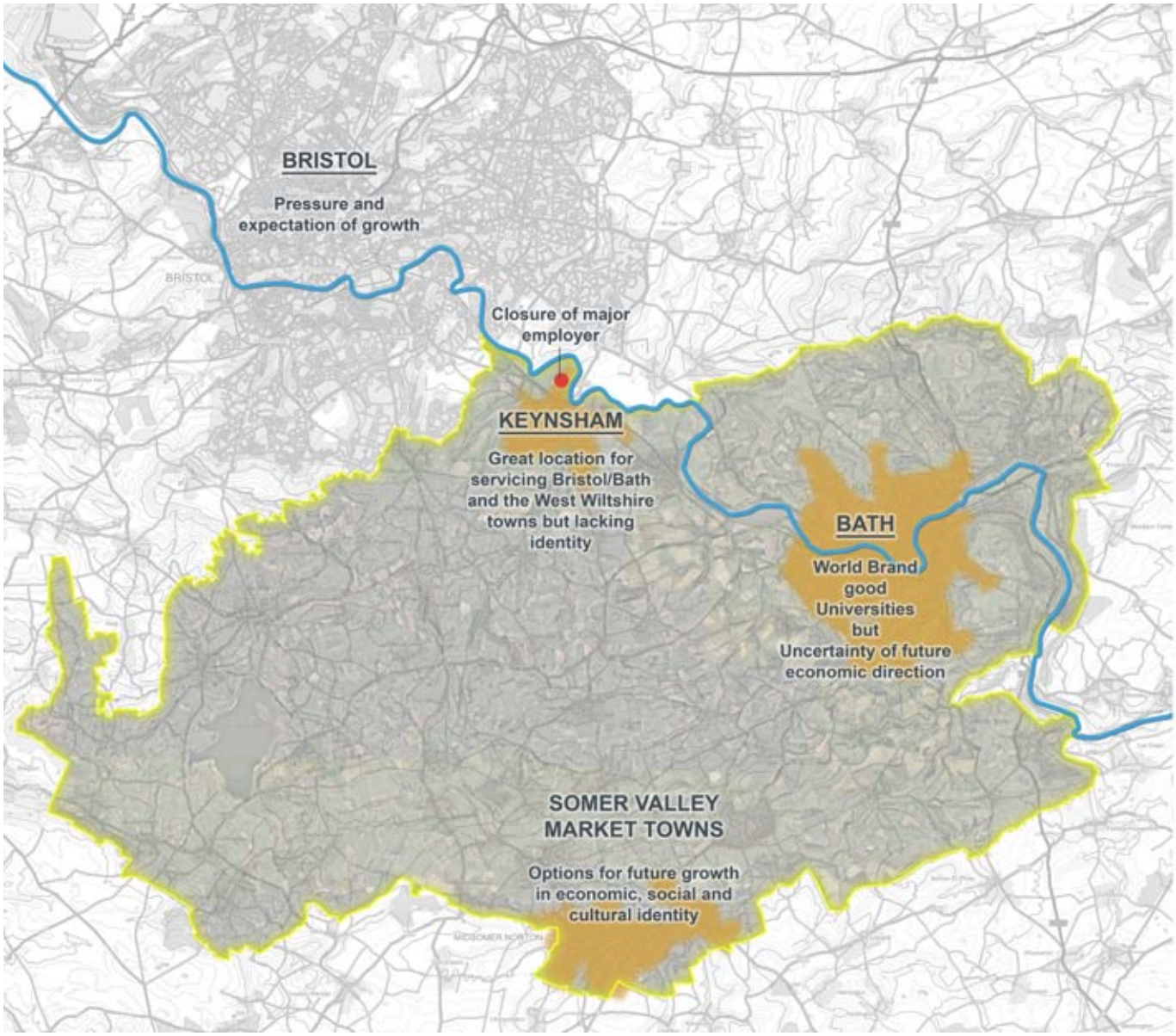
BATH AVON
River Corridor Group

BATH AVON RIVER ECONOMY

FIRST REPORT OF
BATH & NORTH EAST SOMERSET COUNCIL
ADVISORY GROUP

SUMMER 2011



Group Members

The Bath Avon River Corridor Economy Advisory Group held its Inaugural Meeting in the Guildhall in Bath on 29th October 2010. Group members were nominated by Councillor Terry Gazzard or John Betty, Director of Development and Major Projects and North East Somerset Council, for their particular skills and relevant experience.

Those present were:

Michael Davis	For experience in restoring the Kennet and Avon Canal
Edward Nash	For experience in urban regeneration and design management
Jeremy Douch	For experience in transport planning
David Laming	For experience in using the river for boating
James Hurley	Representing Low Carbon South West and for experience in resource efficiency
Steve Tomlin	For experience in reclamation of materials
John Webb	Representing Inland Waterways Association and the Kennet and Avon Canal Trust and experienced in Waterways management
Nikki Wood	For experience in water ecology
Councillor Bryan Chalker	For experience in Bath's heritage and representing the Conservative Political Group
Councillor Ian Gilchrist	For experience in sustainability issues and representing the Liberal Democrats Political Group
Melanie Birwe/ Tom Blackman	For Bath and North East Somerset Council – liaison with Major Projects Office

Steve Tomlin stood down in early 2011.

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APPENDICES

The River Avon extends for a distance of 30 km as it meanders through our borders the 570 km sq. that comprises the administrative area of the Bath and North East Somerset Council. From the point it enters the District at Dundas to the east of Bath and leaves at Hanham to the west of Keynsham, the Avon Valley and its tributary water courses of The Bybrook, The Frome, The Mells, the Somer, The Chew, The Boyd, The Newton, The Sistor define the District through catchment areas and watersheds.

Although the World Heritage City of Bath lies draped on the hill slopes above one of the Avon's many meanders, those who value and are concerned about the City have become increasingly aware how very far short the City's relationship with the river falls from what it could and should be. There is a point around Pulteney Weir within the view from North Parade Bridge where the results of several centuries of developmental history have produced a magnificent vista where townscape, architecture, landscape public open space and the river all come together. Otherwise in only just a handful of places where the river passes through the City do occasional coincidences of historic built environment, geography and landscape suggest anything of the same quality. For the most part, the river is perceived as an engineered drain, something the city's life does not connect to or value, irrelevant to people's perceptions of the World Heritage City, when it should be one of the glories.

This problem is not confined within Bath's urban boundaries. Those who do know the river, how it meanders across the broad Avon Valley between Newbridge and Keynsham, know how different that experience is from the impression of continuous ribbon development that the main road link through Saltford and Keynsham suggests. Keynsham has problems of its own, in needing new economic, social and cultural identity, but bizarrely not before now has it embraced the potential of the relationship its proximity to the River Avon could bring around its magnificent weir and other evidence of its history as a navigation.

Stimulated by such concerns from many quarters, and as other key steps in the future Economic, Social and Cultural life of the District have progressed, Southgate, Western Riverside, in the Vision Statements and Core Strategy, the Council have resolved that it is important to bring a particular focus now on making the Avon River Corridor, both urban and rural, the subject of particular regeneration study so that the potential of the river's future role and its potential as a generator of positive change and is fully recognised and written into all future policy and regeneration delivery plans.

Terms of Reference

From an initiative by former Councillor Terry Gazzard, the Council's Directorate of Development and Major Projects Economic Development Team has convened a Group of individuals with particular relevant professional and practical experience, which includes representation by the main political parties. The Group are independent of the Council and are charged with advising Members and key Council Officers and departments on all aspects of a river led regeneration economy and engaging with all relevant consultees and interests to do so.

This document, issued in in the summer of 2011 is the Group's first report and seeks to set in place a framework of understanding for how significant the river led regeneration envisaged in the Core Strategy can be, the challenges, the opportunities and the mechanisms needed to achieve the best long-term solution in the most pragmatic ways.

We request the director of the Economic Development Team to present and commend the Report to the council Cabinet as a necessary conceptual framework from which a chain of engagement and executive action can be planned.


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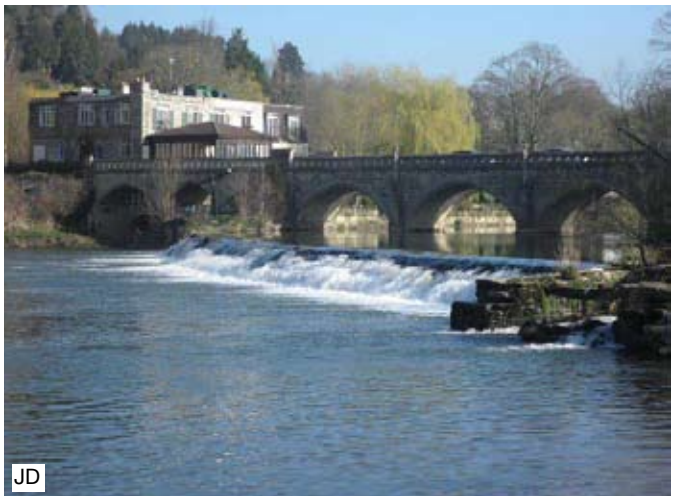
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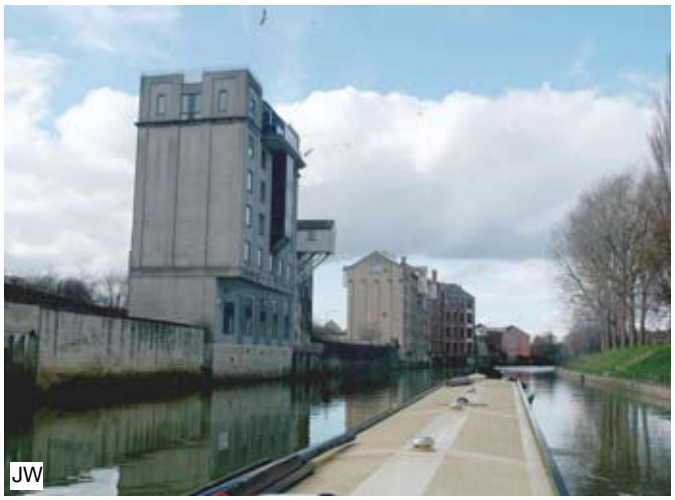
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2. EXECUTIVE SUMMARY

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Within the boundaries of Bath and North East Somerset Council's District the River Avon runs for a distance of 30 km. It enters at the dramatic gateway of Dundas Aqueduct, passing through the ravishing scenery of the Limpley Stoke Valley. Upstream of Pulteney Bridge it finds Bath discreetly, the grandeur of Cleveland Bridge largely unknown. Passing through the great arches of Pulteney Bridge and onto Pulteney Weir it seems, for a moment as if the river and the historic identity of Bath are at one, as if this river might be the defining feature of the World Heritage Site. But then it disappears south of North Parade Bridge, and although passing through a further 5 km of the developed City it is seen as an engineered canal lacking economic, environmental, social or cultural value, something we are ashamed of and do not want to see, celebrate, and certainly to use.

West of Bath, the river meanders for many miles through the broad Avon Valley offering stretches of superb quality and wildlife interest, before coming to life with boating activity in Saltford. So beautiful is this stretch of river that it is hard to believe when travelling by road from Bath to Keynsham that the journey is between the same places.

The town of Keynsham, despite being built largely around employment offered in the former chocolate factory which sits on the river's banks, barely connects with the Avon despite the magnificent weir, great views and a wealth of past industrial and social history to draw on.

Reflecting increased public concern that strategies to recover the river, particularly in Bath are lacking, former Councillor Tony Gazzard charged the Council's Economic Development Team to convene a group of expert individuals with experience in watercourse regeneration, ecology, development and many other specialities, to advise the Council on how the River Avon as it passes through the District could become the focus of wide ranging economic regeneration. The Group was convened in the Autumn of 2010 and this document represents their first report.

The Report seeks to set out a conceptual basis from which a River Corridor Economy Regeneration Model can be structured and is now being circulated for wide consultation.

History

Rivers pass through many physical states as they become modified by human activity and development. The Bath Avon became a navigation in the early18th century, allowing Bath to become an inland port, producing a history of industrial activity all along its banks, much of it now neglected and misunderstood. As, for many years, the river has been viewed as a drainage feature engineered to accommodate water in peak rainfall, we currently do not ascribe any other values to it. It is under-appreciated as an aspect of environment, as a generator of economic life, as part of our cultural identity or our social engagement. Ways need to be found of bringing all these values back to the river so that they become generators for change and investment.

Lessons from Elsewhere

So used have we become to Bath's and Keynsham's river being irrelevant to our lives and perceptions that it is easy to under appreciate just how different things could be. A wealth of examples of river- based towns and cities throughout the UK and Europe show just how diverse riverscape environments are in contributing to the unique character of such places. River corridor regenerations have taken place over the last 30 or 40 years; notably in Bristol Harbour and London Southbank that reveal just how radically economic, environmental, social and cultural activity has changed by capitalising on the assets rivers and their frontages offer as a back-drop to human activity of many kinds. But equally, with Bath and Keynsham both needing to redefine their economic futures and their cultural identities in coming years, we have to decide what kind of river we want and what sort of priority needs to be given to the many ways in which different river environments could contribute to future economic and cultural identity directions.

For instance, as Bath's Universities grow in status and aspire to be closer to Oxford and Cambridge in stature, it is worth recalling that the quality of their rivers is an important element of their identity, places where boating activity, both competitive and for pleasure are an essential ingredient. There is presently an expectation that in Bath, Brownfield Land is ripe for redevelopment for the usual mix of offices and homes, but before this happens it is really important to scope the potential in character and environmental regeneration and utilisation we could have and how the river corridor can contribute to those sectors of the economy of our river towns that are likely to emerge and prosper in the years to come and could be supported by the identity our river will bring them.

Current Issues Driving Change
Regeneration on an urban landscape scale comes about because needs are allied to opportunities in a structured and well-focused way. Over time a series of measures all pulling in the same direction achieve transformational change. Currently these drivers are;

1) The need for new economy regeneration. Both Bath and Keynsham have seen decline in their traditional sources of employment and have to build new economies.

2) Flood Resilience. An engineered Flood Management solution to past flooding has exacerbated Bath's problem of utilising its river well now, but that challenge of flooding remains and will worsen with climate change. New solutions are needed.

3) Low Carbon Living. Our urban models and lifestyles have been based on high levels of carbon fuel; the new economies have to be fashioned around greater fuel efficiency and lessons we can learn from how people lived before carbon fuel deposits were extracted.

4) Bio-diversity. Many of our riverside habitats have been degraded by development and flood management. The new environment we need to create along the river has to take enhancing bio-diversity as one of its primary goals.

5) Transportation, All urban settlements are having to address the needs for new models of transportation as part of diminishing carbon emissions, reduce congestion and improve quality of life fit for the developmental change that will occur.

6) The Regulatory Regime. In a complex urban society, many imperatives are already in place seeking to address these drivers of change. They set a pace for consideration and investment which can be used to drive the wider regeneration this report is about.

Changing perceptions and creating values
For regeneration strategies that take many years to fulfil, at the start, changing the perceptions of those who use them, do not use them or are responsible for them is fundamental. The river corridor is the way it is because we have come to no longer value it economically, environmentally, socially, culturally. To regenerate it, those values have to be placed on it once more. We have to want the enhanced bio-diverse natural environment it could be, to want the river to be subject to economic activity which is compatible with that goal, to want to make it the focus of social activity and to embrace it as an aspect of our cultural life. The strategies for each of these strands of value creation can be designed and applied.

But there are a host of simple measures, perception changing events, minor changes, minor development projects re-connecting with the river that can be undertaken now and at very low cost to create the confidence amongst stakeholders that the larger goal is achievable and make things happen.

Really important are the challenges of recovering and creating character and identity.

The District's river has many layers of history, some predating its 18th century navigation, in the siting of mills and the formation of weirs. The navigation spurred the development of the rivers' industrial revolution economy and many illustrations of this still lie along its banks, under-appreciated and misunderstood.

Each is a potential point of understanding and value, a focus of new economic and social activity, a new movement of economic life on the river. There are so many aspects of past character to be celebrated, such as the confluence of the Kennet and Avon Canal and the Avon, the rich history of Stothert and Pitt, recovering a meaningful relationship with the river for Twerton and Keynsham and, importantly, the opportunity to ensure people travelling between Bath and Keynsham can appreciate experiences of the river corridor very different from those revealed by the ribbon development along the A4.

The river has many characters, degrees of use and accessibility which are illustrated in the report through a combination of aerial photography and annotated photographs.

The Transportation Imperative
Patterns of movement and transportation throughout the district will be fundamental to the future role the River Corridor has. Their future will be driven by National Transportation Policy and local objectives, many of which are already established in the Joint Local Transport Plan, The Report analyses the present weaknesses and conflicts in transportation and sets these against economic, social and environmental objectives. It lists major proposals for land use change already emerging and the major transportation proposals already well advanced across the region. Against this background, the report then describes the role that river borne transportation, principally in Bath, could play within a comprehensive future transportation strategy, looking at different sectors of the urban corridor in turn.

New Uses for the River
The importance of river borne activity and movement, is then set within wider regenerative aims and opportunities for public transportation, riverside walking and cycling, as a means of getting to work as a source of pleasure and tourism. There is also a consideration of the role that river transport could play in servicing major city events and in carrying bulk goods.

Flooding Resilience
The report highlights the significance of flood management in creating the considered riverside of Bath downstream of North Parade Bridge, and that addressing flood risk will remain a very significant issue for the whole of the River Corridor and settlements. It explores some of the methodologies available for addressing flood risk which would allow the river to present a very different appearance, more accessible to people with leisure uses. It highlights how some of these methods are potential generators of new economic activity in themselves through enhanced status and character, provision of marinas and moorings, etc.

Spatial Sustainability and Renewable Energy
The river passing through the District represents one of a very few geographic endowments with potential for renewable energy we have. As such, realising its potential as a source of power through turbines at its weirs and thermal mass extraction, have to be taken seriously. The report summarises work already done to identify these potentials. Many other aspects of 'Spatial Sustainability' are identified determining how optimum land use patterns should be placed at particular points along the river, to maximise the movement to low carbon lifestyles.

Creating Growth Points for Change
As the River Corridor currently underperforms in economic, environmental, social and cultural terms, in the rural areas, in Bath and in Keynsham, a strategy for building new values is needed. This requires growth points for change to be identified, located where the prospects for building new economies is the brightest. These are likely to be areas where perception change can most be transformational, where connectability and commercial opportunity are strongest.

Drivers of Economic Development
As Bath and Keynsham are both urgently in need of new economic activity, it is extremely important that the regenerative need and opportunity of the River Corridor is used to stimulate and advance new economic life where it can assist in regeneration.

Several strands of future economic activity, some already in place, others newly emergent, are identified, and the role the River Corridor could play in their emergence and development is explained. These include;

1. Cultural and social identity
Expanding the existing offer to visitors

It is in this dimension that the positive experience of Bristol's Harbour and London's South Bank are very instructive. A re-valued river can create new attractions, new cultural icons, new hotels, new events.

2. University-led economic renewal.
The University of Bath has reached Top 10 UK university status remarkably quickly. Through the Innovation Centre it already has a presence on the river that it is keen to expand. To give that expansion identity and the added energy that comes with regeneration, planning for an enlarged riverside presence is essential.

3. The Sports Economy
Bath has already established itself as a world player in sport, through rugby and its University training offer. Its rowing clubs would like to have a city centre presence, whose daily activity can transform perceptions of the river, from which the beginnings of new economic activity, cafés, bars, etc., can flow.

4. Creativity and Consultancy
Bath and Keynsham both need new enterprise and much of this is likely to come from new employment in creativity and consultancy, design and in media. Industries and businesses need characterful locations and clustering and the regeneration of the River Corridor can be a great stimulus to creating the identity of critical mass that such businesses really need.

5. Servicing Settlements
Many of the former villages now embraced within the City of Bath, and Keynsham itself once had physical and practical relationships with the river, notably Twerton and Keynsham through its 18th and 19th century industries. All of these settlements deserve to have their river identity reconnected, strengthening the local economics and community identities.

6. Healthy Urban Living
As a world illustration of building in harmony with topography and landscape - and a long standing centre of healing, Bath has an established platform from which to develop a broader economy around healthy living and impact accountable lifestyles addressing it's student population, it's family, tourists and it's older residents and visitors. A river corridor regeneration can embrace and illustrate all of these.

7. A River Based Waste Management Model
The management and processing of waste is achieving considerable significance as it increasingly offers the primary source for the material resources a complex global society demands. As an industry, resource recycling is becoming increasingly sophisticated requiring high level knowledge and processing inputs. The River Corridor connects Bath, Keynsham and Bristol and can become a conduit for this new industry for which Keynsham already has a remarkable set of coincidences.

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It contains two significant waste processing businesses now, has land close to the river already earmarked for a new Council rendering depot and is the final collection point for much of Bath's sewage treatment. In an LEP region with leading aerospace and micro-electronic industries using innovative materials and composites, building strength in this area has to be sensible now.

8. The Rural Economy
Despite its attractiveness much of the agricultural land within the Avon floodplain is underperforming in agricultural terms. The challenge of creating a more absorbent landscape to hold back flood peaks from the river channel opens up many new opportunities for alternative agricultural models, such as wetland biomass, freshwater fish and wildfowl farming and a host of new business opportunities associated with boat building and waterway use. Each of these will allow the populations of the District's settlements to move towards more 'impact accountable' lifestyles that can be embraced as a positive opportunity.

9. The Future Economy of Keynsham
From the work of the River Group, Keynsham's present lack of identification with its riverside landscapes emerges as a particular wasted opportunity. Nothing could be more significant in giving the town the new economic, social and cultural identity it needs. Opening up the town to its riverside can be used to raise its profile and status and build new character which is necessary following the long term demise of its major employer at Somerdale. Several sites upstream from Somerdale have increased opportunities for river based leisure, new employment and Low Carbon economy.

9. The Programme for Delivery
The Programme for Delivery
The programme for a new river-based economy the report presents is readily deliverable. It can be delivered incrementally through a series of small steps, and inputs by many, many stakeholders. The Regeneration Model the Group outline mimics the incremental patterns of change that have created our historic towns and cities through alerting opportunities that many players, landowners, authorities, individuals can take towards a common interest and their own. The Historic economy that creates they plans we now value were multi-stranded – always more than the sum of their parts.

For a sound Regeneration Model the project needs a number of key stages;

A. Engagement;
A strategy of consultation and building a common purpose with all the initial stakeholders, the public, landowners, statutory consultee's, local authority departments, political forces and many more.

B. Conception Changing
The report lists some thirty modest actions that can be taken to encourage stakeholders and others to start seeing the river in different ways, the prelude to more significant investment. These are immediate, cheap and necessary.

C. The Regeneration Model
It is essential to present more fully the broad pattern of actions and stages the River Corridor Regeneration needs to go through as an overall model, so that essential steps, whether of engagement, perceptive, physical or necessary policy are not missed out inadvertently. A Regeneration Model is very different from a Land Use Model.

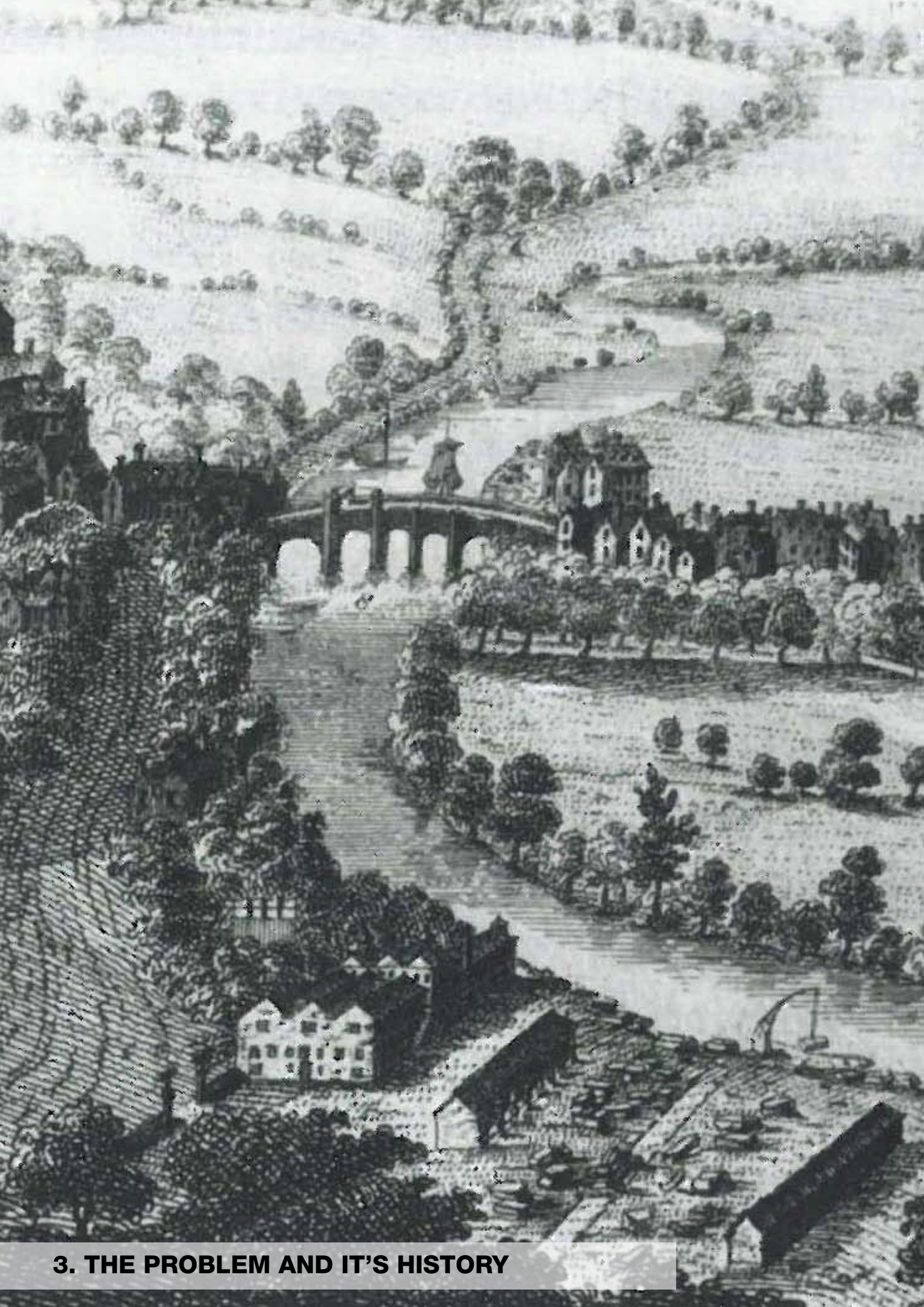
D. Policy Support for Regeneration of the River Corridor Economy
The report lists twenty areas where we will need specific policy support for the regeneration development. Much of this could be bound together within a single Regeneration Strategy Document.

E. Water Management
Those who know and use the Avon, understand how far from ideal is the level of management the river presently experiences and the lack of purpose its various management agencies achieve. If we are demanding more utilisation and value from the river, it will be essential to establish an overall management body or common strategy to deliver it. Consultation, the management of fallen trees, stabilisation of banks, these are only a few of many management issues that need to be tackled.

Conclusion
In our first Report, the River Corridor Economy Group have set out to explain our river's history – and show how much more integral to the life of the District and its two river based towns it could be. But to make this happen and happen well, real choices have to be made about the relative values to be aspired to and the forging of the Regeneration Model to be applied over 20 to 30 years. We urge all those reading it to give serious consideration to its ambitions and play their part in asking the Directorate of Development and Major Projects commit the Report to the Council as the necessary conceptual model for re-embracing the River within the District.

Interim Version: mid July 2011.

Edward Nash
Chair, Bath Avon River Corridor Advisory Group



3. THE PROBLEM AND IT'S HISTORY

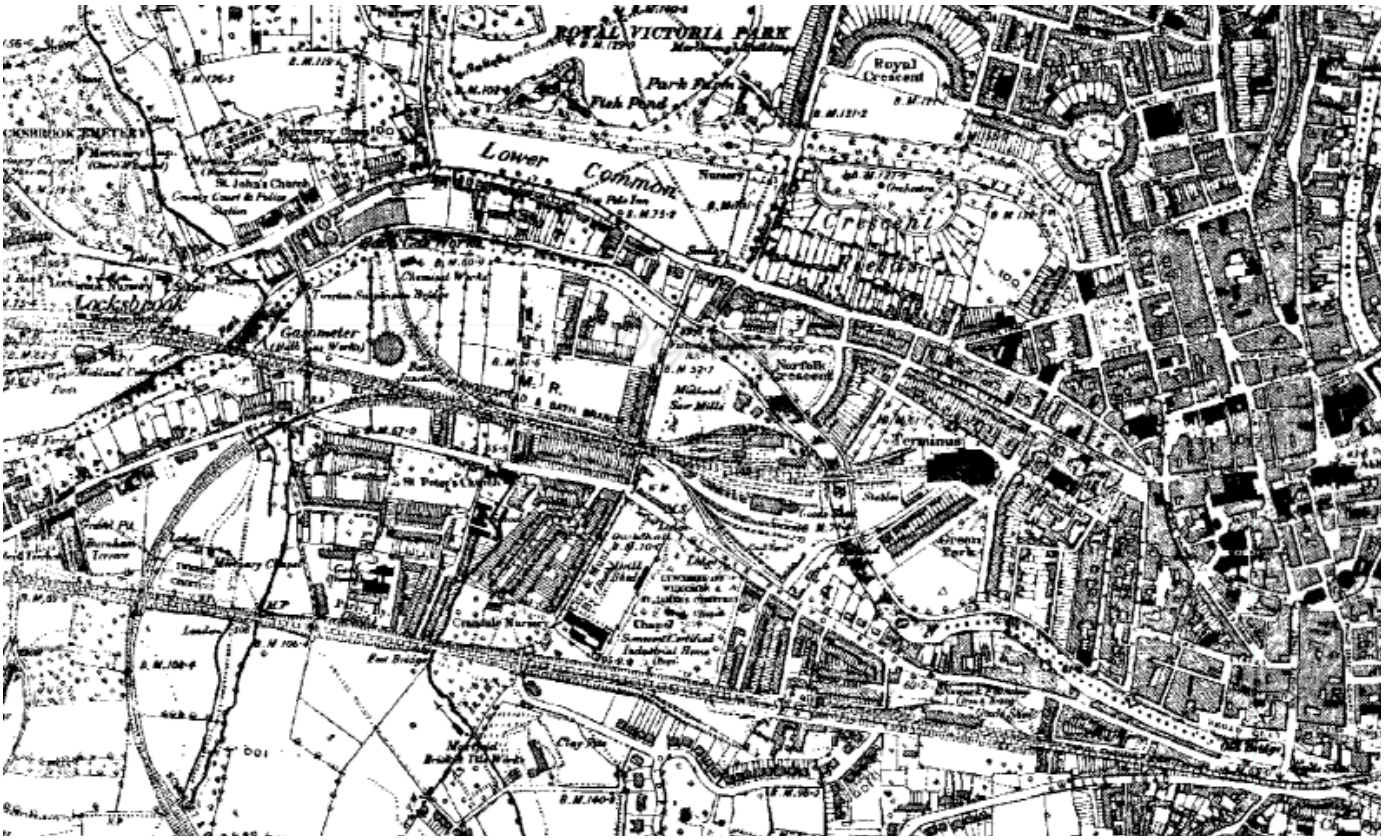
a) The Geographic History

To understand what the District's relationship with the river can be in the future, it is important to comprehend the many phases of life the Corridor and the river linked settlements have passed through. The Bath Avon has a significant catchment and, generally, a wide flood plain, untypically constricted where it passes through Bath before the operation of a navigation involving weirs and locks in the 18th Century and the draining of the flood plain for agricultural purposes. Once, much of that flood plain would have been marsh without the clearly defined river channel we are used to today. From that point on, scouring of the river bed by boats, dredging deposits and the natural siltation of the banks in periodic floods have all compounded to further emphasise and constrain the river between its banks, whether natural or manmade. So, we no longer think of it as a river system with a variety of wetland characters and bio-diversities, but as a drainage channel canalised by metal sheet piling or high walls in the urban areas or steep earth banks elsewhere.

Of course, the navigation of the river was done to support agriculture and the burgeoning industrialisation economy. The navigation between Bristol and Bath was completed in 1727, the Kennet and Avon Canal in 1810. In the late 18th and 19th centuries the river was an extremely active place, justifying Bath's city centre having both its North and South Quays. Despite its inland location, Bath rapidly developed a strong industrial economy through these decades to a degree that it is now difficult to appreciate. Before this time the City was remarkably compact and much of the development from Norfolk Crescent westwards is a product only of the later 19th Century and the early decades of the 20th Century, (for which the river no longer had any economic purpose). Before this development came periodic flooding of the River Corridor had little penalty, but now its impacts became a cause of real concern and led to the major flood management engineering and canalisation that now characterises so much of perceptions of the river from North Parade Bridge to Twerton.

At Keynsham too, the 18th Century navigation and evidence of historic river based industries are crucial in rebuilding the town's social and cultural identity and offer clues to how new economic purpose can be established once more.

Broad Quay, Bath 1920



Historic Map - 1880

b) The Challenges and Opportunities Now

As the River Corridor and its settlements have experienced new drivers of economic change and purpose in the past, they are doing so now. There is a pressing need for economic regeneration and renewal across the District, crystallised in Bath by the long decline of industry, the reduction of public sector employment, in Keynsham by the closure of the Cadbury's factory. Both settlements have to build new economic identities for themselves around their assets in a competitive world where they have to fit within the aspirations of a new Local Enterprise Partnership, but the perceived constraints posed by World Heritage Status, an Area of Outstanding Natural Beauty and a Green Belt. All those factors determine the kinds of economic activity they need to aspire to.

But new economic life has to be forged within the new challenges of seeking to create sustainable models of human activity to low carbon economy models. Climate change is suggesting new solutions for flood management and the management of water as a resource. These pressures mean that the economy needs to work to new transportation models and patterns of life less dependent on personalised transport and carbon based fuels.

And there is an urgent need to seek patterns of living and land management that support biodiversity as part of a more resilient, sustainable relationship with the natural environment. All these challenges have to be worked into a future picture of the role of the Avon Corridor and the economic life to be built around it.

Historic Photo of Somerdale Factory

c) The Regeneration Model

Within the understanding that now exists of how economic regeneration and renewal can work, it is a truism that the Regeneration Goals can become Regeneration Drivers. So this report is structured with this in mind, following these strands of understanding:

i) The need to understand the past character and roles of the river, and how our relationship with it has come to be the way it is.

ii) Understanding the drivers for change.

iii) Understanding that positive change can come only by ascribing new values, Environmental, Social, Cultural and Economic to something that we have historically not valued. So steps needs to be taken to understand present perceptions of value, how, through a series of achievable steps those perceptions can be changed, new values sets created and the river given new purpose and meaning in our lives, from which further positive improvement, Economic, Social, Cultural, Environmental Value can be built and evolved.

iv) The importance of Spatial Sustainability; ensuring that the competition for new land uses along the River Corridor whether rural/agricultural or urban/developmental, could be intense and needs mechanisms to identify those uses for which a riverside location is most conducive to sustainability. Part of this is recognising that the river offers a rare opportunity within the B&NES District, for the creation of renewable energy through a variety of modes, and that it can be a creator of quality and value that needs to be judged well beyond the land values of individual sites.

v) Recognising that a more sustainable pattern of life will have different transportation imperatives, affecting transportation infrastructure and services, connectability, water based activities and where new models of working and living apply.

vi) Understanding the kinds of economic activity that the District's future prosperity needs to be built around, and ensuring that in the competition for relatively limited developmental opportunities, the needs of the economic growth sectors are properly understood, located and supported, to best achieve the overall regeneration objectives.

vii) Demonstrating how the River Corridor economy can be delivered, and new jobs created in a series of well integrated and sequential stages, that place no more expectations on public subsidy than can be supported, maximise the opportunities for private sector initiative and community engagement, but deliver the very best result.

viii) Managing the Waterway for it's uses and values

Active waterways are systems that need to be managed and maintained. Where a river is being expected to service several different value sets, environmental, economic, social and cultural, effective management means several different things, but agreed common goals and workable structures across the several agencies involved.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4. A NATURAL RIVER

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‘’From a human perspective wild rivers are hazards; water flowing to the sea is wasteful; shallows are obstructions to navigation. These traditional views are slowly being replaced by recognition of the ecological and landscape values of natural rivers. The dilemma is to reconcile our immediate practical needs with long-term sustainability in terms of an ecologically sound and aesthetically acceptable environment – something that can only be achieved by strategic planning and sensitive management involving thorough ecological understanding”. This was written in 1992 by Dr Phil Boon, Head of Aquatic Science for the Nature Conservancy Council of Great Britain, following an international conference on the issue of river management.

The tension referred to in the first paragraph made above means that not all rivers can be treated in the same way. Most rivers have suffered some form of human impact; yet all seem to have an innate capacity to recover, at least partially, after stress and disturbance.

This human impact over many centuries leads to difficulty in concluding exactly what we mean to understand as a natural river. What point in time do we take? Most have been, to some degree, regulated or engineered for agricultural and industrial purposes over a long time span with specific periods, such as the industrial Victorian era, where human impact was intensified especially on river systems such as the River Avon through productive cities and towns.

The key thing about a river environment, in terms of its habitat, is that it is dynamic. It is constantly moving – fast or slow, regulated or not – across terrain which usually changes much more slowly and seasonally. Rivers are great transporters and the water is a habitat in itself and through its variation in movement it constantly creates diversity.

Some idea of a natural English lowland river would include a generally sinuous, mainly water-filled system, with a water flow-through time of minutes to weeks (unlike lakes or wetlands which generally retain water for much longer periods).

The key elements of the river freshwater habitat are:

• physical: beds and banks of channel, patterns of erosion and deposition, flow conditions, velocity and wetted perimeter;

• chemical: oxygenation, nutritional status, pollutant variability, concentration and loading; and

• biological: carrying capacity, reserves and recruitment, competition and predation, introductions, managed species, and fishing.

Whole river systems (from their source to their mouth with the sea) are physically diverse with a combination of faster flowing upland feeder streams, open water areas such as slow water turnover lakes, wetland areas with marginal vegetation and reed-beds, meandering slow flowing stretches with oxbow lakes where natural flooding is unconstrained, wide floodplains where river material is continually deposited and eroded over years of variable climatic conditions, banksides with earth cliffs undercut on outer meander bends and where material is deposited as sand/silt banks on the inner bend. The physical diversity of the river extends further into the river landscape where adjacent land would more naturally consist of wooded areas, with scrub, perennials and ground cover. All this provides a range of micro-habitats and even includes on the River Avon some deep valley gorges.

The freshwater system is not only physically linear in movement but also cyclical in contributing to the great water wheel of life – transportation, evaporation, precipitation, dilution, hydration.

Physical diversity and dynamism leads to supporting a range of life and biodiversity. Freshwater aquatic biodiversity includes iconic species such as the water vole and otter, obscure and useful indicators of the quality of water such as various fish species, pondweeds, vegetation and algae, or strange aquatic insects and their larvae.


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Access to water is a necessity to life, not only to life within the river but also to supporting those of us who live on its fringes – humans, wildlife, and habitats. And of course it has always been the silent partner in our industries and dominant in shaping our landscapes.

The stretch of the River Avon we are concerned with is a freshwater habitat, in various altered and degraded stages. The River Avon has been abstracted from, fished in, boated on, discharged into, its waters have been diverted, its reaches have been dammed, and its natural floodplains developed. To some extent and in consequence of human historic actions we, as custodians and users of the river habitat, have become disconnected from this essential resource.

The opportunity to achieve a sustainable river ecosystem is threatened by many factors. Sustainability requires predictability and climate change is making predictability particularly difficult for river systems. An emerging approach and attitude to how we understand and interact with habitats is developing through Ecosystems Services. Human health and wellbeing depends upon the services provided by ecosystems and their components: water, soil, nutrients and organisms. Equally, the health of these components depends upon human activities including river management.
The United Nations Millennium Ecosystem Assessment provided the most comprehensive assessment of the state of the global environment to date; it classified ecosystem services as follows:

• *Supporting services:* The services that are necessary for the production of all other ecosystem services including soil formation, photosynthesis, primary production, nutrient cycling and water cycling.

• *Provisioning services:* The products obtained from ecosystems, including food, fibre, fuel, genetic resources, biochemicals, natural medicines, pharmaceuticals, ornamental resources and fresh water;

• *Regulating services:* The benefits obtained from the regulation of ecosystem processes, including air quality regulation, climate regulation, water regulation, erosion regulation, water purification, disease regulation, pest regulation, pollination, natural hazard regulation;

• *Cultural services:* The non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation and aesthetic experiences – thereby taking account of landscape values

The River Avon contributes to each one of these essential categories.
If we recognise that more importance/value should be placed on the river, it is helpful to recall the many roles river-linked environments can bring, as these are the tools we have to work with.

In the rural areas, beyond settlements, rivers lie at the centre of the fertility a River Corridor flood plain brings, generally offering maximum soil depth and quality, water infiltration and the ready moisture and drainage that agriculture needs. As both a ‘margin’ and invariably a shaded landscape corridor the banks, and the water itself offers the maximum potential for biodiversity, in which varying water depths, degrees of shade and the soft soil of riverbanks, are all important factors.


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5. WHAT RIVERS CAN DO FOR THEIR TOWNS, CITIES & HINTERLANDS

But rivers are also barriers to movement, their meanders constraining where people can go and, thereby creating moods and atmospheres, places of quiet and calm, that are valuable in themselves.

They can be dangerous in flood, but they can also be used as highly fuel efficient transportation routes. Within the way we define the character and identity of our towns and cities, the relationship with a river is often fundamental. If the river is wide it significantly defines the form, function and status of a capital city, such as London.

Since geography often dictates that the transport systems of roads and railways have to run alongside rivers, the riverscape often determines the character of an approach to a city, such as for instance in Bristol, the dramatic entry to the city through the Avon Gorge.

Often it is the coincidence of bridges, and significant buildings such as the cathedrals of Worcester or Durham, that become the icons of the city's identity.

But this can happen just as much through the quality of public open space that can be created through the very nature of a riverside walkway, whether in the form of green landscape or, on the London South Bank, through the bringing together of a great diversity of activities, to create a cultural and social critical functional mass of their own.

Elsewhere, rivers of a very modest size, completely set the mood and identity of towns, a sense of calmness, a sense of generosity and architectural quality such as the minor rivers that meander through the Colleges of Oxford and Cambridge.

Sometimes, in a busy historic city centre, the river margins are fully dominated by transportation and it is the sense of movement that takes visitors across a sequence of bridges that symbolise the energy of the city, notably in Paris and in Newcastle. For those who know well a particular town or city that lies on a river, it is the variety of character different parts of the river system hold that is memorable, not least because rivers meander and so come and go away from the main transportation corridor desire lines. At one point a sense of busyness and the status and size of embankment bridges and buildings send strong messages of urban status, elsewhere sometimes only a stone's throw away all can be quiet and calm.

Rivers in the urban environment often serve as a particular form of public open space, creating a rare sense of distance and long vistas in the urban grain. But often where commercial pressures have driven development patterns, rivers or water frontages can be remarkably inaccessible bringing a character of its own, such as the pedestrian only bridges of Venice, places where both nature and access to the waterfront are denied.

Punting on the River Cam, Cambridge

Paris 1878

Venice 1729

Avon Gorge, Bristol

In the best riverscapes, it is often the sense of water borne activity, the movements of boats of all shapes and sizes, and of people, that river based and supporting activities and pleasure trips bring, that makes us value them as an asset.

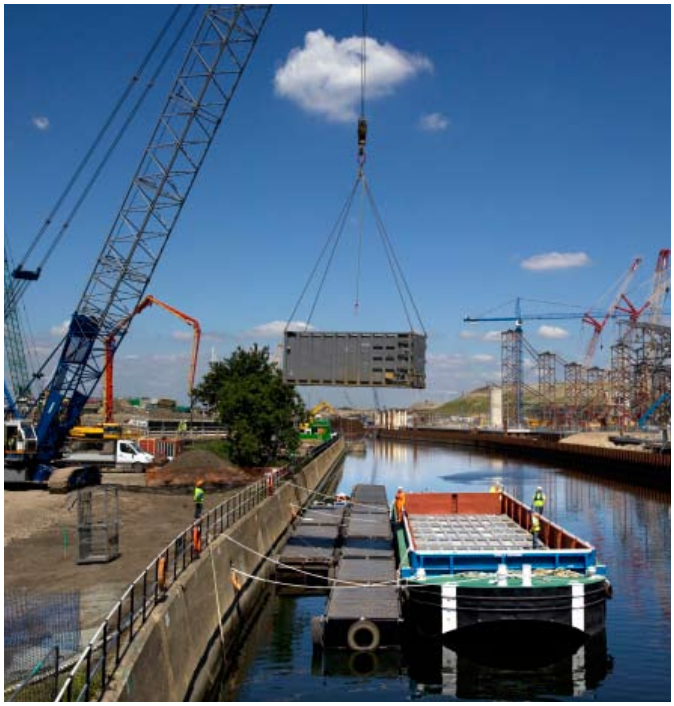
The Regeneration Delivery Plan for the River Corridor will, in time, need to consider what balance of new characters for the river needs to be created, what can best enforce and enrich the character of the city's present Conservation Area and best respect its role as the only World Heritage City in the UK. In this report some of the considerations explored can suggest how these critical planning policy decisions should be made to ensure that in decades to come Bath's riverscape will be valued as a wholly integrated element of the city, that had the ambition and confidence to revalue its river in the early 21st Century and by doing so make it worthy of the 18th Century endeavour which produced a World Heritage City.

Waste & Materials Transportation – Olympic Park
The network of post-industrial waterways around Bow Back Rivers that were left derelict and underused since the Second World War, have been given a new lease of life to provide materials in and waste out of the 2012 Olympic Park. They will continue to function beyond the Olympic and Paralympic Games through the post regeneration of the site and the legacy period. This ambitious venture had been written into the Sustainability Strategy of the Olympic Park by Hyder Consulting from the outset of the project, ensuring the legacy of the Games provided sustainable, economic development for the area for many generations to come.

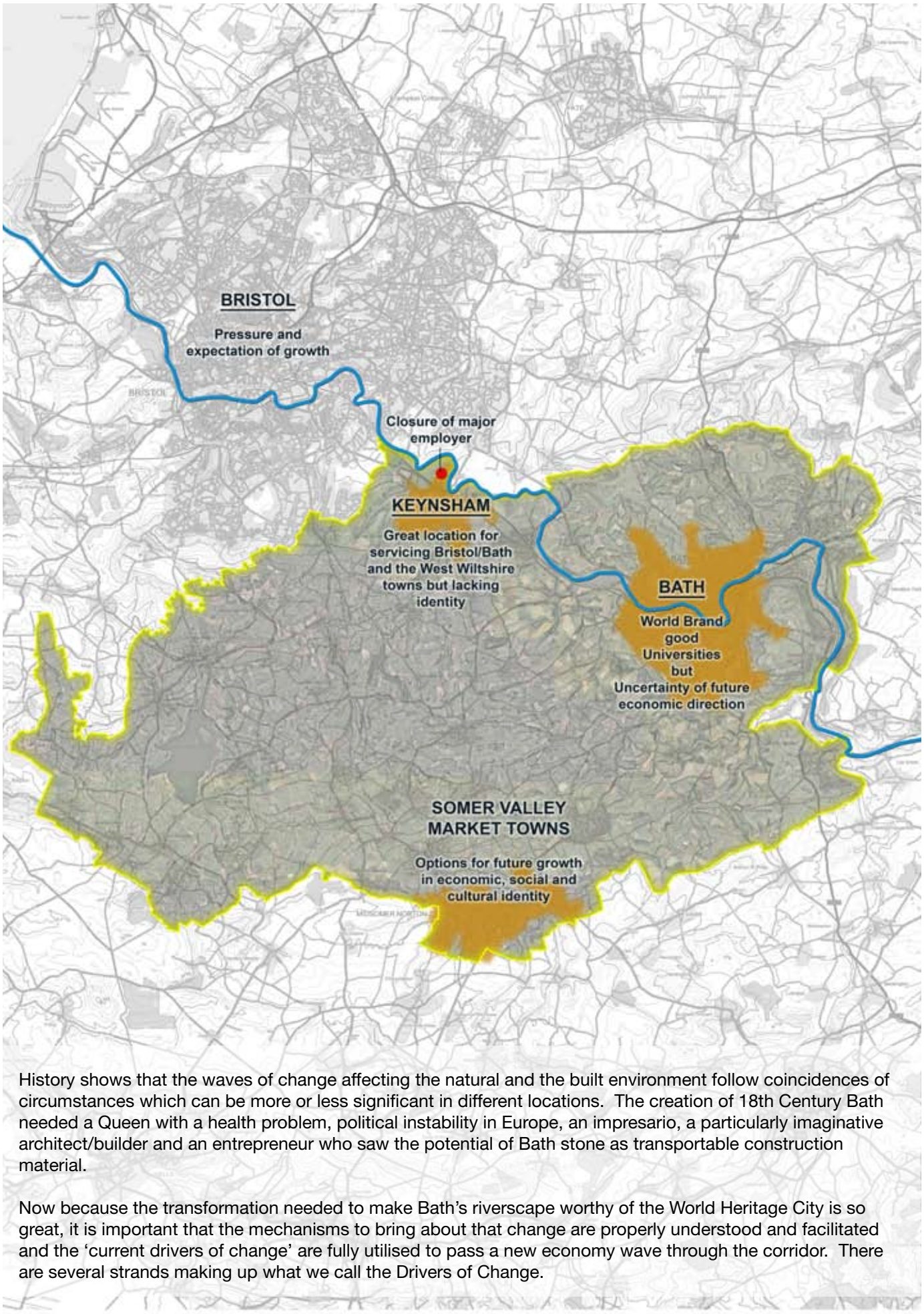
The re-establishment of the waterways was made possible by the imagination and drive of the Olympic Park Project Team, British Waterways, Natural England, Defra and other interested parties and through the key development of the new Three Mills Lock. This restoration of the Bow Back Rivers has allowed navigation for barges and other watercraft entering the Olympic Park area for the first time in 50 years. ''The lock is part of a wider strategy to maximise the use of the rivers in the area for wildlife, navigation and people, creating a thriving waterway legacy." British Waterways, 2011

The Olympic Park restoration of the waterways is a fine example of how Keynsham too could benefit from a legacy project to carry waste and materials from the homes and businesses within and beyond B&NES, as well as attracting increased leisure boat activity; tourist trails, ferry boats, water taxis, floating restaurants, houseboats and visiting craft. As with the Olympic park example, this would naturally incorporate wildlife habitats to enhance and protect species and provide access to the riverside and on the river via new paths and signage, plus links to the existing Avon Valley Wildlife Park and other facilities.

Kingston Mills, Bradford on Avon


The Olympic Park waterways restoration

6. CURRENT ISSUES DRIVING CHANGE



History shows that the waves of change affecting the natural and the built environment follow coincidences of circumstances which can be more or less significant in different locations. The creation of 18th Century Bath needed a Queen with a health problem, political instability in Europe, an impresario, a particularly imaginative architect/builder and an entrepreneur who saw the potential of Bath stone as transportable construction material.

Now because the transformation needed to make Bath's riverscape worthy of the World Heritage City is so great, it is important that the mechanisms to bring about that change are properly understood and facilitated and the 'current drivers of change' are fully utilised to pass a new economy wave through the corridor. There are several strands making up what we call the Drivers of Change.

The Need for a New Economy Regeneration
In common with all towns and cities, Bath and Keynsham have each in their own ways been through several cycles of economic activity. In Bath from a Roman Garrison to Medieval market town to 18th Century spa, to centre of industry. And as industry declined the new increasingly important future powerhouse of the city's economy, its universities were established with the University of Bath rising rapidly up the chart of UK's best Universities.
But now, the need for new strands of economic life is particularly pressing; to consider building on its success Bath's Universities need to show how research and knowledge is being applied to generate employment beyond the University campus in new high tech industry, new education and training offers, new connections with global industry. After being mainstays of the City's economic life for several decades, substantial employment with the Ministry of Defence or in the Local Authority and Health Public Sectors is diminishing. Historic University Towns like Cambridge show what can be achieved.

Keynsham's single most significant historic employer has gone. So the District needs to be clear where, building on its past strengths and skills the geo-spatial opportunities for the District's new areas of economic activity and growth are going to be.

Flood Management
Although Bath has escaped major flooding since the flood management scheme of the 1960's was put into place, the rising rainfall expectations of the climate change era are demanding higher levels of resilience, flood protection and escape to safety Managing the higher flood water flows induced by climate change is becoming an important consideration potentially sterilising land at the heart of River Corridor towns and cities unless alternative flood storage arrangements can be made where they will work. This need will have a significant impact on both the speed, nature and form of riverside development – the need for bridges, the need to create riverside flood storage where this is judged essential, and the appearance and character of the urban corridor throughout its length.

Low Carbon Living
An economy based on fuels and products derived from below ground deposits of carbon is not sustainable as it has contributed so significantly to global warming, and such fuels will run out. During the carbon fuel era, we have become used to the freedom and flexibility of travel that carbon fuel transportation brings and our towns and cities and, the food economy that service their populations have become extremely spatially inefficient. This means that people, their consumption goods and their food travels far further than is sensible or sustainable. Commuting long distances to work has been accepted without question.

At every turn now capital decisions in land, buildings and infrastructure need to be made against the high expectation that their carbon footprint will diminish and energy used needs be self-renewing.

One of the biggest challenges facing industrialised consumer societies is how to have lifestyles that can be "impact accountable" in environmental terms. When it seems all of our lifestyle decisions involved food, products, travel etc are dictated by the power of advertising in a capitalist society, how on earth can the true global cost of such choices be captured and managed by individuals, settlements or regions. Current thinking hear talks about building, closed systems or 'impact loops' to relate consumption of, say, energy to available supply in geographic terms, energy, food, water, readily lend themselves to such approaches. Much can be learnt from how,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for instance, the Swiss came to establish high levels of self-containment in their economics because the geographic constraints to travel and trade were so extreme before tunnels and flight changed the model. Increasingly, even less topographically challenged places, the idea of the natural catchment of a river is being seen as a more credible boundary for impact accountability and governance - in areas of the world seriously challenged by shortage of water, it may well become the only valid measure of environmental sustainability – where all economic and consumption decisions revolve around maintaining the water cycle.

Biodiversity

Both within the built environment and the countryside the range of habitats available for wildlife have been diminished. Much of the river through Bath is contained within tall sheet metal piling and lacks the varieties of water margin, so typical of a natural riverscape. Very little of the banks even contain trees or sheltering vegetation and access for wildlife is impossible.

In the rural areas too an exclusively agricultural led use of the flood plain has diminished biodiversity, replacing minor open water courses with closed culverts, draining natural wetland areas, reducing rivers edge vegetation and scrub, although much has improved since the end of the Industrial Era.

As a river catchment draining system is so important as an eco-system, new economy models can be based around the potential of a river to create opportunities for enhancing and enriching biodiversity. Within the built up areas, stepped banks, new lowered wetland and flood compensation areas can restore habitat removed centuries ago, new riverside parkland and shaded walks create new wildlife corridors carefully planned to link with existing refuges and routes as well as contributing the flood relief. Beyond the build-up area, creating a value out of a more absorbent flood plain landscape might mean removing fast draining culverts, restoring wetland and perhaps opening up new economic opportunities in wetland bio-mass, marinas and fresh water fish farming.

7. THE REGULATORY REGIME

The European Water Directive
The European Water Framework Directive came into force in December 2000 and became part of UK law in December 2003. It gives us an opportunity to plan and deliver a better water environment, focussing on ecology and sustainable water use.

The Directive helps to protect and enhance the quality of:

- surface freshwater (including lakes, streams and r rivers)
- groundwaters
- groundwater dependant ecosystems
- estuaries
- coastal waters out to one mile from low-water.

The Environment Agency in England and Wales is the lead authority to deliver the Water Framework Directive objectives.

The Water Framework Directive looks at the ecological health of surface water bodies (defined as a slight variation from undisturbed natural conditions), as well as achieving traditional chemical standards. In particular it helps to deal with diffuse pollution which of often associated with agriculture.

Wildlife conservation sites identified under the Habitats Directive and Birds Directive (with water-related features) are also included and are designated as 'protected areas' under the Water Framework Directive.

The sustainable development concept – social, economic and environmental progress - is at the heart of this legislation. This is reinforced by the requirement for Sustainability Appraisal of development plans, incorporating Strategic Environmental Assessment (SEA), and the application of the SEA Directive to the Water Framework Directive. The Water Framework Directive looks ahead to 2027 and so the effects of climate change will also be taken into account in planning.

River Basin Management Plans
The WFD creates new River Basin Management Plans. There are eleven River Basin Districts in England and Wales and the River Avon falls within the Severn River Basin Management District, which is further divided into 10 catchments. The River Avon is part of the Bristol Avon and North Somerset Streams Catchment. By 2015 there will be improvement of the quality of our waters. The core aims of the WFD and RBMP are to prevent the deterioration of aquatic ecosystems, protect, enhance and restore polluted waters, comply with water standards, reduce pollution from hazardous substances, and protect groundwaters.

Some key actions for this catchment have been identified as:

- improvements to sewage treatment works and addressing urban intermittent discharges to reduce inputs of ammonia, phosphate and other pollutants;

- 'Operation Streamclean' a partnership project with Wessex Water to identify and correct sewerage misconnections at domestic properties;

- provision of advice to farmers including through the England Catchment Sensitive Farming Delivery Initiative;

- investigations to assess the impacts of abstraction on the environment under the Restoring Sustainable Abstraction programme;

- mitigating the spread and impact of non-native invasive crayfish through the South West White Clawed Crayfish Conservation Project;

- improving habitat and encouraging community action to tackle non-native invasive weeds through the Avon Frome Partnership and Bristol Invasive Weeds Forum.

The EA creates and manages these plans. Water in rivers, estuaries, coasts and aquifers will improve under measures set out in River Basin Management Plans. River Basin Management Plans are plans for protecting and improving the water environment and have been developed in consultation with organisations and individuals. They contain the main issues for the water environment and the actions we all need to take to deal with them.

The River Basin Management Plans have been approved by the Secretary of State for the Department for Environment, Food and Rural Affairs and the Welsh Minister.

Spatial Planning and the Water Framework Directive

Spatial planning can help to deliver River Basin Management Plan objectives by:

• checking that proposed development does not cause deterioration of water bodies;

• ensuring that the scope of Sustainability Appraisal/ Strategic Environmental Assessment for spatial plans includes impacts on water bodies;

• respecting the limits of the water environment when generating development options;

• adopting spatial plan policies that will help to achieve 'good status' in water bodies.

Best practice for plan making includes using water cycle strategies to check the capacity of water bodies and infrastructure including public water supply and waste water treatment. In addition spatial plans can promote strategies to improve the water environment, for example to improve river corridors.

The Water Framework Directive requires the consideration of water ecology and physical modifications to water bodies including, for example, water resources, chemical water quality and flood risk.


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8. ASPECTS OF THE RIVER INITIATIVE

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Changing Perceptions and Creating Values for the River

Once studied it is easy to understand how Bath's 19th and 20th Century developments turn their back on the river. So thorough has this been that now the city's infrastructure of transportation, its linkages for footpaths and cycle ways and its venues of social and cultural identity, including its parks and open spaces and its zones and centres of commercial and economic life have all been determined without reference to the river. These cannot be changed overnight.

Re-valuing the river is a regeneration project that will take many years. This has to begin with understanding how perceptions of the river's value can be changed, incrementally, progressively.

The river is the way it is because for much of its lengths we have ascribed only low values to it in recent decades.

It is judged valuable for carrying rain water through the city and avoiding flooding. But if it is to become more significant within the District once more, new layers of meaning and value have to be ascribed to it.

These can be:

Environmental - Recognising the river as an important habitat and route for wildlife, a source of energy.

Cultural - Recognising that the river contains elements of history that each contribute to our cultural identity and as it is enhanced and brought to life again in all sorts of ways, it can come to be an important part of the cultural life and identity of the District as has so evidently happened in other towns and cities.

Social - Understanding how new river activities, constant boating movement, rowing, new public transport, pleasure boats, new riverside social venues, parks, pubs and restaurants would all contribute to the social identity and character of the city as a whole.

Economic - Understanding that as, by definition a corridor and so central to the identity of a District, seeing it as the starting point for the renewal of economic life in these areas is fundamentally sensible as a regeneration goal.

- In established areas of the river such values, environmental, cultural, social and economic have already been ascribed. For instance, around Pulteney Weir the coincidence of historic buildings and the level of activity are evidence of social/cultural value and there is economic value in the significance of the central part of the World Heritage City and in the presence of the Rugby Club.

- Elsewhere, such as upstream of Pulteney Bridge, high significance is given to the environmental value of the river and the social value that comes from it offering one of very few places where Bath residents can take a boat and get close to the water and its natural life.

- Downstream in the heart of the industrial zone, there are areas where environmental, social, cultural and economic values are all negative and yet, close by in areas like Norfolk Crescent and Green Park there are already elements of high cultural value, with some social value, underutilised public open space which, being wholly unconnected with the river are not yet part of its value set. The point is that where there are social regenerative needs and opportunities, there is a need to identify how to create the most appropriate hierarchy of values for each part of the river, or that combination of value goals for each part that best contributes to the quality of the whole.

Pulteney Bridge and Weir, Bath

Bath Boating Club

- For instance, at the City of Bath's western approaches, perceptions of the World Heritage Site for those arriving along the Lower Bristol Road are currently significantly diminished by the number of semi-redundant or derelict sites as industrial uses have faded away. Many of these sites are shallow in depth, but they completely obscure views of the river and the historic city on the northern hill slopes and so delay a perception of its value.

Views entering Bath along the Lower Bristol Road

But removing development from these sites could contribute to the flood storage that many central development sites need, or yield considerably enhanced wildlife habitats that transform perceptions of the city for visitors and residents.

Being clear about the value goals to set to different parts of the river will be fundamental.

Although much of the western corridor within the city is blighted or underutilised, the developable land is limited and so there will be competition for uses. If all such sites are seen only as development sites for conventional, commercial or residential development, it is unlikely goals for enhancing the social, economic, cultural or environmental value of the whole river will be achieved.

On the other hand, focusing on environmental enhancement opportunities makes more sense if the habitat of the River Corridor is linked up with established public open space and wildlife routes beyond the corridor.

So within this report we will say a lot about the ways in which social, cultural, environmental and economic value can be ascribed to elements of the river, to achieve the best long-term result. We also say a lot about how perceptions need to be changed because much of the investment in positive change that needs to come, can only happen when it is evident to investors, both in public and private sector, that higher values can be ascribed to areas that are currently of low value.

In our conclusions we list many steps that can be initiated to change perceptions of the river and to stimulate water born activity, to make the river more important as a route, to open up its heritage and to reconnect it back into the life and perceptions of the area.

We try to show how a series of relatively modest, simple measures on the ground supported by the development of appropriate planning and other policies, linking up in an initiative between various agencies and the putting in place of strategic goals can all stimulate the regeneration of the River Corridor for the District that is so strongly desired.

Recovering and Creating Character and Identity

Part of the process of changing perceptions and creating values for the river involves highlighting those things that already create the character and identity which, over time, we have come to devalue, or no longer recognise. Once discovered, the power of such things to stimulate new character and economic life can be fostered. Illustrations of this might include:

• Along the river there are several places where weirs remain in evidence of past mills, none currently generate hydropower. Re-establishing hydropower will contribute to a low carbon way of life that brings new purpose and 'value' to our perceptions of the river once more.

• At Thimble Mill in Widcombe is an opportunity to celebrate one of the great inter-changes between the Thames and the Bath Avon so bringing the Thimble mill back into use as a social venue for promoting community life and identity is essential.

• West of Bath's City Centre it is easy to assume that the industrial wastelands have nothing of essential value to offer, but there is a proud history of Stothert and Pitt to be celebrated, urban design links to be opened up between the river and nearby Royal Victoria Park to be forged. The most significant river feature of the Western approach, Weston Island is a bus depot.

• At Twerton there is the opportunity to recognise that the community's life once revolved much around the economic power the river brought and set out, to ensure that the physical links between the river and Twerton are all fully exploited in the design form that a riverside regeneration of the Twerton frontages ultimately takes.

• At Keynsham, there are so many points where the underlying economic history of the town once had a river dimension that has now been almost entirely lost in the way the town perceives itself. At Broad Quay the massive factories of the Polysulphin Company business remain, as proud elements of Keynsham's Quaker traditions awaiting the new economic activity that the town requires and which could be built around the character these buildings bring.

• Further upstream sites like the Avon Valley Wildlife Park have very successfully shown how the character of the Avon Valley is so different from that evident to travellers along the A4. Such sites could be crucial in showing how new agricultural management could in time contribute to new models of economic life for a River Corridor.

River Avon & Weston Lock 1900

Thimble Mill, Widcombe

Old Polysulphin Factory Building, Keynsham

Avon Valley Wildlife Park

Along the River – Seen from the Air

From Dundas to Hanham/ Dundas to Bathford

From where it enters the District south of Dundas the River Avon is closely constrained by the narrow and steep sided valley south and north of Claverton Village. Here the flood plain is narrow and the river charts slow curves rather than marked meanders, followed closely by the Kennet and Avon Canal and the Railway.

It is the confluence of the Kennet and Avon Canal and the former Somerset Coal Canal that marks the river's entry point into the District and although not connected in its navigations before Bath, the historic Claverton Pumping Station on this section was operationally connected to water courses two centuries ago. But here, despite the drama of the wooded valley the river itself is low key, narrow, with no bridges between Dundas and the river crossing at Bathampton and discontinuous footpaths.

At Dundas the Midford Brook joins the river.

Between Bathford and Bath

Between the settlements of Bathford, Bathampton and Batheaston the river takes a 90 degree turn towards Bath. It receives the flow from the ByBrook which began as a tributary in the north of Wiltshire and commands a much broader valley to the east. Between this point and Bath the river is impounded at Bathampton Mill and meanders only slightly across a notable floodplain. It is largely hidden from view by the continuous frontages of development on the Bath approaches along the Warminster Road and the London Road and so glides discreetly into the City, registering first at the high point of Clevedon Bridge, one of the most important of the City's river crossings, worthy of more celebration.

The City Centre - From Clevedon Bridge to Western Riverside

Bath City Centre is largely contained within a single meander of the river, crossed by 14 bridges, road, rail and pedestrian, between Clevedon Bridge and Windsor Bridge. In Cleveland Bridge and Pulteney Bridge natural banks and riverside trees give way to the wholly urban. Pedestrian access is intermittent; until south of Pulteney Bridge where access is available continuously on the east/south bank before crossing to the north bank at Southgate (Churchill Bridge). Within the City the river has many moods but is celebrated with a major open space and promenades running on both banks below Pulteney Weir.

Western Riverside to Newbridge

Between Windsor Bridge and Newbridge the river scribes a single slow bend and is impounded at its southernmost point by Twerton Weir. This was Bath's late 19th and 20th Century industrial zone, now up for comprehensive redevelopment. On this section only 4 bridges cross the river, one a former rail bridge, two for pedestrians only, the fourth carries the Upper Bristol Road. But along much of this section, river and embanked railway to the south are closely aligned, isolating Twerton village centre from its historical contact with the river. West of the Western Island – created by the canal cut, trees return to both banks.

Newbridge to Saltford

West of Newbridge the river passes into a wide floodplain free of development but traversed by the main railway line and the former rail link to the north, now the Bristol/Bath cycleway. For around half of this route the embanked main line borders the river so closely to the south to render it invisible from the A4.

Saltford to Keynsham

Leaving Saltford the river takes a large meander to the north-east where the floodplain widens considerably. As the river meanders less dramatically towards Keynsham it is flanked by the extensive land of Avon Valley Country Park and Broadmead. But for those travelling along the A4 the river and its wide valley are completely out of view. At Keynsham the river is strengthened by the River Chew.

Keynsham to Hanham

Here the wide floodplain continues and the river meanders lazily across it, after the impounding of Keynsham Lock. As it leaves the District close to Hanham Lock the railway once more flanks the river through the narrow Hanham gorge. The East Bristol Ring road makes the western gateway to the valley.

Along the River – Seen from the Bank

Dundas Aqueduct – the Kennet and Avon Canal crosses the River Avon. The magnificent upstream gateway to the District of Bath and North East Somerset.

Another of the District's remarkable waterways – the Somerset Canal joins the Kennet and Avon at Dundas.

The Somerset Coal Canal Marina Station at the foot of Brassknocker Hill shows very well how new economic life, pleasure, employment, new models for living all follow waterway regeneration.

Cycle hire, electric motorboats, kayaks and canoes café, books, chandling, momentos, events, education. The diversity of social, cultural, economic and environmental value to be stimulated by waterway regeneration is remarkable.

Dundas marks the start of the magnificent Avon Valley in which Claverton and Warleigh lie.

In the shadow of the Aqueduct, the boat house for Monkton Combe School.

River and Canal connect again at Claverton Pumping Station where the canals flow can be supplemented from the river.

In areas wholly determined by nature the river has many moods and a rich flora. Some of these qualities could be restored to the urban structures with the right kinds of restoration and management.

At Bathford, the Avon bends sharply west to pass through Bathampton Meadow on the approach to Bath.

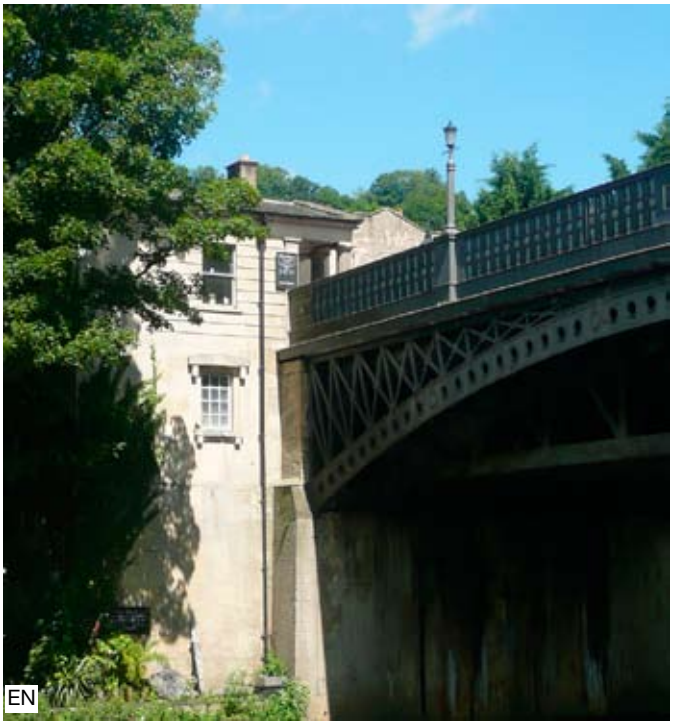
In the bend of the river between Bathford and Bathampton, fields and orchards once contained the market gardens the city's population depended on for food. For years these areas have appeared as marginal land, neither part of the developed city, nor rural agriculture.

Even in terms of planning policy and World Heritage Site Setting and Management, we have yet to declare what these zones are actually for. But projects like this, a Transition Town's initiative are showing their way, reconnecting the loops of economic and environmental life that are essential to creating the "impact accountable" lifestyles coping with climate change well need.

At Bathampton, the St. Catherine's valley joins the Avon Valley.

One of the few places east of Bath, the Avon has a public face – Bathampton Toll Bridge above the weir.

The river enters the World Heritage City of Bath discreetly, between Bathampton Weir and Cleveland Bridge, wholly hidden to public view behind lines of development and flanked by private gardens. At Bathwick, the Bath Boating Station has offered residents and visitors a rare opportunity to get on the water and experience its moods, its flora and fauna.



Unknown to many residents and most visitors, is the grandeur of the the Cleveland Bridge, designed by H E Goodridge. If this could be made more readily visible, its significance as the eastern gateway to the city centre would signal that new values are being attributed to the river in the 21st Century. An upstream 'park and glide' carrying commuters/visitors past its towers would see it celebrated in the changed perceptions of the City.

The only point within Bath where the river is truly celebrated, consciously the centre of attention due to the visual power of Pulteney Bridge and its weir. The drama of major buildings, a place where the backdrop of the World Heritage City is revealed, climbing onto the northern hill slopes. This is one of the few points where there is daily evidence of boating, social and cultural identity and activity, the ability to promenade, a feeling of accessibility created by stepped banks and accessibility on both sides.

There is much scope for improvement either to the west or the east through the pattern of uses placed towards the river and its assets.

The area south of North Parade Bridge illustrates how rapidly the mood of a river can change; there is a well-used riverside walkway, stone embankments, natural banks and trees, distant views and dramatic buildings, but approaching a major bend the walkway here is a desire line to housing remarkably close to the City centre.

From beneath the Great Western Railway Bridge east of Bath Spa Station the sheet metal piling begins that has led so much to present perceptions of the river as a wholly engineered waterway. There are still trees and interesting characterful views but the status of this area is downgraded and needs enhanced activities or an upgrading of status to recover.

The section south of Bath Spa Station to Churchill Bridge has many trees. The river embankments are relatively low but the unguarded river's edge is threatening for the few who use this route.

One of the current missed opportunities; the Kennet and Avon Canal was designed to link the rivers of the Avon and the Thames together but where the canal and river meet at Thimble Mill is wholly without celebration. The rapid succession of hotel chains that have owned Thimble Mill have chosen not to recognise the power of this confluence or its water pound as part of its commercial identity. With its generous external open space and great views this could be so much better and it needs an owner able to see its potential.

The river from Rossiter Road. Although the road is busy, landscape borders, trees and an elevated viewpoint bring enhanced status to the riverscape within the city.

Churchill Bridge, once Southgate; the southern gateway into Bath, flanked from the 18th Century by the evidence of the city's status as an inland port with North Quay and South Quay servicing warehouses, several of which remain. But currently this area is only telling a story about traffic, and the low clearance of the Churchill Bridge constrains boating activity.

The Great Western Railway celebrates the drama of arriving in the city by rail. Close to Southgate these arches are waiting for a new pattern of use that the regenerated Southgate Shopping Centre can justify commercially.

Opposite the City's recently completed new Bus Station, no thought at all has been given to the urban landscape that people see. How disappointing that in the heart of the city the importance of riverside enhancement was not recognised and grasped. This is meant to be a transport interchange where rail, bus and boats all come together.

As one of the Economic Drivers of the District's economy the University of Bath does have a presence on the river, but does this feel like an Innovation Centre, does it inspire?

The section of river due west of Churchill Bridge is one of the most familiar and successful parts of the river for Bath residents and visitors through its place in the city's traffic system. But there is conspicuously nowhere in sight to savour the river, to sit and watch, talk and play, have a drink or a meal.

Along the north bank path away from the river's edge a sense of generosity is brought to the riverscape with large trees and picnic tables.

The Avon Street Car Park, the Council owned site identified for development in the near future. Being so prominent, and of a significant size, the future form of such a site could be transformational in our perceptions of the river and its status/ value within the city. What sort of relationship with the water should such a development have and what sort of uses? How necessary is it to retain this section of Green Park Road at all?

Green Park, a mature but grossly underused public open space, the scale and drama of the river could be revealed, already dramatised by trees and historic warehouses and a wooded backdrop to the east. The river currently lacks activity, but in such a view its drama and scale are unmistakable.

At Green Park the status problem of the Avon in the city is starkly revealed. On the left the narrow rambling riverside path, on the right a generous public open space viewed against the backdEN of one of the 18th Century terraces, but the two wholly separated by a hedge.

Public access to the river north of Midland Road Bridge; in terms of status and connectability this is typical of the low value given to linking up the city with riverside routes.

Again, at Norfolk Crescent the generous Council owned public open space that could be part of defining the river's character and identity is under-celebrated by visual and physical barriers. This route alongside Norfolk Crescent Gardens should be a western gateway to the city centre.

For several decades the uncertainty over the future of the Western Riverside site has blighted this section of the river. It will become much more actively used and dramatised by the scale of new buildings proposed, but, as yet, the values to be attached to this section of the river remain unclear. Is it only to be river fronting development or has it bigger roles to play in the way the city works and sees itself?

Two recent riverside developments west of Windsor Bridge Road, one close to the river walkway has a riverside focus with surveillance, high level balconies, but no low level activity, unlike the housing development beyond.

The recent student housing on Lower Bristol Road with minimal ground level presence perpetuates the longstanding problem of the riverside sites turning their back on the river.

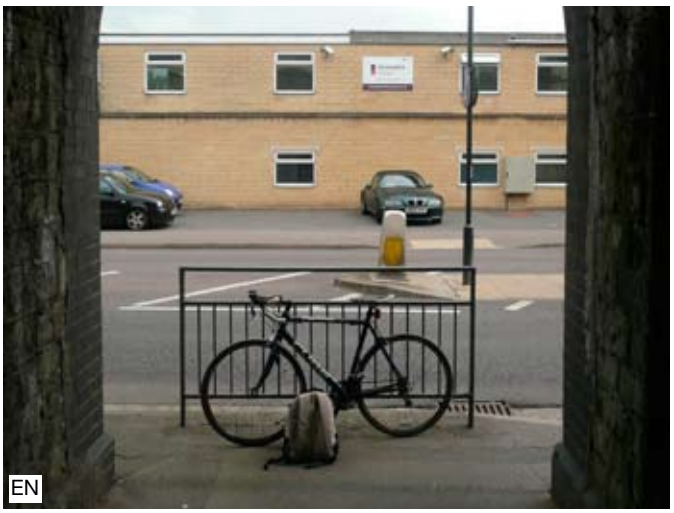
The Herman Miller Factory at Locksbrook. An illustration of how simply a generosity of space, scale and shelter of trees can create a place of significance before the adjoining factory.

The Dolphin Public House at Locksbrook, the first place downstream of Pulteney Weir in which any social and recreational celebration of the river are visible in the form of a pub beer garden.

Twerton Weir, with the sheet piling the Western Island to the left. This area, once dramatised by the massive brick buildings of Twerton Mill now lacks a meaningful urban identity.

The Waste Transfer Station south of Victoria Park. This site sterilises what could be one of the most socially, culturally and financially valuable of the riverside sites close to Victoria Park and the Royal Crescent.

The present Sainsbury's store marked an imaginative reuse of the former Green Park Station when it was built around 30 years ago. Now the probable relocation of the Sainsbury's store on the Homebase site creates the opportunity to review the role of this site and the historic Station building afresh within the context of their important role as the link with the Western Riverside development and the revitalisation of the western end of the city centre.



The urban village of Twerton once had an active economic relationship with the Avon around their weir. Despite the physical barrier of the GWR ramparted tracks a riverside site's Masterplan would ensure the linkages that do exist are given the significance they deserve.

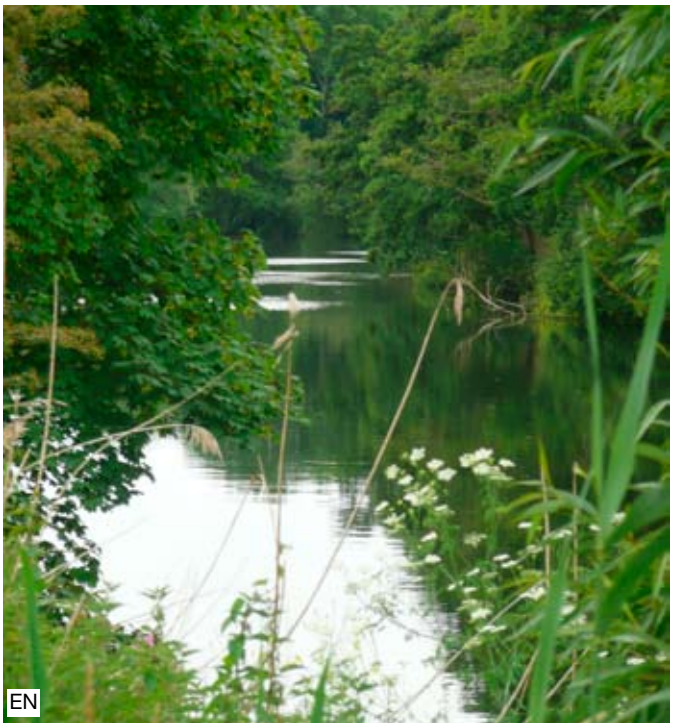
Even now from the churchyard, Twerton feels connected with the Avon Valley – it deserves to be so again.

All along the Western Approach to Bath created by the Lower Bristol Road, the river is an asset denied to view by slivers of already developed or enclosed land. A geographic feature of the significance of Weston Island should be seen and celebrated.

These photographs help understand how significant re-profiled and landscaped southern banks to the river could be – with trees and cycleways – creating a western gateway worthy of a World Heritage Site once more.

Even where, along the western approaches, road and river coincide the river remains invisible to view and overshaded...

...it could be like this



Between Newbridge and Keynsham the river meanders across the broad valley, taking the waterside far away from the busy A4. The Somerdale Factory, once the generator of 5,500 jobs, was the driving force behind the 20th century expansion of Keynsham. The Town now needs a new sense of its own identity, new creators of employment. Planning for Keynsham to build both of these by reclaiming its river dimensions is important.

Creating close contact with water, with its movement, they play of light, the changing seasons, are all part of the values regenerated river experiences can bring.

Approaching Keynsham from the East, well established moorings frame the approach to the huge buildings of the 19th century Polysulphin works.

Keynsham already has several riverside dimensions to it, but these feel remote from and unconnected with the town.

Keynsham has a magnificent broad weir, but who would know it, passing through the town or bypassing it on the A4?

The Massive Somerdale factory dominates the valley viewed from afar, but close to, despite its scale, had no relationship with the river. In taking the site forward to new uses, extracting maximum value for the town in its power to transfer perceptions of the river will be fundamental and any schemes coming forward need to be judged accordingly.

The valley is at its broadest around Somerdale, creating landscapes and waterside character of great quality.

West of the broad ham on which Somerdale lies, the river has many moods as it meanders towards the narrowing of the Hanham Gorge.

The Bristol Ring Road marks the downstream gateway of the Avon as it exits the Bath and North East Somerset Council District.

New Uses for the River
At present the levels of activity on the District's river can be summarised as follows:

Upstream of Bathampton Mill
Boating activity is limited to Monkton Park School, angling and incomplete lengths of riverside footpath and swimming at Warleigh Weir.

Between Bathampton Weir and Pulteney Bridge
Daily pleasure boat trips and small boats for hire from Bath Boating Station; riparian ownerships influence any other activity.

Between Pulteney Weir and Twerton Weir

Despite being a navigation, below the canal intersection there are no proper serviced moorings, (some at Avon Street and the Dolphin Pub) no small boating facilities or angling, there is limited pleasure boating as the sheer engineered banks, lack of wildlife interest and habitats or visible links to heritage all mitigate against this. There is traffic in canal boats between Bath and Bristol, but no landings, boat facilities or evidence of boating related activity through Bath.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Twerton Weir to Hanham

The wide floodplain and the river's rural meanders through extremely attractive undeveloped countryside make this an exceptional length of river for pleasure boats and narrowboat cruising. There are extensive inline and offline moorings including residential moorings at Saltford and Keynsham that are well used. The natural banks support good angling. There are attractive riverside social, drinking and eating venues at Newbridge, Saltford, Keynsham and Hanham and good well connected footpath networks aided by proximity to the elevated Bristol/Bath cycleway. Sporting use of the river occurs at Newbridge where the Minerva Rowing Club has their boat stores and access to 3km of river, and at Saltford where the Saltford Club is based.


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Validating the River - Its Role in Connectability

We do not value what we do not notice or do not use – there are many ways of noticing or using a river:

- Travelling on it as a visitor, a commuter or worker
- Travelling beside it, on foot, bicycle, public transport or motor vehicle
- Crossing it, as a city resident, commuter, tourist, business or education visitor
- Working beside it
- Relaxing and socialising beside it or on it
- Eating and drinking at riverside venues
- Undertaking sports activity on it, such as rowing
- Looking at it
- Getting closer to nature beside it
- Deriving energy from it
- Understanding it as part of the social/cultural identity of the settlements and parishes it passes through
- Seeing it as a foreground to urban or rural views and a feature in long vistas

As the river is both a continuous linear feature and a barrier to crossing, it presents itself as a strong element in transportation infrastructure in which riverside routes link limited crossing points.

If we are to engage with it more, make it more purposeful in people's lives, then its connectable opportunities need to be brought to life once more and stitched back into the daily life of the rural areas, of Keynsham and Bath. Currently many such links that had status when the river was active have been downgraded to become overgrown and are poorly used, all indicative of low values now attached to it.

Some illustrations of how little we currently connect with the river:

• Between North Parade Bridge and the British Waterways Marina at Newbridge there are only mooring facilities at Avon Street and the Dolphin public house in Locksbrook Road. None have any servicing facilities..

• Most Bath residents would consider the Bath riverside routes unsafe to walk after dark for fear of the risk of mugging and of falling in, backed by an alarming number of recent fatalities. The narrow pathways create perceived hazards of pedestrian/cycle conflict without evident prioritisation protocols.

• There are at times much graffiti and rubbish.

• Between North Parade Bridge and the Western Island there are hardly any places to sit and enjoy the riverscape, nowhere to enjoy a riverside social venue, pub, cafe or restaurant.

• There are stretches of the river that are a kilometre, without any trees or vegetation and so no wildlife.

At many of the bridge crossings, cyclists and walkers have to traverse steep steps to access the river. Ramps suitable for the disabled are few.

• There are no river based businesses apart from very limited pleasure boat opportunities that operate from Bath city centre and Saltford/Keynsham and for the servicing of narrowboat/cruiser hire at points well outside the city of Bath.

• The impression District residents and visitors receive of the river along the main thoroughfare of the Lower Bristol Road is conditioned by the lack of access and the ribbon development along the A4. A different impression is gained from the Newbridge to Bitton road, but even here, despite the proximity of the river, awareness of the actual water course is very poor.

• There are many places along the river where recognised assets such as Victoria Park, Green Park, Norfolk Crescent lawn and Keynsham Weir are very close to the river but are not connected by meaningful patterns of use, so denying the river association with known features of the settlement's identities.

The Projects in the Changing Perceptions and Creating Values Chapter of this report show how a start can be made. But the route to overcome these shortcomings needs to be expressed in the formulation of policy coming forward to secure regeneration objectives. To do that the Drivers for Change likely to affect and determine transportation policy in the coming years need to be understood. (Group member, Jeremy Douch has prepared a report for the Group which is included in full on the following page:


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Transportation Issues

In this section of the Report, the Group members with particular experience of transportation issues describe how transportation issues are a significant driver of regeneration change in themselves.

The section explains the significance of movement modes within and across the District and how they are linked to the level of economic activity. The National Policy Framework for transport is described and Local Objectives including policy objectives are set out that have transportation implications.

A section on Issues identify necessary areas and topics of study, social and environmental aspects.

Significant developments coming forward and existing major transort proposals are identified with their likely implications.

All of these areas of study create the backdrop from which to examine the opportunities for of a River Based element to the areas transportation systems. The section following – New Uses for the River draws these strands together to illustrate how transportation issues fit within the overall Regeneration Model.

CONTEXT & POLICY

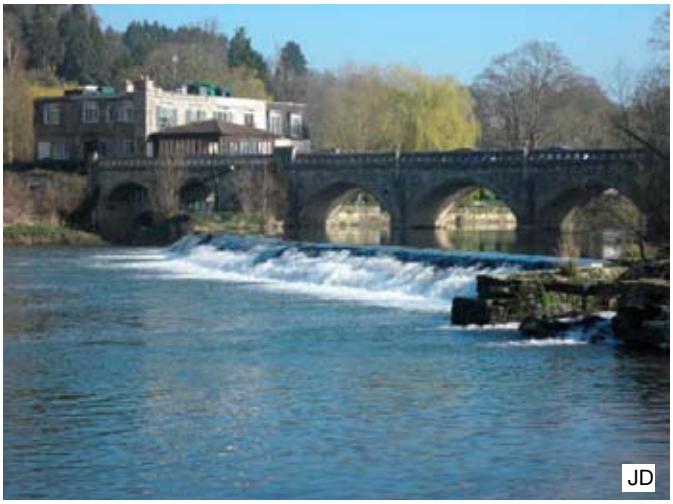
Context

There are significant pressures for movement in the study area – both internal journeys; those with either an origin or destination within B&NES; and those that use the corridor as a through route. There are around 180,000 people who live in the B&NES administrative area, of which approximately a half live in Bath. People move into and out of the City, within the City, and in the wider B&NES area on a daily basis - these movements comprise a plethora of journey purposes; for example, journeys to and from work (there are 20,000 car commuting journeys into the City each day), places of education, and for retail and leisure purposes.

The demand for travel is closely associated with the economy (more people travel as GDP grows) and therefore there is a balance to the vitality and growth of B&NES; with environmental considerations in reducing emissions, noise levels and promoting more sustainable modes of travel; and the social aspirations of improving accessibility and connectivity, providing travel choice and improving safety.

Some people currently use either the river Avon or its banks as a corridor for movement, although the purpose of this study is to identify opportunities to make better use of the river asset (for passenger movements, leisure pursuits, freight traffic, and connectivity with other modes and transport hubs). It is important to recognise that although the study remit concentrates on the River Avon corridor through the length of B&NES (Dundas Aqueduct in the east to Keynsham in the west), travel movements vary from journeys within this corridor to those that also link with external origins or destinations (or both).

This study concentrates on the River Avon corridor and not the Kennet and Avon canal. However, it is important to recognise opportunities where these two assets meet, that connectivity between the river and canal should be promoted, and also that the canal restoration gives an example of a successful water based project.



River Avon Corridor in BANES

Transport Policy - National

Both national and local policy drives the requirement to promote sustainable travel practices. Planning Policy Guidance Note 13 (PPG13) covering transport, sets out objectives to integrate planning and transport at the national, regional, strategic and local level, in order to:

Promote more sustainable transport choices for both people and for moving freight.

Promote accessibility to jobs, shopping, leisure facilities and services by public transport, walking and cycling. Reduce the need to travel, especially by car.

A key planning objective is to ensure that jobs, shopping, leisure facilities and services are accessible by public transport, walking, and cycling. This is important for all, but especially for those who do not have regular use of a car, and to promote social inclusion.

The likely availability and use of public transport is a very important ingredient in determining policies designed to reduce the need for travel by car - the aim should be to establish a high quality, safe, secure and reliable network of routes, with good interchanges, which matches the pattern of travel demand in order to maximise the potential usage of public transport.

Walking is the most important mode of travel at the local level and offers the greatest potential to replace short car trips, particularly under two kilometres. Cycling also has potential to substitute for short car trips, particularly those under five kilometres (and to form part of a longer journey by public transport).

Transport Policy - Local

Although the B&NES Draft Core Strategy fails to specifically highlight the role that the river and its banks can play in meeting strategic objectives, policies clearly shape an opportunity for this asset. The Key Strategic Issues of the Strategy (section 1.12) emphasise "reducing car use in B&NES" and "ensuring that the natural environment is maintained and enhanced to maximise opportunities for mitigation". Clearly both these policies give weight to serious consideration of making better use of the river corridor. The Strategic Objectives in the Strategy also give direction that the river should play a role in shaping the transport strategy of B&NES – these objectives, which have a transport and movement theme (section 1.15) include:

Objective 1: Pursue a low carbon and sustainable future in a changing climate – ensuring the location and layout of new development enables and encourages people to make the fullest possible use of public transport, walking and cycling.

Objective 2: Protect and enhance the District's natural, built and cultural assets and provide green infrastructure – helping to conserve and enhance the quality and character of our built and natural heritage.

Objective 3: Encourage economic development, diversification and prosperity – enabling tourism to continue to make an important contribution to the economy of Bath and promoting the tourism potential for other parts of the District.

Objective 4: Invest in our city, town and local centres – providing better pedestrian and cycle routes into and within the city, town and local centres; enabling appropriate tourism opportunities in the city and town centres.

Objective 6: Plan for development that promotes health and well being – enabling more opportunities for people to lead healthier lifestyles and have a greater sense of well-being through facilitating active modes of travel.

Objective 7: Deliver well connected places accessible by sustainable means of transport – in conjunction with the Joint Local Transport Plan, the Local Development Framework will deliver this by: locating and designing new development in a way that reduces the need and desire to travel by car and encourages the use of public transport, walking and cycling; ensuring that

River Avon Corridor Attractions

development is supported by high quality transport infrastructure which helps to increase the attractiveness of public transport, walking and cycling; promoting improved access to services especially for rural areas and more remote areas.

This chapter looks at the opportunities for promoting river transport and comprises the following components:

• Issues and objectives surrounding transport in the river corridor;

• Drivers of change – the pressures for movement into the future;

• River transport opportunities

ISSUES AND OBJECTIVES

One of the main challenges for the corridor (particularly within Bath) is the high level of motorised journeys being undertaken. The local road network is often congested which brings about significant economic and environmental costs. One challenge is to encourage those travelling short distances to use more sustainable modes – particularly walking and cycling (and potentially making use of the river). Additionally, the reliability, frequency and penetration of public transport needs improving (the Bath Package will help deliver significant enhancements, if approved) – some of these current constraints relate to un-segregated facilities and buses being subject to similar traffic congestion as private motorised road users. There is also the problem of the lack of "through routes" to Bath – for example, traffic (including a high proportion of lorries) route via the City to travel on north – south or east – west journeys.

Acknowledging the wider B&NES topography is hilly and not always conducive to walking and cycling modes, the river corridor (on river and its banks) is flat. One of the opportunities therefore is to improve connectivity to the river corridor and to provide links both on-water, and along its banks.

General Travel Issues

Some of the overlying travel issues in the river corridor include:

• Transport links along the river corridor are centred on west - east movements (primary roads, rail links, and the river) with lower capacity for north – south travel.

• Lack of connectivity and accessibility to the river.

• There is a high level of short distance trips being carried out in Bath and many of these journeys are by motorised modes (source: journey to work data, 2001 census).

• Transport network needs to cater for a number of land uses and trip types – commuting, educational and shopping trips as well as a significant element of tourist and leisure travel in Bath.

• High volumes of through traffic along the study corridor external to the study area / outside the City and B&NES boundaries.

• Traffic "rat running" along rural and residential roads – impacting on the local environment and safety.

• Significant congestion on road links adjacent to the river corridor, and in particular at the following pinch-points:

- Junction of London Road with the A46 at Bathampton;
- Along the London Road – one of the most polluted sections of road in the UK;
- At Cleveland Bridge;
- Along the A36 via Sydney Gardens;
- The Churchill Bridge gyratory;
- Victoria Bridge connecting north with south of the river;
- Lower Bristol Road / Brougham Hayes junction;
- Twerton Fork;
- The A4 linking to Keynsham (and beyond to Bristol);
- Along the Upper Bristol Road and Newbridge Road corridor; and
- The A36 going southwards at Sydney Gardens towards Dundas Aqueduct / Warminster.

• Modes competing for the same space which is often to the detriment of walking, cycling and public transport.

• Constraints for walking and cycling – challenging on-road routes with negotiation of junctions, parked cars and sometimes high vehicle speeds. Lack of segregated facilities. Need a perceived safer and less polluting environment to encourage theses modes (LTP3 targets a 76% increase in cycling within the West of England covering B&NES, Bristol, North Somerset and South Gloucestershire for an eight year period to 2016).

• Constraints for public transport – poor segregation of buses (makes journey time unreliable); lack of integration between modes (for example lack of joint ticketing, space for cycles on trains, car parking at key nodes and waiting facilities / real time information). Any river corridor transport should learn from these lessons and will benefit from segregation.

Study Objectives

There are a number of economic, social and environmental objectives that are priorities for the area with respect to transport. These objectives have been set out in line with Council policies. Naturally decisions need to be made on a commercial level, in terms of value for money and priority.

Economic Objectives

Economic objectives are to facilitate the optimisation of the area's potential to enable B&NES to meet strategic housing and economic growth demands (aligned with the Core Strategy) without harming the values of the World Heritage site. Some of the overall economic aims of the regeneration plans include the retention and promotion of employment in B&NES, to reduce out-migration of those who grow up and study in the area before leaving to find jobs, and to attract new investment in Bath. There is also the aim of continuing to, and improving on, meeting the needs of the substantial tourism trade in Bath and its surroundings, which generates significant benefit to the local economy – currently one in ten of the City's jobs are tourism related and the sector generates an estimated £348 million to Bath's economy (Bath Tourism Plus, 2011). The directly transport related economic objectives include:

• Promote buoyancy of the local and area wide economy (transport infrastructure is aligned to accessibility and regeneration).

• Connectivity between land uses in the corridor and area-wide.

• Addressing congestion.

• Improve accessibility for north / south movements (river and rail line often seen as a barrier and could be used as opportunities).

Social Objectives

Social objectives are aligned at protecting Bath's history and character as a World Heritage site, and enhancing the fabric of the wider B&NES beauty, and providing travel choice. Transport plays a key role and social objectives relating to transport comprise:

• Provision of travel choice by a number of modes.

• Make travel in the corridor safer.

• Creation of vibrant mixed use attractive functional developments (transport linkages are key in creating this vibrancy).

• Improve connectivity and integration of modes.

• Enhance accessibility to corridor.

• Make better use of the rail corridor and improve facilities.

• Making use of the river facility and its banks.

• Improving walking and cycling facilities for leisure activities.

Environmental Objectives

Policies and priorities have also indicated a number of environmental objectives aimed at improving the local environment. Relating to transport, these include:

• Promote sustainable transport and encourage modal shift within B&NES.

• Reduce the number of journeys by motorised vehicles (in particular the large amount of short distance trips being carried out in the City by car).

• Reduce HGV through traffic from the City.

• Reduction in C02 and NOX emissions.

• Potential to make better use of the river as a transport corridor (both on-river and along its banks) – although this needs to be balanced with the river environment conservation with the river being seen as an environmental asset that the area can relate to.

• Reduce operational impact.

River transport proposals have been set out which are focussed on aligning issues with area-wide objectives. The next section looks at changes in travel demand over the Core Strategy (2026) horizon

DRIVERS OF CHANGE

It is important to understand background traffic growth, planned land use and infrastructure enhancements and likely changes to transport provision and demand going forward through the study's timeframes. The Core Strategy timescales are for 2026 and analysis has looked at planning changes through this period, although with an eye on "quick wins" which will have a shorter term benefit to the river corridor. Naturally proposals and commitments are largely dependent on the economic climate, and policies may be changed or refined in the future in response to market conditions, changes to priorities and emerging technological advances.

Future developments will put increased pressure on the transport infrastructure in the corridor although some of the planned transport proposals will help to mitigate impact from background and generated traffic (and other movement) growth and will be geared at providing an integrated system allowing greater choice of travel options. This section is broken down with respect to land use commitments and infrastructure commitments.

Background Traffic

Regardless of any changes to land uses and transport enhancements going forward, there will be an element of background traffic growth. This increased demand will occur from movement using a variety of modes and will have a close relationship with growth in Gross Domestic Product (GDP). In the short term, projections for GDP are low; however, in the longer term it is anticipated that a recovery in the economic climate will drive growth. As the economy grows, car ownership levels increase and the demand for travel goes up. Associated with this, peoples' value of time also increases for some market sectors (particularly relevant to business trips) and the knock on attraction of using the fastest / most reliable mode for travel. However, for other users including tourist and leisure travel, journey time will normally be less of a factor.

Land Use Proposals

There are a number of major land use proposals in the study area and some of these may allow for the release of funds (via Section 106 agreements) to drive regeneration and improvements to the river corridor.

Southgate

The ongoing Southgate development will be completed this year (2011). The development is largely retail incorporating a number of high street brand names, but also constitutes an element of flats and a large underground car park. Completion of this development will provide further movement pressures along the river corridor.

Bath Western Riverside

The Bath Western Riverside proposals (currently under construction) are for a major regeneration development in the heart of Bath, coming forward in the Core Strategy timelines. The circa 18 hectare site has riverside frontage and has outline planning consent. The brown-field site is bounded by the River Avon to the north, Windsor Bridge Road to the west, the Lower Bristol Road to the south, and the Homebase retail store to the east. Plans are to provide around 2,200 new homes (of which 25% will be classified as affordable), an element of student housing, a new primary school, convenience shops and the creation of two new parks.

The development will provide walking and pedestrian infrastructure both along the river bank (south of river) and through a new segregated bridge across the river. In addition there will be a road bridge linking into the site (making use of Midland Road) providing links north of the river into the site.

Former Herman Miller site

The former Herman Miller site is located on the northern side of Lower Bristol Road, adjacent to Weston Lock Retail Park and the pedestrian bridge over the river. A planning application is currently under consideration, for converting part of the building into a new Lidl neighbourhood store, and incorporating 91 parking spaces.

Bath Rugby Club

There are current proposals on the table surrounding the future of the Bath Rugby ground. A favoured position is upgrading the facilities on the current Recreation Ground site in order to improve spectator facilities and increase stadium capacity in line with both demand to watch the games, and Rugby Premiership rules. This upgrade could potentially realise funds to assist the regeneration of the river in the vicinity of the Club and also bring complementary facilities on site which will benefit the wider river corridor. Transport to and from the ground is naturally a key consideration, being a major generator of demand (for circa 16 1st XV games per season plus special events), and use could potentially be made of the adjacent river.

Keynsham

The future use of the Somerdale site in Keynsham is a major consideration in the west of our river corridor study area. In addition there has been a transformation of the B&NES Council facilities over recent years and due to plans going forward their operations may change significantly with regard to the Keynsham site.

Speculative Major Developments
Other potential considerations going forward with regard to the long time horizon for the study include urban extension proposals within Bath. Although these are speculative in nature, it is worth bearing in mind plans for around 6,000 new homes in Bath within the Core Strategy period. This may include potential land at Newton St Loe to the west of our corridor, which would have a significant impact on the Lower Bristol Road; land to the south of Bath at Odd Down; and further afield potential urban extensions to the east of Bristol. Housing land opportunities could also become available with the de-canting of Ministry of Defence operations within Bath, at the Ensleigh, Foxhill and Warminster Road sites.

Wider Area Developments
Other major land use changes to the west of the B&NES area will also have impact on travel demand in the corridor – particularly along the A4. These "trip generators" will include employment and retail development in and around Bristol (recent developments have included Bristol Broadmead and the Temple Gate area of the City, and other projects are being planned). In addition, expansion plans for Bristol Airport (which now have planning consent) and the Bristol Science Park - a joint venture between the University of Bristol, University of the West of England and Bath University (currently being built) will also drive a significant travel impact.

B&NES Major Transport Proposals

Bath Transportation Package
The Bath Transportation Package (not yet approved and subject to the Government's spending review) is for a £34 million scheme designed to tackle congestion in Bath and the surrounding area by improving public transport and enhancing public access for the benefit of residents, commuters and visitors. The Package includes the following enhancements:

• Expanding Bath's three existing Park and Ride sites located at Newbridge, Odd Down and Lansdown - this will increase current capacity from circa 2,000 to 2,900 spaces. Longer term there may be an opportunity to link the routes from the Park and Rides at a central hub improving connectivity for all directions.

• Creation of a more pedestrian and cycle friendly City through changes to access arrangements on a number of city centre streets and the widening and enhancement of footways.

• Improving a number of the City's bus routes to Showcase standards, including raised kerbs for better access, off bus ticketing and real time information (RTI) – this will improve reliability and journey times and increase attractiveness of public transport.

• Introduction of active traffic management in the City with RTI to direct drivers to locations where parking spaces are available.

Measures of the package are designed to reduce the number of cars entering the City and therefore improve congestion, air quality and pollution, and lessen impact on Bath's heritage.

Note: the original £59 million package which has been downgraded also comprised a Bus Rapid Transit (BRT) route including a 1.4km section of "off-street" dedicated bus route to remove Newbridge Park and Ride buses from any congestion for a significant length of their journey and therefore allowing for fast and reliable journey times. The original package also included opening a new Park and Ride site to the east of the City (locally known as "East of Bath" site – increases overall Park and Ride space in the City to circa 4,500; and bus lanes on the congested A36 and A4 routes. The overall goal of the £59 million measures was to reduce the number of cars entering the City by circa 1.5 million per year, reduce vehicle kilometres in the City by 5 million kilometres per year, increase public transport patronage by 2.2 million journeys per annum and reduce the amount of emissions in the City creating a more pleasant and healthy environment. This background may be important for longer term transport improvements.

Other Public Transport Changes
There will be a number of changes to public transport services and infrastructure into the future. Bus service provision will largely be addressed on a commercial basis with the operator amending routes and frequencies in line with demand. Small scale infrastructure enhancements, including bus shelters, stops and information will be carried out on a piecemeal basis. RTI is being rolled out on a city-wide basis.

In terms of rail, the Great Western Route Utilisation Study (prepared by Network Rail) has set out a number of improvements and priorities for their long term strategy. Relevant to our study corridor are the following:

• Industry consensus that there is a compelling case for the railway to grow further which will be compounded by the introduction of electrification and a new fleet of rolling stock.

• Bristol is forecast to experience the biggest growth of 41% in peak rail demand among key urban centres (growth of around 3.2% per annum).

• The Great Western corridor will see more trains, better connectivity and shorter journey times.

• Five additional daily services for the Cardiff to Portsmouth Harbour services (which call at Bath Spa). Revised stopping pattern of one morning and one evening peak Cardiff to Portsmouth Harbour service to reduce journey times.

• An additional vehicle for Gloucester to Westbury services which will benefit passengers from Oldfield Park and Bath Spa.

• Additional hourly service between Bath Spa and Bristol Temple Meads (subject to performance modelling).

In light of the travel pressures along the corridor and the anticipated future growth in rail usage and supporting infrastructure, there may be an opportunity to re-open *the station at Twerton. This would provide increased connectivity to the west of the corridor and increase capacity for movement.*

Two Tunnels Project

Construction is underway on the Two Tunnel walking and cycling route. This route will use an old railway line to create an almost level and direct route between the city centre of Bath and the Midford valley, 2.5 miles south of the City. Two existing tunnels will be reopened and made suitable for cyclists and walkers, including lighting and new surfacing. The project will provide a 4-mile link from East Twerton (giving direct access to our study area), through the Linear Park, Lyncombe Vale and on to Midford. The link will be less steep and more attractive to cyclists than some of the current routes through the residential areas in the south of Bath.

The planned link to the route from Lower Bristol Road is via Inverness Road, which runs into Burnham Road. It is understood there are proposals to widen the footway into a shared footway-cycleway along the Lower Bristol Road, to Jews Lane. The existing pedestrian crossing will be upgraded to a Toucan crossing, which will then provide a link to the Fielding Road bridge, which in turn links directly to the Bristol-Bath Railway Path.

Travel Planning

As part of the travel planning / smarter choices agenda there will be greater emphasis on meeting mode switch and sustainable transport targets in the future. This will be particularly relevant with new developments in terms of parking availability, provision of cycle and motorbike parking (and complementary facilities with respect to employment sites) and the nomination of Travel Plan Co-ordinators. Targets for sustainable travel will be set between landowners at the Council.

Behavioural Change

There is continuous behavioural change in travel. In order to generate modal shift to more sustainable modes there needs to be (for public transport modes) improved customer perception in factors such as improved reliability, quality of service and overall value for money. The market will also be driven by key issues including access and egress to sustainable modes (including integration of facilities and for example cycle parking and car parking at rail heads or at bus hubs).

In addition there may well continue to be significant changes to working patterns and life styles, as in keeping with recent years. More flexibility will develop in working practices with more people working from home and travelling outside peak times.

Encouragement of the healthy lifestyles agenda and the provision of facilities such as cycle and clothes storage and showers at places of employment and other land uses will also be of paramount importance in driving demand for walking and cycling. Naturally this will be accompanied *by the provision of safe infrastructure in pleasant environments for these modes to benefit from, in order to gain significant mode switch and increases in the take up of these journey types.*

Other Key Considerations

Current economic climate and pressures on public spending are forcing a tidal change in policy and financial commitments. Infrastructure projects are being reviewed and the provision of publicly assisted transport (for example subsidised bus services) are under pressure from cuts.

Potential long term aspiration of a new highway link to the east of Bath linking the A46 with the A36 for north - south traffic. This will relieve the City from through traffic which currently has to route via the city-centre and over Cleveland Bridge.

Technological advances are making vehicles more efficient and less polluting. As advances continue there may need to be planning for changes – for example provision of hubs for electric cars and buses and provision of other fuel or charging types. There may also be an increase in the take up of electric bikes.

As technology advances and infrastructure improves, travel should also become safer. As well as influencing motorised modes this should create growth in cycling and pedestrian travel.

Potentially employers' parking charges may be introducing as a tax for business parking. This may further encourage mode switch.

As the study window is long term, thought may also be given to the introduction of road charging in the City and the mode shift this may provide to more sustainable modes. Naturally there are a number of political, economic and technological hurdles this would have to encounter before becoming a reality.

The growing concern regarding oil shortage and the increase in its cost will have an impact on motorised modes which will encourage more people to travel and live sustainably (and fundamentally for this study, opportunities to make use of the river).

Opportunities exist in providing passenger and goods movements by river. Although detailed business cases will need to be developed, there could be time and cost savings to users and associated social and

environmental benefits to the corridor.
A further significant area of interest to the use of the river, is the movement of waste which is becoming more of an economic, environmental and social issue. Within the study area there are important waste hubs at Midland Road in Bath and at Keynsham. There may be opportunities to look at an alternative site within Bath (replacing the Midland Road facility) which may be convenient for access by river transport

RIVER TRANSPORT

By aligning the study issues and objectives, embracing the need to enhance sustainable transport opportunities as emphasised in the Core Strategy, and by looking at the pressures for movement going forwards, it is clear that the river offers a more or less untapped opportunity for addressing many of the transport needs of the B&NES area.

The Core Strategy clearly focuses on reduced reliance of car travel, the enhancement of public transport (of which river transport should be considered); promotion of walking and cycling facilities (the river banks must play a key role in this due to flat contours, and an attractive, conducive and safe environment for these modes); the promotion of tourism (the river can be a major attractor for visitors); economic growth (the regeneration of the river corridor will attract new business opportunities); and the encouragement of healthier lifestyles and recreation (the river provides a plethora of opportunities to promote leisure pursuits). Some of the key merits of looking at the river and its banks in promoting transport is this corridor include:

Images of current Bath commercial boat services

• River offers a segregated asset for the movement of people and materials.

• River transport will help regenerate the river as an integrated land use within B&NES. River activity will then attract complementary land uses (including bars and cafes) driving economic stimulus.

• Promotion of the river as a “facing” amenity rather than a potential gem (activity along the river corridor to have frontage onto the river, rather than turn its back on the asset).

• Bring environmental, ecological and wildlife benefits to the corridor.

• Reduce congestion within B&NES by offering an alternative to road based travel – plans will need to be integrated with other modes.

• Promotion of boat usage is a key facet to bringing a river to life.

• Open up walking and cycling activity along the river banks – remove barriers to use for these modes by developing seamless linkages, and segregation.

• Provide access and connectivity with the river (including movements over the river).

• Promotion of tourism.

• Encourage and stimulate water based activities and recreation / healthier lifestyles.

• Recreating B&NES heritage in utilising the river and a working component within the area’s day to day business.

• Opportunity for river housekeeping – clean up the river and its banks and improve safety and facilities throughout the corridor.

• The large number of short distance trips by motorised vehicles (including many journeys to adjacent wards), the drive of the healthier lifestyles agenda, and opportunities to open up links along the river banks should provide further opportunities for pedestrians, cyclists, on-river transport and recreational pursuits.

A package of interventions (including both “quick wins” and longer term strategy) along the river corridor from Dundas Aqueduct to Keynsham has been assembled through understanding key issues and objectives,

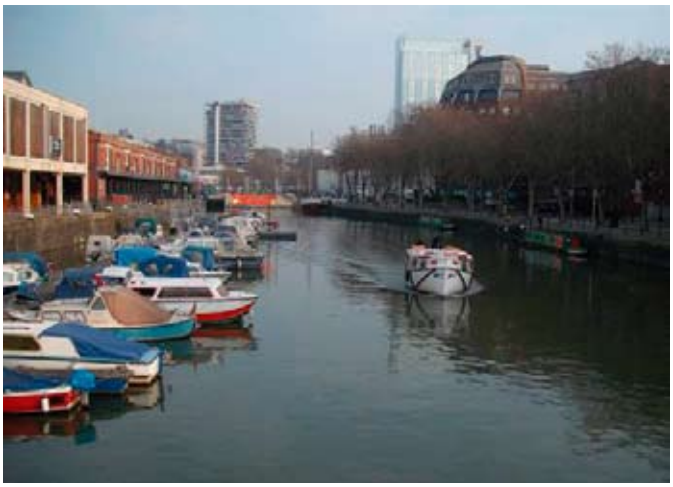
and balancing the opportunities and constraints of the river and its surroundings. The concept of river transportation of people and goods is not a new one to B&NES as historically the river has utilised these movements. The inventions laid out vary from short term quick wins to longer term strategy and comprise both low and high cost investment.
In neighbouring Bristol passenger river transport currently operates a service through the heart of the City and also incorporates a high quality network of pedestrian and cycle links through many areas of the harbour edge.

This section breaks down the corridor into component parts (moving from east to west) in order to present a package of measures that could be further investigated in order to provide river transport. Naturally, detailed engineering, environmental assessment and potentially transport modelling work (utilising the Council's multimodal transport model) will need to take place in order to put weight and cost benefit analysis to the business case. This is a starting point for more detailed work downstream.

We are proposing a series of "pods" along the river corridor which would act as key nodes of opportunity. These pods will offer focus points for the corridor and provide the spark to kick start both localised and corridor wide investment.

Dundas Aqueduct to Bathampton
At this scoping stage, it is suggested that through this section of the route, energies should be directed at promoting access to the river for recreational pursuits and potentially opening up / cleaning the river banks to enhance facilities for walkers and cyclists. Due to the relative remoteness of this part of the corridor (in terms of demand for travel and land uses), and river constraints including the weir at Bathampton Mill, on-river transport has not been considered at this stage.

Mainly leisure based activities occur on this section of the river with notable "hot spots" at Dundas Aqueduct, Warleigh Weir – Claverton, and Bathampton. Typical pursuits include boating, picnicing, walking, cycling, swimming (at Warleigh) and fishing.



River activity in central Bristol including river ferry service

Dundas Aqueduct

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Bathampton to Lambridge
Having discussed land ownership issues and perceived low opportunity to make a real difference, the Group decided that this section was another area of low opportunity. Improving access to the river and encouraging water based leisure pursuits may have the biggest merits in meeting the study objectives.

POD 1 - Lambridge
The team suggests that the opportunity for "park and glide" should be explored at this Lambridge pod (location to be established within the Lambridge area). Proposals would be for a key public transport interchange promoting a river boat service from Lambridge into Bath city centre (and potentially further as part of a longer term strategy requiring engineering consideration at Pulteney Weir). The pod would incorporate car and bicycle parking along with a facilitated bus stop. It is suggested that a 30 minute frequency passenger river boat service operating through the week, could be developed providing stops at Morrisons and Waitrose stores (in order to trigger potential investment from these key landowners) and then onto a termination point at cattle-market.
An exact location of this facility would need to be explored in further detail – but considerable befits would include removal of traffic along the London Road (one of the UK's most polluted routes), offering commuter, leisure and tourist based transport.

An example of an operational local passenger river service (in Bristol) is highlighted. The service operates through the central area of the city providing a regular service from Temple Quay and onto the Pump Houses towards the Clifton Suspension Bridge. The ferries have a capacity of around 50 seats. Although it is acknowledged that Bristol has a larger population than Bath, the scale of the service could be tailored to the area of interest. In addition, Bath's catchment includes those who live, work or study in the city, retailers, and a significant element of tourism demand.

There are some ad-hoc services operating in Bath already - the "Penny Lane" and "Silver Salmon" have capacities of circa 150 and tends to run at a speed of between 4-6 mph. These services offer static restaurant / bar facilities and leisure trips along the river corridor.

Bathampton Weir and landing jetty

Bristol passenger ferry service infrastructure (including stepped banks to view the river)

The scheme would reduce some London Road congestion (and pollution) bringing economic, environmental and social (safety) benefits. Peoples' decision making in terms of mode is closely associated to journey time, although different market segments (for example commuter, employers business, tourists) have significantly varying values of time. River transport may be time / cost effective especially with escalating town centre car parking charges / work place parking taxes coming into force. In addition, although the potential river speed may seem low, average speeds through much of the day along London Road are also very low (and the user needs to factor in parking charges / time to find availability of parking, and onward travel to ultimate destination). The river boat would take users into the heart of the city and would have a dedicated timetable that passengers could plan around. It is anticipated that the service would offer opportunities for the commuting and off-peak leisure markets. Potentially the Council's public transport model could assess demand for services and help determine the business case.

The distance along the river from Lambridge to the Podium is 2.0 kilometres. The journey time is summarised in the following Table - assuming a maximum speed of 8 kph (5 mph). Dwell time consists of 2 minutes for acceleration / deceleration and mooring; and 2 minutes stop (dwell) time.
Over time it may be possible to increase the river speeds to make journey times faster and more attractive (for many users), although this would need to be balanced against the impacts of river bank erosion, wildlife, noise, and other factors.

Journey	Distance	Trasnsit Time	Dwell Time	Total Time
Lambridge to Podium	2.0kms	15 mins	4 mins	19 mins

The business case should compare against alternatives – for example in relation to car travel the total journey time (including parking time and duration to ultimate destination), fuel and operating costs, parking charge. Regarding public transport, fare, interchange and waiting time are considerations. The assessment would also look at values of time by market segment to establish the overall journey cost and convenience factors. To develop the business case further, the total journey by competing modes and by market segment would need to be calculated into a cost (carried out by converting travel times into costs applying industry based values of time and by adding on fuel, parking, operating and fare cost components) – to provide a comparison of alternative travel choice.

Overall assessment of individual transport proposals at a high level could also be set out in terms of Appraisal Summary Tables. These Tables are used industry wide to compare options and potential economic, social and environmental benefits (and other considerations). Scoring is often done through a scale of significant dis-benefit through to significant benefit, either by numbering (such as -3 to +3) or by colour. An example template is shown on the following page:
This process could then be advanced into a detailed benefit - cost ratio / full detailed business case if an option is taken forward for further consideration.

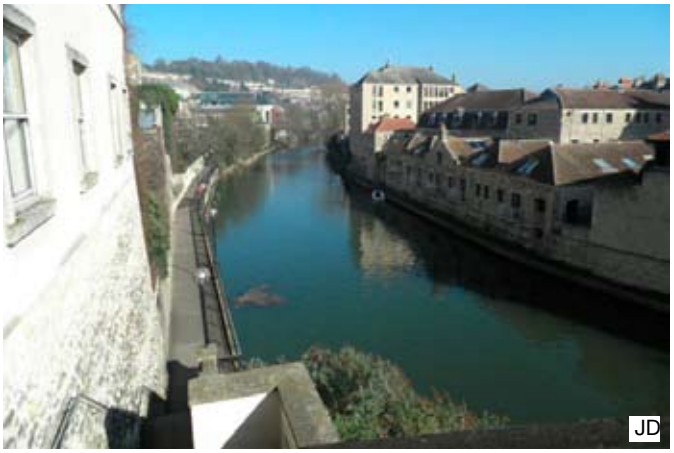
In the Bristol example, the river boat fare (subsidised) is in the region of £2 to £3 for a return adult journey dependent on distance travelled.

Theme	Criteria	Score
Economic	Transport economic efficiency	
	Economic activity and location impacts	
	Funding and affordability	
	Value for money	
Social	Transport safety	
	Personal security	
	Permeability	
	Physical health	
	Social inclusion	
	Conditions for vulnerable users	
Environmental	Noise	
	Air quality and greenhouse gases	
	Landscape and townscape	
	Biodiversity	
	Heritage	
	Water	
Other criteria	Alignment with Core Strategy	
	Alignment with Local Transport Plan	
	Technical feasibility	

Lambridge to Pulteney Weir
There may be the potential to build river boat platoons adjacent to Morrisons and Waitrose supermarkets. Improvements to walkways along both sides of the river where possible (including Podium walkway) to promote walking and cycling activity – the opportunity for floating walkways may also need to be considered. Promote access to the river for recreational pursuits.

Pontoons and stepped banks can create both a river boat station but also a recreational asset for people to sit and enjoy the river.

Approaching Pulteney Bridge including fragmented tow path



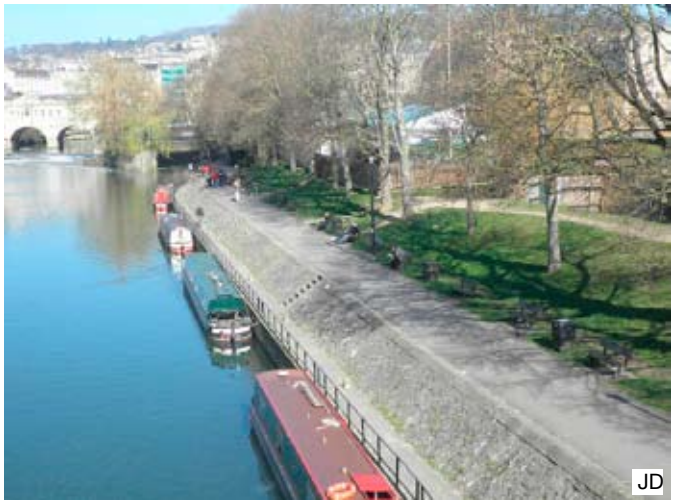
Pulteney Weir

Investigate opportunity for a “Flash Lock” with hydraulically operating slide gates to replace the radial gate (requires further engineering and hydraulic consideration) in order to remove the Pulteney Bridge pinch-point - this would release the constraint for river transport going beyond the weir. It would also allow for a river boat service from Lambridge to Weston Lock / Keynsham (and beyond) giving benefits to potential business and tourist markets.

Pulteney weir and radial gate

Recreation Ground

River service station provided adjacent to rugby ground – will provide further stop in central area and also transport passengers from the west of the City to the stadium on Bath Rugby match days - information regarding home post codes of the circa 7,000 season ticket holders plus other supporters’ addresses on the Club’s database would assist in assessing the business case. With the negotiation of Pulteney Weir, services could also be provided from the eastern side of the City. Promotion of improvements along river path on east side of river by Bath Rugby ground. Potentially rugby ground improvements could release some section 106 funding.



River transport including jetty and segregated tow path with low level river access adjacent to the Recreation Ground

River meets Canal
Opportunity to make a river feature at the point where the canal leads onto the river. Potential tourist attraction and promotion of B&NES heritage.

River meets canal and land-mark opportunities (Bathampton water-wheel shown)

POD 2 - Southgate Arches
This location could be seen as a central point and landmark to the whole corridor. We envisage a river boat station close to this point which will integrate with the rail and bus stations and allow for a short walk into the city centre. This investment could drive the demand for cafes, art facilities and other land uses within the railway arches and along the river frontage. We see the riverside walkway across Churchill Bridge into Southgate incorporating a land-mark feature. This would realise the pod as a central stimulus for the corridor achieving transport, amenity and aesthetical benefits. An example of where this has been successfully achieved in region, includes the Exeter Quay – arches on the historic waterfront are now occupied by independent retailers including galleries and cafes. Land-marks of this pod could include a significant water feature such as a water-wheel, and a potential industrial heritage feature. This would be in keeping with the setting and offer an historical land-mark. The ambience could also be further enhanced by “amphitheatre” style river bank steps like those fashioned at Temple Quay in Bristol, which will attract those wanting to sit and enjoy the river asset.

Southgate arches and Churchill bridge

Southgate to Locksbrook

Provision of a highly attractive and segregated walking and cycle promenade from Southgate Arches through to Weston Island and the Dolphin public house in Locksbrook the investigation of floating walkways may need to be explored where there are land constraints. Overall need for housekeeping along the river path removing litter and clutter, and maintaining vegetation, bridges (particularly Windsor Bridge, Midland Road Bridge and Victoria Bridge). Improvements to connection / access onto the river will also be required to encourage recreational pursuits as well as transport connections - there are a number of "quick wins" that could come out of this work, with one real example being the corridor linking Green Park station with the Western Riverside development.

Regeneration opportunities and current lack of river connectivity

Potential for river boat pontoon at Sainsbury's (either at current location or possible future premises on the adjacent Homebase site) which may release some financial contribution. Another option for one or more river boat stations would be at the Western Riverside site, which again could release Section 106 funding to improve the river amenity – offering an alternative sustainable transport mode for a large urban mix-use development.

When assessing the river transport opportunities, low lying bridges including Churchill Bridge need to be taken into consideration in the technical feasibility.

Locksbrook: tow path and segregated walking / cycling bridge; view westwards

POD 3 – Weston Island

A mixed use development on Weston Island potentially accommodating residential dwellings and leisure activities, and incorporating a water station / hub for integration with other modes - this could drive regeneration along the western section of the river and be an "anchor area" for this side of Bath and open up the river to the Twerton and Locksbrook areas. We envisage making a tourist / heritage feature of the Weston Locks and developing additional eating / drinking facilities in addition to the Dolphin pub (which is situated on the north bank of the Lock cut).

Weston Lock; and the Dolphin public house

This pod would include a passenger river service which could alleviate some of the travel pressure on the Lower Bristol Road and also benefit tourist and leisure pursuits. Due to the neighbouring lock we see this point as the commencement of the river boat from the west of the corridor into the City (longer term through to Lambridge). The pod would allow for a bus interchange, cycle parking and some car parking.

We appreciate that there will be many hurdles to making this happen including land ownership and constraints. However we feel that with vision and drive such aspirations should be considered, especially given the high value potential of the site.

The distance from Weston Island to the City centre at Southgate (along the river) is around 2.9 kms (1.8 miles) with a journey time on boat of around 30 minutes (assuming a speed of five mph and allowing for two stops at Western Riverside and Sainsbury's). Although the journey time may not compete with cycling, it may compete against car at peak times (including time to park car and reach ultimate city centre destination). The river option may also compete with other modes outside of peak times when the overall journey costs are considered.

Weston Island to Keynsham

There are opportunities to further open up the river corridor along this section of the river, for example, walking and cycling to link in with National Cycle Route 4 and by creating a more formal tow path between Weston Island and Keynsham. Opportunities to promote / enhance recreational use along the river and provide access / launching facilities for canoes and other leisure pursuits. There are already rowing stations along this section of the river at Newbridge (Minnerva rowing club) and Saltford with on-river activity regularly taking place.

Poor connectivity west of Bath; Saltford rowing club

In addition, a number of canal boats and sail boats are housed at the Saltford Marina, and near to Kelston Lock and Saltford Lock. It is suggested that promoting a canoe and trail boat launching slipway along the western end of this stretch of the river (preferably within Bath) should be encouraged.

Saltford Marina; weir at Kelston Lock

More use of tourist leisure boats may be worthy of consideration, between Weston Island and Keynsham although the market would most probably need to be targeted at tourists, chartered services and the transportation of goods and materials. It may prove difficult to build an economic case for more regular passenger river transport on this stretch of the river - not only is there a limited catchment for demand, but also a number of river constraints due to weirs.

River attractions / river boat constraints at Kelston Lock and Saltford Lock

POD 4 – Avon Valley, Keynsham

Our team acknowledge Keynsham as a significant location for opportunity and the regeneration of the town and its master planning can be centred around river activity. Opportunities for redevelopment of the Somerdale site and surrounding land are explored in other chapters of this report.

The River Corridor Group's proposals build on B&NES four-point plan for Keynsham which incorporates the creation of employment, improved waste management, regeneration of heritage buildings, river transport and connectivity with existing transport modes and hubs.

Potential vessel for freight transportation; and chartered passenger boat

We suggest that there is strong potential for waste movement to Keynsham by river from Bath (and Bristol) – it is calculated that a 70 foot vessel could transport 100 tons of compacted waste, removing the need for nine 11 ton lorries from the road network, bringing considerable economic (de-congestion) and environmental benefits.

Our team see Keynsham as a major pod of opportunity and regeneration should be focussed in the river corridor.

Building the River Corridor Transportation Modes

The River as an Element of Public Transportation:
If we are looking towards a world in which effective and efficient public transportation is seen to be important then the status, quality and character of that experience are important too and need to be given high priority, seen to be an attractive experience in itself. Currently much of the District's riverscape is kept from view from public transport corridors, notably in the eastern and western approaches to Bath and along the corridor between Bath and Keynsham.

But where it is revealed, such as at North Parade Bridge, Rossiter Road and the Churchill Bridge approaches, value or potential value is created and where there is much scope for public realm and urban enhancement this needs to be recognised.

There are many other places where the River Corridor passes so closely to public transportation routes that the new visual and physical connections need to be made, some of which could have very significant perceptive and conceptual consequences. Bath's western approach along the Lower Bristol Road from the end of the Newton St Loe dual carriageway is dark, secretive and now approaching dereliction, but here the first glimpse of Western Island, (perhaps one day re-wooded) can once more testify to being sufficient to be the remarkable landscape setting this World Heritage City deserves, acting as a foreground to stunning new architecture along the northern riverbanks. Elsewhere, opposite the Western Riverside where the river passes remarkably close to the Upper Bristol Road and within a stone's throw of Royal Victoria Park, similar transformational connections can be made.

The Riverside Walkway/Cycleway:
If we want the river to be valued once more, improving its utility and attractiveness as a spine for low carbon transportation then a new way of perceiving the River Corridor is fundamental.
Within Bath the issues are:

- Improving the quality, generosity and safety of a riverside spine route.

This does not mean such a route needs to border the river continuously as an embankment. Many of the other goals of the corridor, creating places to enjoy the river, improving wildlife habitats etc, dictate otherwise. But there needs to be a route that creates cycle and pedestrian priority throughout the length that is clearly identified with the river in which conflicts of speed and purpose between pedestrian, cyclists and other traffic modes can be well managed.

- To work well its convenience, safety and connectivity with the existing road, pavement and public transportation networks need to be improved and well considered along with signage. This needs to be subject to a detailed study so that it can, in years to come, guide the development of riverside sites and identify where publically funded interventions will be needed.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The Role of the River in Getting to Work:
The existing riverside pathway is already a vital element in the commuting patterns of many residents in the city or out to the Newbridge Park and Ride. As the city's regeneration plans at Western Riverside and along the corridor and those across the District as a whole take effect, ease and convenience of commuters, however they travel, will become increasingly important together with whatever role the river might play as a transportation medium.

Because the River Avon is circuitous around Bath and there are weirs at Bathampton, Pulteney Bridge and Twerton its role as a public transportation medium has been questionable. Its narrow width limits speed. Churchill Bridge has limited headroom clearance and in peak rainfall conditions, options of use become more limited. But, it is clear that as imperatives change and the development of the Park and Ride strategy occurs the financial and sustainability arguments for a river based public transportation system increase.

Where such a system would be key to the perception change that regeneration requires it may, as with Bristol's yellow ferryboats, be transformational in itself. And if, the BRT proposal does not proceed on funding grounds, as a relatively low cost alternative a western city centre link would merit very serious consideration, not least because with some public support on landing stages it could be a wholly private sector initiative.

Practically, such a service would make sense passing between the Western Lock Island and say, Norfolk Crescent, which would offer the most direct way into the city centre, with an extension to the Churchill Bridge area. It is also where the river is straightest and best navigated at speed. Over the length in question (2.9 km) a travel distance at say, 4 knots per hour, would make reasonable sense if stops are limited. The disadvantage is that it remains 850 metres short of the Newbridge Park and Ride, but with a good continuous hopper bus with single ticketing it should be no more inconvenient than a single platform change on the London Underground.

Similar opportunities exist upstream of Pulteney Bridge where a start point at Bathampton Weir would create a Park and Ride run of 2 km. The congestion on London Road means there are limited opportunities to maximise a BRT here because of road width. Such a system would benefit regular workers and would merit close examination. Here the potential for conflicts between other river users and interests is real, but in the interest of taking Bath where it needs to be in the longer term those interests need to be set against the benefits that would accrue to London Road no longer being the sole channel for eastern entry into the city, especially if BRT does not proceed. Stops at the Morrison's and Waitrose stores would have benefits of their own in reducing traffic impact in the city and as escalating town centre car parking charges and work place car parking taxes come into play, the financial imperatives of such schemes changes in a positive direction.

Water Taxis
In places where river-based public transport is well established and integrated, private water taxis invariably follow providing a faster, personal and direct customer focused service. Where such places have an added tourist offer the two often coincide. The Bath Avon project has a long way to go before this point is reached but with a multi-layered transportation system geared around the river as a spine, imperatives will change.

As the River Corridor becomes the focus of regeneration in development terms with new developments, new employers etc, it will be really important that the aspirational goal of future transportation systems are clearly identified in forward planning strategy, site development and travel plans prepared that work towards these goals. Without a clear strategy and set of objectives in place the ability to use planning obligations to secure general and site specific infrastructure will not be possible.

Public Transportation needs a density of uses, daytime and evening activity to work. Many successful historic towns show that density is not a new issue, if anything low suburban densities have been the problem.

Pleasure and Tourism Transportation on the River

In parts of the Avon throughout the District the attractiveness of the river as a focus for leisure and transportation has been recognised both now and in the past, particularly around Saltford/Keynsham where with its wide meanders, generous valley and unspoilt banks the River Corridor is naturally attractive. Even so, the experience of travelling by road from Bath to Keynsham means that many potential users for these services are probably unaware of how magnificent these stretches of river are. There is both a marketing and a business development job to be done to highlight the leisure opportunities and associated venues are needed to open up their opportunities opportunities and integrate them into the tourist offer of Bath and the region.

Tourist boats between Pulteney Weir and Bathampton Weir have been a feature of the tourist offer in Bath for decades. The river here is very attractive but is able to convey only a very small part of the Bath story. Downstream at Pulteney Weir providers have maintained a tourist boat service intermittently over many years despite the highly engineered canalisation of river and the disadvantage its high banks bring to those using it.

With its long vistas, a wooded backdrop and opportunities to view the city's heights and major historic buildings, the potential for such services to become a key part of the city's offer in years to come is immense. So much of the city's stories could be told from the river once a regeneration strategy gets underway. In fact, the benefit to the market and attractiveness of these services through some of the 'easy wins' this report proposes would be immediate and considerable in opening up aspects of the city's heritage to the river that are currently hidden, and in opening up restaurants, café, social venues along the river that would add purpose to those trips. Such enhancements could be worked directly into increased visitor spend and length of stay and increased marketability, a new contemporary cultural offer that plays to Bath's global visitor market as other historic cities, like Barcelona, have done so well.

The navigation between Bristol and the Kennet and Avon Canal is now very well established as a holiday offer and against this background it is remarkable that the journey through Bath from Thimble Mill to Weston Lock offers the cruise or long boat tourist so little, not even temporary moorings, no boater's facilities, water points, waste collection, nor any riverside venues for refreshment or from which to access the city. Whatever the flood management and engineering reasons for this (there are few) it is almost inconceivable that a city with Bath's tourism turnover and identity has not yet addressed the challenge of creating better gateways into the city for water based visitors. The scope to do this is immense with marinas (which can contribute to flood storage volumes) and the opportunity for much boating based economic activity, boat building, servicing, catering etc.

Servicing the Big Events

As a cultural centre Bath's visitor economy thrives on significant events that bring large numbers of people to the city, offering both primary and secondary spend. Chief amongst these is the Bath Rugby and much of the debate about the ultimate home of an enlarged stadium has centred on the value of the city centre of that spend. How larger numbers of spectators will get to the city is a big part of that debate as such travellers are not as 'time precious' as daily commuters are. The river can have a big role to play in how such events are serviced and visitors can use the Park and Ride or temporary field parking sites and access the ground via large capacity boats like the Penny Lane and the Pride of Bath (capacity 150) which can service refreshment and entertainment offer. Similar opportunities exist in relation to the Christmas markets as part of balancing the transportation challenges in bringing a large number of coaches into the city. There are and should be more unique ways that Bath does these things. It is the uniqueness of the distinctive transportation models of Venice and Amsterdam that make them so attractive to tourists who want to be taken away from the common place.

The Carriage of Bulk Goods

When the Avon through Bath and Bristol was turned into a navigation with locks and weirs, this was a wholly commercial investment that serviced the manufacturing economy of Bath well into the 20th Century, allowing it to be, in effect, an inland port. It was the entrepreneurial activity of Ralph Allen, very much associated with the Avon navigation that enabled the river to be used to transport the stone from the Combe Down Mines to coastal ports throughout the country. The cheapness and convenience of carbon fuels has changed all that, but imperatives are changing again and as pressure mounts to make motor transportation more fuel efficient the efficiency of water based transportation too will inevitably come under close examination. Currently wholly new bulk waterway transportation infrastructure is being commissioned in France and Germany in response to these imperatives. In Britain the case for significant investment in general purpose bulk water based transportation is not yet being made strongly enough to enlarge existing infrastructure and equip river systems for wider use and bigger vessels, but there are situations where particular economic services and regeneration imperatives can point the way towards river transportation making sense.

Bath's remarkable building stone could again be the opportunity it once was, for which carriage on the river to a container ship in Bristol could be considered.

In the next section of this report we focus particularly on the role the river has played in linking Bath with Bristol and the role a waste recycling and treatment economy can play, seeing this as a fundamental building block of the future economy and an ingredient in how new economic identity, purpose and value can be given to Keynsham.

Conflicts of Use

In this report we highlight various ways in which activity can again come to the river, in public transportation, leisure activity, sporting activity and bulk transportation. The River Avon is modest in size and its capacity to carry all these transport modes is limited. But it has been the narrowing of the natural river to service temporary industrial needs that has limited capacity and exacerbated flood risk. We need to assess all the layers of new value, a new, (in places), wider river and its related activities can bring. But it would be ridiculous if the potential for conflict of uses is seen as so great that, in practice, nothing happens at all! More important is to see these potentials as tools with a role to play within an overall incremental and accumulative regeneration framework.

The first objective is to have meaningful visible activities that change perceptions; for this, opportunities for boating and rowing are desirable and are 'easy wins'. As the boating economy has already become so well established on the Kennet and Avon Canal and within Bristol Harbour, and the lower Avon the present 'blind spot' of Bath, must be addressed immediately.

Establishing new commuting models for Bath will be crucial to the city's economic renewal plans and as imperatives change, may, in time become of higher importance.

Similarly, if the commercial imperatives around climate change and low carbon living do bring forward new streams of economic life, those have to find their place against the relevant value of other uses at the time. Urban economies are dynamic, need to adapt to emerging imperatives to change, the important thing now is to recognise that the river is an entity, an asset, a potential powerhouse once again.

Bristol's late 19th Century centre

Making the River Relevant

So, fundamental to bringing the river back into importance is making it a place of meaningful activity once more by yielding values:

• Social – giving it a place in daily lives through the convenience it offers in daily travel both along it or across it.

• Cultural – making it somewhere that has history, identity, character and creative life.

• Environmental – building new wildlife habitats and landscaping new layers of quality and interest, creating low carbon energy.

• Economic – making the river meet needs, support new businesses and create new jobs.

All of these mean bringing life, activity back to the river.

Forty years ago Bristol's dockland centre lay dead and inactive, awaiting new validity and purpose. Now it has become the focus of a multitude of purposes, heritage, leisure, entertainment, socialising, cultural activities, living and working. Much of that character and identity have been brought by the way icons of the past such as SS Great Britain and the Matthew have been locked into its regeneration model, but also by the way its yellow ferry boats daily criss-cross the harbour, making it meaningful and relevant to people's lives, in getting to work or just joining up its areas of attraction and interest. With a permanent population of riverboat dwellers and much waterside activity it has become a ready and familiar venue for all sorts of seasonal events where, despite no longer being the international port it once was, the city can still claim that its relationship with the river and the sea are both part of its past and its present identity.

Bristol's centre now

Crucial to rebuilding this water-based identity is integrating the water environment into the ways of getting around the place on a daily basis. This is seen at its greatest extreme in Venice where an extraordinary degree of spatial compactness and an absence of roads have created a transportation network wholly based on water based public transport serving both the city and the outer islands, but, at the opposite end of the scale a highly pedestrian permeable city in which the pedestrians/vehicle conflicts of the road and the pavement have been taken away. Where the physical infrastructure of bridges across the Grand Canal does not provide continuously operating passenger ferries work continuously to meet the need.

It is this integration of transport modes that is fundamental to a city working well. Bath is unusually compact but at present its primary public transportation routes radiate strongly from the centre and are often congested and conflicted where they are concentrated along the River Corridor.

If the river and its riverside paths can become more central to transportation infrastructure many areas of the city could achieve a new model of accessibility as the routes for which the River Corridor is the spine. Transportation studies commissioned by the Council have identified a major transportation need of Bath residents is for short trips, too short to justify the complications of using the car and having to park. Throughout the 20th Century the rise in carbon based fuel transportation has brought high expectations of motor vehicle permeability and freedom of movement everywhere. But it has also introduced the high levels of spatial inefficiency that have separated out functions, and so diminished the 'temperature' at which economic life can occur, and once did in our major historic cities.

There are currently many pressures acting now in the opposite direction, favouring compactness, permeability, public transportation which, in economic terms play into Bath's hands, not least because of the problems that day to day congestion brings to an economy.

Those urban environments that can handle public transportation and the problems of commuting well become attractive to employers and workers. Currently Bath experiences high levels of in-migration by workers in relatively low value jobs, particularly in tourism, who cannot afford to live in the city, but also high levels of out-migration of people who choose to live in the city and can afford to, but to have the salary levels necessary to do so, require work in other more significant centres of employment.

It is currently a major plank of the Council's Economic Development Strategy to both achieve more housing within the city on Brownfield land, and raise the value and quantity of higher value employment. This lies behind the long planned present transportation model for directing commuters and visitors car penetration of the city principally to a ring of Park and Ride sites serviced by improved and rapid public transportation infrastructure, including the BRT, supported by other initiatives such as improving bus services. The Two Tunnels project will provide a new cyclist connection with the Midford valley. Beyond this transportation model now it is clear a new vision for the economic, social and cultural life of the city is slowly emerging in which these qualities of business to business activity, education, the exchange of ideas and much higher qualities of cultural life can be stimulated within a compact, dense city centre, somewhere that knows it is different from other places, distinctive in everything it does, a place to which arrival becomes a sense of occasion in itself.

For this vision to be achieved, using the river regeneration opportunity to make modes of arrival to Bath remarkable and distinctive is fundamental; arriving in Bath for the first time by train is still a really remarkable experience as is the journey down Lansdown Hill or along London Road.

How much greater the status of a World Heritage City would be if similar qualities were recreated in the Lower Bristol Road/Upper Bristol Road approaches, for anyone cycling along the river banks or of course, travelling on the river itself?

Although London Road has retained integrity in urban design and landscape terms – despite its traffic, the river valley landscapes from the bypass to Cleveland Bridge await a new role as the parkland setting worthy of a World Heritage site, celebrating our river.

9. THE ROLE OF THE RIVER IN FLOOD RESILIANCE

OP

9. THE ROLE OF THE RIVER IN FLOOD RESILIANCE

Many of the problems of the District's river that have prevented Bath, in particular, having a positive relationship with it now, came about through historic problems of river related flooding and, in more recent times the technical solutions employed to address that.

Through Bath the engineered banks and deepening of the main channel have worked from a flood engineering point of view. One of the consequences of climate change is that for future decades a new set of flood risks have to be addressed to handle forecast higher and extreme peak rainfall and, further downstream, the consequences of higher sea levels affecting river flows.

Against those expectations, currently many of the potential redevelopment sites along the river are challenged by perceptions of future flood risk, the need to raise the floor levels of new constructions higher than previously required, the need to create areas in which the floodwaters displaced by this can be redirected (to avoid making problems worse downstream) and the need to ensure that suitably safe means of escape can be provided from the sites whose access roads would become flooded under these new circumstances.

Although resolving all these matters is an engineering matter beyond the scope of this Group, the way it is resolved will have a significant bearing on the kind of riverscape residents and visitors to Bath will see in future decades, some of which could be very different from now. It is useful within this report to describe some of the technical solutions available so that their strengths and weaknesses can be weighed in relation to other aspects of the River Corridor regeneration economy ambitions.

In any discussion of options available for river flood management it is helpful to appreciate how rivers, particularly those passing through urban areas, have changed over centuries of human intervention.

A natural river flowing through a broad floodplain before the interventions of agricultural, development or river commerce would be sluggish and marshy with waters spread over a wide silt bearing area, in places lacking a clear main channel. Gradually human intervention whether for fishing or agricultural cargoes would have created a main channel whose status became consolidated through gradual drainage of marshland for agriculture. This generally took place from the early medieval period, but grew particularly significantly in the 18th century. It is likely within such a main channel that river conditions will vary greatly from one stretch to another and weirs for water mills and fish weirs were common throughout the medieval period.

Even before the formation of a River Navigation Act of Parliament in the early 18th century several factors were operating to transform the river further from its marshy origins to the steeply banked water conduit we have today. Agricultural land levels tend to build up over the years through the deposit of natural river silt in flood conditions and often the dumping and spreading of dredgings, creating the common appearance along many rivers that the river banks are higher than the surrounding land. The eddies introduced by the movement of boats scours and loosens the river bed silt, further deepening the channel. When the Avon navigation was engineered in the 18th century, it sought to balance the need to create the necessary conditions for commercial boat traffic by larger vessels and long established water mills.

The effect of all these elements has been to create the situation we have nowadays, in which both in the town and in the country, water levels are generally several metres below the top of the riverbanks, so creating the flood conveyance capacity which now only rarely spills out beyond those banks to flood surrounding agricultural land or developed areas.

The engineering works of the 1960's in Bath were specified to create as efficient a movement of floodwater through the city as possible, with smooth sides and deepening the river creating a channel able to carry the greater volumes and speeds of water that such depth brings. Some of the weirs were also made more hydraulically efficient with the regulated bypass channels introduced to vary the storage capacity of the river in different conditions.

Bath & North East Somerset Council have been liaising with the Environment Agency and engaging consultants for many years to plan for how future enhanced flood threats along the river can be addressed. In the proposal going forward for detailed design in 2011, a scheme is being advanced to divert flood waters on to water meadows in the valley upstream of Bath, much earlier in the peak flood cycle and so reduce the need for enhanced flood storage capacity within the City and beyond. The primary aim of this exercise is to create enough up river storage volume that the Lower Bristol Road can be protected from the floods; ensuring sites along it which would now be inaccessible in a peak flood can always be accessed to facilitate escape of building occupants.

But, as things stand, those sites along the River Corridor which would flood in whole or in part in the threshold extreme flood condition, cannot be built on individually, until it can be demonstrated that they will be able to offer the same flood storage volume that they can at their present site levels, whilst raising new construction floor levels above flood risk. Generally speaking this means that areas of such sites forecast for flood will have their level raised where the buildings and access roads are placed but the storage volumes lost will be recreated by lowering land creating new flood storage elsewhere, generally close to the riverbank. This is the approach adopted in the approved Western Riverside scheme where areas of present high sheet metal piling will be lowered or a new

indentation created and landscaped at lower levels which, in extreme flood circumstances will flood and appear as extensions of the river itself.

Many of the River Corridor redevelopment sites are narrow and cannot afford to lose development area. It is likely that some of 'trading off' in flood storage volumes across sites will be needed with those considered the most strategic and central having highest priority of development from others more peripheral to the City possibly being favoured for alternative use serving some of the other positive objectives for the rivers future character highlighted in this report.

The town of Keynsham is largely free of these considerations, being elevated well above its two rivers and not having exploited its river frontages substantially. But flood risk is a major consideration on the Somerdale site, with other sites historically important to Somerdale such as the large 19th century industrial structures of Broadmead having floor levels marginally below the design flood standard. Any future use of these sites is likely to involve similar considerations of how flood storage volumes and needs should best be balanced.

So, against this background there are a number of ways in which new flood storage volume can be created available to the Hydrological Engineers who will advise the Council on the way forward, each of which could play its role in determining the character and use of the River Corridor throughout the District and the economic contributions it can yield.

If those are led only by engineering considerations, as they were, in the 1960's scheme the overall quality of the result will still not give Bath the character it deserves, worthy of its World Heritage Site status. It is in design matters such as this, through the integration of the different considerations of landscape, amenity, transportation, social and cultural identity, environmental sustainability, etc., that those results can be achieved overall.

The design tools available in addressing these challenges could include:

1. Water absorption in the upstream catchment

Currently the speed with which extreme rainfall flows pass through the city is determined by the configuration of the river channel and the speed with which water landing on fields and developed areas makes its way into the river. In new developments consideration is now given to intercepting and delaying the addition of such floodwaters, through what are known as Sustainable Urban Drainage Schemes. But most of the farmland is itself subject to land drainage in which slow moving ditches and tributaries of the river have been converted into culverts and field drains over centuries of use. Professor Chris Banes, a member of the Council's Urban Regeneration Advisory Panel has highlighted the role that a turning back from such drainage could play in mitigating the enhanced flood risks to the City and improving the utilisation of the City Centre land along the corridor. At a time when the economic relationship between the settlements and their agricultural hinterlands is becoming tangibly more important, we believe this approach deserves further study and we believe there are many ways in which new models of rural land use and farming practice could open up new streams of economic life for farmers and landowners with the more resilient and much agriculture can meet new needs. This might include:

- Production of wetland bio- mass to offer a carbon neutral fuel such as willow.
- The enhanced bio-diversity in wildlife that such wetland habitats would bring.
- New options for freshwater fish and wildfowl farming.
- The new pleasure boating, and living opportunities that new marinas and wetland areas would bring.

All these would be profitable contributors to a river based economy even before the net benefits of enhanced City Centre land use are factored in.

For Keynsham upstream and downstream of Somerdale, enhanced water based activity in the form of bio-diversity rich wetlands and marinas could be transformational in the wider perceptions of the town and the interests of those who might choose to live/visit there and so become a very important contributor to a new river focused identity.

2. Sheet Piling

For many considering the challenges of the Avon within Bath, the severity and height of the black metal sheet piling is a major stumbling block to perception change, one made even worse by the lack of water margin vegetation that is associated with it. Such sheet piling was an efficient way of dealing with the pressing needs of the 1960's flood scheme and replacing it with anything of a better appearance on an active river is always expensive and technically challenging. The River Corridor Regeneration Strategy that will emerge in the aftermath of the adoption of the Core Strategy will need to develop a clear and unambiguous view about what standard of appearance, construction methodology and materials need to be used along the river and where such hierarchies of use need to become minimum expectations of future developments and be applied consistently from one site to another. What follows is a commentary on a number of the technical solutions and design options that can be used;

The lowered banks in Paris

Sheet piling

Replacement of the sheet piling with a stone facing

The appearance of the sheet piling and stone retaining walls can be directly compared either side of the point where the Kennet and Avon Canal adjoins the Avon. It is noticeable how the disadvantages of the sheet piling are noticeably diminished where the height is reduced by the provision of a lower riverside walkway or landscaped areas and trees take attention from it. It is apparent from studying the river's various sections where the riverside path comes away, even by only a few metres from the river's edge and there is grass, trees, possibly a change of level (such as between Rossitor Road and the river south of the railway stations), the sheet piling no longer appears to be the dominant element.

Since it is desirable for there to be much greater provision for tree planting, grass and informal vegetation to create a diversity of habitats along the river as an enhanced wildlife corridor, introducing such landscape margins and setting a path back would appear to be a sensible option where replacement in stone cannot be justified. But it is also evident that stone embankments create a particular kind of appearance and, where the whole of the sheet piling to be replaced by stone, in time, many of the river's problems would still remain, especially for boaters. A design strategy is needed that identifies where high quality materials are appropriate to create a hierarchy of riverside experiences that relate to the hierarchies and status of use of the urban centres. This would determine minimum standards of railings, balustrades, piers, lighting, Public Realm furniture etc. appropriate in such areas.

In Paris a lowered river wall creates a platform for trees and flood capacity – with the much higher wall set back by several metres of cobbled surface. This allows people to be near the river and away from the noise of busy roads and in the shade of urban trees.

It is apparent now that in those few areas along the river where grass and trees do intervene between the water's edge and path how they offer opportunities for walkers to experience the river in valuable ways, for picnics and informal play.

Lowering the Banks

A major disadvantage at present is how the steepness of the river's sides in many situations takes viewers out of contact with the river as a moving medium and away from the wildlife that it might support.
It determines whether boats are moored at all.

Creating lowered or stepped river banks is one way of overcoming this and is likely to occur on many future development sites as a way of enhancing storage volume to offset higher ground levels where building occurs. Stepped banks are a notable feature of the river's most successful exposure in the City, south of Pulteney Bridge and opposite Parade Gardens, one of the only areas where boating moorings occur on any scale and which creates a strong sense of promenade and identity. It is costly and space consuming to lower banks, but it is clear that the quality and utility of the riverside environment that is created merits the effort. The emerging design strategy for the River Corridor needs to be able to identify where there will be genuine public benefits in introducing such banks as points of activity in themselves, such as along riverside refreshment venues or moorings; each of which can become a centre of identity, activity and economic life in itself.

Bath Rugby Ground

Marinas and Moorings

The need to create new flood storage volumes along the river in both the developed and rural areas will favour the construction of new off-river marinas, or in some cases, areas where river banks could be dug away completely to create wider areas able to moor boats from pontoons. Boating activity like this offers many layers of economic value and economic activity creating many streams of new jobs such as:

• The construction work itself.

• The creation of mitigating flood storage to which a value can be attached where it enhances the development of sites elsewhere.

• Boat building and boat servicing activities.

• The contribution to tourism, and trade that such boaters bring, as both owners and visiting hirers.

• The way boats add to the identity and character of places, supporting and stimulating parallel development in retail, commercial and catering.

• Options for 'entry level' housing on locally built longboats.

• Variety of activity at the river's edge, which attract even more users.

It is essential to the character of historic towns that have a river aspect that their rivers have many moods and characters, developed over centuries, as they have been where a river has passed through many phases of need, use and management.

Looking back in Bath, it has been a history of flooding and an engineering led approach to its mitigation that has created the problem the Council is now keen to solve and the regeneration opportunity that presents itself as the challenge ahead.

Building Against the River

Presently, two of the most characterful areas of the river now are:

• Where Pulteney Bridge is flanked by the colonnades of Grand Parade, bringing drama and scale.

• The surviving industrial era warehouses south west of Churchill Bridge which abuts the river dramatically, evidence of a once direct operational relationship with it.

In historic towns and cities it is the variety of riverside moods, the variety of functional relationships and uses, the contrasts of urban and landscape led design that create the richness and identity that can give Bath the relationship with the river its World Heritage status demands.

So there will be a role too for new buildings coming straight to the water's edge; possibly built over arcades to maintain the management access that can be needed in emergencies. Sometimes such solutions will work alongside new river storage created as marinas within the depth of new development sites. In the town centre regeneration at Bradford on Avon (a site previously 90% inundated in a 100 year flood) the new riverscape includes many elements, stone embankments, waterside terraces, arcades below tall riverside buildings, a low level walkway flanked by trees, a tower thrust out into the watercourse and then, where the River Corridor is narrow and deserves celebration, low marshy grassland banks that with peak rainfall will flood and dramatically expand the river's breadth while creating the mitigating flood storage the development requires.

What is now needed is a Strategic Regeneration Plan that can identify where, for pragmatic operational, heritage, connectability, environmental and design reasons, different solutions are most appropriate, absorbing and managing many specialist views of hydrologists, urban managers, ecologists, transportation engineers etc which need to be put together with the policy imperative of economic and planning policy.

Historically, many rivers have the character they have because, prior to carbon fuels, they serviced power generation or low energy means of transportation. The evidence of that era still influences the riverscape we have of weirs and locks and the surviving evidence, often now only in placenames, of the river's history as an inland waterway serving an inland port.

Keynsham Marina

Kingston Mills, Bradford on Avon

Pulteney Bridge, Bath

10. SPATIAL SUSTAINABILITY & RENEWABLE ENERGY

As transportation imperatives change through the demise and expense of carbon fuels and the recognition of the harm their consumption brings, transportation imperatives and economies will change and much of the spatial inefficiency the carbon fuel era has brought will need to be reviewed.

So, in planning for the future of the River Corridor throughout the District as an economic generator we do need to develop clear views and policies that direct uses to those sites that have optimum locational sustainability, since, once put to the wrong purpose, those opportunities can be lost for decades.

For instance, at the places along the river where weirs already impound water flow and create the head that water turbines need, if sufficient space and access are not built into the regeneration plans for this to happen – it will not happen. There will be other activities essential to the most sustainable patterns of life which have to be located near a river, such as the servicing that boat activity needs, the restaurants and waterside leisure opportunities that a fully integrated riverscape deserves, opportunities for people to enjoy riverside sports, such as rowing, the riverside opportunities to create the tangible links with established features of the city's character, such as Victoria Park and Green Park.

All have land use implications which need to be built into the regeneration Masterplan.

Furthermore, if the River Corridor is to be seen to be the Regeneration driver of the District's economy, both in Bath and Keynsham, riverside space needs to be reserved for new streams of economic activity to be built up gradually and to thrive by being part of the regeneration success. There is a present danger, not least through the present residential bias of the Core Strategy, that River Corridor sites will be seen as easy pickings for residential development only, rather than an opportunity to allow high value new employment economies to establish themselves, according to their own pace over a period of years.

Other aspects of riverside land use need to be thought through in order to capitalise best on the regeneration opportunities that can do most to boost the quality and character of this new riverside focus.

For instance, Bath needs a waste collection and transfer station within the City. The present one at North Western Riverside and south of Royal Victoria Park falls within the Western Riverside planning approval, but remains in the ownership of the Council. This and adjacent sites are crucial to improving the character and quality linkages that can be made, bringing the river within the ambit of Royal Victoria Park and the Royal Crescent; and it needs to be asked whether their potential in this regard has been made enough of in the present Western Riverside Planning Permission. Urgent too is the need to identify a future location for a replacement refuse transfer station, one still on the river where river transportation and connections to Keynsham and Avonmouth are realistic prospects. Around that, in a rapidly changing world which sees recycling as the primary source of new materials, specialist businesses will develop. Bath and Keynsham have the opportunity to capture this business.

For instance, within Keynsham there are already two established waste reclamation businesses on riverside sites and there is the opportunity to strengthen those businesses through R & D, fresh knowledge and more sophisticated primary and secondary activity, nurturing the formation of many specialist jobs in which the enterprise of small companies is likely to be of paramount importance.

The Council has identified a site for final stage rendering of waste and the District's largest Sewage Treatment plants all collect sewage streams to this vicinity. This unusual spatial coincidence of such waste activity needs to be recognised.

Somerdale creates the opportunity to fix such a centre of expertise within Keynsham, giving it one of the ingredients of new employment identity in which the river itself provides the link and connector, embracing Bath, Keynsham, Bristol and the Avonmouth Port in a single concept from which regional, national, international expertise could grow, fed by work in the Universities.

Another aspect of this concept of spatial or locational sustainability could be tested in the proposals for the larger stadium for Bath Rugby. The Planning Application for that will have to balance the undoubted economic benefits to the City of the Rugby Club with the detriment that aspects of bringing large numbers of people, flood lighting, noise etc will also bring. That mitigation demands to consider closely the role of the river in the transportation of spectators and the waterhead available at Pulteney Weir in powering floodlighting.

We believe the River Corridor Regeneration Model needs to be based on a study that identifies such coincidences of Spatial Sustainability and economic opportunity and locks them into the Future Uses Plan. We are concerned that the point at which this can make an immediate contribution is quickly approaching in the planning policy stages that will follow rapidly upon the Core Strategy.

RENEWABLE ENERGY OPTIONS ON B&NES RIVER AVON

Introduction

Group Member Ian Gilchrist was asked by the group's Chair to investigate what is known concerning renewable energy opportunities involving the river and its corridor. These opportunities to include "thermal storage, turbine, growth of biomass etc ". At this stage of preparation my report covers only 'Turbines' (section 1) and 'Biomass' (section 2).

1. 'Turbine' opportunities i.e. hydroelectric (HE) plant.

Results here draw entirely from two sources:

1. The Transition Bath (TB) report by Simon Taylor, dated July 2008.

2. The study by CamCo for B&NES Council on (all) renewable energy options in the B&NES area, dated November 2010.

The Transition Bath study

This looked at potential sites and tried to assess their technical potential, putting aside any practical considerations. The results put plainly are:

Location	Potential Output
Warleigh Weir	100kW
Bathampton Weir	67kW
Pulteney Weir	131kW
Twerton Weir	73kW

The total of 371kW would be sufficient to power the typical energy needs of 250 dwellings assuming an average consumption of 1.5kW each. Of these, the site at Bathampton Weir is considered to present the fewest practical difficulties. The construction of an HE scheme was being pursued by Transition Bath, offshoot, Bath Community Energy Ltd, but this has recently been shelved due to difficulties with the landowner. It is not known whether or when these discussions will restart.

The CamCo study

In a report totalling 90 pages, the total devoted to HE potential in B&NES occupies about 6 pages. This section is derived from the Environment Agency's study (2010) on HE potential across all England and Wales rivers.

It considers many more sites that the Transition Bath study, not just on the River Avon, but examination of the map suggests that it does not differ from the TB study in terms of potential on the River Avon. It is not possible to identify from this report the estimated potential output from the River Avon sites.

The CamCo study can be found on the Council's website at http://www.bathnes.gov.uk/SiteCollectionDocuments/Environment%20and%2 0Planning/Renewable%20Energy%20and%20Planning%20Research%20-%20November%202010.pdf

Conclusion on HE

On present evidence, the experts who have looked at the potential for HE schemes on the River Avon in the B&NES area seem reasonably agreed on what is available. The site (Bathampton Weir) which offers the best scope for practical exploitation is already being actively pursued.

2. Biomass

This contribution is somewhat speculative but has passed a quick scrutiny from Pete Capener, a local renewable energy consultant.

It is noted that the river has various flood 'plains' along its route to help alleviate floods. These might be planted with bio-mass (e.g. short-cycle coppice such as willow), and then harvested for firewood (transport along river?) or used direct for electricity/CHP.

According to Prof David Mackay, the theoretical energy yield of such crops is 0.5 w/m2, so 1 sq km (10^6 m2) might yield about 0.5MW, which is not negligible. I also know that for efficient use then any electricity/CHP generation would need to be done as close to source as possible, with customers as close to generation as possible.

The reference to Prof David Mackay is his book, 'Renewable Energy without the Hot Air'. The figure I have used can be found in Chapter 6, in the section on Solar Biomass.

It is noted that grants are available for planting of such biomass (see www.naturalengland.org.uk). The economics of such a scheme would not become apparent until the Government has revealed the details of its Renewable Heat Incentive program which should be launched in July 2011.

Any such schemes would depend 100% on the current land-owners.

Objections would need to be overcome from those that consider such land areas should be used for growing food. This debate is explored in the Zero Carbon Britain report from the Centre for Alternative Technology.

11. CREATING GROWTH POINTS FOR CHANGE

Economies are, by definition, multi-stranded. It is the interaction of those strands which might be manufacturing, education, tourism, professional services, cultural and social activity, healthcare etc that create a healthy economy throughout a region. But the significance of such strands varies over time and now, for Bath and North East Somerset Council, the removal of MOD jobs, the contraction of the Public Sector and the importance of building a strong role for the District within the new priorities of the West of England Local Enterprise Partnership are real considerations.

The need to regenerate the River Avon Corridor can be and needs to be a major driver of new economic activity in itself, otherwise it is a missed opportunity. It is a chance to identify Bath and Keynsham as new centres of expertise, cultural and social identity and a chance to recognise the beauty and significance of the river valley that links them. One of the main parts of the brief given by the Council to the River Group is to identify how and where new economic activity and new jobs can be created both in the short and medium and longer term.

To achieve this it is necessary to explore some of the strands of existing economic activity and emergent activity and show what the significance of the River Corridor opportunity and challenge is to each of them. The history of our urban settlements is the history of the rising, falling and blending of waves of economic vigour and activity. History shows that one thing leads to another as economic activity mutates and develops according to the opportunities and synergies that lie before it.

We have the opportunity in a regeneration project like this to influence those forces, and need to do so in clarifying the key ingredients of a River Corridor Regeneration Plan Model. Without this, given the high property values and the popularity of Bath there is a real danger that 'property led', rather than 'economy led' development takes place largely predicated on housing that would not deliver the revitalised economy the Region and City needs, but instead consolidate(s) the City as a dormitory of Bristol. The areas of land up for potential redevelopment along the River Corridor are relatively small and a few poorly placed uses or a surrender to commercial opportunism would not deliver the well integrated growth in economic, environmental, social and cultural values that regeneration in a World Heritage City needs.

The strands of new economic activity that can re-invigorate the District do not start overnight; in fact many of them are already in place, but still below the radar, not recognised in the fabric of the built environment or in evidence of where they can be most influential in perpetuating their own success and that of our urban settlements. So it is helpful to the process to identify some of those existing or emergent strands of economic activity and consider how they can interact and show their presence within a River Corridor regeneration programme.

For those studying the historical evolution of towns it is very evident how growth and development of particular economic strands grew around particular places and particular people. In Keynsham the influence of a number of Quaker families produced local long-standing industries, around soapmaking at Broadmead and Chocolate at Somerdale, which defined the identity of the place for many decades. In Bath the 18th century revival of the Baths, the social entrepreneurism of Beau Nash, the canny opportunism of Ralph Allen in opening up the stone trade and the skills of Stothert and Pitt have had major influence - all began somewhere around the insight of particular people.

We know where we have existing strengths; a World Heritage City, a tourism offer, a research led university in the top ten in the United Kingdom, some very strong companies in the fields of built environment, design software and publishing, strengths in education and healthcare. How can the River Corridor plan be developed to support these economic strands and assist others and those new firms that can grow around secondary activity? What are the dangers to the District if this aspect of the Regeneration Model is not given sufficient consideration in the allocation of land use?

We believe it is important to identify how, in spatial and locational terms, the growth points for economic change and development already exist and need to be spotlighted and supported. Also to identify those areas of the corridor that particularly lend themselves for reasons of location and assets to the establishment of new strands of economic life. Without this these economic challenges will not take place or have the favourable supportive conditions they need to nurture and develop the necessary new economic activity, which is constantly under competitive pressure from elsewhere.

Somerdale has the chance to bring new significance to the river and enhance its value in doing so.

12. DRIVERS OF ECONOMIC DEVELOPMENT

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Cultural and Social Identity; Expanding the Visitor Offer

Within Bath, many sites and buildings have uses focussed substantially around the City's role as a visitor venue, heritage sites, public parks, museums, cafes, restaurants and hotels. As the River Corridor within the City is regenerated it can add new dimensions to that visitor economy, new attractions that build on the cultural capital that the City already enjoys, but add something new. It can be new heritage attractions, galleries, festival venues, public open spaces, education, social or accommodation offers and we need to identify where those offers can be most distinctive and valuable. This is where opening up the river to established but neglected aspects of the city's existing cultural capital is so important, such as linkages with Royal Victoria Park, Norfolk Crescent, Green Park etc and the re-connection with parts of the City and its history (especially its industrial history) long isolated from the regular tourist trail.

Looking back it is extraordinary to see just how much wholly new social and cultural identity has been achieved within the Bristol Docks or London's South Bank within the last four decades, that simply did not exist at the start. In Bristol, the Arnolfini, @ Bristol, The SS Great Britain complex, the Dockside Museum and a host of refreshment venues.

On the South Bank, Tate Modern, The Globe, new museums and a string of cultural venues now of international importance. Is there any reason why, in its own special way, Bath's River Corridor regeneration should be any less significant, conceiving and delivering those venues and activities that can grow naturally out of its existing strengths, tapping into aspects of historic life that have so far gone unrecognised, creating the alternative cultural scene so far lacking?

In this context, Keynsham has an opportunity to stake out a position for itself as a distinctive outpost of Bath and Bristol's visitor economy. Somerdale and the attractive riverside between it and the Avon Valley Country Park upstream, could all be used to put Keynsham on the map for the first time as a place with a visitor economy. It has environmental assets and the history to do so amidst stunning riverside and valley scenery and, within Avon Valley Park, the enterprise and experience in doing this and making it work. There is also, along this stretch of the river much established expertise in boat building and boating management.

The Sports Economy

Bath has already established itself well as a centre of sporting excellence, evident in the support for Bath Rugby and the strength of sports training and management within the University's offer. These are real achievements that already strongly define aspects of the City's culture and around which the further deepening and broadening of economic life can be expected and should be planned for. The River Corridor regeneration throughout the District provides the opportunity to create new facilities for sports at both a popular and competitive level, in cycling and running trails for instance, but most immediately and tangibly in opening up the central river for water based activity, team rowing, sculling, and canoeing.

Within the District, there are already two well established and historically significant rowing clubs, The Minerva, based beside the Boathouse Public House at Newbridge and the Bristol University Club based at Saltford . Both have aspirations to expand their facilities – The Minerva has an exceptional 3 km. of excellent river between Newbridge and Saltford which is used by Bath University's rowing club, but Minerva would very much welcome having a presence within the City Centre too. This would then immediately show water based exercise and sport to be a far more visible and available activity. It would serve their objectives of making the sport available to people of all kinds and all ages, (being one of the few sports that have competitive classes for octogenarians). It would at a stroke give the river the visible activity it so much needs.

Around that sense of activity, new commercial opportunities, such as cafes and restaurants open up and new character is built. The facilities for opening up boating activity on the river are:

- land to operate from.
- a pontoon to store boats
- minimum essential land based facilities for changing, W.C's etc, boat storage.

These could be provided on some of the existing Council-owned public open space, such as Green Park or on the SWRDA-owned land that lies within the Newark Works Site. Both such locations would be highly visible and transformational in their regenerative effects. Such city central facilities would be attractive to the City's many schools and might in time stimulate a much stronger competitive rowing base for the City, as a further dimension of its University sporting prowess. Is it any accident that Oxford and Cambridge created the National Sporting event of The Boat Race?

Bath Boating Station has provided boats for hire for over 100 years, and remains popular although a partly hidden asset of the City. There are opportunities to open up boating for hire elsewhere, as part of the rediscovery of environmental quality and attractiveness of the rivers rural stretches, essential to helping people re-value the river corridor all are so keen to regenerate.

University Led Economic Renewal

Within the economic enterprise model that lies behind the establishment of Local Enterprise Partnerships by the Coalition Government, the role of the Universities is paramount. The model relies on Universities to research and innovate, roll out new business opportunities and provide the graduates to service them to be players in the global economy. Bath's University at Claverton Down has risen to a position within the Top 10 in the UK within 60 years and is directly represented on the Board of the West of England Local Enterprise Partnership (the only regional university to be so). Bath Spa University has an established reputation in training in education, a position it can use to service and support many strands of the District's new economy which revolve around the transfer and handling of knowledge.

Bath's University has long sought to establish a stronger presence within the City and its Enterprise Centre in Carpenter House (opposite Churchill Bridge) has proved remarkably successful in a short space of time in supporting roll out companies. This is undoubtedly an important and now well established growth point for change and the Regeneration Plan the centre's need for expansion space need to be recognised within its immediate context and beyond.

Its existing presence needs to be celebrated and made more visible (as we described in our Delivery Plan), but there are synergies between what it does and some of the businesses in the well established, but equally uncelebrated office quarter along Lower Bristol Road, such as the pioneering work of international engineers Buro Happold. Handled well, these synergies and strengths can be used to build a regeneration that is very much more than the sum of its parts.

The sort of companies that are being nurtured and launched at the Innovation Centre often need tenure models and facilities that the conventional investment led commercial property world does not provide and which the more enterprising workspace model of Bristol's Paintworks does admirably. Not all the space needs of such businesses will be conventional offices, some will need R&D space that does not lend itself to multi-storey buildings, for which some spatial provision may need to be made in the City's newer business park areas such as along the riverside at Newbridge. The point is that if the University is to be seen as being a long-term primary driver of our future economy, the workspace and facilities needs that will most ideally suit that development over two or three decades need to be recognised and safeguarded simply because we all want and need it to be successful. We need to remember, if Bath aspires to have the World status of the Universities of Oxford and Cambridge, the quality of the environments in which study and innovation are done are really important, demanding qualities of riverscape, landscape, public open space, connectability, cultural and social life that have to be brought to these areas.

The new employment expectations of the Somerdale site also create opportunities of their own – potentially attractive to a presence from the Universities, relieving them of some of their present pressures of space (in areas tightly constrained by Greenbelt designation), perhaps, too, opening up areas of study in new knowledge and applied skill.

Our relationship with the Universities is a two-way phenomenon; we are as entitled to tell them the knowledge sets we believe we as a society and our own regional economy need, as they are to tell us what facilities and support they need to prosper. But we cannot assume that the Universities and Educators will become workspace managers, that is a role for the Council as policy makers in collaboration with business and the development investment industry.

Creativity and Consultancy

It is well known and well researched that Bath and District have a multitude of businesses in the creative and design sector, many very small in size, lacking adequate premises or the opportunity to agglomerate their services to create the wider identity for Bath as the Centre of Creatives the City needs to capitalise on its heritage and cultural life. The Creative Sector, like all others, is locationally competitive and those sectors of the population that meet the premises and tenure needs of a creative workforce will inevitably thrive to the disadvantage of those that do not.

The skills the Creatives bring – in design, graphics, publishing and media etc are increasingly essential to all businesses. But Bath has found it difficult to meet these needs in spatial terms and because the economics of workspace development have not historically worked in the City and the cheap space that might be available invariably gets lost to housing or higher value uses.

The Western River Corridor in Bath does create lower land value opportunities, but even here the merits of this kind of flexible workspace need to be trumpeted within the Regeneration Model so that the opportunities provided are not lost as values rise. But, equally important, is the need to bring identity and character to allow such creative focussed workspace and venues to thrive and be seen as of alternative character involving conversion more than new build, having the spark of creative ingenuity that such schemes can bring.

How valuable it would be to ally this need with the opportunity of helping previously undervalued parts of the City to come to life once more. Such opportunities clearly exist in the riverside sites which connect Twerton to the River and could do so at Western Island or, closer to the City as part of the regeneration of the present Sainsbury's site.

This also offers tantalising possibilities for Keynsham and Somerdale where the closer proximity to Bristol would enable such businesses to balance out their accessibility to both Bristol and the Bath markets and where, within the existing Somerdale buildings, great space is waiting to be transformed and brought new character without land value considerations necessarily getting so much in the way. The evidence of schemes like Bristol's Paintworks is that where Creatives are helped by clustering together, the virtues of proximity mean that the businesses thrive and the low start up rents such businesses need, grow, as such businesses favour flexibility, versatility, creative companionship and proximity to support services and markets more highly.

Over the last few decades Bath has steadily been building a reputation for design creativity too in the built environment, including its major engineering employer, Buro Happold and an unusual number of architects, built environment consultancies and design firms, some of which have an international reputation and clientele. Where this occurs the tendency is for those skills to consolidate and influence the output of higher and further education establishments whilst developing exploratory and experimental dimensions to the work which take them into new realms of economic life.

In the end, the actual accommodation and tenure models that best service the growth and development of these companies and the housing offers their workforce need, all merit consideration in ensuring the patterns of land use and deliverability models employed within the corridor regeneration are those that service such economic growth.

Healthy Urban Living

Bath has always had significance as a place of healing, of good health and pleasure. From the discovery of the medicinal waters by King Bladud, the extensive Roman, the society diversions of the 18th century the great urban hotels of the Edwardian era and the international tourists of today, these themes have continued. So there are many ways in which a city of Bath's status and its region can further develop this aspect of its identity and its economy if it chooses to do so;

• It starts as an illustration of the built environment unusually in harmony with its natural setting.

• It is visited by millions of people coming to refresh and renew themselves on holiday, open to new ideas, new experiences; in arts and culture and in food.

• With a strong reputation in international sport, it can build an offer to visitors and residents around fitness, physical health and wholeness.

An improved river walking and cycling route, the two tunnels project, the K & A canal, new boating and rowing opportunities on the river, new dimensions to the water spa, offers can all be built with these in mind.

The city can use its reputation as a place of relaxation, healing and wholeness and harmony to show how urban living can achieve a new sense of balance with the natural world of its hinterland and its role in the supply of food resources in accountable ways. A compact city whose boundaries with its landscape setting are visible, if such a balance of supply and demand can be demonstrated in the quality of local food in the markets and restaurants it sends powerful messages to many visitors.

Bath and its hinterland have attracted many new residents in their retirement years. The cultural and social life of the region is particularly strong on this account. But a good spread of demographic is maintained by a high student population too. With the population demographic changing to attract an older bias, there is scope to develop aspects of the region's economy account around offering healthy lifestyles, social and cultural and educational life for older people for whom the mobility of the compact city and its geographic convenience are already strong attractions.

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Servicing the Settlements

In exploring how the regeneration needs and opportunities along the river might best unfold it is easy to forget that along the corridor there are already centres of historical settlement, many of which once had a stronger economic relationship with the river than they do now.

Bathford once had its own rowing club and in the early 20th century at Bathwick, around the Boating Station, had a very strong swimming Lido facility. Twerton's riverfront once featured mills on a massive scale. The riverside regeneration here could do much to make more sense of the linkages beneath the railway viaduct and make Twerton village feel it has a meaningful relationship with its river once more. At Keynsham on the Broadmead Peninsula, the massive buildings of the Polysuphine Works would once have been a major centre of economic life. Downstream, Keynsham's magnificent weir and island all feel strangely disconnected from a town that greatly needs to capitalise on such assets.

So, the more economic activity can be brought to the river, the more appropriate and well considered re-use, and re-development occurs along the riverbanks, the more effective is the connectability and diverse transportation modes, the more each of the established settlements along the river can celebrate that relationship and thrive on the particular identity and economic activity a riverside location brings. In some cases there is the opportunity to effectively extend the district centres of such Urban Villages right down to the river itself, so they no longer turn their backs on the river and see its life and activities as an essential ingredient in what they are.


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A River Based Waste Management Model

Over the last decade the aggregation and treatment of domestic, industrial and commercial waste has become a major issue for society and a significant economic activity in itself. The rapid development of separated recycling streams for the collection of domestic waste and the sophistication of recycling options at municipal waste sites all demonstrate how the business models needed to handle and recycle materials produced by a consumers society have come into place. It is becoming increasingly clear that as some mineral resources become in global short supply and subject to increasing competitive pressures, we will increasingly have to see re-use, recycling, re-manufacture as the primary source of base materials and develop the skills and the economy that can service this need. Every settlement and region will need to embrace this ability, this economy and these businesses and we believe the West of England LEP is particularly well placed to do this with the economic regeneration of Keynsham having a particular role to play midway between Bath and Bristol, with direct access to the river as a conduit between the two and extending beyond Bristol to relevant facilities and the global port at Avonmouth.

Within this concept waste streams collected at Bath would travel the river to Keynsham where already two recycling businesses have their premises, The Severn Waste Recycling Company and Mead at Broadmead Lane. The Council itself has reserved land at Broadmead Lane for a future waste rendering site and the sewage treatment plant beside this land represents the final collection point for sewage treatment from Bath for the sludge pumping operation and final discharge at Avonmouth.

This coincidence of facilities and commercial operations is very significant and we suggest, handled in a planned way, could be turned into an economic strength for the District, making new models and setting new standards for the treatment of waste and the multitude of new economic activity in research and consultancy which will increasingly grow from it. Waste recycling requires a host of specialist firms with particular expertise in handling the individual materials that come out the material of waste stream and providing consultancy advice and experience on waste minimisation and management. This includes:

• Consultancy for waste minimisation and designing products systems, buildings and infrastructure for maximum recyclability.

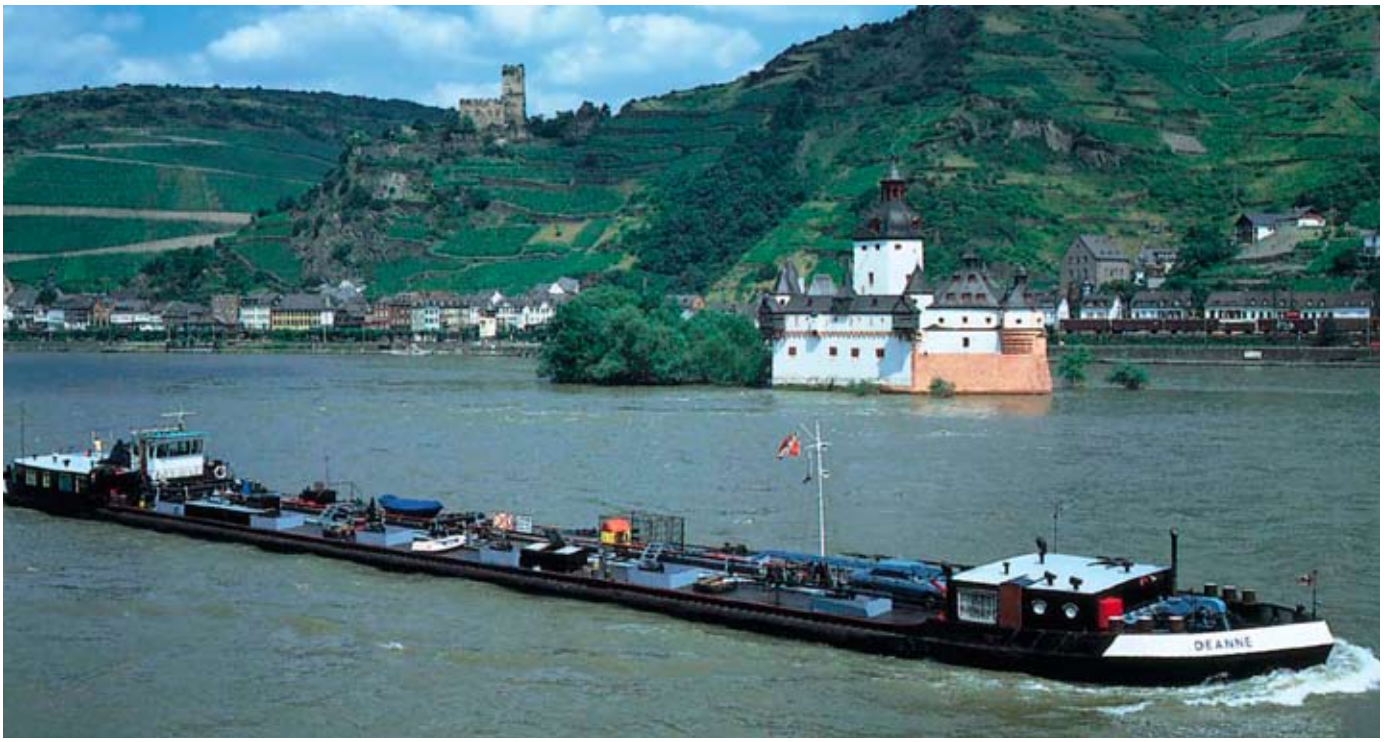
• Identifying and tracking future waste streams.

• Commercial operations to collect, sort and direct waste materials for re-use and re-rendering.

• Architectural and consumer goods recycling; specialists operations and brokerages in rendering and returning materials to manufacturing streams.

• Final rendering operations to return materials to organic recycling.

It is apparent how much more sophisticated knowledge and practice in these areas have become in recent years and the coincidences already in place at Keynsham could make this one of the themes of the new business employment that the Somerdale reuse plan demands. There are also possibilities to develop and mature business clusters around these skills in the former soap works buildings at Broadmead. In time, sewage waste collected here could be part of this, whether for energy creation or organic reuse. Its possibilities are expanded on in the paper included at Appendix (i) by Group member James Hurley and others as one of our study subgroups.




£10
£5

The Rural River Economy

A key goal of the District's river regeneration is achieving tangible economically significant activity on the river. By definition, activity on the river cannot happen only in the settlements of Bath, Saltford and Keynsham. The significance of the river is as a catchment and as a conduit and geographically, a defining feature of our environment. Practically, and in economic terms there are future relationships between the built settlements and their upstream and downstream catchments that cannot be ignored. We have highlighted how achieving the optimum utilisation of city centre sites in Bath and other prospective development sites around Keynsham may depend on adopting more absorbent landscape approaches to land management upstream of these areas. Such an approach would bring new streams of economic activity of its own which, handled well, will produce a stronger rural and agricultural economy than we have now.

New boating activity will contribute to perception change and take Bath and its river hinterland to another level in its visitor offer, and create new transportation based streams of economic life which all need to flow between country and town and will need many layers of economic activity; boat building, servicing, river management and infrastructure that require a range of supporting facilities, some of which can only be provided on lower value rural sites.

The quality of the rural landscapes, both upstream and downstream of Bath are significant assets for visitors and residents and it is evident how in the last two decades the restoration of the Kennet and Avon Canal, the opening of the Bath/Bristol cycleway and now the opening of the Two Tunnels cycleway are all evidence of how such assets have begun to contribute to our quality of life and the economy. Through narrowboating, cycling, accommodation and all the facilities visitors and day users need – and added benefits to our quality of life and health.

There is more of this to come and we should embrace it as a way of celebrating the quality of landscapes that at the moment few have access to. Existing, well established enterprises such as the Avon Valley Country Park and the Limpley Stoke Marina have shown how these assets can be put to good and effective use, in ways that educate, provide leisure experiences and that enhance bio- diversity and connect people with the world around them.

The Future Economy of Keynsham

Throughout this report we have highlighted the needs and opportunities Keynsham presents to grow in strength around the enhanced social, cultural and economic identity strengthening its relationship with the river can bring. We are concerned that present regeneration plans concentrate so much on the town centre and whilst they feature Somerdale strongly as a land use opportunity, what is currently missing is the economic, social and cultural identity needed to achieve transformational change. . Keynsham sits mid-way between Bath and Bristol and we believe the ability of businesses to serve both markets from a Keynsham base is a strong asset coupled with the amenities a compact town centre, good schools, good transportation links and a good housing offer.

We believe it will come to be seen that there are synergies of interest between the regeneration needs of Bath and those of Keynsham, in terms of what each is best able to do; so important do we believe it is to focus on the particular role Keynsham can play within the District's economy in the coming years that, at our Appendix i, we have included a comprehensive Vision Statement for Keynsham's riverside sites linking the Avon Valley Country Park right through to Somerdale, reflecting a number of the themes within this section of this report that has been developed by one of our specialist sub-groups.

This presents a vision of how a re-enerised river economy might look through several linked strands of activity need and opportunity.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13. WHAT A NEW RIVER FOCUSED ECONOMY CAN DO FOR US

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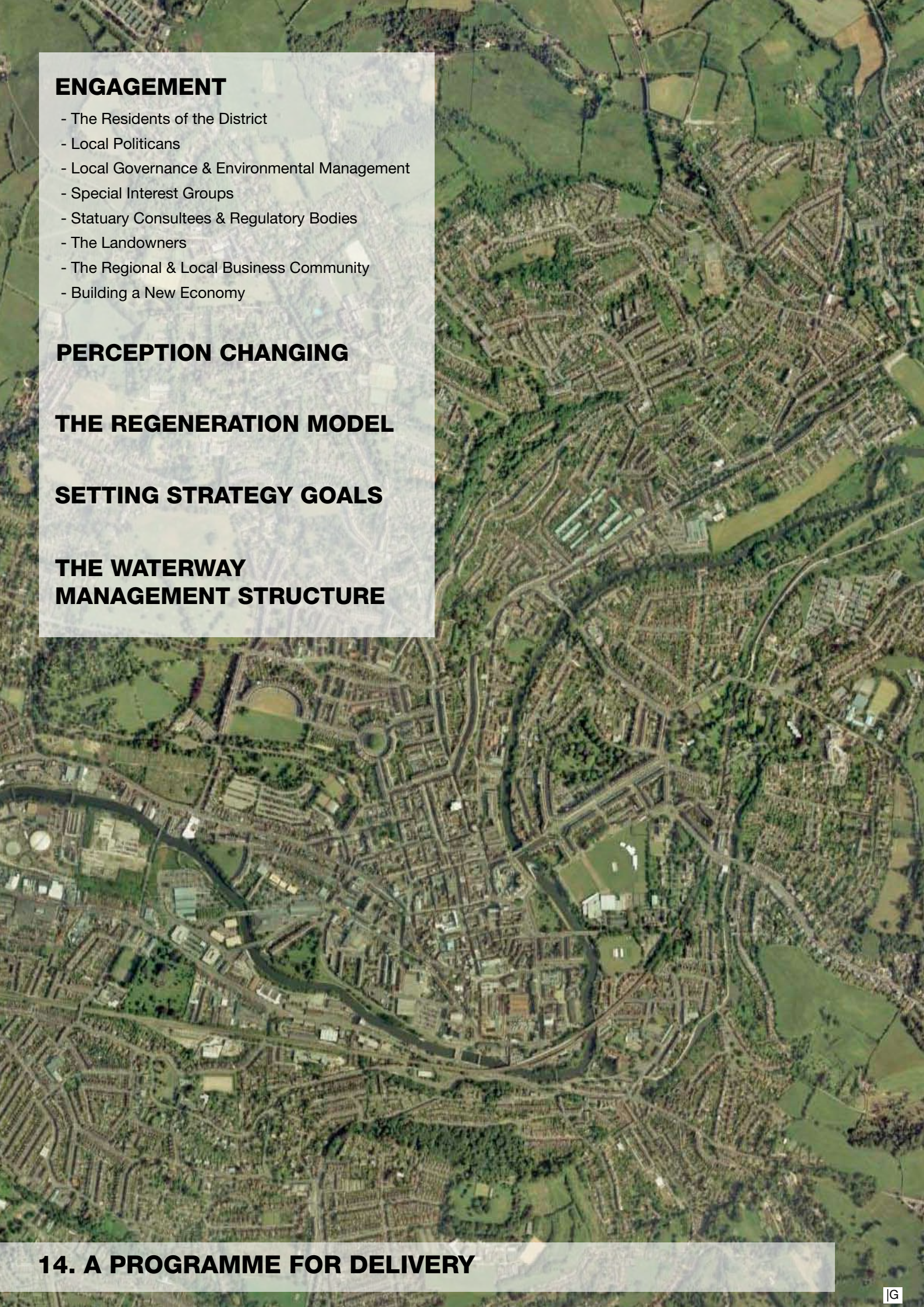
13. WHAT A NEW RIVER FOCUSED ECONOMY CAN DO FOR US

In this report we have set out to illustrate just how different and active a strong river focused economy could be; where what happens on the river and along its banks are as important in our perceptions of the District, as what happens within the heart of Bath or in Keynsham now.

By definition the economies are multi-stranded and involve complex networks of millions of daily interactions, individual considerations of value and cost around the ingredients that new economic life might be built from. We can take the necessary steps to ensure that each of those essential layers, the sort of things that in an historic town or city are built up over centuries are carefully laid down and stitched back into the living fabric of the city, town and country.

It is a big task, but if we can take ourselves back to what has been achieved in half a century of London's South Bank or Bristol's Harbourside, we know what can be achieved. When we stop to consider, we have the many advantages of an established tourist economy and a District with many other established economic strengths, and if we look at this challenge with an historian's eye, we can see how each wave of investment and developmental change has influenced and created places that we now value, their visual richness and the integration of a manmade with natural geography, the diverse cultural and social life that has been spawned.

Embracing the new river centred phase of the District's life, requires the same steady and far-sighted building up of each of these strands of value, social, cultural, economic and environmental, keeping the balance, creating new points of character, identity and purpose so that, maybe, three decades hence, residents or visitors alike will look back and wonder how things could ever have been different.



ENGAGEMENT

- The Residents of the District
- Local Politicans
- Local Governance & Environmental Management
- Special Interest Groups
- Statuary Consultees & Regulatory Bodies
- The Landowners
- The Regional & Local Business Community
- Building a New Economy

PERCEPTION CHANGING

THE REGENERATION MODEL

SETTING STRATEGY GOALS

THE WATERWAY MANAGEMENT STRUCTURE

14. A PROGRAMME FOR DELIVERY

14. A PROGRAMME FOR DELIVERY

Taking the first steps towards regeneration delivery goals is never easy. It involves aligning the interest of views of a multitude of agencies, each of which begin with their own agendas and responsibilities. It involves engaging with many drivers of change potential, but initial conflicts of interest having to be aired and clear common goals formulated.

But because regenerating the river has been a such a difficult challenge to grasp, it needs, at the outset, a series of simple actions that help all concerned see that change is possible and that positive change is accumulative, i.e. that one thing will naturally lead to another and that momentum can be built around not only the vision that lies in front, but what to do to get there.

So, our programme for delivery focuses first on the perception changes, the easy wins, those things that the agencies involved, and principally the Council, can initiate without raising significant issues of policy, things that are sensible and timely to do at minimum cost and show where primary infrastructure costs could fall to private rather than public sector.

There are 22 such items on our list.

Next we highlight the importance of engaging with a wide range of interested parties whose existing perceptions of the river and its potential needs to be challenged and developed alongside their working out of the responsibilities or room for influence and action. Through these layers of necessary engagement, we believe the River Regeneration objective can become their objective too.

Next, we list several future actions, relevant leads, fundamental strategic goals and policy objectives that need to be explored, subjected to public consultation and tested, around which many areas of policy involving many of the Council's departments need integration with other agencies.

Lastly, we identify how each of these stages – engagement, perception changing and policy formulation needs to be reflected in a comprehensive Regeneration Model that describes what needs to be achieved – in 2 years, 5 years, 10 years, 15 years – how it will happen, how necessary expenditure might be funded and what the consequential benefits will be.

This will need to be a fully consulted and adopted Regeneration Strategy to carry sufficient weight in Executive and Planning teams, but it is a tool less about specific land use, more about achieving strategic goals, connections, economic relationships; creating the fertile ground in which the right things can and will happen.

This first Report of the River Corridor Group sets the scene for the kind of long term project a New Economy River Corridor Regeneration could be and begins to indicate how it can both be planned for and unfold through incentivisation.

But neither of those things will happen without the project first being understood, recognised and valued by a host of relevant interests whose engagement, enthusiasm and critical contributions will all be necessary to secure the best of outcomes in the longer term.

STAGE A - ENGAGEMENT

Although the decline and redundancy of the urban aspects of much of the River Corridor have been evident for over three decades and their need and opportunity flagged up in the current Core Strategy planning framework round, this Report is the first document that attempts to illustrate how comprehensive and significant a River lead economic, environmental, social and cultural renaissance could be. Each of the Groups relevant to that task going forward needs to be engaged with these ideas over a period of months so that the scope and ambitions can be developed as a true Regeneration Delivery Model that is realistic and credible at all necessary levels. These groups include;

- The residents of the District
- Local politicians
- Local governances
- Statutory Consultees and Regulatory Bodies
- Special Interest Groups of many kinds
- The Major Landowners
- The regional and local business community

The focus of the New Economy who can see how the Regeneration Opportunity can be made viable through their ambitions.

The Residents of the District

The Report is a conceptual model, in effect a Regeneration Model for how 'new life value' can be created along the district's river. But it is one that needs to be explained and tested through sharing and discussion with the district's population, among whom, concern about the river, particularly within Bath has been evident for a long time. The difficulties in progressing change, particularly in Bath, inevitably breed scepticism at what can be achieved, how and at what cost. In writing this report we have been at pains to show how progressive incremental change can, and in fact here, needs to happen.

We believe there is a psychology to how change is managed which first requires historical understanding, then recognition of how change can occur through changes in perception and value. We believe all along the river, but in Bath and Keynsham in particular, part of the present problem is that the areas actual industrial and river economy history is not widely understood and appreciated and in fact not embraced strongly enough within the role Bath plays on the national stage as a World Heritage City. Until that industrial era of history is recognised, trumpetted and celebrated, we cannot move on. This has certainly been the lesson of heritage-led regeneration planning elsewhere in recent decades.

So, we believe the first task needs to be to create a public exhibition, ideally one lasting for up to a month or even a summer season; ideally located at a venue recognising the river and regeneration focussed. The exhibition will focus on the evolutionary history of our river, its industries past, its transportation infrastructure and how this impinged on social and cultural life of the district's population. The transformational role for such an exhibition needs to be recognised by giving it a strong cultural and arts dimension as well, in which artistic activity, large scale historic images and associated musical and literal events can all play their part making the event itself part of our folk culture and not something only of interest to historians. It needs to be well publicised, supported by speaker and art based events throughout the City.

Associated with and following this we believe there could, and should be other events aimed at engaging other dimensions of the public audience, such as through organisations like BPT and Community Groups, making the history relevant to individual communities, out of which particular champions for the bigger project ahead can emerge. This is a project that needs to be able to engage with residents at all sorts of levels and that can only happen by making them feel they have a stake in the way the project will unfold.

Local Politicians

B&NES has recently undergone a change in political leadership, but the issues the District has to address in the coming years remain the same. The way those issues are addrssed inevitably have to be reviewed against the economic challenges and changes of today, such as reduced government expediture, our place within the Local Enterprise Partnership and the neighbourhood planning agenda. All of this is giving local politicians a different set of tools, constraints and opportunities to work within. Of particular importance within the District is to generate the Vision that is able to show the interdependence of both the urban centres of Bath, Keynsham and the Somer Valley towns and the rural areas. This is something that the river project can make a significant contribution to. To this end we have sought particularly to show how incremental change can take place that benefits as many people as possible and in as many communities as possible, in ways that are realistic, not over-dependant on government subsidy or district budgets, able to engage individuals and emergent business very effectively. There is so much in the river project that can give all the District's residents things to celebrate and be positive about.

Real regeneration happens when the forces for change are engaged and spurred on consciously and subconsciously by common goals.

Green Infrastructure Group

Local Governance and Environmental Management
Within a Local Authority district such as B&NES, change management is administered through departmental structures such as Planning, Economic Development, Tourism, Education etc. in response both to political direction and statutory responsibilities and duties. If the Group's advice does win political support and encouragement, as we believe it will, it is necessary for the development and execution plan to engage with the operational side of the Council's work at many levels. Each department will have to work through its ambitions and turn them into tangible, operational policies led by the executive machine the Council's political leadership, Chief Executive and department heads. The Council has various co-ordinating bodies to whom the proposals will need to be presented, such as the Gateway Group, the Green Infrastructure Group and through the overall advisory guidance of the Urban Regeneration Panel. Part of the role of the River Group, which is independent and advisory to the Council is to be able to report to the political leadership on how achieving these objectives is fairing over time through the bi-annual reports we are charged with producing.

Statutory Consultees and Regulartory Bodies
Although the Group advise the Council, the changes in status and value we are outlining for the River will inevitably engage the statutory and regulatory responsibilities of many statutory consultees and organisations with real executive responsibilities which need to be acknowledged and understood. These include organisations such as the Environment Agency, British Waterways, Natural England, English Heritage, Wessex Water and many more. For these bodies to be able to engage with the Vision presented here, many aspects of the Vision will need to be subject to formal consultation, in which the views of these bodies will be paramount before any regeneration model can be suitably politically endorsed as a clearly defined strategy and one to which these bodies can be expected and then required to apply effort towards delivery.

Many of these bodies will require specialist and in-depth work to be done to help them assess the true impact of these proposals against their statutory obligations, particularly where matters as important as flood risk, water quality, environmental management are concerned. The Council will need to use their position to create the environment in which pre-consultation and consultation discussions can take place, placing these opportunities and challenges within the wider national and international regulatory frameworks within which these bodies operate. Existing interfaces such as the Council's Green Infrastructure Group already create the meeting point for some of these discussions to begin.

Special Interest Groups
Within the District there exist many special interest groups whose objectives are already aligned to some of those inherent in the message of the Group's Report. These include bodies like the Bath Preservation Trust, and the World Heritage Site Consultation Committee charged with guardianship of heritage and its future prospects of management. There are others such as the Bath Renewables Group and Transition Bath whose focus is on contributing to the emergence of patterns of economic life and living that are impact accountable in environmental terms. Part of our role in the Group is to engage individually with such organisations, create as much synergy of understanding and purpose as we can so that the River Project is genuinely something that is able to respond to these interests and concerns and use the energy, goodwill and talents of those involved to bring it about. Accessing these interests is probably best done through the personal involvements focussed around an exhibition and events to allow engagement and an exchange of views.

The Landowners
The ideas within the Group's Report will, if taken up, lead in time to developmental and land use change on sites along the River Corridor, affecting the interests and opportunities for Landowners. The Council own a number of critical sites, such as the Avon Street Car Park and Newark Works on the Lower Bristol Road whose future uses can be aligned to the ambitions of the River Project; other sites already in the hands of private and corporate developers with commercial investment or housing projects in progress or in mind. Others are sites in transition where past uses have come to an end and a new future is awaited. In many of these, the present context of the sites is too low in status and certainty to allow reinvestment decisions to be made without a stronger clarity and endorsement of the future direction of the River Corridor through the picture a Regeneration Model and elements of Masterplanning would create. Such exercises will be necessary to create confidence in the way forward and also to set in place the structure of planning briefs, and planning obligations that will allow some of the more important infrastructure provisions such as improved walkways and improved linkages to be legitimate demands of developers and landowners in planning terms.

All of this has to wait the development of a Regeneration Model and adopted planning strategy; our task at the moment is to demonstrate how synergies of interest can be created among landowners consistant with the ambitions and ideas of the report that will create the wider value framework that lie at the heart of our message. Important to this message is that it is not only those sites directly fronting the river

that will be affected by the scenarios we have outlined; if we can work towards the enhanced river environment, enhanced through social, cultural, economic and environmental improvement, it will affect and open up new regeneration prospects well beyond those sites that have river frontage.

In its western reaches, the river borders South Gloucestershire Council for several miles so engagement is needed here too.

It is for this reason that it is important that what is ultimately achieved along the river is not only continuous development but that the quality of pedestrian/cycleways, the generosity of access between road and riverside levels, the presence of open space and trees are all factored in, so that these are things that contribute to the identity and character and value of areas well beyond the river too. For these ambitions to have weight, rapid acceptance of the principles through the over-arching planning process is needed and a strong message from the Council that all riverside proposals and planning applications will be assessed for the contribution their designs and uses would make the wider regeneration ambitions. At the same time, we believe the Group and the support for its ideas with the Council and the advisory bodies can be used to steer the pattern of regeneration and redevelopment, including the agglomeration of site interests in the direction it is most likely to deliver the ambitions.

The Regional and Local Business Community

Withn the B&NES area the Regional and Local Business Community is not identified as strongly as an influential body as in other aeras such as Bristol. The emergence of the West of England Local Enterprise Partnership does give Bath, Keynsham and the Somer Valley towns the opportunity to have a clearer and a stronger voice within a wider business region, but to have this voice they need to know what they have to say together and how their skills and interests fit within that larger picture.

We have outlined how the River Corridor regeneration can create a growth and business development opportunity across several strands of economic life. Our task here is to engage with local business and show how the future of the riverside can be one of the bridges between the skills, knowledge and interests of local business and the wider regional business identity and the LEP. We can do this by engaging with local business through established organisations, having a business to business event within the River Project Exhibition, keeping the river's challenges and opportuntities in the spotlight in the regular seminars and events that take place.

The positive message of the River Project can be used as a promotional sponsorship opportunities for particular businesses and as the strategy takes effect the strength of the riverside site opportunity can be used to draw new employment to the District. The corridor is an employment growth area, but much of that employment will need to be serviced from the settlements beyond Bath or have direct economic relationships with them. It is only if the quality of the environment that can be created is high that the river corridor can be used as one of the lead economic regeneration dimensions of this challenge.

Building a new economy

We need to focus our efforts particularly on the engagement with those areas of ecnomic life that are emergent or on the rise for which we need a particular shop front within the opportunities the river corridor regeneration offers. This is the economic activity that is already trying to grow, as part of the new wave of economic life that periodically passes through all settlements as their skills and spatial opportunities coincide. So we need to engage with each of the employment growth sectors, explore how their interests can be aligned with the opportunities of the River Regeneration Model.

Once this report has been fully circulated and digested by all the parties concerned, we believe it is desirable to set a timetable for these actions and develop them into a more fully expressed River Corridor economy regeneration plan.

STAGE B - PERCEPTION CHANGING

• Remove the barriers of hedging that currently prevent major assets of Bath's heritage being visually and positively associated with the river at Green Park and Norfolk Crescent. Here the backdrop of the terraces and the Crescent are potentially visible over long stretches of the river, both sit in land already owned by the Council. In the case of Green Park, there is the opportunity to divert the present riverside walkway/cycleway through the flat section of the park, creating a wide recreational bank and the kind of riverside space that is lacking on the entire length of the urban river. If necessary a line of fencing can be replaced some way back from this into the park but it would send a much stronger message without. At Norfolk Crescent the change of level between the lawn and the river is more problematic, but a riverside path that extended at the western end partly along the cycleway would allow Norfolk Crescent to be seen to be the western gateway of the city centre for half a mile.

• Use the Council's existing assets including Green Park and Norfolk Crescent lawns and stimulate other landowners to create the riverside venues that Bath currently lacks for sitting, watching, eating, relaxing, socialising that would bring the river back into the daily consciousness of people using the city. One of the easiest ways of providing such uses is as moored vessels located in prominent places associated with long vistas of the river such as west of Churchill Bridge. Bath currently has no such venues at all, now.

• Land based locations where such facilities would be highly visible and be likely to attract a market include:

• The arches, south of the new bus station, an ideal spot for a highly visible contemporary restaurant enjoying an attractive terrace to the river;

• The green space between Green Park Road and the river south of Avon Street.

• A moored river restaurant at North Quay celebrating Bath's on time River Trade.
• Norfolk Crescent Lawn.

• Associated with Victoria Bridge, a venue remarkably close to Victoria Park and The Royal Crescent.

• A roadside/riverside venue in Twerton that would create a tangible riverside dimension to Twerton once more.

• A high profile, high quality venue in Keynsham would open up the river frontage to more popular use.

• Celebrate the Southern Gateway into Bath at Churchill Bridge, this, after Pulteney Bridge is the second most significant point at which the city and the river combine, given significance by the visible presence of the railway and its bridges, characterised by the long vista down the river to the west and the powerful riverside warehouses. The southern gateway is presently only valued as a piece of highway engineering. An Arts competition could produce banners or sculpture along its parapets as part of a 'celebrate our river' campaign. These would also serve to bring a spotlight to the Innovation Centre, the University's main presence within the City, but looking far from innovative with its six inch lettering on one of the City's blandest buildings. Here the use of projection art on the facade would be utterly transformational in perceptions of the City, highlighting this area as a gateway, celebrating the links with the river and making the Innovation Centre actually look innovative for the first time. Such projection art displays are extremely economical to provide, typical of the outputs of an arts competition, and for which Arts funding may be available.

• Invest in identifying and branding Bath's most concentrated workspace quarter, the buildings either side of the Lower Bristol Road, immediately west of Churchill Bridge to demonstrate Bath actually does have a workspace quarter. This could be achieved with permanent signage across the Lower Bristol Road, or projection art onto the tallest buildings.

• Celebrate the Dundas Aqueduct as the upstream gateway to the District's river, one of the points where a link can be made between the waterways in marketing terms.

• Open up and develop the story of the City's river based heritage*,* linking together all those aspects of history that still have physical evidence, filling in the gaps in the social cultural and economic history.

• Similarly celebrate the link between the Kennet and Avon Canal and the river at Thimble Mill. This needs to support finding a more permanent solution, and in a highly visible location from the Lower Bristol Road, projection art might well have a role to play.

• Celebrate Cleveland Bridge as one of the rivers great bridges in the tourist literature for the World Heritage City to get more visitors on the river.

• Produce tourist literature that identifies the City's heritage in the context of a full river trail; pointing out how close to the river major assets and heritage interest are and the significance of aspects of the river heritage that have been lost. This story may in time justify permanent interpretative signage. It is important to note that opening up awareness and providing interpretation are an essential step in regeneration work, helping people to create the value, cultural and social understanding, from which further investment can be proposed and justified

• Purposefully hold a season long exhibition, perhaps in a temporary venue such as Newark Works Foundry*,* to explain how the river came to be the way it is and to formally commence the Regeneration Strategy process.

Within the regeneration sphere there is clear evidence that bringing forward aspects of underappreciated and undervalued history is an essential step on the undervalued path to re-evaluation of areas. By recording the history it becomes easier to move on and by presenting the history well it becomes possible to see aspects of social and cultural value from the past that inspire and engage people to invest more in the future. In a well-considered regeneration plan this will be a central feature.

• Create signage along the river and from nearby routes that supports this story and links the river route back into major assets, drawing the visitors away from the usual tourist hotspots, which open the case for investment elsewhere. Critical connectors include Royal Victoria Park, Locksbrook Cemetery, the town park in Keynsham, significance of the riverside at Twerton, the role of the Western Eyot etc.

• Progress an annual Bath/Bristol rowing match as an early priority. This means identifying a temporary location on the river from which boats could be launched and a temporary pontoon erected for the purpose. This needs to be in a highly visible position and where temporary car parking can be made available, such as opposite Avon Street or associated with the Weston Island.

• Highlight the significance of the River Corridor Regeneration by making the necessary connections with the Rugby Club project and doing the same with other significant planning applications within the City. At the Rugby Club the regeneration of electricity for floodlighting from the Avon weir head and creating a water-based ferry service transporting match goers from Newbridge Park and Ride are considerations.

• Prepare an alternative private sector led river transportation system*,* if the funding for the BRT does not materialise quickly,

• Undertake a study on the opportunity that Somerdale and Keynsham presents to stimulate a focus of skill, knowledge and practice in waste management, then manage the Council's asset facilities in the area accordingly.

• Establish an understanding with the University, the Innovation Centre and the West of England LEP on the kinds of floorspace and tenure models and optimum locations that business growing out of University founded companies and skillsets will need and engage with the Universities on the skill sets the emergent economy will need in years to come.

• Engage with the Council on how their assets can best be used to deliver the goals of the regeneration economy so that the longer term benefits of doing so are built into the future regeneration plan.

• Engage with established community groups and councillors involved in settlements close *to the river* to explore how their identity and strengths can be supported by river focused projects.

• Liaise with the Environment Agency, Inland Waterways Association and British Waterways to establish where and how city moorings can be provided as a matter of urgency, notably along Green Park Road opposite Royal Victoria Park.

• Explore future options for Keynsham's river dimension with land owners around establishing a common interest agenda.

• Draw out a study on how the Western Island could be used to create a Western River Gateway to the City, what implications this might have for future land use, landscape treatments etc along Lower Bristol Road. Out of this study produce suggestions for reducing the land take of the bus depot would emerge.

• Establish permanent river landing points along the river downstream of Pulteney Weir that would serve pleasure boat operators in offering a pickup/drop off service equivalent to that operated by the City's open top bus companies.

STAGE C - THE REGENERATION MODEL

The Vision the Report has put forward shows how over 20 or 30 years wholly new value sets, economic, environmental, social, cultural can be applied and generated to make an asset out of the Bath Avon once more. But creating this Vision requires many layers of engagement, intervention, monitoring and, in today's world, the opening up of opportunties at all sorts of scales and levels for engagement by local communities, special interest groups, education and business. These ambitions cannot, and will not be achieved by the allocation of land use only as a planning control mechanism. Rather than a land use plan, they require a Regeneration Model.

A Regeneration Model, described more particularly as a spatio-temporal economic model is a way of tying in all the different kind of engagements, processes, the pacing of change that needs to take place to get from A to Z. It recognises that at the start, it is impossible, in fact unhelpful to try to tie down the form of everything that would happen.

What it does instead is to identify those elements of land use change that are essential to create the right framework and set the right quality stream that enables other values to be achieved.

It identifies where key infrastructure change needs to happen and how this might be achieved, such as improved walkways, cycle paths, crossings and linkages.

It then identifies how and where centres for growth in activity and economic opportunity can best start to be encouraged and how these can be influenced to make them most fertile.

It describes how processes that are then set up can be managed, nurtured and steered so that the overall objectives of the project are not lost and each change can be tested and judged for its contribution to the success of the models overall long-term ambitions.

But producing such a model requires widespread consultation with all of the interested parties outlined above, so that each body can then align its own ambitions, contributions and obligations to its goals.

STAGE D- SETTING STRATEGIC GOALS THROUGH POLICY

In the previous sections we have highlighted several of the actions that the Council or others could take to stimulate the gradual process of changing perceptions about the river that all need to go through. Bath residents, and all those who promote the City to visitors, need to see that we could come to value the river dimensions of the World Heritage City in new ways so political and funding support can be achieved for the changes needed. Private sector commercial and investment interests need help to view the riverside sites in new ways seeing them as part of the genuine expansion of the economic social and cultural life of the city.

Such change is needed too in Keynsham so that the remarkable assets the town has along the river can become appreciated and valued. Such change of perception is needed also in the rural areas so that the attributes the landscapes bring are seen as part and parcel of the context of the major settlements. All these perception changing steps are accumulative, small at first, but each builds on the other so that, year by year, more becomes evident, then bigger, longer term decisions about positive change become possible to make.

But the re-evaluation of the River Corridor, ie. the ascribing of new social, cultural economic and environmental values to it, needs policy support to make sure the objectives of the Economic Regeneration Strategy are suitably researched, widely understood, recognised by all the critical agencies and most particularly reflected in the work of the various branches of the Council, Planning, Economic Development, Property and others (Environment Agency, British Waterways). It is through the making of policy that strategic objectives for the corridor can be set out, land protected for appropriate needs and uses and the framework put in place that can guide Riverside planning applications in the right way and secure developmental funding including via Planning Obligations.

New Policies will also be needed to secure public funding for significant infrastructure interventions.

In this section of the Report we list all of the areas in which we believe the River Corridor economy regeneration needs specific policy support. Each of these aspects merits detailed study so the policy is rightly directed and the necessary consultations with stakeholders and strategically important consultees take place. In practice in the formulation of a river economy focus to a set of policies needed to progress the project beyond the Core Strategy, many of these policy objectives overlap and to best support each other could be combined within a single SPD document.

1. Produce a strategy for creating strong river focussed gateways at the key points along the River Corridor that highlight quality, value and accessibility of the river and its patterns of use. Such gateways are already in place or would be significant in the following locations;-

- Dundas Aqueduct
- The Bybrook/Avon confluence at Bathford
- Bathampton Bridge
- Cleveland Bridge
- Pulteney Bridge
- Churchill Bridge/Great Western Railway crossing
- Weston Island/Twerton Weir
- The Eastern and Western approaches to Keynsham
- Hanham Gorge

These are all points where recognising the existence and significance of the river and giving particular attention to the quality of the riverscape setting and patterns of use are important. Some of these locations are already highly valued and in good condition and need little positive enhancement, but recognising their importance and significance to the overall story of the river's environmental, social cultural and economic value will, over time make them more valued still. There are others, where their qualitative contributions to our perceptions of the river have much scope for enhancement.

For instance, the City of Bath has a very poor western approach dominated by semi-derelict buildings which close down views of the valley and the Lansdown slopes and largely hide the river from view. The removal of some of the very marginal development sites between Lower Bristol Road and the river opposite Brassmill Trading Estate and would serve the following objectives:

- It would remove blight and increase pride

- It would allow Weston Island to be seen as the Western Gateway feature to the City and justify, in time, new patterns of landscape led use and functional value in relation to various systems of River transportation.

- It would release land that could be used to create balancing flood storage to better utilise sites closer to the City.

- It would open up a long vista along the river towards the heritage of the Lansdown Slopes and allow the Western Approach to have a higher quality of green landscape and enhanced biodiversity.

2. Undertake research and develop policy support for recognising where reintegrating the river into urban design functionality and perceptive awareness of the District needs new linkages to be made to established cultural assets. We believe there are many situations where raising the perceived value of the river requires both physical and visual connections to be made and the virtues of these connections need to be safeguarded sufficiently by policy so that, as sites are developed, they reflect these links in urban design. Some of these linkages are already anticipated in the Council's Public Realm Strategy. Typical examples include:-

• Establishing tangible hierarchies of importance north of Victoria Road Bridge (to Royal Victoria Park and The Royal Crescent) and Midland Road Bridge.

• Recognising that over many decades Locksbrook Cemetery is likely to revert to parkland use offering a significant open space and connectability for the whole of the Lower Weston area. A linkage to the river is desirable via the small park that already exists here.

• In Keynsham, forge a much more significant connection between the town park and the river frontage.

• Open up a cycle linkage between Keynsham and the Bristol/Bath cycleway along the riverside.

3. Researching and creating policy support for identifying and highlighting those aspects of the heritage of the River Corridor that can be used to bring character and identity to the regeneration whether through standing structures, such as the bridges and weirs and former mill sites, or through street and site names creating new and physical linkages back from the river onto adjoining areas where such linkages serve a regeneration purpose.

4. Connectivity; researching and preparing policy support for protecting land necessary to ensure new linkages through, along and across the River Corridor are made where these will benefit the regeneration objectives. Many of these links have already been anticipated within the Public Realm Strategy, such as the optimal location of additional bridges. There are cases where footpath links exist between Upper Bristol Road and Lower Bristol Road and the river that have exceptionally low status and other cases, such as through Locksbrook Cemetery where elements of potentially high Public Realm value could be used to gather and collect pedestrian and cycle traffic and link it with the river in very effective ways.

5. Riverside Venues
Research consideration of developmental parameters to identify a number of locations along the River Corridor in the District where the creation of riverside venues would both serve and stimulate the regeneration objective; bringing new life and activity to the riverside and stimulating perception change or as a development partner in future development of riverside sites. It is by creating such venues and making the river relevant again in people's lives that perception changing occurs and confidence about investment is built. Bristol's very successful Paintworks new workspace project was predicated entirely on the creation on the Bocabar and an Event Space in an area in the city that lacked any commercial identity. Such venues can be located where aspects of heritage, new river sport or other commercial activity is desired and could be either land based or river based. The opening up of such facilities has been very significant in building the character and the economic value of the Kennet and Avon Canal:

• At Cleveland Bridge to enable this remarkable structure to be better appreciated.

• North of Pulteney Bridge to enable one of the more characterful parts of the river to be better appreciated.

• At Thimble Mill where the former mill structure, (now a secondary meeting suite for the adjacent hotel) needs to become a venue in its own right with open-air seating to celebrate the junction of the canal and the river and enjoying a large basin that should be being used as a marina.

• At Churchill Bridge, either to the east side in the railway arches or to the north west opposite Avon Street, a restaurant/bar venue here would be highly visible and open up the riverside experience to many. This could be a floating venue.

• Associated with potential redevelopment of the Sainsbury's supermarket at Green Park.

• Possibly associated with Victoria Bridge as a way of stimulating and celebrating the strong links between the river here and the high status uses of Royal Victoria Park/The Royal Crescent.

• Lower Weston/Locksbrook, as a way of giving these established residential Districts a riverside social and cultural identity once more, one celebrating a new identity for Weston Island.

• At Twerton associated with one of the cuts beneath the railway as a way of giving Twerton a riverside face once more and bringing life and activity to a dead section of the Lower Bristol Road.

• At Newbridge the Boat House public house has so far failed to achieve the desired identification with the quality of the river downstream, but might do so

through a development of the nearby Minerva Boating Station, pulling in a wider clientele. This is the City's Western Gateway to River users.

• Between Newbridge and Saltford, highlight the quality of the riverscape and its enhancing significance as Bath based boating activity increases.

• At Keynsham a way of firmly sending messages that Keynsham has a very strong Riverside dimension to its identity. Current refreshment venues along the river undervalue the riverside location; it is possible that Somerdale might go in part to uses that draw visitors here.

•Research and prepare policies for identifying and protecting those areas where river-based sporting activity can be particularly successful, such as a high profile, visible centre for rowing, sculling, canoeing etc. Particularly good locations for this would be on the stretch of the river west of Churchill Bridge usually associated with land already in the Council's ownership of Green Park or Norfolk Crescent.

6. Cultural Icons
The importance of undertaking research and preparing policies for recognising the role of new cultural icons within a River Corridor regeneration, is very evident in the successful implementation of the regenerations of Bristol Docks and London's South Bank. Bath is of course very much smaller, but as an established visitor centre punches very much above its weight. If we wish the riverside economy regeneration to be good it is essential to expand the cultural life of the city into new areas offering facilities the City currently does not have, but within the context of the World Heritage City which it competes with, ought to. This may include new galleries, new museums, new music venues, possibly places specified to present alternative faces to the City. Such venues are self-evidently often a stimulus to regeneration and value creation in themselves and could be placed with care accordingly to, for instance;

• Provide a gateway into Bath's south western employment quarter via the foundry building in Newark Works.

• Establish the significance of the riverside sites between Western Riverside
and Royal Victoria Park.

• Bring cultural identity and value to Twerton and the Weston Island.

• Put Keynsham on the map at Somerdale.

The Somerdale site with its iconic presence, large internal spaces, riverside dimension and convenient placing between Bristol and Bath could open up a cultural dimension, that would draw audiences from Bristol and from Bath around the visual arts or music, very strongly 'alternative' tariff.

7. Under the banner of Spatial Sustainability, develop policies to protect those land areas along the River Corridor where water turbines can be located to ensure that the opportunity to do this is not lost by inappropriate alternative development. Consider where land should be reserved for uses which contribute to a low carbon economy for the District so the opportunity to locate such functions in the optimum places is not lost.

For instance, there is merit in re-locating the present waste transfer station on Upper Bristol Road, but the economic analysis suggests that this should still be on a riverside site to make the most of the synergies with Keynsham and Bristol. This suggests the need to allocate such a site on the western approaches. Similarly identify where the river meanders lend themselves to the introduction of new turbines.

8. Commit to a bio-diversity study and strategy that will aim to demonstrate where along the River Corridor, both in the urban and the rural areas, bio-diversity enhancement objectives can best be achieved by recognising linkages to existing open space and water courses etc. This study can then be used to help identify where soft and landscape led treatments and the breaking down of existing sheet pile banks will be of greatest value so that bio-diversity enhancement can be set appropriately alongside many other objectives, such as flood management. This means a 'joined up' approach to ecological enhancement can be taken so that changes such as the incorporation of flood storage zone on developed sites are approached consistently.

9. Develop a strategy for how heritage along the corridor sites will be identified and interpreted through signage, information and new linkages.

10. Develop a strategy for how improved pedestrian and cycle use along the corridor are maximised and conflicts resolved. In some cases the pathway is wide enough for segregated cycling and pedestrian use. In others widening might need to be achieved by allocating additional land on developed sites. How pedestrian and cycleways are related to schemes of new flood storage needs consideration under such principles. In some cases the widening of pathways might not be possible and protocols need to be established to give appropriate priority between

conflicting uses. In this strategy the prioritisation and continuity of the pedestrian/cycle route in relation to other crossings needs careful consideration as this is one of the significant benefits of the riverside route at the moment.

11. Within the strategy, goals need to be identified for improving accessibility from bridges and linked points to make it less likely that cyclists will need to dismount and optimising the accessibility for the disabled. A clear strategy in this regard will enable the minimum standards to be made clear for future development and securing planning obligation contributions.

A strategy for enhancing pedestrian and cyclist's access to the river within Keynsham and to make connections to the Bristol/Bath cycleway need to be explored.

12. Develop a strategy for creating moorings and landings along the river to enable boat users to access areas west of Pulteney Weir and to make it possible for pleasure boats and water taxis to do the same. The regenerative benefits of improved traffic on the river are significant and this is a project that merits public funding.

13. Establish a River Management Group, recognised by representation from the Council, the Environment Agency and British Waterways and charged with maximising the operational and value set management of the river against agreed objectives.

14. Supporting the strands of economic activity on which the future of the District will rely through research.

Undertake research to better understand the future economic life that will create the wealth of the District and develop an understanding of the supporting strategy for the land use requirements of each of those strands, and their spatial synergies so that the opportunity to deliver is maximised.

By way of illustration;

• As well as restaurants etc along the River Corridor are there locations where new hotels would open new areas of understanding of the river. Currently Bath has no significant riverside hotels and those that do exist alongside the canal fail to utilise their locational advantages. Such sites might include venues between Cleveland Bridge and Pulteney Bridge, south of North Parade, Avon Street/Newark Works, Green Park, north of Western Riverside.

If much of Bath's future economic health is expected to be generated by the research and roll out companies started at Bath's University what workspace needs and models of tenure will such companies most need and where is this best located? Are there other aspects of those economies such as temporary accommodation offers and areas of educational support and business advice that need to be factored into this study? Are there aspects of the city's cultural and social life that need to be tuned to those needs?

15. High Value Employment
If it is believed that Bath's heritage and it's cultural and educational life can attract new employers not previously represented in the City are there clear signs that existing employers are needing new high quality office space? Where is this best located and to what extent can the river regeneration contribute to the quality and success of such space? Are there aspects of critical mass or spatial synergies that need to be reflected in the pacing and bringing forward of such development? Are there particular roles that the development opportunities at Keynsham can play in this regard, capitalising on Keynsham's position where it can service markets and contacts in the two cities?

16. Sports Related Economy
Bath already has a high profile in sporting activity and a 'head start' in funding further such activities. A rebuilt Bath Rugby stand would be a significant contributor to a re-focussing on the identity, character and economic focus on the river;

Making the river active and alive again can be done most readily and easily through rowing canoeing and related water-based activities, but these sports have functional requirements that mean they can occur only at some venues. Rowing needs a minimum of 2km of river, a landing boat storage facility and to be effective it needs to occur in a highly visible location. Identifying the optimum locations for such facilities and whether they can be part of existing public open space, (thereby not incurring land value costs) is an important consideration at this stage of the regeneration plan.

17. Servicing the Settlements
The social and cultural identity of settlements along the River Corridor, such as Bathford/ Batheaston, Widcombe/Lyncombe, Lower Weston and Twerton, Saltford and Keynsham all have potential interfaces with the river which in some cases have been much stronger in the past than they are now. As the river comes more to life there is the opportunity to reconnect the settlements with the river to expand their District centres and social economies onto the river. How that can best be done merits detailed study so that the opportunities are not lost by inappropriate or premature development.

18. Building the Waste Management Economy
We have identified how the growing role of the waste management economy fits well with existing synergies of activity and land use along the river, with particular relevance to Keynsham. For this strand of future economic life to deliver the most, it is essential that its spatial requirements in Bath, Keynsham and elsewhere are adequately recognised and protected, particularly as they are so closely integrated with some of the municipal requirements of the Council.

19. Growing the Rural River Related Economy
We believe that several forces are at play which will make the rural, agricultural economy more versatile in future years as the necessary enhanced flood management and achieving 'impact accountability' of towns and cities forces them to develop clearer economic and environmental relationships with their hinterlands. We believe a study of the future of the rural economy around the District's towns would help identify the best way forward for flood management and identify those new strands of rural based economic and agricultural activity more clearly.

20. Keynsham
We believe the present plans for enhancing Keynsham focussed on the High Street, do not go far enough in showing the town how it can have the enhanced social, cultural and economic identity it needs to overcome the recent job losses and to capitalise on its position looking to both Bath and Bristol. We believe further study will illustrate how the identity of the town will be enhanced through some of the river focussed initiatives in this report, such as illustrated at Appendix (i) and that in due course examination these should be recognised in policy support.

It has been prepared by;

-James Hurley – a materials resource expert, representing Low Carbon South West.

- David Laming – now a Councillor, with experience in building and operating canal and other boats on inland waterways.

- Nikki Wood – an environmental consultant and water systems ecologist.

The sub-group set themselves the task of visualising how a more active rive would generate new economic activity of many kinds and how that might manifest itself in a real land and water based project. Essential to this visualisation of the future was to address the values of low carbon lifestyles, bio-diversity and the realities of boating as a way of life and of work. The study shows how all these drivers of change can be embraced and integrated and deliver outputs that serve many other goals already declared in the strategic ambition of the District.

The key elements of the proposal are:

- Key infrastructure support for a water based waste transport and handling system.
- A Materials and Waste Consolidation Centre.
- A linked New Skills Research Establishment.
- A new Marina creating flood storage capacity relevant to the optimum utilisation of other redevelopment sites.
- A water park with waterside leisure and social venues.
- A Heritage and Nature Trail.
- Habitat diversification for wildlife and landscape enhancement.

River Management.

The Group has identified a weakness which is that whilst the river obviously represents the spine for the River Corridor it is an unfortunate fact that its management is devolved to various parties who have separate interests and responsibilities. The principle players, apart from the riparian owners, are the Environment Agency (The river and along with flood risk implications) and British Waterways (Navigation from Widcombe to Hanham Lock)

The Local Authorities, through which the River Corridor runs, are B&NES and South Gloucestershire. Both, apart from also being significant riparian owners also have an interest in ensuring that the river itself is brought up to the required standard and maintained in that condition. This is essential since for the River Corridor to work commercially and environmentally an attractive and vibrant river is an absolute must.

Some of the issues requiring to be dealt with so as to achieve the above are as follows:

• Encouraging all forms of boats to use the river. Boats both moving and moored bring a waterway to life. Some relatively inexpensive infrastructure will be required to allow this aspiration to be met.

• So as to encourage the safe use of the river satisfactory water quality becomes an important prerequisite.

• A regime needs to be put in place to remove debris and detritus.

• Safety for both those on the river and those enjoying the river from the bank

• A regime of vegetation clearance/planting/ management needs to be instigated.

• Dredging and bank repairs will be required both initially and in the future.

• Maintaining and possibly improving the rivers natural ecology.

When the river was a real part of the region's economy keeping its operational practicality in good shape would have been essential. Now, despite being a navigation with regular boating activity several things considered important to waterway management, either do not happen or fall between stools. A lack of dredging reduces capacity in floods, fallen trees raise hazards and lead to destabilisation of banks. Currently split responsibilities between landowner, British Waterways and Environment Agency complicate this issue and need resolving.

As we add values to the river again, environmental, social, economic, cultural, there become many more reasons, and more necessity to have comprehensive management. There needs will cut in at several levels and of several kinds and need an agency or joint working arrangement between agencies that can address them.

Early in the development of the Regeneration model, the demand for management needs to be identified so a suitable vehicle for this can be devised to become operational instep with the demands that will be made on it.

This is the necessary task of a Management Sub-Group involving those with most experience of waterway restoration, operation and the handling of boats. The Sub-group can advise on the scale of regular maintenance required, how conflicts of use and interest can best be addressed, lend consultation with existing stakeholders and statutory agencies, clarify the optimum structures for future management needs or cross agency working and advise the Council on what funding mechanism need to be employed and whether infrastructure devices should be part of this.

Particular issues for urgent consideration include;

- Provision of suitable landings to meet the practical needs of boat handlers and crew.

- Interpretation of the river's heritage for the benefit of boat crew – including more information in boat guides.

- Embracing the river between the Avon/K&A Canal intercept and Pulteney Weir within the Navigation to reduce management fragmentation.

- Clarify remaining uncertainties on responsibilities for management upstream of Pulteney Weir to Bathampton Weir.

- Address comprehensively the hazards to life along the unprotected and sheet piled section of the river. Here inserts for ladders, advice and lack of rescue equipment, lack of surveillance and activity have all contributed to an alarming number of fatalities in recent years. Railings will be only a small part of the answer. Stepped banks and landscaped slopes are needed to remove users from danger. Such solutions take land from adjacent sites and so need urgent Special Recognition as legitimate demands in the Development Control process.

- Reducing cases for conflict between pedestrians and cyclists.

- Strategy for addressing litter and graffiti.

- Attention to provision of launching slipways and accessibility to boats for the disabled.

A further matter which would fall within the remit of the Sub Group would be what we will term Section 106 Improvements to the River Bank funded by future riverside development as may be identified by the main River Corridor Group.

So as to address the ("weakness") mentioned above it is proposed to form a specialist "River Management" Sub Group which would:

1. Create a forum for informing those Authorities and Parties who have specific responsibilities for the river of our Main Groups aspirations for the river and

2. To explore how best those aspirations can best be implemented.

The suggested composition of the proposed Sub Group would be:

• A representative from British Waterways local unit at Devizes who have navigational responsibility for the river from Widcombe to Hanham

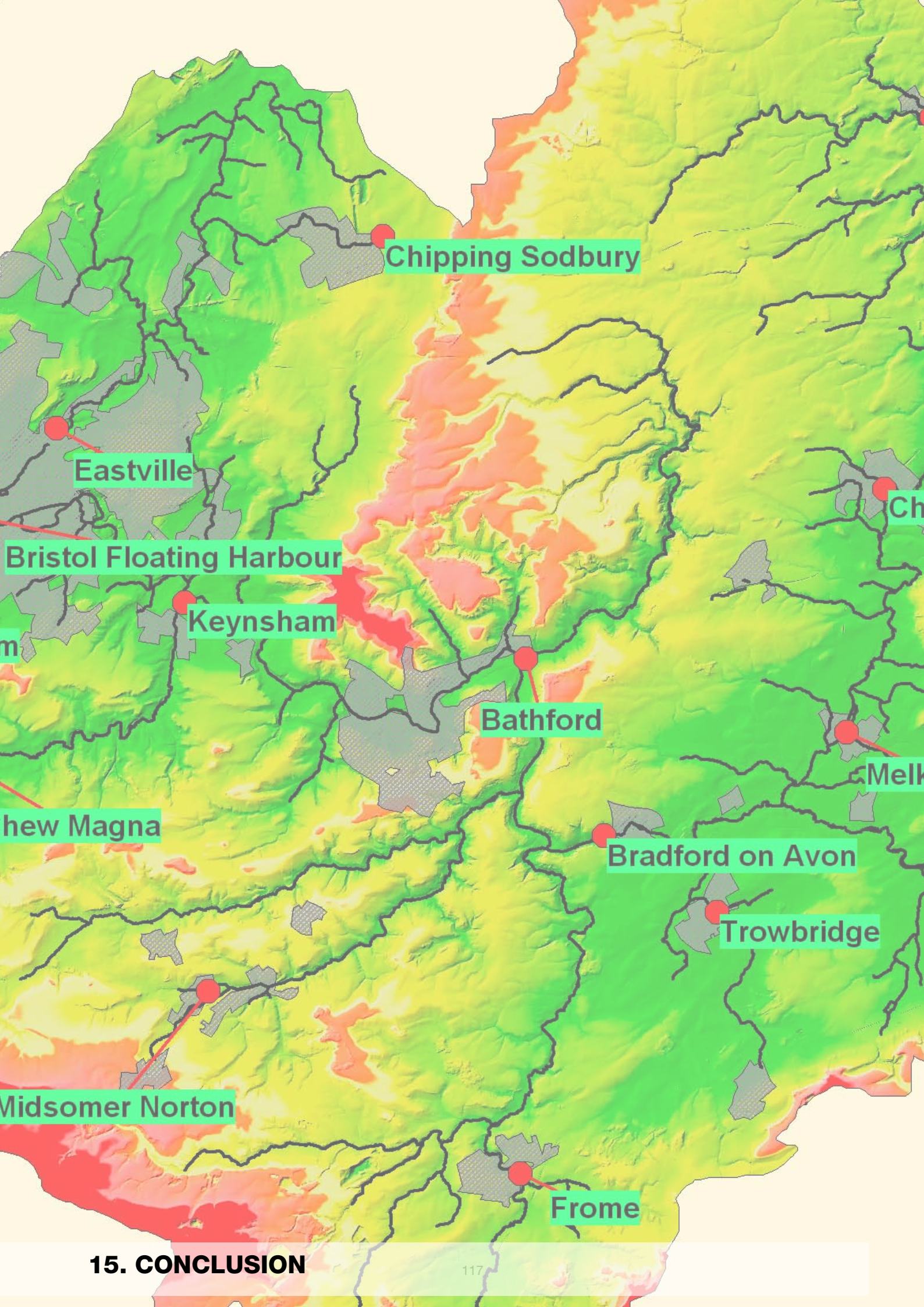
• Such representation from the Environment Agency as is deemed necessary to address the 7 "bullet point issues" as set out above.

• From our River Corridor Group Nikki Wood to handle the "Ecosystem" implications, Dave Laming and John Webb to deal with the river generally including navigation, leisure opportunities and the river management generally.

• Such representation as is deemed necessary from the significant Riparian Owners including the two principle Local Authorities.

One "skill" that we may need and is currently missing is that of a hydrologist. It may be that the Environment Agency can field one as part of their input.

Unfortunately, and it is suspected unintentionally, the various publications dealing with the future of Bath, and these include but are not necessarily confined to the Bath Public Realm Consultation, the World Heritage Site Management Plan, The Western Riverside Planning Guidance Document and the Core Strategy all tend to stop at the river bank or adjacent to it and ignore the river which flows between these boundaries. Our Group and in particular the River Management Sub Group can hopefully for the benefit of our City remedy this omission for the benefit of our city.



15. CONCLUSION

15. CONCLUSION

In this report the members of the Bath Avon River Group have sought to describe how the River Avon as it passes through the District came to be the way it is and how significant it could come to be over the next three decades if the challenge and the opportunity it represents are seized and recognised.

We have tried to highlight what the hurdles are, but identify the stages and elements of the processes needed to make the vision a reality.

The next stages in this process involve engaging with many constituencies of potential users, the commitment by the Council and others to deepen and substantiate the challenges and opportunities, and test them and a willingness to explore in more detail how significant the River Corridor can be to our economic, social, cultural and environmental lives.

We believe the combined processes need to be recognised in a Regeneration Model, something more significant, more about process, goals and stages than a regeneration plan, but a model that needs to backed up with policy support across many areas of the Council's influence and through engagement with many statutory and other consultees whose views and policies will be crucial.

So, taking this decision forward needs an act of will; it is a task in its own right, one essential to the future health and vitality of Bath, Keynsham and the landscape that River Valley and its tributaries represent.

Achieving these outcomes is far from automatic; although at the moment demand for development land for housing and commercial activity is flat, physical development opportunities are limited and, as we have seen already in recent years it would be all too easy in Bath for conventional development to occupy the riverside sites without the City achieving any of the benefits of social and cultural identity or the real economic and environmental gains that this vision describes.

Similarly for Keynsham, the town either seizes its chance to use its river to create a new face for the town to the world outside and to itself, or it does not.
We hope this report will be helpful to all who read it to open up discussion about how significant river-led regeneration could be.

Edward Nash, Chair

APPENDICES

(i) Identity for Keynsham

(ii) Summary of Consultations

(iii) The River Map

(iv) Illustration Credits

(I) IDENTITY FOR KEYNSHAM

Appendix (i)

Identity for Keynsham

Avon Valley Park - Regeneration & Economic Plan

Summary

The proposed Avon Valley Park builds on B&NES four-point plan for Keynsham which is included in their Core Strategy, Infrastructure Delivery Programme and Economic Regeneration Development Plan. The Avon Valley Park offers an additional, new economy that will pull together the Avon Valley, Broadmead and Somerdale ideas using the River Avon as a conduit. It includes the creation of jobs, improved waste management, regeneration of heritage buildings for offices and tourism, ferry boats for commuting and visitors, connectivity with existing highways and railway, further diversification of the rural economy, an ecological educational facility, flood compensation through a marina and hydropower array, a new model of home ownership (leased houseboats) and a University affiliated research establishment for Materials Resource Efficiency & Sustainability that provides business spin-outs to feed the materials & waste consolidation centre and micro heat grid.

In this way, Avon Valley Park provides a complimentary case study to the B&NES Core Strategy, Infrastructure Regeneration Programme and their evolving Economic Regeneration Delivery Plans. It also demonstrates the capacity of the River Corridor Group to consolidate the interconnectivity of their ideas with local interests and possible projects that benefit a local community and plays a role in spatial economic activities with definite social and cultural elements in a climate changing world. The adoption of Avon Valley park would demonstrate that B&NES is interested in more than the Core Strategy and their proposed investment in the High Street is truly a catalyst for growth elsewhere.

Avon Valley Park has been conceived following discussions, meetings and wanderings in the vicinity of Broadmead Peninsula, Avon Valley, Keynsham Riverside and Somerdale. It constitutes:

- Transport of waste and goods via the River Avon Corridor
- Strategic location for a state-of-the-art materials and waste consolidation centre
- Up-stream flood compensation to offset residual flood risk at Keynsham, Somerdale, Bristol
- Development of a marina and water park that will enhance local ecology, provide residential and visitor moorings, incorporate hydropower and generate a honeypot for tourism/leisure
- Regeneration of Keynsham's lost heritage at the Bartelt Soap Factory circa 1881
- Keynsham and Avon Valley Heritage & Nature Trail by ferry, bicycle and foot
- Somerdale as a state-of-the-art research establishment for materials resource efficiency
- Sustainability spin-out businesses affiliated with the University of Bath and sponsored by a major high-net-worth individual/organisation

With increasing interest in using the river to transport waste, the need to create a sustainable local economy for Keynsham and an urgent demand for affordable homes that are accessible to first time buyers and fed by alternative energy sources, Avon Valley Park can provide B&NES, landowners and other 'interested parties' the regeneration of the Avon Valley including Keynsham and Somerdale with new economic ventures and diversification of existing businesses. Its success would provide significant support to the local economy, create skilled and semi-skilled jobs, provide facilities for residential, pleasure, visitor and holiday water craft, enhance the diversity of local ecology, stimulate improvements to existing businesses and infrastructure, provide facilities and services for waste by river barge, develop new and innovative ideas and technologies for materials and waste and attract funding for a micro heat grid fed with waste and sewage sludge.

Avon Valley Park will include a functioning canal route from the river into a meander of moorings, hydropower array and marina, residential houseboats fit for Code for Sustainable Homes Level 4 and built locally, residential and visitor moorings, a water park, ecological enhancement and facilities for evening, weekend and leisure economies. Our investigations show that the canal route, marina and water park are feasible, but has the added value of providing strategic flood compensation that acts as residual capacity to protect down-stream developments and businesses. More importantly, Avon Valley Park is best placed for this type of major development along the Avon Corridor, as it already has full backing of the landowners, will generate least controversy when compared with other locations up-stream and along the Avon Corridor and is crucially linked with the spatial economic needs of Keynsham, Somerdale and Riverside as well as peripheral towns, villages and hamlets.

Avon Valley Park could transform the Avon Valley and Broadmead Peninsula, support the urgent development needs of Keynsham, Somerdale and Riverside whilst creating valuable jobs, investment and houseboats. Whilst the quantifiable value for money is not yet known, Avon Valley Park should be characterised as a transformational physical infrastructure project for Keynsham, B&NES and the West of England (WoE). It promises a suite of outcomes that are aligned with current thinking, supports B&NES Major Projects, responds to the Local Growth White Paper, is strategically placed for the Two Cities Project, will attract attention of the Regional Growth Fund, is aligned with the West of England Local Enterprise Partnership, will help deliver B&NES targets for diverting waste from landfill, and most of all will be difficult to match elsewhere in the area.

In summary, Avon Valley Park would:

- Play a vital role in the transport of waste and materials along the Avon Corridor
- Provide employment-led development for Keynsham and Somerdale
- Bring significant benefits to existing businesses on the Broadmead Peninsula, including a waste and materials consolidation centre, river wharf, waste barges and boat businesses
- Provide a flood compensation marina to absorb up-stream water catchment and manage down-stream flood risk, especially at Broadmead, Keynsham, Somerdale and Bristol
- Create jobs – 128 temporary construction jobs, 8 FTE jobs working in a canal-side pub and/or restaurant, 8 FTE jobs from direct visitor spend, 22 FTE jobs from direct water park spend, 4 FTE jobs to provide lifting-out and maintenance services to water craft, 8 FTE jobs to work the barges, 5 FTE jobs to support the management and safety of the marina and water park, 2 FTE and 4 PT jobs for the ferries, unknown jobs for the Somerdale research facility
- Provide access to first-step mortgages for residential houseboats designed and built locally (existing business at Broadnead) to meet Code for Sustainable Homes Level 4
- Encourage investment in a local heat grid including heat exchange, anaerobic digester and alternative energy strategy to help capture and share the surplus heat/energy from and for existing and planned businesses associated with the Broadmead Peninsula redevelopment
- Introduce a 250 berth marina for residential, pleasure, visitor and holiday watercraft
- Include a water park and access to the river for sailing, rowing, kayaks and non-engine craft

- Include a number of interconnected ponds and waterways to provide ecological corridors, wildlife habitat for protected species and enhance/protect existing wildlife that are managed by a Warden and Park Rangers and operate as an educational facility
- Incorporate allotment and storage zones for moorings that provide soft screens between houseboats, improve local food security and provide ecological corridors
- Provide property uplift to adjacent developments (e.g. Somerdale), existing businesses and residential properties, but at a level unlikely to cover construction costs by itself
- Provide ferry, walking and cycling routes linked to existing routes, highway and railway services that join the canal towpath in either direction to Bristol and Bath
- Provide a central route for utilities serving new and existing businesses including potential for utilising surface water drainage flows for the marina and water park
- Edge of town (Keynsham) ambience water space and heritage and educational facilities trail
- Significant tourist attraction accessible by ferry, road, train, bicycle or walking
- Present no significant conflicts with existing planning, tourism, housing or economic policies
- Cost just over £178m[1] to construct, although the net value is yet to be calculated

More specifically, Avon Valley Park provides the following key benefits to support the sustainable economic growth of Keynsham:

Principles	Key Benefits for the Keynsham Sustainable Community Strategy
Economic	A catalyst for regeneration in Keynsham. The marina, water park, canal corridor, heritage trail and educational facilities will provide a strong tourism brand for the area. It may encourage more national retailers and leisure operators to establish a presence in and on the edge of Keynsham. Enhanced local property tax revenue and property prices in Keynsham, Somerdale and beyond. Create 128 temporary and 47 FTE jobs in marina, sport, tourism and support services; an unknown number in Somerdale and spin-out businesses. Play a key role in the development of Keynsham and Somerdale. Provide Keynsham with ambience water space.
Environmental	The creation of a network of ecological corridors. Increased biodiversity, more sites for protected species and enhance existing habitats on site and along the River Avon. Pontoon allotments for residential food security and ecological enhancement. Provide flood compensation and hydropower management systems. Additional local ecological features, water facilities and leisure zones
Social	Provide an accessible and inclusive urban space. Raise Keynsham's profile as a tourism destination Enhance the distinctiveness of Keynsham. Give Keynsham an investment location edge over similar urban centres. Help to attract and retain high skill, high wage workers. Increase cultural vitality and civic pride. Support a greater variety of leisure activities. Provide additional traffic free walking and cycling routes. Increased local leisure facilities.
Quality of Life	Encouragement of higher housing densities. Up to 130 residential narrowboats in the marina.

[1] This is an initial assessment based on other canal and marina based projects. However, an initial cost plan is needed to substantiate this figure which is beyond the scope of this initial feasibility study.

	First time buyers of Code for Sustainable Homes Level 4 houseboats. Improved physical and psychological links to Keynsham and Somerdale. Option for an edge of site development of new houses/apartments. Opportunities for live-work residential narrowboats.

Introduction

Overview

Keynsham has been identified as a key, strategic location for redevelopment and the creation of sustainable employment that is less dependent on the Public Sector. As such it is likely that the town will increase in population from 15,553 to around 17,000 by 2021. The Keynsham Town Centre Vision, adopted by B&NES includes proposals for redevelopment of areas in Keynsham Town Centre and edge of town redevelopments that include Riverside and Somerdale. The **Vision for Keynsham** must look to the previous consultation where the people of Keynsham said that they want:[2]

- To enhance the town through physical development
- Improve the economy and provide better jobs
- Make Keynsham ready for the future
- Help Keynsham to capitalise on its location
- Help Keynsham remain proud and independent

As well as **Improving the Shopping Experience** and **Improving the Park**, the Council's **Priorities for Action** also include:

Creating New Jobs: The Town Hall, Riverside and Somerdale have the opportunity to be major employment destinations that can anchor each end of the High Street, attracting higher quality office occupiers and increasing the footfall on the High Street.[3]

To help support the sustainability needs of local people and strategic direction of B&NES, the Avon Valley Park case study has been prepared by members of the River Corridor Group to examine the feasibility of Avon Valley Park and the role it would play in waste, tourism, homes, alternative energy and jobs. Not only does the location lend itself to the benefit of Somerdale, the transport of waste along the River Avon and an alternative tourist honeypot, it would also provide B&NES with a University affiliated research and development facility for treatment, reuse, reconditioning, remodelling and remanufacturing of domestic, commercial, industrial, construction and demolition waste in addition to existing recycling, energy recovery and disposal activities complemented by a micro heat grid. We have also considered the added value of flood compensation upstream of Broadmead, Keynsham, Somerdale and Bristol in the form of a marina, water park and ecological educational facility that would further diversify Avon Valley Farm and Avon Valley Adventure & Wildlife Park which already receives 95,000 visitors and 126 school visits in an average year. In essence, Avon Valley Park would add great value to the people of Keynsham, B&NES and the West of England.

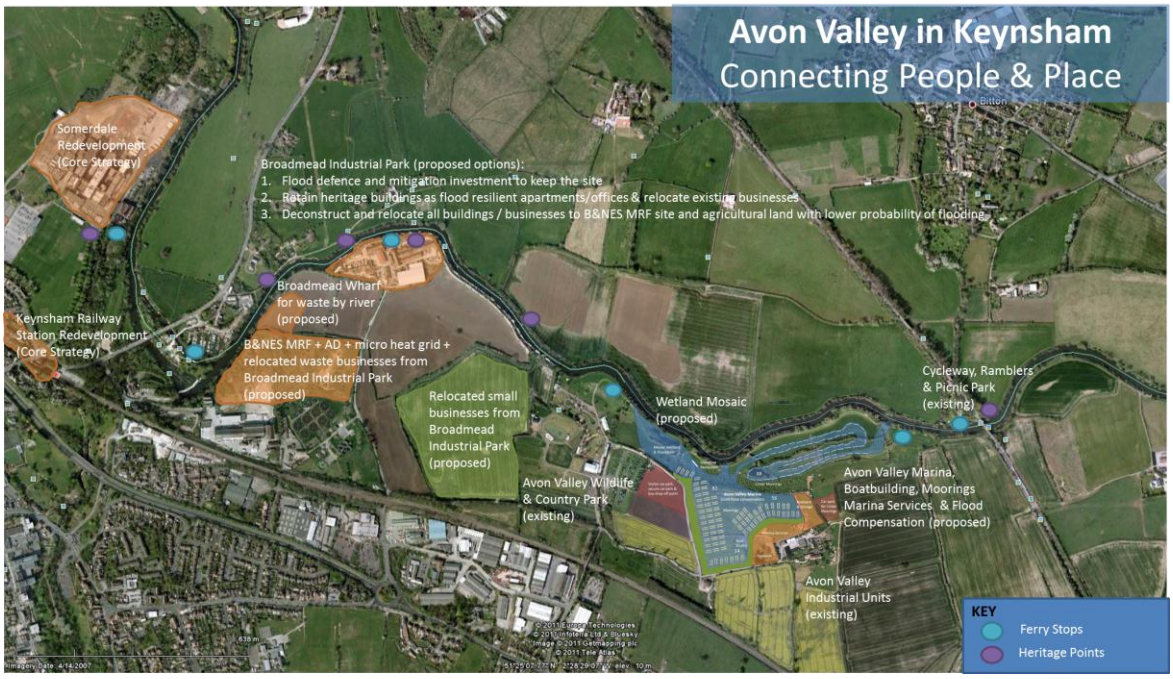
An initial assessment of costs and benefits has been carried out, but this will need to be fully accounted for in accordance with HM Treasury guidance for Green Book Appraisals. The Green Book emphasises the need to take account of the wider social costs and benefits of development proposals and the need to ensure the proper use of public resources. Hence, this is not a comprehensive report; rather it is a first step for the River Corridor Group in identifying strategic locations along the Avon Corridor and to advise B&NES and in this case the people of Keynsham what is feasible and should be given due consideration in planning and Major Projects. Similarly, to provide the landowners and interested parties a concept design for their further consideration and possibly a phased master plan and planning application to the Planning Department that is in tune with their strategic thinking.

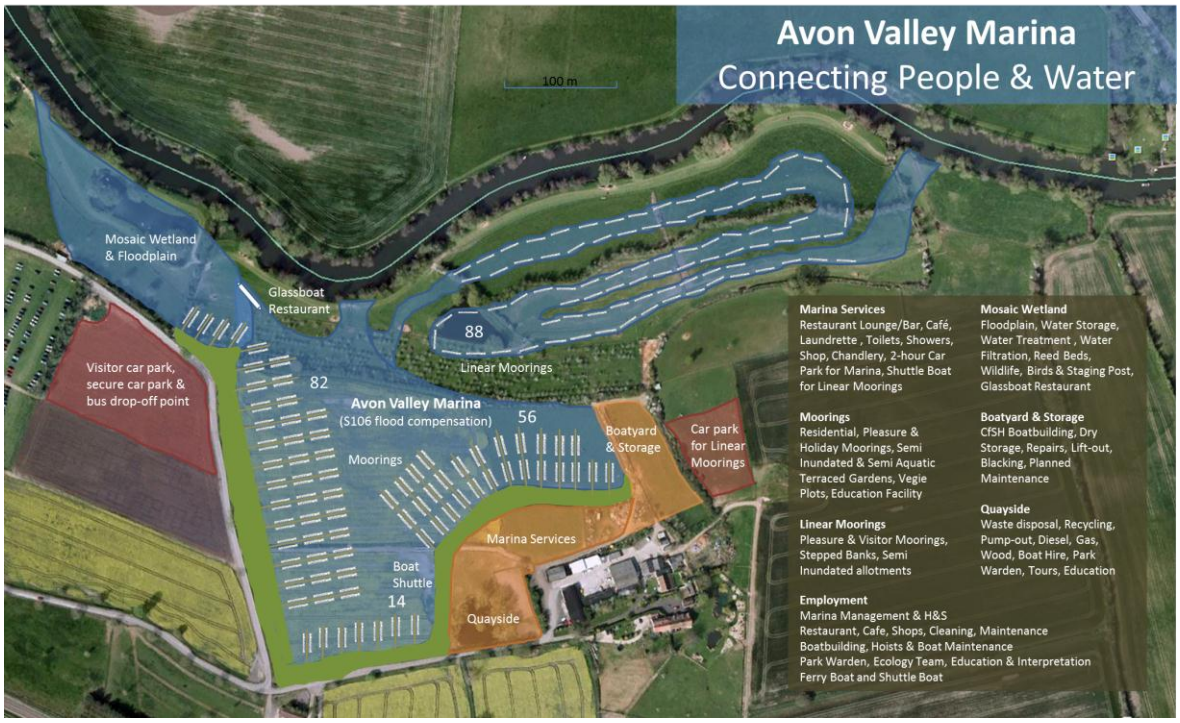
[2] Bath & North East Somerset Council website

[3] Bath & North East Somerset Council website

Description of the Site

Avon Valley Park is north and east north east of Keynsham, includes Somerdale, is situated between Bath and Bristol and is close to river, rail and highway transport routes. It is bounded by River Avon to the north and includes farmland, flood plain and established, low-value businesses by the river. The site is over 290 acres and mostly privately owned, but includes a sewage treatment works (Wessex water) and disused landfill (B&NES) that has planning proposals for a materials recycling facility. The river and riverbanks are managed by British Waterways and the Environment Agency. The following diagrams provide an overview of the whole site and a more detailed plan for Avon Valley Marina.





Assessment of Options

In accordance with the Green Book method of assessment, the costs and benefits of the preferred option should be measured against those of the “Reference Case” (Do Nothing) and the “Do Little” Options. For the purposes of this study the options are:

Option A – ‘Reference Case’. No water park constructed. Land uses continue as they are, no development of the infrastructure, no heat grid, flood plain react as previous with resultant flooding of part of the site and existing business zone. Residential developments beyond the town centre are to proceed as planned. Option A has been guided by the existing Core Strategy and Economic Regeneration Development Plans. It followed lengthy discussion with the landowners and interested parties about where else along the river this size of facility could occur, with no local competition other than The Hams (downstream of Broadmead, Keynsham and Somerdale) and Broadmead (too close to sewage works, recycling facilities, waste transfer station -i.e. nuisance- and in the fastest/deepest floodplain zone). Because of the absence of a masterplan for this site, it has been assumed that land released for development at Somerdale will be at least equal to that released under Option C and will support the same number of residential units.

Option B – ‘Do Little’ Provide a large water feature to act as a flood compensation system of ponds and water ecological corridors, linked to the River Avon but there is no marina, water park nor any of the associated businesses. Allow development of the Materials Recovery Facility on the disused landfill site. There would be no waste barges, no residential moorings and limited ecological enhancement. There would be little to offer local people or tourists. As in Option A, the absence of a masterplan means that we have to assume that land released for development at Somerdale will be at least equal to that released under Option C and will support the same number of residential units.

Option C – ‘Preferred Option’. Provide a navigable canal route between River Avon and Avon Valley Marina. Include a hydropower array, 250 berth marina, interconnected water park, integrated flood compensation system, leisure facilities, ecological enhancement, new jobs and stimulus for the commercial development of businesses to capitalise on waste and materials resource efficiency. Include provision for a pub and/or restaurant, riverside facilities and waterborne leisure activities associated with a heritage and nature trail. Include a micro heat grid and provision for 130 residential houseboats as well as moorings for pleasure, visitor and holiday craft. Include or relocate commercial businesses to land adjacent to sewage works and recycling facility (land use change needed) with associated infrastructure and benefits. Integrate a University affiliated research facility at Somerdale.

We considered the impact that the three options would have on the costs and benefits of the area and the exclusion of other sites. We also questioned if we were happy about the location of the marina, its benefits to Broadmead, Somerdale and Keynsham, how public opinion would react during any public consultation and what mitigation would be required for the Environmental Statement? We agreed that a full appraisal of these issues was beyond our scope at this time, but the River Corridor Group would support B&NES with comparison with other sites and consultation with interested parties.

Key Considerations

With little direct experience of marina and water park developments and associated businesses especially with an element of waste transport, treatment and micro heat grids, we decided to look at some other developments from feasibility to operation. This included a number of marinas in Brittany, France which are successfully operating and in many cases with limited commercial / residential support during development. We also made use of the background papers of Economic Minister Andrew Davies' (Welsh Assembly Government) fact finding missions to Brittany to consider their marina developments. Some of the conclusions from Brittany were mentioned in the Wales Coastal Strategy which we have adopted as our key considerations; these will need further development during any multiple site options assessment and public consultation:

- Any marina strategy is a long term strategy
- Marinas and other watersports can be developed in tandem
- There are definite benefits to rural hinterlands from marina developments
- Marina and watersports should be linked to other tourism opportunities such as heritage /golf
- There needs to be local support from the outset
- The incorporation of visiting berths are important
- Events play an important part of establishing profile and reputation
- Getting children onto water for fun and experience as early as possible is important
- Innovative building methods and materials can be used in marina construction
- Facilities for boat waste disposal and drainage systems are important as are proper shower and toilets required by EU regulations with increasingly higher standards
- Dual use of space – winter boat storage areas used as food markets in the summer

Avon Valley Park

Avon Valley

The proposed development is shown earlier in the *Description of the site*. This is based on Option C of our initial Assessment of Options, although it will be later modified to take account of:

- Emerging proposals from prospective developers
- Site Investigations
- Engineering technical requirements
- River flow modelling
- Habitat Survey results
- Location of any utilities, services, drains, abstraction points
- Location of existing residential moorings
- Structure and positioning of canal route to allow for turning circles up- and down-stream
- The control of surplus material from excavation and maximising reuse within the design

Waste Transport

The transport of waste is currently conducted along the road using numerous types of vehicles. There always will be a need for various types of trucks and the use of the roads, but where there is commercial opportunity to transport by river or train these transportation networks should be used. A lengthy debate was undertaken by the members of the River Corridor Group about how best to transport waste, where this should occur, where to best place facilities, what types of waste would be transported and to which facilities (existing and new) certain types of waste should go. Our aim was to identify one or a small number of locations along the Avon River Corridor for receiving and separating waste and one location for a major facility that would receive pre-treated waste (separated) so that maximum value could be recovered from the waste streams. Ultimately, some waste will end up going to landfill or better still an incinerator, but our role was to formulate a river borne involvement.

The transport routes for waste will always include roads and railway but there is a growing need and increasing desire to use the inland and coastal water networks or canals, rivers and sea. The Two Cities Project (Bath-Bristol) was conceived that both Bristol and Bath would need their own riverside collection and separation facilities. However, there was also a need to establish where best to locate the materials and waste consolidation centre on a large enough site, with close proximity to the river, road and railway networks and where it could play a contributory role to the wider development plans of B&NES. We decided that the reception and separation facilities would be the River Corridor in Bath and the materials and waste consolidation centre and associated businesses at Broadmead Peninsula within Avon Valley Park. Both locations are adjacent to the river with good access to other transport routes. More detail of locations along the river is included in the Transport chapter.

Materials & Waste Consolidation Centre

A state-of-the-art materials and waste consolidation centre would act as a central location along the river to receive, treat, reuse, recondition, remodel, remanufacture, recycle and recover energy from all non-hazardous waste streams from a large geographical area. As a central hub, it will act as a key strategic point along the river that will help serve a large number of towns, villages and hamlets within the economic boundaries of B&NES and the Two Cities Project. A sustainability strategy for the regeneration of the existing, low-tech waste facility and skip hire companies would need to be undertaken to ascertain the right mix of the Sustainable Industries Park (SIP) that incorporates the existing buildings, structures and infrastructure at Broadmead in readiness for the new build programme, operational phase and eventual legacy period over the short-, medium- and long-term.

This would include preparing a facility that will not only serve the Two Cities Project, but which is vital infrastructure for the overall regeneration of Keynsham, Somerdale and Avon Valley Park.

The materials and waste consolidation centre and associated barge, boat maintenance and waste processing skills will need to make best use of the demolition, site clearance, bulk earthworks, remediation, enabling works, infrastructure, new build, energy management and operational utilisation of materials and resources. It would need to consolidate these activities into a cohesive series of separate plans and processes in line with environmental regulatory requirements and sustainability expectations of B&NES. The sustainability strategy would be a component part of the overall development framework for the SIP. The following are core considerations for materials resource efficiency in the sustainability strategy:

- Record the source, types and volumes of waste markets and availability
- Identify the opportunities to reduce, reuse, recycle and recovery of materials
- Incorporate waste efficiency through design, construction and lean operations
- Establish storage, handling and transportation of materials and waste by river and land
- Employ suitable controls for hazardous, non-hazardous and inert wastes
- Identify procedures for valuable materials including waste electrical and electronic equipment
- Advise on preferred approach to material segregation, site layout and remedial activities
- Secure contractor and supplier buy-in through contractual clauses, pre-lets and preliminaries
- Monitor waste duty of care, licences, exemptions and permits
- Provide pollution abatement equipment to mitigate contamination risks

A key facet of the SIP will be considerations for materials resource efficiency and the utilisation of available materials and products back into the economy. There will need to be a good level of understanding of the types, volumes and frequency of wastes from all waste streams and their transport route which should primarily be by river. This would need to be facilitated up-stream and down-stream of the facility and be supplied by amphibious barges that would navigate the small number of locks via lock slipways; yet to be designed and conceived, but are functional needs of commercial movement of waste along the river. James Dyson's amphibious vehicle designs may be of significant value here, in fact they could be built at Avon Valley Park.

Together these will maximise the resource efficiency opportunities for significant amounts of materials, key demolition products and key waste products that are to be processed through a consolidation centre and soil washing plant for engineering use during the works or as feedstock for the mixture of commercial, industrial and research and development facilities. The consolidation centre will be an operational facility to complement other businesses that play a vital role in reclaiming, reconditioning, remodelling, remanufacturing, recycling and recovery of energy from the separated waste streams. Some of these will be high-tech businesses with skilled and semi-skilled roles aligned with apprenticeships and both Further and Higher Education graduates.

This novel and integrated approach to the efficient use of resources on a high-profile project will demonstrate how a sustainability strategy can be delivered on the ground, in-line with the programme of works and embedded into the design for materials resource efficiency across the lifetime of the SIP. These objectives could be achieved by implementing a structured methodology for collecting and analysing data to pinpoint the source, type, quantity, quality, condition and fixture of the key waste products and identify which of those should be set-aside up-stream or down-stream for delivery to Avon Valley Park or recycled down-stream at Avonmouth (i.e. Two Cities Project).

Somerdale Research Establishment

The redevelopment of Somerdale is sufficiently covered in the Core Strategy and Economic Regeneration Development Plans. However, due consideration should be given to a proportion of the site set-aside for a state-of-the-art research establishment for materials resource efficiency and

Sustainability spin-out businesses affiliated with the University of Bath and sponsored by a major high-net-worth individual/organisation. The site should also play a role in river transport, ferry journeys and the Avon Valley Heritage & Nature Trail. This will include a link to the heritage of Keynsham over and above Somerdale, which has played a dominant part in the town and can play a much needed educational and business spin-out role to activities proposed across the whole of the Avon Valley Park.

Somerdale Research Establishment would concentrate on the development of spatial economic businesses that interconnected their technical and high-skill minds to the semi-skilled works of materials resource efficiency and flood mitigation strategies that integrated spin-out businesses to train the world. Climate Change is real and educational facilities need to demonstrate how they apply minds to the physical solutions. Avon Valley Park would be central to the Somerdale Research Establishment ethos and educational syllabus. Conversely, the materials and waste consolidation centre and associated businesses that transport waste by river would act as proving grounds to test their ideas and develop spin-outs that actually delivered new economies. Water would play a vital and functional role that weaved all the materials, waste, flood, tourism, transport, homes, jobs and economies into a functional way that we use the rivers and its resources. Somerdale Research establishment would be the foundation stone for climate change living.

Avon Valley Marina

The proposed marina (see diagram in the *Description of the site)* is based on a conservative business model. The canal route links Avon Valley Marina with the River Avon. It provides an access and egress route so it would need to be sufficiently wide enough to facilitate ease of use and include a holding zone on the River Avon side to reduce waiting craft on the main river. Facilities and services would be provided to offer waterside development opportunities including a major pub and/or restaurant, gift shop/s, viewing platform and pedestrian / cycling routes. The canal route will also include sluices to supply replacement and flood waters into the water park occupying the flood plain.

A 250-berth marina is proposed providing residential, pleasure, visitor and holiday moorings which are either permanent or short-term. The marina will include an office, marina Master house, showers, WC facilities, launderette, a convenience store, fuel and gas store, boating facilities, mains water, power points to all moorings, permanent grey water and black water tanks incorporated into the pontoons, pontoon allotment and storage screens, picnic areas, designated bar-b-q zones, emergency assembly point, access for emergency services, fire-fighting points, rescue life rings and fuel spill equipment. The marina will be accessed on land by two new transport routes; one south of the marina for permanent residents and staff and one at a tangent to Broadmead Lane, which is primarily for visitors, coaches and water craft using the water park for various non-engine activities. A dedicated car, trailer and coach park is adjacent to the marina, which is suitably screened for noise, vibration and dust. This will minimise impact on the marina and ensure the peaceful pleasure of residents and visitors.

The water within the network of marina, water park and ecological corridors would naturally regulate itself with the River Avon mostly by gravity and the water would still reach the River Avon as it does now, merely by a different route. This whole assembly of water diverted from the river to feed the marina and water park and together to act as a balancing tank for up-stream flood waters to reduce risk of down-stream flooding will require suitable water modelling and contingency engineering to ensure through-flow and avoid stagnation zones. It will also identify efficient means to capture, store and gradually release flood waters that additionally complement hydropower arrays. It has been assessed that the marina could provide additional revenue support for the overall maintenance of the canal route, water park and associated flood compensation measures and hydropower arrays. This is because a portion of the moorings income generated by the marina could be returned to B&NES council by renting the marina to an operator, For example at Braunston Marina, British Waterways granted a 75 year lease to the operators in return for a 20% share of moorings income.

Given the strong local demand for moorings especially residential moorings, it is believed that a similar mechanism could be put in place at Avon Valley Park. Given that the costs of constructing the marina are included in the Option C estimate, B&NES could pass these on to a marina developer (e.g. Crest Nicholson Marinas) or alternatively obtain a share of final revenues in excess of the 20% secured as at Braunston. Initial talks with British Waterways, Avon Valley Moorings, Bristol Harbour, Phoenix Marine and Saltford Marina have suggested that there is congestion and excess demand for berths in nearby marinas. This is supported by the fact that many have waiting lists for secure high quality moorings. Introducing 250 berths at Avon Valley Park would increase the number of berths within 4 hours cruising of Bath and Bristol by 18%. This will need to include premium facilities:

Proposed marina Facilities	
Electricity / water / gas supply	Wet /dry dock facilities
Toilets	Boat / engineer repairs
Showers	Chandlery
Refuse disposal and recycling	Car parking
Pressure wash and blacking	Slipway
Telephones	Laundrette
Diesel, petrol, propane, solid fuel	Trailer storage
Mobile and fixed pump out	Nearby pub or restaurant

Most of these facilities are likely to be available at Avon Valley Marina, with the inclusion of a boatshop and crane if research indicates demand for the facility. Alternatively, allowance could be made in the design so that a mobile crane can be brought onto the site or a permanent crane can be installed at a later date. Other commercial opportunities associated with the marina could include boat sales, hire boat operations, a narrowboat holiday company and narrowboat servicing club.

It is believed that gravity will play a large part in delivering and moving water through the water park and associated balancing ponds, boating lake and water corridors. However, there may be some need of pumping so modelling will be required to indicate the delivery capacities of the pumps to complement the gravity systems and to ensure a healthy demand. The modelling will need to take into account any peak periods of demand when the balance is low and the location and capacity of the pumps to maintain variable but healthy water balance across the site. However, it is expected that for most of the year the duration of pumping will be a small proportion of the day; the canal route, sluices and gravity feeds to the balancing ponds should be designed to allow for variation in levels which will in turn allow flexibility in the time of day that pumping is carried out. It may well be possible to use off-peak electricity overnight, solar panels or energy exchanged from the heat grid.

All existing water courses, including the River Avon, would continue to follow their present routes apart from the abstraction of water balance from the River Avon and into the canal route, onto the marina and wherever required fed through the sluices and into the water park which eventually returns the net balance back into the River Avon alongside the existing businesses (7). This allows the present river system to remain intact and avoids the need to manage large variations in water flows. Essentially, the water level of the canal route and marina is the same as the River Avon itself. It is only during flood events that the water park which occupies the existing flood plain receives flood water as it always has, but controls the capture, storage and soft release of the flood water to reduce flood risk down-stream. In effect, the Avon Valley will be a truly Sustainable Drainage System (SUDS) that provides significant benefits to the sustainable community of Keynsham.

Water Park

The proposed water park has three primary functions: One is to act as a flood compensation system for down-stream developments through the capture, storage and controlled dispersal of up-stream

flood waters through a series of balancing ponds and water corridors. The second function is to provide a boaters lake for non-engine craft including, sailing dinghies, rowing boats, wind surfing boards, canoes, kayaks and similar type craft. Areas of the boating lake will include picnic tables, bar-b-q facilities, fishing pontoons, children and school ecology teaching zones and pedestrian /bicycle routes. The third function is to provide peaceful nature walks within and alongside a series of ecological corridors that will include sensitive areas set-aside for specialist flora and fauna. This will ensure that habitats and species diversity is optimised and conserved by a full time Warden.

Studies will need to be completed to ascertain the flow rates in and out of the canal route, marina and water park to ensure that the water balance across the network of waterways can be balanced with the river and capture, store and softly release the water balance in tune with the river rates, hydropower arrays and mooring draft. A British Waterways demand model and a provisional water balance model will be required in order to ascertain the volume of water required to sustain the canal route, marina complex and the network of lake, balancing ponds and water corridors to the exit sluices currently planned adjacent to the existing business zone (7). Initial discussions with a high level representative at British Waterways have been undertaken and he has given his endorsement of an integrated development that makes best use of the river.

The approach of intercepting feeds from the River Avon then discharging from the canal route into the marina and water park have been initially explored by members of the River Corridor Group. Further evaluation of the water balance model will need to be ascertained in order to facilitate a preferred water balance solution. This would redirect and/or pump flows from the River Avon into the canal route and then onto the marina, with excess flow being directed through sluices into and through the water park. This approach has the following key benefits:

- The quality of the inflow is variable, but can be filtered prior to entering the water park using screens and sediment traps in the balancing ponds
- Extracting water from the River Avon and not drain-off from the fields and roads should ensure that the water feeding the canal route and marina is of best available quality
- The operation and seasonal variation in the River Avon water levels especially during flood events can be partially balanced, stored and softly released back into the river up-stream of the major residential redevelopment and associated flood plains at Somerdale
- Existing water courses in which flows are known to vary considerably can be left unaltered
- Water levels in the canal route can be more readily managed or easily diverted into the screens and sediment traps of the balancing tanks if needed
- By designing the canal route and marina to operate separately from the water park, balancing ponds and water corridors, flood risk assessment and management is simplified

There will be consent issues to address with the transfer of water to the new canal route, marina and water park. A generous allowance for seepage and evaporation will need to be included within the modelling demand at this stage, whereas actual losses are likely to be much less.

Waterside Pub and/or Restaurant

The inclusion of the waterside pub /restaurant was based on an existing scheme run in partnership between British Waterways and Scottish and Newcastle Pub Enterprises. Under that scheme, prime waterside locations are released to the partnership by British Waterways, whereby Scottish and Newcastle Breweries develop the sites into profitable businesses. The rationale for the partnership is that visitor numbers, recreation and leisure opportunities will increase while the British Waterways achieves a 50/50 share of profits which can be reinvested into the care and maintenance of canals.

For Avon Valley Park, a transfer of suitable development land could provide the necessary conditions for a pub/restaurant partnership. Based on standard business practices, any pub/restaurant is likely to be run on a business franchise basis. Here business support could be provided by a brewery with land supplied by a third party (e.g. British Waterways, B&NES or developer of the site). The franchise

package would be based on a non-repairing lease, with minimal start-up costs for prospective tenants. In exchange for providing the premises, business support and related services, the pub partnership would charge a fixed turnover fee. This turnover fee is likely to be in the region of 12%, but will vary with location and circumstances.[4]

Previous turnover estimates have been gathered by Michells & Butlers (1,880+ facilities) and Whitbread benchmark, a weekly turnover of approximately £15,000 for a waterside location at Avon Valley equates to an annual turnover of £780,000, with 12% being returned to the pub-partnership in the form of rents (£93,000). Based on this assumption, British Waterways or a similar organisation could expect to receive revenue of approximately £47,000 per annum as a contribution toward canal maintenance. However, the development of such a scheme would entail the provision of development land at a suitable waterfront location. Currently, British Waterways owns no rights to the land but this could become a Section 106 allocation to British Waterways or B&NES.

Heritage & Nature Trail

The regeneration of Keynsham's lost heritage at the Bartelt Soap Factory circa 1881 is covered in the Heritage & History chapter of the report, so there is little more to mention here. However, it would play a vital role in defining and capitalising on the tourist and educational economies that would visit the site for heritage or nature experiences.

The Keynsham and Avon Valley Heritage & Nature Trail will be accessible by ferry, bicycle and walking. It would include significant signs and meanings in the landscape, businesses and riparian zones that would tell a story of what was and is now. The introduction of marinas, residential moorings, water ecology, historic buildings, sustainability research facility, hydropower arrays, warden-led education and fun zones for children would explain how we are combating climate change that integrates the waterworld rather than turning our backs on it. Rivers and floods are a natural occurrence, but if we use them to our advantage and build economies around them we can best serve the development of ideas, businesses and living in the flood zone rather than shutting it off behind concrete walls. We need to live with the ecology and landscape.

Ecology and Landscape

The preferred option of the feasibility study is also the preferred option for ecological enhancement. Although the canal route, marina and water park will have some adverse environmental impact on the existing flood plain, the ecological enhancement of the development will significantly increase biodiversity, improve existing habitats and generally be sensitive to existing ecological corridors, hedgerows and trees. The only woodland in the study area is small areas of wet woodland around the River Avon and some isolated trees on land.

The area is dominated by arable land used largely for low-value crop farming, however a large section of riverside functions as the Avon Valley Adventure & Wildlife Park. The fields are large with wide margins of uncultivated land and bordered by generally species-poor hedgerows. The soils in successful crop growing areas and floodplain are likely to have good drainage and be of medium to high fertility. Initial trial pits in some areas have been undertaken by the landowners to locate the water table in the proposed area for the meandering moorings and hydropower arrays, but formal site investigations have not yet been commissioned. The existing route to the Broadmead site will be upgraded and lifted above the flood level with incorporated sluices for water balancing, whereas the Avon Valley Marina and Water Park site already has a network of access roads that will need some improvements. However, two new vehicle access routes will be created to align with existing

[4] Source: www.channel4.com & www.thepublican.com

hedgerows, tree-lined stream and small number of brooks. There will also be some minor dissecting of existing hedgerows, but the existing biodiversity value of these corridors as a whole is limited.

There is very little standing water within the proposed developments, although during floods the low lying areas receive flood waters that override the riverbank. It is this natural phenomena that the Avon Valley Marina and Water Park will enhance, capture, store, use and transfer as and when required. The River Avon sweeps around the site as a natural meander, and a small number of ponds are within the site. There are a few tiny spring-fed streams and brooks running into the River Avon. General ecological mitigation and enhancement proposals have been considered by the River Corridor Group, including sympathetic and soft engineering using native species of local provenance, creating artificial places of shelter for otters and water voles, enhancing existing and creating new areas of importance for wildlife. Ecological measures will be informed by further assessment and detailed design during the formal Environmental Impact Assessment processes.

A more detailed study of the area should be completed for the preferred option route. This should be augmented by a site walk-over and preliminary exploratory survey to build on the trial pits discussed earlier. The assessment can then be used to identify a fuller scope of survey work required as the design develops, construction methods are selected and the location of structures fixed. Further work is recommended to confirm foundation design for the road, bridges, buildings and water bourne facilities. The surveys will also need to show instability in existing slopes along the canal route, within the marina and for some of the other areas that will be subject to excavation activities. Detailed design will need to consider temporary and permanent impacts on slope stability throughout the scheme and identify how excavated materials will be processed and reused on-site in the design.

Funding

Potential Funding Sources for Avon Valley	
Central Government	Money from B&NES, Regional Growth Fund and/or the West of England Local Enterprise Partnership could provide a kick-start to funding
Local Authority	B&NES has interests on the site and could contribute to funding through capital and revenue budgets for Major Projects, land swaps and staff times
Countryside Agency	Resources are largely accessed through a strategic approach with this agency
Heritage Lottery Fund and English Heritage	A key source of funding for canal restoration schemes in the past
Private Sector	The private sector could potentially have a large role in generating sources through land swaps, 106 agreements and sharing the cost for elements such as the marina
Major Investor	For example, James Dyson who may be interested in the facility, the manufacture of amphibious vehicles and high-tech education facility associated with University of Bath

(II) SUMMARY OF CONSULTATIONS

In the preparation of this report, Bath Avon River Economy Group has been informed by baseline data commissioned or issued by Bath and North East Somerset Council and other bodies with significant roles in the management of waterway including:

We have met and corresponded with:-

- Michael Lee and Mark Stephens from British Waterways
- Ron Humphreys, Director of Bath Ventures, University of Bath
- Professor Chris Baines – Urban Regeneration Panel
- Sainsburys plc
- Jane Turner, Minerva Rowing Club
- Cllr Terry Gazzard, Conservative Political Grouping Cabinet Member
- Paul Crossley and Cherry Beath, Liberal Democrat Political Group
- Nick Blofeld – Chief Executive of Bath Rugby
- Attempted to consult with Environment Agency but unsuccessfully
- Bath Avon River Users Association
- John Douglas, Avon Valley Wildlife & Country Park
- John Wilkinson – BANES Economic Development Team
- Stephen Mead - Allmead Recycling
- Caroline Kay - Bath Preservation Trust

(III) THE RIVER MAP

B&NES River Corridor RoadMap 2011-2016

Creating a river of ideas where we live, work and play

Hanham Lock
The end of the B&NES River Avon journey

To Bristol & Avonmouth
Two Cities Project

Keynsham Cyclepath
Create a cycle and pedestrian access route from the south riverside of the Bath/Bristol Cycle Track through Avon Valley Country Park into Keynsham

Somerdale
New housing, business units for high-skilled, knowledge and creative based start-ups with a centre of excellence for materials resource efficiency that is connected to the High Street, Riverside and Broadmead regeneration pods

Broadmead & Avon Valley
Materials waste management facility for waste from barges, manufacturing of barges, micro heat grid and anaerobic digester, flood compensation tank, marina and water ecology park

Lower Bristol Road
Loading facility wharf for waste transfer by river

Weston Island
Park & Sail facility for River Ferry/Taxi into the City centre, clearing the canal cut to the lock and providing serviced boat moorings, research innovative development opportunities for the Island, Start of the Inter Varsity Boat Race

Churchill Road Bridge
River Ferry/Taxi pontoon, Shops & Cafes in the railway vaults, finishing line for Inter Varsity Boat Race, Flag Poles and enhancing features for the bridge and the Innovation Centre, Water Fountain features

Improving access to and condition of the towpath, cycle-way and pedestrian routes

Pulteney Weir, Colonnades and Rugby Ground
Restored Colonnades, Rugby Ground colonnades, floating restaurants, moorings along Parade Gardens Wharf, River Ferry/Taxi terminus

Lambridge Training Ground
Park & Sail Terminus for river ferries/taxis into Bath City Centre

Cleveland Baths
Restoration Project with River Ferry/Taxi drop off pontoon

Dundas Wharf
The beginning of the B&NES River Avon journey

JH

(IV) ILLUSTRATION CREDITS

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