Kambites, Carol J and Johnson, Phil and Lewis, Nick and Owen, Stephen and Short, Christopher J (2006). *Green Infrastructure Planning in the Swindon Urban-Rural Fringe - Final Report to the Great Western Community Forest.* **Project Report. Countryside and Community Research Unit (CCRI), University of Gloucestershire.**

Green Infrastructure Planning in the Swindon Urban-Rural Fringe

Final report to the Great Western Community Forest

March 2006

Carol Kambites
Phil Johnson
Nick Lewis
Stephen Owen
Christopher Short

Countryside & Community Research Unit
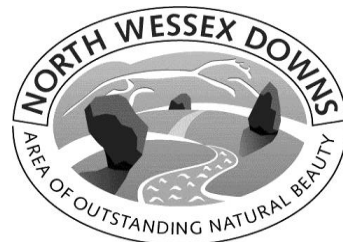**University of Gloucestershire**

Table of Contents

Acknowledgments

1: The context for the study

This project was initiated by the Great Western Community Forest (GWCF) in response to issues raised and proposed actions identified in the Urban Fringe Action Plan for Southern Swindon.

The clients wished to explore the application of Green Infrastructure Planning as a contributor to the broader process of planning for new development on the southern fringes of Swindon. The development of a planned approach to Green Infrastructure is becoming central to the pursuit of sustainable development objectives. However, Green Infrastructure Planning (GIP) is not fully established as a 'normal' component of broader planning processes, and a deeper understanding of the concept is essential.

One of the key purposes of the project, therefore, was to develop a fuller understanding of the concept and practice of Green Infrastructure Planning (GIP) and to assess the benefits that such an approach could provide during the southward and eastward expansion of Swindon. To this end it was necessary to examine literature and other resources on GIP and to evaluate the success or otherwise of GIP practice elsewhere in the UK.

Because the concept of GIP is relatively new, it is useful to adopt at the outset a definition of 'Green Infrastructure'. Precise definitions are notoriously difficult, so a pragmatic approach is taken here, adopting the definition used by both the East Midlands Green Infrastructure Scoping Study and the Green Infrastructure Guide for Milton Keynes and the South Midlands: *Green Infrastructure is a network of multi-functional greenspace provided across the defined area. It is set within, and contributes to, a high quality natural and built environment and is required to deliver 'liveability' for existing and new communities.* Reference in this definition to 'the defined area' makes it important to emphasise that the area under consideration could range in scale from the individual site through the whole territory of the local authority to that of the sub-region.

More difficult, though, is a precise definition of Green Infrastructure Planning, because this is a much more complex concept that brings into play co-ordination with other, broader planning initiatives, political decision-making, trade-offs between different interests, financial considerations and matters to do with implementation. The project did not attempt such a definition at the outset, but a working definition evolved as the project progressed.

It should be emphasised that this project was concerned with Green Infrastructure *Planning*, not just Green Infrastructure *Mapping*. The process of mapping Green Infrastructure could be construed as a relatively straightforward technical activity and much of the work on GIP to date has focused on this process, including the use of Geographic Information Systems. The development of a fuller GIP process that enables proper consideration of Green

Infrastructure alongside all the other considerations in complex decision-making processes including community involvement was the more difficult challenge of this project.

2. The organisation of the study

The refined **Aim** of the project was to put forward a generic Green Infrastructure Planning process that could be adapted to different circumstances and to suggest how it might be applied in the Swindon urban-rural fringe.

The **Objectives**, which drove the research process were to:
1. examine the concept and practice of Green Infrastructure Planning with reference to published and other sources and recent practice;

2. identify different approaches to Green Infrastructure Planning in different parts of the UK and evaluate the potential benefits of the different methodologies adopted;

3. explore with the local planning authority(ies) the means by which Green Infrastructure Planning can make a constructive contribution to formal and informal spatial planning processes;

4. recommend a process that could be adopted by the Great Western Community Forest together with appropriate partners, including the local planning authorities, for Green Infrastructure Planning within the broader process of planning for the Swindon urban-rural fringe.

To achieve these aims and objectives within a restricted time period, the research process needed to be as straightforward as possible and it comprised a series of self-contained **Tasks**, which overlapped with each other.

Task 1. Undertake an Internet search of references to GIP but also to related practice under the umbrella title of Strategic Landscape Planning. Distinguish between UK and non-UK references and omit those not considered relevant to UK practice. Produce a digest that identifies key points relating to e.g. scope of subject matter, sequence of process, methodologies, implementation of GIP, together with a critical commentary.

Task 2. Identify examples of GIP that have been proposed/implemented in practice recently in the UK. Collect relevant documentation, analyse significant points relating to methodologies and identify key players. Where feasible undertake evaluative telephone discussions with key players concerning methodologies and techniques used. Produce a digest highlighting key points that can be fed into the development of a process.

Task 3. Pull together digests from Tasks 1 and 2 to produce an interim evaluative report on generic matters relating to GIP methodologies, including the identification of critical success factors.

Task 4. Examine reports specifically relevant to the Swindon urban-rural fringe, such as the Urban Fringe Action Plan, existing Local Plans, any extant Structure Plan, preparatory work for the Regional Spatial Strategy and supplementary planning guidance. Produce a digest of key points relating to planning policies for development, access, recreation, conservation etc.

Task 5. Visit Swindon urban-rural fringe to make on-site assessments of issues relevant to a GIP approach. Produce an annotated list of points.

Task 6. Produce an annotated inventory of relevant information currently or potentially available that would inform the implementation of GIP in the Swindon urban-rural fringe. Assess the accessibility and 'useability' of this information.

Task 7. Meet with, and subsequently liaise with, local authority planners, and representatives of the AONB, to discuss their appreciation of GIP and their willingness to consider it as a component of statutory and informal spatial planning. Produce a brief report reflecting on the issues raised.

Task 8. Pull together digests from Tasks 4 - 7 and produce an interim evaluative report on geographically specific matters relating to the local context in which GIP would be implemented, highlighting opportunities and potential difficulties.

Task 9. Using the internal reports from Tasks 3 and 8, match the specific situation in the Swindon urban-rural fringe with the critical success factors in GIP methodologies and design a draft process (where appropriate, including alternative elements of the process) for use in Swindon.

Task 10. Conduct a focused meeting with selected stakeholders (to include local authority planners amongst others) to test the amended process and adapt it further in the light of the comments received.

Task 11. Write a draft final report and make final amendments in response to comments made by the client.

Task 12. Run a seminar to present the findings of research.

The project was completed on 24 March 2006.

3: Functions and Benefits of Green Infrastructure

Before developing a process for GIP, it is helpful to consider how GI will be used and what benefits it will bring to both the ecology and the inhabitants of the area. Land use pressures faced in the UK make it important that most green spaces and green corridors, particularly in residential areas, are multifunctional and perform both ecological and social functions. Exceptions to this could be habitats for very shy or vulnerable species and formal playing fields. Table 1 below summarises the functions and benefits of GI based on a review of literature and examples of recent and current practice.

Functions	Benefits
1.Exercise, sport, recreation and quiet contemplation	Improved health and mental well-being
2. Educational and training resource	Appreciation of natural world for children Provide training in habitat maintenance, including traditional crafts such as coppicing.
3. Community involvement in protection, creation, maintenance and use of green spaces.	Improved sense of community for residents Smoother integration of old and new communities Reduced crime and anti-social behaviour due to community 'ownership'
4. Green routes for people and wildlife	Increased levels of sustainable travel and exercise Prevention of habitat fragmentation
5. Provision of natural drainage	Reduced risk of flooding
6. Improvements to water and air quality, local climate control and noise mitigation	Improved local environment for people and wildlife Personal health benefits to residents
7. Habitat provision	Maintenance and enhancement of biodiversity. Increased quality of life for residents arising from interaction with flora and fauna
8. Landscape protection and enhancement	Creation of an aesthetically pleasing environment Increased tourism and attraction of businesses and skilled workers
9. Protection of local heritage	Increased sense of identity which can also be a focus for tourism
10. Creation of a distinct urban identity	
11. Links between town and country	Improved image of the town Increased interaction of urban residents with rural areas
12. Encouragement of employers to locate in pleasant area	Provision of employment and strengthened local economy

Table 1: Functions and benefits of green infrastructure

It is apparent that functions 4 and 11 in Table 1 in particular require green 'corridors' linking green 'hubs' and forming a network of linked, rather than isolated, green space. Green infrastructure also needs to be flexible enough to respond to changing needs on a number of levels from the global (e.g. climate change) to the local (e.g. local demographic characteristics) and through time.

Again, it is important to note that these functions and benefits occur at a range of scales from the very local through to the sub-regional.

4. Principles of Green Infrastructure Planning

From the review of literature, green infrastructure planning appears to be grounded in certain consistent principles and it is necessary to establish these before looking at process. In the UK and the US literature numerous principles are proposed in relation to Green Infrastructure. US principles tend to have a primarily ecological focus, whereas UK ones are more socially based. However, they are not inherently contradictory and Figure 1 below attempts to combine the two approaches into a unitary set of consistent principles, addressing both the ecological and the social functions of green infrastructure.

Ten Principles of Green Infrastructure Planning

1. Comprehensive planning –GI should ideally be planned in advance of, or concurrently with, the built environment. Long-term maintenance should also be considered.
2. Information collation – Extensive information collection relating to ecological, historical, social, and visual matters should be undertaken to guide GI development.
3. Holistic approach – The development should be considered as a whole, on a number of different levels and scales including:
    a. Geographically – each individual area of green space (or hub) will be linked via a network of 'corridors'. Hubs and corridors should be considered collectively
    b. Politically – all relevant local authorities should work together to create a unified vision that can overlap administrative boundaries. Neighbouring communities (including interest groups and minority groups) should also be engaged
    c. Functionality – the resulting GI should be multifunctional, benefiting both people and wildlife, and allow easy installation of 'grey' infrastructure (roads, lighting, electrical cables, sewerage etc).
4. Linkage – Links between natural areas and features, and between people and programmes should be created.
5. Community involvement – Interest groups, stakeholders and others such as minority and disadvantaged groups should be involved as this will ensure that development has a degree of ownership for those living within the surrounding area.
6. Recreational needs – The development should meet residents' needs for recreational opportunities and green routes/corridors.
7. Preservation and conservation – Where possible the development should protect, restore and create habitats and ensure that all designated sites (ecological, landscape, historical etc) are conserved.
8. Respect for the site – By using and incorporating existing characteristics and features the development will exhibit a greater degree of diversity and identity.
9. Local distinctiveness – Local character and distinctiveness should be identified, enhanced and protected wherever possible.
10. Sustainable funding – Financial support for the development of GI should be sourced at an early stage and particular attention should be paid to longer-term issues such as maintenance and improvement.
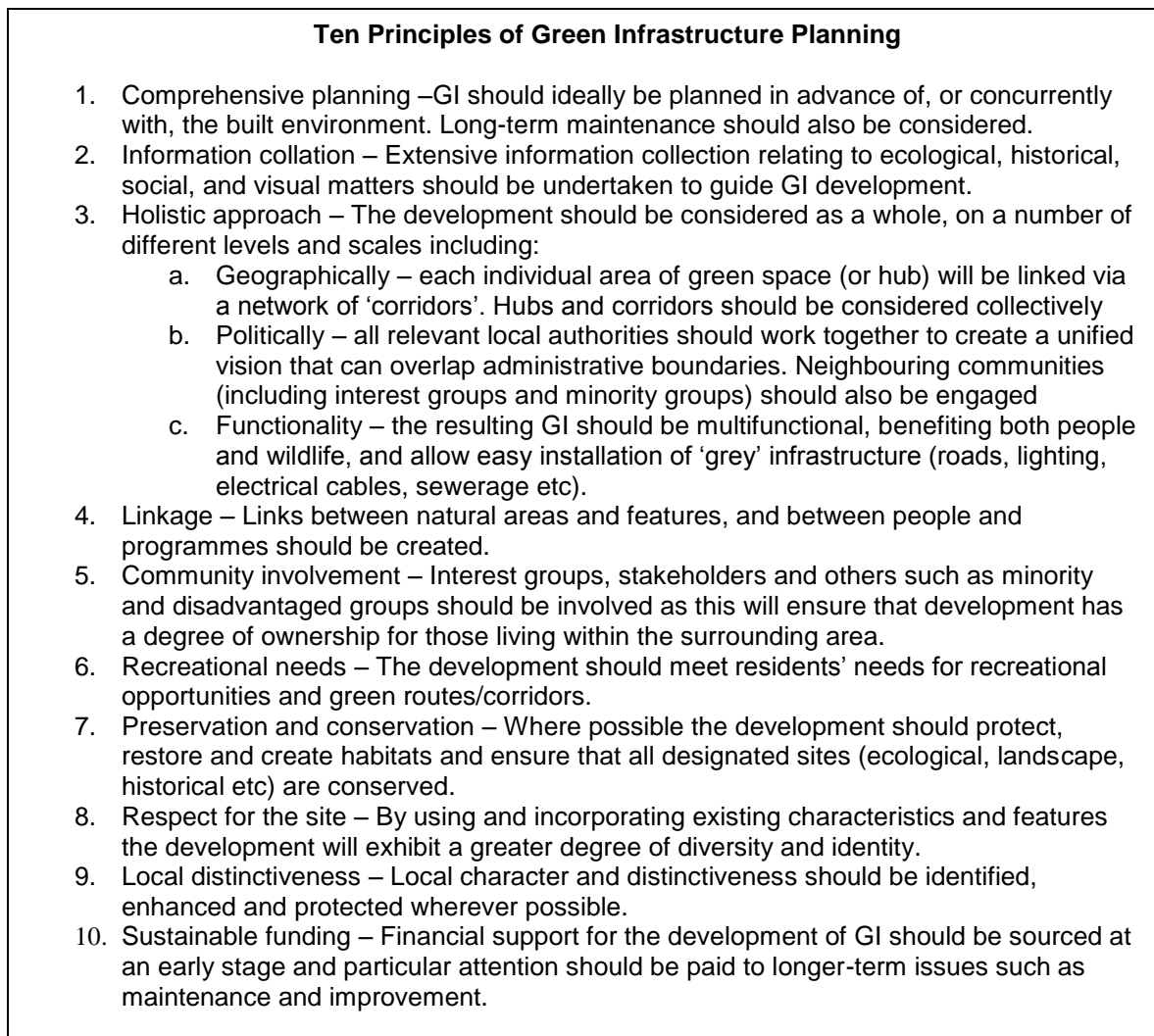

Figure 1: 10 Principles of Green Infrastructure Planning

Connectivity

One of the most important attributes of green infrastructure planning is the notion of *connectivity*. In this respect, connectivity takes a number of forms. Five different forms are discussed in outline here as examples.

First, there should be *spatial connectivity* within green infrastructure. Here we are referring to the need for linear connections that allow movement through, indeed, throughout green infrastructure: corridors along which wildlife moves, along which plant species extend, and along which people move for exercise, access and enjoyment.[1] To secure optimum connectivity in this respect, green infrastructure most appropriately takes the form of continuously connected networks extending over local, and sometimes sub-regional, areas.

Second, the potential connectivity between different *components of green infrastructure* – for example, the interaction between people, wildlife and plants, needs to be considered as part of green infrastructure planning. Sometimes it will be possible to secure benefits to the mutual advantage of different components - for example through increased investment in habitat management as part of a conservation strategy. Sometimes, though, it will be necessary to keep different components separate to prevent conflict - for example through diverting human use away from certain areas to ensure the protection of vulnerable species under pressure from increased recreational use. Considering this form of connectivity is an essential part of trying to ensure that green infrastructure fulfils multifunctional purposes.

Third, and again relating to the concept of multifunctionality, there should be *connectivity between different human interests in the use of green infrastructure*, whether these be the interests of, for example, residents, visitors, workers or landowners. These interests sometimes will coincide or overlap and sometimes they will be in conflict. They need, therefore, to be considered together and with significant levels of involvement by these various stakeholders at all appropriate stages in the process.

Fourth, and related to the first of these forms of connectivity, there should be *administrative connectivity*. The linear movement of wildlife, plants and people does not recognise administrative boundaries; it can extend from the centre of a town through its suburbs, across the urban-rural fringe and out into the open countryside, crossing a number of local authority boundaries along the way. To deal adequately with green infrastructure it is essential that GIP should involve operational connections between different administrative organisations,

---

[1] It should be noted, however, that some linear features of green infrastructure, such as rivers and streams, can act as barriers to movement rather than as corridors.

particularly neighbouring local authorities. In effect, therefore, this demands a partnership approach to green infrastructure planning.

Fifth, there should be *connectivity between different professions and between different parts of the organisational structures of local* authorities with responsibility for addressing green infrastructure planning. The 'silo mentality' whereby, for example, different departments of a local authority (and this approach characterises other types of agency as well) work separately from each other – and occasionally in conflict with each other - is inimical to the nature of green infrastructure planning. The highest level of co-operation and co-ordination between departments is essential to deliver the benefits that green infrastructure planning can confer.

Clearly, this tendency towards greater connectivity – or integration – is reflected in many, if not most, contemporary policy initiatives. It is not specific to green infrastructure planning. However, the argument here is that the notion of connectivity is an inherent characteristic of green infrastructure and should characterise all stages of green infrastructure planning processes.

5. An evaluation of Green Infrastructure Planning processes

The creation of processes for GIP does not appear to have been comprehensively addressed in the UK. English Nature (undated) has developed a seven-stage process and the Environment Agency (2005) have produced a strategic framework and delivery programme for GIP. Of the examples of GIP implementation in the UK, the case of Peterborough is most useful as it concerns its integration into the planning of extensions to an existing settlement. These three approaches are considered and compared below. We then look at the development of Warrington New Town in the 1970s and 1980s to provide more detail of the implementation of an early GIP process.

a) English Nature
The English Nature seven-stage process consists of four broad steps:
- Inception
- Assessment
- Analysis
- Response

The seven stages are:
Stage 1 – Inception – (Inception)
  o Team established; information sources identified; resources allocated; scope of project set and progress indicators determined

Stage 2 – Inventory of candidate sites – (Assessment)

Stage 3 – Inventory of natural sites – (Assessment)
Stage 4 – Inventory of accessible natural green space – (Assessment)
- o Data gathered; green space and its status identified

Stage 5 – Map of provision – (Analysis)
Stage 6 – Map of deficient areas – (Analysis)
- o Establish spatial pattern of accessible green space and catchment zone; establish those areas lacking in provision

Stage 7 – Response – (Response)
- o Set priorities for policy and management action to address analysis issues

The English Nature approach is represented diagrammatically in Figure 2 below:

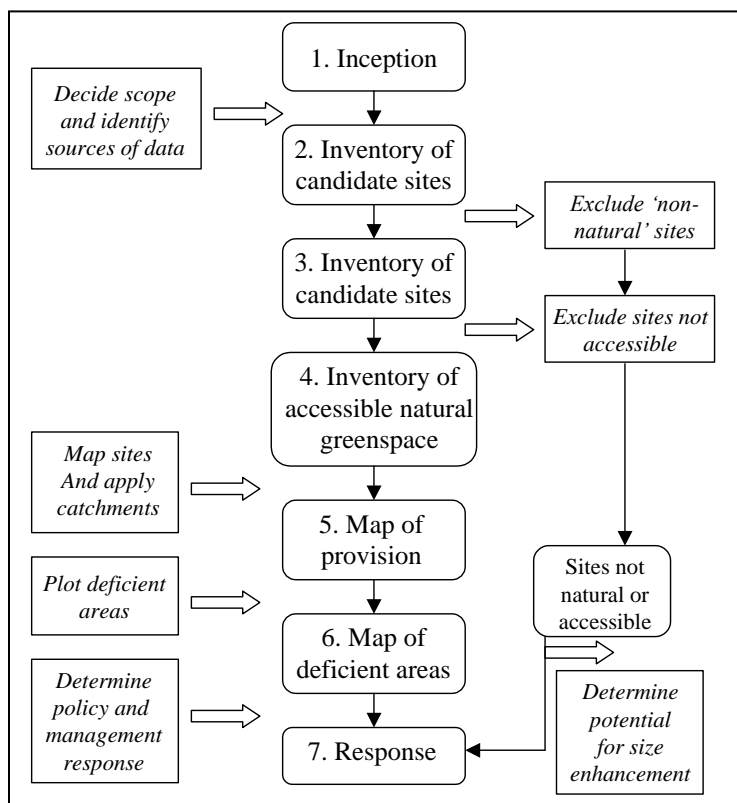Figure 2: English Nature Green space Implementation Process

The English Nature approach is useful in that it provides a basic four-step framework to structure the GIP process, stressing the necessity for initially identifying a 'team' or partnership to guide the process and sources of information and of funding; secondly, gathering data; thirdly, mapping and analyzing the data; and lastly setting priorities for action.

However, there are limitations to the suitability of the data proposed by English Nature for the purposes of the present project. Firstly, it is geared towards improving the green infrastructure of an *existing* development, and secondly, it is not specific about the final 'response' stage. In addition, it makes no reference to the involvement of local communities or the integration of green infrastructure planning into the statutory planning system.

b) Environment Agency
The Environment Agency's framework and delivery programme stresses that 'integration with the planning system is essential to deliver GI' (Environment Agency, 2005). This approach is shown in Figure 3 below:
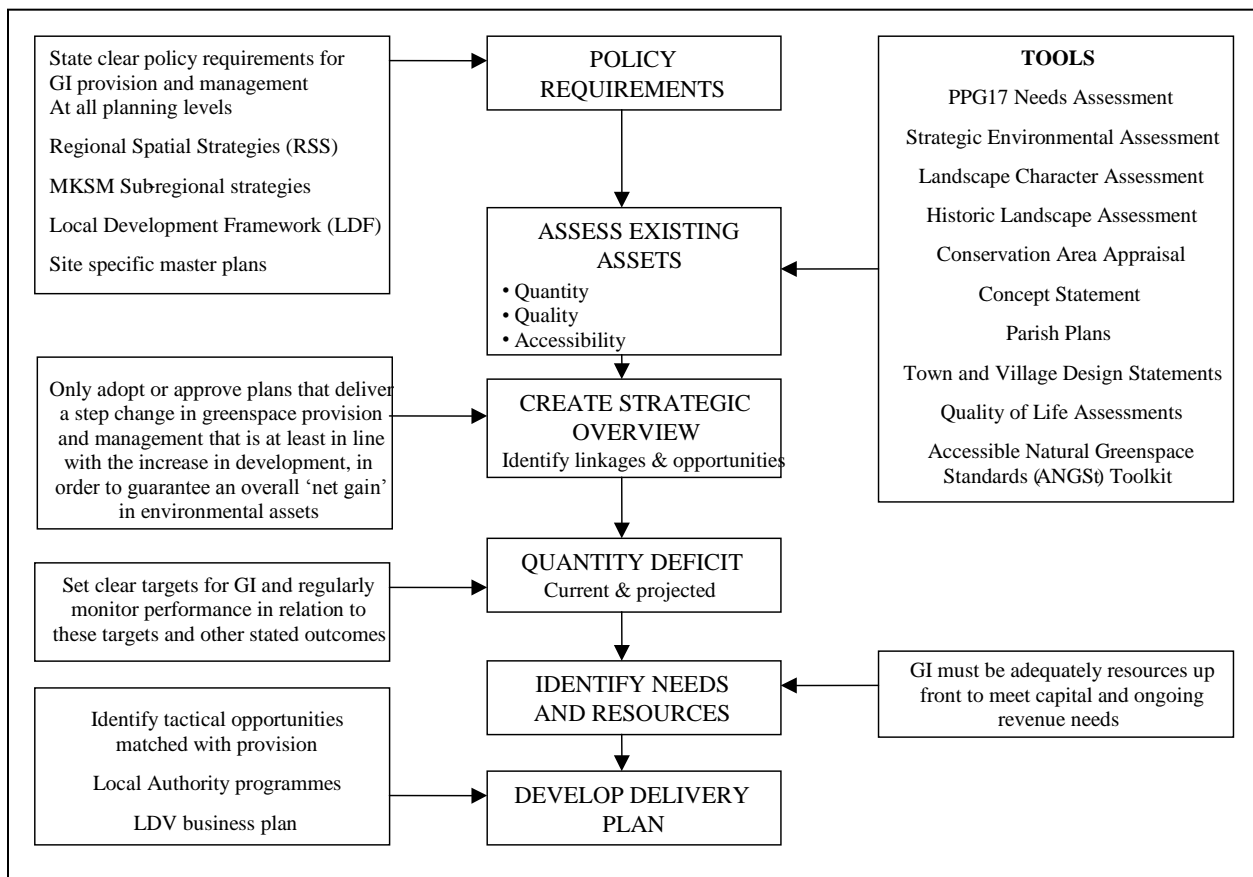
Figure 3: Environment Agency - Integrating GIP with the planning system

The Environment Agency framework and delivery programme can been seen to approach policy issues and the integration of GIP into the statutory planning system to a much greater extent than the English Nature process. The list of 'tools' that might be used in assessing existing assets is especially useful. However, like the English Nature process it gives little guidance on implementation and appears to be aimed primarily at green infrastructure improvement rather than the use of GIP in the planning of new developments.

c) Peterborough
Peterborough forms part of the London-Stansted-Cambridge-Peterborough Growth Corridor. In 2004, a study identified possible locations for additional growth around Peterborough. In a study produced in December 2005 by the Landscape Partnership for the Greater Peterborough Growth Partnership, five of these areas were examined 'in order to identify any fundamental environmental constraints to development, provide buffers to important sites and assess their potential contribution to green space standards' (The Landscape Partnership, 2005, p.1). The process was as follows:

Stage 1: Review
- Five 'potential growth locations' were reviewed through a combination of field visits and desk-top studies.
- These locations were visited by a landscape architect and desk-top studies looked at landscape character, archaeology and flooding and drainage implications.
- An ecologist examined the biodiversity aspects of each location.
- An environmental planner investigated relevant national, regional and local planning policies.

Stage 2: Analysis
- This included a review of the findings and a SWOT analysis for each site.

Stage 3: Development of Strategies
Draft proposals were drawn up, seeking 'to make a positive contribution to local and regional biodiversity and green space targets', taking into account green space standards including those suggested in:
- *Providing Accessible Natural Greenspace in Towns and Cities* (English Nature, undated)
- PPG 17: *Planning for Open Space, Sport and Recreation* (ODPM, 2002)
- *Green Space Strategies – A Good Practice Guide –* (CABE Space, 2004)
- *Biodiversity by Design –* (TCPA, 2004).

The Peterborough document does not mention the term 'green infrastructure *planning'* although there are frequent references to 'green infrastructure'. The approach is useful in that it is concerned with forward planning for green infrastructure in planned extensions to an existing settlement. The Review stage emphasizes the need to bring together a variety of specialists to look at the same site in different ways. However, the Analysis stage is concerned at least in part with the comparison of the five sites considered and a SWOT analysis is probably unnecessary when dealing with only one site.

The three approaches are compared in Table 2 below. It can be seen that none of the three processes analyses the implementation stage in any detail. Additionally, it is apparent that of these three processes, only Peterborough is

specifically concerned with the planning of green infrastructure on greenfield sites.

English Nature	Environment Agency	Peterborough
Stage 1: Inception	Policy requirements	
Stage 2 – Inventory of candidate sites Stage 3 – Inventory of natural sites Stage 4 – Inventory of accessible natural green space	Assess existing assets • Quantity • Quality • Accessibility	Stage 1: Review • Landscape character • Archaeology • Flooding and drainage • Ecology • Planning policy
Stage 5 – Map of provision Stage 6 – Map of deficient areas	Create strategic overview Quantify deficit Identify needs and resources	Stage 2: Analysis • Review of findings • SWOT analysis
Stage 7 - Response	Develop delivery plan	Stage 3: Implementation -taking into account green space standards

Table 2: GIP process – comparing English Nature, Environment Agency and Peterborough

d) Warrington
As an example of the implementation of a Green Infrastructure Strategy, we turn to the development of Warrington New Town in the 1970s and 1980s as described by Scott et al (1983) and Scott (1991). Warrington New Town was built largely on brown-field ex-military sites, which presented challenges but also opportunities, the principal benefit being that the Warrington New Town Development Corporation had complete control over the development and did not have to negotiate with land-owners and developers. In addition the varied but poor soil encouraged the use of a variety of native plants.

Planting took place three to six years before building development, allowing plants to become established and was based as far as possible on existing features such as woodland and waterways. Linear parks along stream courses and waterways linked a hierarchy of parks of different sizes and functions.

Scott *et al* (1983) point out the importance of:
- use of native species that are appropriate to the area, the soil type, the topography etc
- a diversity of planting
- respect for the existing landform and vegetation
- consideration of how individual green spaces are to be maintained.
- providing a diversity of landscapes that appear to be as natural as possible.

They suggest three stages at which diversity can be achieved:

1. retaining and manipulating landform, soil and water
2. planting and seeding
3. management

Park Rangers, whose duties include interacting with and involving the public, were based in the major parks.

Building on the strongest and most relevant elements of each of these four approaches, and respecting the principles of GIP in Figure 1 above, the research team has identified an indicative six-stage process of GIP, which is described in Section 7.

6: Issues in the Swindon urban-rural fringe

a). Development Plans for Swindon

The Regional Spatial Strategy for the South West recommends that Swindon should expand to accommodate an extra 32,000 houses during the period 2006 to 2026. There are plans for significant development on three sites adjoining Swindon. They are:

- Southern Development Area
- Commonhead/Gateway Area
- Eastern Expansion

Southern Development Area:
Outline planning permission has been given for 4500 houses and retail/commercial/community facilities, subject to 102 conditions, one of which is a requirement for 'design coding'. No development can happen until the conditions have been satisfactorily addressed and approved by the planning committee. Development is likely to start at end of 2006 and take place over 12 years, although it is likely to be skewed heavily towards the beginning of the period.

Commonhead/Gateway Area
This area of land is to the east and south of Coate Water Country Park extending to the A419 and M4 and has been allocated for town expansion in SBC Local Plan (to 2011), which is due to be adopted in June 2006. Development will include a University campus for the University of Bath, 1800 houses and other facilities (retail/commercial space). In addition, 5.5ha is allocated for hospital expansion. Two outline applications have been submitted and have undergone consultation. Applications have not been placed in front of the planning committee and will need to be amended/withdrawn/re-submitted in light of objections received before coming to committee. A decision before the end of the year is considered unlikely.

Eastern Expansion
13,000 houses are recommended for the eastern area expansion as a preferred area of growth. Timings are unclear but development could take place any time in the plan period from 2006-2026. Specific areas in which development will take place are as yet not identified. The whole of the eastern edge of Swindon (to the east of the A419) has been put forward as a preferred area of search in which growth areas could be allocated, including both north and south of the A420.

b) The Physical Context

Southern Area
The southern part of this area is defined by the M4 stretching east/west. Entering at the western end is the North Wilts canal, which in theory travels from west to east just north of the motorway. A branch of the canal travels into the main area of central Swindon but keeping to the western edge of the development area. The main area has a large number of small natural drainage routes, most flowing from north to south. Overall the main land use is grazing and land is generally wet in nature. In the northern section there is a disused railway, which is an important access route for bikes and walkers, as well as being a green route into the existing developed area. There are public rights of way in the southern area; of particular note are three routes crossing over or under the motorway and offering access to the area beyond including the AONB.

Commonhead/ Gateway Area
This area is dominated by Coate Country Park, the southern part of which is an SSSI. The area is very popular as it is has easy access from central Swindon at its most northern point. The Sustrans route 45 also goes across this area and over the motorway and from there to Marlborough. The eastern end has no rights of way and is characterised by the A419 in the East and the M4 in the south. The western part has a number of well-used paths around the area of the Coate lake. The land is grassland and predominantly wet, hedgerows are well maintained and there may be historical interest in the area.

Eastern Area
This area of land lies to the east of the A419. It is low-grade agricultural land mostly grassland but some arable. It is clearly wet with slow natural drainage. There is only one right of way from north to south, which crosses the river Cole but the southern entry/exit is not passable. There has been a permissive path along the river Cole but this has now lapsed after the Countryside Stewardship Scheme agreement finished. There are no access routes into this area from the area of Swindon to the west. To the south there are views of the scarp within the AONB, and the boundary of the AONB crosses the M4 and comes a little way north from Junction 15.

c) The Policy Context

Based on an examination of the policy documents listed Appendix 1, policies relevant to green infrastructure planning at regional, structure plan and local level were studied. The following key findings emerged:

1. None of the statutory development plan documents examined makes specific reference to, or acknowledges the role of Green Infrastructure Planning, although all have a comprehensive range of environmental policies that provide the planning context for GIP.

2. Discussions on the emerging Regional Spatial Strategy (RSS) for the South West give significant prominence to GI and its importance within the future planning policy of the Region. If the suggested policy on GI is eventually included into the approved RSS it will require a new emphasis on GI to be incorporated into the Local Development Documents produced by the local authorities.

3. Of the statutory plans, the Swindon Borough Local Plan has many policies and statements that relate closely to the definition of GIP. In particular:
   - Master Plan / Framework Plan preparation for strategic development areas (policy DS4);
   - Definition of Rural Buffer areas (policy ENV13);
   - Designation of Green Corridors (policies ENV20 and ENV21);
   - Provision of open space in strategic development areas (R5).

4. There is an acceptance and support for the use of Supplementary Planning Guidance (now Documents) where appropriate to provide detailed planning guidance in support of the broader policies contained in statutory documents.

5. The Urban Fringe Action Plan for Southern Swindon identifies GIP as the mechanism for the delivery of its Landscape and Habitat management proposals. It defines the purpose of a Green Infrastructure Plan and establishes a hierarchy for a Green Space Network.

6. There is consensus that green space has a multi-functional role beyond formal and informal recreational functions. Its value to wildlife, biodiversity and the development of socially cohesive and healthy communities is widely recognised throughout the documentation.

While there is little direct reference to Green Infrastructure Planning in the current planning statements examined, their strategic objectives and individual policies provide a supportive context for the development of GIP in the study area. In addition, the emerging RSS may well introduce a clear statutory requirement for green infrastructure planning

d) Local Authority Dialogue

Interviews were conducted with representatives of Swindon Borough Local Planning Authority (LPA) and North Wiltshire District LPA. The key findings were as follows:

1. The Swindon LPA has a thorough appreciation of GIP and its significance in the future development of the town. In the case of North Wiltshire it was felt that GIP was more appropriately related to the Swindon fringe than the district as a whole.

2. The master-planning approach to Swindon's strategic development areas, and particularly the Southern area, already embraces much of GIP philosophy.

3. There would seem to be no obstacles or objections to fully incorporating a GIP process into the formal planning processes in the Swindon urban-rural fringe. The existing mechanisms of Master Plan and Supplementary Planning Document are likely to be the most appropriate approach. The newly introduced Area Action Plans may also be worth investigating.

4. The LPA is likely to take the lead role as promoter and co-ordinator of GIP, but the preparation and development of a GI plan should be a multi-agency activity, drawing on expertise from as broad a set of agencies as possible, including developers. Delivery and implementation will also be through multi-agencies.

Not surprisingly the two LPAs display considerably different views on, and appreciation of, GIP. The difference relates to the nature of the planning issues; one centred around major urban expansion as a Principal Urban Area in the Regional Spatial Strategy, the other a largely rural area with small market towns and villages.

The very encouraging finding is that both sets of professionals are supportive of GIP, and in the case of Swindon itself, believe they are already pursuing a GIP agenda, if not yet entirely comprehensively. For the research study area the seeds of GIP are well-rooted and producing benefits, as witnessed through the current master planning for the Southern Development Area.

The LPAs would also be very happy to see GIP embedded within the planning system, and believe the existing mechanisms of SPD, Master Plans or Area Action Plans can be used for the purpose. However, while the LPA is likely to be the main promoter and co-ordinator for GIP it is unlikely to be the main party in its preparation or the main body for its delivery. For the latter the developer should carry the main responsibility.

7: A proposed Green Infrastructure Planning Process for the Swindon urban-rural fringe

a) Suggested Six-stage GIP Process

Building on the strongest and most relevant elements of each of the four approaches described in Section 5, and respecting the principles of GIP in Figure 1, the research team has identified the indicative six-stage process of GIP described below.

As a preamble, though, it might be helpful in some circumstances for the people involved in initiating the process to establish at least an outline vision of the possible network of green spaces at the very outset of the process to provide impetus to the initiative.

Stage 1: Preparation
- Identification of area to be considered, preferably before development takes place
- Creation of suitable GIP team or partnership – ensuring members have necessary expertise and local knowledge
- Initial study of the planning policy background
- Identification (and if possible securement) of funding streams for green infrastructure.
- Identification of interest groups/stakeholders etc. for initial and/or future consultation

Stage 2: Data collection
Collection of relevant local data concerning:
- Landscape
- Ecology
- History (including archaeology)
- Existing green space provision (including that in adjoining areas)
- Existing special designations concerning ecology, landscape or historical remains
- Existing planning designations and policies
- Other data considered relevant

Although collection of data should concentrate on the area under consideration, it will also be necessary to include surrounding areas in so far as they affect or are affected by changes in the area under consideration. The exact area considered will depend upon the perspective from which the study is being done. For example, a landscape study may take into account a wider area than a study of archaeological remains.

Local communities should be involved as fully as possible in data collection and local knowledge and priorities should be taken into account.

Stage 3: Data analysis
- Mapping and analysis of information collected in Stage 2.
- Comparisons of existing provision with agreed standards for open space provision and identification of any shortfall or special needs.
- Possible prioritisation both within and between specialities.

It is likely that further work will need to be done to develop the means by which local planning authorities are able to audit and analyse *qualitative* information so that it is appropriate for use in green infrastructure planning. Developing this type of analysis was not part of the project brief; this is an area that might require further research to be commissioned.

Stage 4: Establishing and agreeing a vision
Visualisation of what a network of green spaces and corridors might look like superimposed upon map(s) produced in stage 2.
- Consultation with professionals in a range of fields including ecology, landscape planning, history, archaeology, highways and building development.
- Presentation to, and consultation with, local people and organizations
- Integrating the vision into the Local Development Framework (LDF).

Stage 5: Detailed planning
Detailed planning of green infrastructure both at development level and in smaller sub-areas, but always with a view to the larger area, involving both experts and local people, culminating in a detailed delivery plan for the sub-area involving targets and a timetable.

Stage 6: Implementation
The arrangements for implementation will depend upon the local situation. However, it is likely to be by a combination of developers, local authorities, landowners, voluntary bodies, and, particularly in the light of the Government's 'double devolution' agenda, parish councils. The involvement of local people in implementation is desirable as it fosters pride in, and concern for, protecting the green infrastructure. This could be achieved by organizing specific 'events' such as tree planting.

Taking each stage in turn, we can see how it might be applied in the Swindon urban-rural fringe.

b) Stage 1: Preparation

i) Identification of area to be considered, preferably before development takes place.

The Regional Spatial Strategy for the South West recommends that Swindon should expand to accommodate an extra 32,000 houses during the period 2006 to 2026. There are plans for significant development on three sites adjoining Swindon:

- Southern Development Area
- Commonhead/Gateway Area
- Eastern Expansion

Although all three sites are as yet undeveloped, they are at different stages of planning as described above in Sections 6a and 6b. GIP could be implemented in any or all of the three areas, helped by an existing commitment from Swindon Borough Council, and in the Southern Development Area could be said to have already commenced. However, there is more time to follow the six-stage process recommended by this research in the Commonhead/Gateway and Eastern areas.

ii) Creation of suitable GIP team or partnership – ensuring members have necessary expertise and local knowledge
Local expertise on GIP is already being built up within Swindon Borough Council and Great Western Community Forest. However, it is still necessary to make sure that a range of expertise is available in specialities such as landscape planning, ecology, local history and archaeology. Some of this expertise may be available in local communities via, for example, local history societies or other agencies such as the AONB.

iii) Initial study of the planning policy background.
This has been carried out as part of the present research project and found to be favourable to the implementation of GIP. However, it is necessary to take into account changes, both in planning policies and in designations of particular areas of land.

iv) Identification (and if possible securement) of funding streams for green infrastructure
In the case of Swindon the strategic development areas are of such a scale as to enable substantial financial leverage to be applied to developers prior to the issuing of formal planning permission. However, they may still be a need to identify additional sources of funding, particularly for continuing maintenance and improvement of green spaces after the completion of the development.

v) Identification of interest groups/stakeholders etc for initial and/or future consultation
It is recommended that this should take place as soon as possible, and that the lead should be taken by the Local Planning Authority/ies in association with GWCF.

c). Stage 2: Data Collection

The data required can be categorised in two ways. The first concerns the nature of the information, which can be divided into *basic* (location, area and number) and *in-depth* (type of use, fit for purpose, potential, designations) data. The second division concerns the subject matter, which can be broadly broken down into 6 categories, as shown in Table 3 below.

Type Category	Basic Data	In-Depth Data
Biodiversity	Existing areas, corridors	Site potential, existing management, designation
Access routes	Location and type	Level of access, signage, state of surface
Open space	Total area and locations	Existing management, type and level of access, fit for purpose, potential for dual purpose (e.g. flooding), usage.
Historical/Landscape	Location, other records	Extent, surrounding implications
Community/Social	Number and type of buildings	Fit for purpose, usage
Commercial	Location and type of commerce	Satisfaction with location, connections with immediate community

Table 3: Data Required by Category

Discussions regarding what data are available indicate that while there may be *basic* information on issues of area and location, there is far less *in-depth* information. Existing information may meet the needs of GIM (as layers within a GIS mapping exercise) but would not meet the in-depth needs of GIP. Appendix 2 links the two types of data outlined here to the functions listed in Table 1.

Overall, the research highlights two points relevant to data collection. The first is the need to investigate what further basic data exist as well as any in-depth data that would fall within the GIP framework. The second is an assessment of the further in-depth data required in the context of the GIP framework and the location concerned. It should be emphasised, however, that not all data will be available at the outset of the initiative and that the process should not be delayed or lose momentum as a result of waiting for the assembly of complete data sets.

d) Stage 3: Data Analysis

Amongst other approaches, mapping techniques can be used to superimpose different features of the area and gain an overall view. Such features might be:
- Environmental designations such as Coate Country Park SSSI;
- Historic/archaeological designations;
- Planning designations;
- Ecological data gathered during Stage 2;

- Existing open space provision, including that in adjoining areas, and distinguishing between spaces with and without public access;
- Existing green routes, such as Sustrans route 45;
- Existing features that should be retained e.g. woodland belts;
- Existing linear features such as major roads, railway lines and rivers, which be barriers to movement but can also be utilised as the basis of green routes and linear parks.

In addition, existing open space provision needs to be compared with agreed standards or indicators to identify any shortfall in surrounding areas that will need to be compensated for in the development. Also, a social profile of the existing and anticipated communities should be used to identify any special needs; for example, there may be a large number of young children, needing play facilities.

e) Stage 4: Establishing and Agreeing a Vision

Ways of visualising green infrastructure are important in emphasizing its holistic nature i.e. in seeing the green spaces in an area as a whole and being aware of the links between them and with surrounding areas. Green spaces can be visualized, for example, as '*green fingers'* reaching from the countryside into the built-up area (Stockholm) as a '*green grid'* (Peterborough and Kent-Thameside), as a '*green necklace'* (Peterborough) or as '*hubs'* and '*corridors'* (Maryland, USA). In addition, Scott *et al* (1983) talk of a '*web'* of linear forests. The most appropriate model in a particular case will depend upon the characteristics of the area.

A vision for the green infrastructure of an existing or intended development can be used to plan the green infrastructure holistically and to gain backing and promote enthusiasm for the GIP process amongst local communities and stakeholders. As indicated in Section 7b above, the outline for this vision might be established at the very beginning of the process and developed iteratively until clear agreement amongst relevant partners and stakeholders is secured. Maps produced in Stage 3, *could* be a starting point for forming a vision of what a network of green spaces might be, incorporating areas to be protected and providing green routes for wildlife, recreation and utility. This could be done at a community planning event before being subject to scrutiny by experts and then to wider consultation. While it will not be possible to involve the people who will be living in the new development, it is possible to involve neighbouring communities and possibly similar communities in other parts of Swindon. The vision then needs to be integrated into the statutory planning system.

f). Stage 5: Detailed Planning

It is envisaged that Swindon Borough Council local planning authority (together with neighbouring authorities where the development area overlaps or is close to local authority boundaries) will take the lead on developing detailed planning proposals. However, it is important to involve local people as much as possible in

generating proposals for their immediate surroundings; as much consultation and local input as possible should be integrated into the green infrastructure planning process. This is elaborated in Section 9 below. While much detailed planning will take place for smaller areas and involve the communities adjacent to those areas, it is important also that an overall, strategic, view of the development is maintained as part of the broader planning process.

g) Stage 6: Implementation

The initial implementation green infrastructure proposals, particularly where open space and other components of green infrastructure are potentially an integral part of new development, is most likely to be undertaken by developers. In Swindon the strategic development areas are of such a scale as to enable substantial financial leverage to be applied to developers prior to issuing planning consent. Where the scale of development is much less, and where green infrastructure extends well beyond the confines of the proposed development, this advantage will be considerably lessened. In this wider setting and in the longer term, there might well be an implementation role for a number of bodies including, for examples, farmers and other landowners, parish councils and local communities themselves. It is important to emphasise that GIP is not a project or a one-off event, and that continuing management of the use of green infrastructure is essential including, for example, the separation of uses that are incompatible with each other. In some circumstances the preparation of a management plan for the use of green infrastructure will be appropriate.

8: The need to embed Green Infrastructure Planning in the statutory planning process

It seems clear from the research findings that the planning system should be the principal vehicle whereby green infrastructure planning is initiated and continuously implemented. It seems equally clear that, to be consistently effective, GIP needs to become embedded within the system as a normal part of the statutory planning process.

Clearly, many stakeholders other than planners have important roles to play in GIP, not least local communities, interest groups, developers, other local authority departments etc., but unless the onus for initiating and undertaking GIP is vested in a system with continuing statutory responsibility, GIP will depend from time to time and from place to place on the enthusiasm of particular participants. There is overwhelming evidence that such reliance rarely results in widespread or sustained commitment.

Mindful of the significant pressures on understaffed local planning authorities it would be counterproductive to devise a GIP process that would add yet more

duties to the workload of planners. Any such process would need to be as straightforward as possible and be capable of ready integration into existing duties. It is not the purpose of this brief research project to tell planners how to do their job; rather it is to offer pointers towards the means by which GIP might be undertaken within the emerging, reformed planning system.

With these factors in mind, a simple model is offered here whereby GIP might feature in the hierarchy of statutory planning instruments. It is possible, of course, to devise other such models, and different local panning authorities might wish to design arrangements suited to their particular circumstances. The purpose of the model offered here is to show how GIP might be built into the emerging hierarchy of development plans in a relatively straightforward manner.

1. Policies relating to the benefits of green infrastructure and the value of GIP could be included in evolving **Regional Spatial Strategies** as a directive context for the implementation of GIP as part of statutory development planning at the level of the local planning authority. (It is heartening that draft policies on green infrastructure have been prepared already for inclusion in the South West Regional Spatial Strategy).

2. There could be a clear, **core policy** on green infrastructure in the emerging **Local Development Framework(s)**.[2] This would provide a firm policy context for the development of more specific proposals and guidance on green infrastructure and for determining planning applications for particular development proposals.

3. **Supplementary Planning Document(s)** that provide guidance, criteria and examples of good GIP practice could be developed for the whole local planning authority territory, including existing built up areas (it should be remembered that the benefits of green infrastructure should be available throughout - and beyond – the territory of the local authority).

4. In specific areas where significant change is anticipated, **Area Action Plans** – or site specific development briefs – could be prepared that set out more detailed proposals for the protection and enhancement of green infrastructure in advance of, during and after the implementation of development. Given the importance of spatial connectivity in GIP the need to ensure that these individual action plans relate effectively to each other emphasises the importance of overarching guidance such as that which could be offered through Supplementary Planning Documents. It is possible that the resources of developers might be brought into play to assist with funding the preparation of Area Action Plans and the deployment of specialist skills not readily available in the local authority.

---

[2] This would be reinforced if policies on green infrastructure were to be in the overarching and holistic Sustainable Community Strategy prepared by the Local Strategic Partnership.

We turn now, though, to the process whereby green infrastructure planning, throughout the six-stage process, could be integrated into the statutory planning process. This is not offered as a definitive process, but rather as an aid to thinking through the potential ways in which green infrastructure planning and the statutory planning system might interact.
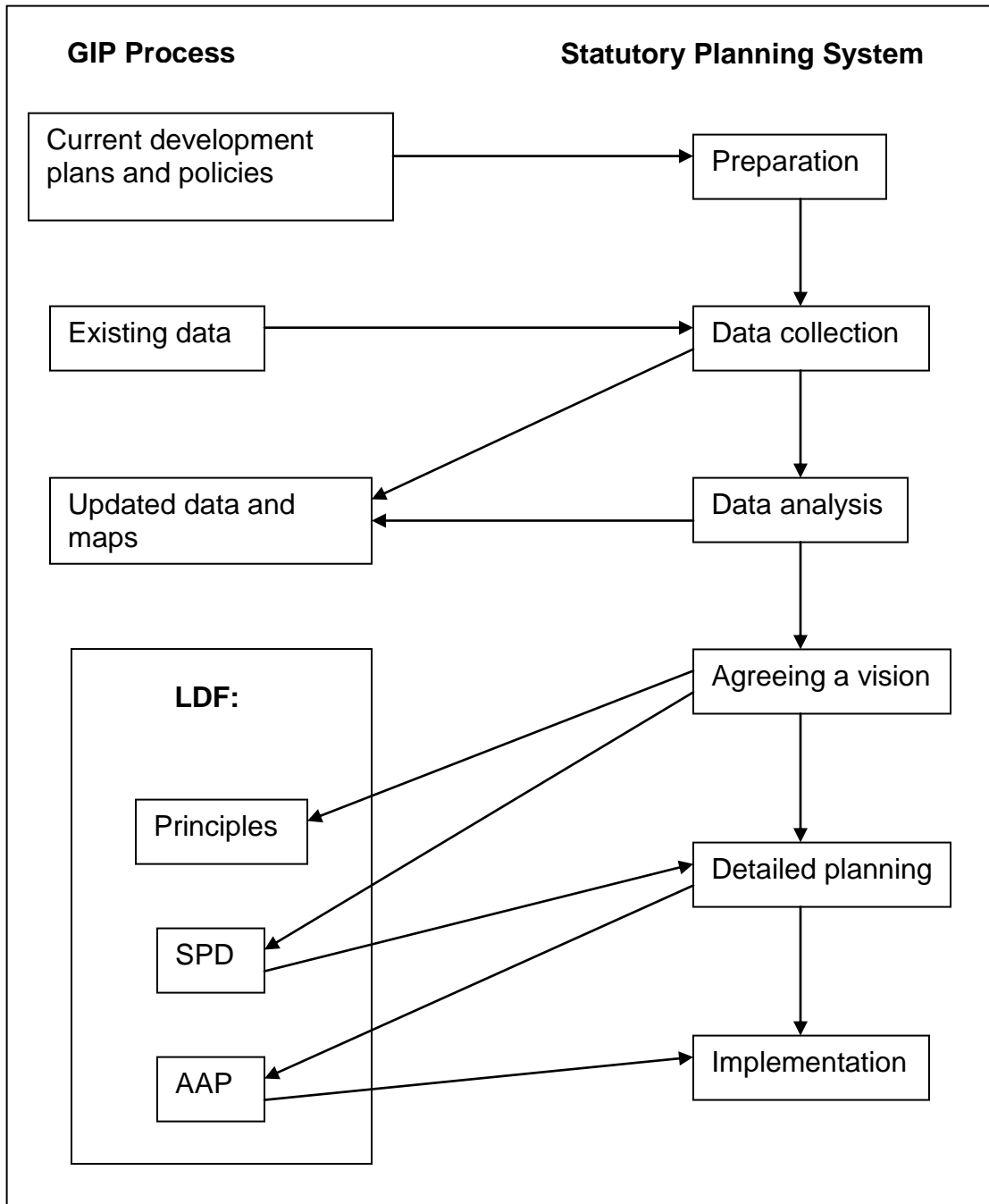

Figure 4: Integration of the GIP process into the statutory planning system

Figure 4 above summarises the potential links between the GIP process and the statutory planning system. However, it is notoriously difficult – and often misleading – to represent process in a diagram. Inevitably the linear representation oversimplifies the process as it occurs in real time. It is important to recognise that the process is continuous in two senses. First, the green infrastructure will need to be maintained and developed in line with changing circumstances. Second, the process is cyclic through time rather than simply linear and it involves 'feedback' loops at many stages. For example, the Local Development Framework that is informed by this particular GIP process will subsequently become a constituent of the 'current plans and policies' for the further iteration of the GIP process.

It would be misleading to suggest that the statutory planning system is the only vehicle for green infrastructure planning. Many other initiatives outside the planning system, albeit connected with it, provide further opportunities. For example, the preparation of green transport policies, as well as reflecting the emphasis in green infrastructure planning on access, linear movement and connectedness, potentially provide a source of funding for selected initiatives. For similar reasons, the forthcoming preparation of Rights of Way Improvement Plans could well form an integral element of green infrastructure planning proposals.

9: Involving the Community

Community involvement is a statutory requirement of the planning system and one of fundamental principles of GIP. As part of the social inclusion agenda, it is important to involve a wide cross-section of the community, including hard-to-reach groups. There are several practical reasons for community involvement.
1. There is a fund of local knowledge within the community, which can be used to augment the data collected by 'experts'.
2. GI is more likely to meet community needs if the community is involved in its design. However, it is important that all sections of the community are involved so that the needs of minority groups, such as disabled people or ethnic minorities can be met.
3. Facilities with which the community have been involved, either through design or through practical work such as tree planting, are more likely to be looked after and less likely to be vandalised.
4. Involving neighbouring communities in the design of new development and providing facilities for them within that development is likely to lessen opposition to, and maybe engender support for, the development.
5. Involving both residents of neighbouring areas and occupants of the new housing can help build bridges between the two communities.
6. Increased community spirit may improve the quality of life of residents and reduce crime.

Figure 5 shows how the community can be involved throughout the six-stage GIP process from data collection through to implementation. Furthermore, the continued involvement of the community beyond the initial planning and implementation stages can help the adaptation of the green infrastructure to respond to changing needs.

GIP Process **Community Involvement**

Preparation

↓

Data collection ← Local knowledge

↓

Data analysis

Community planning event

↓

Agreeing a vision

Consultation

↓

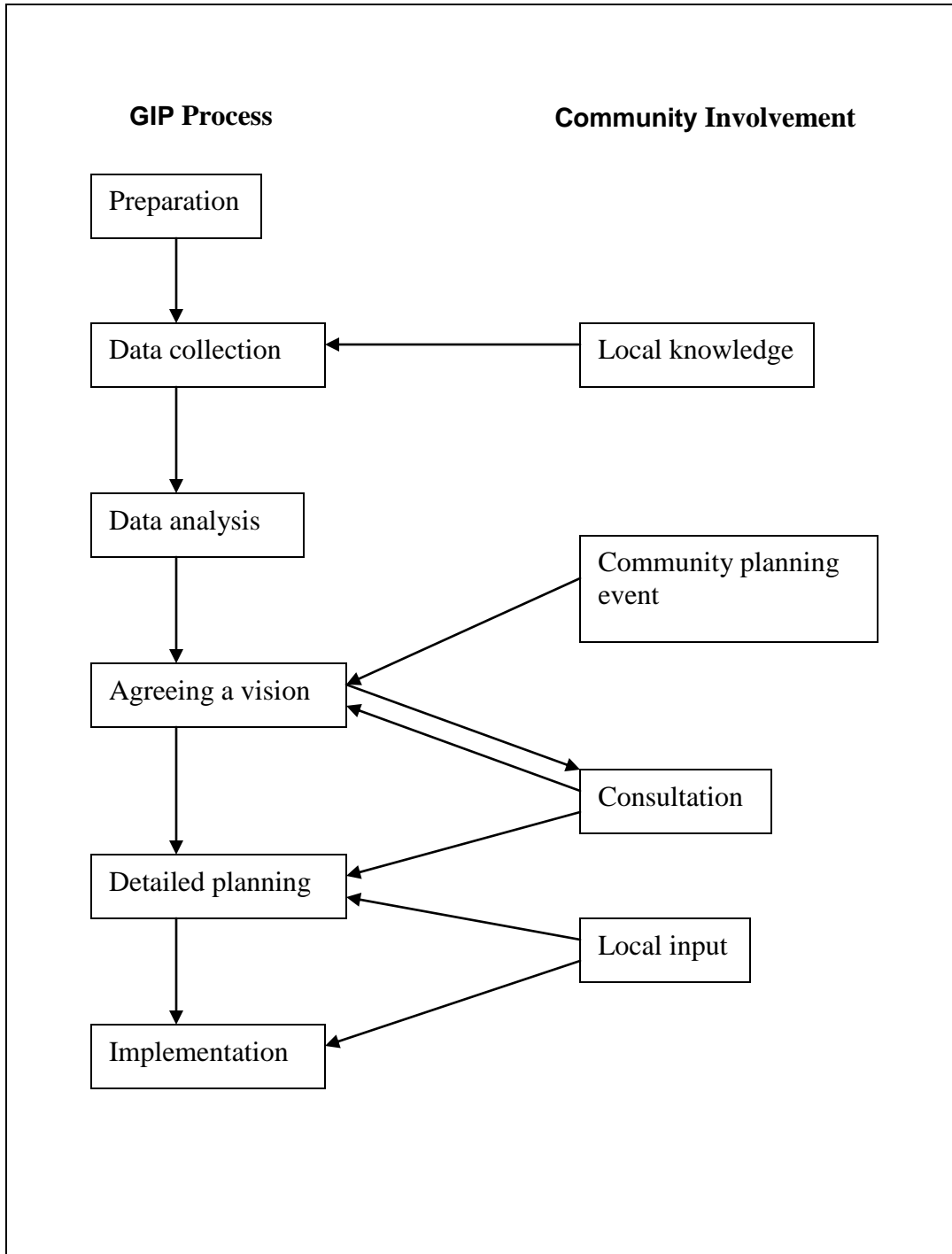Detailed planning

Local input

↓

Implementation

Figure 5: Community Involvement in the GIP process

Community involvement can be achieved through a wide variety of means. Community planning events can be used to agree a vision for green infrastructure, but it is important that that vision is then subjected to wider consultation to get the views of sections of the community who are unlikely to attend such an event but who can be approached in the street or visited at home. Schools and events for the elderly may be good means to get the opinions of particular age groups. In addition, parish councils may be in a good position to identify and consult people who might otherwise have been left out, so ensuring that the consultation is as broad and as inclusive as possible.

10. Conclusions

Introduction

Alongside those characteristics that might shape GIP in the particular context of the Swindon urban-rural fringe, the research project has identified aspects of green infrastructure planning that might well be common to all situations in which it is practised in the UK. The fusion of these two perspectives, the generic and the specific, is essential for the effective practice of GIP in any particular situation.

Three key elements of the generic perspective are worth re-emphasising here; they are recommended as important foundations for the approach to GIP in Swindon:
- the analysis of *functions* and *benefits* of green infrastructure (Section 3),
- the *10 principles* of green infrastructure (Section 4),
- the proposed *six-stage process* of green infrastructure planning (Section 7).
All three elements are sufficiently robust to be applied in any situation, but they are also specifically relevant to the Swindon urban-rural fringe.

Additionally, there are five further generic points that warrant re-emphasis here:
- connectivity as a pervasive characteristic of green infrastructure planning,
- the need to embed GIP in the planning system, particularly in the hierarchy of development plans,
- the crucial role of community involvement,
- the need to adopt a partnership approach throughout the GIP process,
- issues relating to continuing responsibility for and funding of GIP.

Connectivity

A connected approach to green infrastructure planning is essential. First, without acknowledgement that green infrastructure itself is intrinsically a connected and dynamic phenomenon it is unlikely that an adequate planning and management

approach will be developed. The components of green infrastructure interact continuously with one another; they comprise a living system. Green infrastructure fulfils multifunctional purposes; planning and management are needed to ensure that these varied functions co-exist in mutually supportive ways, and conflicts need to be minimised. Second, the undertaking of green infrastructure planning must reflect this connectedness. Administrative boundaries and professional demarcation should not be allowed to become barriers to the effective – and therefore connected – planning and management of green infrastructure.

The need to embed GIP in the planning system

Embedding green infrastructure planning in the statutory planning system is essential for its success. The preparation and review of development plans as a statutory and continuous function of local authorities provides the firm framework within which green infrastructure planning must be nested if it is to have 'bite' in the development process. The fact that development plans must be reviewed periodically will ensure that green infrastructure planning, if embedded within the formal planning system, will itself become a continuing function of the democratic system rather than relying on the sporadic enthusiasm and initiative of individuals or groups of people. The reform of the planning system offers the best opportunity for 60 years to encompass the principles and practice of green infrastructure planning as a normal part of its operation.

Partnership Approach to GIP

Reflecting the discussion above on the importance of connectivity in green infrastructure planning, it is almost axiomatic that a partnership approach to GIP should be adopted. Many partners will be involved in initiating, implementing and taking continuing responsibility for GIP. The range of members of the partnership will vary between different situations. In the case of the Swindon urban-rural fringe members should include: Swindon Borough local planning authority, other Swindon Borough local authority departments, neighbouring local planning authorities, parish councils in the areas potentially affected, the Great Western Community Forest, the North Wessex Downs AONB, committed and prospective developers and a number of other agencies such as Natural England and specific interest groups. In most situations where GIP is being undertaken, the key local planning authority should take the lead in initiating and co-ordinating the partnership. It should be remembered that green infrastructure planning is a continuous process and that the partnership will need to continue in existence beyond the initial implementation of proposals

Community Involvement

Community involvement is an important constituent of green infrastructure planning and, indeed, it is a formal requirement of the statutory planning system

through the preparation of a Statement of Community Involvement. There are many advantages in involving a broad cross-section of the community throughout the GIP process and beyond. The resulting green infrastructure is more likely to meet the needs of the community. The process of involvement may also increase community spirit and the fund of social capital and so improve quality of life. The process may also lessen opposition to the development and aid integration of old and new communities. Perhaps most importantly, community identification with the resulting green infrastructure is likely to lead to it being valued and cared for.

A wide variety of methods needs to be used to reach all sections of the community – and this might involve the need to develop additional skills in community engagement on the part of the local planning authority. This will inevitably take time and cost money, but it should result in better and more appropriate green infrastructure that is valued and cared for by local people. Parish councils may be in a good position to advise on and/or undertake community consultation. In addition, in the Swindon area, the Great Western Community Forest has considerable experience in this field.

Funding and Continuing Responsibility for Green Infrastructure Planning

It is tempting to think of the funding of green infrastructure as a single event of capital expenditure at the outset of planning and development, possibly to be covered by the developer as part of initial development costs or as developer contributions through planning gain. This kind of expenditure is, indeed, vital as a means of 'kick-starting' the implementation of green infrastructure planning, but it is just one element of funding, and possibly the easiest to achieve.

More intractable is the problem of continuing the funding of green infrastructure beyond the initial stages of development, particularly in terms of management and maintenance costs into the future. Here, a wider – and possibly more innovative – range of funding arrangements is needed. Amongst the arrangements already put into practice or discussed are: endowment investments, whereby developer contributions are invested and yield funds for expenditure over a fixed period of time; the establishment of Trusts for the upkeep of green infrastructure, and private management agreements for land remaining in private ownership. For land in public ownership it is possible that parish councils might take on an enhanced role. Central government appears to be sympathetic to extending both the responsibilities and, to some extent, resources of parish councils. It is likely that this will be directly related to the Quality Parishes Initiative. In this context, some parish councils might well be enthusiastic about taking responsibility for managing and maintaining green infrastructure, an extension of the work that some parish councils already undertake for cemeteries and some other open spaces. Again, mindful of the overriding importance of connectivity, it would be sensible for neighbouring

parish councils to work together to secure mutual benefits from the proper management of green infrastructure.[3]

Mindful of the distinction made towards the beginning of this report between green infrastructure *per se* and green infrastructure *planning*, it is salutary to recognise that the process of planning itself will make extra resource demands on the members of green infrastructure planning partnerships, not least the local planning authority. Further research might well focus on developing a means by which green infrastructure planning could be incorporated into the normal processes of planning with minimal net additional costs. Even so, few local planning authorities employ the full range of skills necessary to cover the process of green infrastructure planning effectively and there might well be costs associated with buying in such skills.

The Future

The urban-rural fringe of Swindon offers fertile ground for the development of a green infrastructure planning initiative. There appears to be readiness amongst the major stakeholders and potential partners in the area to engage with the opportunities and benefits provided by green infrastructure. This appears to be matched by willingness amongst these key players to adopt a collaborative approach to initiating and continuing green infrastructure planning.

The drafting of model policies for green infrastructure in the emerging Regional Spatial Strategy offers a promising context in which green infrastructure policies and proposals can be further developed through the statutory planning system at the local scale. Furthermore, the reformed planning system generally offers the prospect of a wider scope and greater flexibility for development plan policies and proposals, which is an encouraging framework for the concept of green infrastructure planning. In particular, the embarkation by Swindon Borough Council of the preparation of a Local Development Framework from July 2006 following the adoption of the Local Plan offers a timely opportunity to build green infrastructure planning into the 'normal' practice of development plan preparation and review. This is likely to be the key moment at which the impetus for green infrastructure planning in the Swindon urban-rural fringe can be secured.

---

[3] Parish Plans, prepared by parish councils with full local community involvement, might well provide an effective vehicle for making detailed proposals for green infrastructure and its management. It will be essential that Parish Plans are prepared in such a way that they meet the criteria for adoption as supplementary planning documents so that they might more readily dovetail into the statutory planning system.

Appendix 1: Relevant reports and publications

Policy Documents

Regional Planning Guidance for the South West – RPG10: September 2001

South West Regional Spatial Strategy:-
Discussion Paper 4: Suggested Environment Policies
Discussion Paper 5: Strategic Sustainability Assessment
Draft Discussion Paper on Green Infrastructure: August 2005

Wiltshire and Swindon Structure Plan 2016: Deposit Draft Alteration October 2003 and Proposed Modifications August 2005

Swindon Borough Local Plan 2011: Revised Deposit Draft, October 2005

North Wiltshire Local Plan 2011: Revised Deposit Draft

Vale of White Horse Local Plan 2011: First Deposit Draft

Kennet District Local Plan 2011: Adopted April 2004

Swindon Borough Local Plan 2011: Adopted Supplementary Planning Guidance; Open Space and New Housing; Nature Conservation

Urban Fringe Action Plan for Southern Swindon; September 2005

Swindon Borough Local Plan 2011: Open Space Audit and Assessment – Final Draft

Other Documents

Benedict, M. A. and E. T. McMahon (undated), Green Infrastructure: Smart Conservation for the 21st Century, Sprawl Watch Clearinghouse Monograph Series Washington DC, The Conservation Fund**:** 32.

Burgess, J., Harrison, C.M and Limb, M (1988), People, Parks and the Urban Green: A Study of Popular Meanings and Values for Open Spaces in the City, Urban Studies **25**(6): 455-473.

Campaign to Protect Rural England (2004) Thames Gateway: Making Progress, London: CPRE

Enfusion in association with Nicholas Pearson Associates, (2005) Green Infrastructure in the South West

English Nature (undated) Providing Accessible Natural Greenspace in Towns and Cities – A Practical Guide to Accessing the Resource and Implementing Local Standards for Provision, (on-line) available at http://www.english-nature.org.uk/pubs/publication/PDF/Accessgreenspace.pdf

Environment Agency (2005) Planning Sustainable Communites – A Green Infrastructure Guide for Milton Keynes & the South Midlands, Nottingham: Environment Agency

Eugster, G. (2000) Seven Principles of Green Infrastructure, APA National Planning Conference.

Greater Peterborough Greengrid (2005) Peterborough Green Grid Phase 1: Growth Opportunity Areas, (on-line) available at http://www.peterborough.gov.uk/pdf/env-pl-sdp-nsdp-gg-goa-growthopportunityanalysis.pdf

Gunn, S. (2003). Reconnecting People and Nature: Strategic Direction, English Nature

Greeninfratructure.net (2006) Principles for Green Infrastructure Planning, Design and Implementation, (on-line) available at http://www.greeninfrastructure.net/?article=2009

Handley et al (2003) Accessible Natural Greenspace Standards in Towns and Cities: A Review and Toolkit for their Implementation, Peterborough: English Nature

Harrison et al (1995) Accessible Natural Greenspace in Towns and Cities: A Review of Appropriate Size and Distance Criteria, English Nature

Kent Thameside (undated), Creating a Greener Place, (on-line) available at http://www.kt-s.co.uk/kts02/pdfs/ggbro.pdf

Knight, D. (2004). English Nature's Urban Strategy, English Nature.

ODPM and Defra (2003) Creating Sustainable Communites: Making it Happen: Thames Gateway and Growth Areas, ODPM

ODPM and Defra (2004) Creating Sustainable Communities: Greening the Gateway. A Greenspace Strategy for Thames Gateway, ODPM: Wetherby

ODPM and Defra (2005) Creating Sustainable Communities: Greening the Gateway Implementation Plan, ODPM: Wetherby

Peterborough City Council Local Plan (adopted 2005), (on-line) available at
http://www.cartoplus.co.uk/peterborough/text/00cont.htm

Scott, D (1991), The Greening of Warrington, Landscape Design, February 1991,
p 24-25

Scott, D, Greenwood, R. D. Moffatt, J. D. & Tregay, R. J. (1983) Warrington New
Town: An Ecological Approach to Landscape Design & Management, in Ecology
and Design in Landscape (24th Symposium of British Ecological Society –
Manchester 1983), Blackwell Scientific Publications

Scott Wilson (2001) Greening the Borough Initiative: A Landscape Strategy,
Worthing

TEP, IBIS Environmental and Design Consultants, et al. (2005) East Midlands
Green Infrastructure Scoping Study: Final Report.

TEP (2005) Green Infrastructure for the Liverpool and Manchester City Regions,
TEP

The Countryside Agency and Groundwork (2005) The Countryside in and around
Towns, Countryside Agency: Cheltenham

The Landscape Partnership (2005) Peterborough Green Grid: phase 1.

Town and Country Planning Association (2004) Biodiversity by Design: A Guide
for Sustainable Communities, TCPA: London

Urban Task Force (2005) Towards a Strong Urban Renaissance

Walmsley, A, (2005) Greenways: Multiplying and Diversifying in the 21st Century,
Landscape and Urban Planning, unpublished

Warrington Borough Council (no date), Biodiversity by Design in Warrington (on-
line) available at
http://www.warrington.gov.uk/images/biodiversity_by_design_tcm15-7039.pdf

Warrington Borough Council (2002) A Parks and Green Spaces Strategy for
Warrington 2002 – 2007, (on-line) available at
http://www.warrington.gov.uk/images/parks_green_spaces_tcm15-4252.pdf

Warrington Borough Council (2005). Draft SPD Open Space and Recreation
Provision, (on-line) available at
http://www.warrington.gov.uk/images/SPD_Open%20Space_tcm15-6527.pdf

Warrington Borough Council (2005) Local Development Scheme, (on-line)
available at http://www.warrington.gov.uk/images/LDS_tcm15-5491.pdf

Appendix 2:

Table 2: Linking Functionsand Data for Green Infrastructure Planning (*_italics_ indicates the primary data category/ies)

Uses	Data categories*	Basic data	Indicative in-depth data
1.Exercise, sport, recreation and quiet contemplation	Access routes, Open space, Community/Social	OS base map, schools, country parks, LA open access, common land, village greens, water, county wildlife sites, PROWs, LA open access, proposed canal route(s), Priority Greenways Routes, transport/travel movements/travel to work.	What organised and unorganised exercise/sport and recreation activities occur in the area? How can the area be improved so these can be encouraged? Is the range of routes (short, medium and long) sufficient? Is the surface acceptable?
2. Educational and training resource	Community/Social Biodiversity, Access routes	OS base map, schools & colleges, water, woodland, SSSIs, county wildlife sites, agri-env schemes, PROWs, proposed canal route(s), SAMs, SMR.	How can the immediate area be used to meet the educational needs of those within full-time education? Can local sites be used to develop sense of local ownership?
3. Community involvement in protection, creation, maintenance and use of greenspaces.	Community/Social Biodiversity, Access routes, Open space, Historical/ Landscape	OS base map, Boundaries, water, woodland, SSSIs, county wildlife sites, common land, village greens, PROWs, country parks, LA open access, proposed canal route(s), other community facilities.	What groups, clubs and organisations met in the area? What concerns and/or interests them about their locality? Are any involved in existing management, could they adopt some local sites? Is there a link to training here?
4. Green routes for people and wildlife	Biodiversity, Access routes, Community/Social	OS base map, Boundaries, PROWs, Agri-env schemes & other permissive access, promoted non-motorised routes, proposed canal routes, Priority Greenways routes, water, woodland, SSSIs, county wildlife sites, transport/traffic movements/travel to work.	What existing routes are there between the existing and proposed development area? What is the biodiversity value (and potential) of these access routes? How can these be enhanced for biodiversity and permeability between built up areas?
5. Provision of (natural) drainage	Open space, Access routes	OS base map flood risk, boundaries, water, woodland, SSSIs, county wildlife sites, common land/village greens, country parks, LA open access, proposed canal routes.	What is the potential for areas of open space to be used to improve drainage? Where and how does water flow within areas of proposed development.
6. Improvements to water and air quality, local climate control and noise mitigation	Community/Social Commercial	Development area plans, air quality data, boundaries, water, woodland,	Where are the areas of high pollution? How can the development of woodland and smaller green areas help to alleviate this.
7. Habitat provision	Biodiversity, Access routes, Open space	SSSIs, County Wildlife Sites, Local Nature Reserves, Strategic Nature Conservation areas, Priority wildlife zones, Agri-environment schemes, woodland, water,	Surveys to assess the quality of non-designated sites that could provide extensions to or links between existing designated and well-surveyed

		agricultural land quality, boundaries, PROWs, country parks, LA open access, proposed canal route(s),	areas. This would include areas within existing developed areas as well as areas of proposed development.
8. Landscape protection and enhancement	Historical/ Landscape, Community/SocialCommercial	OS base map, Contour lines, boundaries, woodland, SAMs, SMR, landscape character assessments, development plans.	How do the key characteristics of landscape link to areas of heritage and habitat? Locate specific areas to be enhanced to strengthen key characteristics.
9. Protection of local heritage	Historical/Landscape, Community/Social	OS base map, boundaries, woodland, common land, SSSIs, PROWS, proposed canal route(s), other community facilities, SAMs, SMR, landscape character assessments.	Enabling local groups to identify key characteristics of heritage within their area using techniques such as 'placecheck'. What are the key sites, names and routes in the area?
10. Creation of a distinct urban identity	Community/ Social, Historical/ Landscape	OS base map, boundaries, country parks, other community facilities, multiple deprivation indices, transport/traffic movements/travel to work, landscape character assessments.	As above, what is distinctive about their community, what are the key buildings, vistas/views that they would like retained and enhanced. How can key areas be developed to make better 'gateways' and meeting points within the community?
11. Links between town and country	Access routes, Historical/ Landscape, Community/Social	OS base map, boundaries, water, woodland, PROWs, Promoted non-motorised routes, Priority Greenways Routes.	What is the quality of the signage, the infrastructure and the surfaces, who are the existing users? How permeable are the built up areas leading towards open areas?
12. Encouragement of employers to locate in pleasant area, improving area for existing employers	Commercial	Development area plans, transport, traffic movements, travel to work, multiple deprivation indices,	What are the views of existing employers on the quality of their surroundings? How could the area be improved for them and their employees? What type of commercial business are you trying to attract and how doe sit relate to the residential areas?