunction and interaction of all these elements and, in its totality is something more."*
>
> (Cutler and Cutler, 1983)

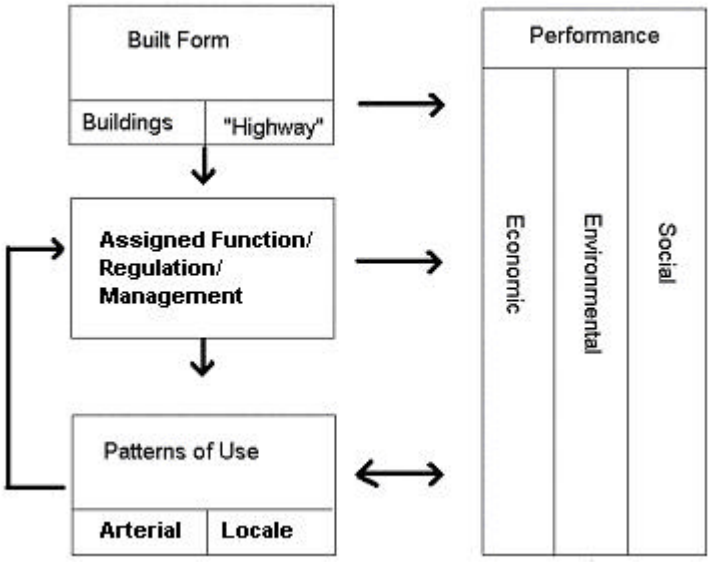
and that we need to review a wide spectrum of street attributes that are potentially influencing street (system) performance.

4. The Logic of the Proposed Approach

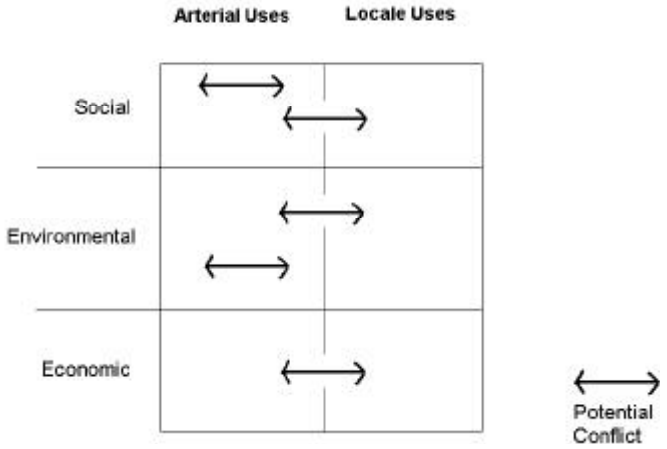
4.1 Drawing parallels with the URBED approach, we propose to assess to street performance on the basis of a limited number of indictors relating to "arterial" and "locale" roles and to aspects of comprehensive sustainability. We then propose to look behind these performance indicators at what is potentially influencing performance. Just as a "town centre health check" is intended to establish the town centre attributes influencing its performance, we propose reviewing the street attributes that influence street performance. Despite the need to still clarify our definitions, we propose arranging those attributes into themes relating to the core foci for classification ("form", "function" and "user groups") stated within the Description of Work, i.e.

- "Built Form";
- "Assigned Function" (i.e. that assigned by virtue of its position within the current road hierarchy etc) and resulting management and regulation regime; and
- "Patterns of Use" both "Arterial" related and relating to other "Locale" activities.

Attributes within each theme work in combination to influence the social, economic and environmental performance of the street, with a feedback mechanism by which performance influences patterns of use.



We suggest that as well as the street having a physical carrying capacity, there are also perceptual carrying capacities beyond which the “Arterial” and “Locale” uses begin to conflict (depending on the means by which arterial movement is achieved). Within use categories there will also be conflicts influencing social, environmental and economic performance. However, we propose a focus on the former and suggest (section 10) an approach to “benchmarking” streets in terms of exceedence of perceptual traffic carrying capacity.



5. Performance Indicators

5.1 We have reviewed:

- international sustainability monitoring indicators (UN and OECD); and
- at the European level the emerging transport and environmental monitoring (TERM) indicators and other indicator sets,

to avoid "reinventing the wheel" and to achieve consistency and compatibility where appropriate. Similarly we have looked across LUTR at emerging indicator sets, reviewing the TRANSPLUS and PROPOLIS policy monitoring indicators. Below we propose a minimum list of performance indicators appropriate to the street system /spatial scale of sustainability. We propose two "summary" sets of indicators relating to overall "arterial" performance and "locale" performance. These are respectively "people movement" (numbers of people moving past "busiest" point by all modes during peak hour) and "vitality" (number of people observed in "busiest" 100m length, residential population and working population). Outlined below is the proposed set of indicators with comment about disaggregation and control/reference groups etc. Comment on control/reference groups is only provided where it is considered necessary to go beyond use of "unchanged" street examples as our control for the "changed streets". We have not proposed at this stage "softer" measures derived from attitudinal surveys or focus groups. However one might suggest that –

- planning "with the people" rather than "for the people" dictates that such approaches be employed; and
- the ARTISTS focus at the street level means that such an approach would be appropriate, whereas it is maybe less so within other LUTR projects looking at monitoring policy effects at the regional or wider level.

Table 1. Summary of Proposed Performance Indicators

Theme	Secondary Theme	Indicator	Disaggregation	Comment on data sources and additional control/reference groups
"Arterial" Performance	People Movement	Number of people moving past busiest point during peak hour		Derived from review frame
"Locale" Performance	Vitality	Number of people in street Number of activities in street	Age, sex	Derived from review frame
		Residential population Working population		Derived from review frame. Suggest compare with locational average e.g. if example street in inner city, compare with inner city average
Economy	Viability	Prime yield Average yield Vacancies	Retail, Office	Suggest compare with locational average e.g. if example street in inner city, compare with inner city average
Society	Safety	Traffic deaths	Sex, age, mode	
		Traffic injuries	Sex, age, mode	
		Speed		Prepare speed profiles for links along the case study street
	Security	Reported crime	Within street, Within buildings	

	Affluence/ deprivation	Unemployment Income Residential rents/purchase price		Suggest compare with locational average e.g. if example street in inner city, compare with inner city average
	Health	Medical prescription issuing rate		Suggest compare with locational average e.g. if example street in inner city, compare with inner city average
		Exceedences of locally important pollutant limit values.		Thus assumes that all cities are currently measuring and modelling performance relative to EC directive led limit values
		Kerbside and background concentrations of locally important pollutants		Only for locations where monitoring already undertaken
Environment	Air Quality	Emissions of locally important pollutants		Derived from “line source” emissions inventory within city air pollution model or calculated from review frame (traffic speed, volume and mix) by the application of standard emission factors
	Noise	Outdoor daytime noise levels Outdoor night time noise levels		If not already being assessed by city, will require surveys Compare noise levels on case study street with those at points approximately 100m back from case study street

6. The Review of Street Attributes

6.1 Here we outline the proposed review of street attributes seeking to address the questions -

Why?
When?

We already addressed the question of "Where" at para 3.6 when considering the need for the researcher to define both the spatial scope of each example "street" and "sections of character".

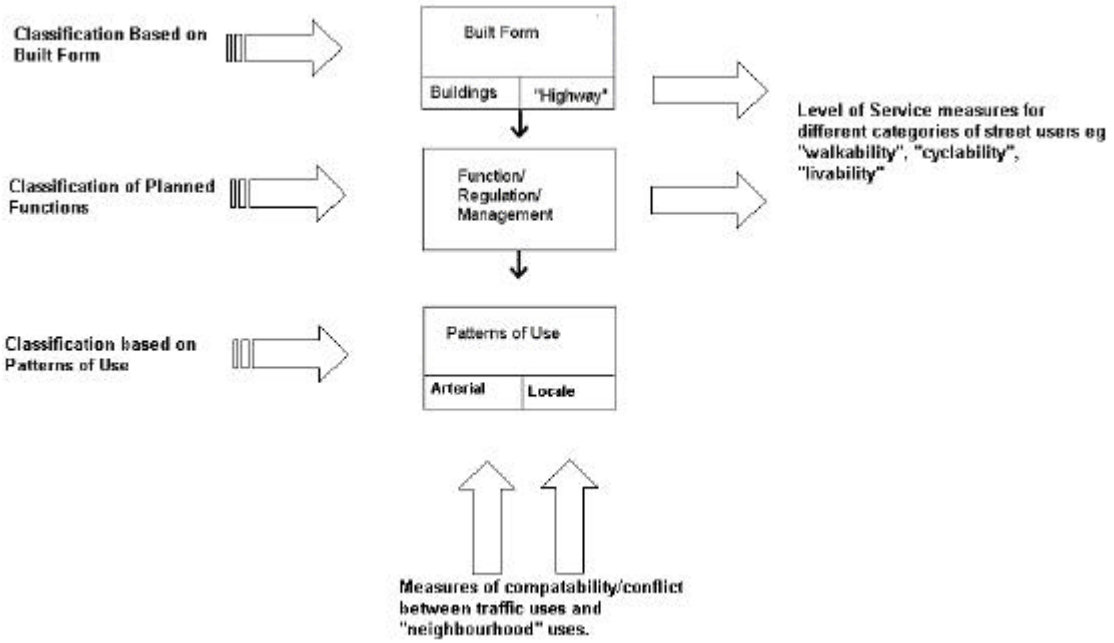
6.2 The review would be guided by a "frame" (appendix 1). The breadth and depth of research suggested by the frame is a balance between reflecting the intricacies and complexities of street life, and "analysis paralysis". Taken as a whole, the framework is intended to establish and describe reasonably comprehensively the street attributes that may influence performance. "Descriptors" relating to street attributes are grouped under the thematic headings mentioned in section 4. Some of these descriptors are combined to provide "more meaningful" secondary descriptors.

6.3 The review frame has been developed in large part through an analysis of current approaches to street assessment. In its form it is not dissimilar to some in current use[9] but extended in scope to address more of the aspects of "multifunctional arterial streets" (e.g. by building in components of town centre health checks). The comprehensive nature of the review means that data collection will be resource intensive. However it does sit at the core of the proposed assessment approach, and data gathered via the review will serve a number of purposes. Attribute descriptors will:

- Inform a number of the proposed "performance indicators"
- Form the basis of assessment of the perceptual carrying capacity and the compatibility of the current arterial use with locale uses
- Act as the starting point for an assessment of "benefits" and "services" derived from the street, undertaken with stakeholders to determine what matters and why.
- Form the basis of "level of service" benchmarks
- Act as reference points for a "timeline" appraisal of long term change
- Form the basis of the street classification system (see sister draft D1.1)
- Act as a current baseline.

The review frame is intended to guide the systematic description of the arterial streets.

[9] e.g. that within UK "Guidelines for Cycle Audit and Cycle Review" (IHT, 1998)



6.4 Time of surveying/research is not critical to many of the descriptors. However for the “Patterns of Use” descriptors, timing is important. This is particularly so for the observation of people, which will have to take account of seasonal variation in street activities.

6.5 The review frame has been through many drafts with the inclusion and then removal of certain attributes. Those not appearing in the current draft include –

- “urban role” i.e. the street as local centre, strategic centre, or a part of the city centre?;
- “urban grid/granularity” i.e. the degree to which the adjoining streets/blocks form a course or fine grain and hence influencing permeability, enclosure and definition etc;
- “topography”
- “linearity” i.e. is the street straight or curved?

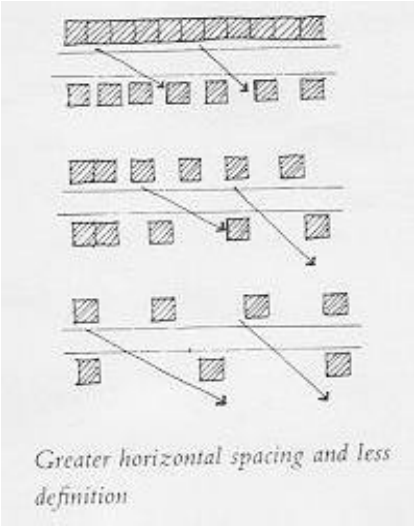
Each of the above are quick and easy to collect. The latter three influence “walkability”, “cyclability” and general enjoyment of the street space. However, they are only changeable in the long term if at all.

6.6 Outlined below are the proposed themes and associated descriptors with a brief note on their relevance and importance.

Thematic Element 1. Built Form

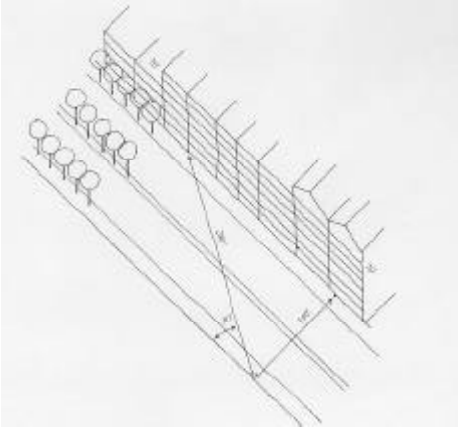
The street is an intrinsic component of the built form, the street in one sense being the space between buildings. At the wider level, the city morphology sets the levels and patterns of "spatial integration" and "hence movement potential" (Hillier, 1996) resulting in certain linear spaces having an "arterial" role or at least "arterial potential". Elements of built form are also major influences on street aesthetics. Many of elements of the built form are unchanging in the short to medium term. However these elements still need to be understood in terms of the degree to which they are contributing to (or working against) the street being a place within which to walk or otherwise enjoy. These need to be understood in order that policy to influence long term change can be put in place, if necessary.

Street Definition
A street requires definition and all three dimensions are important in providing that definition. Tighter building space is more effective at achieving street definition. It also provides a greater sense of enclosure both factors facilitating enjoyment of street space.



(Jacobs, 1993)

The street is potentially more enjoyable if the building height is on a human scale and "Generally, Buildings are likely to provide a sense of definition when height-to- horizontal-distance ratios are 1:4 when the viewer is looking at the a 30 degree angle to the street direction" (Jacobs, 1993)



At height to distance ratios of 1:3: there always seems to be definition. At 1:2 definition is strong. As the ratio approaches 1:5 or beyond definition is weaker. Trees may be as important as buildings in creating street definition.

"*Transparency" and "Surveillance"*

Whilst the street requires definition and enclosure, it also requires "transparency" particularly at ground level (at the meeting of the horizontal and vertical planes). There needs to be a softening of the edge between the public and private realms. This can be achieved visually with glass frontages but more strongly with doorways allowing movement between the two realms. Rather than blank walls, the street requires windows and opening doors to allow visual and actual movement between the public and private realms, to provide interest and an added sense of security. It is important that the frontages are "active" to provide greater interest and a sense of surveillance. The existence of active frontages/ground level activity appears to be one of the key factors associated with higher levels of pedestrian activity (Space Syntax, 2001).

"Apportioning of the Highway"

> *"Functions and character of streets are closely connected. A wider carriageway at the expense of space on the sides means loss of function in the areas of leisure, non-motorized street usage and residential environment and simultaneously, a loss of character by giving up the traditional proportions scales and segmentations of the streetspace….A key element of the traditional generally accepted street proportions is the division of the total street area into three parts: side area, carriageway, side area, approximately in proportions 3:4:3*" [10]
>
> (Topp, 1990)

Trees and Other Greenery

Trees may be as important as buildings in creating definition (Jacobs, 1993). As well as their general aesthetic appeal, trees and other greenery can have a compensatory effect on the otherwise visual impact and other psychological impacts of higher traffic levels (Topp, 1984 and Appleyard, 1981).

Landmarks

Historically important (or otherwise distinctive) sites or structures can be important in terms of contributing to legibility, creating a sense of place and a sense of identity and /or providing a focal point for the street. They may be places to visit or attractors in their own right. Such structures should be briefly described and highlighted on the plan

[10] We will explore the applicability of such targets within ARTISTS and whether there are cross-cultural differences relating to such a target.

Proposed Descriptors

Theme1. Built Form
Theme 1.1 Buildings

Descriptors

1.1.1 Building Height (m)
1.1.2 Spacing of buildings (ratio of frontage to space between buildings)
1.1.3 Active frontages (number per 100m)
1.1.4 Doorways opening onto the public realm (number per 100m)
1.1.5 Historically important buildings or significant structures
1.1.6 Qualitative description of the built fabric

Theme 1.2 Space Between Buildings

Descriptors

1.2.1 Street Width (Distance between building lines)
1.2.2 Width of "side space"[11] (both side 'a' and side 'b')
1.2.3 Width of median
1.2.4 Width between "side space"
1.2.5 Trees and other greenery
1.2.6 Description of street surfaces and furniture and other design elements
1.2.7 Use of guard railing
1.2.8 Number and nature of "people spaces"
1.2.9 Lighting

Secondary Descriptors

1A Definition (Two Dimensional Scale)
Based on 1.1.1 and 1.2.1 but with consideration of 1.2.5
1B Definition (Enclosure)
Based on 1.1.2
1C Transparency
Based on 1.1.3 and 1.1.4
1D Street Division
Ratio of (1.2.2a : 1.2.4 : 1.2.2b)

[11] "Side space" is the area at the edge of the carriageway not used for movement of motorised vehicles. It will include the footway and constructed cycle track and parking bays etc.

Thematic Element 2. Function, Regulation and Management

From the functions assigned to the street will flow policies and design standards that shape both the layout and management of the street space, but also (over the longer term) the nature of built development along the street. In order to understand the current nature of the street, we need to understand its functional classification and resultant polices. The evolution of the streetscape needs to be "tracked" (see section 8.) against milestones in policy development. Hence within this theme we seek to describe both the current functional classification of the street (and the past policy evolution) and the street space regulation and management regime arising from that functional classification. The review frame then takes the user through a brief description of the basic design approach/philosophy applied (i.e. segregation of uses or sharing of space; reducing road risk or reducing road danger etc) before then describing the nature and types of traffic management and regulation applied. Additionally, management responsibility may be related to its classification. The degree to which management of the street (both space and buildings) is spilt between differing authorities or administrations potentially affects the ease with which the street can be managed and policy direction agreed upon (what URBED refer to as "Organisational Capacity").

Proposed Descriptors

Theme 2	**Function, Management and Regulation**	
Theme 2.1	**Functional Classification**	
Descriptors	2.1.1	Classification (description of current classification and evolution)
	2.1.2	Street design approach (description of highway design standards flowing from the classification)
	2.1.3	Land use policy (description of development related policies flowing from the classification)
Theme 2.2	**Administration/Management**	
Descriptors	2.2.1	Highway authority
	2.2.2	Planning authority
	2.2.3	Public transport planning authority
	2.2.4	Public transport operating agency
	2.2.5	Other (maintenance, cleaning, regeneration, voluntary sector agencies)
Secondary Descriptors	**2A**	**Organisational Capacity**

Theme 2.3 Regulation/Management

Descriptors

2.3.1 One-way or two-way working
2.3.2 Speed limit
2.3.3 Physical traffic calming measures used
2.3.4 Number and width of marked general traffic lanes
2.3.5 Width of lanes
2.3.2 Visual width
2.3.3 Division/allocation of carriageway space
2.3.4 Division/allocation of side space
2.3.5 Pedestrian crossings
2.3.6 Location and type of signal junction
2.3.7 Location and type of roundabout junction
2.3.8 Location and type of other junctions
2.3.9 On-street parking
2.3.10 Cycle “lanes”

Thematic Element 3. Patterns of Use

Elements or attributes of the built form, in combination with the imposed management and regulation regimes, influence the nature of activities taking place within the street. From studying the “patterns of use” or activities we gain an understanding of the current user groups and their relative size. We are also able to assess the degree to which the street is “multiuse” rather than “ single use”. We are also able to make an assessment as to the degree to which “Arterial” uses and other “Locale” activities are in conflict.

Although shown as just one heading within the review frame, “3.2.1 Street Activities and Behaviours” is intended to be a key focus of the assessment.

Proposed Descriptors

Theme 3 Patterns of Use
Theme 3.1 Arterial

Descriptors

3.1.1 Average vehicle flow
3.1.2 Peak vehicle flow
3.1.3 Flow of cyclists across the street
3.1.4 Vehicle speed
3.1.5 Traffic composition
3.1.6 Vehicle occupancy
3.1.7 Bus/tram reliability

Theme 3.2 Locale

Descriptors

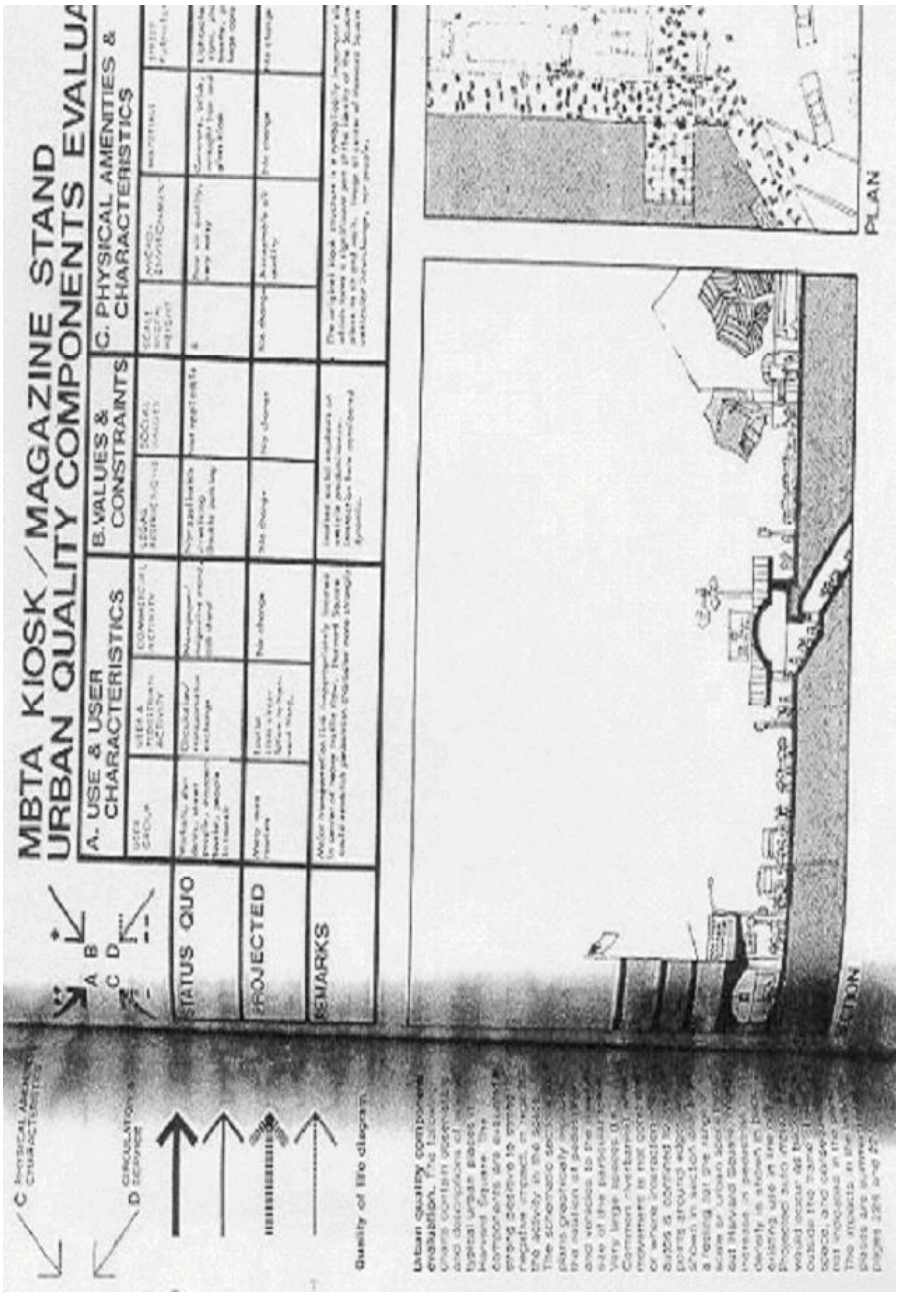
3.2.1 Street activities and behaviours
3.2.2 Pedestrian movement along the street
3.2.3 Pedestrian movement across the street
3.2.4 Predominant land use
3.2.5 Ground floor land use
3.2.6 Off-street parking
3.2.7 On-street parking and servicing

Secondary Descriptors

3A Ratio of Normal to Peak Traffic (n-h / pk-h)
3B Percentage of HGV Traffic Outside Peak Hours

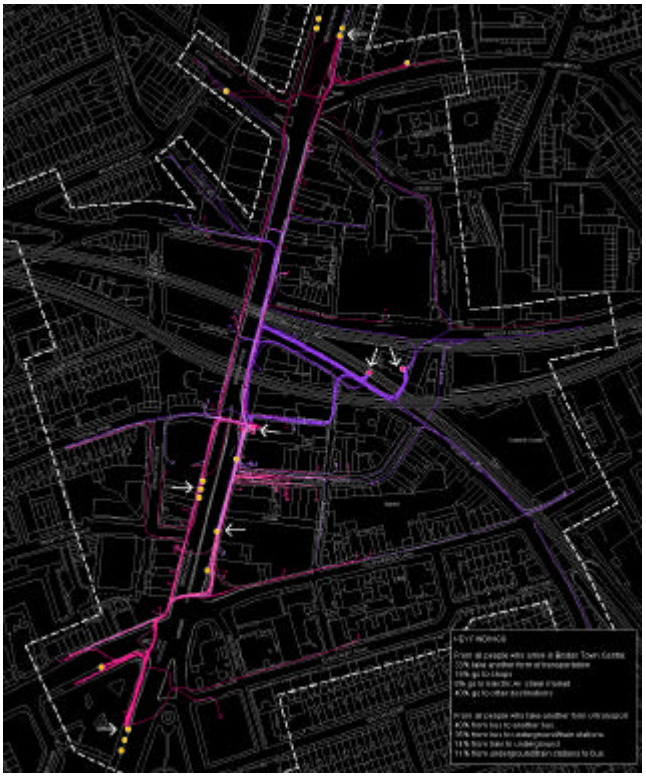
7. Data Presentation – Communicating Our Findings

7.1 If the indicators and review are to be understood by and inform user groups and politicians, then they need to summarised and presented in a clear and accessible form. The Review Frame data and indicators could be summarised/conveyed more meaningfully by being shown graphically. This can be done using GIS to produce a series of overlay maps. GIS has the benefit of holding data and hence is useful as an ongoing monitoring tool. However whilst GIS can help, it need not be relied upon as illustrated by the street review example below taken from Cutler and Cutler (1983). Below that example are a few examples of GIS presentation taken from one of the London (Brixton) case studies from a report produced by Space Syntax in 2000. These are followed by a rough sketch (along the Cutler and Cutler line) of the same Brixton location.

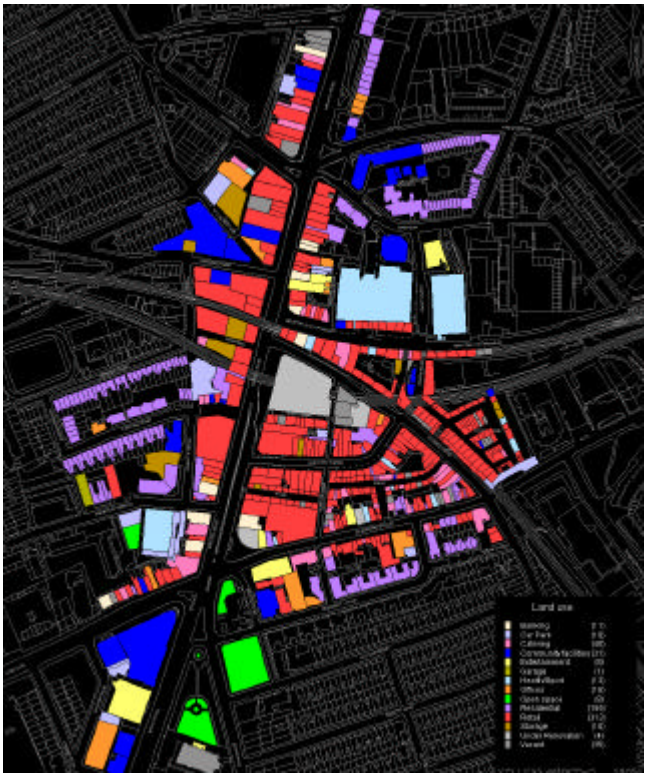


(Cutler and Cutler, 1983)

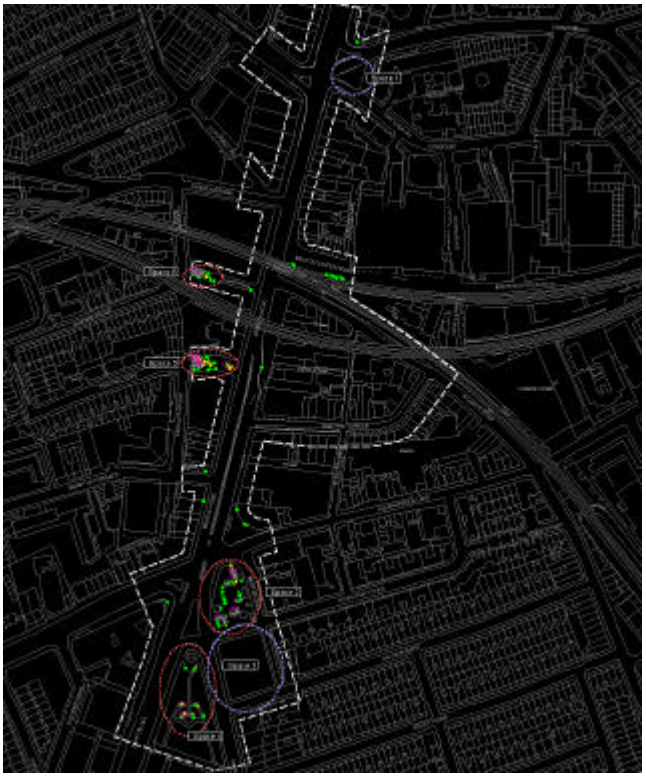
Location and Type of Standing Behaviour



Quantity and Path of Interchange Movements



Ground Floor Land Uses



Location and Type of Seated Behaviour

(Space Syntax, 2000)

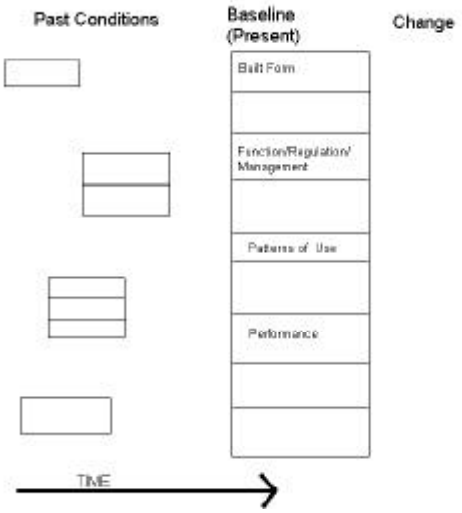
Brixton

8. Assessment of Long and Short Term Effects

8.1 Despite our reference to “changed” and “unchanged” street case studies, all of our case studies will have undergone some change (to a greater or lesser degree) over the longer term. Each will have been shaped by internal and external pressures, and changing policy and management regimes. However, data availability is likely to be patchy. In order to try and understand the long term change our example streets have undergone, it is suggested that we undertake a “timeline” appraisal where we gather what information we can on issues relating to-

- Built Form (e.g. old photos, maps etc);
- Function, Regulation and Management (e.g. old policy documents); and
- Patterns of Use (e.g. old traffic counts, public transport patronage figures)
- Performance (e.g. old accident statistics)

and then summarise milestones along a 30 year timeline leading up to our current baseline. From this timeline anticipate being able to describe to a degree changes in policy and resultant changes in built development, vehicle use etc.



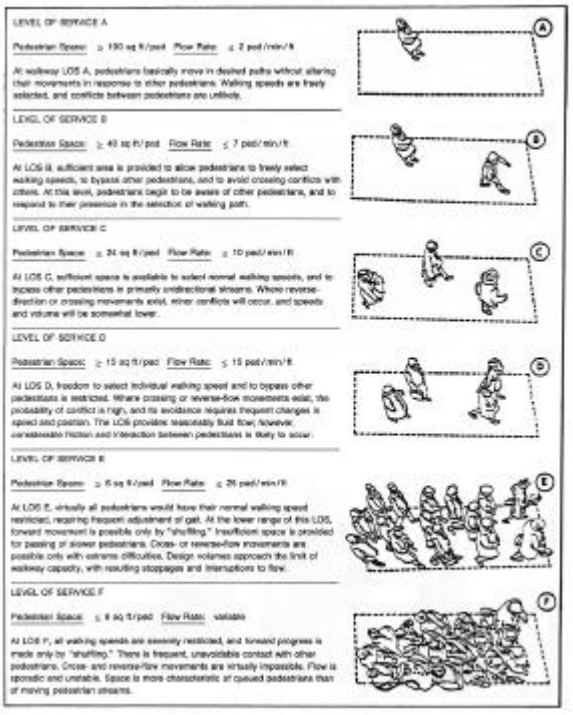
8.2 “Changed” street case studies have been selected in order to make some assessment of short to medium term change. However, whilst the proposed performance indicators and review descriptors are fairly comprehensive, they may be inadequate to assess this change. We will be flexible at each of the case study sites, making maximum use of before and after research, and any other relevant data held by the city partner. From these data we will produce further “input” indicators (financial and other resources) and specific “output” or “effect” indicators.

9. Level of Service Measures

9.1 Amongst the ARTISTS partners, there are number using a “Fruin” [12] type approach to calculate pedestrian level of service. A question still under consideration is the degree to which within ARTISTS, we look to develop and widen the concept of “level of service”. We need to consider the benefits/disbenefits of the more “simple” straight forward and transparent “Fruin” type approach compared with a more complex approach based on a longer list of street attributes and with possible weightings. The UK approach to calculating the “level of service” for cyclists (IHT, 1998) is one such example of a “complex” approach to calculating “level of service”. The proposed ARTISTS review frame is purposefully comprehensive in order that we might use the gathered descriptors for a more “complex” and comprehensive approach to the level of service concept. For example the proposed frame allows the calculation of cyclist level of service along the UK lines.

9.2 Amongst the matters still under consideration are:

- use of the simple pedestrian density approach; and
- what other attributes/descriptors should we/might we combine to give a level of service measure?



[12] See references.

level of service for pedestrians	
Quantity [pedestrian/m²]	
A	< 0,10
B	< 0,25
C	< 0,40
D	< 0,70
E	< 1,80
F	> 1,80
(HBS 2001, Germany)	

9.3 We are still considering how far we should attempt to take the concept in terms of the breadth of user groups. Our current thinking is that we should focus on the most vulnerable (e.g. people with disabilities, children). An environment that meets the needs of the most vulnerable and currently excluded, should meet the needs of all.

10. Perceptual Carrying Capacity and Compatibility of Traffic Use with Other Street Uses

10.1 The review frame contains elements taken from a methodology developed by Topp (1984) to calculate the volume of traffic on urban roads compatible with its surroundings. The method builds upon the hypotheses that:

- street users perceive traffic and its impacts in a holistic way (and consequently the assessment method seeks to reflect this); and
- certain street attributes (quality of design, trees and other greenery etc) can influence the perception of users and thus the psychologically compatible traffic volume of a street i.e. they have a "compensatory" effect.

The aim of the methodology is to define a marginal value of a street's traffic volume from which a further increase has a restrictive impact on street users. This approach can be employed within the ARTISTS project to "benchmark" example streets based on the degree to which the measured traffic flow is deviating from the calculated compatible traffic flow. The method consists of two steps:

1. a basic value (Q_{basic}) of a suitable traffic volume is derived from the demands of adjacent users based on the type and density of adjacent buildings and land uses.

2. The basic value is corrected on the basis of street attributes diverging from the average to give a value for the traffic volume compatible with the surroundings ($Q_{surroundings}$). The corrections (cQ) are assessed on the following attributes:

    - Use of the street by cyclists and pedestrians (descriptor 3A)
    - Apportioning of the street area (descriptor 1D)
    - The nature of street design, lighting and other street furniture, and the presence of trees and other greenery (descriptors 1.2.5 and 1.2.6)
    - Traffic speed (descriptor 3.1.4)
    - Daily variation in traffic volume (descriptor 3A)
    - Proportion of HGVs (descriptor 3B)

The correction added to the basic value results in the final value (vehicles per peak hour) for the compatible traffic volume. Each example street might than be benchmarked based on the ratio the calculated compatible traffic volume to measured traffic volume.

11. Initial Evaluation With Stakeholders

11.1 The review approach alone, relying on the observation and recording of behaviours activities and uses, does not adequately identify current user groups, potential user groups, nor their needs and the degree to which those needs are being met. Used alone, the approach would also accord more with "planning for the people" rather than "with the people". To address these limitations it is proposed that we link the review approach with an assessment of "benefits" and "services" and their relative importance, employing the "Quality of Life Capital approach". This approach was developed by UK agencies responsible for environmental management to provide a consistent and integrated way of managing quality of life. Originally termed Environmental Capital, further development (CAG Consultants and Land Use Consultants) has shown that the approach is equally valid for social and economic benefits. The developers of the system explain that frequently politicians, policy makers and planners face decisions that seem to set different social, economic and environmental goals. Such decisions need a fair and comprehensive method for setting out and comparing all the different plusses and minuses of potential policy or project options taking account of both expert and lay views. The QoL Capital approach is intended to provide this. It:

- "Stands back" from things or places and considers the benefits or services that they provide to users/for human well being (what matters and why?)
- Provides a consistent, systematic and transparent evaluation framework for different scales of decision making
- Integrates environmental, social and economic issues

- Emphasises improvement of quality of life rather than acceptance of the status quo

- Values the common place as well as the unusual and rare

- Facilitates participation, putting the professional/expert judgements alongside the concerns of local people

(CAG and Land Use Consultants, 2001)

11.2 The core idea is that the environment, the economy and society provide a range of benefits for human life, and it is these benefits or services that need to be protected or enhanced. Both the terms "benefit" and "service" are used by the developers of the approach because they feel neither captures the meaning perfectly on its own.

The first stage in the application of the process would be –

A) **Identifying what is there** – undertaken via the review process

Following stages would be –

B) **Benefits and services** – The question is asked what are the benefits and services provided.

C) **Evaluation** – This examines the services systematically, using a series of questions:

- **Who the services matter to (i.e. the user groups), why and at what spatial scale** (e.g. distribution of longer distance traffic at a national or regional level, meeting place or play space at the local level).
- **How important are they**, which is distinct from the above question: a service that matters at the city or regional level is not necessarily more important than one that matters locally.
- **Whether we have enough of them** – it is more important to maintain services which are in short supply (or in danger of becoming so) than ones that are plentiful. Where we currently do not have enough, the aim should be to increase
- **What if anything could make up for any loss or damage to the service** – for example other places local people could go equally readily for the same types of recreation.

D) **Policy/management implications**. From the evaluation, this step draws messages about the policies that would be needed to ensure that the social, economic and environmental benefits are maintained or enhanced. This would enable us and stakeholders to propose change at our implementation case study streets.

E) **Monitoring**The benefits and services identified as important in the process are for this very reason, the aspects of the environment which should be monitored. Hence the process would reshape the Review Frame and the Performance Indicator Set as more locally tailored monitoring tools and act as the basis of the development of a more refined assessment tool. We have so far formed the view that some form of assessment tool based on multicriteria analysis rather than cost benefit analysis is needed.

12. Concluding Discussion

12.1We conclude at appendix 2, that assessment of progress towards sustainable development should be based on the first following steps:

? *Guiding vision and goals :*

> clear vision of sustainable development at the study case level.

? *Holistic perspective :*

> inclusion of a review of the whole system as well as its parts ;
> consideration of the well-being of social, ecological and economic sub-systems ;
> consideration both of positive and negative consequences of human activities.

? *Adequate scope :*

> to adopt a time horizon long enough to capture both human and (eco)system time scales, thus responding to needs of future generations as well as those current to short-term decision making.

? *Practical focus :*

The assessment should be based on :

> an explicit set of categories or an organising framework that links visions and goals to indicators and assessment criteria ;
> a limited number of key issues for analysis.

These are reflected within the approaches outlined in this paper. The core approach is one of measuring street performance based on a short set of readily collectable indicators and looking behind these indicators in detail at the street attributes influencing that performance. Both indicators and street attribute descriptors will inform the assessment of “benefits” and “services” and services to be undertaken with stakeholders refining our indicators and a further assessment tool.

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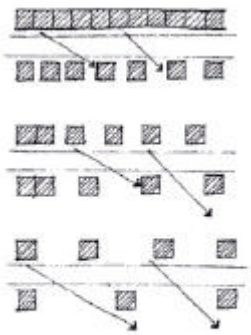
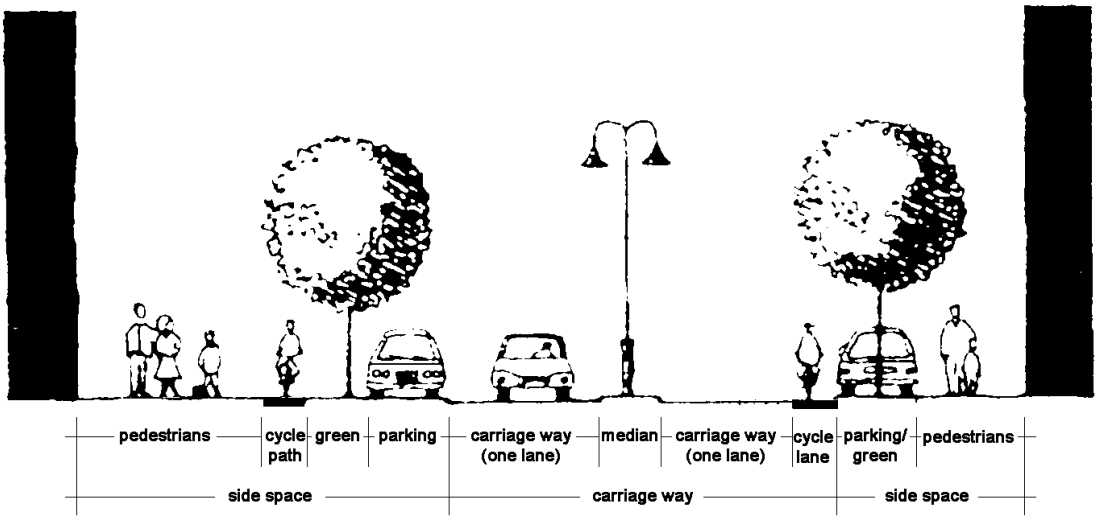
Appendix 1. Proposed Review Frame

Theme 1. **Built Form**

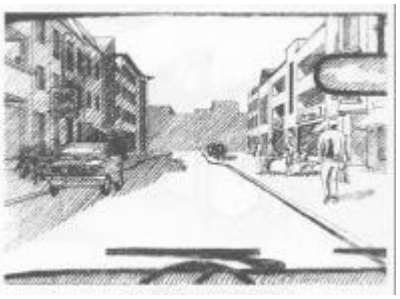
Theme1.1 **Buildings**

Primary Descriptors	Measurement and or Comment	Change	Guidance/Advice on conducting review
1.1.1 Building Height	Average height of roofline within character area (m)……..	…….. ……..	
1.1.2 Spacing of Buildings	Ratio of frontage to space between frontages …… …… ……	…….. ……..	 Greater horizontal spacing and less definition
1.1.3 Active Frontages	Number of buildings per 100m with activities behind windows facing onto the street …… …. …… ….	…….. ……..	Show location on plan
1.1.4 Doorways	Number of doorways per 100m opening onto the public realm …… …… ….	…….. ……..	Show location on plan
1.1.5 Historically important buildings or significant structures	Describe …….. …….. ……..	…….. ……..	Are there historical important sites / buildings / structures in the street? What? How many? Do these historical sites attract attention or add to legibility. Show location on plan
1.1.6 Quality of Built Fabric	Describe …….. …… …	…….. ……..	Describe state of repair, quality of design, building complementarity etc

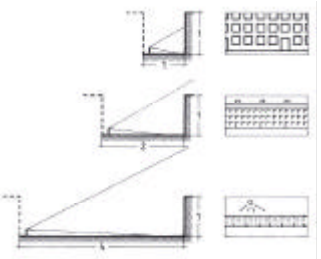


Theme 1.2 **Space Between Buildings**

Primary Descriptors	Measurement and or Comment	Trend (Increasing/decreasing etc)	Guidance/Advice on conducting review
1.2.1 Street Width	Distance between opposing building lines within character area (m)	…….. ……..	
1.2.2 Side Space Width	Width of side space on one side (a).....m and other side (b) .....m.	…….. ……..	
1.2.3 Median Strip	Width .... m and description eg does it aid pedestrians crossing or act as a barrier	…….. ……..	
1.2.4 Width Between Side Space	Width .... m	…….. ……..	
1.2.5 Trees and Other Greenery	☐ Green shapes the street space and is an important formative element, unmistakable of the street ☐ Green has an influence on the street space / Green outweighs over technical installations. ☐ Green does not shape the street space / Green and other installations cancel each other ☐ Green has no influence on the street space / Green	…….. ……... …… …… ……	 Green has an influence on the street space

	sporadic exist ☐ There is no Green …… …… …… Show locations on plan illustrate with photographs		 Green has no influence on the street space
1.2.6 Street surfaces, furniture and other design elements	What materials are used – ☐ *asphalt* ☐ *paving stone* ☐ *concrete* ☐ *cobblestone pavement* ☐ _____*?* *How well maintained are they. What impression do they give?* How might it be influencing, noise levels, walkability, access for people with disabilities etc.	…….. ……... …… …… ……	Illustrate with photographs
1.2.7 Guard Railing	Where is it used? ……... …… How many metres in total?… Why is it there?……	…….. ……... …… ……	Show locations on plan. Illustrate with photographs.
1.2.8 “People Spaces”	Describe places provide for people to congregate, sit etc. *Are they green?* ☐ yes ☐ no	…….. ……... …… ……	Show locations on plan. Illustrate with photographs.

1.2.9 Lighting	Describe the lighting eg ☐ the places are very well light, illumination is part of design of the place ☐ places are light ☐ no light (the places are places of fear) ☐ the footpaths are well lit ☐ the footpaths are poorly lit ☐ only one side lit ☐ the lighting is at the median ☐ no lighting of the footpaths colour of light …… aesthetically pleasing? ☐ yes ☐ no	…….. ……... …… ……	Illustrate with photographs

Secondary Descriptors			
1A Definition (Two Dimensional Scale)	Based on 1.1.1 and 1.2.1 and with consideration of 1.2.5 describe street definition both as a ratio of street width to building height and sense of definition …… ……..	…….. ……... …… …… ……	
1B Definition (Enclosure)	Based on 1.2.2 along with 1A, describe degree and sense of enclosure/canyon effect.	…….. ……... ……	Illustrate with photographs
1C Transparency	Based on 1.1.3 and 1.1.4, describe level of transparency between public and private realm at the meeting of the vertical and horizontal planes	…….. ……... ……	Illustrate with photographs

Theme 2.	**Function, Management and Regulation**		
Theme 2.1	**Functional Classification**		
Primary Descriptors	**Measurement and or Comment**	**Change**	**Guidance/Advice on conducting review**
2.1.1 Classification	Describe the streets current classification, its position within the street/road hierarchy and assigned functions.	…….. …….. …….. …….. ……..	
2.1.2 Street Design Approach	Describe the “highway” design standards and design philosophy flowing from the current classification…….	…….. …….. …….. ……..	
2.1.3 Land Use Policies	Describe the land use policies flowing from the classification.	…….. …….. ……..	For example, is direct vehicle access allowed from the street into new development?

Theme 2.2 *Administration/Management*

Primary Descriptors	**Measurement and or Comment**	**Change**	**Guidance/Advice on conducting review**
2.2.1 Highway Authority	Describe Highway Authority and its duties/responsibilities	…….. ……...	
2.2.2 Planning Authority	Describe the Planning Authority and its duties/responsibilities	…….. ……... ……	"Planning Authority" is the body for land use planning and development control.
2.2.3 Public Transport Planning Authority	Describe the Public Transport Planning Authority and what responsibilities it has in relation to the street	…….. ……... ……	Does the PT authority have responsibility for the provision of bus/tram stops and shelters etc
2.2.4 Public Transport Operating Agency	Describe the Public Transport Operating Agency and what responsibilities it has in relation to the street	…….. ……... ……	May or may not be different to 2.2.3
2.2.5 Other Agencies	Describe any other organisations or agencies with a responsibility towards or interest in the street environment	…….. ……... ……	
Secondary Descriptors			
2A Organisational Capacity	Describe the ease with which 2.2.1 to 2.2.5 can work together towards shared objectives	…….. ……... ……	

Theme 2.3	**Regulation/Management**		
Primary Descriptors	**Measurement and or Comment**	**Change**	**Guidance/Advice on conducting review**
2.3.1 One-Way or Two-Way Working	One-way or two-way? ……	…….. ……... ……	
2.3.3 Traffic Calming Measures	Is traffic “calmed”? ☐ yes ☐ no *If so describe how……..* ……..	…….. ……... ……	
2.3.4 Number of Marked Traffic Lanes	Number of lanes per carriageway ……	…….. ……... ……	
2.3.5 Lane Width	Width of lanes ……..m	…….. ……... ……	
2.3.6 Visual Width	Visual width of carriageway or lanes ……m	…….. ……... ……	The visual width may be reduced below the physical width by changes in the surface materials etc
2.3.7 Division/ Allocation of Carriageway Space	*Describe segregation of carriageway* **bus / tram** ☐ separate ☐ in mix width:_____ **bicycles** ☐ separate ☐ in mix width:_____ **pedestrians** ☐ separate ☐ in mix width:_____ **HOV / taxis etc** ☐ separate ☐ in mix width:_____	…….. ……... ……	

2.3.8 Division/ Allocation of Side Space	Describe division of side space- ☐ pedestrians: _____m ☐ bicycles: _____m ☐ green: _____m ☐ parking: _____m ☐ bus/tram: _____m ☐ waiting places: _____m ☐ _____: _____m	…….. ……... ……	
2.3.9 Pedestrian Crossings	Describe pedestrian crossing points - ☐ everywhere possible to cross ☐ to cross the street only at some points possible number of crossings per 500m: _____ ☐ no possibility to cross ☐ Number/location of signal lights at pedestrian crossings: ☐ Number of marked pedestrian crossings (e.g. zebra crossing) ☐ Number of built pedestrian crossings ☐ Number of over-/ underpasses ☐ ”Staggered” or straight across crossing	…….. ……... ……	Show location on plan and illustrate with photographs
2.3.10 Signal Junctions	Describe each signal junction pedestrian phase provided? ☐ no ☐ yes “all green” pedestrian phase provided? ☐ no ☐ yes diagonal crossing provided? ☐ no ☐ yes cyclists catered for? ☐ no ☐ yes how?…… *priority/timing for pedestrians relative to vehicles……*	…….. ……... ……	Show locations on plan. Illustrate with pictures.

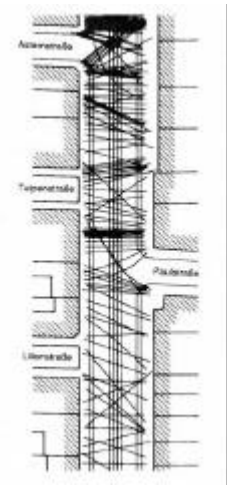
2.3.11 Roundabout Junctions	*Describe any roundabout junctions and whether cyclist and pedestrians are catered for and how……..* …….. ……..	…….. ……... ……	Show locations on plan. Illustrate with pictures.
2.3.12 Other Junctions	Describe any other junctions	……	
2.3.13 On-Street Parking	Describe number and types of parking and servicing bays etc Times of operation? …….. Permitted length of stay? …. Type (eg residents)?…….. Shared use? ☐ no ☐ yes Charge? …….Euros Quality of enforcement? …… ……	…….. ……... ……	Show locations on plan
2.3.14 Cycle "Lanes"	For each side of street describe the type of cycle provision eg – ☐ none ☐ path/lane for both directions ☐ on road bicycle lane ☐ bicycle path on the sidewalk ☐ bicycle path in the side space ☐ with support at crossings ☐ _____	…….. ……... ……	Show locations on plan. Illustrate with pictures.
2.3.15 Cycle Parking	What is the number of formal cycle parking places? …….	…….. ……... ……	Show locations on plan. Illustrate with pictures.

2.3.16 Bus Stops and Stands	Describe number and location of bus stops and stands Marked spaces? ☐ yes ☐ no Parking prohibited? ☐ yes ☐ no Times of operation? ……. Shelter provided? ☐ yes ☐ no	…….. ……... ……	Show locations on plan

Theme 3 *Patterns of Use*

Theme 3.1 *Traffic*

Primary Descriptors	**Measurement and or Comment**	**Change**	**Guidance/Advice on conducting review**
3.1.1 Average Vehicle Flow	Provide the Average Daily (12 hour) Traffic flow disaggregated by vehicle type and with estimated occupancy rates.	…….. ……... ……	Vehicle types – Car/van Van/truck >3.5T Bus Tram Cycle Motorcycle/Moped
3.1.2 Peak Vehicle Flow	Provide the Peak Hour traffic flow disaggregated by vehicle type and with estimated occupancy rates.	…….. ……... ……	Vehicle types as above
3.1.3 Flow of Cyclists Across the Street	Peak hour flow of cyclists across the street/character area.	…….. ……... ……	
3.1.4 Vehicle Speed	Provide V85 …….km/h	…… ……	
3.1.5 Traffic Composition		…… ……	
3.1.6 Vehicle Occupancy		…… ……	
3.1.7 Bus/Tram Reliability		…… ……	

Theme 3.2	**Activities**		
Primary Descriptors	**Measurement and or Comment**	**Change**	**Guidance/Advice on conducting review**
3.2.1 Street Activities and Behaviours	All street activities (moving, standing, sitting) should be observed, counted, recorded and displayed visually)	…….. ……... ……	A separate detailed note will be provided giving guidance on observation and measurement. Children playing in street should be included
3.2.2 Pedestrians Along the Street	Provide peak hour pedestrian flow along the character area	…….. ……... ……	
3.2.3 Pedestrians Across the Street	Provide peak hour pedestrian flow across the character area showing routes taken	…….. ……... ……	
3.2.4 Predominant Land Use	Code each building based on its main use – Business Industrial Retail Public service Residential and show on plan Describe quantity and density of each land use type	…….. ……... ……	**Retail** use should be subdivided into *Convenience*- Food stores such as supermarkets, butchers, bakers *Comparison*- clothes, household goods, furniture

3.2.5 Ground Floor Use	Code each building based on its main use – Business Industrial Retail Public service Residential and show on plan	…….. ……... ……	*Durables*- Department stores, variety stores, retail warehouses *Services*- Restaurants, bars, cafes, street cafes (with seating outside), hairdressers, banks Markets- Open air market held on street *Shopping* centre – Shopping centre or enclosed market **Public Service** should be subdivided into – *Education* *Culture* *Health* *Administration* *Sport*
3.2.6 Off-Street Parking	Show location, type, (eg public, residential, business) and quantity of off-street parking.	…….. ……... ……	
3.2.7 Residential Population	From population census provide at appropriate geographical scale population figure disaggregated by age, sex, ethnicity, car ownership, employment status, income	…….. ……... ……	
3.2.8 Working Population	From census of employment (if available) provide at appropriate geographical scale number of people employed in and around the street/ character area	…….. ……... ……	
Secondary Descriptors			
3A Ratio of normal to peak traffic	Give ratio of normal to peak hour traffic volume __ : __	…….. ……... ……	
3B Percentage of HGVs Outside Peak	Express proportion of heavy goods vehicles (>3.5T) as a percentage of total vehicle flow outside of the peak hours.	…….. ……... ……	

Appendix 2 Additional Consideration of Sustainability and Indicators