Comhar Sustainable Development Council

Submission to the Regional Planning Guidelines 2010-2022 for the Greater Dublin Area

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Executive Summary

Comhar SDC welcomes the review of the Regional Planning Guidelines (RPG) for the Greater Dublin Area and appreciates the opportunity to give input. The overarching goal of the GDA Regional Planning Guidelines should be to achieve a good quality of life for all through the planning process. The first important step for the GDA Regional Planning Guidelines is to ensure that a strong cohesive long-term vision for the sustainable development of the region is established. The Guidelines should structure the future distribution of the population in a sustainable way that focuses on improving the population's lives and promoting well-being while dramatically reducing greenhouse gas emissions, pollution, water-use, energy use and waste. The Guidelines must also deal with cross-over between different sectors and different types of actors. Sustainable development requires strategies and actions that go beyond administrative boundaries or professional disciplines.

Planning and Development

Proposed development should be adequately appraised using appropriate sustainability, environmental, regulatory and impact assessments which consider a host of issues including the economy, social cohesion, poverty, biodiversity, environmental sustainability, climate change and transport. The incentives that key actors face need to be identified, and they need to be compatible with sustaining the social and environmental economy and environmental endowments. The 'polluter pays' principle is an important strand of such policy.

Transport and Planning

Development constructed in the present day will have an effect on resource consumption in the future. Bad transport and infrastructure planning have long-term implications that trap people into unsustainable lifestyles. The RPG needs to send a clear signal that land-use planning and transport planning will be fully integrated. Streets, squares, and green spaces should be designed to create safe routes, linked to public transport. Better design raises the quality of life, and creates places where people want to spend their time and money.

Accessibility has implications for peoples' physical and mental health, both directly and indirectly. Well planned areas with accessible services encourage people to walk, improving physical health through exercise, and have better air quality from reduced harmful gaseous emissions from cars. All development should examine the availability of essential services and should ensure that people living in the area can access them by foot. Making a car unnecessary should be a primary consideration in permitting development on a site. In the Greater Dublin Area (GDA), lower cost investment options such as improved bus services and pedestrian and cycling facilities should be implemented ahead of higher cost alternatives.

Water

In the future, the most important climate change impacts in Ireland that we will have to adapt to will be changing rainfall patterns and rising sea levels. Preventing and adapting to flooding and sea-level rise should be a pivotal factor in influencing future housing and economic development. Spatial planning should provide an integrated framework to link up vulnerability and risk assessment with adaptive capacities and adaptation responses, thus facilitating the identification of policy options and cost-efficient strategies.

Increased temperatures due to climate change will reduce water supplies, which are essential for domestic consumption, industry, agriculture and maintaining biodiversity. Economic instruments and the user pays principle should be applied across all sectors, providing strong incentives to reduce water consumption and increase efficiency of use.

To protect citizens living in coastal areas, it is crucial to integrate risks associated with coastal erosion into planning and development. In Ireland development has, in the main, proceeded in an ad-hoc manner. Coastal zone management guidelines are needed at national level.

Green Infrastructure

Good urban design provides solutions for the management of water, temperature and biodiversity. Planning authorities need to set a development framework that prioritises the provision of strategic good-quality open space for social and environmental reasons, rather than releasing it to development for economic return. A green infrastructure plan based on this assessment can help protect the spaces that are critical to adapting to climate change and providing resources for people living in the locality.

Green infrastructure can support biodiversity through providing and maintaining connected open space. An ecologist should be consulted in the development of connections to avoid any negative impacts on biodiversity, such as the spread of invasive alien species

Food production and distribution is a major contributor to carbon emissions. Local Authorities should seek to provide allotment land and space for community gardens to meet demand and encourage local food production in areas of significant new development.

We can only evaluate what we can measure. The RPG needs to generate key indicators that are measurable, directly relevant to performance, and are timely. Monitoring and evaluation needs to cover social and environmental aspects as well as financial and economic criteria. Monitoring and reporting on cross-cutting issues requires expert interpretation of properly gathered data referring to objective criteria, all carried out in a transparent and verifiable process.

Context

Comhar SDC welcomes the review of the Regional Planning Guidelines (RPG) for the Greater Dublin Area and appreciates the opportunity to make input into the consultation process. Comhar SDC believes that strong and vibrant regional authorities are essential to the delivery of sustainable development. The planned review of the National Sustainable Development Strategy in 2009 coupled with the RPG review offers the potential for mutually reinforcing the framework for sustainable development in the Greater Dublin Area.

This input from Comhar SDC is structured as follows: the first part of the recommendations describes a vision for a sustainable Greater Dublin Area and addresses general principles of sustainable development that should be included in the guidelines, and the second part is framed around the questions[1] set out in the issues paper.

Comhar Sustainable Development Council

Comhar Sustainable Development Council[2] (Comhar SDC) was established in 1999 as the forum for national consultation and dialogue on all issues relating to sustainable development. Its terms of reference are to:

- Advance the national agenda for sustainable development

- Assist in devising suitable mechanisms for sustainable development

- Advise on the implementation of these mechanisms

- Contribute to the formation of a national consensus in these regards

Comhar SDC is comprised of 25 members who are drawn from five pillars: the State sector, the economic sector, environmental NGOs, social/community NGOs and the professional/academic sector. The broad representation allows Comhar SDC to arrive at informed and balanced conclusions.

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[1] The questions from the issues paper are identifiable in italics format in these recommendations.
[2] Previously the National Sustainable Development Partnership; the name was changed in 2006.

Part I: The Vision

The overarching goal of the GDA Regional Planning Guidelines should be to achieve a good quality of life for all through the planning process. The first important step is to ensure that a strong cohesive long-term vision for the sustainable development of the region is established.

This vision should map out what the strategy wants to achieve and the overall objectives for regional planning (i.e. economic recovery, social and environmental well-being). The vision should incorporate simultaneous social, environmental and economic development that provides mutual benefits to each pillar; one pillar should not be developed at the expense of another.

The GDA Regional Planning Guidelines (RPG) should effectively manage the various development pressures and processes related to land-use, infrastructure and the natural environment. The Guidelines should structure the future distribution of the population in a sustainable way that focuses on improving the population's lives and promoting well-being while dramatically reducing greenhouse gas emissions, pollution, water-use, energy use and waste.

The RPG should address the challenges of co-ordinating multi-level governance. The Guidelines should suggest co-operation, co-ordination and collaboration activities between community, local, sub-regional, regional and national actors. The Guidelines must also deal with cross-over between different sectors and different types of actors. Sustainable development requires strategies and actions that go beyond administrative boundaries or professional disciplines.

It is important to develop a policy framework and incentive structure that responds to what we already see and know. The Regional Guidelines should think holistically about spatial and service delivery plans. Policies for economic regeneration, public service improvement and health and well-being should be mutually reinforcing and fully integrated.

What is Sustainable Development?

The term sustainable development has become more common in policy, which is certainly a positive step. One of the most common definitions for sustainable development is based in the Brundtland Commission's report *Our Common Future* (1987) - 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'. Sustainable development is, importantly, based on the three pillars of environmental, social and economic development. One fundamental element of sustainable development is the **integration** of these three pillars into thought and development processes. Comhar, the Sustainable Development Council (SDC),

has developed Principles for Sustainable Development[3] that outline the issues considered integral to sustainable development.

Recent thinking on how we measure progress contends that GDP is not a reliable indicator on its own[4]. New measures of progress that incorporate social and environmental development in tandem with economic prosperity are essential.

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[3] Available on www.comharsdc.ie
[4] See various work from the New Economic Foundation: http://www.neweconomics.org/gen/; also Brereton F., J. P. Clinch, S. Ferreira (2008) Happiness, geography and the environment Ecological Economics, Volume 65, Issue 2, 1 April 2008, Pages 386-396

Part II: *What is essential to achieving good quality of life for the residents of the Greater Dublin Area and how do we actively encourage, through regional planning processes, more sustainable patterns of development?*

The aim should be to create strong localities with adequate facilities for the people living there. All development should both be of benefit to and benefit from surrounding areas. Urban sprawl should be halted in place of strategic planned areas with adequate facilities linked to other strategically planned areas. Planners and developers should avoid building in areas that put pressure on scare resources. Proposed development should consider a host of issues including the economy, social cohesion, poverty, biodiversity, environmental sustainability, climate change and transport. Proposed development should be adequately appraised using appropriate sustainability, environmental, regulatory and impact assessments.

1. Planning and Development

Comhar SDC (2006)[5] submitted recommendations to the National Development Plan (2007-2013), many of which are applicable at the regional level and are summarised as follows. A copy of the executive summary table is available in the appendix:

- Breaking the link between economic growth, energy use and environmental pressure is a key measure of sustainability performance.
- Information and impact indicators are essential. More detail is given in section 5 of these recommendations - How can the Guidelines be best monitored?
- The incentives that key actors face need to be identified, and they need to be compatible with sustaining the social and environmental economy and environmental endowments. The 'polluter pays' principle is an important strand of such policy.
- It is important to find new, cheaper and better ways to foster excellence and to support the evolution towards the knowledge economy. An educated and informed citizenry is a pre-requisite for a fulfilled and effective society. We need also to identify the least cost means of moving our sustainability agendas forward so as to minimise the burden on the economy.
- Full employment has many benefits, but one of the negatives is that it increases the costs of engagement with family and the wider community. We need to find ways as regards living and working arrangements to allow us to participate and support the community interest.

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[5] Comhar SDC (2006) **Sustainability in the National Development Plan 2007-2013, available on www.comharsdc.ie**

- Finding ways to improve institutional linkages, effectiveness and joined-up thinking is important in improving our performance as a society. Unless the institutional arrangements for delivering policy are in place and effective, promises in the RPG will not match performance. Our interest is specifically to ensure that institutional coherence applies in regard to the sustainability brief.
- The market will not, on its own, protect key environmental and heritage endowments. The RPGs need to specifically address how market failure is to be addressed, especially with regard to key areas such as biodiversity and climate change.
- Not all good things can be simultaneously delivered - there are tradeoffs that are rarely documented or deliberated upon. Likewise, who or what organisational structures can deliver most effectively shapes performance.

Building Standards: The buildings we construct now will last between 50-100 years. This means it is essential that buildings should be able to cope with the impacts of climate change and be designed for a low carbon lifestyle. The new 2008 Building Regulations require new residential buildings to be 40% more energy efficient and meet a 40% reduction in CO_2. From 2010 new buildings will need to be 60% more efficient with the ultimate aim of achieving a zero carbon standard for new houses in the medium to long term. New buildings should also be future-proofed to be easily upgraded to higher energy and CO_2 standards in the future.

Rural Development: The rural development policy agenda is defined in the White Paper on Rural Development. The strategy calls for balanced regional development to ensure that the benefits of economic and social progress are distributed throughout rural areas. This requires investment in services and infrastructure and a focus on tackling poverty and social exclusion (Comhar SDC 2008)[6].

Poverty Proofing: As well as carrying out environmental and sustainability assessments, all plans should be poverty proofed.

National Sustainable Development Strategy: A revised National Sustainable Development Strategy is due for 2009 and the RPG/County Development Plans may need to be modified to comply.

Renewable Energy: To achieve the Government target for 40% of electricity consumption to come from renewable sources by 2020, planning guidelines must be supportive to the development of renewable projects. In cases where such projects may be delayed in securing grid connection then planning consents should be adjusted accordingly and in line with national policy. The same applies

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[6] Comhar SDC (2008) Towards A Sustainable Rural Transport Policy, Available on www.comharsdc.ie

to the provision of transmission and distribution infrastructure required to bring such projects to market.

2. Making Streets Fit for People

How should integration of land use and transport be achieved?
Planning and development that separates employment locations, shopping, services and housing locations actively promotes private car usage. Studies in the US have demonstrates that people living in suburban sprawl drive three to four times more than those that live in efficient well planned areas (IPH 2006)[7]. Comhar SDC recognised the fact that this model is not sustainable in the long-run in its recommendations on the review of the National Sustainable Development Strategy[8]. Comhar SDC also made recommendations to the Sustainable Travel and Transport Action Plan[9] and identified the integration of land use and transport as key in the development of a sustainable transport strategy. A chief recommendation is the implementation of a national road pricing scheme, which would happen at a national level and would drive better planning of development. Many of these recommendations should be implemented at the national level, but require co-operation and collaboration with regional and local authorities. The RPG should also be aligned with the findings of the wide-ranging consultation on a transport vision for Dublin to 2030 of the Dublin Transportation Office (DTO) in 2008[10].

Land Use and Planning

Development constructed in the present day will have an effect on resource consumption in the future. Bad transport and infrastructure planning have long-term implications that trap people into high carbon lifestyles. On the other hand, places designed around walking and cycling can sustain a high quality of life with a small ecological footprint. The RPG needs to send a clear signal that land-use planning and transport planning will be fully integrated.

- Land use and planning must be aligned with the National Spatial Strategy and be integrated into transport decision-making and vice-versa.
    - o Land use planning has a longer term impact on the sustainability of transport.
    - o Poor planning without heed to transport requirements has created much of the residential sprawl throughout Ireland and led to car dependency. More formal legislative requirements are needed to ensure good planning and transport integration (Comhar SDC 2008).

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[7] Institute of Public Health (2006) Health Impacts of the Built Environment: A Review
[8] Comhar SDC (2007) Recommendations on the Review of the National Sustainable Development Strategy, available on www.comharsdc.ie
[9] Comhar SDC (2008) Sustainable Travel and Transport Action Plan: Comhar Sustainable Development Council Response to Public Consultation, available on www.comharsdc.ie
[10] More information available from the DTO website: http://www.2030vision.ie/cms/

- Places need to be well connected, offering a choice of ways to get around. Walking, cycling and public transport must become attractive and easy options. Making a car unnecessary should be a primary consideration in permitting development on a site. Designs should be mixed use and pedestrian orientated, enabling residents to perform daily activities without the use of a car. Other mechanisms include keeping people away from heavy traffic and reducing speed limits and building greenways and footpaths (Cabe 2009)[11].
- Accessibility has implications for peoples' physical and mental health, both directly and indirectly. Well planned areas with accessible services encourage people to walk, improving physical health through exercise, and have better air quality from reduced harmful gaseous emissions from cars. All development should examine the availability of essential services and should ensure that people living in the area can access them by foot. Some areas may have essential services nearby- as the crow flies, but barriers such as walls, fences and cul-de-sacs may restrict peoples' access. These barriers should be reduced. Long commuting times impact on mental health, family life and social networks, with people having less time for social and civic engagement, reducing over-all quality of life (IPH 2006).
- A recent EPA report[12] found that Ireland is performing badly in terms of air quality, due to emissions from cars (particulate matter and nitrogen oxides). Traffic pollution is a major health concern. While better vehicle technology has led to a decrease in emissions from transport per person, an increase in the amount of and size of vehicles has cancelled out any overall benefits (EPA 2008). Green spaces can have a strong positive influence on health as vegetation removes pollutants- whether gas or dust related, improving air quality. Broad leaved woodland can reduce ambient air pollution by 17% (IPH 2006). They also provide more pleasant places for people to walk.

Planning Transport infrastructure

Compare SDC has carried out extensive work on sustainable transport through consultation of stakeholders and research. Some of the findings are listed below.
- We need to reduce the length and frequency of vehicle journeys. This could be through charging all users for the full social, economic and environmental cost of transport infrastructure (Comhar SDC 2007). Passenger and freight transport alternatives to road transport need to be provided in order to provide citizens with real choices when facing fiscal charges, such as a road pricing scheme. Revenues from transport fiscal measures should be hypothecated to fund infrastructure and other measures promoting sustainable transport. This involves the provision of

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[11] Commission for Architecture and the Built Environment (2009) Hallmarks of a Sustainable City, available on www.sustainablecities.org.uk
[12] Environmental Protection Agency (2008) Ireland's Environment 2008, available on www.epa.ie

- transport infrastructure and supports such as integrated ticketing, real-time information, logistical expertise, freight centres (Comhar SDC 2008).
- In the Greater Dublin Area (GDA), lower cost investment options such as improved bus services and pedestrian and cycling facilities should be implemented ahead of higher cost alternatives (Comhar SDC 2008).
- Bus and rail services should provide services driven by demand and social policy (Comhar SDC 2008).
- Prioritisation of walking, cycling and public transport, especially in city centres, is needed to encourage non-car means of transport (Comhar SDC 2008).
- Increased modal share of cycling and pedestrian commuting will require significantly more investment and institutional support than is currently available. Investment is needed in much safer cycle infrastructure separated from traffic to reduce the perceived danger associated with cycling (Comhar SDC 2008).
- Multi-criteria analysis (MCA) should be used to prioritise infrastructure investment in a transparent manner. Priority should be given to investment in transport infrastructure that is environmentally effective, cost efficient and that takes long term demographics into account (Comhar SDC 2008).
- Although congestion can be a problem at peak hours, city wide traffic demand management should also address under-capacity in the network. Increasing the load of vehicles is important in cars and trucks. A mix of uses- residential, business and entertainment- together with sufficient, suitable densities is vital to ensure adequate demand for public transport services (Cabe 2009).
- Streets, squares, and green spaces should be designed to create safe routes, linked to public transport. Better design raises the quality of life, and creates places where people want to spend their time and money (Cabe 2009).
- With infrastructure and fiscal measures designed to promote sustainable transport in place, good information is key to make people aware of the choices they face. The provision of good information can have a significant impact in reducing individual consumption and is a low cost policy measure (Comhar SDC 2008).
- Rural transport has been neglected and many geographical areas have very little regular conventional transport services. This makes it difficult for rural dwellers to travel without using a car (Comhar SDC 2008).

3. Planning for Shortage or Excess of Water

How much should the issue of flooding and sea level rise set the direction of future housing and economic development?

In the future, the most important climate change impacts in Ireland that we will have to adapt to will be our changing rainfall patterns and rising sea levels. These changes will have a significant affect on our water supply, ecosystems and agriculture, and increase the risk of flooding and coastal erosion. Overall

Ireland can expect more seasonal rainfall, with wetter winters and drier summers on average (IAE 2007)[13]. Climate change will also impact on the frequency and intensity of extreme weather. Weather events that typically occur once in one hundred years could become more prominent and a new intensity will characterise a one in one hundred year event (Greater London Authority 2008)[14]. Warmer water will impact on the frequency and intensity of sea storms and sea surges. This will have an effect on vulnerable coastal areas around Ireland (C4I 2008)[15].

These changes would have significant impacts in terms of;
- Loss of life and personal injury
- Damage to property and infrastructure and utilities
- The reliability of flood defences
- Contamination and disease from flood and sewer water
- Break up of communities and social connectivity
- Insurance costs
- Damage to land and development (Greater London Authority 2008)

From its research on adaptation to climate change[16], Comhar SDC recommends the following steps for dealing with flooding, water shortages and sea level rise:

Assessing Risk
Under the EU Flood Directive, the Government must carry out a national preliminary flood risk assessment by 2011. By 2013, flood risk maps of these areas must be produced. These will form the basis for flood risk management objectives and area flood plans.
- Land use management and spatial planning are crucial factors in this directive. Planning authorities will be obliged to conduct a flood risk assessment as an integral and leading element of development planning functions. The regional guidelines should provide some guidance on integrating this data into development plans.
- Flood management plans which incorporate inventories of risk sites which suffer the most are essential for managing flood risks. A thorough assessment of flood risk necessitates examination of where the water comes from, how and where it flows and the people and assets affected by it. It is also essential to estimate the probability of flooding occurring, to

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[13] IAE (2007) *Ireland at Risk* [Online], Irish Academy of Engineering, Available: http://www.iae.ie/pdfs/Ireland_at_Risk_Water.pdf

[14] The Greater London Authority (2008) *The London Climate Change Adaptation Strategy*: Draft Report [online], Available: http://www.london.gov.uk/mayor/publications/2008/docs/climate-change-adaptstrat. pdf

[15] C4I (2008) *Ireland in a Warmer World Scientific Predictions of the Irish Climate in the Twenty-First Century* [Online], Available: http://maths.ucd.ie/met/

[16] Comhar SDC (2008) Adaptation to Climate Change: The Challenge Ahead for Local Government, available on www.comharsdc.ie

assess the hazards that will arise and to examine the vulnerability of the people and assets in the surrounding area.
- Planning authorities in preparing regional and county development plans, local area plans, and deciding on individual planning permission in their areas should use the best possible information on flooding in the future. The OPW maintains a website which maps out areas prone to flooding to aid planners in making decisions on development. The OPW also intends to develop a flood asset register to identify walls and embankments that provide some level of flood protection, assess the level of protection they offer and assess their performance in light of predicted changes.

Spatial Planning

Preventing and adapting to flooding and sea-level rise should be a pivotal factor in influencing future housing and economic development. Spatial planning should provide an integrated framework to link up vulnerability and risk assessment with adaptive capacities and adaptation responses, thus facilitating the identification of policy options and cost-efficient strategies. Appropriate measures include:
- Utilise a sequential approach to flood risk management through first avoiding risk, then reducing risk and finally mitigating flood risk.
- Incorporate flood risk assessment into the process of making decisions on planning applications and planning appeals.
- Identify land for current and future flood management. One of the best ways to mitigate the impact of flood risk is by restoring flood plains- which can be used for recreation and wildlife habitats. Temporary pools and lakes are effective drainage mechanisms, but do require an understanding of water flows across the local landscape and the role of green spaces on those flows.
- Resist development in flood risk areas, particularly floodplains, except in certain circumstances where particular precautions are taken.
- Plan space for green infrastructure. Green infrastructure is a significant tool in adapting to climate change and needs investment. The greatest benefit will emerge from understanding how a green space network and water network interact and developing a co-ordinated strategy to address them both. The strategy needs to cover the local water catchment areas, rather than local authority administrative boundaries.
- Buildings should allow water to percolate naturally into the soil and include green roofs, permeable paving, filter drains, balancing ponds and other natural drainage solutions.

Water Storage and Usage

While Ireland has one of the highest rates of water availability in Europe, increased temperatures will reduce water supplies, which are essential for domestic consumption, industry, agriculture and maintaining biodiversity. Economic instruments and the user pays principle should be applied across all

sectors, providing strong incentives to reduce water consumption and increase efficiency of use.

- Leakage detection work is critical when it comes to protecting water supply. The Department of Environment, Heritage and Local Governments National Water Study (2000)[17] found that up to 47% of all water produced by treatment plants surveyed is unaccounted for. Other recent work shows that leakage continues to be a problem for many local authorities and shows that preventing water leakage is a practical, realistic and economic way of meeting much of the extra demand for water (Forfas 2008)[18].
- It is essential that a surface water management plan is prepared.
- Where new development is planned, careful consideration should be given to local water resources, and planning conditions applied to address any shortage
- Most rain/storm water is wasted in sewers. Rainwater needs to be captured and utilised effectively within buildings, urban gardens, parks and other green spaces. Water harvesting and storage options should be analysed. Water harvesting avoids wasting energy and generating emissions on cleaning water for irrigation.
- Water purification is an expensive process and only a minimum amount of water is used for drinking and cooking. Water re-use should be considered for appropriate applications.
- Evaluate the existing network and the capacity of foul and surface water drainage and river catchments, and levels of water availability and consumption, to see how they can accommodate the future impacts of climate change.

Non-structural defences

Structural defences can potentially raise upstream flood levels when used on riverbanks and shift coastal erosion and damage further down coastlines when used as sea defences. Soft non-structural measures use natural processes to reduce flood risks and emphasise a risk management approach. Some examples include working with wetlands, promoting sustainable land use, using green infrastructure and ensuring that spatial planning limits exposure and vulnerability.

Coastal Erosion

To protect citizens living in coastal areas, it is crucial to integrate risks associated with coastal erosion into planning and development. In Ireland development has, in the main, proceeded in an ad-hoc manner and is grounded in legislation relevant to various sectors, for example fishing, water quality and coastal protection. There are huge differences in the practices carried out by different

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[17] DOEHLG (2000) *National Water Study,* [Online}, Available from: http://www.environ.ie/en/Publications/Environment/Water/
[18] Forfas (2008) Assessment of Water and Waste Water Services for Enterprise. Available at http://www.forfas.ie/publication/search.jsp?ft=/publications/2008/Title,1361,en.php

local authorities, one the main bodies responsible for coastal management and protection.

- A coherent and integrated approach to coastal planning and management would provide a context for synergies and address potential inconsistencies between economic development of coastal zones and necessary adaptation to climate change.
- The EU promotes the Integrated Coastal Zone Management (ICZM) recommendation, which calls for a strategic approach to coastal planning and management[19].
- National guidelines are needed in Ireland on Coastal Zone Management.

4. Making Green Spaces Work for People and Wildlife

How do we actively protect the natural environment in a growing city region?
The city landscape supports many unique habitats on urban green spaces, wastelands, cemeteries, railway embankments and road verges. Biodiversity and the natural environment provide many eco-system services, such as

- Plants improve air quality by removing significant amounts of pollutants and green house gases.
- Vegetation provides shelter and shade and stores carbon.
- Human contact with nature is valuable for child development, restorative effect after stress and enhancing our sense of wellbeing.
- As climate changes occur and weather events become more erratic, urban vegetation and wetlands is becoming more important in maintaining hydrological balance.
- Soil and vegetation retain moisture much longer than hard surfaces and slow down run-off.
- Green infrastructure provides a natural cooling effect to mitigate the urban heat island, reducing the need for energy intensive cooling systems.
- Natural landscapes are important in coastal areas for erosion control.
- Green infrastructure provides pleasant environments that encourage people to use other forms of transport such as walking or cycling.
- Mature or scenic settings can add to the value of property, creating more attractive places for people to live, work and invest (UCD Urban Institute 2008)[20].

Research shows that reduced access to the natural environment can result in social isolation, obesity, chronic stress and poor air quality. The natural environment has three main affects on human- physical activity, reduces chronic stress and creates a sense of purpose and belonging. A review of the economic benefits of green space estimated that provision of green space to bring about a

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[19] European Commission (2007) *Adapting to climate change in Europe:Ooptions for EU action* [Online], Available: http://eurlex.europa.eu/LexUriServ/site/en/com/2007/com2007_0354en01.pdf
[20] UCD Urban Institute Ireland (2008) Green City Guidelines, available on http://www.uep.ie/pdfs/guidelines_page1_43.pdf

1% change in the sedentary population could have an economic value ranging from £479m to £1442m (sterling) depending on whether older people (75+) are included or excluded from the analysis (IPH 2006).

However, planning for urban biodiversity presents a number of challenges;
- High population densities
- Strong development pressure
- Competing demands on space (Cabe 2009).

What is Green Infrastructure?

Green Infrastructure is a strategically planned and delivered network comprising the widest range of high quality green spaces and other environmental features.

Designed and managed as a multi-functional resource capable of delivering those ecological services and quality of life benefits required by the community it serves and needed to underpin sustainability.

Its design and management should also protect and enhance the character and distinctiveness of an area with regard to habitats and landscape types.

Green infrastructure includes established infrastructure and new sites and should thread through and surround the built environment and connect the urban areas to its wider rural hinterland.

Consequently it needs to be delivered at all spatial scales- regional, sub-regional, local and neighbourhood levels, accommodating both accessible natural green spaces within local communities and also much larger sites in the urban fringe or wider countryside[21].

How Can We Protect the Natural Environment in Urban Areas?

Comhar SDC recently commissioned research on biodiversity and climate change in Ireland[22]. Some of the recommendations have been included below; the document provides more information on improving resilience in specific habitat types.
- Good urban design provides solutions for the management of water, temperature and biodiversity. Planning authorities need to set a development framework that prioritises the provision of strategic good-quality open space for social and environmental reasons, rather than releasing it to development for economic return. A green space strategy or green infrastructure plan based on this assessment can help protect the

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[21] Definition used by Natural England.
[22] Comhar SDC (2008) Biodiversity and Climate Change: Briefing Paper, Available on www.comharsdc.ie

spaces that are critical to adapting to climate change and providing resources for people living in the locality (Cabe 2009).

- UCD Urban Institute published the Green City Guidelines document 2008. It provides advice on integrating biodiversity into new developments, specifically medium to high density development in urban areas. The main recommendations have been organised into categories and can be found on the appendix.
- Baseline data on the distribution of species and habitats should be collected (Comhar SDC 2008).
- Climate change considerations should be considered in the management plans for the Natura 2000 network (Comhar SDC 2008) and green infrastructure plans.
- All development should undergo appropriate assessments in advance (UCD Urban Institute 2008).
- Green infrastructure can support biodiversity through providing and maintaining connected open space. Connections must be functional. Connections should be between patches of similar habitat, allow free movement of species and should not be too small or isolated to support species. However, an ecologist should be consulted in the development of connections to avoid any negative impacts on biodiversity, such as the spread of invasive alien species (UCD Urban Institute 2008).
- Designated patches should be allied with important natural features; for example river corridors, woodland and other semi-natural habitat. They should also be connected to one another through existing links or through creating additional links (UCD Urban Institute 2008).
- Designing space for biodiversity requires integration of knowledge from spatial planning and landscape ecology. Patterns in vegetation can be viewed at different spatial scales ranging from the wider landscape scale to the regional scale and smaller habitat scale. Planning for biodiversity needs to be considered at all spatial scales (UCD Urban Institute 2008; Comhar SDC 2008).
- A substantial proportion of urban green space compromises private gardens, which is beyond the influence of the planning system. Wildlife-friendly gardening methods can be encouraged through local biodiversity initiatives (UCD Urban Institute 2008).
- Food production and distribution is a major contributor to carbon emissions, so locally grown food is important. Local Authorities should seek to provide allotment land to meet demand and encourage local food production in areas of significant new development. They should also provide space for community gardens, which allow social interaction and have proven benefits for people's health and well-being (Cabe 2009).
- Comhar SDC will carry out further work on this subject in 2009 and provide recommendations to local authorities on developing green infrastructure.

5. How can the Guidelines be best monitored?

We can only evaluate what we can measure. The RPGs need to generate key indicators that are measurable, directly relevant to performance, and are timely. Sustainable development indicators should benchmark progress on the implementation of sustainable development. Comhar SDC has identified the following gaps in this area:

- In order to benchmark progress adequate baseline data is necessary. It is essential that all strategies outline what needs to be measured and where this data can be attained.
- The monitoring and evaluation of progress needs to be broadly based and cover social and environmental aspects as well as financial and economic criteria.
- Monitoring and reporting on cross-cutting issues requires expert interpretation of properly gathered data referring to objective criteria, all carried out in a transparent and verifiable process.

Comhar SDC recommends that its *Principles for Sustainable Development* would provide an ideal framework for developing or refining a sustainability bench-marking tool for policies and programmes. Comhar believes that these Principles can provide the basis for an over-arching assessment mechanism for measuring progress on the implementation of the new Regional Planning Guidelines.

- The CSO has already compiled a range of data sets and indicators on "quality of life" (e.g. *Measuring Ireland's Progress 2006)* which could be further developed and supplemented.
- The European Commission's work on sustainable development indicators should also inform the development of an appropriate methodology.
- Green Infrastructure provision should be included as an indicator under biodiversity and/or health

Appendix

Sustainability in the National Development Plan 2007-2013- Executive Summary

Activity	Challenges	Actions	Results
Agriculture and Rural Development	Income, entrepreneurship, political, environmental	Payment for environmental services, promotion of competitive advantage - invest in knowledge rich farming and rural economy, and enhanced communication, notably broadband	Pool of internationally competitive farmers in global and niche markets, dynamic off farm economy, cross compliance, high quality environmental services
Forestry	Inability of softwoods to secure high value markets, need for hardwood to produce to veneer quality, lack of transparency re environmental and recreation services	Promote Sustainable Forest Management (SFM) for small holders, identify and pay for public goods, including carbon sequestration, biodiversity conservation, and recreation services, development of forest inventory, R&D.	Softwood and broadleaf farmers who can compete, development on non-wood products and services, high quality environmental services.
Transport	More cars and freight chasing limited road capacity, with consequent rising greenhouse gas and air pollution, congestion and associated waste of time increased stress and shrinking labour pools.	Integration of land use planning and infrastructure provision with traffic nodes, increased investment in rail, busses, pedestrian and cycle ways, investment in demand side management, making roads bus friendly, join the cities outside Dublin, linked to National Spatial Strategy, research and development	Enhanced mobility for all, combined with reducing emissions of greenhouse gasses and air pollutants, reduced obesity and other sedentary health effects. Creation of cities with economies of scale and scope and enhanced global competitiveness
Energy	Increasing total and per capita consumption (electricity and transport) rising emissions, high import dependency, low use of renewables	Invest in: electricity interconnection to UK, the national grid to expand potential to 'take' more renewables, facilitate otherwise more wind power, develop potential of biomass for heat and electricity, R&D focussed on technical, economic and environmental issues, carbon storage and sequestration, Demand Side Management as top priority, focused on all investments that provide private and public gains that exceed costs, including public buildings and housing,	Ireland moves from laggard to European leader in development and implementation of renewables, and of energy efficiency.
Tourism	High cost destination demands that we move up the quality and value diversity chain to survive. Dependent	Identify carrying capacity in key areas and act on the implications. Support investment in eco-tourism	A high quality tourism product and services rooted on a resource and environmental asset base that is protected for

	on environmental endowments not controlled by the industry. Coast in particular threatened by developments	products and services, invest in implementation requirements of Waste Water and Water Framework Directive to help deliver high quality base for water related activities. Support development and implementation of Coastal Zone Strategy to ensure crucial features of the resource protected. Continue to conserve key build and natural heritage features.	now and the future
Industry	High costs and difficulties of scale and scope outside Dublin agglomeration. Need to make quality of people and place a byword, and provide constant innovation	R&D crucial to provide knowledge-based edge, reward for achieving and maintaining in independently audited environmental standards, investment in eco-parks and in high quality waste management.	Dynamic industrial sector where productivity and innovation gains exceed rise in costs, based in a high quality environment, and reducing the volume and toxicity of waste emissions over time.
Households	Achieving neighbourhoods that are safe, facilitate walking and cycling, provide ready access to employment, enable participative and informed citizens	Invest in making National Spatial Strategy a reality so new city regions and rural areas can have high quality of life and compete. Invest in information provision that is relevant, timely, and tied to location, provide resources to community groups, and skills in conflict resolution and negotiation, and resource the outcomes of the Taoiseach's Task Force on Active Citizenship	Engaged, committed, informed and empowered communities
Marine	Peaking of marine fishery, pressures on coastal spawning and other assets, limited knowledge of the marine resource, decline in some stocks.	Invest in research discovery programmes, Seabed survey, and in ocean energy research, Ireland as a landing destination, conservation of key species, notably Atlantic salmon, development and implementation of Coastal Zone Strategy.	Ireland as a leading knowledge centre in marine research, coastal communities that understand options, conserved salmon.
Sustainable Development Fund (SDC)	The need to address the many situations where there are challenges across sectors and communities that would benefit from integration to meet sustainability objectives	Invite bids on a competitive basis for projects from local authorities, enterprises, communities, NGOs that in design and execution will make a substantive contribution to meeting sustainability objectives	A growing pool of experience and achievement on the ground that epitomises best practise in regard to sustainability, including reduced pressure on environment, high quality of social and economic life.
National Spatial	Plans need to move to performance, if critical mass	All investment, but especially transport, need to support	Cities outside Dublin that are linked to the point that they can

Strategy (NSS)	is to be achieved outside the Dublin conurbation.	linkage and reduced pressure on environmental and other endowments and the provision of high levels of infrastructure at transport nodes linked to NSS	and do act as one conurbation. Reduced development pressures in the Dublin region, and improved quality of life.
Good Governance	Ensuring that organisations implementing the NDP have the requisite skills and resources to deliver major sophisticated programmes. Specification and monitoring of outputs.	Invest in whatever organisational and skill development necessary, and in ensuring there are credible and measurable indicators of performance	Elements implemented on time and within budget, with indicators that are measurable and are measured which will allow periodic adjustment as Plan implemented.
Research and Development	In most areas of the economy and society, there is a deficit in innovation and knowledge led activity. As costs rise, this will inevitably result in decline, unless the deficit is addressed.	Build on progress to expand the R&D portfolio to address all phases of activity. Sustainability should be a strand of research activity in all programmes	A society that generates and tests new ideas systematically, and converts those that make sense into services and products that enhance quality of life nationally and globally.
The Right Price Signals	Many of the key environmental and other values that are important are not traded through markets and therefore do not have a 'price'. Without such prices these ecological and other services are not given parity of esteem in the evaluation of choices	There are internationally validated techniques for developing proxy prices for goods and services not traded in markets. Investment in the development of such will improve the ability to assess value for money. Separately recognising environmental capital, as proposed in our earlier submission, is part of the process of providing coherence and transparency	Integration of environmental and other services not valued directly in markets will be incorporated into programme design and assessment across a range of sectors.
Information	As citizens, politicians, policy analysts, business people, some information that is gathered is not accessible, and other key information is not collected. This means that decisions are sub-optimal	Invest in finding out why data collected is not accessible and what gaps are crucial and need to be filled. This will provide the basis for investment.	The Knowledge society will be manifest.
Cities	Cities are the drivers of economic and cultural innovation, the hubs.	The various NDP related initiatives need to be shaped by the city leaderships to ensure that the whole is greater than the sum of the parts.	Dynamic and successful cities, economically, socially, culturally and environmentally.
Environmental Endowments	We have key requirements to meet in regard to Wastewater, Water Framework, Biodiversity, Air quality and Wastewater Directives	It makes sense financially and environmentally to meet these as integrated components of sectoral policy. So each sectoral investment programme should be 'scanned' and action taken where opportunity arises.	Move towards environmentally sustainable performance; meet EU targets in time, and at minimum cost.

Green City Guidelines

Trees and Hedgerows
- Tree lines, hedgerows and trees are important for maintaining and enhancing connectivity.
- Mature trees are beneficial in terms of providing a habitat for other species, storing carbon and due to their aesthetic value.
- New trees need to be of the right stock. Large deciduous trees have particular value in cooling the air, shading buildings in the summer and capturing carbon.
- Native tree species should be planted above other species.
- Clusters of trees provide more shelter and internal habitat.
- The eventual size of the individual trees in relation to the green space and buildings should be considered.
- Woodlands take time to develop and should consist of layered vegetation-canopy of mature trees, shrub and leaf litter/fungi/micro-organisms.
- Hedgerows are important as a habitat and for connectivity.
- Native hedgerows should be used where possible. Non-native wildlife friendly hedges should be used in consultation with experts
- Careful planning in hedgerow planting can supply year long food for wildlife.
- Thorny hedge species can discourage anti-social behaviour.
- Scrub is an excellent food source for wildlife.

Grass
- Tight cut grass, trimmed hedges and mulched borders are not good for biodiversity and should be diversified through native shrub planting and allowing natural ground flora to develop.
- Green road verges should be encouraged.
- The mowing regime should be altered to provide areas of long grass, which provides a more varied habitat.
- Amenity grass land for recreation and sport has limited benefit for biodiversity.

Animals
- Birds are a good indicator of biodiversity and frequent surveys should be carried out to count the number of bird species and if they breed there.
- Bat boxes should be placed in appropriate locations.
- New roads should provide an underpass for animals.

Water
- Avoid building on floodplains. Incorporate these features into the design and use them as flood protection and water management features.
- Sustainable Urban Drainage Systems should be utilised.
- Use permeable surfaces as opposed to hard surfaces. Install grassed

swales to convey surface water run off and treatment basins ponds and/or reed beds that receive run-off before discharge to a watercourse.
- Water features are an excellent way to encourage biodiversity and should incorporate streamside vegetation. Water features should contain zones of vegetation from marshy ground along the edge to emergent species within shallow fringe and floating and submerge species in deeper water.
- Plant only native species as other species can be easily spread in water.
- Watercourses should be maintained as close to their natural state as possible.
- Maintain a buffer of semi natural vegetation around the pond to avoid run-off and extensive nutrients entering the pond.
- Create islands within water features.
- Avoid contaminating or damaging wetlands and adjacent designated sites.
- Create open drainage ditches instead of underground pipes where appropriate.

Connections
- Connectivity must be done on a case by case basis. It is effective at the local level where there is good knowledge of species and habitats.
- Connectivity conservation requires a policy and regulatory regime, incentives and awareness raising.
- Enhance existing corridors. Existing linear features such as hedgerows, linear woodland, streams, road verges and tree lines within the landscape form the basis for a network of wildlife corridors and habitats. New developments provide the potential for enhancing existing connections or create new ones where none exist. All new developments should seek to integrate within the existing network.
- Stepping stones can be created using patches of habitat.
- Use trees, hedgerows and stream as connections.
- Use additional planting to diversify or connect existing habitats.
- Transport corridors should be used as wildlife corridors.
- Back gardens should be well-designed and should be adjacent to each other, back to back providing a continuous connection.

Incorporating new development
- Incorporating natural features into development increases the value of the properties.
- Identify planning policy that can overlap with or support biodiversity.
- Areas of semi natural habitat should be incorporated into the development where possible. Develop on areas of low biodiversity value and provide more open green space in areas of higher.
- Habitats such as scrub, woodland, mature trees, tree lines, hedgerows and streams can be retained to help maintain the original character of the surrounding landscape.
- Where new development abuts existing patches such as the golf course,

graveyard or patches of mature gardens it presents an opportunity to effectively expand the existing area by creating new areas of open space adjacent to existing ones. This effectively expands that existing patch and provides additional habitat for wildlife.

- Create new habitats. Each new development should seek to enhance the biodiversity of the site. Where new development occurs on land of low biodiversity value there is very high potential for enhancement. Habitats such as ponds, which are vital for wildlife and limited in the surrounding area, would make good enhancement measures.
- Use species appropriate to the physical and environmental conditions.
- High density development provide enormous potential for incorporating green walls which support climbing species and provide habitat and food for certain species. These features need to be incorporated into the design of the building.
- Leave deadwood under trees and in suitable places.

Soil
- Create and maintain low nutrient levels in the soil, high nutrient levels only support a limited number of species.
- Re-use top-soil from grasslands with good species richness to encourage natural vegetation in the re-development.

Other
- Slanted area encourages more diversity as it provides wetter and dryer areas.
- Grade habitats (e.g. from mowed grass, to long grass to woodland).
- Use wildflower seeds of local provenance where possible.