

## Module 9: Historic Assets and Climate Change

### Is conservation of the historic environment a sustainable activity?

**Derek Latham**

Dip Arch RIBA Dip T&CP MRTPI Dip LD MLI  
HonDPr AABC IHBC IHA FRSA

Architect / Planner / Landscape Architect  
Conservation Architect  
Urban Designer  
Enabler



- Introduce myself

## Agenda

- The relative values of old buildings vs new buildings – questionnaire
- The importance of our heritage
- Historic buildings as a sustainable resource
- Answers to relative values of old buildings vs new buildings
- National data sources
- Traditional building materials

### Break

- Insulation materials and heating – roofs and floors, breathing walls and sealed insulation, building pathology
- Increasing efficiency and reducing carbon emissions in old buildings
- Design review case study
- Questions

## Built Heritage

### **Product of past climate and human use:**

- Geology – for building materials – Seismic and Climate
- Topography – Created by weathering
- Flora – result of geology
- Locational factors – slope, springs, shelter, cultivation, minerals
- Create underlying character of the building –
- Together with human activity, needs, pride, fashion, progress

## Policy contexts

**'A building, monument, site, place, area or landscape positively identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. Heritage asset includes designated heritage assets and assets identified by the local planning authority (including local listing).'**  
Annex 2 Glossary NPPF 2012

Heritage assets hold meaning for society over and above its functional utility (PPS5 companion guide para 11). This is what justifies its protection in planning decisions.

## The historic environment

### Nationally designated assets

- Listed buildings – grade I, II\*, II
- Scheduled Ancient monuments
- Natural heritage
- World Heritage Sites
- AONBs National Parks
- Registered Parks and Gardens

Designated assets have reached a threshold that demonstrates their significance

## The historic environment

### Local designations

Conservation Areas

Local lists and County treasures

**“some non designated assets such as buildings of good local character or sites of archaeological interest, are of heritage significance but not at a level that would pass the threshold for national designation.... The desirability of conserving them and the contribution their setting may make to their significance is a material consideration....”**

PPS5 Practice Guide

## Historic Assets and Climate Change

### Key national guidance references:

#### **NPPF**

S10 Meeting the challenge of climate change, flooding and coastal change

#### **Together with**

S12 Conserving and enhancing the historic environment

**PPS5 Practice guide** – still in place and recommended source of information on the subject. Includes section on Heritage Assets and Climate change but all applies.

***The climate change impacts on historic buildings can be considered the same as for others – greater temperature fluctuations, flooding, drainage etc.***

Much of this presentation reiterates messages in these documents but you need to use them. We are looking at the practical considerations



## Module 9.2: Importance of our Heritage

## Response to Location



Our ancestors would have taken many factors into account before deciding to build. The drainage of the ground would have been a key element, plus the presence of a shelter belt of trees, essential in mitigating wind-chill factor.

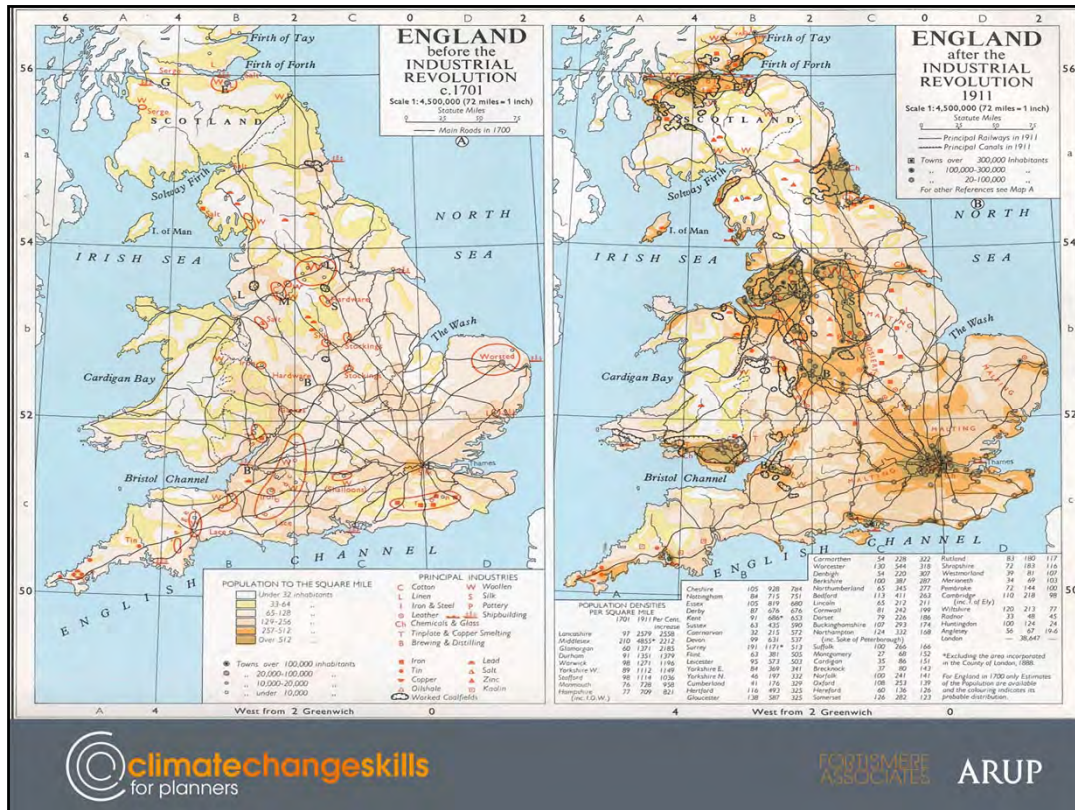
What many recent occupiers do is to modify the landscape so that features like this are removed.

By the same token the availability of water, a river or brook, was not only essential for human and animal life, but the amount of it falling from the sky, be it great or small also determined the nature of the shelter.

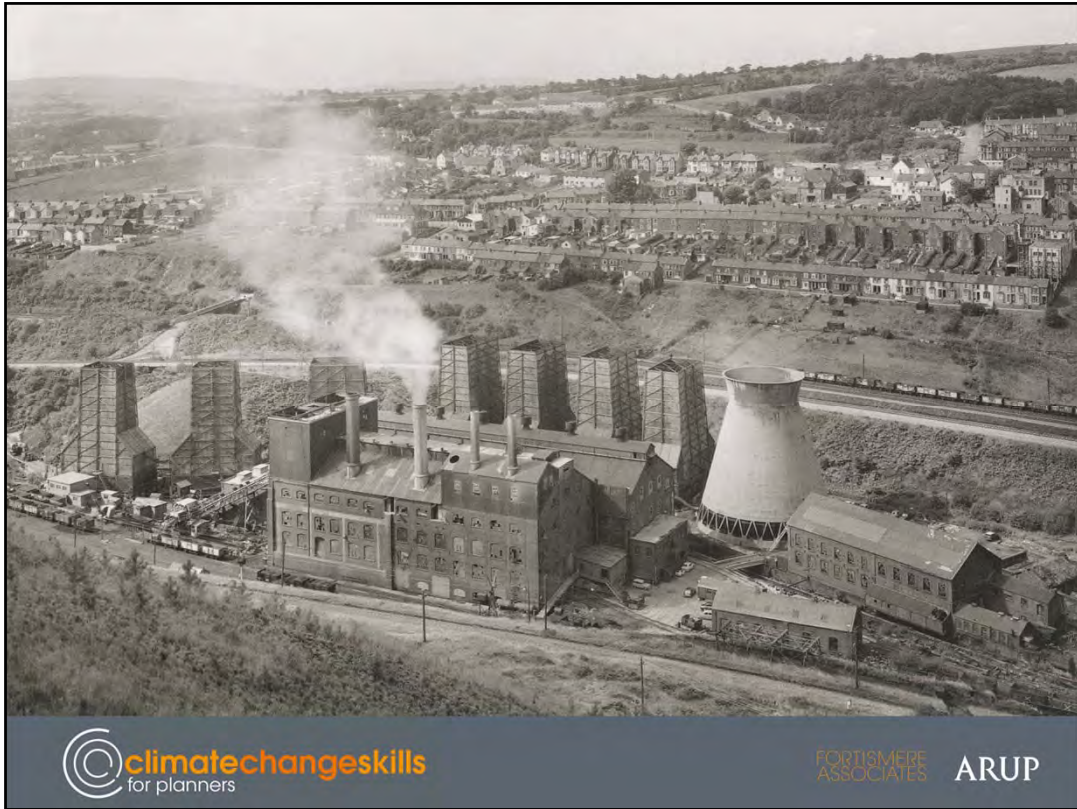
## Conservation is more than protection and enhancement



Conservation is more than just protection and enhancement. We need to look our country holistically identifying what is of heritage value and how we and take the dynamic created by our past, sustainably into the future



We can usefully divide our heritage into pre and post industrial revolution. The post Industrial revolution development still dictates where we build and develop in order that we maximise the use of the transport links we have inherited and protect as much as possible of our undeveloped countryside



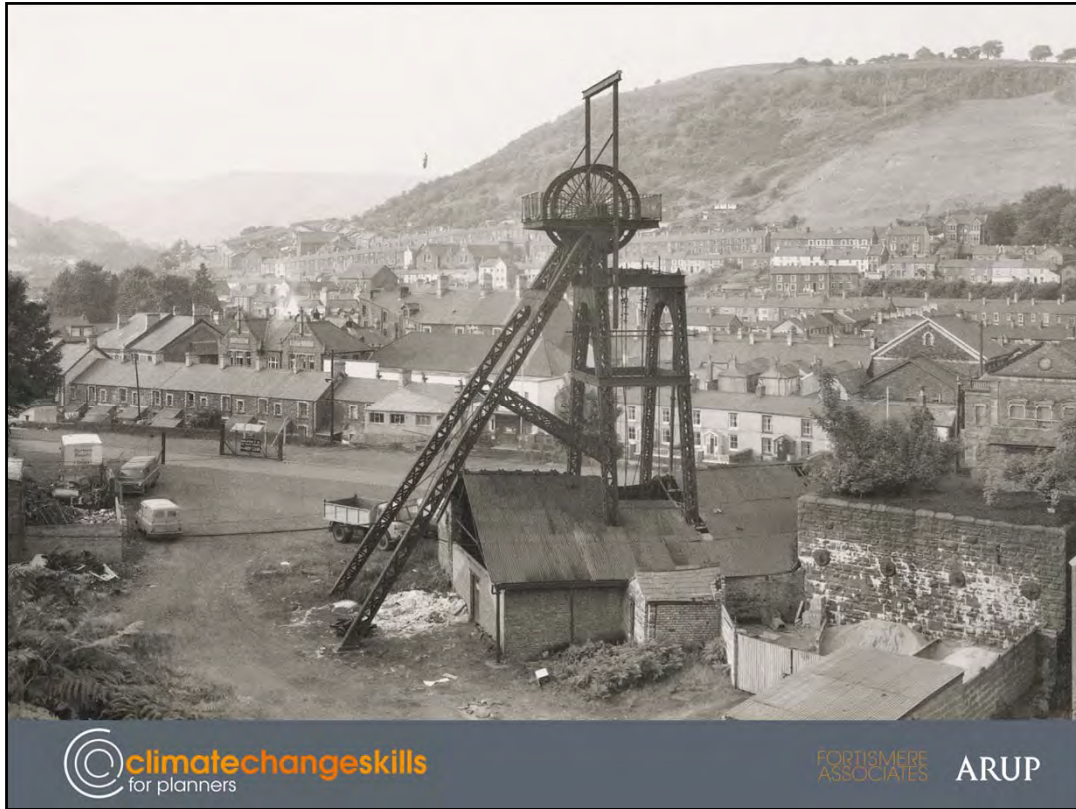
 **climatechangeskills**  
for planners

FORTSMERE  
ASSOCIATES **ARUP**

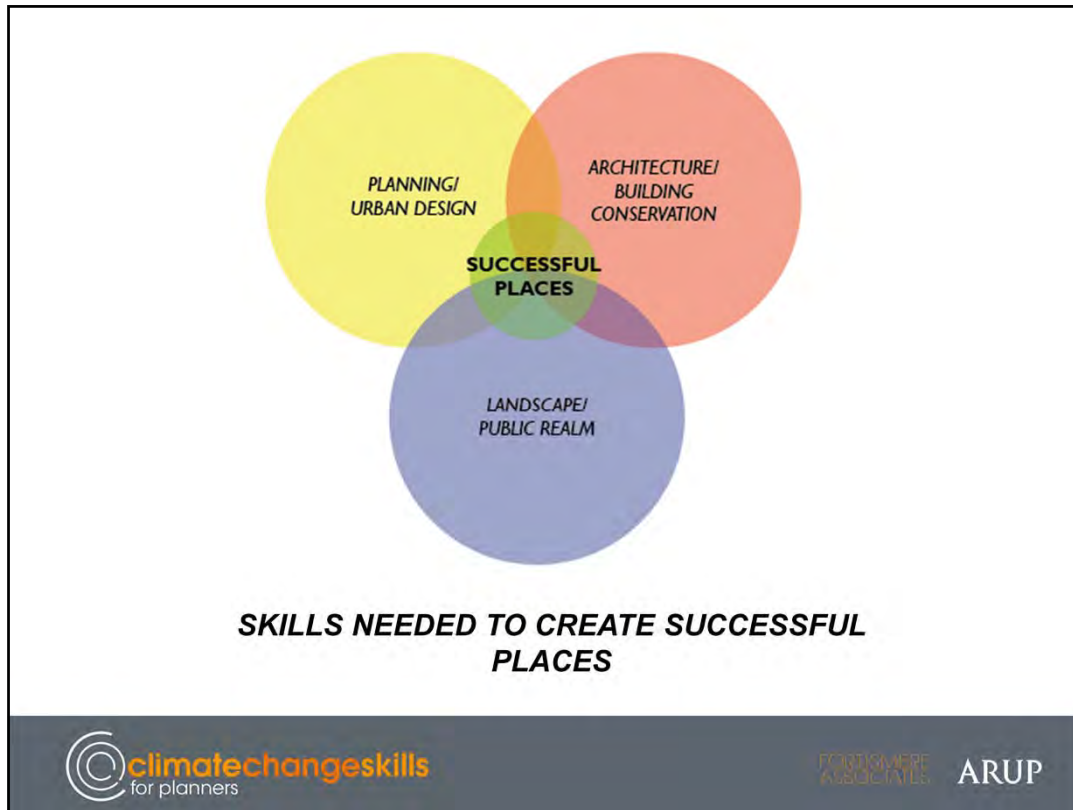
The industrial revolution left us with a legacy of scarred landscape -



and dereliction

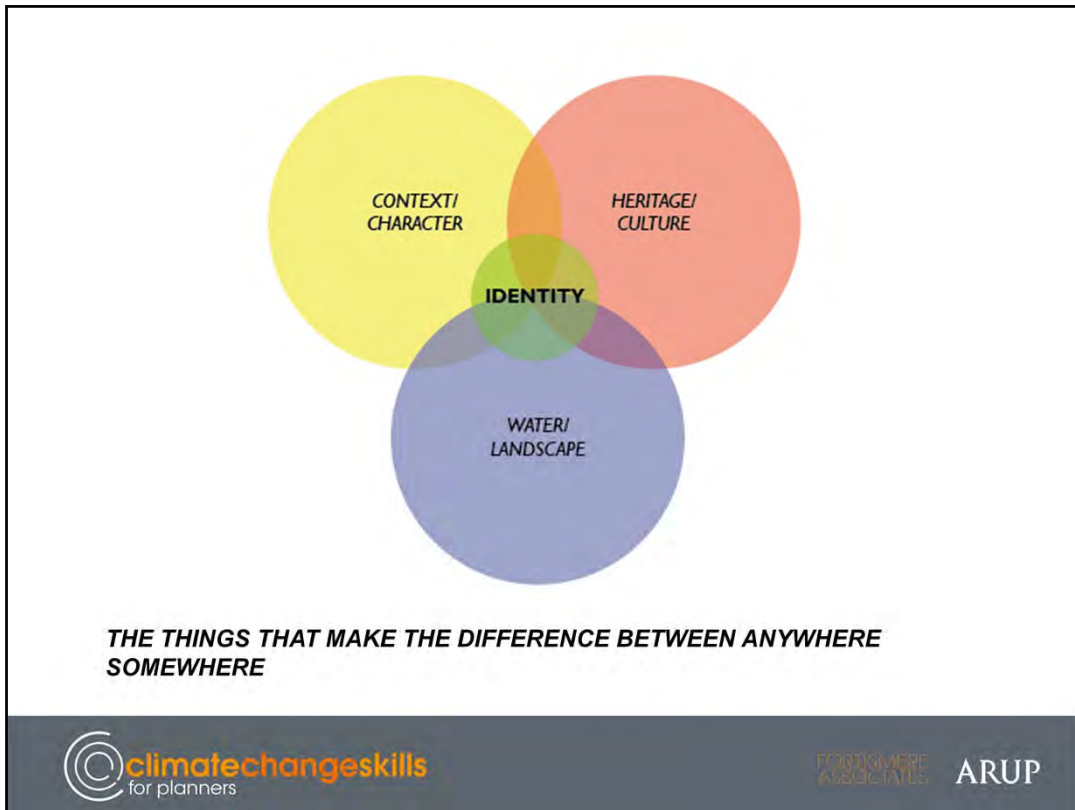


But sometimes these can be celebrated and used to educate future generations

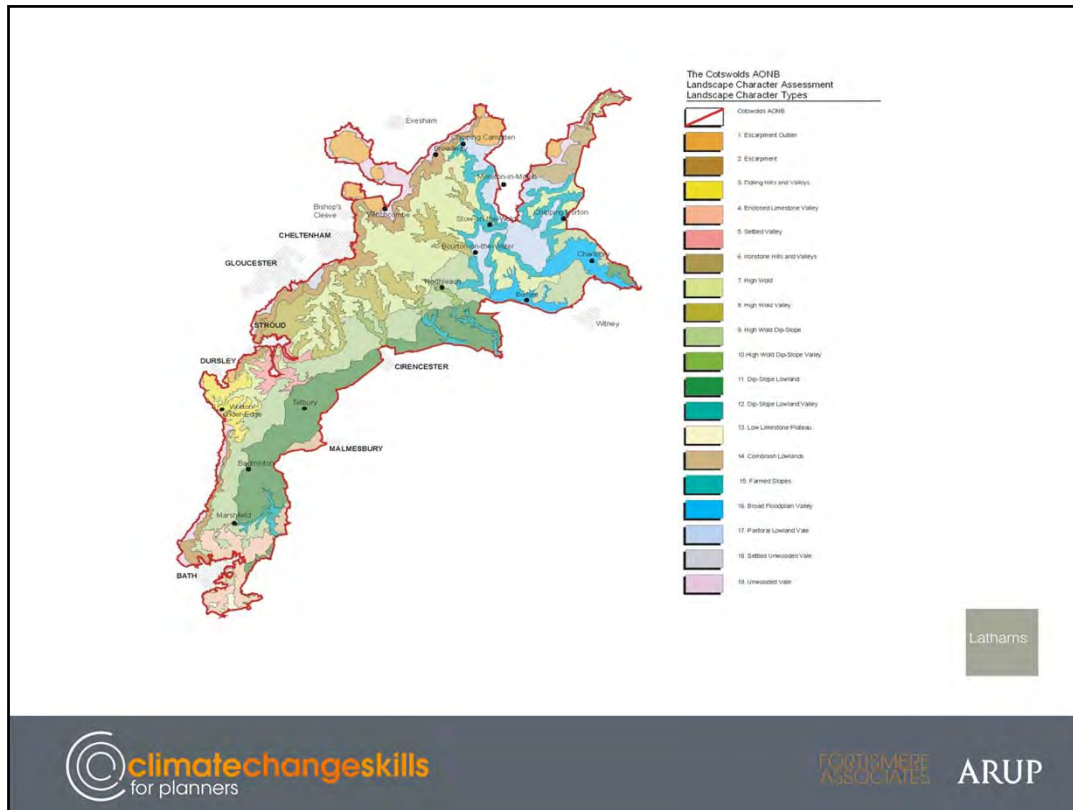


This requires a range of skills - economic and social planning, as well as urban design, - engineering and energy supply and management as part of architecture and conservation; understanding the role of micro climate and horticulture, as integral with landscape and public realm, that responds to people, movement, transport and desire patterns.



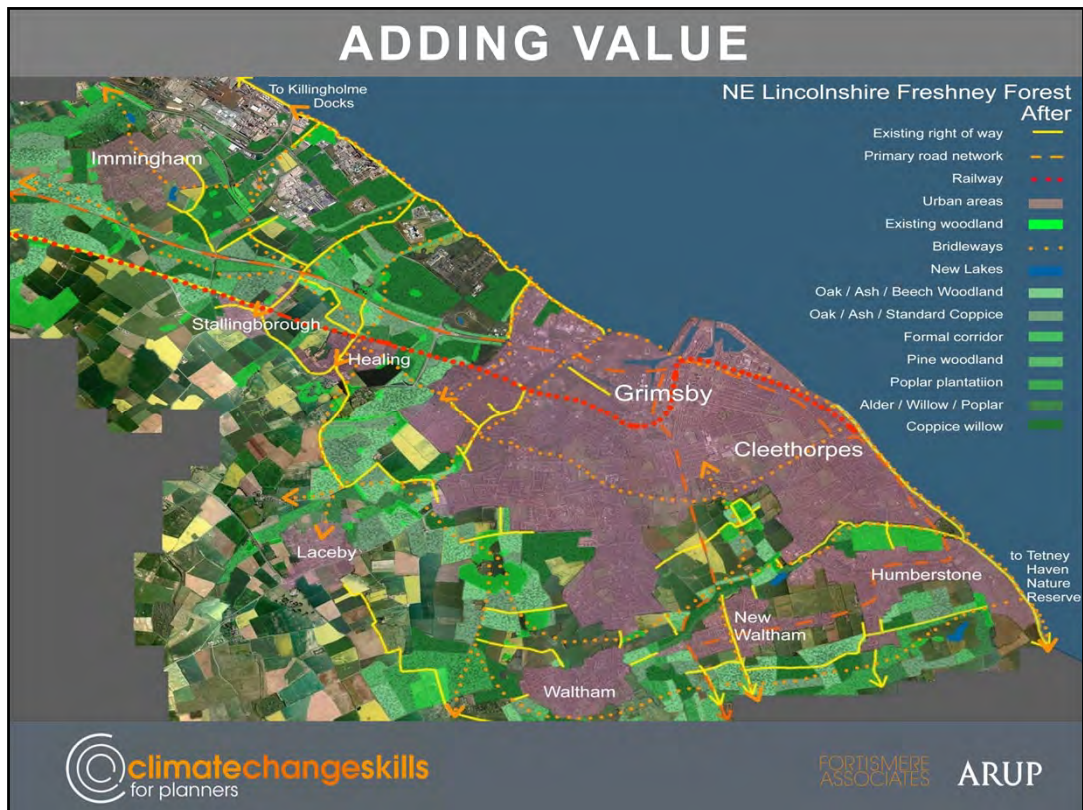


So heritage and culture, the landscape, its character and context create the identity we wish to celebrate and maintain



It is essential that we analyse, and categorise our countryside if we are to understand how to protect it and use it sustainably without resorting to blind preservation of current activity which may not be sustainable in the future

The nature of our towns and villages depends upon the geology of the locality which dictates the topography, the location of springs, the potential for drainage and the materials for constructing dwellings and community buildings












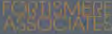

Sometimes we can take the opportunity to enhance the setting of towns, such as our proposal for a new forest on the North East Lincolnshire coast to: provide biomass for former coal fired power stations; screen intrusive industry; and extend and diversify tourism



So, the context of our historic country towns - their relationship with their landscape and topography, as well as land use, must be understood

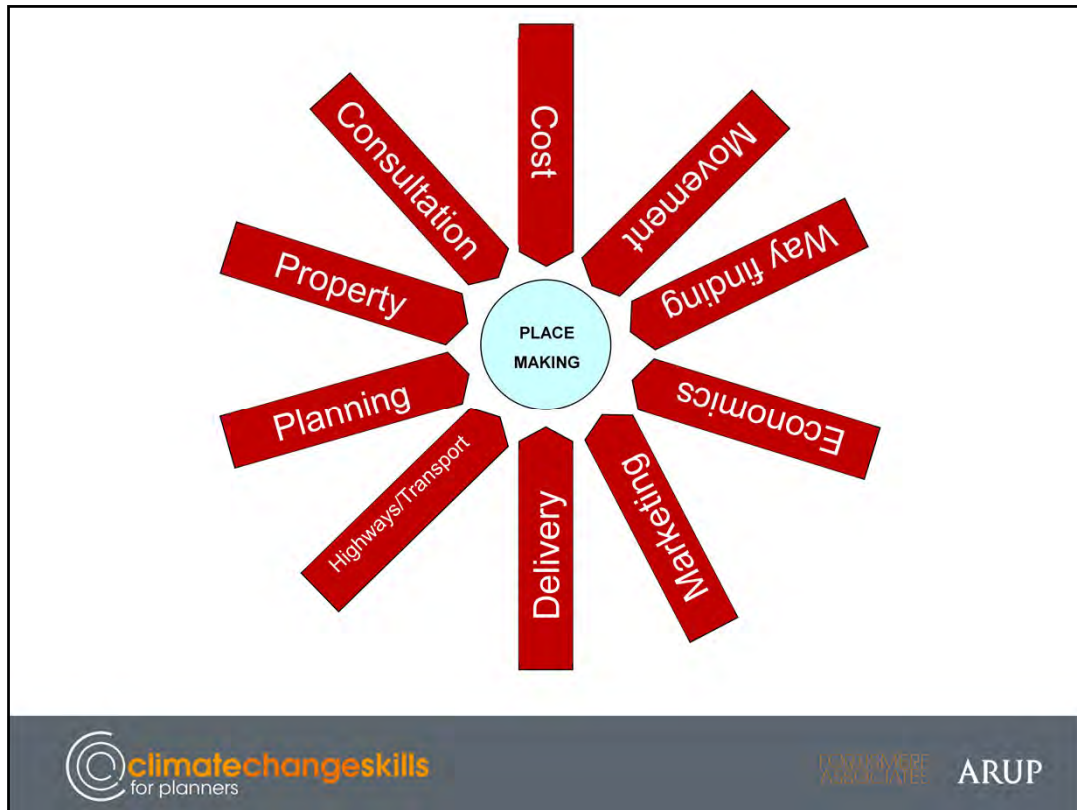
## Urban Character

			
City Street		Urban Street	
			
Suburban Street		Rural Street	

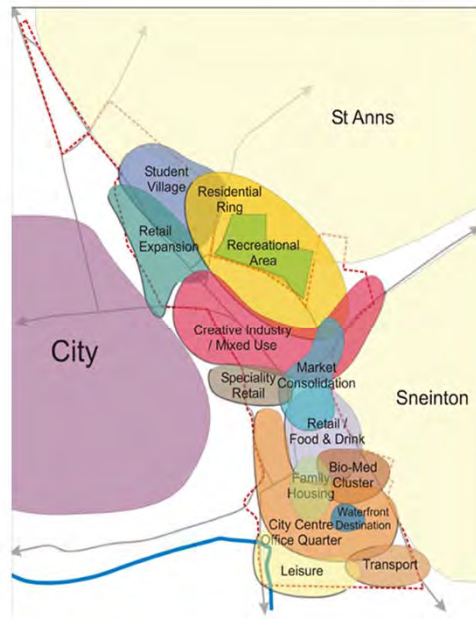
The appropriateness of new development can be considered within the morphology of our towns, which we can use to represent a transect from urban centre to rural fringe. (refer)

This can be achieved through a range of business factors



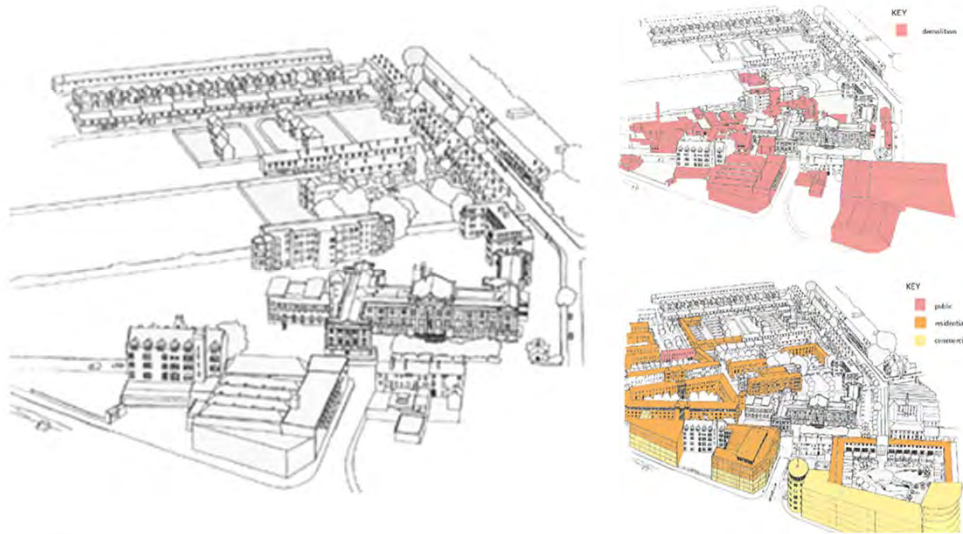
- ... utilising elements from the past through these disciplines and activities
- The art and science of making places where people want to be - sustainable places

# UNLOCKING POTENTIAL



Understanding the nature of uses, their demands and resultant movement patterns creates successful places and reduces the costs of transport.

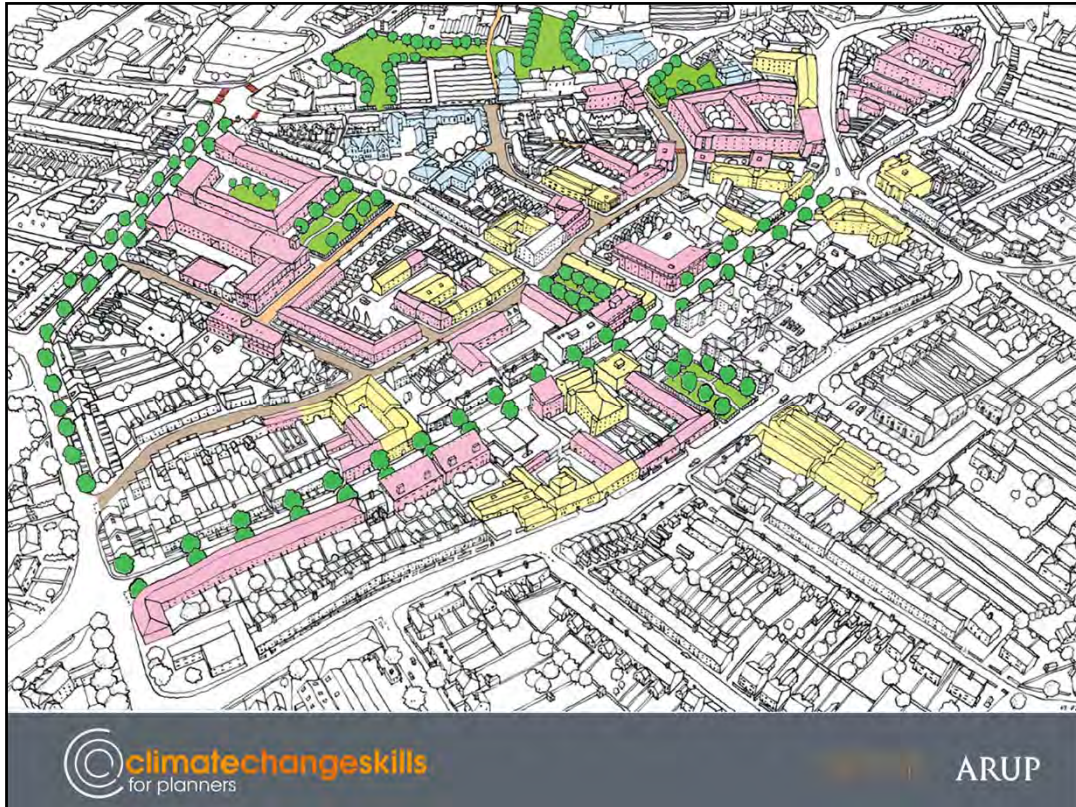
## SOLVING PROBLEMS



Analysing how to repair the fabric of our urban areas is as important as how to repair the fabric of our historic buildings.

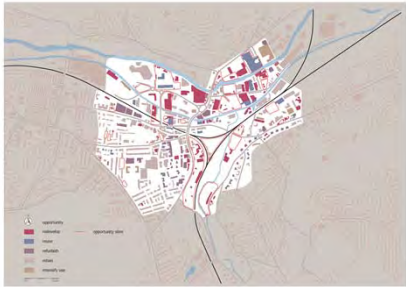
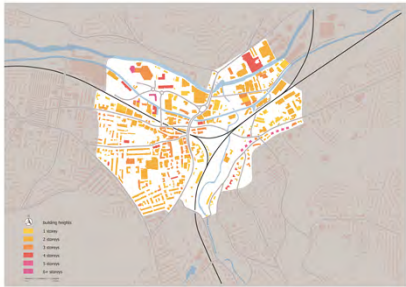
Most empty buildings - can be brought into sustainable reuse



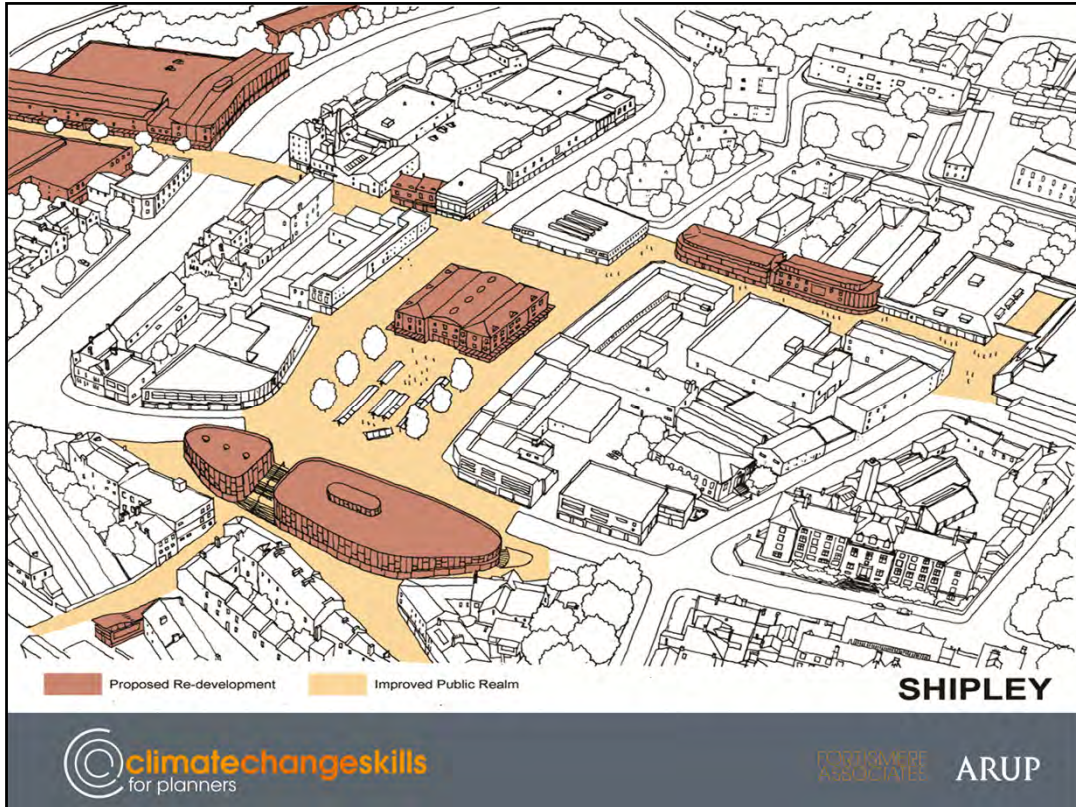


We can both identify both empty buildings to be reused (yellow) and sites to be infilled (pink)

# ShIPLEY

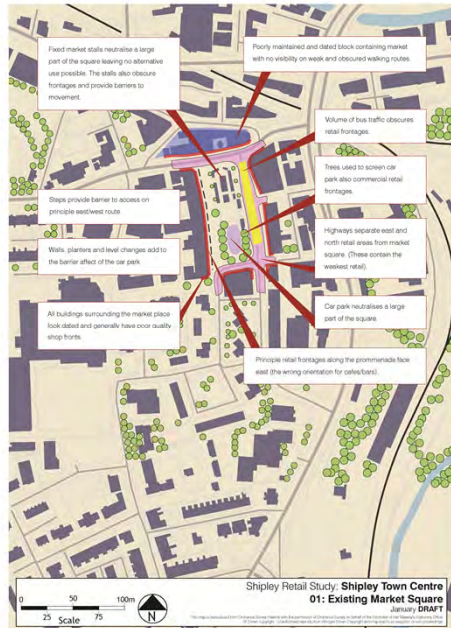


For this to work we need to analyse a range of factors, such as occupancy, opportunity, building height and the materials with which they were constructed, as we did her for ShipleY



This enables us to consider re use and development within their context

# ShIPLEY



And propose a range of options for the future sustainability of the town









































































financial loss. In such cases the costs of conversion must be trimmed – to be simpler and less ambitious – in order to balance cost and income. Analytical appraisals are essential to successful re-use.

### **Resources**

If despite trimming costs the project still appears unviable then other resources may be required such as grants or 'soft' loans, or some special marketing through the media to promote unique qualities in order to attract a 'special interest purchaser' who will pay above market value.





























































































































































### **Sheep's wool batts**

'Thermafleece' is the most widely known of this product, which largely consists of wool but contains polyester reinforcement to create the batts. They are further treated against pests, fungus, and fire, this being essential as wool will degrade if subjected to saturation for a long period of time. The key feature with the wool batts is that they can absorb and release moisture without loss of thermal resistivity, and are less problematic with regard to interstitial condensation. They are also effective in reducing transmission of airborne sound.

### **Cellulose**

Known by its trade name Warmcell 100, the cellulose fibre is derived from waste newspapers and treated with fire retardant and biocides. It is blown into lofts and floor voids.

### **Corkboard**

Another naturally grown material, corkboard is produced from the bark of the evergreen oak, *Quercus suber*. It has to be imported from Portugal, Spain and North Africa, so there is a sea-miles component to the equation. Although its production requires energy for the boiling of the material to encourage the granules to bond themselves together with their own resins, it is a renewable source provided the trees are well managed in the 10-12 years they take to grow their bark. Cork board can be used for flat roofs, in batt form, or as a loose fill material. Very popular in the 1970s as a decorative wall material, corkboard needs to enjoy a rebirth as a wall and floor insulation. It is naturally resistance to fungus and water penetration.

### **Foamed glass**

If made from scratch, using limestone and sand, foamed glass is very energy intensive. It is suitable for those existing traditional buildings where the floor needs to breathe, by virtue of using a crushed glass product in the sub-base of a Limecrete floor to resist rising damp.

### **Softboard**

Ideally it should be made from waste from other wood processes.

### **Woodwool**

The most popular wood wool is Heraklith, made from wood shavings bonded not with cement but with magnesite. The wood shavings are waste, but the composite board is not capable of being recycled once it falls out of use.

### **Compressed strawboard/flaxboard**

The material has huge potential as an insulator and can cope with vapour permeability (ideal for lining of breathing walls) and as thermal insulation for flat roofs, but not with any excessive moisture. In this respect it is very similar to wood fibre in that it is a cellulose product.

### **Wood fibreboards**

Known by the trade name of Pavatex. Used as external wall insulation they give all the benefits of an external render in creating thermal mass, and because they store heat, condensation is avoided. Their best quality is that they allow moisture to pass from inside rooms to the outside, thus avoiding all the problems associated with vapour barriers. In addition, this same thermal mass provides for cooling in summer by delaying the peak of external daytime surface temperature permeating to the inside. A reduction of internal temperature of around 4C is possible, compared to structures with insulation to the same u-value, but with other forms of manufactured insulation.

A system for roofing provides water resistant interlocking wood fibre boards (called Isolair sarking board) over the rafters without thermal bridges, and without the necessity for external membranes or internal vapour barriers. The whole purpose wood fibre boards is to provide an excellent system of vapour buffering, and thus a breathing roof, whilst utilising up to 95% wood waste, and when the material is no longer required it can be composted or recycled.

### **Calsitherm climate board**

Calsitherm climate board is an alternative for internal insulation and can be applied directly to an internal plaster without the need for studs. It is made from calcium silicate and is microporous, with a high capillary action to enable it to buffer the moisture content of a room. It is mould resistant because of the nature of the material.

### **Reed boards/mats**

NOTE: Care must be taken when introducing any cellulose based product into a building which has had an outbreak of dry rot. The fungus feeds on the cellulose molecule and will romp away, causing total devastation.

### **Clay board**

Clayboard manufactured using clay, reed and hessian is reputed to have outstanding thermal and vapour diffusion properties, thus making it the ideal material for buffering moisture in bathrooms, for example.















weekend. Installers of wet systems, radiators, that have tended to supersede dry systems, such as storage radiators (miniature heat stores), have failed to understand the needs of a traditional building. The storage heaters have far more to offer as they provide a low constant gentle heat, and can be just as economic, particularly if the electricity supply can be generated from renewable resources.

Traditional ancient timber framed houses, which are in themselves inherently lightweight in their construction, had a massive brick central stack. This too heated up with fire, which was an ever present feature, and then gently exuded this heat to the surrounding rooms. The traditional place for the master bed was with its head to the stack, shrouded in a ceiling tester and curtains to cradle the free heat from the central stack. Similarly, the stack absorbed solar gain on a hot summer say, which was then directed up the stack by convection, the stack then acting as passive ventilation.







normal masonry backing for this role.

External insulation of historic buildings is physically possible, but this may mean that the character of the building is obscured completely, or certain of its elements, such as window and door openings, are set within deep recesses, creating a very different ambiance of light and shade. It can usually, therefore only be considered for non listed buildings, or facades considered of little importance





























































work more efficiently when they operate as sealed buildings.

An alternative to examining the energy consumption of the building is to convert the energy figures into a measure of the carbon emissions of the building.

The energy is supplied in the form of a fuel which has a carbon emission factor attributed to it. This carbon factor specifies the amount of carbon dioxide that is released into the atmosphere when that particular fuel delivers 1kWh of energy (kgCO<sub>2</sub>/kWh). The current Government standard figures for carbon emissions factors are listed in SAP2009 (DECC, 2010), a selection of which are shown in the graph below.

Alternatively, the Carbon Trust has a Carbon Footprint Calculator on its website that can be used as an alternative route to calculating the emissions from a building or organisation.















































































































