RESILIENT SPATIAL DESIGN
PRACTICE & POLICY

in Portsmouth & the Solent Region
as a regional, national & global paradigm

Project portfolio coordinated by Walter Menteth
THE VISION
- flood defence
- public infrastructure

RESILIENCE / OPTIMISM / GROWTH
MULTIFACETED / SUSTAINABLE
ENHANCEMENT / REGIONAL
HOLISTIC / PARTNERING

Portsmouth working with Government and the private sector has the opportunity to develop at a regional level flood defence infrastructure capable of developing resilience that delivers comprehensive future benefits.

WHAT MIGHT DESIGN RESPONSES TO CLIMATE CHANGE IN PORTSMOUTH BE LIKE?

COVERING LAND AND WATER STRATEGIES for:
- sustainability
- coastal resilience
- a low carbon economy
- new settlements
- civic refuge & development

**fig. 1**
The eastern Solent from the air

**fig. 2**
Portsmouth island viewed from the Solent.
THE VISION
- flood defence
- public infrastructure

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Portsmouth working with Government and the private sector has the opportunity to develop at a regional level flood defence infrastructure capable of developing resilience that delivers comprehensive future benefits.

PORTSMOUTH is a unique Island City and, like Venice, the powerhouse of a former empire.

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COVERING LAND AND WATER

STRATEGIES for:
- sustainability
- coastal resilience
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- new settlements
- civic refuge & development
Southampton
Langstone and Emsworth Channels and the Isle of Wight to the north, with Southampton Sound, Portsmouth Harbour, and tidal power. The coast provides opportunities to develop renewable energy capacity through wind, solar, and tidal power. Pressure on public infrastructure is mounting across the region with detrimental impacts on transport arteries, such as the M27/M25 arterials. There is a high degree of car dependency with frequent congestion along the major road arteries. Economic benefit is derived from water and land transport, but there is a need to reduce CO2 emissions.

The form and fabric of Portsmouth is distinguished by many edge conditions, related to its coastal location. The city’s economy has been in decline for many years. The city lacks a strong clear vision that might be necessary to reverse such trends. Employment in the Portsmouth naval dockyard relationships relative to its growing hinterland. Portmouth has lacked investment. Although Sustainable public transport infrastructure in Portsmouth has lacked investment. Although Sustainable public transport infrastructure in Portsmouth has lacked investment. Although Portsmouth has lacked investment. Although Sustainable public transport infrastructure in Portsmouth has lacked investment. Although Sustainable public transport infrastructure in Portsmouth has lacked investment.

The Solent region described by the South Downs National Park.

South Hampshire and the Solent Region

fig. 3
Location of Portsmouth
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Fig. 4
Contemporary Portsmouth in the south coast region, generic landuses (top) and road network connectivity (bottom)
## 1 PROJECT SUMMARY

<table>
<thead>
<tr>
<th>Designer / Practitioner:</th>
<th>Walter Menteth, RIBA, RIAS, Portsmouth school of architecture, director Walter Menteth Architects and Project Compass CIC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title:</td>
<td>Informing the policy &amp; practice of sustainably resilient spatial development in Portsmouth &amp; the Solent Region as a regional, national &amp; global paradigm.</td>
</tr>
<tr>
<td>Output types:</td>
<td>Books; papers; conference and symposium presentations, attendances &amp; proceedings; hosting and organising the holding of conferences; organising charrettes; public presentations and exhibitions; design studies and the positing of design proposals; consultative and co-creation processes; data analysis and modelling; videos; open international competitive calls; international competition design submission; research, text production and mentoring of associated masters study programme.</td>
</tr>
<tr>
<td>Project / Exhibitions:</td>
<td>2 public exhibitions; 9 public meetings;</td>
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<td>Client / Curator:</td>
<td></td>
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<tr>
<td>Dates:</td>
<td>June 2013 → ongoing</td>
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<td>Walter Menteth Architects; Project Compass CIC; Creative Industries Fund NL.</td>
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<tr>
<td>Budget:</td>
<td>roughly £48,000.00</td>
</tr>
<tr>
<td>Co contributors / Co-exhibitor:</td>
<td>Local, national and international - public, private, NGO and academic. (Various see publications and following).</td>
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</tbody>
</table>
Portsmouth is a truly unique Island City. One of only two similar island cities in Europe which, like Venice, is founded on maritime power. This distinct legacy is relatively under recognised. With roughly 12% of Portsmouth's economy now derived from tourism, it is imperative to nurture its most valuable assets and amenities for the future, particularly the fabulous Southsea to Eastney frontage, so it remains one of the UK's premier urban seaside destinations.

fig. 5
Portsmouth OS mapping, adapted by MUD Studio 2015
2 STATEMENT ABOUT THE RESEARCH CONTENT AND PROCESS

Project Description
This portfolio of applied design action research, addressing specific problems and their solutions, and informing and being informed by context, investigates architecture and spatial planning of sustainably resilient infrastructure in Portsmouth and the Solent region (fig.1-5), as a local, national and international paradigm.

The research design strategy has been sequentially structured to gather early physical, social, economic, environmental, cultural and political macro evaluation, appraising and understanding of the wider context, leading to more detailed branches of enquiry of key infrastructure having staged outputs.

The research programme and process has been reactive and responsive to the outputs, programmes and processes of others, according to resource availability, and to synchronise with academic programmes; as well as pro-active through precipitating progress and development through thought leadership. Engagements and partnerships with others have contributed towards furthering insights, extending the research enquiry, adding to research queries and findings, and informing case studies – enhancing cross-disciplinary, collaborative, co-creation and consultative processes, while expanding and building partnering capacity. Progression and direction has also been impacted by the availability of private and NGO funding accessed by the researcher at stages.

Key Questions
The purpose of this portfolio study of the Solent region, as an exemplar of urbanised coastal locations, is to explore whether resilient spatial planning, in the context of population growth, climate change and induced rises in sea level, can be improved by focus on:-

1. Strategic infrastructure and whether spatial agency can contribute benefits.
2. Identifying constraints on advancement, by enquiry and propositioning, to assess and interrogate whether unaccounted potential may be released.
3. The professional, academic, stakeholder and public context and whether opportunity exists for developing and improving capacity and the convergence of theory and practice.
4. Qualitative advancement of potential whole life and long term design values, and how these can be better embedded.

Research Method
The researcher and a colleague Francis Graves established a masters in architecture design research programme for MUD Studio (Making, Understanding and Doing) at the Portsmouth school of architecture in September 2013, marking commencement of this investigation. Subsequently the researcher developed independent enquiry fields encompassing qualitative and quantitative research, with the first outputs reported in 2014.

The method developed focus on salient subjects from the wider context, such as the regional transportation and coastal management infrastructure, as well as detailed localities, including central Portsmouth’s and its sea front.

Architecture, urban planning, engineering, landscape design, transport planning, quantity surveying, project management, mathematics and statistics, geography, oceanography, economics and social sciences are among those disciplines that have been drawn upon to inform multiple-disciplinary aspects of this research enquiry and the analytical methods that have been applied (fig.15,22-25).
Portsmouth

the island city

1 - mainline rail connectivity

a proposal for change

Walter Menteth,
Portsmouth - The Island City papers
12/04/2016 Rev.3

Portsmouth

the island city

coastal resilience

a regional strategic proposal

Walter Menteth,
Portsmouth - The Island City papers
06/03/2016 Rev.2

Portsmouth civic centre

- public realm

extended for design

Portsmouth

the island city

building better flood resilience

for southsea’s frontage

Walter Menteth

June 2017 (R.3a)

fig. 7

Four monographs

by Walter Menteth

fig. 6

Two websites

by Walter Menteth
Research techniques and tools have drawn on observation; through field research, site visits, surveying, drawing and photography (fig. 16); contextual enquiry, through the masters programme, collaborative engagements, design charrette and design evaluation, appraising, and analysis; survey of participants; document reviews; data and physical modelling; recording, sketching, drawing extrapolations, architectural drawing testing, and hypothesising, along with substantive original design proposals. The research has been accompanied by public and stakeholder engagements (fig. 26-30, 33-35).

Spatial planning requires pertinent insight into broad parameters including, the political context, governance and policy, practice, procedures, processes, economics and social values, as these are manifest influences on design solutions, and where appropriate to this enquiry these have also been addressed, engaged, appraised and analysed.

Dissemination
Investigations, processes, findings and research conclusions have been reported, through a number of original monographs (fig. 7), reports, exhibitions, papers, and videos (fig. 8), along with a range of other outputs to inform policy, process and practice, over the programme. The outputs have been disseminated in print, through purpose built dedicated websites digitally (fig. 6) and through conferences, symposium, public meetings (fig. 26, 34, 35), and by social media, with the outputs also being taken up and reported extensively by the national and local press and media.

So that knowledge might be transferred, participation enhanced and feedback gathered in response to the outputs, the research method has embedded opportunity for public and stakeholder engagement and discourse. This has been achieved through a strategy of appropriately targeted open public outputs which have been clearly communicated in accessible formats with lay content, so as to contribute to shifting the public and political paradigm.

fig. 8 One book chapter and one paper by Walter Menteth

fig. 9 Two videos – the Elephant Cage by Francis Graves & Walter Menteth (top), – Southsea Common proposals by Walter Menteth
fig. 10
Analysis shows Global Exposure to Sea Level Rise. September 2014 © Strauss, B. & Kulp, S.

fig. 11
Map shows the proportion of the city area (UMZ inside the core city) that would be affected by potential inundation caused by a sea level rise of 1m. © European Environment Agency (EEA). Potential inundation exposure for coastal cities due to projected sea level rise and storm surge events.
3 STATEMENT OF SIGNIFICANCE

At a conservative estimate 147 to 216 million people globally live on land at risk of being submerged below sea level, or at regular flood levels, by the end of this century assuming emissions of heat-trapping gases continue on their current trend, but the figure may be as large as 650 million. The largest populations by numbers of those most exposed are in countries in Asia; China, Vietnam, Japan and India, with the UK and four other European countries also making the list (fig. 10). Coastal cities of twenty seven European Union states exposed to the risk of inundation, up until 2100 from 100 year event storm surges, indicates a high preponderance are located around the North Sea, the English Channel and the Atlantic, with states such as the Netherlands and UK particularly exposed (fig. 11, 13).2

With a long highly indented coastline the UK’s coastal exposure is very high. The coastline at roughly 12,429km is high for a land mass of 243,610 km² and has a coast/area ratio of 51.4 m/km², whilst the UK has a low population relative to the length of its coastline at 5.2 people/m.3 Ordnance survey however calculates UK’s main island coast line is 17,820 km and when the larger islands are added, this rises to 31,368 km from which may be derived an upper coast/area ratio of 129.6 m/km².4 This illustrates the significant and unique challenges faced by the UK with a coastline that is proportionately high relative to its land area and with a comparatively low density of people relative to coastal length.

UK therefore needs to ensure its coastal communities, management and mitigation strategies for climate change, and particularly induced rises in sea level, deliver optimum cost benefit, so that investment, which is currently prioritised to protecting life and property, may also be more critically considered in areas of higher population densities, in terms of economic, whole life and social value sustainability, for overall efficiency and effectiveness.

Following the 2008 global economic collapse the deployment of resources on policy implementation and research in spatial planning, within the UK and EU, has been depleted, yet conjunctively climate change has been accelerating. This imposes systemic burdens upon the capacity to develop intelligent forward planning, co-ordination, spatial design governance, design practice, guidance and consideration of whole life values that are all necessary for ensuring sustainably resilient planning can be delivered effectively for the future.

Alongside the economic depletion of the necessary investment needed to address emerging scenarios optimally, spatial planning research by European public authorities is increasingly being addressed through private outsourcing, by restricted procedures, processes and their implementation which imposes constraints on the advancement of open planning research and inquiry, the interrogation of ideas and solutions, societal engagement and the wider development of capacity expertise.

The UK’s main island coast line is overall roughly 31,368 km long, while the Dutch sea coast is only 451km long, yet tellingly the UK frequently still recourses to the Dutch as historic leaders of innovation and best practices for research, consultancies and contracting of coastal water management. The UK’s capacity expertise appears comparatively diminutive impacting nationally on he UK ability to most constructively address national problems, while reducing potential for innovation and future export of design expertise.

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4 How long is the coastline around mainland Great Britain. Ordnance Survey 2017.
How the City of Portsmouth working with cities in the south of England has an opportunity to develop a future transportation strategy with government to improve connectivity, sustainability and economic benefit.

**The Vision**

High speed south England (HSSE) - sustainable regional growth

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**Fig. 12**
Options considered for the future, global hubs, city hubs or communities.

**Fig. 13**
Storm surge & High Tides magnify the risk of local Sea Level Rise.
© Union of concerned Scientists
In this context and in spatial planning, architecture, public realm design and landscape project implementations there is a UK deficiency of capacity, deployment and spatial design research. This absence of engagement across policy, processes and practice, contributes towards a lack of interrogation of potential planned design solutions which can be detrimental for delivery of best value whole life outcomes. Contextually site specific solutions for addressing the emerging issues of climate change impacts in the UK, meanwhile remain embryonic.

This study endeavors to evaluate and address these broad concerns and do so by evidencing, appraising and design propositioning. The research bridges theory, with potential contextual applications and, through the investigation of viable and innovative spatial design resolutions, provides direction on the possible means for achieving and informing better value outcomes both regionally and more universally (fig.8).

In the Portsmouth and the Solent regional context, a range of salient infrastructural issues are freely addressed to inform future practices, with a view to shifting the paradigm towards more open, creative and engaged outcomes that can deliver higher quality and better whole life values, locally, nationally and globally, whilst also engaging in capacity building and opening future research investigation.

In 2018 the Portsmouth statutory plan has been moving towards adoption, and the timing of this research and its outputs have also been designed to inform this local process.

Collaborative national and international partnerships drawing on cross disciplinary expertise in the academic, public and private sectors have attracted independent research funding to this inquiry, the city and its region. The dissemination has raised public awareness, developed a co-creative public and political constituency, provided guidance, informed governance and policy models, procurement, processes, and procedures, while the resultant design solutions have impacted upon planning and spatial solutions and policy within the locale and more widely.

fig. 14
Portsmouth Quality Of Life & Index of deprivation.
MUD studio MArch research adapted from Hampshire County Council, 2010 and others
When considering the future, realising the overall value of the beach front and common should be foremost.
South Hampshire is the largest built up region at risk from coastal inundation in the South East, with Portsmouth in the low lying East Solent coastal area, being pre-eminent (fig.15).

Portsmouth is one of only two island cities in Europe, which like Venice is founded on maritime imperial power. It has a population density of 5,100 people/km², which exceeds that of London. The city’s drainage system makes it vulnerable to future surface water flooding, it has a high dependency on car transportation (fig.17), extensive civil and naval port facilities and recreational maritime activity, its public amenity spaces is provided largely along the seafront or on the sea (fig.5), and residents have a low quality of life (fig.14).

Nearly £6 billion of investment for England had been consented in February. 2017 by central government, for both coastal and fluvial projects, to address flooding issues (roughly 12% of High Speed Rail 2). The 4.5km long Portsmouth Southsea frontage where there are 8,077 residential properties within the primary food cell, with 4,114 residential properties and 704 commercial properties at direct risk of inundation, represents the largest by value of the urban frontages included within the current programme.5 This popular southern frontage, has extensive amenities; is rich in historic assets, with five scheduled monuments and thirty four listed buildings, and has a range of other unique functions (fig.16).

In this enquiry Portsmouth is explored as a case study and research paradigm into climate change resilience, with a variety of unique spatial design issues interrogated in context, with design strategies developed addressing how:-

- Through strategic land-use studies population growth, urban expansion and its servicing is best accommodated with sustainable resilience, where land is limited (fig.5,45-49,52-54).
- By development of proposals for mixed modal rail and light rail transport infrastructure there can be potential for CO2 emissions reductions, more capacity and better accessibility to support sustainable economic growth (fig.24,25,41-43,50-,51).
- The opportunity for securing against coastal inundation through unaccounted and alternative regional managed realignment strategies, including barrages and flood gates to the major harbours and inlets of the Solent, can deliver secure water management with environmental and economic benefit (fig.36,38-40,44,59-61).
- The civic spatial formation of the urban environment can be enhanced through provision of public realm offering identity, focus, and development opportunity, and do so with resilience while accounting for current and future strategic imperatives (fig.40,45-48,59-61).
- The authorities existing detailed proposals for coastal management along the Portsmouth Southsea frontage might be addressed better and deliver more environmental, economic, whole life and social value (fig.20,31,36-40,44-48).

The planning potential for social, environmental and economic sustainability, resilience, well-being and CO2 emissions reductions is explored through these design strategies, and proposals made to inform potential, increase debate, open opportunity and allow for growth.

At Southsea, for example, the research also identifies particular threats, over a projects life cycle that may lock in adverse future impacts, potentially compounding disadvantages and evidences why and how approaches can impact spatial development outputs, aspirations, quality and social values, whilst propounding through exemplary practice more effective, efficient and innovative alternatives.6

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In Portsmouth the max natural height above sea level = approx 6m

fig. 17
Vehicular traffic appraisal derived from 2011 Census and TomTom congestion index by MUD Studio 2014

Figures from 2011 Census and TomTom Congestion Index

fig. 18
The high regional risk from coastal inundation from rising sea levels by MUD Studio 2015
5 AIMS AND OBJECTIVES

This research portfolio is aimed at informing better more efficient and effective resilient, sustainable and social value planning and architectural design outcomes in urbanised coastal regions through improving professional capacity, collaborative and co-creation processes, and do so with better implementation through public design policy and practice. It also aims to provide insights to and identification of new, original, unperceived or inadequately considered opportunities with the objective of reconciling political, economic, social and environmental spatial planning imperatives, which may inform research and future development.

It’s objective is to shift the paradigm of spatial planning and architectural design implementation by design analysis, identifying potentials, opening up opportunity, and improving transparency (and hence public access), as a means of contributing to the development of better and more holistic solutions locally, nationally and internationally.

The research has a range of specific aims and objectives commensurate with some of the broad criteria also necessary for taking forward spatial planning in urbanised coastal locations. In the fields of study key amongst these have been:

**Resilience**
Embedding planned thinking and flexibility into strategically resilient spatial designs with the aim of achieving more future proof and robust outcomes, in the face of predictions for climate change.

**Multivalency**
Investigating how infrastructure investment may provide opportunity for better deployment with the objective of enabling the delivery of multiple outcomes, vis a vis a single project outcome.

**Quality of life standards**
Informing better and more sustainable design and spatial outcomes effectively and efficiently with the objective of embodying qualitative, social, well-being, health and whole life value considerations.

**Creating opportunity for innovation**
Expanding design paradigms, with the aim of precipitating innovation, potential and opportunity for contextually specific and resilient urban design resolutions.

**CO2 emissions reductions**
Evaluations and design studies having the aim of reducing carbon dependency and achieving a low carbon economy from new and existing infrastructure

**Capacity building**
Developing action research through spatial agency, and its dissemination with the aim of building and enhancing engagement, and expanding knowledge and expertise.

**Collaborative design practices**
Charting processes procedures and practices with the aim of delivering more and better cross disciplinary collaboration and engagement in design solutions and their delivery.

**Co-creative processes**
Creating opportunity for public engagement, participation and consultation with the aim of achieving feedback, improving outputs, transferring knowledge and improving cultural discourse.

**Governance**
Informing policy and practice for steering delivery of the above objectives
Projections for global mean sea level rise and its contributions. EEA. for the four representative concentration pathways (RCPs) and emissions scenario SRES A1B used in the IPCC Fourth Assessment Report. The grey boxes show the median of the model projections (central bar) as well as the likely range, which comprises two thirds of the model projections. The coloured bars and boxes show estimates for the different contributions to global sea-level rise.

"In the 20th many of the UK's finest cities were destroyed by roads now considered a liability. Are we in danger of doing something similar to our coastline?"

Montages showing landside view of the authorities concrete sea defence revetments proposal to be constructed along Clarence Esplanade, Portsmouth. as used in publications, exhibitions & video by Walter Menteth

"Southsea Common is inseparably part of the sea front and should be considered conjunctively."
6 QUESTIONS

Because CO2 emissions and their capping, and hence the extent of climate change and induced rises in sea level, remain political determinants over which only limited agreement has yet been reached, the trajectory might be expected to worsen, along with the consequential emerging issues (fig. 19). This raises multiple questions as to how humanity can best respond, because it has not previously had to confront the challenge now faced. Various field observations raise questions that this portfolio of research enquiry has sought to address.

1. Population expansion, increased pressure on land and resources pose significant issues in coastal locations if CO2 reductions are to be delivered, sustainable growth realised and the populations well-being assured. How this may best be achieved through improving the spatial planning of strategic infrastructure and undertaking this through spatial agency is addressed.

2. How sustainable resilience to climate change might be adopted is an emerging challenge demanding implementation of creative, innovative, efficient and effective solutions which are contextual, and to inform response viability this enquiry explores constraints and the potentials for extending opportunities in spatial design solutions.

3. Climate change resilience is a new field of endeavour requiring design enquiry which this research explores and does so through the convergence of theory and practice, and by delivering knowledge transfer whilst seeking to build engagement, capacity and capability amongst professionals, academics, stakeholders and the public.

4. For achieving sustainability more significant consideration in public investment is thought necessary for whole life / long term values, with the policy frameworks of these qualitative criteria, as these are fundamental for achieving CO2 reductions and viable climate change responses.

5. Portsmouth is located on a small flat island endowed with unprecedented assets within a relatively prosperous UK region, but it is not a preferred regional residential location (compared for example to Brighton), for much of the past fifty years its economy has been in decline (as employment within the naval dockyard diminished), and its civic assets and amenities appear to have been inadequately curated (the city has been blighted by some of the UK’s worst traffic planning, with minimal opportunities for cyclists, low provision of mixed modal transport and minimal inter connectivity by water bus services). These are all local issues that raise specific questions informing this research.

6. Most visitor’s transit through Portsmouth without stopping between the ferry ports, the hinterland and beyond, and it is not a primary destination, yet it still grosses roughly 12% of its income from tourism (fig.17). Why the city has been failing to capture more visitor income and wealth, which might sustain better long term planning, would partly appear to be a question about environmental quality, so raising potential, opportunities and aspirations are seen as part of this enquiry.

7. Underpinning all the above issues appears local questions of civic aspiration, identity, pride, and governance, along with economic opportunity, wealth, education and health, and how spatial planning and design might work better as a contribution towards long term beneficial enhancement, growth and well-being.

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7 Global and European sea level: What is the trend in mean sea level globally and across European seas? European Environment Agency (EEA) July 28, 2014, updated Sept 4, 2015. Fig.4
fig. 21
1775 and 1833 maps of Portsmouth
There is no previous known or similar applied design action research in this field of spatial planning, engaging climate change, resilience and coastal management, focused upon the topics addressed and it is understood this portfolio of study is uniquely original. UK research developed previously in the field of coastal water management has primarily been undertaken by geographers, oceanographers and engineers, and been reflective of their disciplines.

Portsmouth and the wider region, encompassing the Solent islands and hinterland, provide the geographic context of this regional spatial research. The area comprises a number of local municipal and county council authorities, extending across Hampshire, West Sussex and the Isle of Wight.

The wider study area has an urban population exceeding 6.142m (fig. 15), (almost half of metropolitan London), with the south of this region contributing over 15% of the UK’s GVA outputs, yet has extremes of economic prosperity, and its transportation networks and facilities are congested and constrained.

Uniquely the water and coastal management of this English region is split between the Environment Agency, and the Eastern Solent Coastal Partnership (ESCP - a local authority consortium). In the study area, and excluding the Isle of Wight, the coast exposed to climate change induced rises in sea levels amounts to roughly 227km or roughly half the exposed Dutch coastline.

Professional, cultural and political formations, and capacity to address the threats and opportunities of climate change induced rises in sea level are however, more limited than are found, for example within the Netherlands and this is also reflected in the public authorities capacity to address sustainable planning across all fields regionally.

ESCP water management designs have been the subject of particular exploration and enquiry since commencement of this research, independently and also through the school of architectures masters programme. ESCP has a water management remit for the coastline of Portsmouth and adjacent authorities and in 2015 sought to consult the public on their proposals to improve sea defences to the Portsmouth Southsea frontage. Existing defences have, in places, passed the end of their life expectancy so replacement is required.

Based on a restrictive political policy, defined as ‘holding the line’, these proposals developed through a further planning strategy stage to entail the construction of terraced concrete revetments to provide sea defence structures on the beaches. This raised a number of challenges, including, whether or not better value might be achievable, and what future lessons might be learnt, which since 2016 have been a particular focus of research undertaken through the Elephant Cage programme organised for this purpose by the researcher and subsequently developed independently with design propositions by the researcher.

On the 2017 invitation of the Isle of Wight councils department of development and planning, the research investigation began engaging with the towns of Newport, Ryde and Shanklin through a masters of architecture programme at Portsmouth University, with public dissemination of outputs from this research scheduled in summer 2018 (fig.61).

11 Ibid
12 Southsea Coastal Defence Proposals and Options. 2016 ESCP, Portsmouth City council, & Environment agency
Examples of data, analysis and modelling deployed in this portfolio
by Walter Menteth

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**fig. 22**

Examples of data, analysis and modelling deployed in this portfolio by Walter Menteth
8 METHODS

Summary qualitative design research methods have included investigating primary and secondary data and acquisitions from interactions, along with quantitative design research from observational and secondary data and survey sources, including:

1. Analysis, appraising, evaluation and assessing data from acquired and original sources, by the researcher and through a Masters programme at the Portsmouth school of architecture, over a period of four years. Exhibiting results, engaging in public consultation and dissemination, and publication of outputs.

2. Publications, papers and other document reviews, forgathering and processing data and information, data modelling, precedent and case study evaluations, site visits, seminar attendances, interrogative analysis, and design synthesis.

3. Developing wider public, professional and stakeholder forums for contextual, topographical and economic evaluation, appraising, knowledge sharing, collaboration, co-creation, and case study evaluations to inform the design research. Drawing upon cross disciplinary professional expertise, site / field visits to design exemplars, stakeholder and public consultations, exhibitions and engagements.

Examples of the research methods in this portfolio and their deployment is detailed below.

Design research investigations instigated through a Masters study programme at the Portsmouth school of architecture

The Masters in architecture MUD (Making, Understanding and Doing) Studio programmes in Portsmouth school of Architecture have engaged annually in research, planning and the architectural design of infrastructure, in the context of climate change impacts, within Portsmouth and the Solent region, exploring issues of sustainably resilient infrastructure, since 2013.

These have provided opportunity for acquiring a broad spectrum of macro quantitative and qualitative spatial planning research and its analysis. This masters research has focused on Portsmouth from 2013 and the Isle of Wight, from 2017.

Public presentations and exhibition of the programmes findings have been held, in Portsmouth and the Isle of Wight, enabling acquisition of feedback from interactions. Examples of these public outputs can also be found on the dedicated www.portsmouthisland.uk website were a further three public reports, by masters students, is anticipated for publication in 2018.

These ongoing research programmes have also engaged external expertise for direction, collaboration and peer review, from the Eastern Solent Coastal Partnerships, (a regional quango formed from a consortium of local authorities), Royal Haskonings, Portsmouth City Council, Isle of Wight Council along with public and private consultancies and stakeholders and individuals.
the Solent, a groyne is effectively provided on the nexus of Western Parade, Castle Road and Kent It is proposed to realign the new site on an axis with stage. enabling redevelopment of Clarence Pier to progress Rotating the site area 90 degrees (fig. 44 + 46) Alternative plan for Clarence Pier value. limited on redevelopment, with one long side land-

The heavy black line in the diagram (fig. 43) shows its existing Clarence Pier site (however fragmented) it can be seen how this would have significant impact 5.1 Clarence Pier redevelopment

Land Uses on Southsea Common, overlaid with the ESCP proposed sea defence works, covering the study area "roads & parking account for roughly 16% of Southsea Common’s total area"

fig. 22. Proposed pedestrian and cycle connectivity

fig. 44. Conceptual montage study of Clarence Pier

fig. 23

"roads & parking account for roughly 16% of Southsea Common’s total area"

fig. 46. Key Plan. The same land area of Clarence Pier re-envisaged in the alternative scenario

fig. 23

Examples of drawing analysis and representations used in this portfolio by Walter Menteth
Document reviews, for gathering and processing data and information, data modelling, case study evaluations, site visits, seminar attendances, interrogative analysis and synthesis.

Document reviews have been undertaken of local, regional, national and international planning policy, published reports and papers from panels of international organisations, the EU and national governments, NGO and private organisations, professional bodies and individuals, in the field of climate and environmental science, sustainability, resilience, infrastructure and its design, ocean science, hydrology, geography, geology, mixed modal transportation, planning, architecture and design. This has included documented text, data, and graphics, images, video and digital outputs.

From review relevant data and information has been for gathered, appraised, and in some cases formatted, mapped and redrawn, so as to deliver spatial representations for the study area context and subject focus. This has included for example; sea level rise projections (under varying scenarios), journey travel times area and land use analysis, topographical measurement of surfaces, heights and perimeters, volumetrics, connectivity, movement and flow chart studies. This data has also been modeled from derived sources to generate new and original evaluations and insights (fig.18,22,23,49).

Historic and contemporary infrastructure precedents and case studies have been analysed and evaluated, including transportation, drainage, water supply, coastal management, power distribution, housing and commercial development, and spatial and civic planning.

Over the study period the researcher has visited a variety of locations, in the UK, Netherlands, Portugal, Italy, France, Czech republic and Germany to view and appraise, coastal cities, coastal and fluvial management infrastructure (UK, NL, IT, PT), resilient hydrological sanitation systems (London UK, CZ), transportation infrastructure (DK, F, PT, IT, NL) and spatial planning solutions (all), that have informed research outputs (fig.32).

The researcher has also drawn upon his personal expertise and engagements in the design, development and dissemination of two implemented London mixed modal transportation infrastructure projects, the docklands light rail (as a contributor on the Limehouse Community Development Group proposals, 1978-80), and the London orbital railway (as consultant to the North Southwark Community Development Group, proposal, 1981-84).
SIGN UP TO YOUR FORUM’s CONFIDENTIAL EMAIL LIST AND GET IMPORTANT LOCAL NEWS: email Southsea.Forum@gmail.com

Hear the latest from award-winning Eastern Solent Coastal Partnership on official plans to protect Southsea homes and businesses…

…and the ambitious alternative plan by an award-winning architect – to protect Southsea homes and businesses with “softer” engineering.

FROM 6.30pm: EARLY TO SEE & DISCUSS THE SEA DEFENCE PLAN

Plus…

Crime wave hits 90+ businesses…

City Council goes into the energy business

Meet Portsmouth South’s first Labour MP

URGENT – your forum needs more members. Can YOU contribute?

PUBLIC MEETING ~ FREE ADMISSION ~ JOIN THE DISCUSSION!
7pm, Thursday, October 19, at the generous Royal Beach Hotel

Visions for Portsmouth
The Island City ‘Going Dutch’

University of Portsmouth, School of Architecture
Masters research
addressing predicted rises in sea level due to climate change

You are warmly invited to a Presentation
& following discussion
10.30 Wed. 25th June 2014
at Somerstown Hub, Portsmouth

fig. 26
Top & middle. Public presentation & notice – Visions for Portsmouth, at Somerstown hub, researcher presentation
Middle. Public notice – Southsea seafront + common at East Southsea Neighbourhood forum.
Other enquiry methods and processes deployed.
Examples include:

**Monographs reporting findings**
Spatial analysis, data, empirical data modeling, case study evaluation, geographic and topographical analysis, photographs, sketches, diagrams with planning and architectural design drawings and propositions related to salient planning and sustainability issues in Portsmouth and the Solent Region are among the research methods deployed and reported in the four monographs, in the series of The Island City Papers’ (fig.7).

**The island city ‘Going Dutch’**
A master of architecture design research programme, predicated upon Portsmouth responding to climate change induced rises in sea level, and the need for sustainably resilient growth and reported in 2014, and Dutch precedent studies (fig.26,27).

This qualitative and quantitative research evaluation and investigation of the island focused on its eastern, Langstone Harbour, waterfront and the authorities programmed design proposals there with the students’ alternative proposals (explored under a wide open remit) investigated through group and individual cognitive mappings and spatial design resolutions. Representatives of the local authority, Eastern Solent Coastal Partnership (ESCP - the regional public water management consortia), private consultants (from Royal Haskonings, RHV) stakeholders and the public were engaged in review and direction.

**The Isle of Wight**
This draws upon analysis of research commissioned by the public authority to inform a master design research programme for 2017-18 investigating sustainable resilience at Shanklin, Newport and Ryde, the gateway to the Isle of Wight, with findings reporting in 2018.
THE PORTSMOUTH ELEPHANT CAGE, 2016-17
addressing the problem...

organised by:

Walter Menteth
Director Project Compass, Walter Menteth Architects + Portsmouth Architecture school

Indra van’t Klooster
Senior project manager Architectuur Lokaal

Cilly Jansen
Director Architectuur Lokaal

& funded by:

ARCHITECTUUR FONDS CREATIEVE INDUSTRIE
Project Compass

7 Eminent international architects, landscape architects, engineers & planners having expertise in the field of coastal design came to Portsmouth to mentor this innovative design research competition process

supported by...

Julia Barfield
Founding Director Marks Barfield Architects.
London Eye, i360 Brighton, Kew Gardens Tree walk

Martin Knuit
Director OMA Landscape architect Katwijk, Cadzand-Bad, Berlin, Athens & Dutch water designer

Nick Clarke
Director of Ports and Marine at Ramboll Engineer, West Bay Dorset, with works in Portsmouth

Matthys Bouw
Director One Architecture New York’s sea defences post hurricane Sandy ‘The Big U’ & Dutch water designer

Sophie Thompson
Director LDA Design Landscape architect Blackpool with works in Portsmouth

Frank de Graaf
Royal Haskoning DHV Urban Waterfront Planner, North Portsea Coastal defences, working with ESCP

Alexander Lee
Royal Haskoning DHV Engineer. Team leader Rivers, Deltas and Coasts

70 early career architects, landscape, engineers & planners selected by international competition to work beside the mentors on design research for Portsmouth’s sea defences

delivering knowledge, seminars & supporting the design processes with....

supported by masters students from Portsmouth School of Architecture

fig. 28
The Portsmouth Elephant Cage - participants
The Portsmouth Elephant Cage, stage 1

This independent two stage research programme organised and developed by the researcher and titled ‘The Portsmouth Elephant Cage’ undertook an international collaborative foresight enquiry addressing Portsmouth’s coastal water management. It launched in August 2016 with the call for participants issued in September 2016. The research programme, into the Portsmouth Southsea frontage, was to enhance collaborative practice, share knowledge, build capacity and expertise, appraise case studies and through design research exercises develop polemical spatial design propositioning having wider application.

Between November 23 - 25, 2016, the Portsmouth Elephant Cage brought together seventeen competitively selected young Dutch and British experts in architecture, landscape, planning and engineering to work jointly, in three collaborative teams, on design research to investigate long term climate change rises in sea level and its impact on the Portsmouth and Southsea coast.

The UK and NL competitors who submitted to participate, were selected through an ‘Open Design Contest’ process and in response to a Competition brief, organised by Project Compass (in the UK) and Architectuur Lokaal (in NL). Seven eminent experts from four disciplines, architecture, landscape, planning and engineering attended to mentor and supported the programme:

Matthijs Bouw (Director One Architecture. Urban resilience fellow, University of Pennsylvania, US & NL), Martin Knuijt (Director OKRA, Landscape Architects. Rotterdam City Space supervisor, NL), Sophie Thompson (Director LDA, Landscape Architects. UK), Julia Barfield FRSA, MBE, RIBA. (Director Marks Barfield Architects. UK) Nick Clarke (Director Ramboll, Engineers. UK), Frank de Graaf (Royal Haskoning DHV, Engineers. NL) and Alexander Lee (Royal Haskoning DHV, Engineers. NL).

who together with

Walter Menteth (Project Compass CIC & Portsmouth School of Architecture. UK), Indira van t’Klooster (Architectuur Lokaal. NL), Cilly Jansen (Architectuur Lokaal. NL) and Zane Gunton (Eastern Solent Coastal Partnership. UK),

presented a broad selection of relevant symposium papers, communicating their knowledge and expertise, and informed the brief and context. The 35 core participants, comprised the young professionals, expert mentors and organisers, with the collaborative teams joined by four self selected masters students, from Portsmouth School of Architecture MUD Studio, and supported by a further seven in production of the outputs (fig.28).

Over three days, the three teams of competitors prepared three polemical designs in answer to the project brief, exploring long term scenarios for the Portsmouth Southsea frontage in response to climate change induced rises in sea levels and the coastal defences already being proposed there by ESCP, critiquing these, and exploring propositions for local and global application (fig.29,31).

Stage 1 of the Portsmouth Elephant Cage concluded with a public and key stakeholder presentation of the three schemes developed over the programme hosted in The Portsmouth School of Architecture, and accompanied by an exhibition showing impacts of the current ESCP proposals derived from the research, providing opportunity for research feedback.
fig. 30
The Portsmouth Elephant Cage, stage 1 - design seminars and workshops
The Portsmouth Elephant Cage, stage 2
The 2nd stage of the Elephant Cage followed in March 2017 over a two day visit to the Netherlands to appraise various recently completed case study exemplars of urban and coastal water management and urban design projects (fig.32). Participants surveyed, reviewed and appraised the exemplars and the three design teams outputs, and a survey of all the participants was conducted on conclusion.

The Elephant Cage programme and design scoping enhanced knowledge and its transfer, developed cross professional expertise and collaborative working practices, and built capacity. The programme participants completed a survey to evaluate the programme upon its completion, informing feedback and the findings. The programme also enhanced outputs delivering spatial propositioning having wider application for improving city resilience and sustainability globally.

The Elephant Cage research and outputs have been publicly exhibited and consulted upon, a video was produced and disseminated, and conference presentations and publications delivered enhancing knowledge, reporting the findings, and informing future research and practice. Outputs have also been extensively disseminated through a dedicated micro-site (fig.6,8,9,20,33,34,35).

The Portsmouth Elephant Cage was funded by: Stimulerings Fonds Creative Industrie, Project Compass CIC and Walter Menteth Architects, and organised by: Project Compass in collaboration with Architectuur Lokaal with the UoP School of Architecture providing accommodation for the UK day events. In the second stage individual participants contributed their own travel, accommodation and subsistence costs. The methodology has contributed towards extending the research inquiry, enhancing knowledge and capacity, informing practice and policy, engaging the public, and providing feedback.

THE PORTSMOUTH ELEPHANT CAGE, 2016-17

TEAM A - asleep / awake / dreaming

a single defence line is split into multiple adaptive defence lines having economic & environmental benefits

TEAM B - The New Common

likely future scenarios are resolved with a plan having 3 different strategic approaches responding to specific frontage conditions

TEAM C - Dancing Coastlines

coastal change expectation and its management can lead to better community engagement and improved opportunities

research & outputs available at: www.portsmouthisland.uk/the-portsmouth-elephant-cage.html

fig. 31
The Portsmouth Elephant Cage, stage 1 - the summary outputs of the three design teams
fig. 32
The Portsmouth Elephant Cage, stage 2 - case study visits and design seminars,
Building Better Flood Resilience for Southsea’s Frontage and Common.

Significant public engagement was deployed on The Elephant Cage and the findings contained in the monograph on building better flood resilience for Southsea’s frontage which were publicly presented and exhibited as part of Portsmouth Cathedral’s 2017 Grassroots Festival (fig.33). The events were well attended (roughly 300 people attended the presentation) and precipitated wider media interest from the local press and regional news services (TV & radio). Four public meetings, and a further video explaining the proposals followed, with a local campaign launched to give residents more and better choice in the outcomes from the coastal management solution. This method of design action research, its testing, outputs and findings have all contributed to extending the inquiry by enhancing knowledge, extending the public engagement, informing policy and providing feedback.

For Southsea’s frontage these engagements collectively created a public paradigm shift, and commitment to more and better engagement by the public in the solutions to be proposed for the seafront by those now in political charge of the city administration, since May 2018, and significant change in the design proposals (fig.57).
The Portsmouth Elephant Cage, stage 1 - public consultation, invitation and event poster
9 FINDINGS

Summary findings.
1. **Investment in infrastructure should aim to deliver multiple not singular impacts (multivalency).**

Infrastructure can be used to develop and enhance wider opportunities which can be derived from alternative planning scenarios, as well as for leveraging further investment, so that long term risks can be better addressed, along with the opportunities and rewards that can arise.

Where investment in public infrastructure is made the opportunity to utilise such investment to lever wider potential and opportunity through spatial design planning to achieve better social and sustainable values is frequently being poorly considered and badly evaluated, because an open systems approach is not being engaged. This has significant impacts over the whole life of a project, on effectiveness, efficiency and quality, and is also diminishing innovation.

2. **Capacity in resilience design expertise within the UK**

Given the extent of the UK coastline and the emerging climate change induced issues needing address, it has been found that the UK has a significant strategic shortfall in capacity, for creative and innovative project implementation.

- Where collaborative cross disciplinary design propositions were researched and developed conjunctively with public engagement, by drawing widely upon international expertise, in the Portsmouth Elephant Cage, this served to further highlight the need and benefit of collaborative design practices, and a UK shortfall across the disciplines that were approached.

In spatial design resilience practice a dearth of UK expertise is apparent. Expertise can largely be found within academia, or within the disciplines of (climate change) geography and engineering research and practice. The required skills in architecture, planning and landscape design are only available through in limited number through mainly large, specialist consultancies.

- There is purportedly significant academic expertise within Portsmouth and Southampton in the fields of climate change and resilience, yet few impacts are being made in the public or political domain by these specialists, transparently, or through collaborative design practice, having direct practical application upon innovative design solutions in the field.

3. **Governance policy and Coastal Management.**

Design solutions are being adopted unitarily as governance policy. Policy should be flexibly framed however to achieve the best value and most appropriate solution for the context, unconstrained by pre-determined design solutions and the processes of their delivery, as effectiveness, efficiency and potential values are otherwise diminished.

Climate change projections and the responses being planned to address the impacts are being optimised against determined matrices through institutional processes. But upward trajectories of both CO2 emissions and rises in sea level are rapidly emerging and better value needs to be placed upon forward strategies and solutions that are robust, adaptable and capable of responding to future changes, to ensure that planned responses retain value. Current policy does not attribute value to responses providing resilience to these upward trajectories, leaving solutions liable to being outdated early.
Portsmouth, Southsea Common - analysis & representation of an issue arising with the public authorities proposals by Walter Menteth

fig. 36
Portsmouth Southsea Common - ‘hold the line’ existing proposal & ‘managed realignment’ compared, by Walter Menteth

fig. 37
Portsmouth, Southsea Common - analysis & representation of an issue arising with the public authorities proposals by Walter Menteth
• A ‘design strategy’, in coastal management termed ‘holding the line’, was adopted by the Portsmouth authorities early in 2012 as their ‘governance policy’ for their sea defence strategy - framing the briefing of the subsequent procurement processes. This is also known to be happening elsewhere in the UK and Ireland (for example The Office of Public Works commissions to address Cork City and the River Lee). As a consequence alternative design strategies such as ‘managed re-alignment’ are been precluded from consideration in specific contextual coastal management locations (fig.36).

• Engineering design solutions being developed for coastal management are evaluated against forecasted projections for sea level rise agreed by Government. These forecasts have a time lag and have been consistently changing on an upward trajectory, but value is not being attributed to solutions providing contingency for these upward projections (fig.19). Risk factors applied by the Dutch are significantly above UK standards providing better design contingency.

4. Procurement processes and practices.

The procurement of water management solutions in the UK of parties commissioned to be responsible for design solutions is being constrained by the authorities' inflexible adoption of competitive selection procedures, the use of inappropriate procedures and their deployment.

In Portsmouth for example it was notably found that:

• Critical infrastructure having significant spatial impacts on the public realm, urban environment, landscape, quality of life, economic prosperity and opportunity, and having a projected whole life span beyond 2100, had been procured by a framework call off outsourced and managed by Scape, at both the first and second design stages.

• This engineering and construction led design approach lacked creative collaborative professional cross disciplinary engagement at the outset, in the interrogation of the brief, and its parameters and in consequence the realised potential fell short. Those appointed teams were required to work to the parameters of a separate, expedient and deficient area masterplan, without opportunity for integration of the proposals and their impacts.

• This procurement approach had been narrow, linear, and considered generically (rather than context specifically), because it had not engaged widely at commencement in all available contextual, technical, spatial and design options competitively, so that the full parameters and widest choice of ideas having most sustainable solutions and best value and could be researched, investigated and publicly scrutinised before allowing the findings to advance. This has reduced competition, precluded wider competitive enquiry, constrained research and investigation, whilst diminishing meaningful public engagement and knowledge transfer.

• Notably such procurement does not, in principle, accord with the requirements of the Public Services (Social Value) Act 2012 and can only lead to results which are in contravention of the Aarhus Convention 1998 (entered into force, 2001).

5. Inadequate briefing, design evaluation and scrutiny

Whole life, social and economic values have been inadequately considered and weighted by policies, and in design briefings and design assessments. The qualitative value of the design outputs are not being adequately considered and the results of the design works being commissioned are not being sufficiently understood, in terms of their social and economic impacts.

It has been found that when presenting to the public a strategy with a shear sea defence wall rising to the height of 3.8m between Southsea Common and the sea the public authorities found this acceptable, and doing so by use of aerial views of the top of this wall.

Findings have been published providing practical guidance for addressing the design issues highlighted, to support developing and steering better procedures, processes, and practice, whilst enabling capacity building and knowledge sharing.
4.1 Southsea Common proposed layout. fig. 37

Illustrated here is an alternative plan for Southsea common. The layout, strategy and detail is described further in the following pages.

This responds to all the area imperatives and the related issues previously identified, with a masterplan that envisions a long-term solution proposing much wider value and benefits.

This proposal adopts a mixed strategic approach, integrating future sea defences, economic, developmental, social, cultural and environmental priorities. The sea defences ‘Hold the Line’ around Southsea Castle, around Peelins redevelopment, developing Clarence pier as a groyne, but introduces managed coastal realignment between, and along this, remaining sections of Clarence esplanade and the South Parade front.

It is considered this strategy is better capable of maintaining the area amenity, securing its assets and attracting inward investment, sustainably into the future and within a phased development programme.

This offers a beach front having unimpeded access through a new naturalised landscape by adopting a sea defence approach similar to that initially (p.18-21) in those locations. While improving the opportunity and benefits from the redevelopment of Clarence the anchoring historic assets, locations for new recreational and other facilities are also provided. This has the potential to deliver growth for the city’s tourism economy, environmental and ecological improvements, better connectivity with the sea along with a coastal defence strategy that is adaptable and capable of meeting a 1:4000 year incidence of sea flooding. As there is a low degree of confidence in current estimates of acceleration in sea level rise due to ice melt, such contingent adaptability is important(10).

A dike links together & re-purposes the Ravelin Wall & Southsea Castle battlements

Underground parking is provided behind the dike. This reduces the impact from cars & generates revenue.

East of the Castle the dike is backed by a water cistern relieving drainage capacity in the ‘Great Morass’.

Dikes are buried under a naturalised landscape offering unimpeded beach access.
4.5 Landscape strategy

Given the proportionate orders of economic benefit delivered, for example, by nearby Medmerry it is to be anticipated this alternative might easily be seen to deliver greater long term benefits. A full comparative economic assessment of this alternative scheme might be commissioned.

Parking is now concealed underground below the common and behind the new dike. This new 3.16 hectares, 0.96 km long underground garage would have an estimated capacity for 1,270 parking spaces. Whilst relieving existing surface parking pressure and providing new capacity, this ensures access can be well provided in proximity to all new and existing facilities including Clarence Pier, the proposed conference centre, the relocated Hoverport and the entire frontage. The dedicated public transport terminal and a drop off route also connect directly with the underground garaging.

4.4 Public transport, parking and drop off

In this proposal the anticipated area of Southsea Common amounts to 77.7 hectares, which represents an approximate loss of 3.89 hectares. However when the provision of 3.17 hectares of underground garaging, the removal of part of Clarence Esplanade, Pier Road, and Long Curtain road and the rearrangement of the road network is accounted there is a net gain in usable area.

Multimedia dissemination of the findings has been deployed to achieve wide communication into the public, academic, professional and political domains. This has been achieved through publication and dissemination of monographs, book chapters, papers, in hard-copy and digital formats, on websites, through exhibitions, conferences and presentations, video, and public meeting presentations, and blogs, which collectively have been taken up by various other media and reporting. This strategy has been seen as necessary because planning, architecture and environmental design is a democratic process requiring dissemination to the public, professionals, those in positions of governance, policy makers, and representatives. Summary disseminations (with descriptions of key outputs) include:

**Publications by the researcher**

*Monographs*


Alternative coastal management proposals for Portsmouth’s Southsea Common, are proposed to deliver more beneficial whole life, social and qualitative value, without detriment to the existing environmental assets and provides recommendations for consideration and implementation. The findings, include evidencing, analysis, and critique supported by drawings, montages and photographs of the public authorities existing sea defence proposals, with a strategic planning and design synthesis comprising option and drawing studies engaging more numerous strategic parameters (fig.36-40,59,60).
the Watercress Line

Monograph extracts: 'The Watercress line. Example drawings taken from from an evaluation for reuse of historic infrastructure by Walter Menteth

Monograph extracts: Bottom proposed primary rail network diagram. Red - High speed rail network >270 kph, Yellow - 200-230 kph network by Walter Menteth

Monograph extracts: Bottom proposed primary rail network mapping. Red - High speed rail network >270 kph, Brown - existing routes. Yellow - supplementary capacity using existing legacy infrastructure by Walter Menteth
Transport accessibility, connectivity and capacity in southern England focused on improving mixed modal transportation, economic opportunity, CO2 reductions. And improving sustainability for the Solent and south east region is considered, evaluated, appraised and analysed. Design proposals and policy recommendations posited for securing pre existent (Beeching) rail network track and its future re-use, along with the provision of a regionally focused higher speed network to enhance capacity, and economic opportunity, while identifying requirements for early infrastructure enablement works at locations such as Clapham Junction (fig.41-43).


The eastern Solent regional coastal defence strategy is addressed, appraised, analysed and critiqued, with comparative study of national governance models and technical resolutions, and design proposals posited for an alternative managed re-alignment strategy. This considers barrages that would allow utility as accessible and bridging connections, with hydro power, and recommending barrage widths, locations and typologies, for which detail engineering briefs would then be developed, to provide better economic effectiveness and efficiency, and offering greater social and whole life value. Reduced flood risk is found to be achievable by managed realignment through significant reduction in the length of the coastline to be protected (fig.44).

Monograph extracts: evaluating coastal resilience by appraising coastal length and onsideration of managed realignment with proposals by Walter Menteth
With the development of Gun Wharf Quays the centre of the city of Portsmouth has become fragmented and spread further. The university campus is distributed largely to the east, with parts located to the north and south of the central area. Recreational facilities not suitable for development might be relocated off site underground or elsewhere within the new urban development. In this way the city centre sporting amenities and consolidating the city, providing a heart, centre of Portsmouth for repairing, regenerating long term public rights of access. These primary, locations are disconnected and forming an articulate, distinct and definable civic programme, scale and ambition.

In this proposal it is envisaged that Portsmouth central area are proposed (keyed & yellow). Portsmouth university, MOD and city centre sporting amenities could be addressed by providing these, in part, within new urban development. In this way the provision of resilient central square providing a city refuge by Walter Menteth could be addressed by providing these, in part, within new urban development. This is a spatial design approach that offers potential provision for separate & public rights of access for MOD personnel capable of contributing in the longer term to sustainable transport strategy.

To Naval Dockyard, the grounds of Portsmouth Grammar school, the sports grounds of HMS Tremeraire, with service road could be provided with a connecting public realm, leading through to Commercial Road and consolidating the city, providing a heart, centre of Portsmouth for repairing, regenerating long term public rights of access (bottom) by Walter Menteth.

Visitors consequently have the opportunity to develop a master programme for Southsea common or for the MOD and consolidating the city, providing a heart, centre of Portsmouth for repairing, regenerating long term public rights of access (top) by Walter Menteth.

Figures 3, 4, 8, 9, 19, 20, 21, 22. Portsmouth centre diagram showing the polarisation of its plan. Portsmouth master-plan diagram - area context. The figure ground map below shows the new connections and primary connectivity BR stations & track, central Portsmouth central Portsmouth historical & open space, public squares, pedestrian & bike connectivity, new development, flood sumps, cisterns & refuge in the urban plan.


Population expansion and land constraints along with the lack of a single identifiable city centre are addressed in this study which finds that with long term planning policy and phased linking of the existing multiple centres of Old Portsmouth, Gunwharf Quays and Guildhall Square opportunities under existing governance remits for residential, retail, commercial and recreational development densification with expansion of the University, can be provided on a topographically elevated level providing for future flood resilience, delivering a civic heart and more sustainably resilient outcomes (fig.45-48).

**Book Chapter**


A comparative analysis of two water management strategies in Cork and Portsmouth cities finds constraint in governance policies and, hence by there preclusion, consideration that could be given to managed coastal realignment strategies offering better whole life and social values, and recommending governance policy and practices be opened and inclusive (fig.8).

**Paper**


Processes, procedures and practices for collaborative multi-disciplinary coastal management design consultancy formations and strategic design development globally are explained with guidance for policy and application in practice, and illustrated by reference to the process, procedures and outputs of the Portsmouth Elephant Cage (fig.8).

**Article**

a high clearance catenary arch with variable incline light rail public transport.......

...... a lightweight structure, small landing footprint and no tunnelling and more fun for a journey to work than the Brighton i360

Gosport has one of the highest indices of UK multiple deprivation

x 4 the peak ferry capacity to clear the aircraft carriers

proposed using eg. the Gosport rail, Hayling Billy line, Chichester canal, and the central reservation of the M275 with grade separation below M27

proposed map - sub-region and local light rail service integrated with opening up of waterways and water based transportation

© Walter Menteth architects

advances in urban light rail now allows new solutions... with new variable incline and mixed propulsion modes... eg the Innsbruck transit

but to allow water transportation - bascule not fixed bridges... except for Rotherhithe Bridge London Reformat Architects

fig. 51

Proposed sub-regional and local light rail network water crossing explored developing scenarios using recent transport innovations and options by Walter Menteth
Conference & symposium papers by the researcher:


Summary of research findings from document reviews and analysis in social, economic, topographical and historical data including transport, employment, policy projections, with drawing and photographic surveys, and existing summary proposals for Portsmouth and the region (fig.49).


Proposals for regional light transit for relieving pressure on the existing arterial road network, expanding the mixed modal transportation provision, improving connectivity, economic opportunity, and reducing CO2 emissions are presented (with findings from the first three Island City Papers). The network proposes harbour crossings and how in different locations they may best be achieved, considers options to expand capacity using variable incline light rail and bascule bridges, (which relative to tunnelling are cheaper, require less land take, offer less set back from the coastal edge) and better infrastructure integration (fig.50,51).


Events organised by the researcher


A collaborative co-production competitive team research process for young professionals in architecture, landscape, engineering and planning, with international participants competitively selected to work with mentors, on the production of polemical design outputs, visiting exemplars and attending seminars, contributing to building capacity, opening opportunity and sharing knowledge, over two stages. Described also in Section 9 Methods. (fig. 28-32,35)

Meeting Presentations

Keynote speaker

Menteth, W. (keynote speaker) *Old Portsmouth and Gunwharf Neighbourhood forum* The Chapter House, Cathedral Street, Portsmouth. 7.30 October 12, 2017. (fig.26)

Menteth, W. *East Southsea Neighbourhood forum* Royal Beach Hotel, Southsea. 5.30. October 19, 2017

Menteth, W. *Portsmouth City Council convened meeting.* Civic Offices, Guildhall Square, , Portsmouth. August 11, 2017

Menteth, W. *Grassroots festival presentation. Portsmouth Cathedral* Portsmouth Cathedral July 15, 2017. (fig.34)

Invited speaker

fig. 52
Portsmouth the Island City. Design research into the city’s growth and expansion, on precedent models, undertaken by Portsmouth School of Architecture masters students from MUD studio (2014). Island viewed from the south west (top) and the south east (bottom).
Menteth, W. Living and Sustainability Conference London South Bank University 10 Feb 2017

Supervisors & Organisers

Exhibitions by the researcher

Menteth, W. (author) Exhibition held to accompany the CCN Coastal Cities Network symposium April 16 - 17, 2016

Menteth, W. Graves, F. (Organisers) Portsmouth the island city - Going Dutch 20 June 2014 → 25 June 2014

Websites by the researcher
Author

Menteth W (Author). Portsmouth, the island city: vision for change London: Walter Menteth Architects. 2017. www.portsmouthisland.uk/index.html (accessed May 30, 2018) Disseminated through This purpose built web site, provides an open access forum for the publication of outputs, exchange of debate and feedback on planning within Portsmouth and the region, and has attracted wider enquiry and significant recorded reach (fig.6).

Menteth W (Author), Curtis R (Author). Project Compass: The Portsmouth Elephant Cage London: Project Compass CIC. 2016. www.projectcompass.co.uk/index.php/category/elephant-cage/ The process, procedure, seminar papers, and research findings of the Elephant Cage are disseminated through this micro website to provide an ongoing resource, for advancement of study and of the research by others (fig.6).

Joint author
Menteth W. Clark C. Graves F. Beck D Southsea Sea Front campaign website June 2018 www.southseaseafrontcampaign.co.uk/ (forthcoming)

Videos by the researcher


Other outputs by the researcher
fig. 53
Portsmouth the Island City. Polemical design research into the citys growth and expansion, undertaken by Portsmouth School of Architecture masters students from MUD studio (2014).

fig. 54
Comparative study for the expansion of the city of Portsmouth, mappings by MUD Studio 2014 with numerical analysis by Walter Menteth

**Interviews with the researcher**


**Other dissemination: Portsmouth ‘The Island City’**

An objective in the dissemination of outputs from this research has been proselytising a better contextual identity for Portsmouth, as ‘The Island City’ to raise public awareness of the unique context and risks, and reinforce its genius loci, enhance civic pride and identity.

A lack of distinctive identity with the genius loci of Portsmouth was identified as an early evident issue amongst the population. It was found, for example, that a large number of residents and visitors were unaware that Portsmouth was on an island. Waterfront access from within the island is poor and local water transportation by residents is poor and restricted to medium and long distance travel. The city however markets itself as the ‘Great Waterfront City’, a title equally appropriate to a large number of other UK cities (Liverpool, Brighton, Hull, London, Newcastle, Southampton, Edinburgh, Aberdeen etc.).

Portsmouth is a unique densely populated island city and one of only two in Europe which, like Venice, is founded on maritime imperial power. It has a wealth of assets and yet evidentially its unique character is poorly recognised. The city’s late C20th curation might be considered poor, with urban regeneration and particularly new transport planning having negative impact on the environment and historic assets, as the economy previously dominated by the naval shipyard fell into decline. The unique character from which historically the city’s spatial form has developed, has become perceptively obscured, diminishing distinction and identity.

This reduced awareness impacts public engagement and perceptions of climate change induced rises in sea level, by obscuring the extent of vulnerability and risk. This has relevance for public engagement in the city’s spatial planning, and for equipping residents better for the opportunities and threat posed by their context, while informing focused consideration upon the islands coastline and its edge condition. In the dissemination of this research portfolio, Portsmouth is referenced throughout by the more descriptive title ‘The Island City’ to create a cultural shift of perceptions towards the emerging opportunities and risks for securing the city sustainably into the future from the risks of climate change rises in sea level.

**Social & other Media**

In addition dissemination has been sustained on social media, via twitter, a Facebook campaign page, LinkedIn and blogs on the University of Portsmouth, School of Architecture and Sustainable Cities sites and targeted to achieve local, national and international reach, with examples of web blogs cited in the bibliography. Through this dissemination strategy the Elephant Cage and the researchers design research and proposals for Southsea’s frontage and common in particular have attracted further local and national press cover.

**Correspondence**

The researcher has also disseminated the research and findings to members of both UK Houses of Parliament, the Environment Agency, the Treasury, the National Infrastructure panel, national NGO’s and to private consultancies. (Authors private confidential correspondences, available on request)
The Anglo-Dutch competition, backed by Architectuur Lokaal and the University of Portsmouth, seeks ‘better and more integrated solutions’ to the sea defences’ public realm proposals. which, when viewed from the city, will be a major landscape feature and as such will need to reconsider existing land use strategies for the sea defences, which have been neglected in previous plans. Stakeholders and city representatives. Following the Charette, participants will also be selected to participate in a two-and-a-half day charette in Portsmouth alongside an enterprise. The ‘elephant cage’ procedure - developed in the Netherlands - places designers in competitive teams.

According to the brief: ‘Better design solutions are sought that can enlighten and inform Portsmouth’s future response to climate change and UK coastal defence strategies in a way that is more integrated, and may support the identification of new and as-yet unthought of potentials. The socio-economic and ecological impacts of climate change and the strategies for its mitigation maybe better engaged to this end.

The competition, which is open to UK-based academics, engineers and landscape architects, is expected to involve substantial new thinking towards the growing impacts of a prescient climate-change problem. The island city of Portsmouth is almost entirely flat and so at risk from flooding amid the impacts of climate change and the strategies for its mitigation maybe better engaged to this end.

The competition is to be open to teams. The competition, which is open to UK-based academics, engineers and landscape architects, is expected to involve substantial new thinking.

The competition, which is open to UK-based academics, engineers and landscape architects, is expected to involve substantial new thinking.
Related publications by the researcher

Interviews with the researcher

Farmer S. (presenter) Menteth W. (contributor) BBC South July 17, 2017 BBC South Today, Evening News: 18/07/2017 sea defence section starts @ 8:05 mins. to 10:07: www.bbc.co.uk/iplayer/episode/b08y3d8n via @bbciplayer


Web blogs by the researcher


Citations of the researcher within political debate
Portsmouth City Council. Full Council Meeting, October 2017 On the following link, the PCC Debate Item 12c https://livestream.com/accounts/14063785/events/7826545/videos/164412627 runs from c. 3hrs 22mins – 4hrs 35mins, with three elated deputations at the beginning of the council session.

Related Public Petitions


Related Writing and News by others on the research (examples fig.55-57)
SOUTHSEA IS AT RISK OF LOSING ITS UNIQUE SEAFRONT

The City of Portsmouth has been allocated around £86million to improve the sea defences stretching between Old Portsmouth and Eastney beach. Life expectancy of these structures is, in some places, less than 10 years, and comprehensive improvements are essential to protect the city from rising sea levels and the risk of extreme flooding events. The EAST SOLENT COASTAL PARTNERSHIP (ESCP) was established to deliver these improvements based on feedback received from a series of public consultations.

THE PROPOSALS

The area shown below in red indicates the location of the proposed 3.8m (12.5ft) high sea wall stretching along Clarence Esplanade from the Blue Reef Aquarium to the Hovercraft terminal.

The ESCP proposes raising the promenade to the desired height through extensive use of concrete, replacing the shingle beach with a high-stepped terrace structure. This would be bounded on the landward side by a solid wall of varying height, culminating in a 3.8m (12.5ft) high section of wall along Clarence Esplanade separating the main body of Southsea Common from the beach.

WHY THIS IS UNACCEPTABLE

- The intrusive separation of the beach and promenade from Southsea Common and the rest of the city
- Inadequate protection of the existing beach landscape
- Lack of compensation for existing seafront businesses such as Clarence and South Parade Piers and Mozzarella Joe’s
- Entirely obscuring the sea view at ground level from most of Southsea Common and the surrounding buildings
- The need to descend a potentially dangerous concrete staircase to travel between the promenade and the beach

fig. 58

A purpose built website and Facebook campaign page engaging the public on the campaign for Southsea Common: by others, with Walter Menteth (contributor),
Simpson V. *Holding The Line* FX magazine June 2018  [www.designcurial.com/aboutus/fx-home-page.html#subscribe](http://www.designcurial.com/aboutus/fx-home-page.html#subscribe) (forthcoming)


Residents are buoyed by delay to plans The News Hardcopy. Portsmouth February 10, 2018.


Controversial scheme to create a sea dyke on Southsea common Walter Menteth May 21, 2017


5.2 Ravelin Moat Lido

Further enhancing the Portsmouth visitor experience, a public Lido is proposed for bathing within the Ravelin Moat. Constructed with the land based facilities at the junction knuckled between the new dyke with the Ravelin Wall, in the north west, this would allow the continuation of the primary sea defence line whilst providing opportunity to sensitively make the new construction to the existing Ravelin wall (fig. 53). Pod style deck, water side access elements and piers would be outside the primary sea defence line and float on pontoons within the moat (fig. 52). There is a history of famous UK Lido structures which also contribute to providing sea defence structures (fig. 52), with a number of cities also recently developing highly successful two civil features (fig. 54). On the Speirs in Berlin a city Lido was recently constructed from a barge by closed funding.

5.3 Conference facilities

A new conference centre is located below ground in a location in close proximity to and sustaining both the existing hotels (The Queens Hotel and the Holiday Inn) and a new hotel proposition Clarence Pier. This would provide the required new facilities, whilst strengthening and consolidating the local economy.

The location is also well located for access to existing amenities within the historic town, Southsea, the Castle and along the historic frontage. Contemporary conferencing, performance and exhibition spaces are largely black box activities which may be located sub-tidally beneath ground. However it is proposed to illuminate the public areas from a 0.55 sq. meter light well. (Shown plan as a green oval in fig. 49). Underwater conference facilities have innumerable uses, providing opportunity to consider the sea for events, meetings and conferences.

This facility would, with the exception of it’s entrance, be concealed beneath the contaminated landscape. Underground conference centres have innumerable precedents worldwide with, for example, notable existing underground conference centres in the UK at the Orange St Paris Hotel and UK Go, Dept for BIS, London. The Portsmouth Conference facility, total floor plate for option indicated amounts to approx.

- 575dm² (excl. light-well)
- By comparison: 'The Brighton Centre' (proposed for)
  - Auditorium 1, 4,500 seater at 1,941m²
  - Auditorium 2, 6,500 seat at 5,917m²
  - A foyer providing 1,320m² exhibition space.
- 2 floors each 400 or 400m² sub-divisible into individual rooms of 200m² each
- Over a total floor plate of approx. 5,750m² (excl. light-well)
- For option indicated amounts to approx.

The Portsmouth Conference centre is well located to all new and existing amenities and facilities.

5.4 Sitting the historic monuments

Any sea defence works requires the repositioning or relocation of many of these listed memorials, but the settings of many of these particularly campaign memorials is becoming overwhelmed in the ever increasing leisure and commercial bustle of the seaboard promenade. This proposal therefore reviews the setting of the monuments.

The Portsmouth War Memorial, maintained on its existing navigational alignment, is proposed to be repositioned to a location further inland on the crest of the new dyke (fig. 51). This offers better long term protection for the monument against salt water erosion, whilst increasing the monuments stature and prominence from both land and sea.

Forgoing the other dispersed memorials from along Clarence esplanade, together with the War Memorial into a considered landscape ensemble (fig. 56) might offer a more powerful, focused and evocative setting, improving their stature.

"Forgoing the dispersed memorials... together with the War Memorial into a considered landscape ensemble might offer a more powerful, focused and evocative setting, improving their stature"

**Related writings by others**


Mark Z. Voorendt. *The Development of the Dutch Flood Safety Strategy.* (Bee’s Books, Amsterdam. December 11, 2015. ISBN/EAN 978-90-74676-18-7): 28 (Fig.1), and 45 (Fig.7.2)


IPCC (Intergovernmental Panel on Climate Change; AR 5- 5th assessment) report Climate Change 2013: Chpt 13. Sea Level Change. “There is currently low confidence in projecting the onset of large-scale grounding line instability in the marine-based sectors of the Antarctic ice sheet. (p.1136 & 13.3.1 to 13.3.3, 13.4.3, 13.4.4).. (the report projections of sea level rise are larger than in theAR4 Report of 2009, primarily because of improved modelling of land-ice contributions)” [www.climatechange2013.org/images/report/WG1AR5_Chapter13_FINAL.pdf](http://www.climatechange2013.org/images/report/WG1AR5_Chapter13_FINAL.pdf) Retrieved 27 June 2017:


5.6 Blue-green strategy

Portsmouth has a dedicated Victorian sewer network which combines both rainwater and wastewater from people's homes. These sewers, known as combined sewers can have up to 25 times more water in them during storms than during dry weather. The system is reliant upon the combined outflows being pumped to Eastney. From there it is then pumped a significant distance north east to the Budds Farm sewage treatment works in Havant. Treated wastewater is then pumped back to the Eastney pumping station and from there into the sea (fig. 61). This system has secured the Blue Flag category along Eastney Beach.

In addition to this three underground storm tanks located at Fort Cumberland provide backup storage for 42 million litres of storm water managed by two new underground pump stations (with a further 7 km at Budds Farm). During heavy rain the pump station releases storm water (sea water and diluted waste water), from an outfall at Fort Cumberland. These additional provisions were completed in 2010.

Climate change has increased the intensity of rainstorms which, along with population rises and water pollution, places ongoing pressures on this system. To provide for the future the city is proposed to supplement the existing system with new capacity by capturing surface water from internal rainfall storms in a Sustainable Urban Drainage system (SUDS) system. Excess would then be stored in a cistern comprising a large diameter sewer pipe buried within the rear of the sea defense wall (fig. 62 + 64). This principle could also be extended elsewhere around Portsmouth island, in a manner similar to the London ring main.

5.5 Building and enclosures on Southsea Common

With new underground garaging, relieving existing parking pressure opportunities are opened up. It is proposed to relocate the swimming pool (The Pyramid) on the site of the D-Day Museum car park site, within the battlement walls. A proposed new cultural facility on the existing valley ball site opposite is also identified (fig. 62). Well planned quality buildings in these locations might create a much needed recreational cultural and leisure quarter in proximity to the existing Castle and Museums, further enhancing the city identity.

Tennis, volleyball, children's paddling, golf and park services are currently dispersed within the new landscape to improve public permeability across the common, their individual site locations and their access to the beach or parking. The new style of existing Rowell and Battleship typically improve the shelter from the sea winds.

Dispersal of activities also better allows for more flexible use of the landscape areas, for example for holding transient activities such as the Victorious Festival and America's Cup and Southsea show which can now be more easily accommodated in the newly designed landscape.

In this particular location it could reduce surface water flooding risks in the area of the Great Morass (fig. 62), storing surface water which would otherwise be sufficiently clean for pumping directly into the Solent without detrimental impact on the Blue Flag quality of the beaches. It could also provide emergency storage backup for the lowest lying ground, in event of any failure of the sea defences.
Proposing a new definition.


fig. 61


Building the Northern Powerhouse. Construction News. CN Focus http://guides.constructionnews.co.uk/2081.guide


Relative carbon performance of rail compared to other modes. Department for Transport (2007);


fig. 62
Examples of some digital publication dissemination (authors own analytics)
Examples of individually authored items, interviews and others from the researchers digital system analysis and monitoring. Not including hardcopy distributions, unless specified (fig.62).

**Websites**

- **30,975 views, 24,034 visits**
  - In 14 months (accessed June 2, 2018) between February 1, 2017 to June 2, 2018 with the reach showing a clear geographic distribution amongst coastal nations and communities internationally.

**Publications**
Menteth W. *Portsmouth the island city, Building better flood resilience for southsea’s frontage + common: - for a more sustainable Portsmouth*. London: Project Compass CIC, 2017. 44 p. (The Island City Papers)

- **250 hardcopy** - print distributed.
- **1,581 readers, 1,808 views**, – from www.PortsmouthIsland.co.uk & Project Compass.co.uk websites (accessed June 2, 2018)
- **72 reads** – Researchgate (accessed June 2, 2018).
  - In 12 months since publication between June 5, 2017 to June 2, 2018


- **31 readers, 67 views** - Academia (accessed June 2, 2018)
  - In 6 months since publication in November 2017 and June 2, 2018


- **30 hardcopy** - print editions distributed.
- **52 readers** – Researchgate (accessed June 2, 2018)


- **30 hardcopy** - print editions distributed.
- **56 readers** – Researchgate (accessed June 2, 2018)
- **13 Readers, 22 views** - Academia (accessed June 2, 2018)

**Videos**
Menteth W (Author) *Portsmouth the island city: building better flood resilience for southsea’s frontage + common.*

- **639 Views** – at May 30, 2018 (views on YouTube site only).
  - between release in October 30, 2017 to June 2, 2018