

# The Convenient Remedy: Cities and Sustainability

## CNU XVI, April 2008

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# The Prince's Foundation

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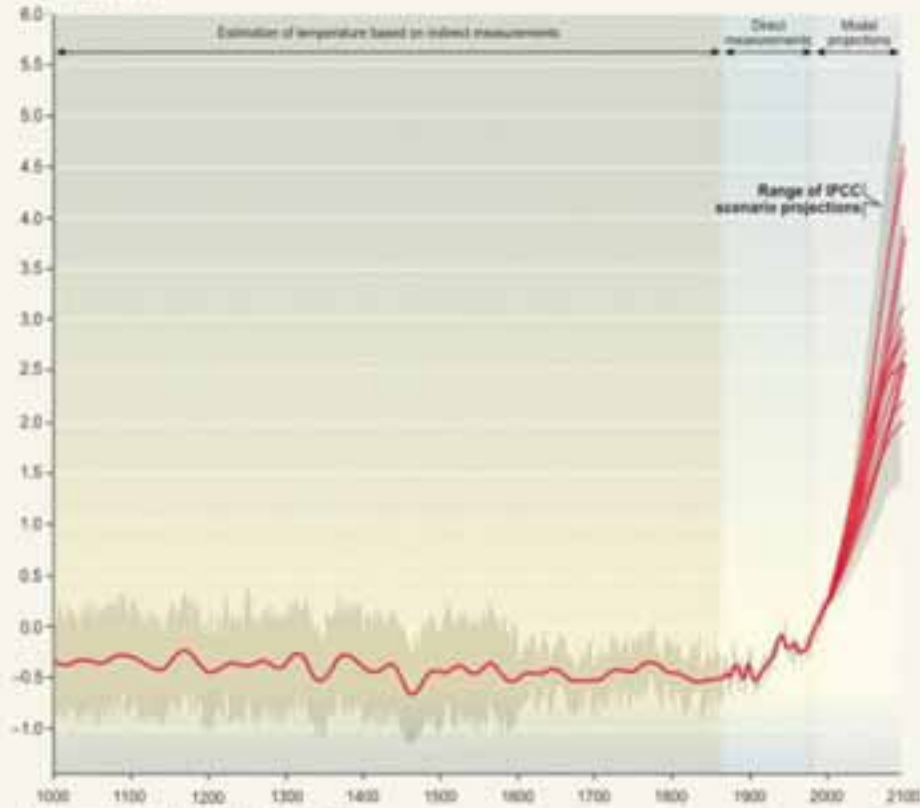
The Prince's Foundation for the Built Environment is an educational charity founded by HRH The Prince of Wales to improve the quality of people's lives by teaching and practising timeless and ecological ways of planning, designing and building. We are one of 24 charities for which the Prince of Wales is President, together we comprise the largest multi-cause charitable enterprise in the United Kingdom.



### HISTORICAL AND PROJECTED VARIATIONS OF EARTH'S SURFACE TEMPERATURE

Estimated global temperature averages for the past 1,000 years, with projections to 2100 depending on various possible scenarios for future human behavior.

Differences in temperature in °Celsius from the 1990 value



Source: Intergovernmental Panel on Climate Change 2002

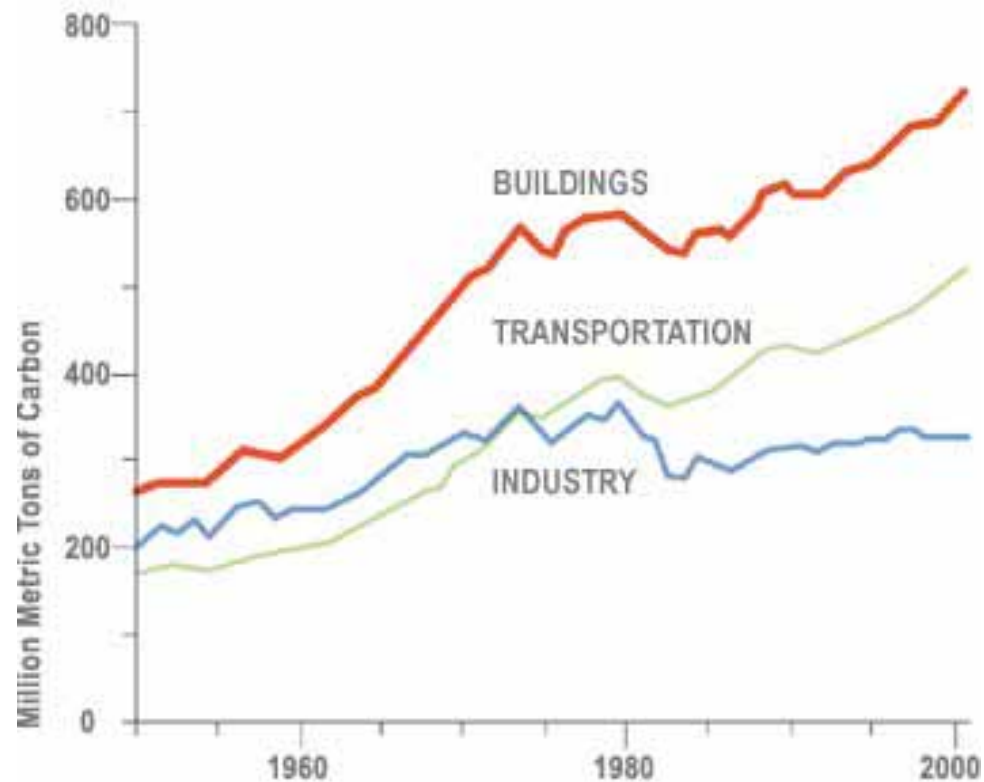
# Tewkesbury, July 2007

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# The Built Environment and Carbon Emissions

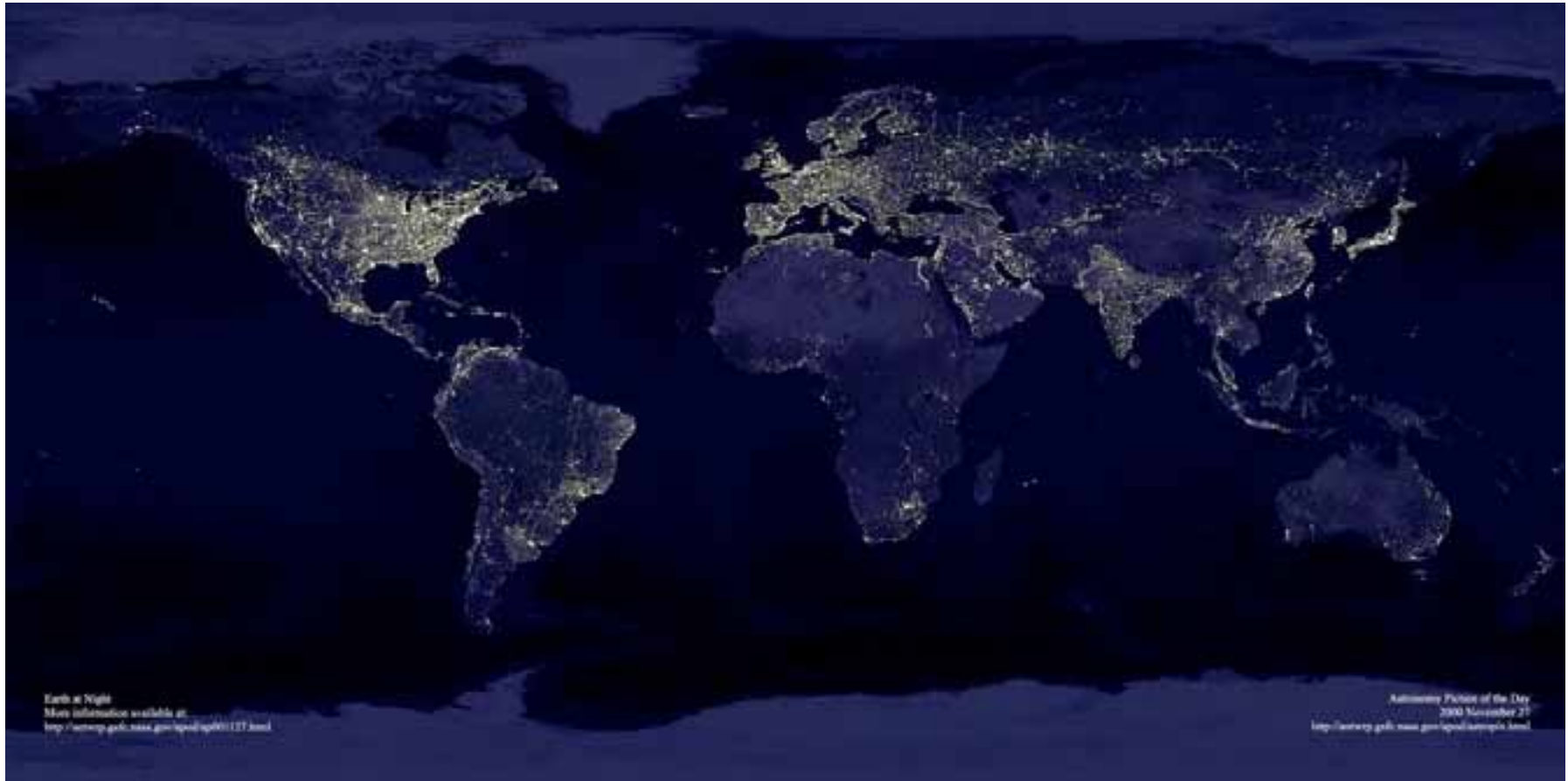
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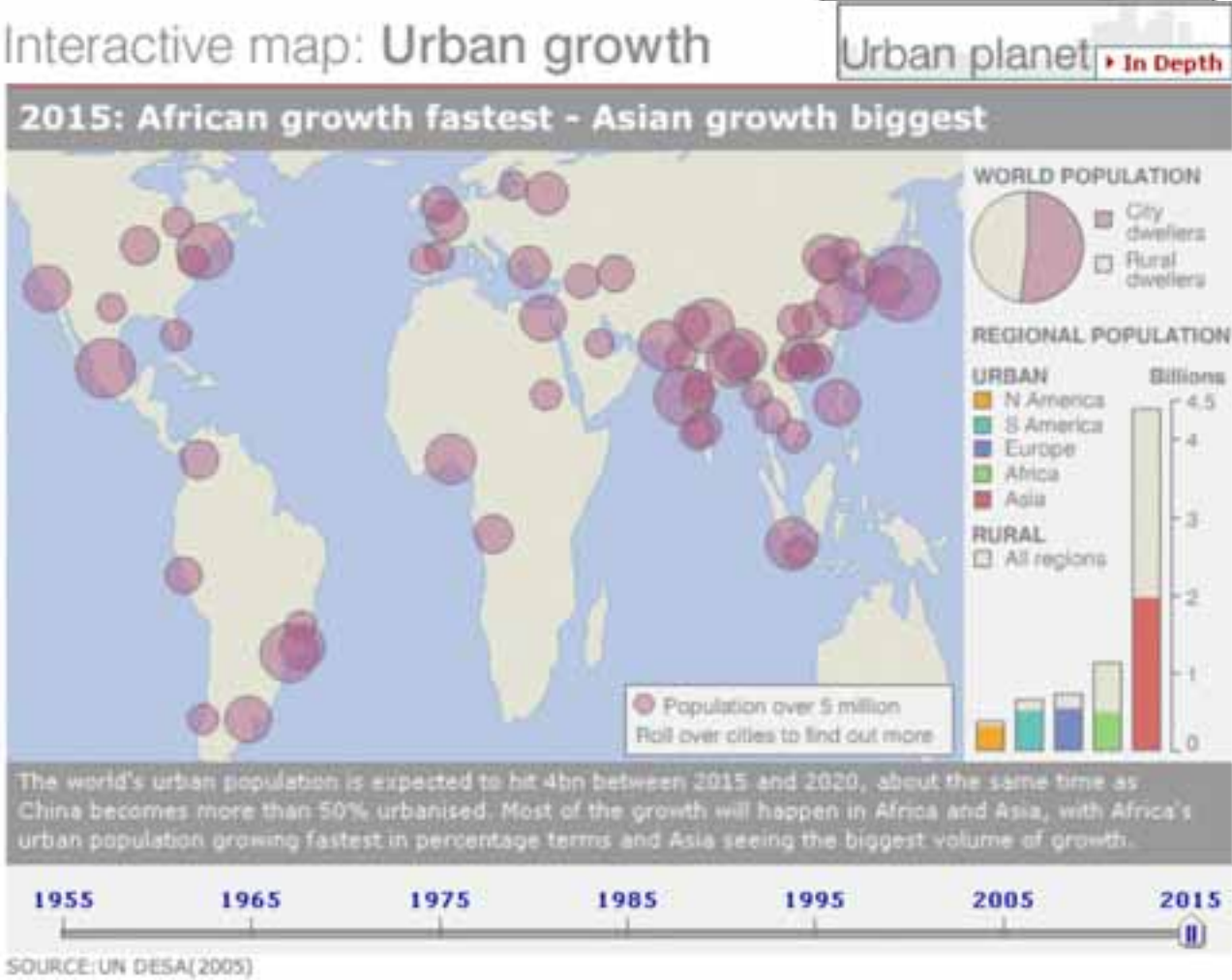
Ed Mazria, Architecture 2030 Challenge, 2007

## 2.1 Billion More People In Cities by 2030

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# World Urban Population 1955-2015



# Millennium Development Goals: Poverty





## Slums and Mega Cities

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“There are two cities within one city – one part of the urban population that has all the benefits of urban living, and the other part, the slums and squatter settlements, where the poor often live under worse conditions than their rural relatives.”

Anna Tibaiuka,  
Executive Director, UN

Habitat, 2007



# Millennium Development Goals: Carbon



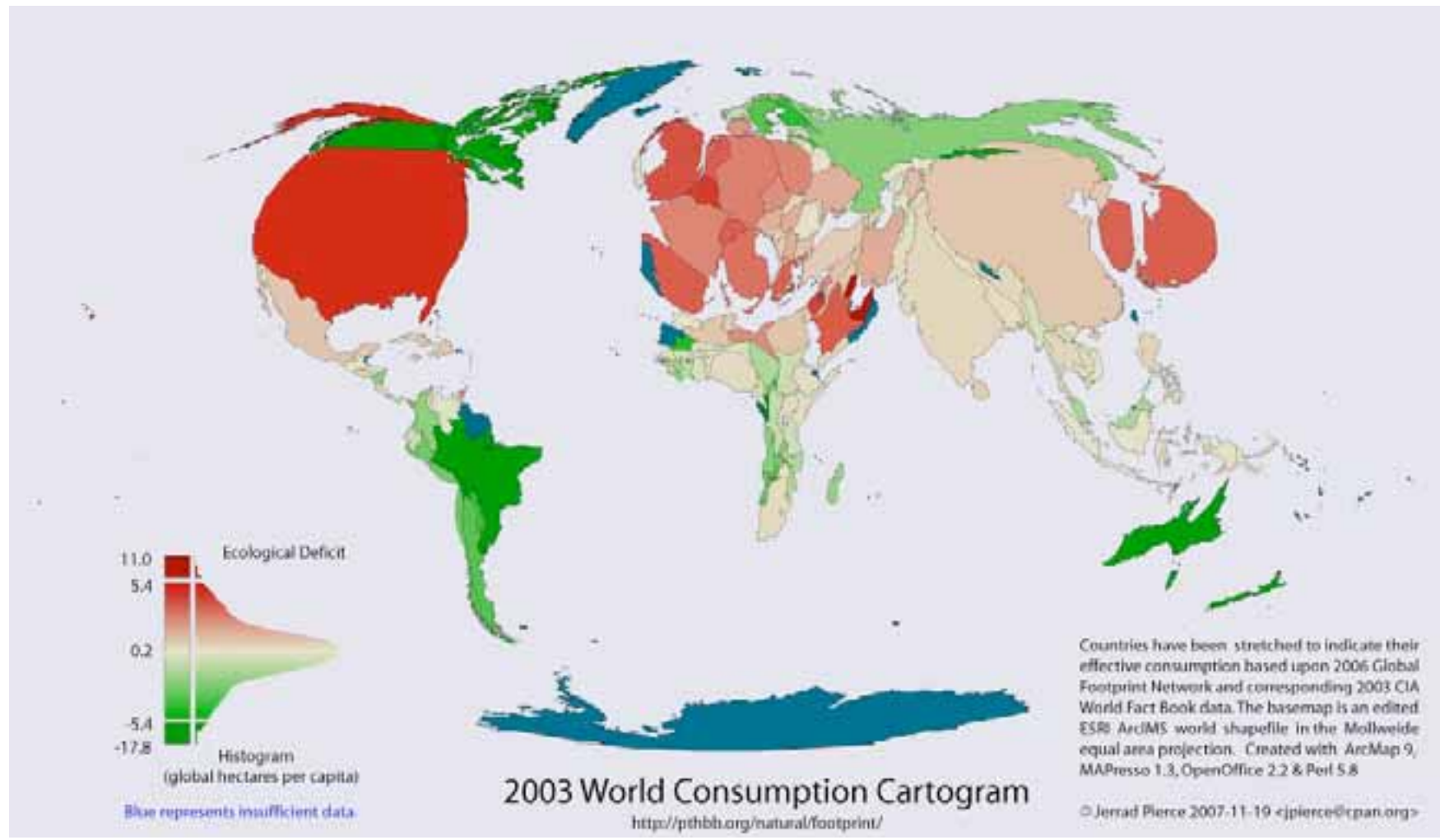
# Sea Level Rise

**Table 1: Per Cent of Population and Land Area in Low Elevation Coastal Zone by Region, 2000**

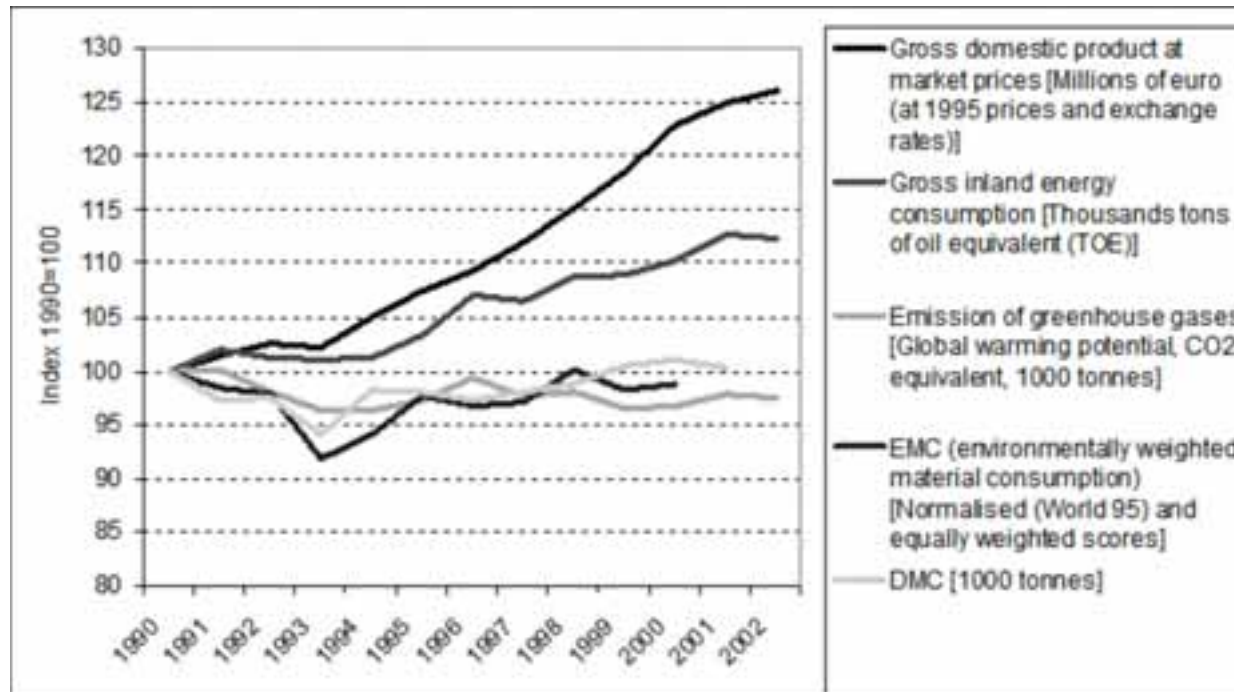
Region	Shares of region's population and land in LECZ			
	Total Population (%)	Urban Population (%)	Total Land (%)	Urban Land (%)
Africa	7	12	1	7
Asia	13	18	3	12
Europe	7	8	2	7
Latin America	6	7	2	7
Australia and New Zealand	13	13	2	13
North America	8	8	3	6
Small Island States	13	13	16	13
World	10	13	2	8

**Source:** McGranahan, G., D. Balk and B. Anderson. Forthcoming. "The Rising Risks of Climate Change: Urban Population Distribution and Characteristics in Low Elevation Coastal Zones." *Environment and Urbanization*.

# Ecological Footprint



# Decoupling GDP & Consumption from Environmental Impact



Source: European Commission, 2005.

## Implications for CNU

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- It is one “interrelated community building challenge” after all -- sustainability is not just about energy conservation and efficiency, but also about poverty, sanitation, health and prosperity.
- Better urbanism offers the opportunity to help decouple resource use and pollution from better living standards.
- We can't leave out architecture, materials use and building technology and practice.
- For world wide application, solutions should be flexible, adaptable, simple, natural and resilient.

## Some Work of The Prince's Foundation

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- Density and tradition : tackling climate change in a London suburb
- Eco towns and Eco Cities: lessons from Sherford
- With trepidation and humility: tackling urbanisation in Kingston, Freetown, Kabul and Beijing
- Green buildings: a middle path

# Density and Tradition: Walthamstow Town Centre

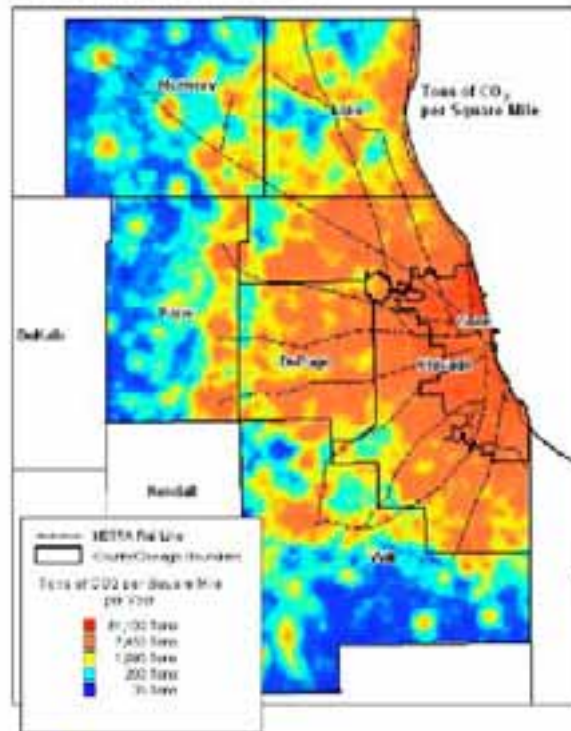




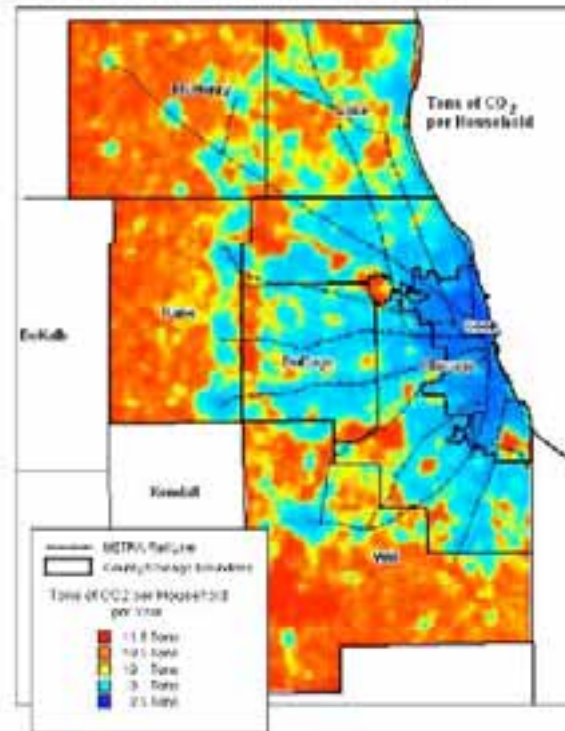
# Chicago Metropolitan Area

## Two Views of Cities and CO<sub>2</sub> CO<sub>2</sub> Generated by Automobiles in the Chicago Region per Year

**Traditional View:**  
Cities produce large amounts of GHGs.



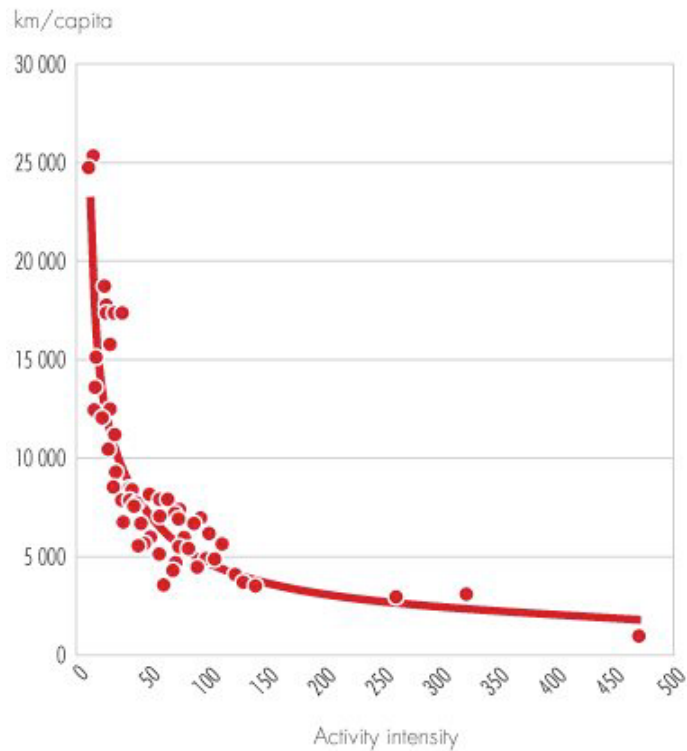
**Emerging View:**  
City dwellers produce relatively low amounts of GHGs.



Each color represents one fifth of the land area on each map.

# Energy Use Reduces in Denser, Mixed Use Places

Figure 2.5 Activity intensity versus per capita personal car use in 58 higher income metropolitan areas around the world



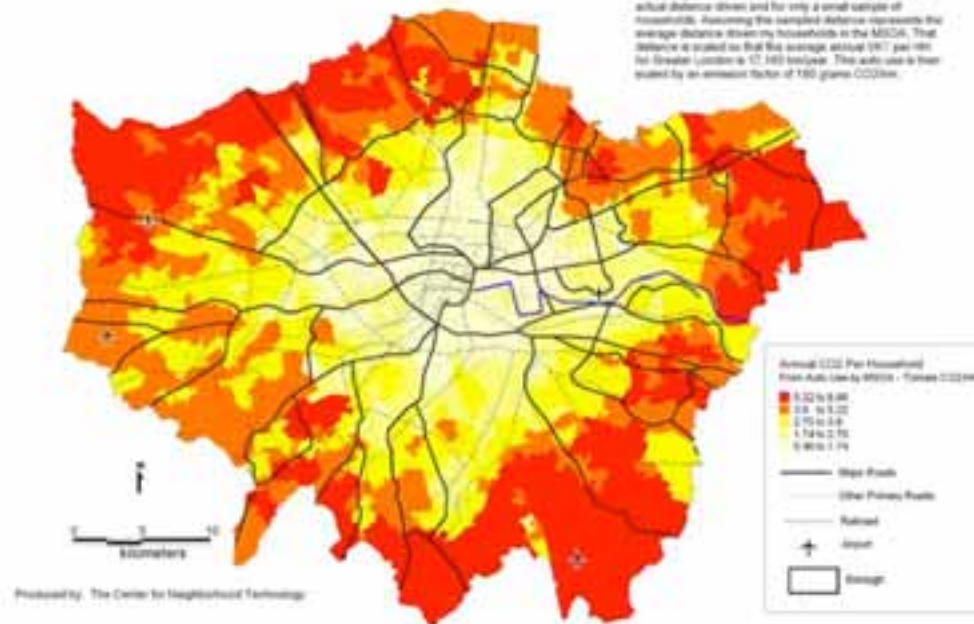
Note: Activity intensity is defined as the number of jobs plus the number of people per urban hectare.

Source: Newman and Kenworthy 2006

# CO2 from Auto Use in London

## CO2 From Auto Use in Greater London: City Dwellers Produce Less GHGs per Household

Based on the London Area Transportation Survey for 2001, which only measured the direct distance of any trip not the actual distance driven and for only a small sample of households. Assuming the sampled distance represents the average distance driven by households in the MSDA, that distance is stated as that the average annual VKT per HH for Greater London is 17,160 km/year. This auto use is then scaled by an emission factor of 190 grams CO2/km.



# Precedent Analysis

50,000 people use Walthamstow Central Station each day



400m radius:

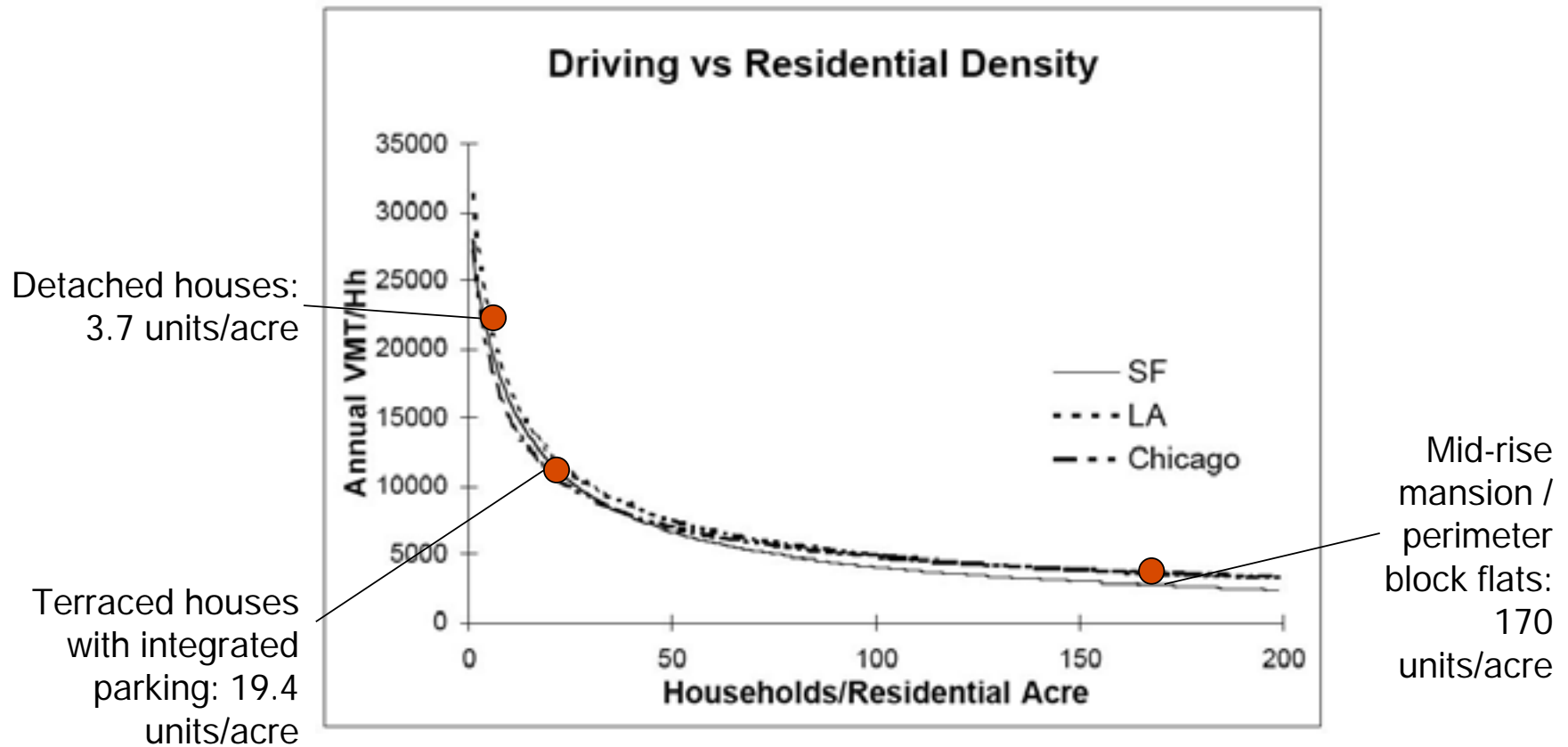
Swiss Cottage 4,000 dwellings

South Kensington 2,500 dwellings

Walthamstow 1,500 dwellings



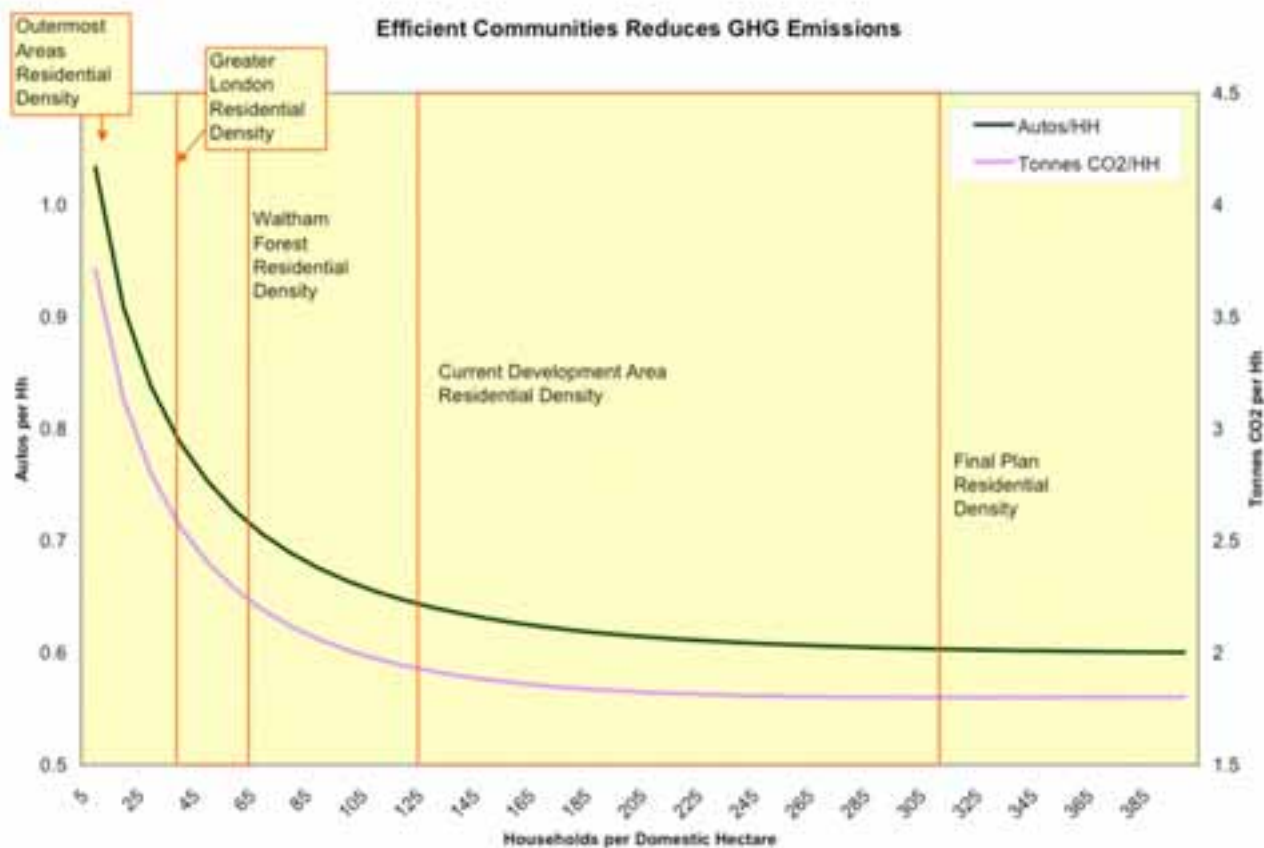
# Location Efficiency



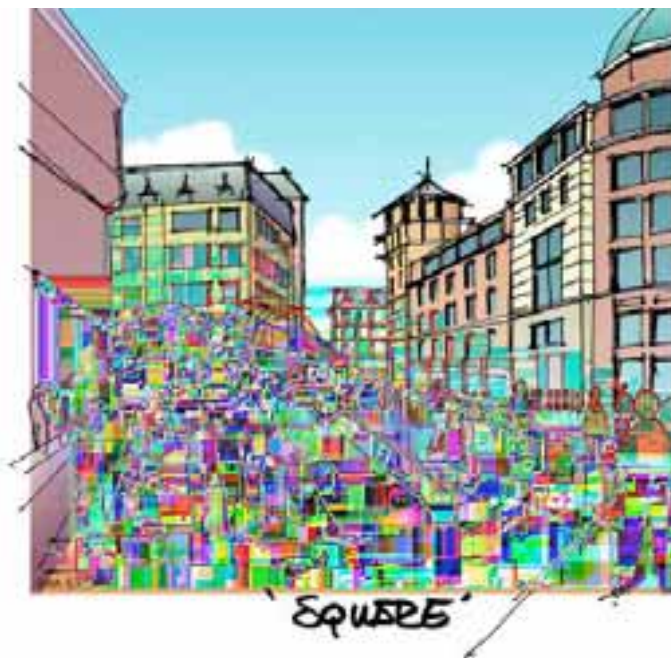
# Master Plan: Massing



# Climate Impacts of Master Plan for Walthamstow



2438 new households resulting in up to a total CO2 emission reduction of 4,654 tonnes



Seth Harry Associates, 2007



# Sherford Sustainable New Community

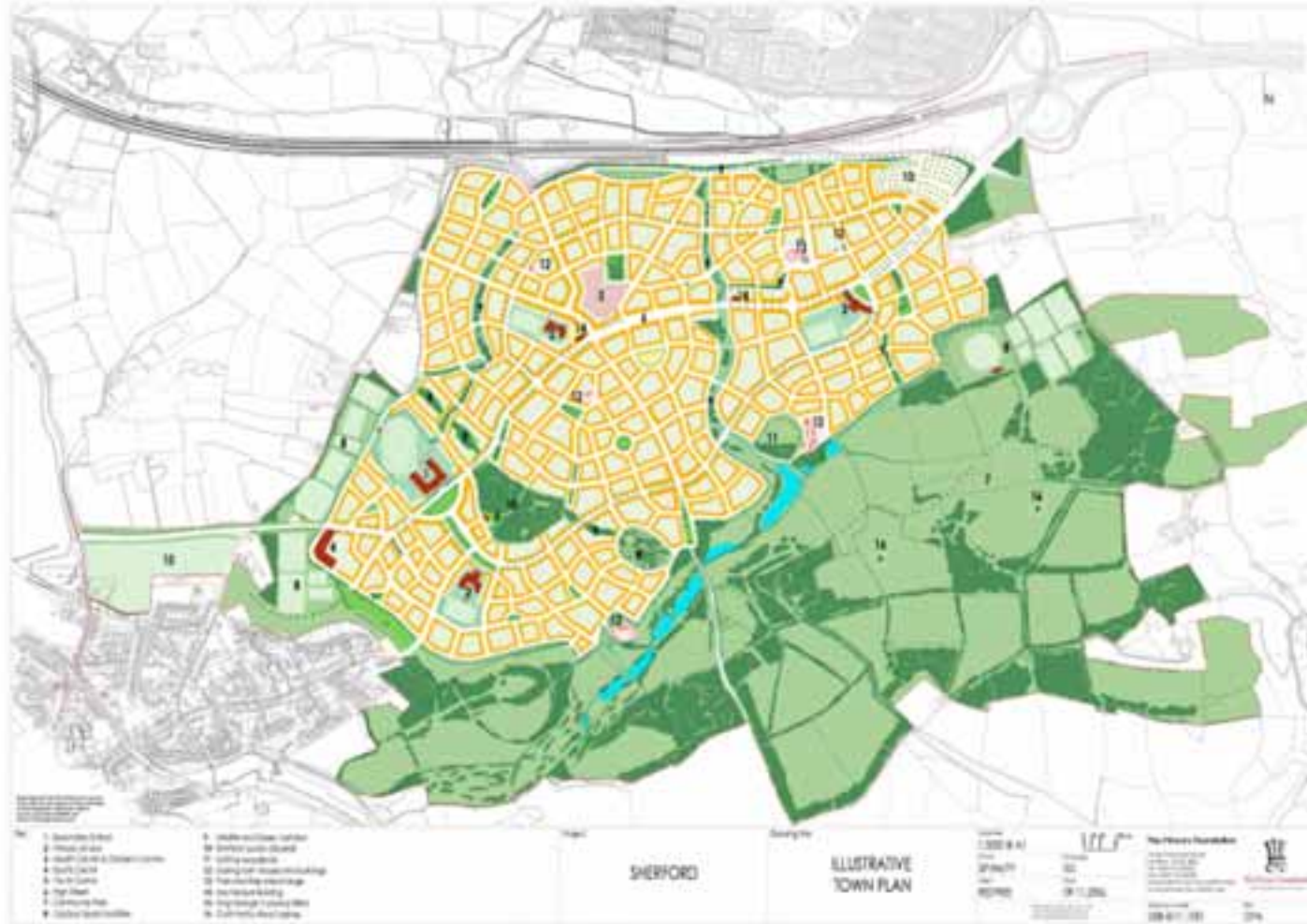
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New community with 5500 homes, town centre with retail and employment, up to 50% affordable, rapid bus connection to centre, eco home excellent, 50% renewables, green structure, local food and materials policy.

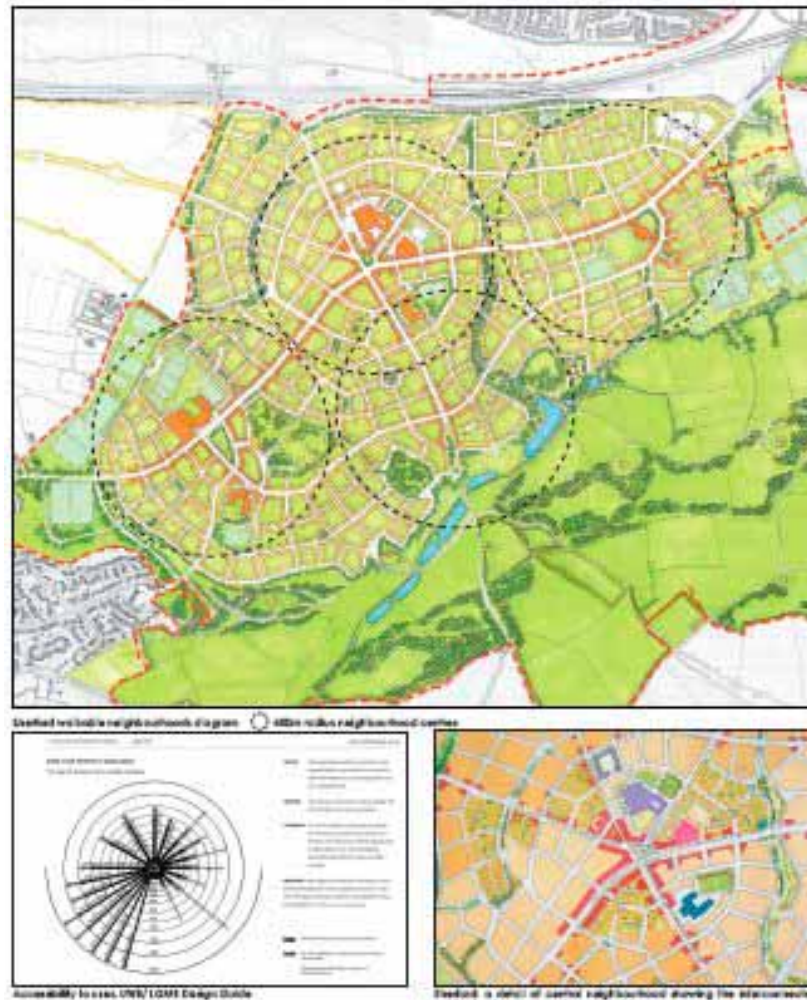
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# Sherford Master Plan



Prince's Foundation with Paul Murrain

# Neighbourhood Structure for Sherford



# Sherford Sustainability Review by BRE

## Performance summary

Development: Sherford, South Hams

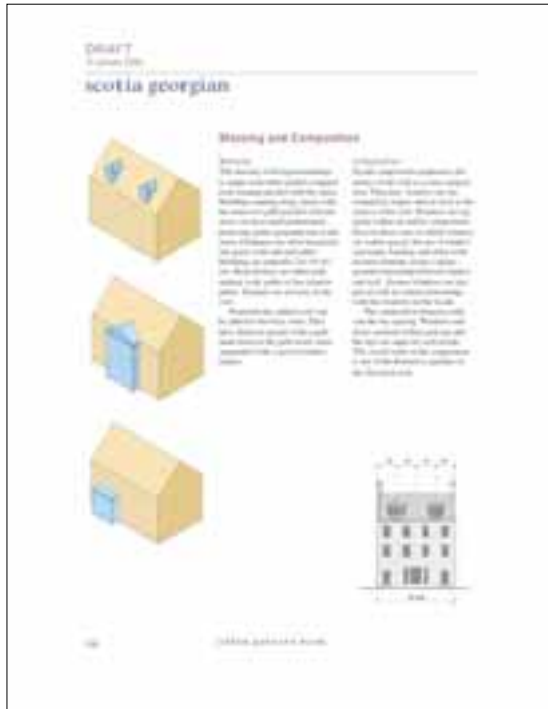
Date: 23<sup>rd</sup> November 2006

Sections		Number of Credits Achieved				Maximum possible score	Actual score achieved	%
		Best	Good	Minimum	Not Met			
1	CLIMATE CHANGE AND ENERGY	10	4	1	1	14.05	11.53	82%
2	SUSTAINABLE CONSTRUCTION	5	5	4	0	11.3	7.93	70%
3	COMMUNITY & SUSTAINABLE LIFESTYLES	5	1	0	1	6.4	5.10	80%
4	PLACEMAKING	6	7	2	0	13.2	10.12	77%
5	TRANSPORT	10	2	1	0	11.35	10.29	91%
6	ECOLOGY	6	1	0	0	5.65	5.44	96%
7	BUSINESS	1	1	2	0	3.85	2.26	59%
<b>TOTAL SCORE</b>		<b>43</b>	<b>21</b>	<b>10</b>	<b>2</b>	<b>65.80</b>	<b>52.66</b>	<b>80%</b>

Overall Performance Rating: **Excellent**

Table 1: Sherford Performance summary Table

# Ellon, Scotland



Prince's Foundation and Urban Design Associates for Scotia Homes, 2007-8

# International Work of The Prince's Foundation

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## Priorities:

- Responding to explosion of urban population and slums
- Dealing with both climate change and Millennium Development Goals
- Rediscovering traditional urbanism and vernacular approaches to climate, ecology, and local materials
- Adapting to climate change and sea level rise.

# Freetown, Sierra Leone



## Hutongs, Beijing

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The Prince's Foundation is working with Tsinghua University to develop a regeneration strategy for the Dashilan hutong district of Beijing, preserving its sustainable form and relieving overcrowding and lack of sanitation and other facilities.



## Kabul, Afghanistan



For the Turquoise Mountain Foundation Douglas Duany has prepared a master plan for Murad Kkane, a mud brick neighbourhood in Kabul.



## Jazan, Saudi Arabia



In Jazan, Saudi Arabia, The Foundation held an Enquiry by Design for a mixed-use, mixed-income neighbourhood in December 2007. The project, on land owned by the King's Foundation, will reintroduce principles of traditional architecture and urbanism to the Kingdom.

## Rose Town in Kingston, Jamaica



In Rose Town, Jamaica, a neighbourhood plagued with gang violence, the Foundation has been working to restore civil society with local partners, to develop a neighbourhood master plan, with DPZ leadership, and create a mixed use economic revialisation strategy

## Rose Town

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The project will focus on both new and rehabilitated housing, as an alternative to tower blocks.

# Experimenting with Simple, Natural Building Systems

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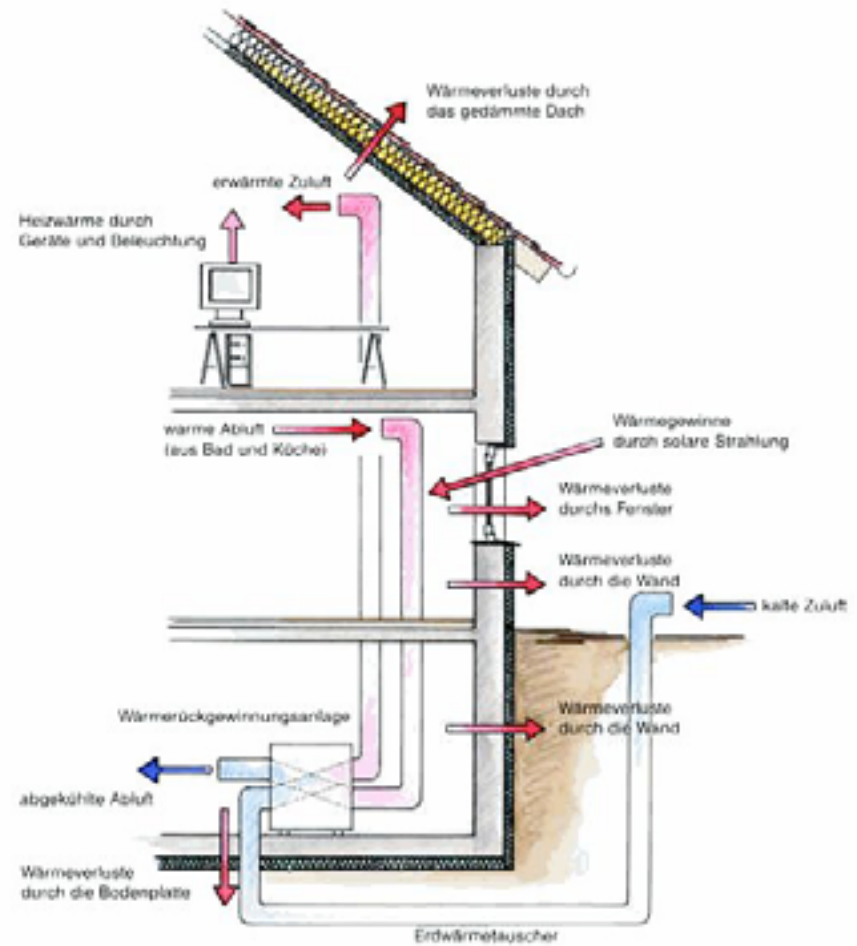


## Ecohome Award 2007: Which Upton building won?



A: All of them; they all meet the same standard!

# Current Approach To Zero Carbon: Wall Section of "Passive House"



# Prince's Foundation Summer School at Lincoln Cathedral

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# Aerated Clay Block Prototype



# Hempcrete Wall



## Building Research Establishment “Innovation Park”

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Prince's Foundation "Good Home" to be built here. Specification: aerated clay block and render, materials must come from the ground or be grown. Partner with BRE, Swan, NBM.

