The generic problem----
How do we organize and conduct the very beginning and strategic stages of designing for longer-term change in a large, multi-system, multi-client and contentious context .....and one which should not become a zero-sum game?

This is very frequently the normal situation for important projects and studies.
This is what geodesign should be doing!

Carl Steinitz
COLLABORATIVE NEGOTIATION AS A GEODESIGN METHOD

Kevin Lynch (January 7, 1918 – April 25, 1984)

A Theory of Good Urban Form
Cambridge, Mass.
MIT Press, 1981

1. It should start from purposeful behavior and the images and feelings which accompany it.
2. It should deal directly with settlement form and its qualities, and not be an eclectic application of concepts from other fields.
3. It should connect values of very general and long-range importance to that form, and to immediate, practical actions about it.
4. It should be able to deal with plural and conflicting interests and to speak for absent and future clients.
5. It should be appropriate to diverse cultures and to variations in the decision situation (variations in the centralization of power, the stability and homogeneity of values, the level of resources, and the rate of change).
6. It should be sufficiently simple, flexible, and divisible that it can be used in rapid, partial decisions, with imperfect information, by lay persons who are the direct users of the places in question.
7. It should be able to evaluate the quality of state and process together, as it varies over a moderate span of time.
8. While at root a way of evaluating settlement form, the concepts should suggest new possibilities of form. In general, it should be a possible theory: not an iron law of development, but one that emphasizes the active purposes of participants and their capacity for learning.
COLLABORATIVE NEGOTIATION AS A GEODESIGN METHOD

A BASIS FOR COMMUNICATION

SHARED KNOWLEDGE OF THE SUBJECT
SHARED ASSUMPTIONS
SHARED LANGUAGE

Norbert Weiner
1894 - 1964

based on Norbert Wiener, Cybernetics, 1948
“Geodesign applies systems thinking to the creation of proposals for change and their impact simulations, informed their geographic contexts, and usually supported by digital technology.”

Tess Canfield after Carl Steinitz after Stephen Ervin after Michael Flaxman

"Geodesign changes geography by design“

Carl Steinitz

adapted from C.Steinitz, 2012, A Framework for Geodesign, preface
“Geodesign” is an invented word, and a very useful term to describe a collaborative activity that is not the exclusive territory of any design profession, geographic science or information technology. Each participant must know and be able to contribute something that the others cannot or do not. ....... yet during the process, no one need lose his or her professional, scientific or personal identity.

adapted from C.Steinitz, 2012, A Framework for Geodesign, preface
COLLABORATIVE NEGOTIATION AS A GEODESIGN METHOD

GEOGRAPHIC SCIENCES
SUPPLY-BASED "DEFENSIVE" STRATEGIES

GEODESIGN IS COLLABORATION AND NEGOTIATION

DESIGN PROFESSIONS
DEMAND-BASED "OFFENSIVE" STRATEGIES

GIS
ALLOCATION
LONGER TERM MANAGEMENT

GEODESIGN
ORGANIZATION
STRATEGIC DESIGN

THE PEOPLE OF THE PLACE

INFORMATION TECHNOLOGISTS

BIM
VISUALIZATION
SHORTER TERM MANAGEMENT
COLLABORATIVE NEGOTIATION AS A GEODESIGN METHOD

A Framework for Geodesign
Carl Steinitz

THE PEOPLE OF THE PLACE
DESIGN PROFESSIONS
GEOGRAPHIC SCIENCES
INFORMATION TECHNOLOGIES

Changing Geography by Design

ESRI Press 2012

1. How should the context be described?
2. How does the context operate?
3. Is the current context working well?
4. How might the context be altered?
5. What differences might the changes cause?
6. How should the context be changed?

UNDERSTAND CONTEXT
PERFORM STUDY

REPRESENTATION MODELS
PROCESS MODELS
EVALUATION MODELS
CHANGE MODELS
IMPACT MODELS
DECISION MODELS

FEEDBACK
CHANGE

SPECIFY METHODS

REVIEW AND DECISION

NO
YES
MAYBE
Geodesignhub is a cloud-based, free and open access, open platform software built by Hrishi Ballal in cooperation with Carl Steinitz and Stephen Ervin. It is designed to link with other tools and models via APIs rather than to contain complex substantive algorithms itself. Geodesignhub is designed to support collaboration and negotiation towards agreement.

It aims to be as simple as possible: easy to learn, set up, use and (most importantly) easy to understand.

A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN

DIAGRAMS OF POLICIES AND PROJECTS

INTERNAL GEODESIGNHUB WORKFLOW OPERATIONS

EXTERNAL API LINKS

DATA
GIS OPERATIONS
MODELS
DIAGRAMS
NEGOTIATION
VERIFICATIONS AND ALTERNATIVES

CHANGE MODELS
REQUIREMENTS
AND THEIR OPTIONS
HISTORY
EVALUATION PROCESS

CONSISTS OF
DECISIONS
AND MODELS
SYSTEMS

INPUTS
Shapefile,
WMS
CartoDB,
KML,
GeoJSON,
WKT,
Drawing

OUTPUTS
WFS (for QGIS / ArcGIS),
KML,
DXF (for AutoCAD),
CSV (for Rhino),
GeoJSON,
Shapefiles as file downloads
or Web Service

CRYPTOGRAPHY
Geodesignhub is a cloud-based, free and open access, open platform software built by Hrishi Ballal in cooperation with Carl Steinitz and Stephen Ervin. It is designed to link with other tools and models via APIs rather than to contain complex substantive algorithms itself. Geodesignhub is designed to support collaboration and negotiation towards agreement. It aims to be as simple as possible: easy to learn, set up, use and (most importantly) easy to understand.

A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN
PROJECTS AND STUDIES ON THE GEODESIGNHUB PLATFORM
AN ALTERNATIVE FUTURE FOR THE COASTAL ZONE OF GEORGIA, USA
AN EXPERIMENT IN MULTI-SCALE AND MULTI-JURISDICTIONAL GEODESIGN DYNAMICS

Lysa McRann, Hunter Bay, Georgia Coastal Regional Commission
Rosanna Rivers, Alison Smith, Brian Drinan, Jon Caledon - University of Georgia
Ryan Fenti - University of Arizona
Car Treaden, Heidi Bailey, Yes Calvert - StudioV6a.com

AN ALTERNATIVE FUTURE FOR YOSANGLI, CEJIA PROVINCE

Nestled in the profits of the yellow pine forests of central China, with a population of approximately 20,000 people, this area has been a center of agricultural production for centuries, with a history of conflict and a thriving population.

AN ALTERNATIVE FUTURE FOR EDINBURGH, VIC, AUSTRALIA

Including the University of Melbourne, the port, and the airport, which is proposed for relocation.

AN ALTERNATIVE FUTURE FOR ESTATE SUBURBS, VIC, AUSTRALIA

Stefano Pensa et al., Turin Polytechnical University

ARE THE RING COUNTY, WASHINGTON, USA, GROWTH MANAGEMENT REGULATIONS SUSTAINABLE TO 2060?
Tim Nyerges, et al., University of Washington, USA and others, 2015

HOW CAN CARNAHAM COUNTY, GEORGIA, USA, DOUBLE IN POPULATION BY 2020 AND RESPOND TO CLIMATE CHANGE?
Rosanna Rivers, Alison Smith, Brian Drinan et al., University of Georgia and others, USA, 2015

HOW CAN THE RESIDENTS OF KILKERRAN, IRELAND, A VILLAGE OF 350 PEOPLE, DESIGN THEIR OWN PLAN TO GROW AND CHANG IN THE FUTURE?
Oliver Jones, University College, Cork, Ireland, 2015

TRANSFORMING THE “CITTA DEL SALUTEN TOINO”
Stefano Pensa et al., Turin Polytechnical University

IN THREE, 5-HOUR WORKSHOPS AMONGST 80+ STUDENTS IN A LUMA HIGH SCHOOL, 2015
Barry Witten, Carlos Liotio, Utah State University

Cristaldos Rio Pardo (The Non Coasrtal City) is a 3000 sq km region located in the State of Minas Gerais, Brazil. It is the largest domestic producer of iron ore. Settlement began with the gold mining boom in the 17th Century. At the end of the 20th Century with the flourishing of mining rights, there was a new stage of development into what now is one of Brazil’s most important regions.
Ana Clara Souza et al., University of Minas Gerais, Brazil, July 2015
AN ALTERNATIVE FUTURE FOR THE COASTAL ZONE OF GEORGIA, USA
AN EXPERIMENT IN MULTI-SCALE AND MULTI-JURISDICTIONAL GEODESIGN DYNAMICS

TRANSFORMING THE “CITTÀ DEL SALUTE TORINO”
Stefano Pensa et al, Turin Polytechnical University

AN ALTERNATIVE FUTURE FOR SRIDURGAPURAM, HYDERABAD

How can Chatham County, Georgia, USA, double in population by 2050 and respond to climate change?
Rosa Rivera, Alison Smith, Brian Ordway et al., University of Georgia and others, USA, 2015

How can the residents of Kilrea, Ireland, a village of 300 people, design their own plan to grow and change in the future?
Dara Murphy, University College Dublin, Ireland, 2015

Independent ↔ Related ↔ Integrated

Recommended Plan 2050

Transfoming the Suburban Villages: Population Growth and Response to Climate Change
Barry Wehman, Carlos Licon, Utah State University
In three, 3-hour workshops among 12th graders in a Utah high school, 2015

Transforming the “Città del Salute Torino”
Stefano Pensa et al., Turin Polytechnical University

How can the residents of Kilrea, Ireland, a village of 300 people, design their own plan to grow and change in the future?
Dara Murphy, University College Dublin, Ireland, 2015

Conventional Visualization

Back to

See the Video Next

Concluding Remarks

Citations

Published on the PlanRoom...
There are IMPORTANT PROBLEMS and—frequently—there is LITTLE TIME FOR DECISION AND ACTION. PEOPLE/GROUPS HAVE DIFFERENT INTERESTS AND PRIORITIES. EACH seeks/NEEDS LEGITIMACY in/via design. GEODESIGN does NOT normally produce A FINAL PRODUCT. IT IS LIKELY TO MOST USEFUL AT THE BEGINNING of thinking about and deciding on THE STRATEGY of what to do….
THERE ARE UNCERTAINTIES:
Multiple GEOGRAPHIC SCOPES: political boundaries, watersheds, etc.
Complex CONTENT: SYSTEMS which vary by size, location, threat, etc.
CHANGE REQUIREMENTS are many.
GEODESIGN METHODS do not scale and do not exactly-repeat.
THEY SHOULD FIT THE CONTEXT.
Therefore GEODESIGN and its technical support must be
FLEXIBLE, ITERATIVE, TRANSPARENT AND RAPID.
CHANGE in a design is a RELATIONAL SYNTHESIS in SPACE and TIME of SETS of system-based POLICIES AND PROJECTS.

AND THE SEQUENCE MATTERS.

DESIGN(S) SHOULD BE ASSESSED AND ITERATIVELY IMPROVED, KNOWING THAT ANY CHANGE CHANGES ALL THE SYSTEMS.

Therefore, a primary aim of GEODESIGN is to RAPIDLY MOVE from infinite possible designs towards an socially, environmentally and economically FEASIBLE DECISION.

THE GEODESIGN ENDGAME MUST SUPPORT INFORMED NEGOTIATION.
GEODESIGN is likely to be **COLLABORATIVE**.

Therefore--

**ALL ASPECTS OF GEODESIGN SUPPORT MUST BE EASILY LEARNED, EASILY USED AND EASILY COMMUNICATED** --and most importantly--

**THE “LANGUAGE” of GEODESIGN MUST BE EASILY UNDERSTOOD BY ALL.**

GEODESIGN is a **COLLABORATIVE, SOCIAL- POLITICAL PROCESS OF DESIGN.**
NEGOTIATION IS PERVERSIVE

A FRAMEWORK FOR GEODESIGN

Carl Steinitz

THE PEOPLE OF THE PLACE

GEOGRAPHIC SCIENCES

DESIGN PROFESSIONS

INFORMATION TECHNOLOGIES

GIS

ALLOCATION
LONGER TERM MANAGEMENT

GEODESIGN

ORGANIZATION
STRATEGIC DESIGN

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ORGANIZATION
STRATEGIC DESIGN

BIM
VISUALIZATION
SHORTER TERM MANAGEMENT

“The Brundtland Report”

NEGOTIATION IS PERVASIVE
NEGOTIATION IS PERSVATIVE
NEGOTIATION IS PERVERSIVE

GIS
ALLOCATION
LONGER TERM MANAGEMENT

GEODESIGN
ORGANIZATION
STRATEGIC DESIGN

BIM
VISUALIZATION
SHORTER TERM MANAGEMENT

THE PEOPLE OF THE PLACE

ENVIRONMENT
Society (education, health, safety, opportunity)
Economy (money, jobs, trade, business)

Sustainability

GEOGRAPHIC SCIENCES

INFORMATION TECHNOLOGIES

VENUSTAS beautiful

FIRMITAS durable

UTILITAS useful


NEGOTIATION IS PERVASIVE

GIS                                 GEODESIGN                             BIM

ALLOCATION
LONGER TERM MANAGEMENT

ORGANIZATION
STRATEGIC DESIGN

VISUALIZATION
SHORTER TERM MANAGEMENT

THE PEOPLE
OF THE PLACE

GEOGRAPHIC
SCIENCES

INFORMATION
TECHNOLOGIES

Report of the World Commission on Environment and Development
Our Common Future, United Nations, 1987
"The Brundtland Report"
WHY APPLY GEODESIGN IN A COLLABORATIVE WORKSHOP FORMAT?

- When working through a framework in order to understand it
- When applying geodesign and there is little time and small data
- When starting fast to identify central issues and options
- When it takes a design to know what the questions really are
- When it takes a design to know what is really wanted

GIS \ ALLOCATION \ LONGER TERM MANAGEMENT

\rightarrow

GEODESIGN \ ORGANIZATION \ STRATEGIC DESIGN

\leftrightarrow

BIM \ VISUALIZATION \ SHORTER TERM MANAGEMENT
WAYS TO ORGANIZE GEODESIGN TOWARDS A NEGOTIATED AGREEMENT

MULTIPLE CONSTITUENCIES

SENSITIVITY

NO

YES

MULTIPLE JURISDICTIONS

REGION TO LOCAL .................................................................................. LOCAL TO REGION

The Eastern Suburbs, Sydney, Australia
Chris Pettit et al

Iron Mining in Minas Gerais, Brazil
Ana Clara Moura et al

The Georgia Coastal Zone, USA
Rosanna Rivero, Brian Orland et al

2017 GEODESIGN SUMMIT, REDLANDS, CA, USA

https://youtu.be/QERJbL9J1Xw
AN ALTERNATIVE FUTURE FOR EASTERN SUBURBS, SYDNEY, AUSTRALIA,
Chris Pettit et. al., University of New South Wales, Sydney, Australia  November 2016
1. How should the context be described?
2. How does the context operate?
3. Is the current context working well?
4. How might the context be altered?
5. What differences might the changes cause?
6. How should the context be changed?
Approximate land area of study site: 5553 ha (ABS 2014)

**Assumptions**

- Sydney’s population is set to grow from 4.7 million (as of 2012) to 7.9 million by 2050 based on the largest population projection scenario for NSW (ABS 2013)

- **Projected changes within the study area:**
  - 180,000 additional dwellings needed between 2016 and 2050 in the Eastern Suburbs to serve an added 360,000 population.
  - Increase in younger population and cultural diversity is expected due to overseas migration.
  - 25% of the population would be people of 65 years and over, while children of 0-14 years of age could make up 16-18%.
  - While the Eastern part of the study area may be relatively unaffected by rise in sea level due to its topography, low-lying areas in the Western part of the study area may experience more nuisance flooding.
  - Kingsford Smith Airport will become domestic, with international commercial flights and most air freights moved to Western Sydney Airport.
  - Growth of High Value Industry drives demand for a new university/expansion of UNSW.
  - The hospital will also expand.
  - There is a need to remake the region’s “Green Infrastructure” and “Blue infrastructure”.

**References**

ABS data
Greater Sydney Plan and District Plans
30 minute city – Federal Government
Eastern Suburbs Economic Profile - SGS Economics and Planning
<table>
<thead>
<tr>
<th>Organisation</th>
<th>Names</th>
<th>Roles/Titles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sydney Water</td>
<td>Luther Uthayakumaran</td>
<td>Senior Leader in Strategy, Analytics and Innovation</td>
</tr>
<tr>
<td>Sydney Water</td>
<td>Marciaw Dawson</td>
<td>Principal Analyst/Project manager</td>
</tr>
<tr>
<td>Sydney Water</td>
<td>Fernando Gamboa</td>
<td>Planner, Liveable City Solutions</td>
</tr>
<tr>
<td>Sydney Water</td>
<td>Emma James</td>
<td>Senior Water Sensitive Urban Designer</td>
</tr>
<tr>
<td>Arup</td>
<td>Oliver Lock</td>
<td>Urban Planner and Data Scientist</td>
</tr>
<tr>
<td>Arup</td>
<td>Sian Elliot</td>
<td>GIS Specialist</td>
</tr>
<tr>
<td>Arup</td>
<td>Chris Schmid</td>
<td>Senior Planner</td>
</tr>
<tr>
<td>EY</td>
<td>Sarah Duignan</td>
<td>Partner/NSW Government Leader, Oceania Leader-Policy, Economics and Regulation</td>
</tr>
<tr>
<td>Randwick City Council</td>
<td>Gary ELLA</td>
<td>Coordinator Community Development</td>
</tr>
<tr>
<td>Randwick City Council</td>
<td>David Ongkili</td>
<td>Acting Manager Strategic Planning</td>
</tr>
<tr>
<td>Botany Bay City Council</td>
<td>Anne Qin</td>
<td>Urban Designer, Strategic Planning</td>
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<tr>
<td>Infrastructure NSW</td>
<td>Sean O'Shannassy</td>
<td>Executive Director</td>
</tr>
<tr>
<td>Land and Housing Corporation</td>
<td>Andre Szczepanski</td>
<td>Senior Planner</td>
</tr>
<tr>
<td>Land and Housing Corporation</td>
<td>Michael Carnuccio</td>
<td>Principal Planner</td>
</tr>
<tr>
<td>Greater Sydney Commission</td>
<td>Alex Gold</td>
<td>Special Advisor</td>
</tr>
<tr>
<td>Greater Sydney Commission</td>
<td>Clare Donovan</td>
<td>Project Lead - Sustainability</td>
</tr>
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<td>Urban Growth NSW</td>
<td>Alexandra Vella</td>
<td>Program Director</td>
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<td>Transport NSW</td>
<td>Kyle Sharpe</td>
<td>Senior Transport Planner</td>
</tr>
<tr>
<td>Transport NSW</td>
<td>David Turner</td>
<td>GIS Analyst</td>
</tr>
<tr>
<td>Department of Planning and Environment</td>
<td>Andrew Hargreaves</td>
<td>Senior Officer for Strategic Open Space and Social Infrastructure Planning</td>
</tr>
<tr>
<td>Department of Planning and Environment</td>
<td>Jennifer Richardson</td>
<td>Team Leader-Transport an Strategic Infrastructure Planning</td>
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<tr>
<td>Department of Education NSW</td>
<td>Susanne Johnson</td>
<td>Senior Assets Planner</td>
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<tr>
<td>UNSW</td>
<td>Hal Pawson</td>
<td>Associate Director, CFRC</td>
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<tr>
<td>UNSW</td>
<td>Sara Padget Kjaersgaard</td>
<td>Lecturer - Landscape Architecture</td>
</tr>
<tr>
<td>UNSW</td>
<td>Katrina Simon</td>
<td>Senior Lecturer - Landscape Architecture</td>
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<tr>
<td>UNSW</td>
<td>Mike Harris</td>
<td>Senior Lecturer</td>
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<tr>
<td>UNSW</td>
<td>James Weirick</td>
<td>Program Director, Urban Development and Design</td>
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<tr>
<td>University of Canberra</td>
<td>Hitomi Nakanishi</td>
<td>Assistant Professor in Urban &amp; Regional Planning</td>
</tr>
<tr>
<td>Core team</td>
<td>Chris Pettit</td>
<td>Associate Director, City Future Research Centre</td>
</tr>
<tr>
<td>Core team</td>
<td>Scott Hawken</td>
<td>Lecturer, Urban Development and Design</td>
</tr>
<tr>
<td>Core team</td>
<td>Scott Lieske</td>
<td>Research Fellow</td>
</tr>
<tr>
<td>Core team</td>
<td>Simone Zárpeleon Leao</td>
<td>Research Fellow</td>
</tr>
<tr>
<td>Core team</td>
<td>Aida Afroz</td>
<td>Technical Specialist</td>
</tr>
<tr>
<td>Core team</td>
<td>Karolina Peret</td>
<td>Intern, visiting post-graduate student</td>
</tr>
</tbody>
</table>

Hrishi Ballal, Tess Canfield, Carl Steinitz
PRE-WORKSHOP PREPARATION
EVALUATION MODELS
### System Requirements by Year 2050

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
<th>Additional provision needed (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDH – Medium Density Housing</td>
<td>New medium density housing of 4-7 storeys accommodating 200 persons/ha</td>
<td>900 ha</td>
</tr>
<tr>
<td>HDH – High Density Housing</td>
<td>New high density housing of 8-25 storeys accommodating 800 persons/ha</td>
<td>300 ha</td>
</tr>
<tr>
<td>PTRANS – Public transport</td>
<td>Train and light rail development</td>
<td>15 ha (15km length x 10m width)</td>
</tr>
<tr>
<td>ATRANS – Active Transport</td>
<td>Cycling infrastructure</td>
<td>50 ha (100km length x 5m width)</td>
</tr>
<tr>
<td>GINFRA – Green Infrastructure</td>
<td>Installing elements of urban greenery; e.g. rain gardens, green roofs</td>
<td>700 ha</td>
</tr>
<tr>
<td>COMIND – Commerce and Industry</td>
<td>Commercial/industrial development</td>
<td>200 ha</td>
</tr>
<tr>
<td>BINFRA – Blue Infrastructure</td>
<td>Swales, green space for promoting water sensitive urban design</td>
<td>400 ha</td>
</tr>
<tr>
<td>EDU – Education</td>
<td>Development/expansion of Primary/secondary/tertiary education facilities</td>
<td>200 ha</td>
</tr>
<tr>
<td>TOUR – Tourism</td>
<td>Developing new points of interest for recreation and entertainment, and/or expanding tourist areas</td>
<td>200 ha</td>
</tr>
</tbody>
</table>

**Population**

<table>
<thead>
<tr>
<th>Year 2016</th>
<th>Year 2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>407250</td>
<td>770000</td>
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**Number of households**

<table>
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<tr>
<th>Year 2016</th>
<th>Year 2050</th>
</tr>
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<tbody>
<tr>
<td>184850</td>
<td>360000</td>
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**Legend**

- **PTRANS**
- **ATRANS**
- **COMIND**
- **TOUR**
- **EDU**
- **MDH**
- **HDH**
- **BINFRA**
- **GINFRA**

**Sources:** Esri, HERE, DeLorme, iMap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, ESRI Japan, MRF, Air Griffin (Hong Kong), enviroLIDAR, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community.
# Pre-Workshop Preparation

## System Impacts Model Format

<table>
<thead>
<tr>
<th>System</th>
<th>GINFRA</th>
<th>TOUR</th>
<th>BINFRA</th>
<th>EDU</th>
<th>TRANS</th>
<th>COM</th>
<th>HDH</th>
<th>MDH</th>
<th>ACTV</th>
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<td><strong>New System</strong></td>
<td><strong>IMPACT Evaluation</strong></td>
<td><strong>Updated Evaluation</strong></td>
<td><strong>New Evaluation</strong></td>
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<td>1 3</td>
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</table>

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**Rule:** If more than one polygon is in one location, use the most positive value. E.g., high density housing with sewer = 2

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<th>IMPACT MODEL</th>
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## PRE-WORKSHOP PREPARATION
### CROSS-SYSTEMS IMPACT MODEL

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<th>BINFR</th>
<th>EDU</th>
<th>TRANS</th>
<th>COM</th>
<th>HDH</th>
<th>MDH</th>
<th>ACTV</th>
<th>Project's cause of system impact</th>
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</tbody>
</table>

**RULE** — If more than one polygon is in one location, use the most positive value. E.g., high density housing with sewer = 2

**IMPACT MODEL**
- 2: most positive, best
- 1: positive, good
- 0: neutral
- -1: negative, bad
- -2: most negative, worst
## COSTS MODEL (based on Seattle, WA, USA)

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>UNIT COSTS</th>
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<th>UNIT COSTS</th>
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<td>w/refs</td>
<td>Greenfield</td>
<td>CP, CS</td>
<td>Urban Redevelopment</td>
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<td>1 CRITICAL AREAS</td>
<td>3000/ac</td>
<td>1 GREEN INFRA</td>
<td>1,000,000/mile, 10,000/ac</td>
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<tr>
<td>2 SURFACE WATER</td>
<td>3000/ac</td>
<td>2 BLUE INFRA</td>
<td>1,000,000/mile, 50,000/ac, 10,000,000/fac</td>
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<td>3 TOURISM</td>
<td>1,000,000/ac</td>
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<td>4 FORESTRY</td>
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<td>4 EDUCATION</td>
<td>25,000,000/fac</td>
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<td>5 AGRICULTURE</td>
<td>10,000/ac</td>
<td>5 COM, IND</td>
<td>16,000,000/fac, 4,000,000/ac</td>
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<tr>
<td>6 LOW DENS HOUSING</td>
<td>600,000/ac</td>
<td>6 HIGH DENS HSG</td>
<td>22,000,000/ac</td>
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<tr>
<td>7 HIGH DENS HSG</td>
<td>6,000,000/ac</td>
<td>7 MED DENS HSG</td>
<td>12,000,000/ac</td>
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<tr>
<td>8 COM, IND, INST</td>
<td>9,000,000/ac</td>
<td>8 AUTO TRANS</td>
<td>1,500,000/lane mile</td>
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<tr>
<td>9 UTILITY INFRASTR</td>
<td>130,000/ac</td>
<td>9 PED TRANS</td>
<td>300,000, lane mile</td>
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<tr>
<td>10 TRANSPORT</td>
<td>2,000,000/lane mile</td>
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Add 50% of value of prior use if taken.
PRE-WORKSHOP PREPARATION

WORKSHOP SCHEDULE

30 November 2016: Pre-workshop
Geodesign team Tour of Study Area
17:30 – 19:30 Public Lecture by Carl Steinitz

1 December 2016: Workshop Day One
08:30 – 09:00 Set up and connect to Geodesignhub
09:00 – 09:45 Personal Introductions and Description of Study Area and Organization of Workshop
09:45 – 09:50 Pre-workshop Survey
10:00 – 10:30 Geodesignhub tutorial
10:30 – 12:15 System teams make at least 10 diagrams of policies and projects
12:15 – 12:30 Form Change-design teams
12:30 – 13:30 Lunch
13:30 – 13:50 Geodesignhub tutorial
13:50 – 15:00 Create Decision model and Change design Version 1, assess Impacts, independently
15:00 – 16:30 Create Change design Version 2, assess Impacts, Independently
16:30 – 17:30 Timeline, cost and 3-D

2 December 2016: Workshop Day Two
09:00 – 10:00 Presentations of Change designs Version 2
10:00 – 12:30 Create Change design Version 3, with negotiation as needed, assess Impacts and cost, and make Timeline
12:00 – 13:00 Lunch
13:00 – 13:30 Presentations
13:30 – 14:00 Comparision and Negotiation tools
14:00 – 14:30 Sociogram and Negotiation strategy
14:30 – 15:30 First Negotiation round, create Versions 4, assess Impacts and costs, staging and 3-D
15:30 – 17:00 Final Negotiation round, create Verion 5 in public, assess Impacts and costs, staging and 3-D
17:00 – 17:30 Discussion and END
17:30 – 18:00 Post-workshop survey and debrief participants
WHAT?
WHERE?
WHEN?

1. How should the context be described?
2. How does the context operate?
3. Is the current context working well?
4. How might the context be altered?
5. What differences might the changes cause?
6. How should the context be changed?

STAKEHOLDER INPUT

REVIEW AND DECISION

UNDERSTAND CONTEXT

PERFORM STUDY

REPRESENTATION MODELS

PROCESS MODELS

EVALUATION MODELS

CHANGE MODELS

IMPACT MODELS

DECISION MODELS

SPECIFY METHODS

FEEDBACK

CHANGE SCALE

NO

YES

MAYBE
Day 1  9am
INTRODUCTION OF PARTICIPANTS,
THE WORKSHOP STRUCTURE,
AND “THE PROBLEM”
Day 1   10am
TUTORIAL:
EVALUATION MODELS AND DIAGRAMS OF POLICIES AND PROJECTS
Day 1  1:00pm
TUTORIAL:  
CHANGE VERSIONS  
AND ASSESSING IMPACTS
Environmental Sustainability and Resilience: Economic and population growth will continue to put pressure on resources, and climate change would lead to sea level rise and extreme weather. The study area may see increased rainfall, and the Botany Bay side of the map could be subject to increased nuisance flooding due to its low-lying topography. Keeping this in mind, how would you address increased demand on housing and services within the study area, and how would you mitigate the potential effects of climate change mentioned?

Housing Development: It is forecast that 1-2-person households will be an increasing trend in the study area towards 2050. But while the study area is also projected to have an increase in younger working population, it will also be faced with an ageing population. How would you plan for housing that would cater to such demographic changes?

University + Hospital employment cluster:
UNSW and Prince of Wales Hospital are major employers in the study area. How would you incorporate the expansion of UNSW and the hospital as major knowledge and health economy precincts in your design? Keeping in mind that such an expansion will increase flow of human capital and global job opportunities in the study area.

Efficient Public service:
How would you design a ‘Just City’ with services aligned to support a multi-cultural diverse society and high quality amenity, with policy mechanism for ‘value sharing’ in the investment of supporting initiatives as affordable housing? A driver for this scenario is about improving the liveability and quality of life for residents and visitors to the area.

Tourism and Recreation: The beaches and coastal walk are the main draw for tourism within the study area. Tourism flows will continue to increase, putting pressure on existing infrastructure. How will you design the study area that responds to this increase and also caters to potentially diversified cultural interests to accommodate international tourism and activities from China, India and other Asia markets.

Compact City
Accessibility driven scenario based on the concept of the 30 minute city; and minimising travel and commute times. This will lead to healthy city outcomes with people spending less time in cars and more time using public and active transport modes.
Day 1   1:20pm
CHANGE VERSION 1
AND IMPACTS,
INDEPENDENTLY BY TEAM
Day 1  2:30pm  
TUTORIALS  
TIMELINE AND COST, AND 3-D
Day 1  3:00pm

CHANGE VERSION 2+
AND IMPACTS,
TIMELINE AND COST
AND 3-D,
INDEPENDENTLY BY TEAM
Day 2  9:00am
REVIEW AND PRESENTATIONS (6)
Day 2  10am
CHANGE VERSION 3+
WITH NEGOTIATION
AMONG TEAMS AS NEEDED
Day 2  1:15pm
TUTORIAL:
COMPARISON TOOLS
NEGOTIATION TOOLS
COMPARING ALL DESIGNS

VERSION 3

Note how the designs are moving towards even more similarity because of negotiation among teams.
COMPARING ALL DESIGNS

VERSION 3

“BEST” (C S)
Geodesign Hub 3D Viewer

This plugin uses OSM Buildings library for visualization and design data from Geodesign Hub. See the GitHub repository.

1. Wait till the processing is complete
2. Turn on or off streets and systems
3. Click “Regenerate Scene” button to rebuild

Streets
☐ Display generated streets

Systems
☐ PTRANS ☐ ATRANS ☐ MDH ☐ HDH ☐ COMIND ☐ EDU ☐ TOUR ☐ BINFRA ☐ GINFRA

Refresh

Regenerate Scene
COMBINED ANALYSIS

Combined synthesis of all the change team designs selected above. Change features visibility using slider below:

0 = No Visibility / 100 =
Max Visibility

FILTER BY SYSTEM

- GINFRA
- BINFRA
- TOUR
- EDU
- COMIND
- HDH
- MDH
- ATRANS
- PTRANS
SHOW ALL DIAGRAMS
DIAGRAM FREQUENCY

The grid below shows the count of the diagrams for the synthesis that are loaded.

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Sociogram showing positive choices made

Arrows point from person choosing to person chosen.
Day 2  2:00pm
SOCIOGRAM TO ORGANIZE NEGOTIATION
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-1 to +10

+10

+4

+4

++ PARTNER

+ Possibly

-1

X NOT LIKELY

-2

XX NEVER
### REVIEWER TEAM

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**Rating Legend**

- **++** Likely to partner
- **+** Possibly
- **x** Not likely to partner
- **xx** Never

### NEGOTIATION 1

- Environment → Design
- Development → Compact City
- University + Hospital → Design
- Tourism → Final Design

### NEGOTIATION 2

- Environment → Design
- Development → Compact City
- Public Services → Design
- Tourism → Final Design

### PUBLIC NEGOTIATION 3

- Environment → Design
- Development → Compact City
- University + Hospital → Design
- Tourism → Final Design
Day 2  3:00pm
NEGOTIATION STAGE 1

DEVELOPERS
ENVIRONMENTALISTS
COMPACT

UNI-HOSPITAL
PUBLIC FACILITIES
TOURISM

EACH GROUPING
NEGOTIATES ONE DESIGN
THE AGREED POLICIES AND PROJECTS BEFORE THE FINAL NEGOTIATED DESIGN

### Negotiated Design

Showing:  ○ Both  ○ Only from A  ○ Only from B  • Agreements

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Hover over a feature on any of the two maps to show feature details.
Day 2  3:30pm
DEVELOPING THE FINAL NEGOTIATION STRATEGY

DEV-ENV-COMP

UNIH-PUB-TOUR
Day 2  3:30pm
THE FINAL NEGOTIATION IN PUBLIC
Day 2  3:30pm
THE FINAL NEGOTIATION IN PUBLIC
DEV-ENV-COMP and UNIH-PUB-TOUR
THE LAST BIG DECISION...
THE ALIGNMENT AND MAJOR STOP OF THE METRO
DESIGN BUDGET AND COSTS

TOTAL PROJECT BUDGET: EUR 0.

CHANGE AREA AND COSTS

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STAGING OF THE FINAL DESIGN

DESIGN TIMELINE

DESIGN BUDGET AND COSTS

SYNTHESIS MAP

IMPACTS MAP

SYNTHESIS COMPARISONS

VIDEO
Day 2  5:00pm
REVIEW AND DISCUSSION
END
HISTORY OF THE DEVELOPMENT TEAM’S DESIGN DEVELOPMENT AND NEGOTIATION

TEAM’S

INITIAL          VERSION 1          VERSION 2          VERSION 3          VERSION 4         VERSION 5         FINAL DESIGN
Feedback from participants

Did you find the Geodesign process difficult or easy to follow?

How well do you think your team's interests were addressed or included in the final proposal?

Do you agree with the final proposal?

Which workshop tools/resources did you find most helpful and/or influential?

- Negotiation process
- Geodesignhub’s tools for comparing different team designs
Roderick Simpson  
Environment Commissioner, Greater Sydney Commission  
Professor, University of Sydney

“The Geodesign approach is most effective in dealing with complexity and emergence of the city in the context of the city as a mosaic of places- this is an approach that is gaining currency at the Greater Sydney Commission. Place-based planning allows a wide range of factors to be considered concurrently by reducing the scale not the scope. It also allows a contextually specific response which Geodesign supports”.

“The selection process and negotiation in the geodesign process could be considered a form of emergence, particularly if emergence is seen to be a pattern or an idea that gains prominence. This is through the negotiation process and consensus - which is where the geodesign process adds significant value.”
Designing a scenario-based study of derivative futures is an art... it requires judgement.

It is not a science... although it depends on science. There are no perfect formulae... but there are methods. There is no universal "tool-kit"... but these are tools. You cannot copy an example... but you can gain experience.