



*5th Healthy Cities: Working
Together to Achieve Liveable Cities*
Conference

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aaax architecture

City of Layers

Reconfiguring the Built
Environment for Sustainability

BUSINESS NEED & PROJECT REQUIREMENTS

Architecture Phases & Deliverables

A01 Outline Brief
Client Agreement

A02 Master Plan Study
Assessment of Existing Assets
Site Investigation/ Evaluation
Audits / Appraisals
Value Assessments
Master Plan Report / Functional Brief

A03 Feasibility / Concept Design
Feasibility Study
Preferred Delivery System
Conceptual Design / Design Brief

A04 Schematic Design
Development Application
Buildability Audit

A05 Design Development
Developed Design Documents
Development Approval
Documentation Brief

A06 Documentation
Contract Documents

A07 Tender
Successful Tenderer Selected
Letter of Acceptance

A08 Construction
Constructions Administration
Contract Completion
Project Handover

A09 Post Construction
Defects Liability Period
Post Construction Evaluation / Client User Feedback
Asset Maintenance

Quality Assurance System
AS/NZS ISO 9001:2008

Q00 Management Responsibility
Q01 Quality System

Q02 Contract Review

Q03 Design Control
Q04 Document & Data Control
Q05 Purchasing (Procurement)
Q06 Process Control

Q07 Inspection Reviews & Testing
Q08 Control of Non Conforming Product
Q09 Corrective & Preventative Action

Q10 Control of Records

Q11 Internal Audits

Q12 Training

Q13 Risk Management
OH&SR
Environmental Management
Industrial Relations
Fire and Emergency

Project / Design Roadmap

01 Initiation

R0 Client Agreement / Project Charter

Step R1: Administration
Step R2: Project Governance
Step R3: Risk Assessment

02 Development

Step R4: Define Project Requirements / Prepare Project Plan / Design Process

Step R5: Develop Scope of Activities/ Project Planning
Step R6: Develop Preferred Option
Step R7: Develop Concept Design
Step R8: Statutory Approval
Step R9: Design & Documentation

03 Implementation

Step R10: Review of Project Plan
Step R11: Tendering
Step R12: Post award construction planning
Step R13: Construction
Step R14: Handover

04 Finalisation

Step R15: Post project completion and contract finalisation
Step R16: Project Finalisation

05 System Improvement

Step R17: Work Audits and Corrective Actions

DELIVERY STRATEGY & BENEFIT REALISATION STRATEGY

Benefit Realisation Plan

Benefits

Project Specific Plan

Agreed Outcomes

P01 Project Management Plan

P02 Scope Management Plan
P021 Green Star / Lead Requirements

P03 Time Management Plan

P04 Cost Management Plan

P05 Quality Management Plan

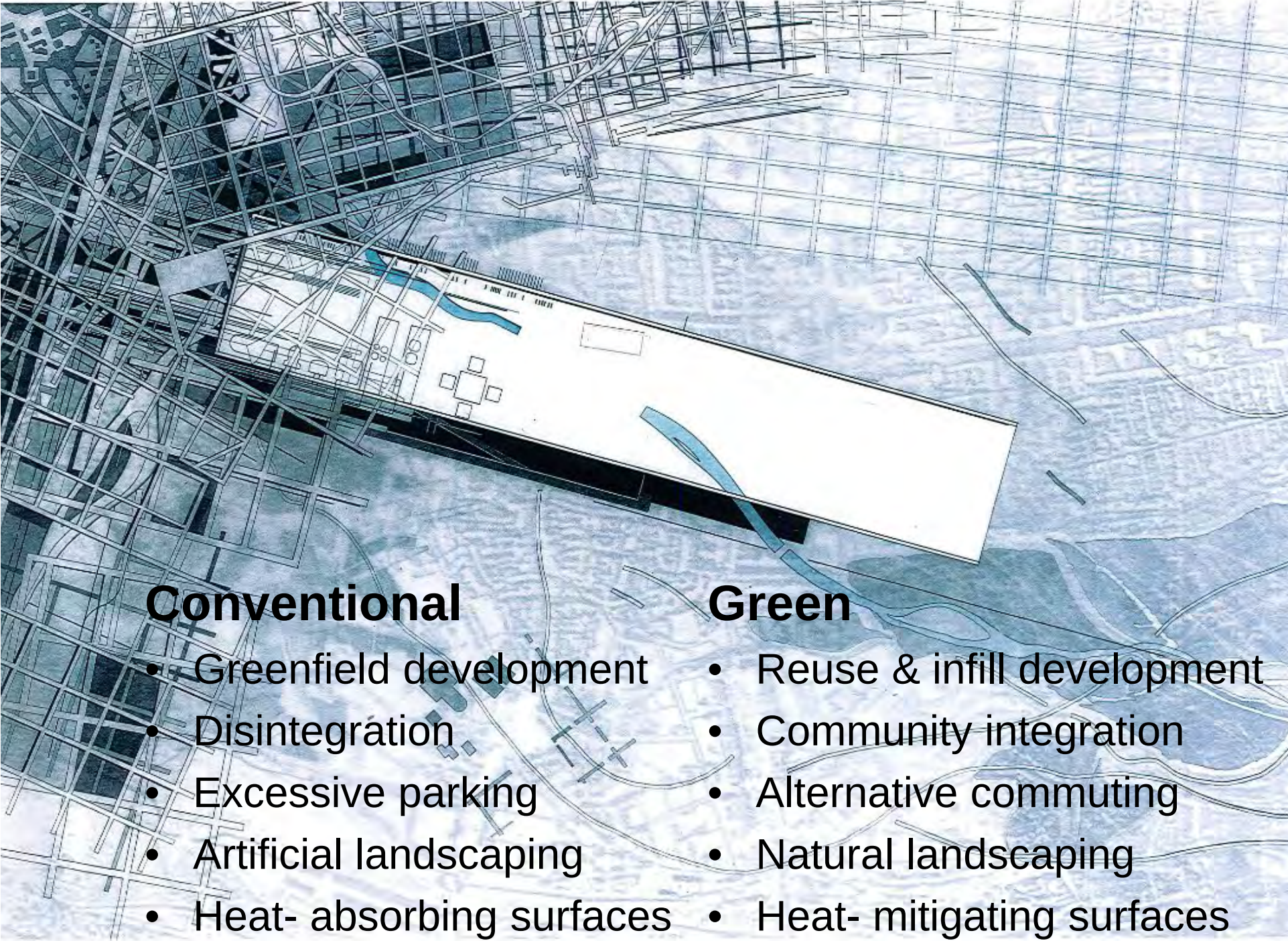
P06 Risk Management Plan

P07 Communication and Consultation Management Plan

P08 Human Resource Management Plan

P09 Procurement and Probity Management Plan

Construction
P10 OHS Management Plan
P11 Environmental Management Plan
P12 Industrial Relations
P13 Fire and Emergency
P14 Waste Management
P15 Site Management
P16 Commissioning and Completion Plan

An aerial photograph of a city grid. A large, white, rectangular area is superimposed on the grid, representing a development site. The grid lines are thin and light blue. The white area is slightly tilted. Inside the white area, there are some faint blue lines and shapes, possibly representing a road or a building footprint. The overall image has a blueish tint.

Conventional

- Greenfield development
- Disintegration
- Excessive parking
- Artificial landscaping
- Heat- absorbing surfaces

Green

- Reuse & infill development
- Community integration
- Alternative commuting
- Natural landscaping
- Heat- mitigating surfaces





URBAN CRUSH

500 million

The estimated number of Indians who will need new urban homes in the next 10 years

To reap benefits of rapid urbanization, all the tiers of government need to have a proactive approach, sound planning and efficient implementation.

—Rajiv Kumar, secretary general, Federation of Indian Chambers of Commerce and Industry (FICCI)

Megacities Circa 2015

In just three years, five of the 10 largest cities in the world will have 20 million or more citizens, according to the United Nations forecasts.

1. Tokyo, Japan: 36.4 million
2. Mumbai, India: 21.9 million
3. São Paulo, Brazil: 20.5 million
4. Mexico City, Mexico: 20.2 million
5. New York, New York, USA: 20 million
6. Delhi, India: 18.7 million
7. Shanghai, China: 17.2 million
8. Dhaka, Bangladesh: 17 million
9. Kolkata, India: 17 million
10. Karachi, Pakistan: 14.9 million



JOHN DAGGE

BIG SQUEEZE

Melbourne struggling as population booms

Plan for 500,000 people in Geelong by 2040

BOOM TOWN BLUEPRINT



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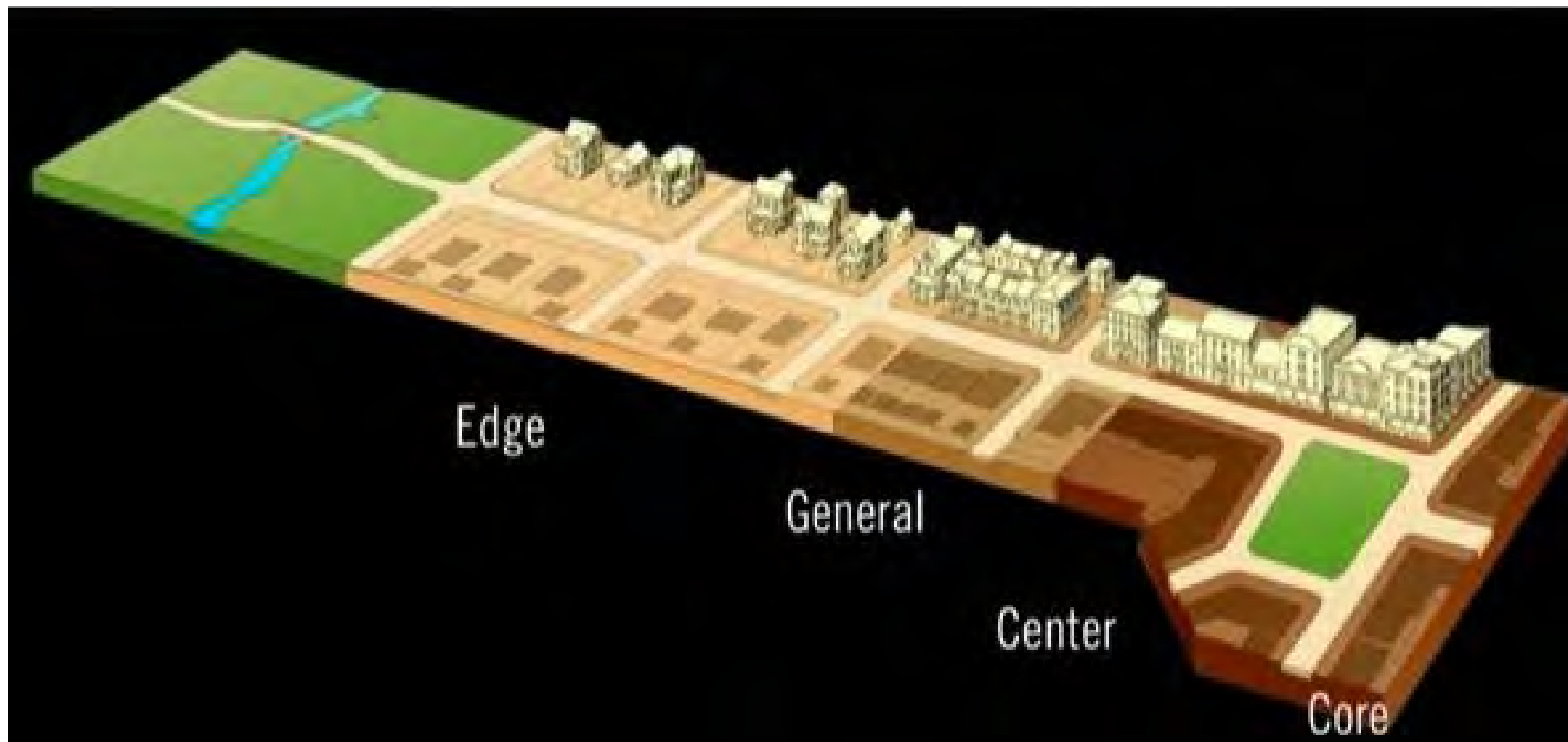


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**Songdo International
Business District,
South Korea**



**60 million
square meters**
(72 million square yards)
of new office, retail and
public space





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Photo courtesy of Moule & Polyzoides



Melbourne

Diversity, Density & Complexity

- In 1980 the city was a 8 to 5pm city that was dead at night
- From 1992 -2002 over 9,000 new residential units were added to CBD
- This composed of many distinct communities with many cultures and micro economies that has formed a dynamic urban environment.
- In 2006 Melbourne was proclaimed as 'one of the most liveable cities in the world'.
- In 2010, Melbourne was assessed in terms of sustainability, it was ranked 7th from the 20 largest Australian cities (According to the Australian Conservation Foundation's first sustainable cities ranking).



Melbourne 1983
Each Grey dot represents five dwellings



Melbourne 2002
Showing a total of 9,895 dwellings. The black dots represents convenience stores



“In inner Melbourne . . . you’ve got everything there. It’s a pedestrian city, it’s a cycling city, public transport wherever you look.....The problem is how do you make that real for Melbourne as a whole. That’s a huge challenge.”

Professor Howe, ex-senior Minister for the Hawke government and ex-deputy prime minister to Paul Keating

The Age Monday, April 02, 2012 - Sprawl ‘threat’ to Melbourne’s title
Expert warns relentless growth puts liveability in doubt

“The region is constrained by a lack of infrastructure – including centres of activity around entertainment or leisure sites to create attractive scenes – and pales in comparison to other key regional cities, it found.”

Shane Fowles

Geelong Advertiser Saturday, April 07, 2012 Geelong’s Field of Dreams



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Liveability Criteria (Five broad categories with over 30 qualitative and quantitative factors across)	Sustainability Criteria	Common Factors for Future Cities
Stability	Employment Household debt	Work
Healthcare	Health Well-being	Health
Culture & Environment	Public participation Air quality Ecological footprint Green buildings Water Biodiversity Climate change readiness	Community Connection
Education	Education	Education
Infrastructure	Density Transport Food production	Equitable" access to services. Amenity

References:

Liveability Criteria - The Economist Intelligence Unit Limited

Sustainability Criteria - Australian Conservation Foundation's (ACF) sustainable cities' ranking



The differences in the set guidelines from Greenstar and Leed to enable 'greener' developments

GBCA - Greenstar Communities	USGBC - LEED Neighbourhood Development	Common factors
Create Opportunities for Economic Prosperity	Regional Priority	Work
Foster Environmental Responsibility	Green Infrastructure and Buildings	Health
Enhanced Liveability	Smart Location and Linkage	Community Connection
Embrace Design Excellence	Neighbourhood Pattern and Design	Amenity
Demonstrate Visionary Leadership and Strong Governance	Innovation and Design Process	Design and Configuration

Design Criteria and Associated Choices

- **Work / Community / Connection** – the Interfaces between people / businesses / system
- **Amenity** – represent the needs of the population within the built spaces
- **Design and Configuration** – how the many disparate parts within the built environment are integrated

The Choices

- Traditions / Protection Vs Change / Performance Measures
- Process / Policy Driven Vs Outcomes & Evidence Based
- Urban Spread Vs Urban consolidation
- Short Term Focus Vs Benefit Realisation and Benefit Sustainment

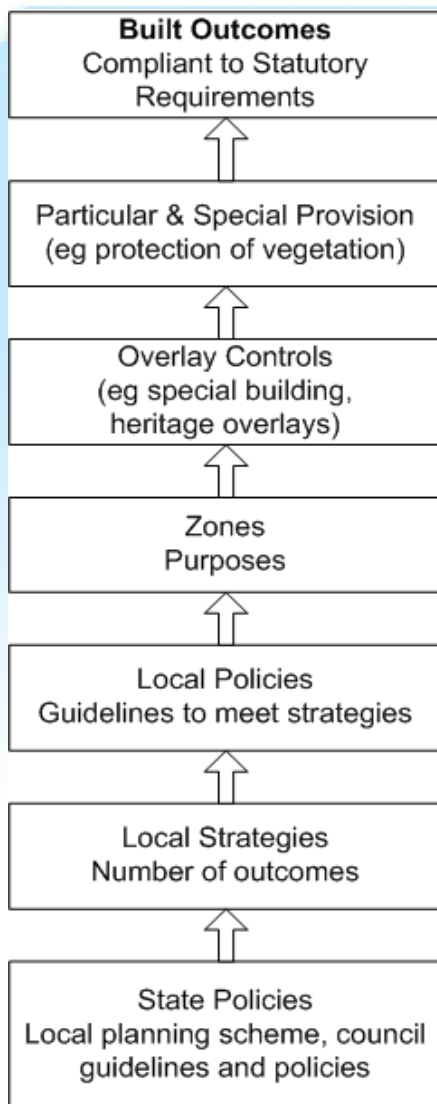
A complex 3D maze made of concrete blocks, with a small figure standing at the end of a path. The maze is composed of many interconnected rectangular blocks, creating a labyrinthine structure. The lighting is dramatic, with strong shadows and highlights, emphasizing the geometric forms. The overall tone is dark and mysterious.

Benefit Realisation & Sustainment

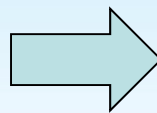
- Requires a shift in focus from ‘tasks’ and ‘works’ to ‘outcomes’ and ‘benefits’
- Benefits emerge when the right things are done right
- Benefits can be long-lived and sustained

Business Case Considerations

- The financial aspects
- The environmental and ecological aspects
- The social aspects
- The technological aspects
- The life cycle aspects



The Existing Statutory Framework



The Environment

The carrying capacity of the environment in terms of:

- Global
- National
- State
- Regional
- Local



Environmental Opportunity and Constraints

Capacity for growth and expansion of the urban fabric with respect to the ecological infrastructure. Consider the areas' ecosystem, biodiversity and existing natural environment



Social Opportunity and Constraints

The built infrastructure and the social aspects (eg water harvesting, energy generation, food production, waste management, local employment, transportation)



Infrastructure & Technology

The appropriateness of the urban society's requirements. Consider performance by systems integration



Guidelines for New Development

Built form and built environment Consider integration, networking



Built Outcomes

The appropriately integrated of the environment Consider the environmental, economic, technological and lifecycle aspects

Sustainable Built Outcome

- Benefits and Well being
- Appropriately 'fits' the built environment
- increasing the areas carrying capacity with onsite renewable energy generation, water harvesting, the recycle of products, by increasing the social wellbeing with improved services, facilities and amenities, and by even helping restore the ecological infrastructure

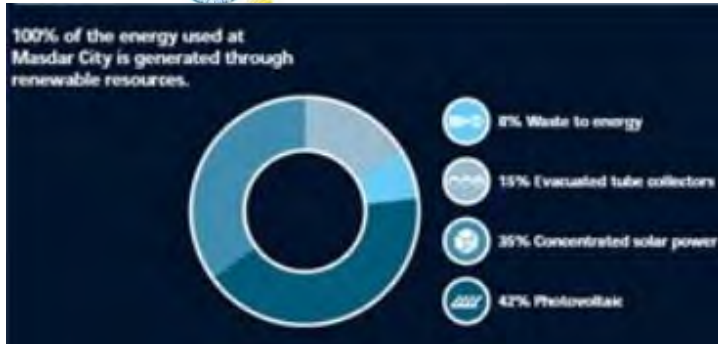
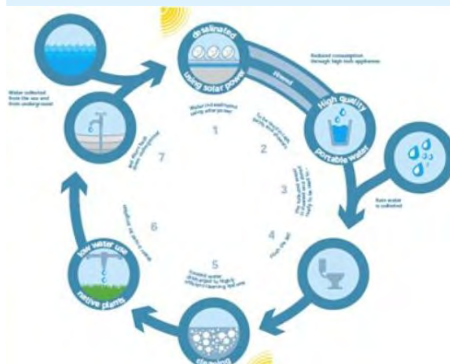
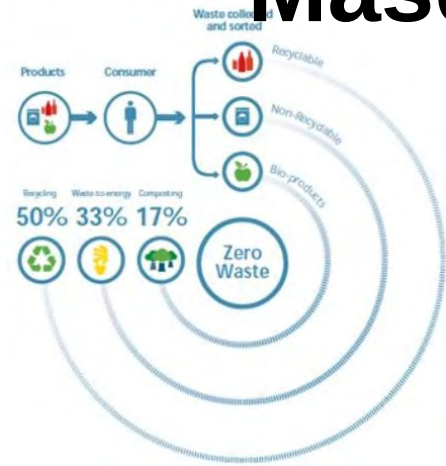
Evidence Based Approach

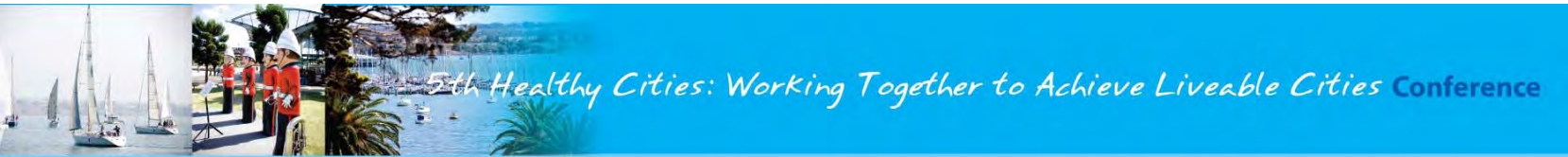
Required Outcome



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Masdar City, United Arab Emirates





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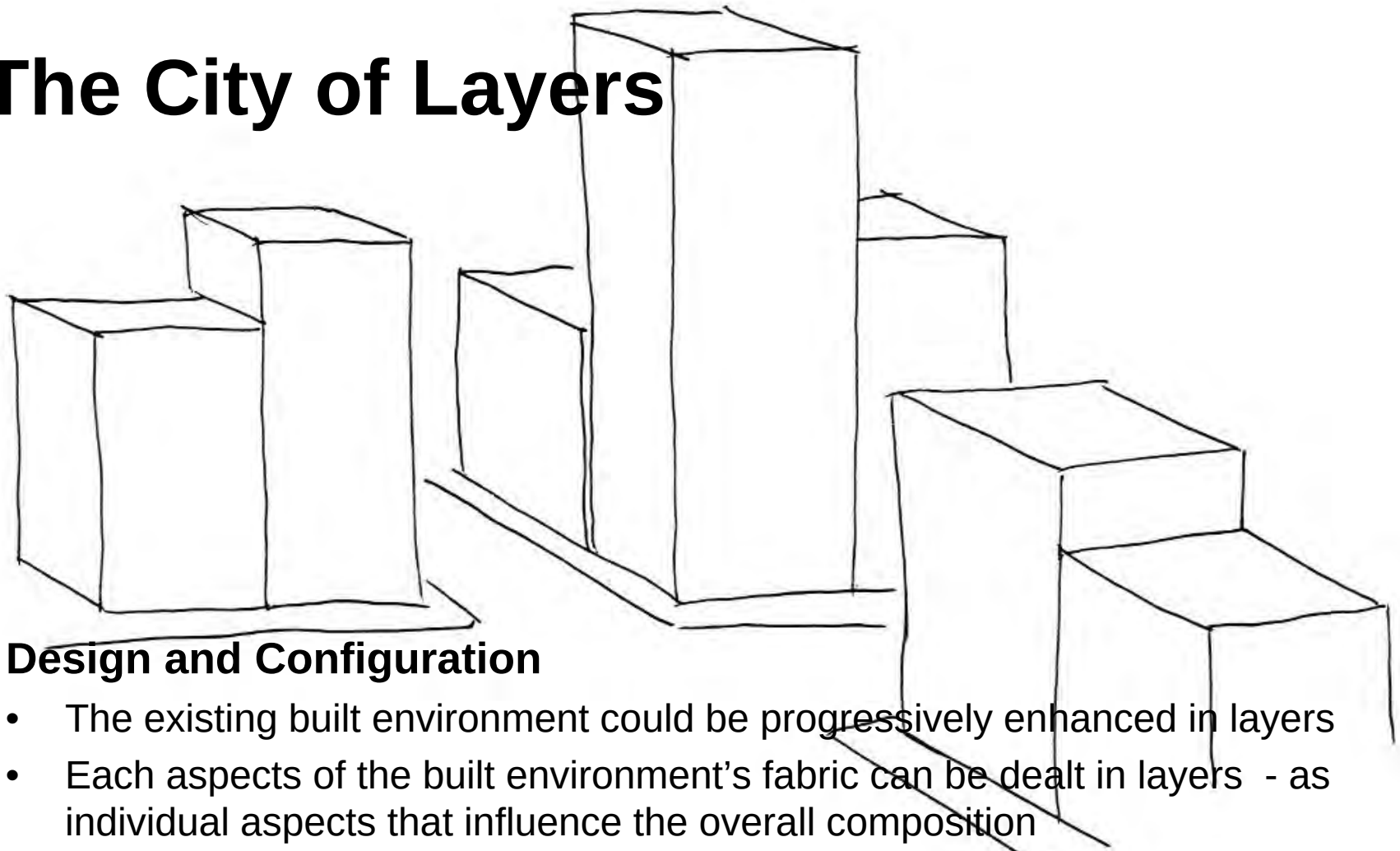
Masdar City, United Arab Emirates



Planners on the
**US\$22
billion** Masdar
City project will ban
cars within city limits to
force 50,000
residents to use public
transportation.

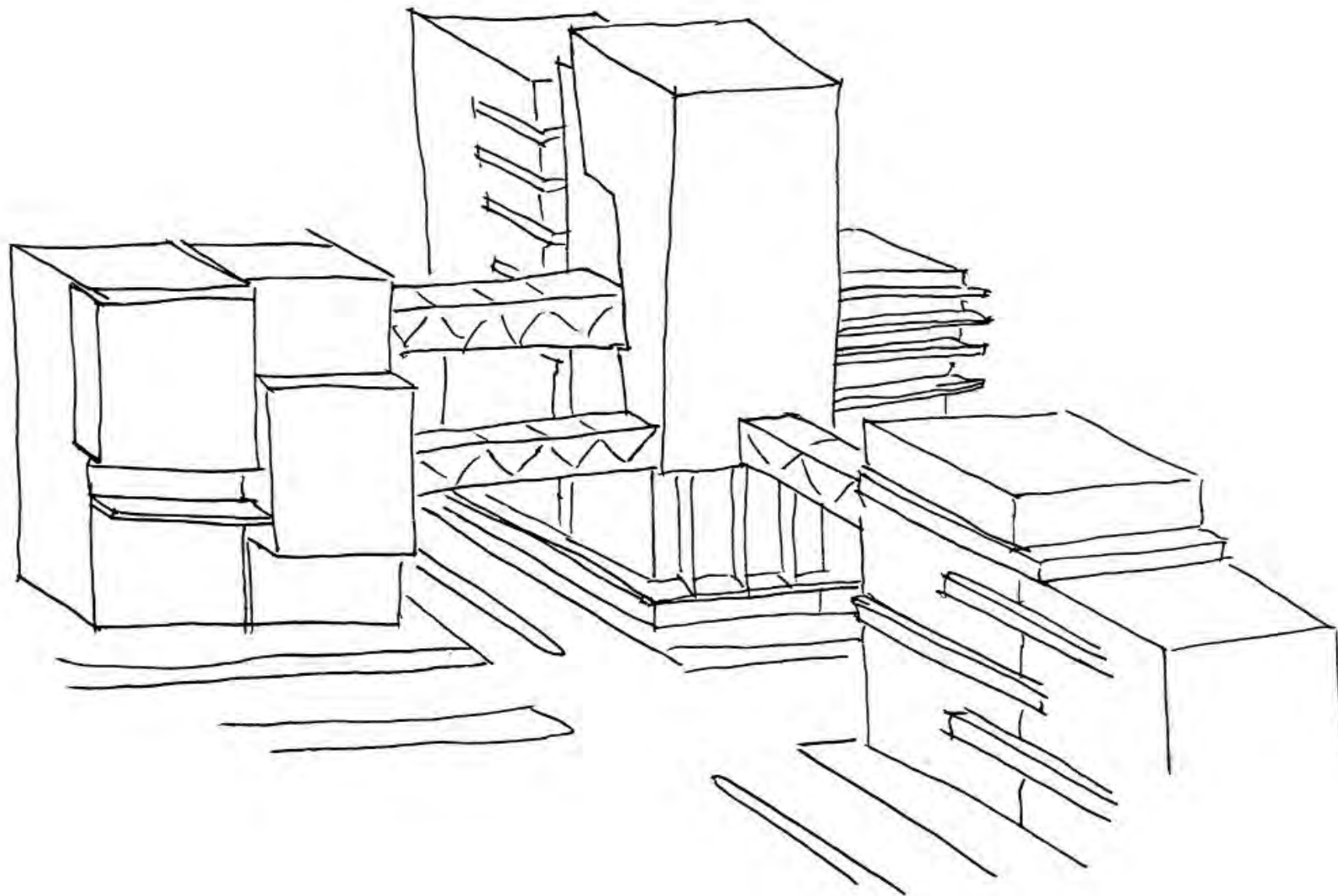


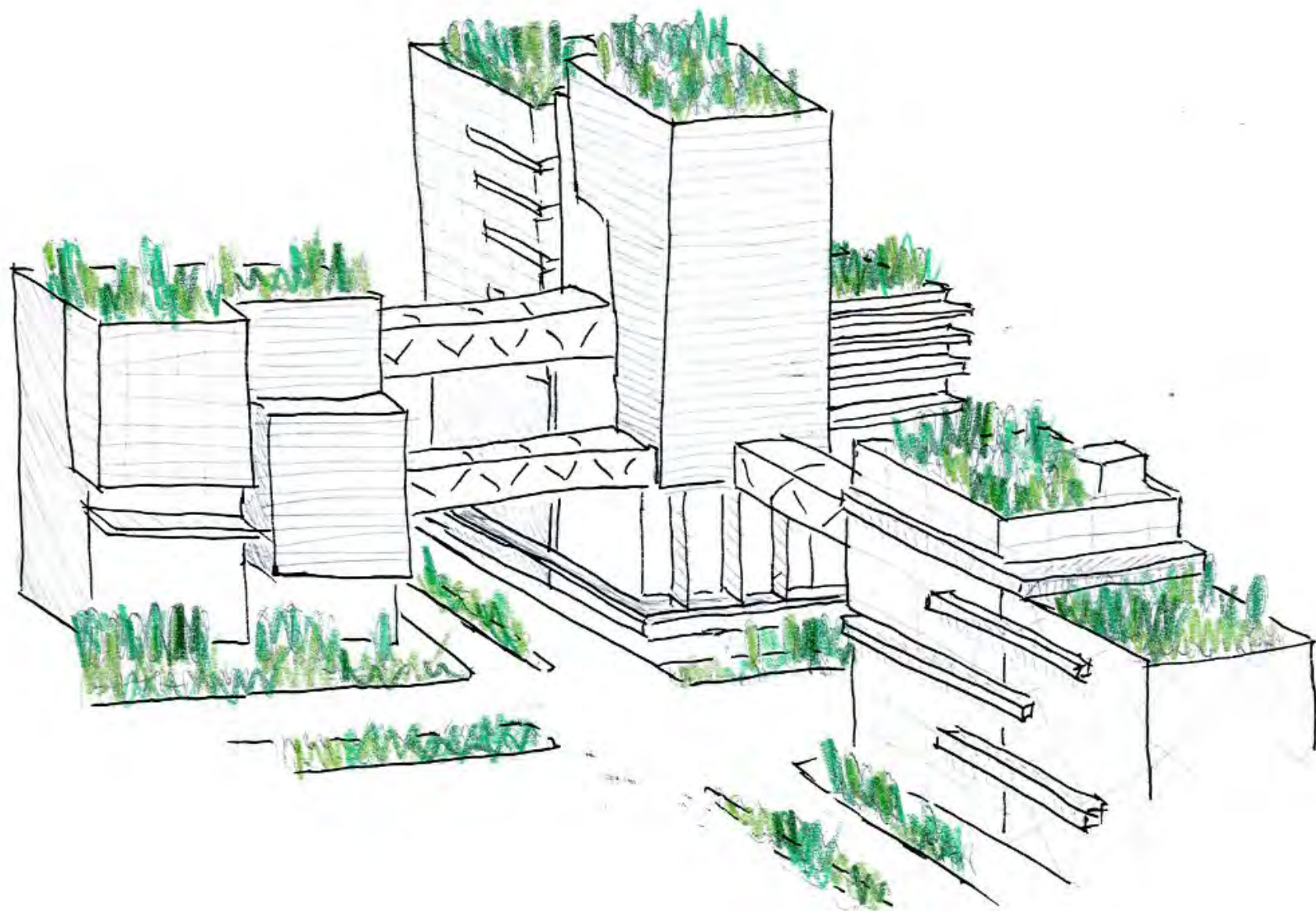
The City of Layers

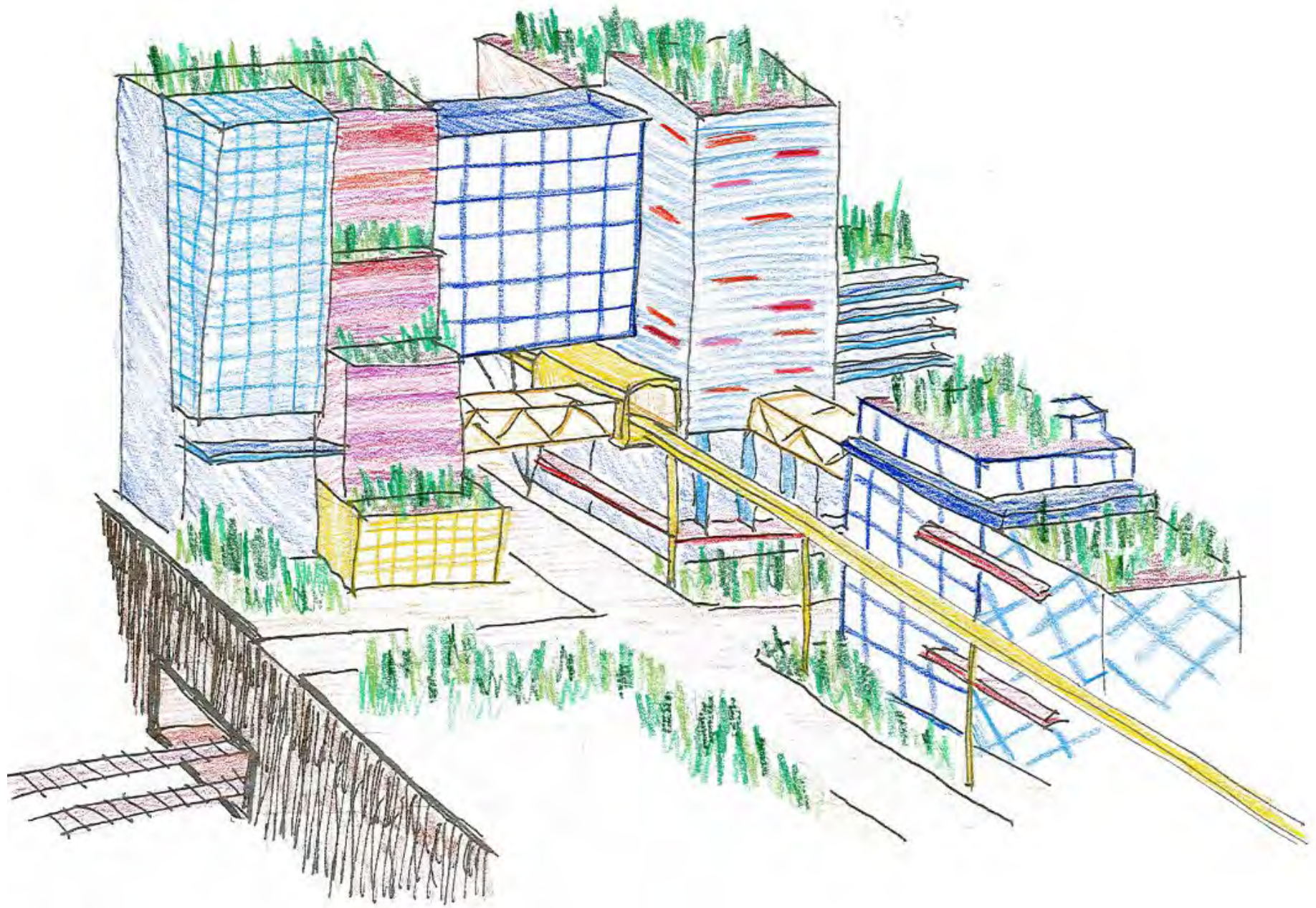


Design and Configuration

- The existing built environment could be progressively enhanced in layers
- Each aspects of the built environment's fabric can be dealt in layers - as individual aspects that influence the overall composition
- Each layer can be progressively developed and superimposed on to and configured into the city fabric – so each adds value, functionality, and capability - creates new connections and increases the overall robustness and resilience of the whole
- The eventual outcome could produce an enhanced built form that can sustainably support, enrich, and nourish us mentally, physically, and spiritually.



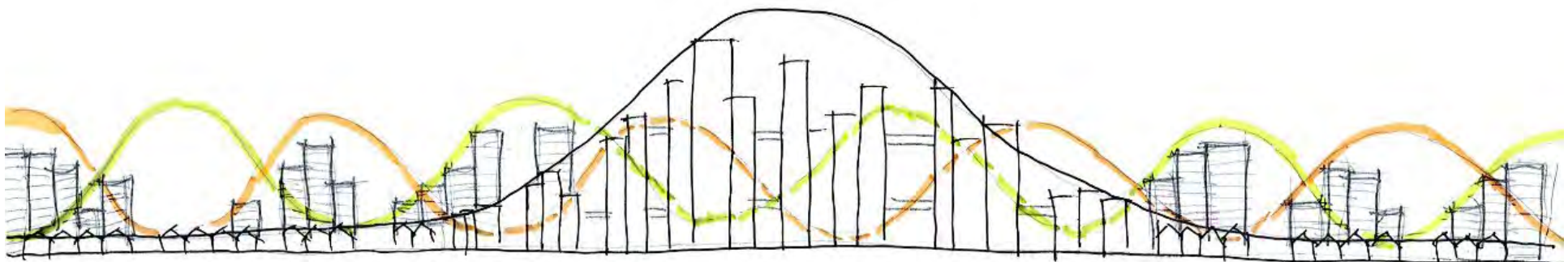
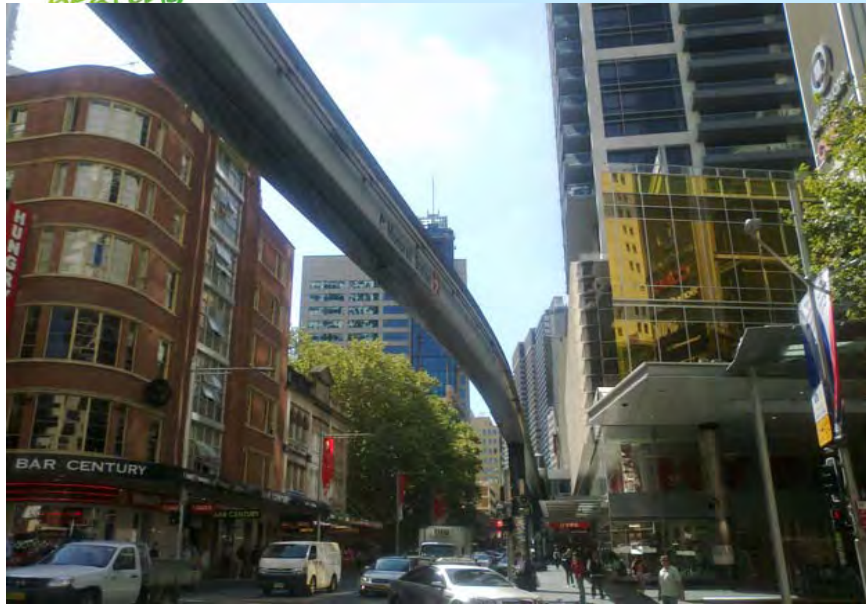




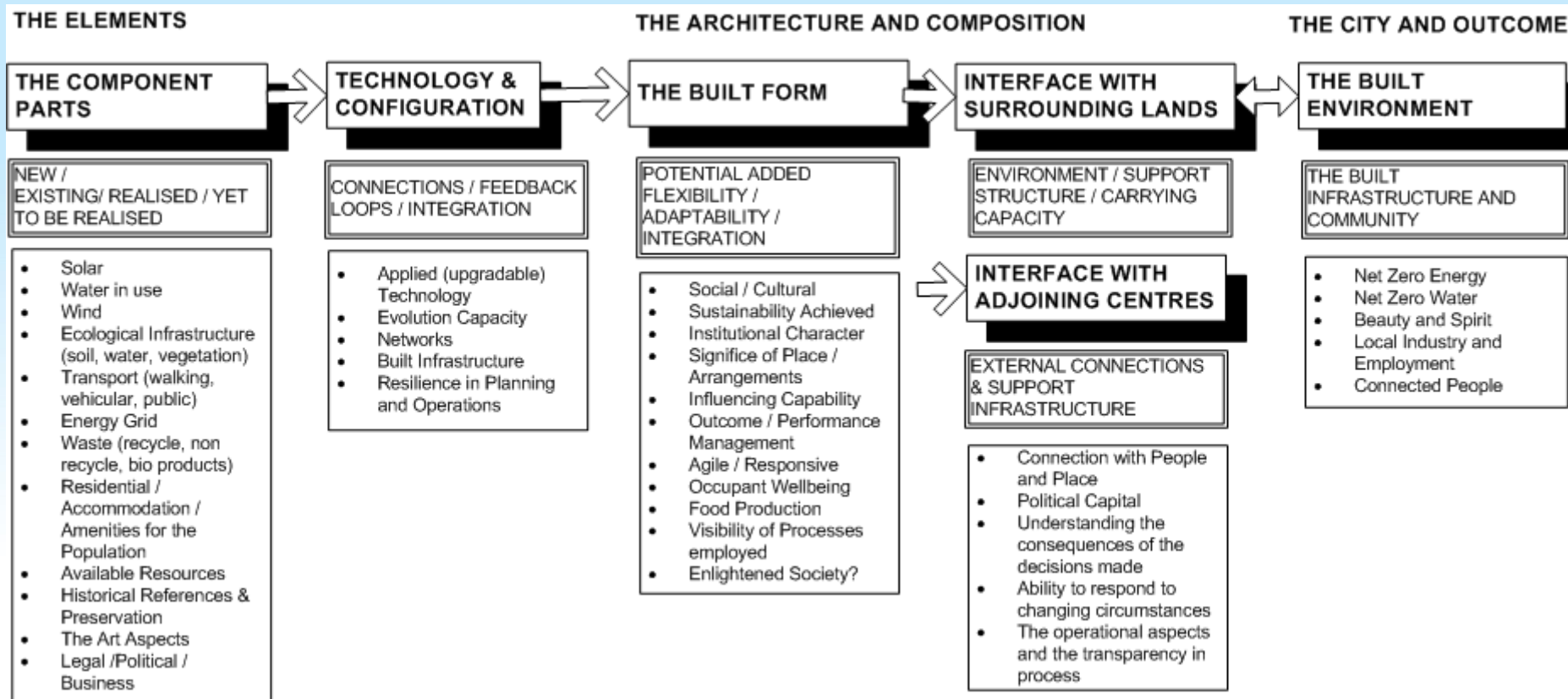
Sectional Sketch Image

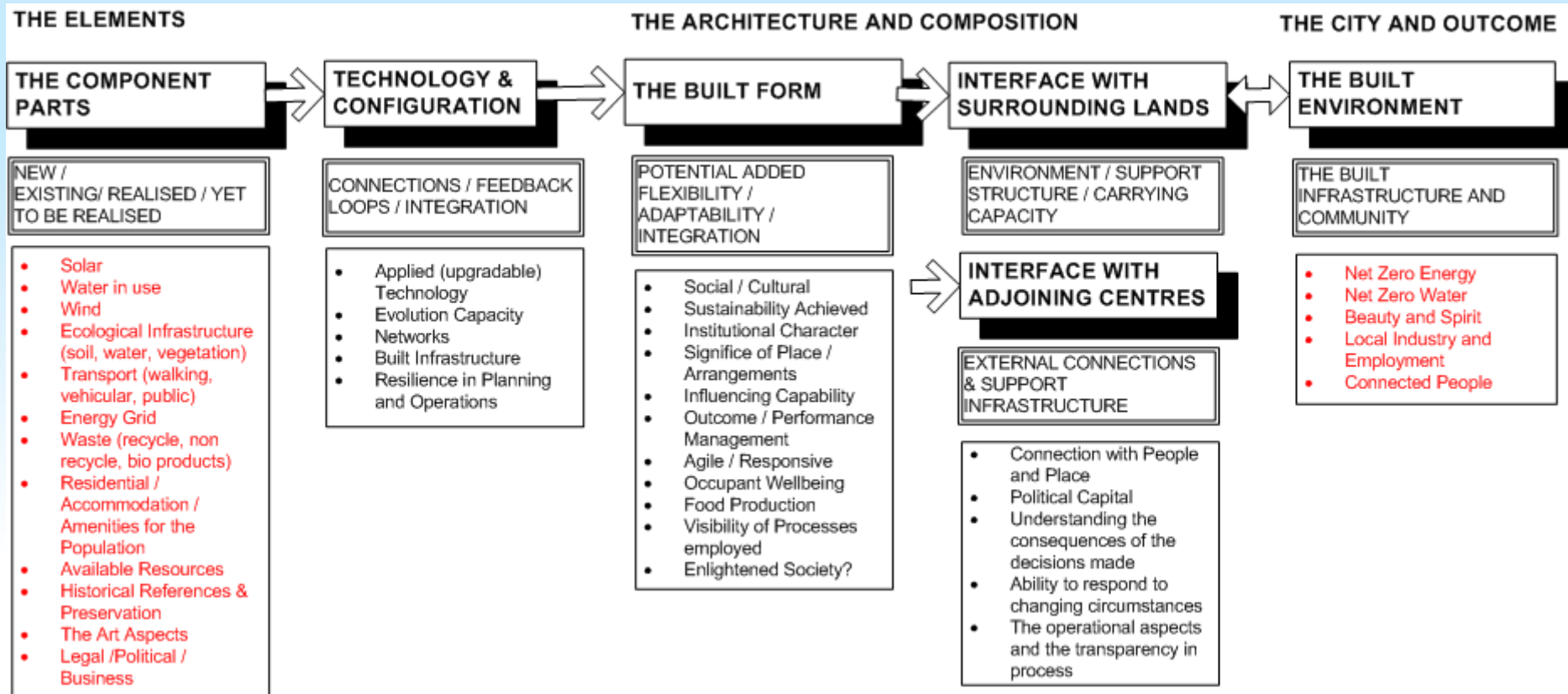


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The Evolving Multi Centric Urban Composition



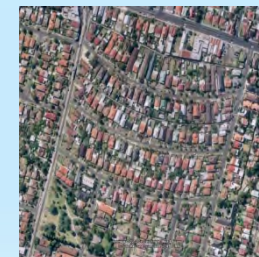
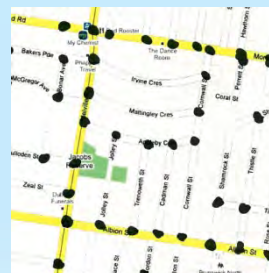




Urban Connections

Brunswick, Victoria (typical suburbia)

- Total No of Intersections: 37
- Area size: 0.65 Sq Km
- Connectivity (intersection / Sq Km): 57



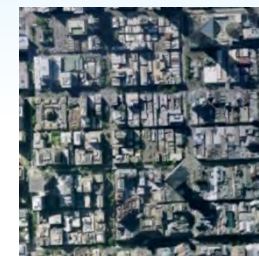
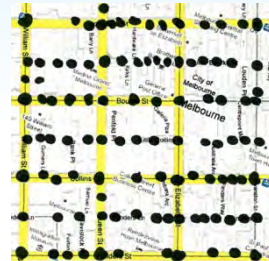
Canberra, ACT (a modern pre-planned city)

- Total No of Intersections: 65
- Area size: 0.65 Sq Km
- Connectivity (intersection / Sq Km): 100



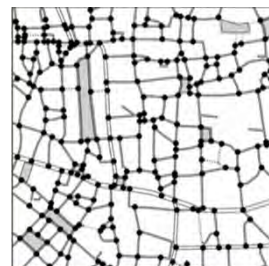
Melbourne, Victoria

- Total No of Intersections: 102
- Area size: 0.65 Sq Km
- Connectivity (intersection / Sq Km): 157



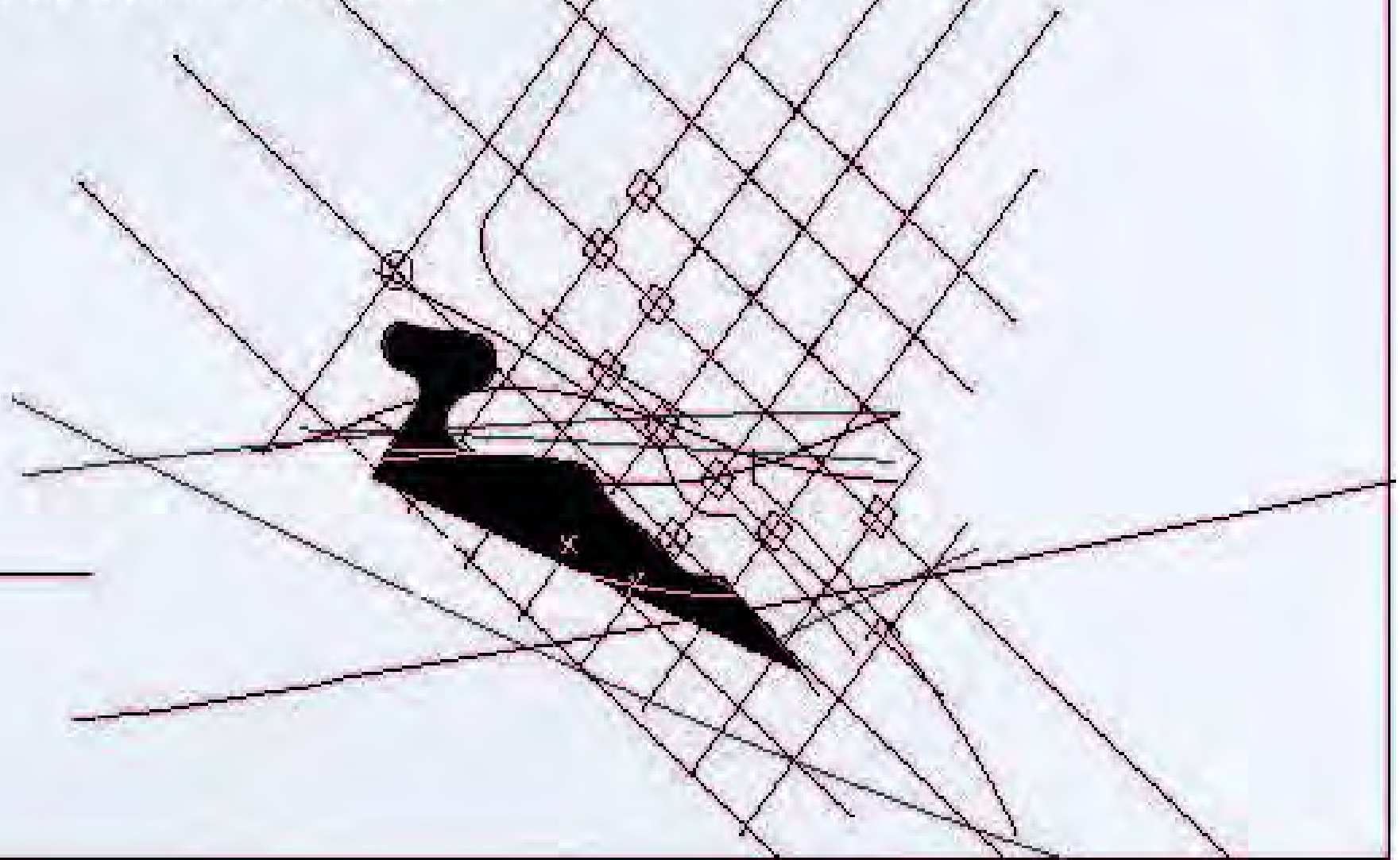
Rome, Italy

- Total No of Intersections: 247
- Area size: 0.65 Sq Km
- Connectivity (intersection / Sq Km): 380



ART AND SOCIAL INTERACTIONS LAYER

THIS LAYER SIGNIFIES THE MANY NEW ART DISTRICTS, ISLANDS OF HOPE AND PLACES WITHIN THE BUILT ENVIRONMENT THAT ALLOW PEOPLE TO PONDER AND INTERACT THE FORMAL AND INFORMAL PLACES OF EXPRESSION OF ARTISTIC ACTIVITIES





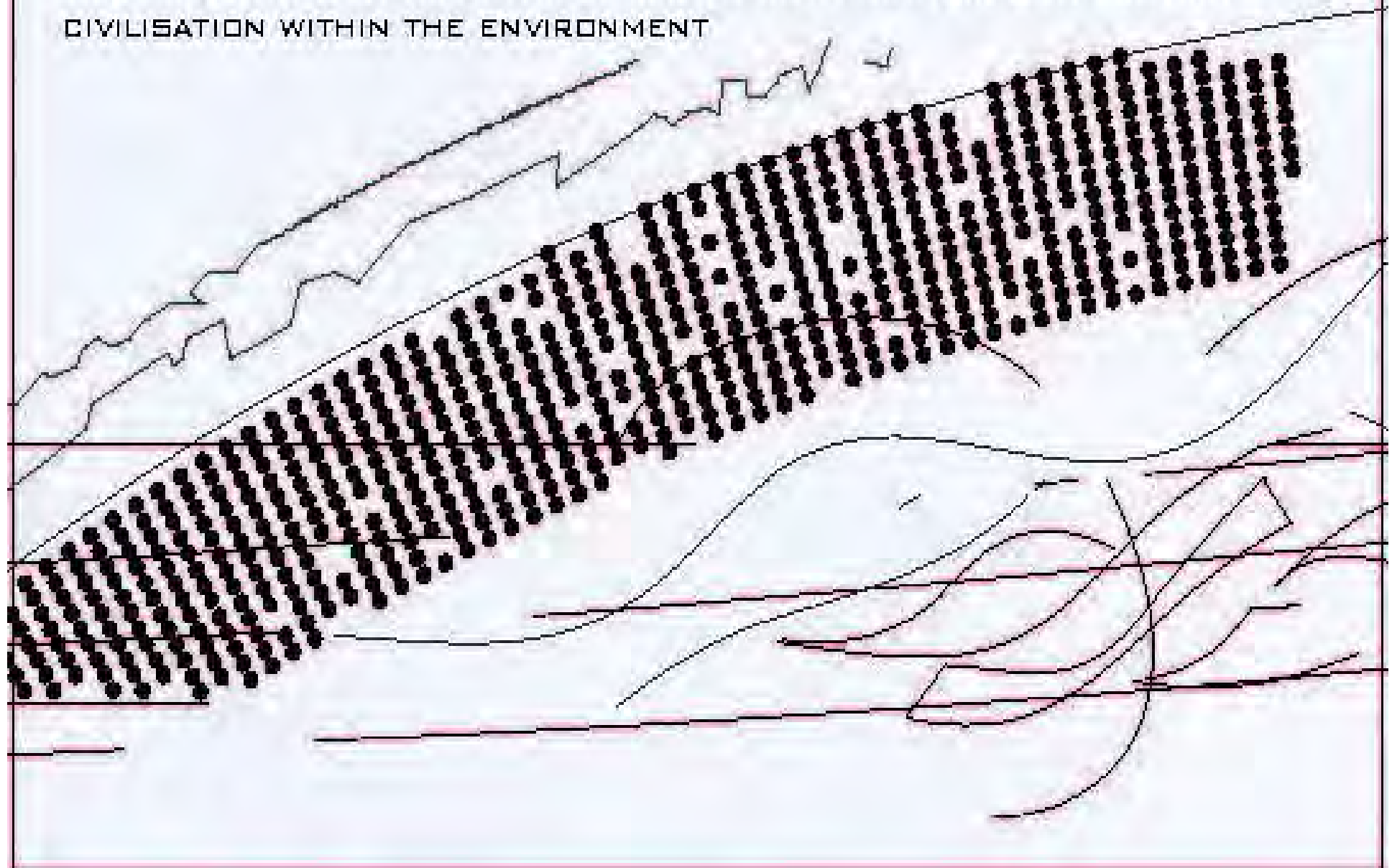
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Shobuj Pata Eco Community



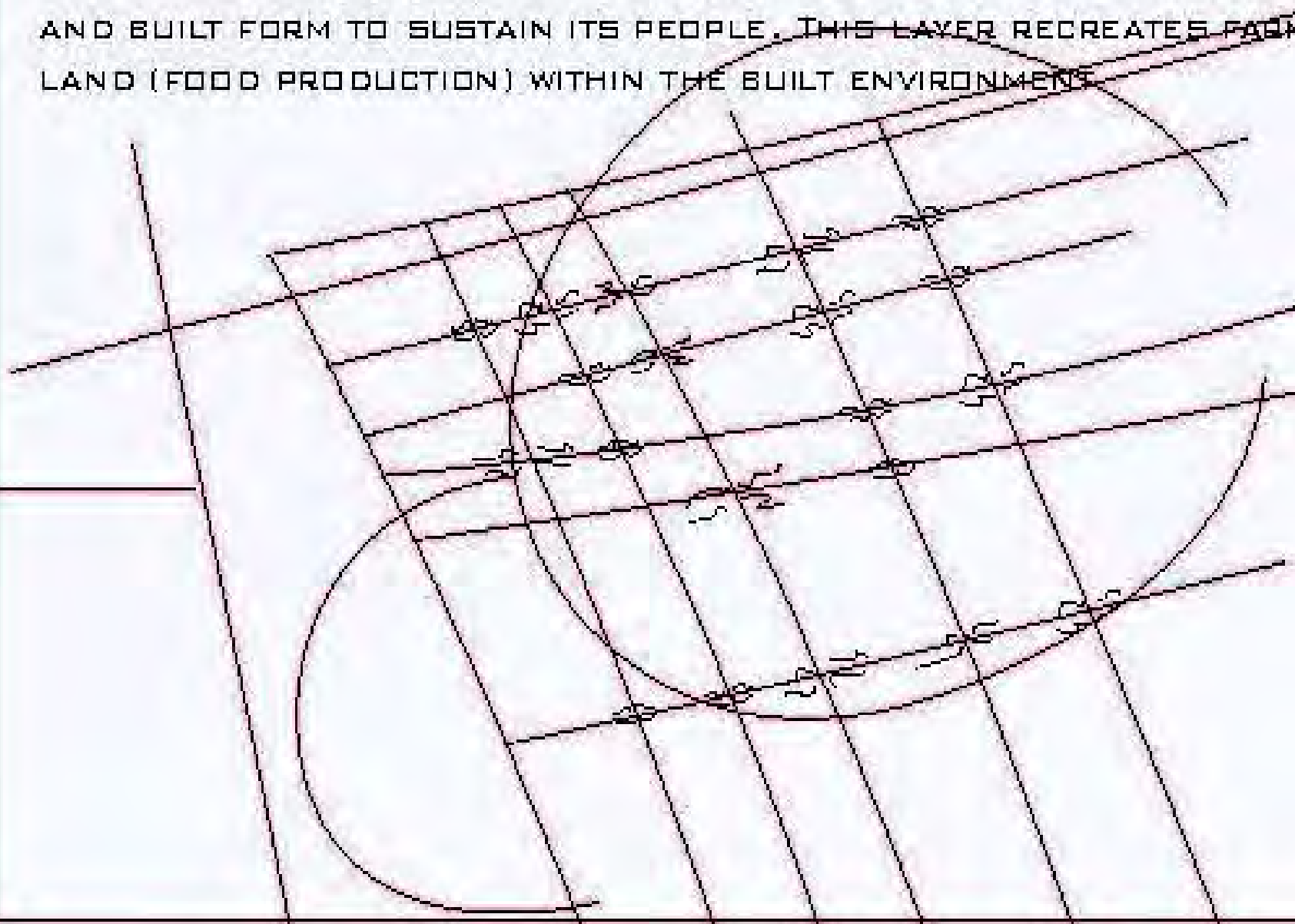
LANDSCAPE, VEGETATION AND REFORESTATION LAYER

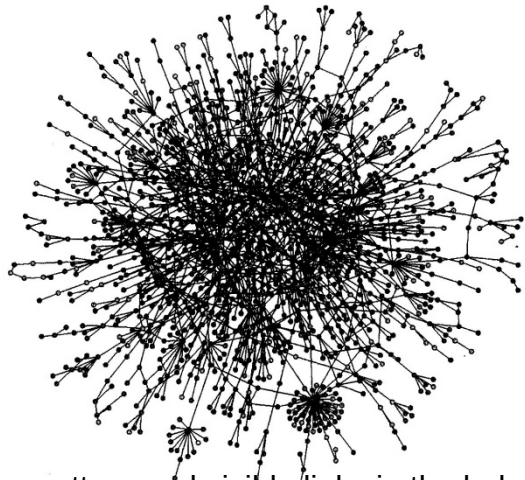
THIS LAYER DRAWS ITS INSPIRATION FROM THE ARBORETUM AND THE MYSTICAL CIRCLES THAT HAVE THE POWER TO BOTH SUSTAIN AND PROTECT CIVILISATION WITHIN THE ENVIRONMENT



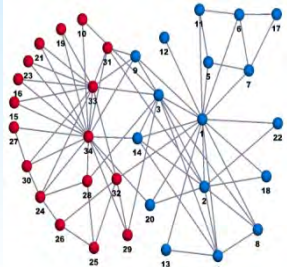
FOOD PRODUCTION LAYER

THIS LAYER BRINGS THE MEMORIES OF THE PAST AGRICULTURE THAT OCCUPIED THE SITE AND WHICH IS NOW BROUGHT INTO THE BUILT ENVIRONMENT AND BUILT FORM TO SUSTAIN ITS PEOPLE. THIS LAYER RECREATES FARM-LAND (FOOD PRODUCTION) WITHIN THE BUILT ENVIRONMENT.





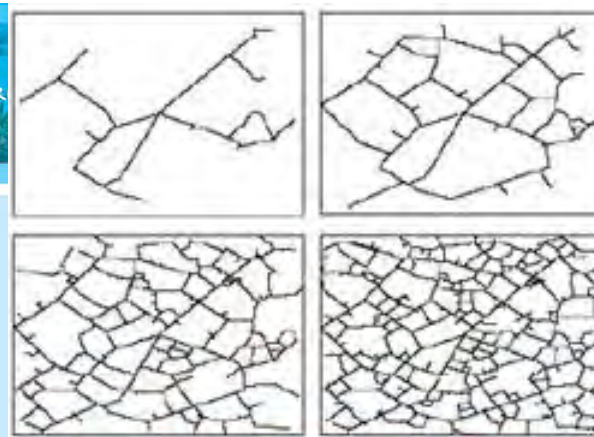
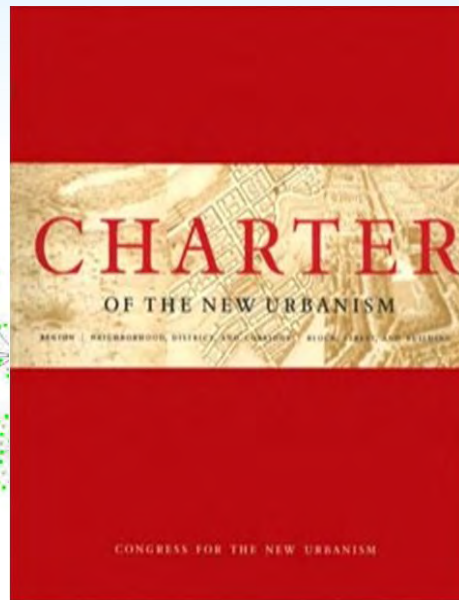
The pattern and visible links in the baker's yeast protein Source: Buchanan, 2002



The map of Internet connections



Diagram of a Social Networks



The structure of the leaf replicated in the urban grid of Paris



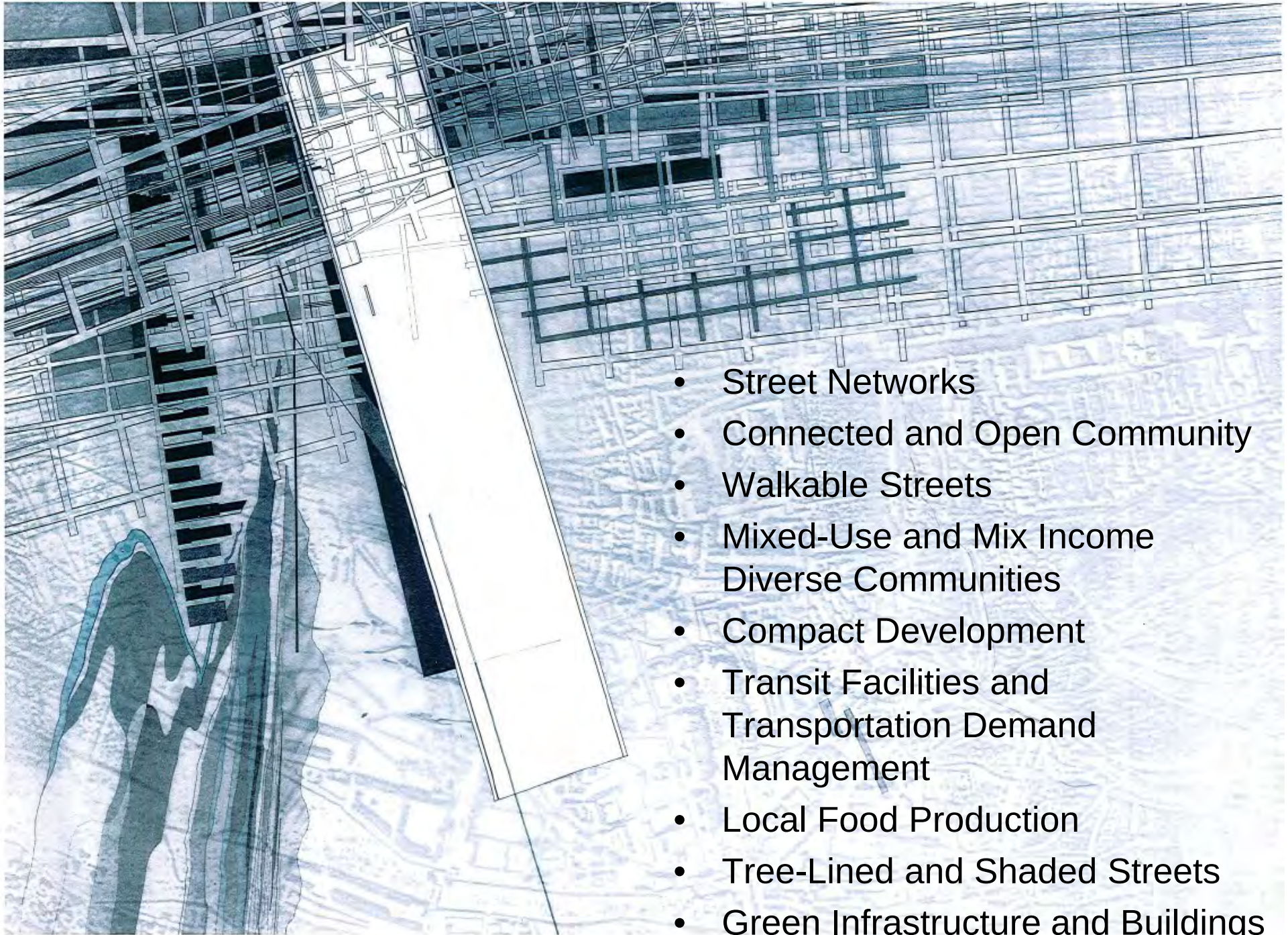
The City



The Neighborhood



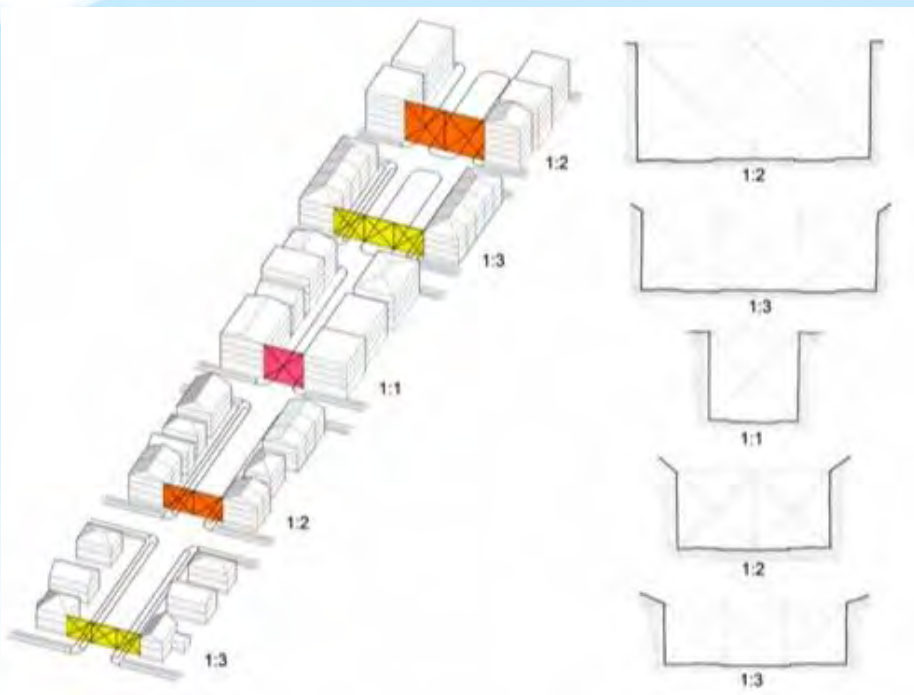
The Block



- Street Networks
- Connected and Open Community
- Walkable Streets
- Mixed-Use and Mix Income Diverse Communities
- Compact Development
- Transit Facilities and Transportation Demand Management
- Local Food Production
- Tree-Lined and Shaded Streets
- Green Infrastructure and Buildings



Walkable Streets



Top
Relationship between building
height-to-street-width ratio

Right
Form Based Zoning

Image Source: Dover, Kohl &
Partners and Ferrell Madden
Lewis



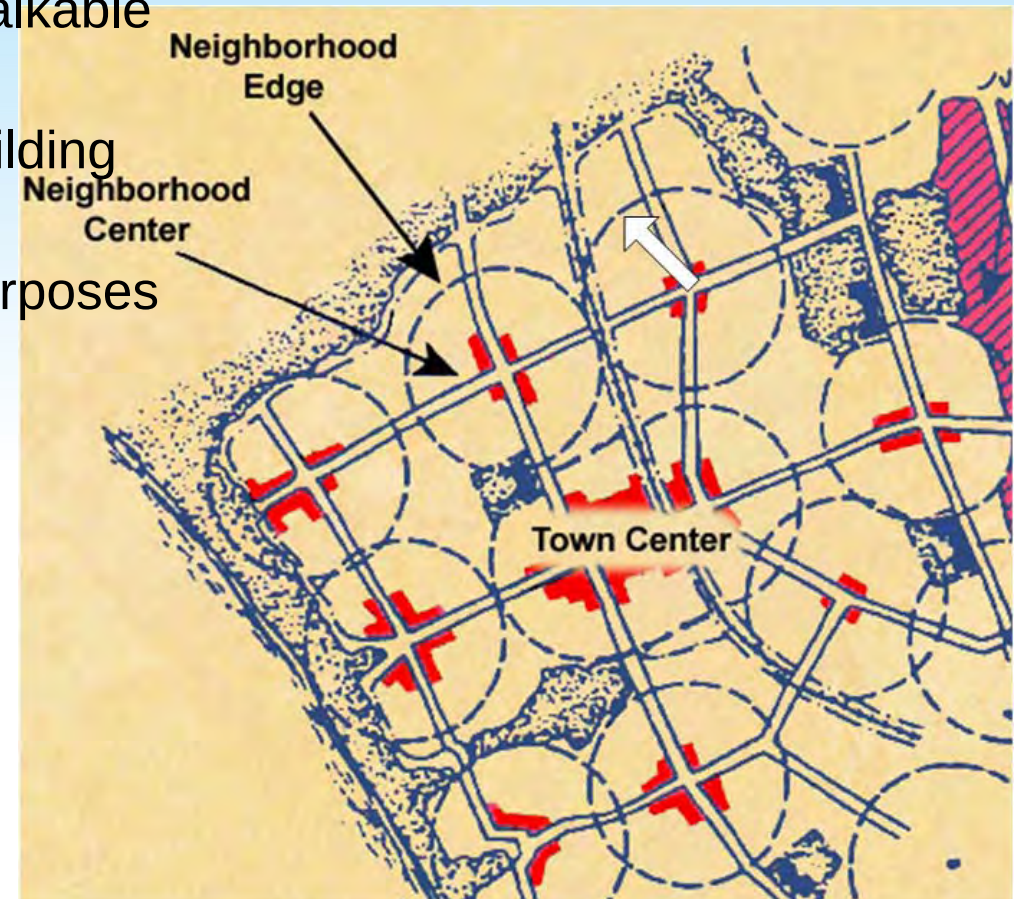
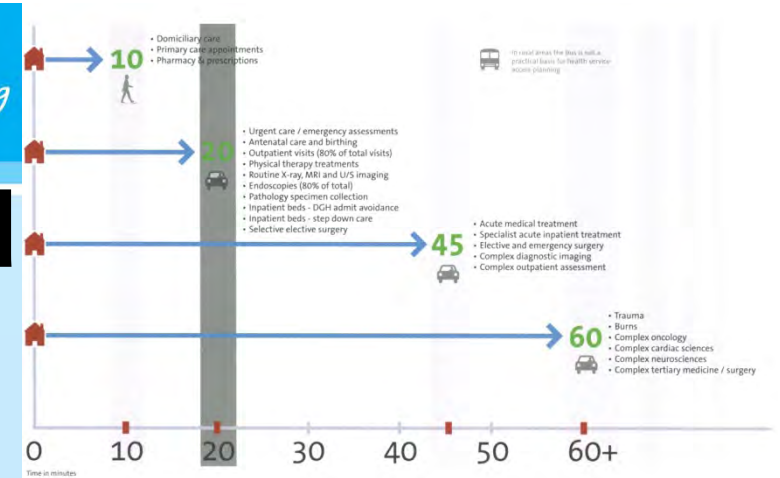
The Neighborhood

Based on Five Key Principles:

1. Identifiable centre and edge
2. Walkable size
3. Integrated network of walkable streets
4. Mix of land uses and building types
5. Special sites for civic purposes



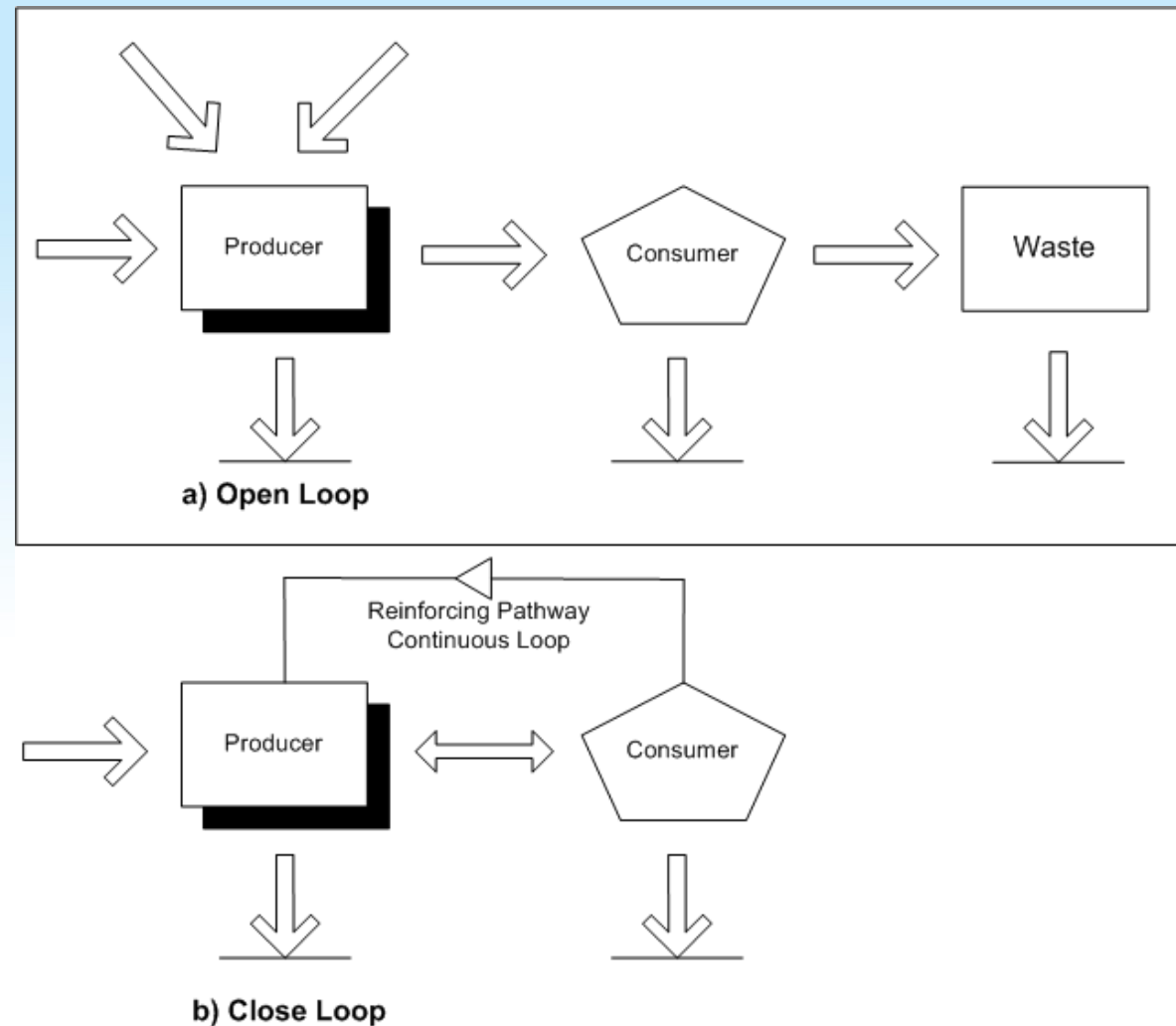
Brunswick 800m x 800m



The Artificial Vs The Natural

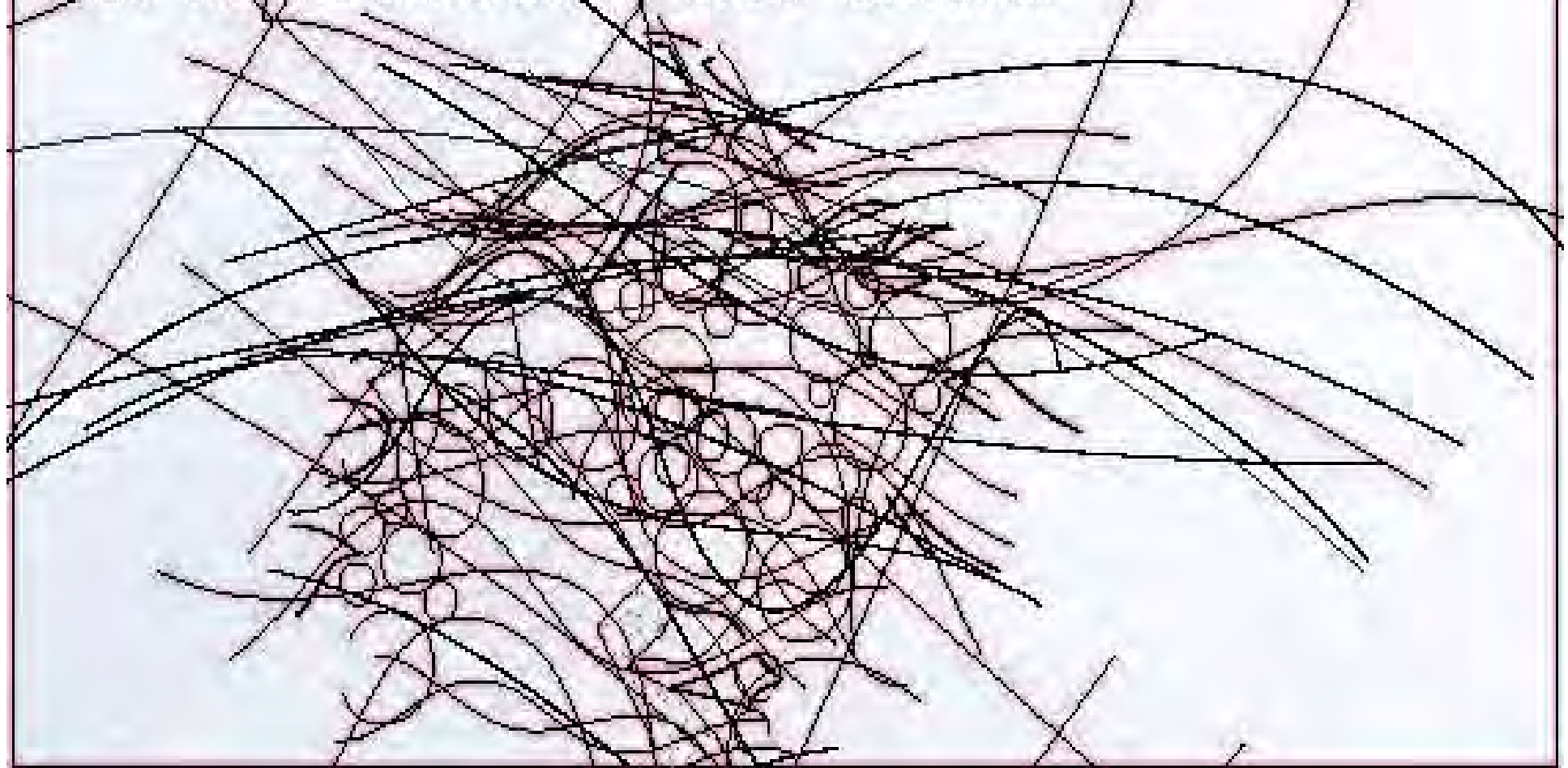
The Artificial or open looped has no limits placed on the built environment and is reliant on having an inexhaustibly supply of resources that can be consumed and then discarded.

The Natural or closed loop cycle has materials, products and a built form that can be recycled indefinitely. The closed looped can be designed to have virtually no waste and becomes sustainable as it uses outputs as food for production of new materials and products.



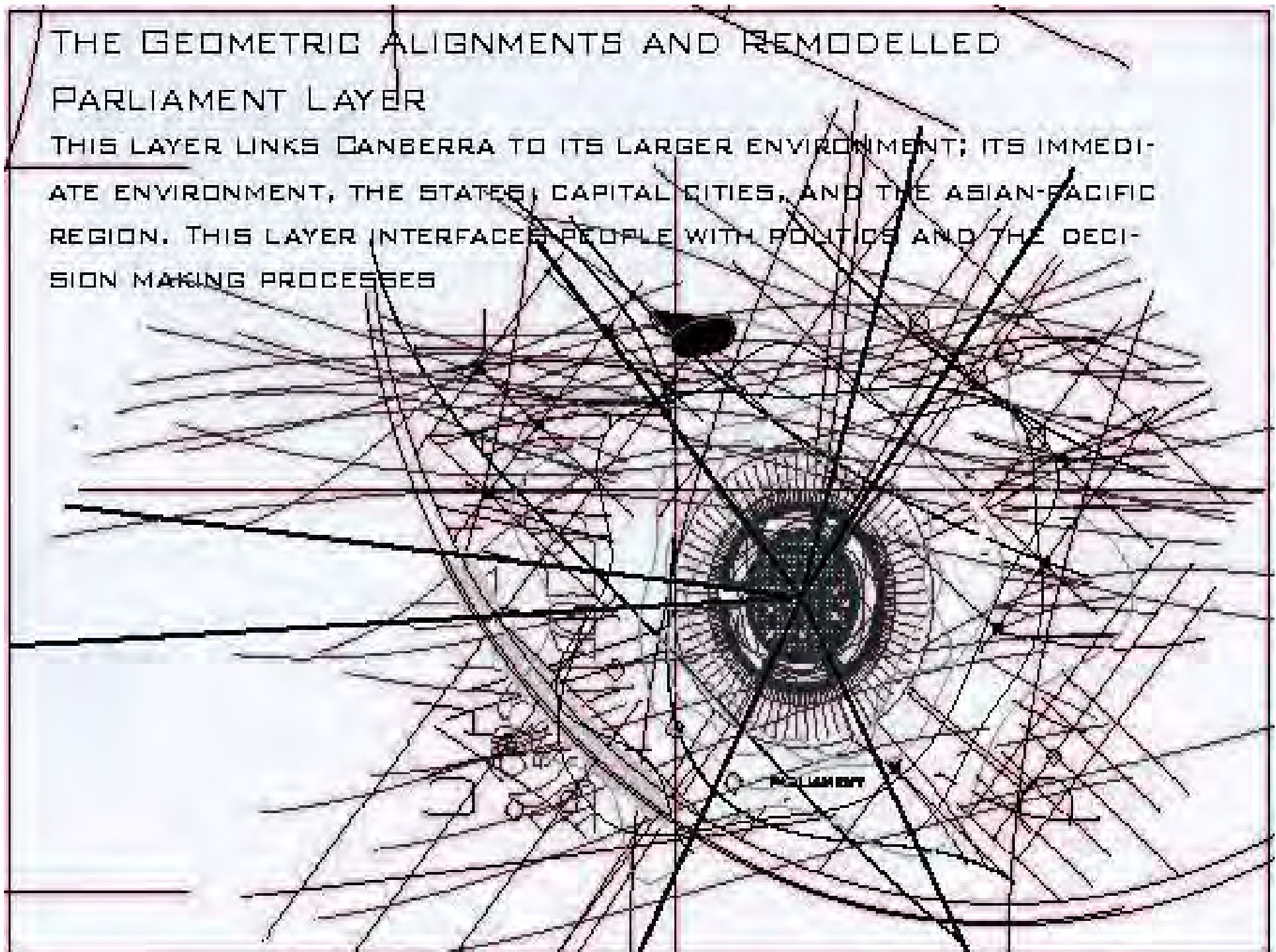
ABORIGINAL AND WAVES OF MIGRATIONS LAYER

THIS LAYER RECREATES THE DISAPPEARED MEMORIES OF CANBERRA'S PAST, AS A MYSTICAL AND SPIRITUAL MEETING AS A MEETING PLACE FOR PEOPLE, WITH CIRCULAR IMPRINTS OF LONG FORGOTTEN CAMPFIRES. THIS LAYER ALSO REPRESENTS THE MANY WAVES OF MIGRATION FROM DIFFERENT CONTINENTS, COUNTRIES, CULTURES, RELIGIONS, PHILOSOPHIES, CUSTOMS; THE EVERY EVOLVING AND CHANGING FACE OF CANBERRA.



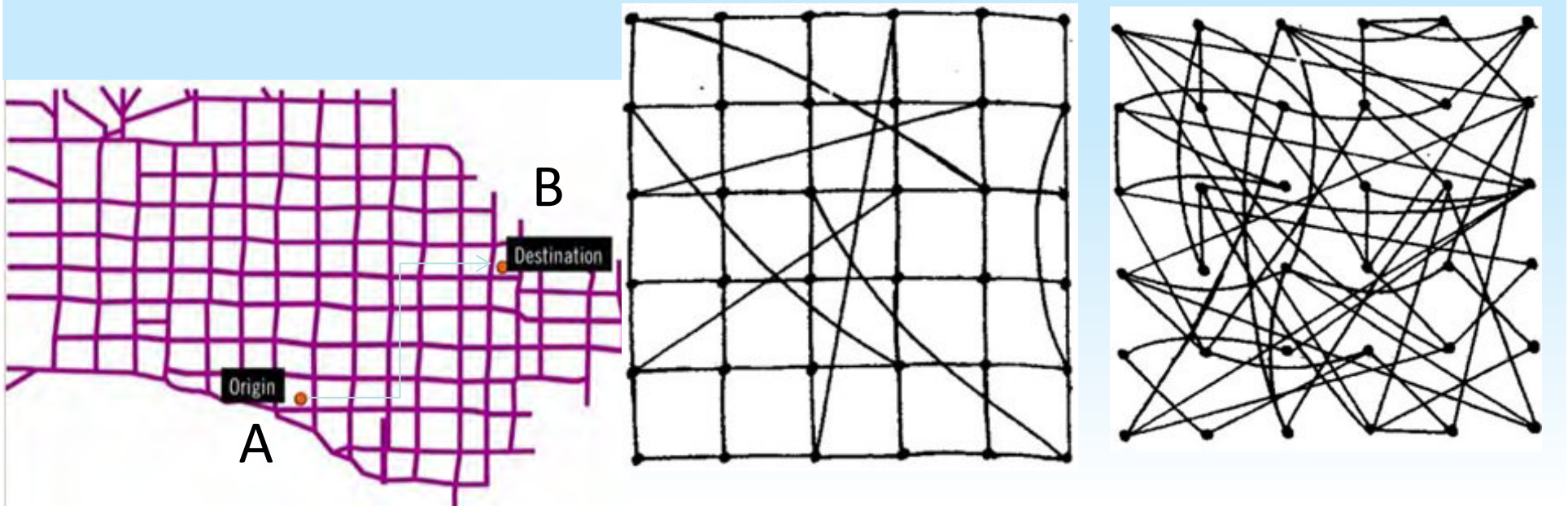
THE GEOMETRIC ALIGNMENTS AND REMODELLED PARLIAMENT LAYER

THIS LAYER LINKS CANBERRA TO ITS LARGER ENVIRONMENT; ITS IMMEDIATE ENVIRONMENT, THE STATES, CAPITAL CITIES, AND THE ASIAN-PACIFIC REGION. THIS LAYER INTERFACES PEOPLE WITH POLITICS AND THE DECISION MAKING PROCESSES



The Place Aspects

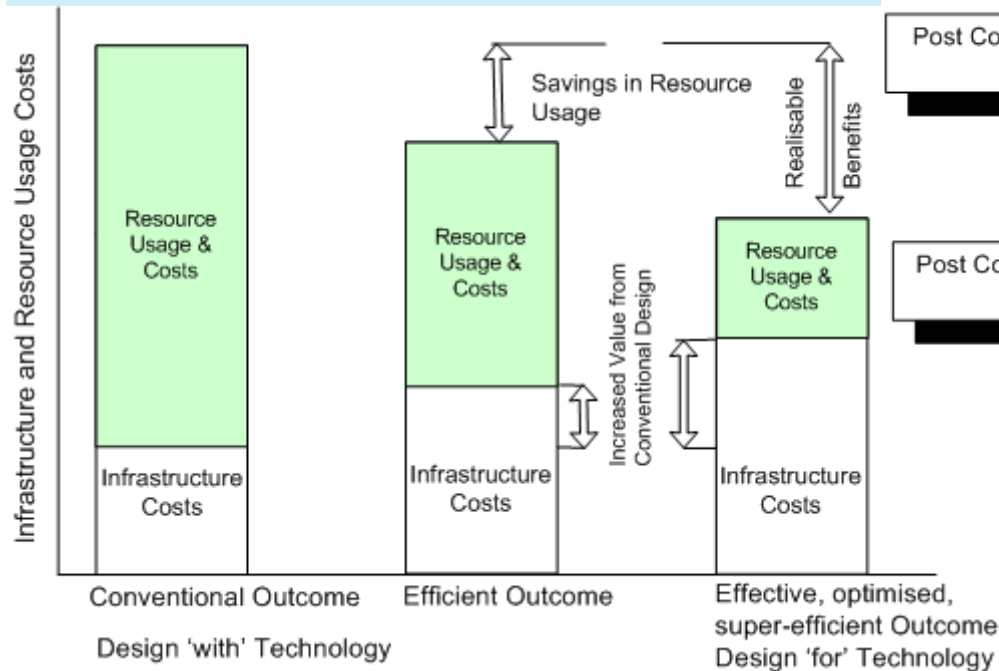
Networks /Connections/Patterns and Design



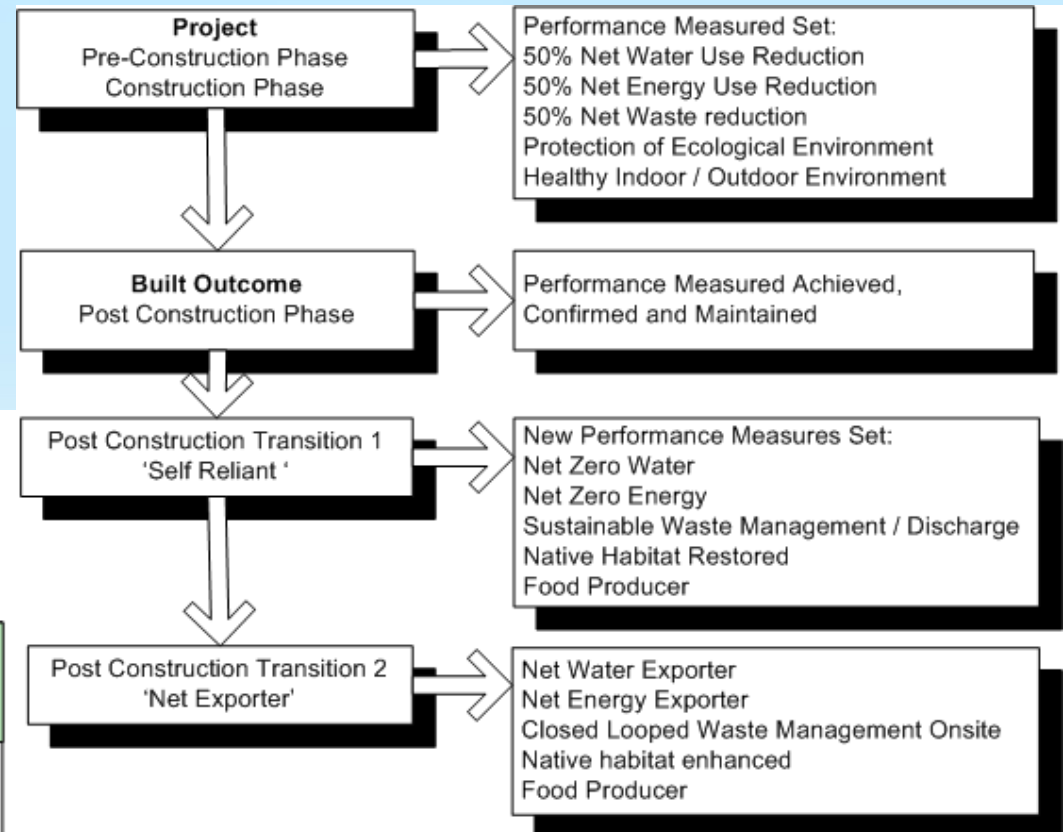
A random pattern reduces the 'degrees of separation' within the space.

Moving from the origin to destination takes more steps and greater distance in an ordered network than in random network.

Built & Infrastructure Improvements



Higher cost technologies becomes viable when lifecycle costs and long term benefits are considered



Higher urban densities create economies of scale that allow urban enhancements and efficiencies to be realised.

THE REMODELLED INFRASTRUCTURE LAYER

THIS LAYER IS THE ADDED INFRASTRUCTURE THAT PROVIDES NEW ART, ARCHITECTURE, SYMBOLISM, TECHNOLOGIES, SERVICES, AND IMPROVED AMENITIES THAT CONNECTS PEOPLE TO THEIR COMMUNITIESE



HOUSING AND RESIDENTIAL LAYER

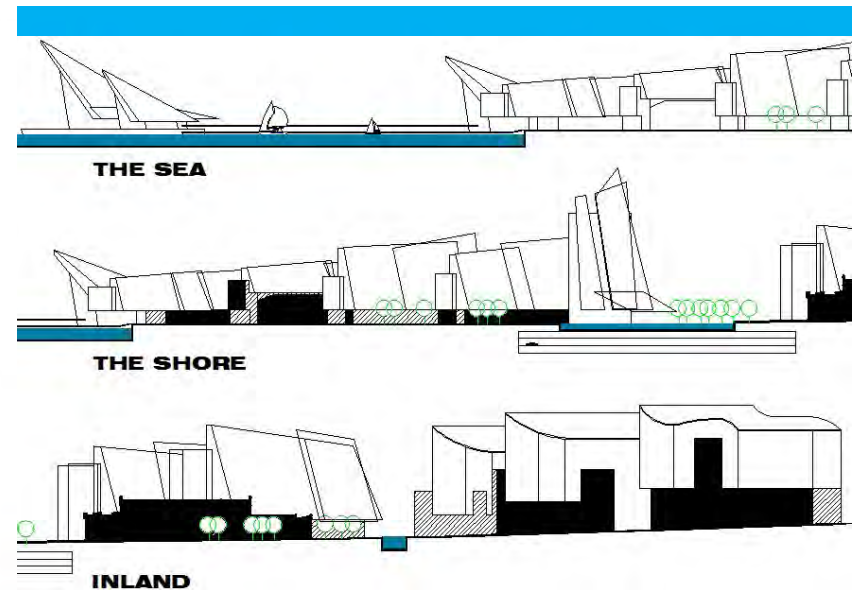
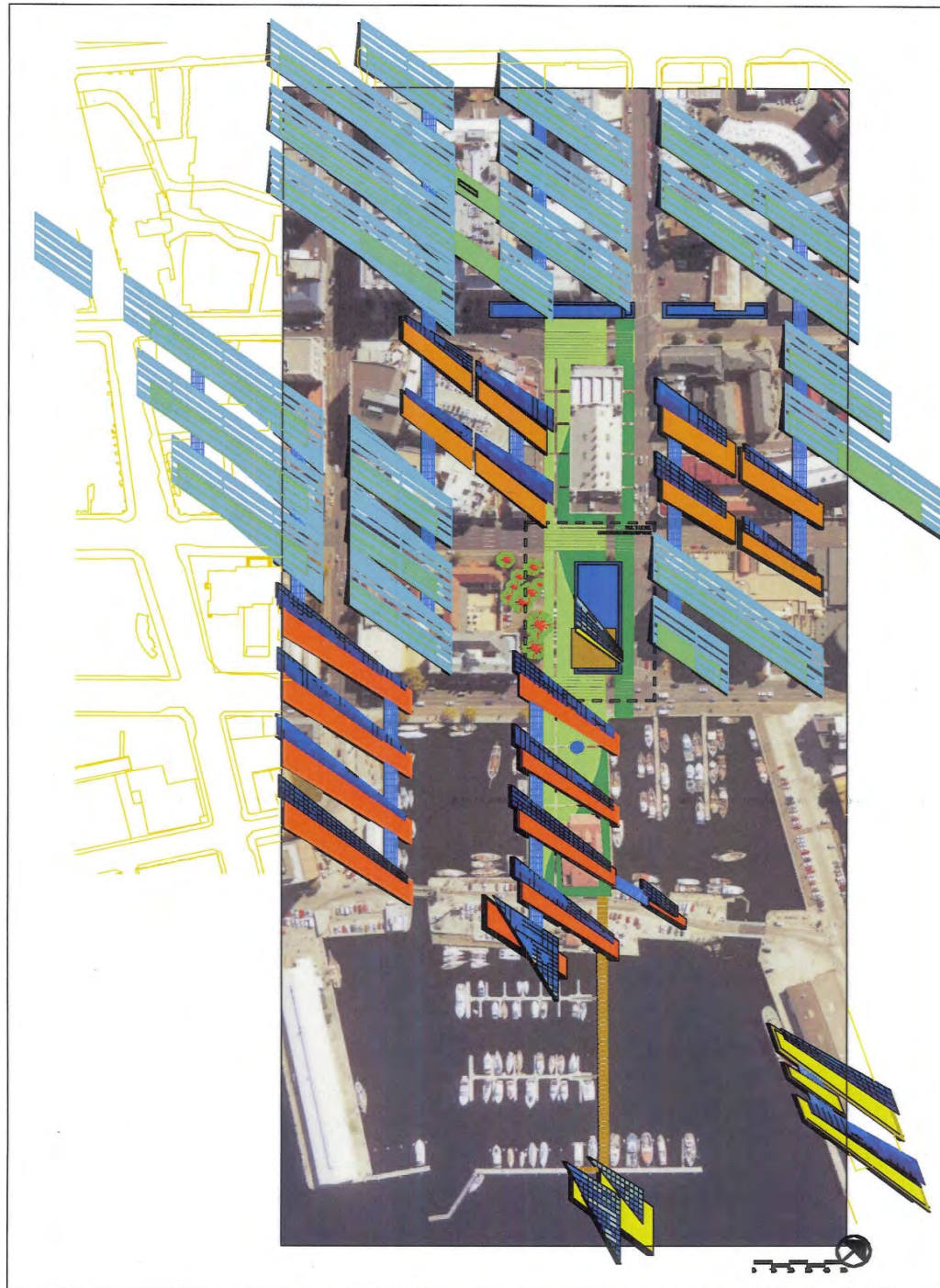
THIS LAYER SHOWS THE PROPOSED RESIDENTIAL DEVELOPMENTS TOGETHER WITH RECREATIONAL AREAS, PATHWAYS AND INFRASTRUCTURE TAKES THE FORM OF WAVES (HORIZONTALLY AND VERTICALLY) FLOWING NATURALLY THROUGH THE LAND, ORIENTATED FOR SOLAR ACCESS IN BOTH LINEAR AND CIRCULAR NOTIONS AND INTEGRATED WITH THE EXISTING URBAN AREAS



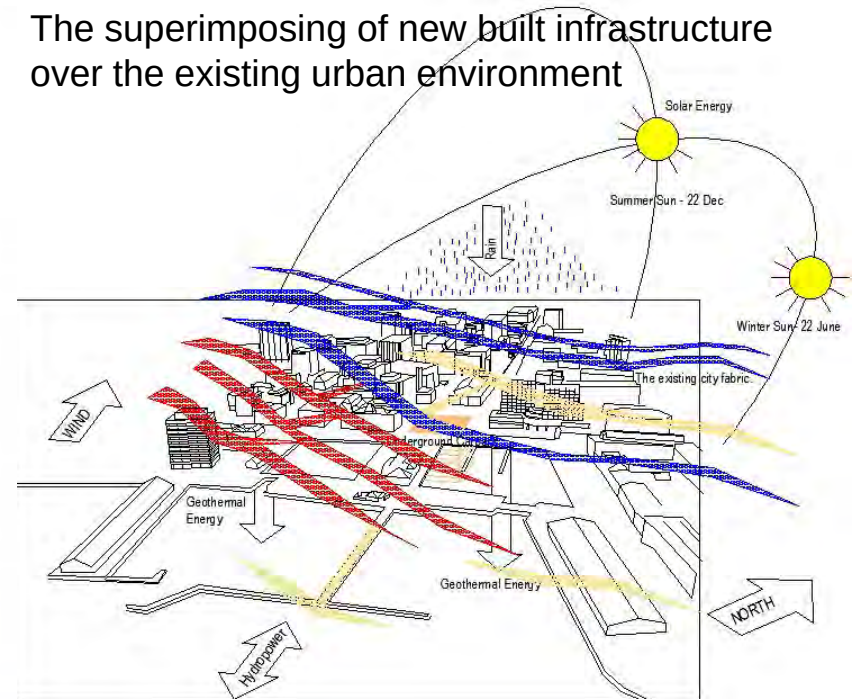
The City Plan Re-Envisioned

The Layering Effect





The superimposing of new built infrastructure over the existing urban environment



"In the world economy we live in today, economic development is no longer about cheap land, cheap gas and low taxes ... It is all about amenities, quality of life and community differentiation."

— Edward T. McMahon,
Urban Land Institute,
Washington, D.C., USA

Thank you

Mark Urizar

aaax architecture

www.aaax.com.au

