

Wanneroo Job Summit

MEGATRENDS

Jim Singleton, City of Wanneroo

Presentation Outline:

1. Megatrends
 - Out-there Stuff
 - Global MEGATRENDS in general
2. Western Australia?
3. How to deal with Megatrends?
4. City of Wanneroo – strategic perspectives

LIVING IN TUMULTUOUS TIMES

Geopolitical, Environmental Shifts and Disturbances

We're all familiar with.....

- The Crisis of Democratic Capitalism and Free Market System
- Faltering Globalization
- Resurgent protectionism and isolationism
- Brexit and Trumpism
- Resurgent totalitarian systems
- Global extremisms and terrorism
- Failing states & 'rogue nations'
- Twilight of the Carbon economy
- Energy, global climate change and species extinction
- Asia and the developing world rising

Realities and Opportunities – On the Edge of Chaos

- Transitions as large as the industrial revolution
- Whole industries will disappear
- Others will entirely transform
- Past little use in understanding the future
- Adaptability with speed will be key

Key Question: Do we have FUTURE FIT?

Ref: Organizational Change for Corporate Sustainability. Professor Dexter Dunphy

On whether we have FUTURE FIT

- **Dinosaurs** made it for 135 million years
- Then proved an evolutionary 'dead-end'
- **Young Mum and kids with 4WD.....**
- energy to biomass equivalence to 70 ton land animal (*i.e. a Dinosaur*)

***How do you rate chances of civilization making
135 million years?***

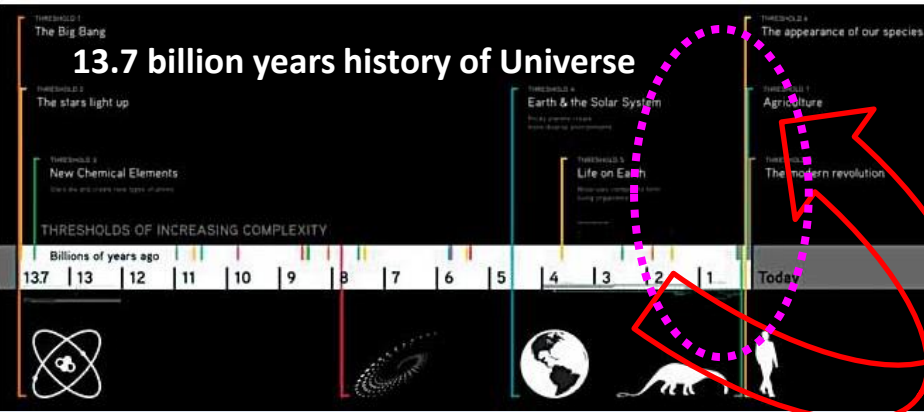
Definitions

- **Megatrend** (Economic emphasis)

Global, sustained and macro-economic forces of development that impacts business, economy, society, cultures and personal lives thereby defining our future world and its *increasing pace of change*.

- **Megatrend** (Global tipping point/Step change emphasis)

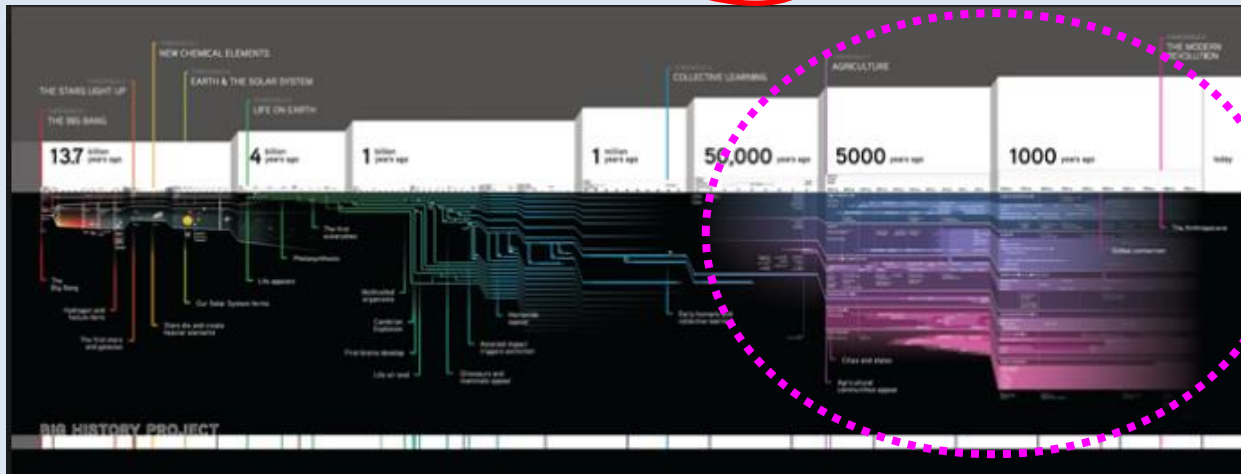
“An international or regional political, social, environmental or economic change factor, influence or event that suddenly goes ***beyond forecasted incremental change***....to ‘orders of magnitude’ change for which current solutions and responses are no longer viable or valid.” (J Singleton 2008)



'Big History' indicates a very big MEGATREND ...

....and that there's a pattern

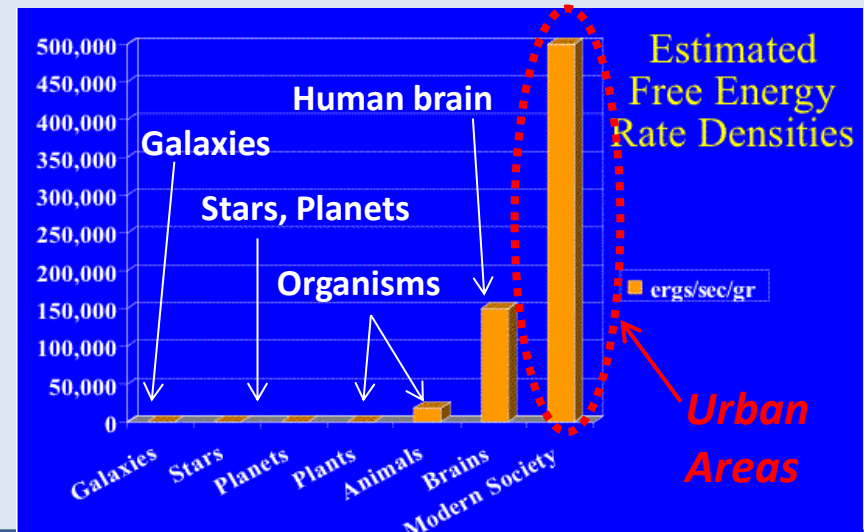
Change moments and thresholds are occurring at an increasing rate – right up to the present day...



...each threshold involves increasing complexity

...and each increase in complexity involves greater energy to maintain stability (Ergs/second/gram)

Hence: *urban areas on planet Earth – the most complex thing in the known Universe* (ref: Eric Chaisson, astrophysicist)



The point...

- **Longevity a big issue for modern civilization...**
- **UNLESS we learn to deal with key megatrends**

Out There Stuff

Centre for Existential Risk (Cambridge University):

- Long term survival of the human species
- Looking at usual suspects – *science, nuclear war, asteroids*
- How to cope with human optimism
- Do we live in a computer simulation?
- Hyper-intelligent machines – *very dangerous*
- Technological singularity – *artificial intelligence takes over from humans*
- Quantifiable risk – *no problem (by definition fixable)*
- SCARY: risks not thought of – *the unknown unknowns*

Al Gore Rides Again....

Six great drivers of global change and disruptions:

- 2 focus: inter-connectedness of economies and human minds
- 1 focus: changing balance of world power
- 3 focus: environmental and bio-medical issues
- Robotics – relationship between capital and labor
- 3-D printers, carbon nanotube energy transport
- Disintermediation
- Wealth isolation
- Fossil fuels to solar power systems

Game Changers: CSIRO Global Foresight Project (2013)

- ✓ Aging population
- ✓ Food and water shortages
- ✓ Shift from West to East
- ✓ Digital age – cloud computing
- ✓ Controlling carbon emissions
- **Rising demand for experience over products**
- **Rising importance of social relationships**
- Teleworking
- Smaller office spaces
- Impact of shale gas on US economy???
- **Escalating sovereign debt**
- **Unwinding of central bank money - printed on historic low interest rates**

DNV GLOBAL MEGATRENDS ASSESSMENT 2010-2020

Looking at Technological Uptake

Topics:

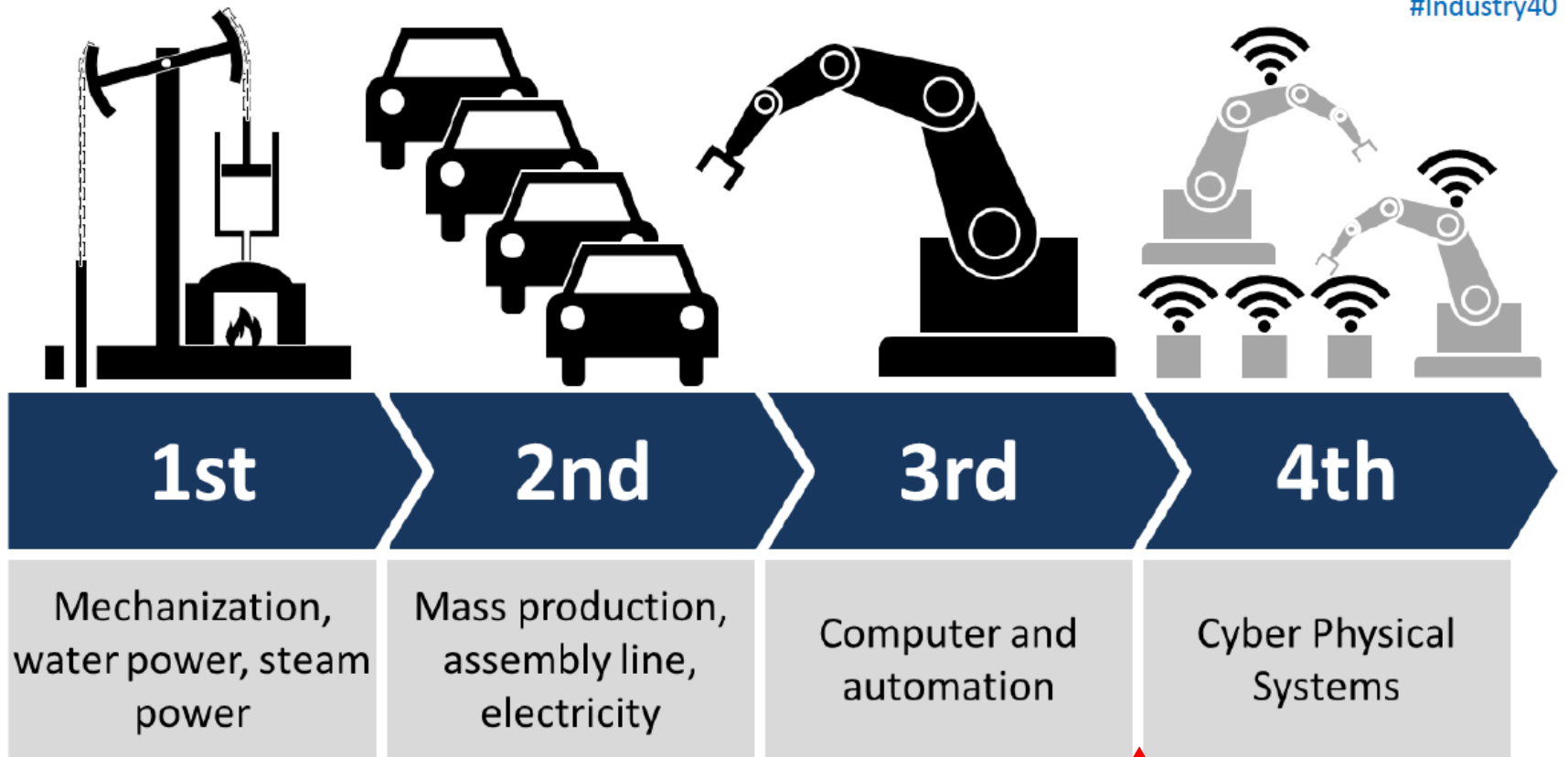
1. Population
 2. Economy
 3. Governance
 4. Information Technology
 5. Energy
 6. Natural Resources
 7. Climate change
- 

In each case considered:

- data and trends
- uncertainties
- disrupters

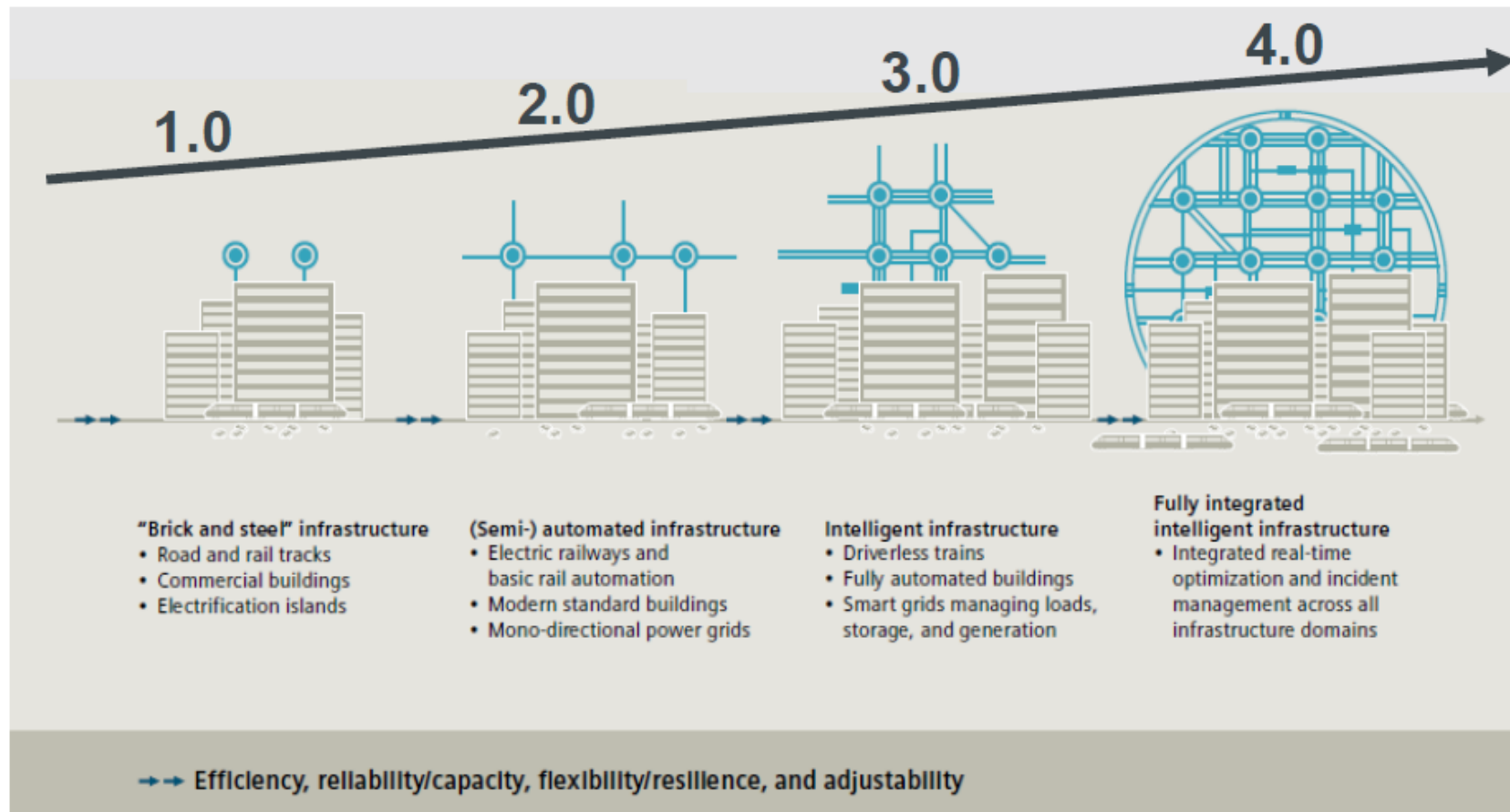
The Fourth Industrial Revolution

Twitter: @RickNewnham
#Industry40



Currently we're here, but
moving fast

Infrastructure 4.0 – 4 stages of infrastructure development

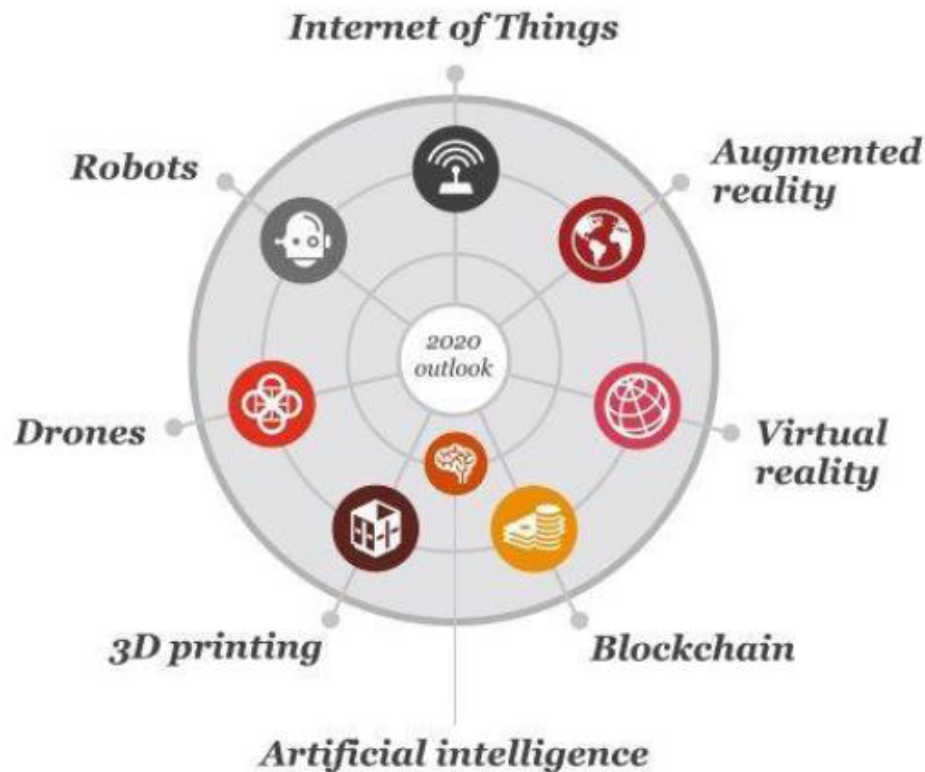


Source: Siemens

Key Emergent and Disruptive Technologies

Twitter: @RickNewnham
#Industry40

The essential eight technologies

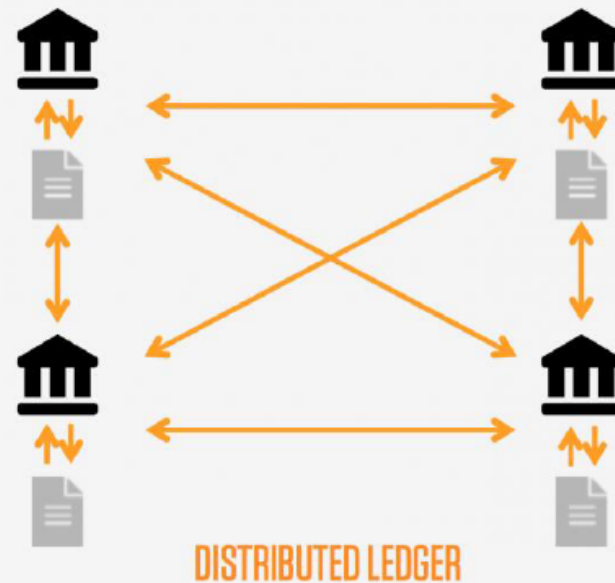
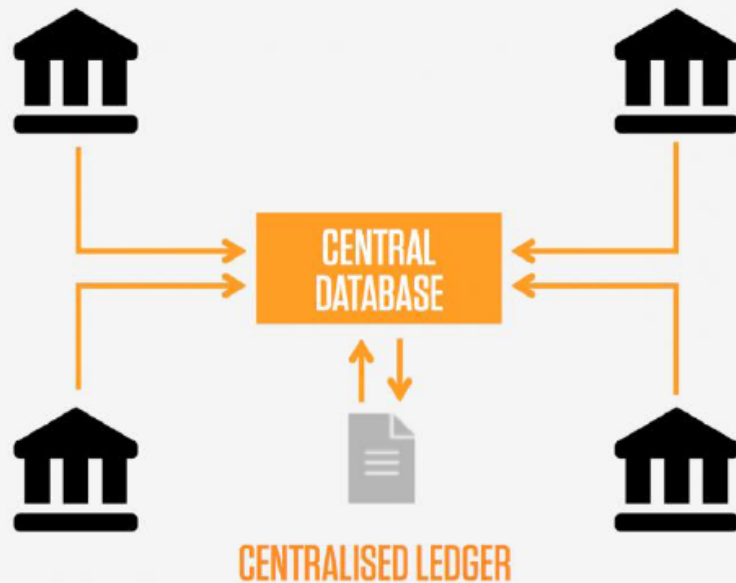


What is Blockchain?

Twitter: @RickNewnham
#Industry40

EMBEDDING DISTRIBUTED LEDGER TECHNOLOGY

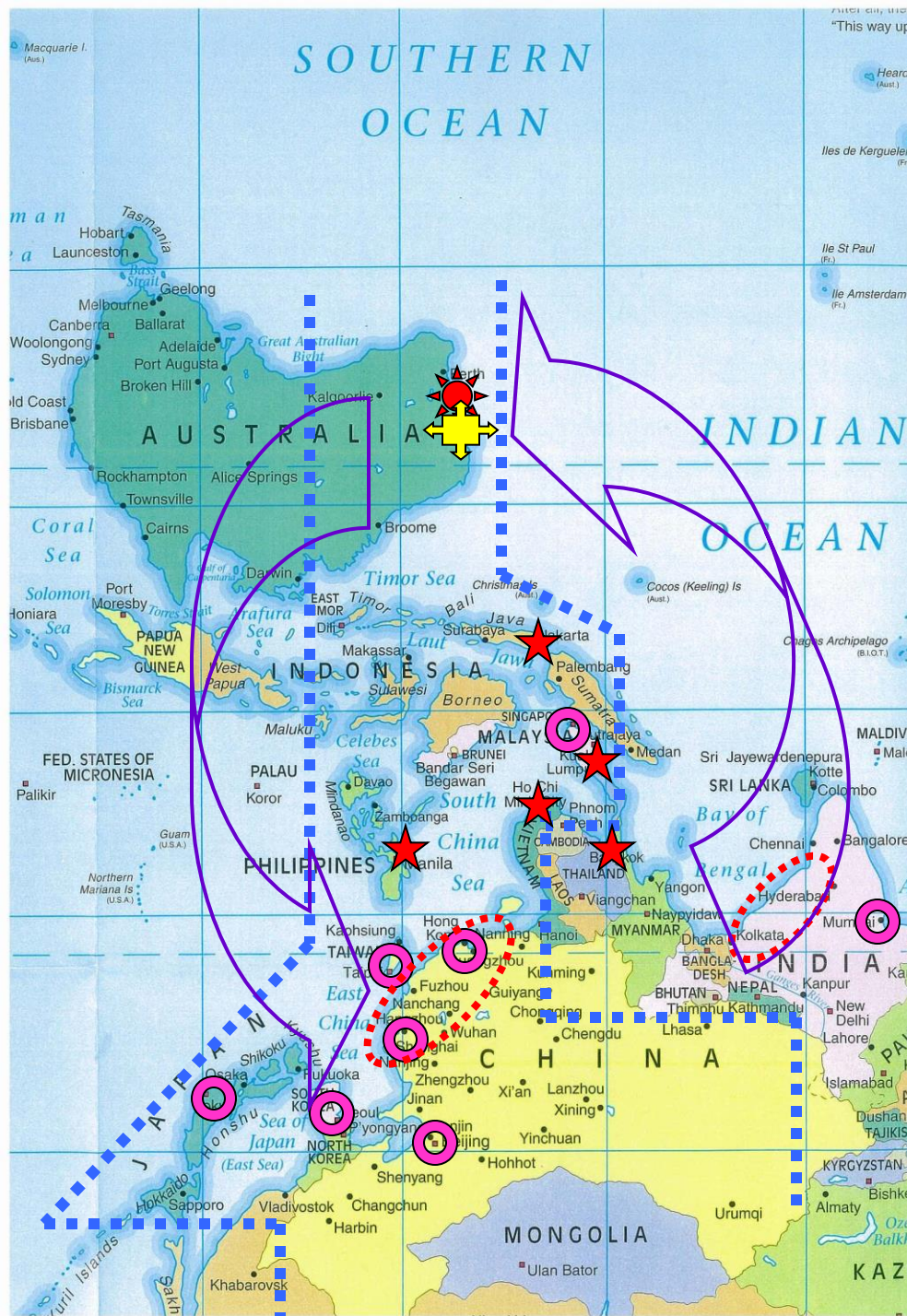
A distributed ledger is a network that records ownership through a shared registry



Megatrend Summary Sheet for Job Summit

- Overview of near-term megatrends
- Megatrends to 2025
- Megatrend related challenges
- Emerging technologies
- Connectivity and convergence
- Industry impacts
- Smart factories and automated jobs
- Politics of technological uptake
- Urbanisation
- Social trends by 2020
- Risks and the 4th Industrial Revolution
- Megatrend implementation

Part 2: LETS TALK ABOUT WA



 **Global economic hubs**

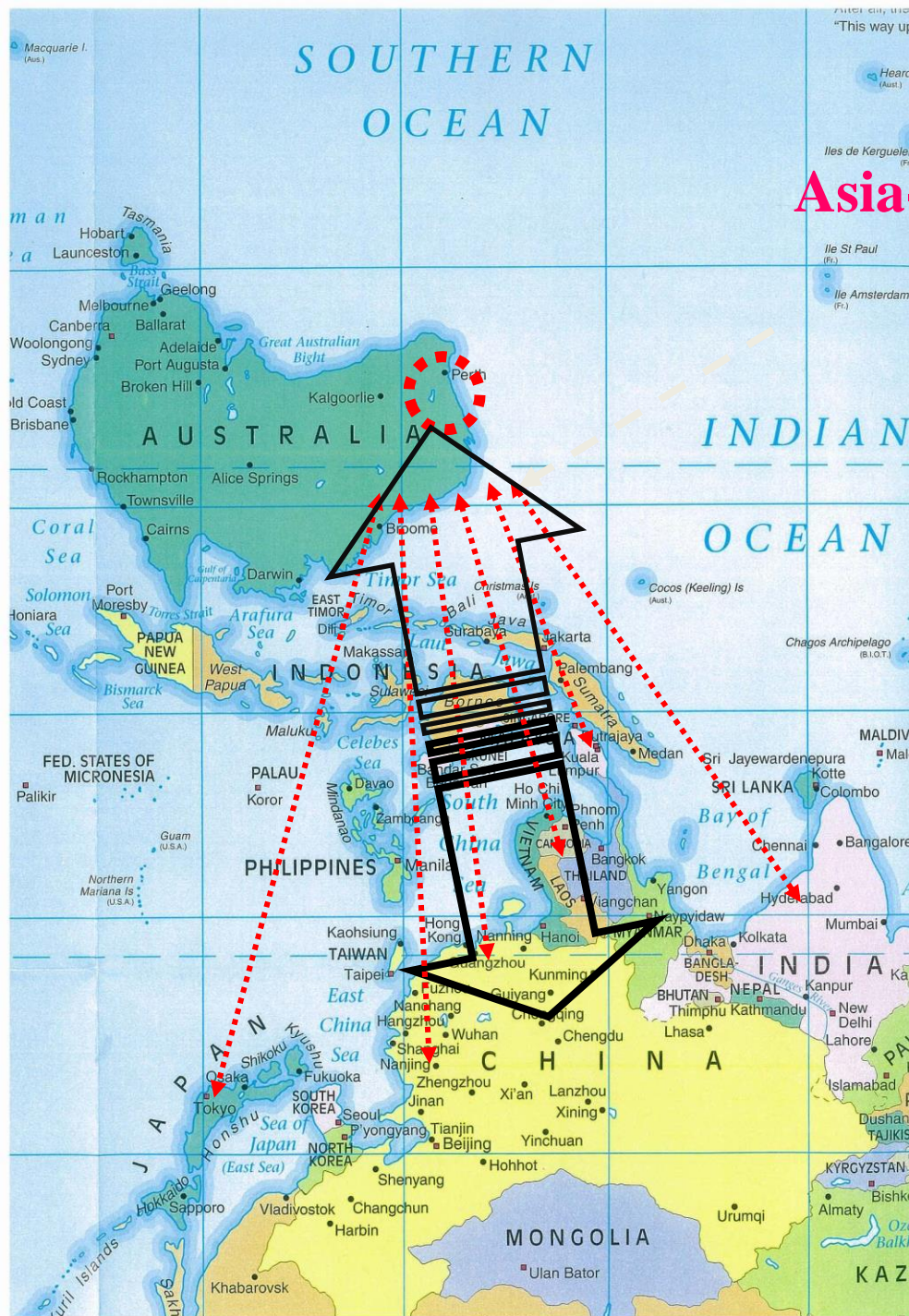
 **Rising global cities**

 **Time zones (+ or - 1 hr)**

 **Regional flows:**

- FDI
- elite commuters
- business networks
- materials
- products
- resources
- innovation
- knowledge
- expertise
- values

Ref: Worldwide
Centres of Commerce
Insights (2007),
MasterCard



Asia-Australia settings:

- down stream processing
- IT based industry
- ‘silicon valley’ model
- tourism living
- immigration
- food production
- settlement design
- liveability innovation
- regional commuting

WA's Key Vulnerabilities?

Basic Vulnerabilities to External MEGATRENDS:

- **Isolation** – long distance supply lines
- **Remote NW resources** – strategically vulnerable
- **Primary producer economy** – too much dependency on too few sectors
- **Resource sector financial 'jet-stream'** – missing out!
- **Lack of economic diversification** – low resilience economy
- **Stressed small business sector** – 'small economy' resilience is low
- **Climate change impacts** – we're the 'canary in the cage'!
- **Outlier ecosystems** – vulnerable species, habitat niches to rapid shifts
- **South West forests** – how resilient? Could fall over?
- **Agricultural lands** – potential devastation scenario on a vast scale?
- **Surge dominated' sandy coastline** – sea level rise?
- **Long trip travel patterns** – low density land use/road travel dependency
- **Housing stock legacy** – inappropriate for 'north African' type climate

Some Topics for WA Strategic Planning & Economy

- Escaping **Boom and Bust** cycles
- **Mining Sector Dependency**
 - **Trends in the Mining Sector**
 - robotics and workforce downsizing
 - Capex to Opex
 - Reduction in mining industry gross salaries = reduction in WA household expenditure
- **Land and lease costs** (“killing small business softly”)
- **Congestion** and ‘real’ travel costs
 - jobs where people live vs people where there are jobs
 - real costs of public transport (practicality, cost and marginal propensity to consume)
- Response to **climate change**
- **Water**, water and water
- **Innovation Imperatives** (e.g. housing stock, food security, citizen governance, gated communities, urban equity, 3D additive Manufacturing cooperative centres etc.)
- Modular **housing**, courtyard housing and innovation in the housing sector?
- The **residential lot density progression** – getting silly?!

Residential Lot Density Progression?

In the Beginning

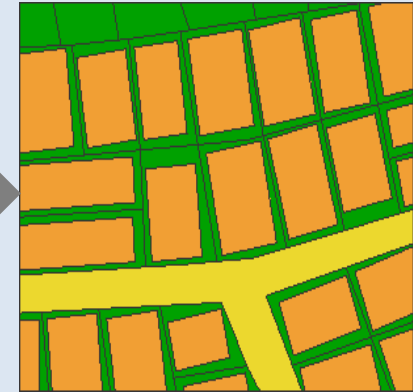
1. Small houses on large lots with big gardens



2. Big houses on smaller lots with much less garden



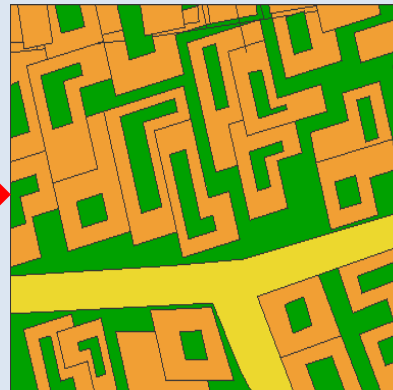
3. Huge houses on v small lots with v small gardens



4. Just houses/dwellings, no gardens



5. Housing cosmos explodes outward from the centre.....



...Behold! Courtyard housing is born



Part 3

What can we do about Megatrends?

What should we do?

And how?

Megatrends and the frequent response....

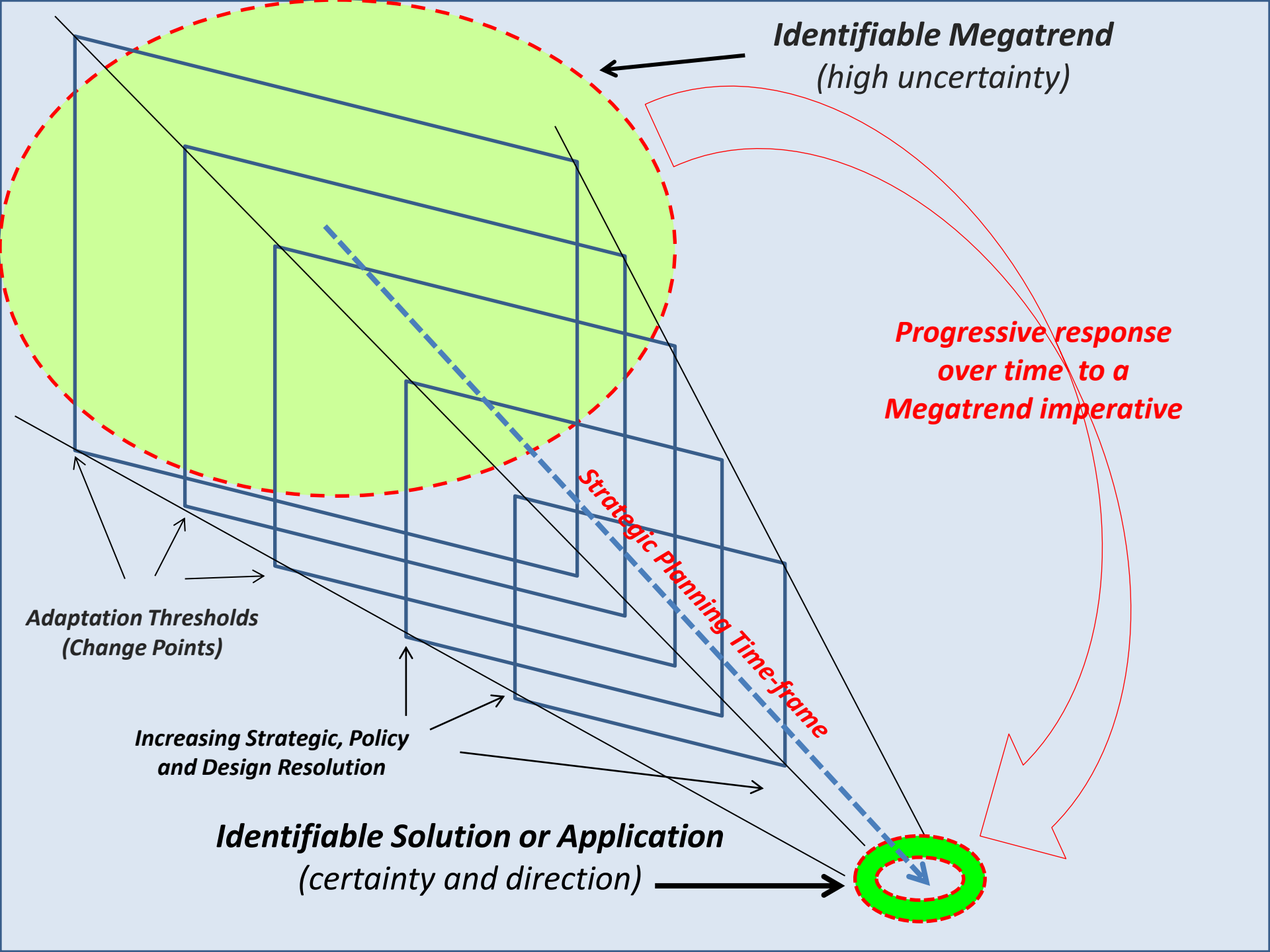
“Yeah, I hear you..... so what?”

“ It’s just too big to deal with.....”

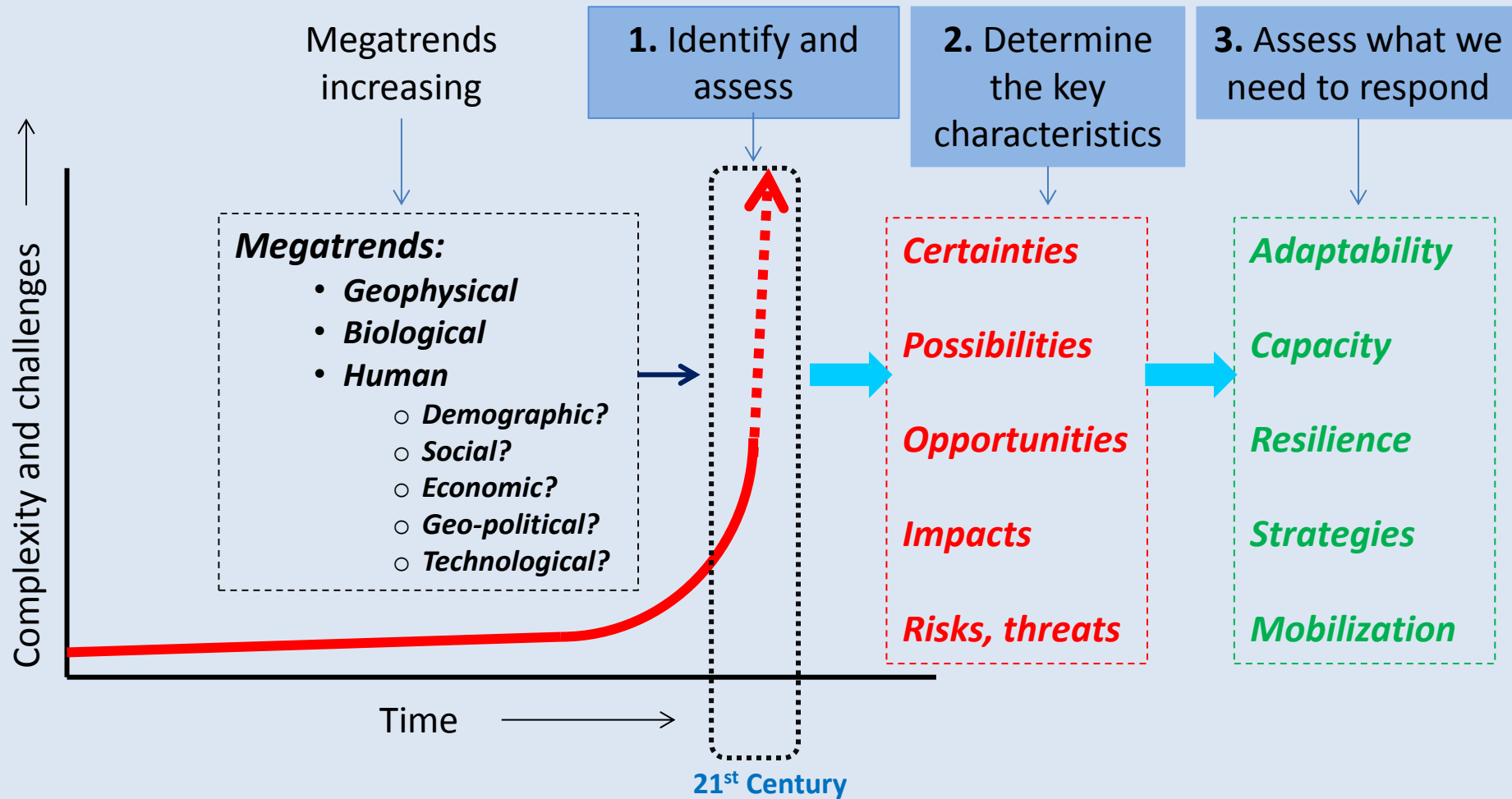
“ Sorry, not realistic right now...”

So we need practical frameworks:

- How to deal with something very big and long term
- And do something manageable in the short term



How Can We Practically Respond to Megatrends? What might be involved?



So, how can planners respond?

Framework for Planners?

1. Determine megatrends to be considered and why?

Megatrends & societal issues

2. Identify what is important i.e. criteria applied?

Opportunities & Risks

3. Decide what to consider in planning and design terms?

Adaptability & Resilience

4. Prepare and/or undertake:

- **Strategies**
- **Modelling**
- **Objectives**
- **Targets**

- ***Abstract aspects = principles, policy***
- ***Physical aspects = spatial & design***

- **Comprehensive 5 yearly reviews**
- **Monitoring and review cycle**

Note: State policies increasingly incorporate 5 year review cycles – an essential requirement for the world we now operate in.

5. Planning implementation

- **Action plans**
- **On-ground delivery**

Accept the need for ongoing adaptive management:

- *Step-changes will occur*
- *Radical departures from existing trend-lines & practice will happen*

We Still Need Filters to Deal with Complexity

(i.e. Diversity of Megatrends: Disruptive Technologies, Emerging Innovations, Social Change, Political Shifts, Economic/Economy Transitions)

Primary Filters:

- Is it global, glocal or local?
- In all cases – how, what, when, where, why?
- Can we respond?
- Passive observers only?
- Non-active participants
 - response & adaptation
- Active participants
 - Can we contribute to solutions?
 - Can we influence?

Secondary Filters:

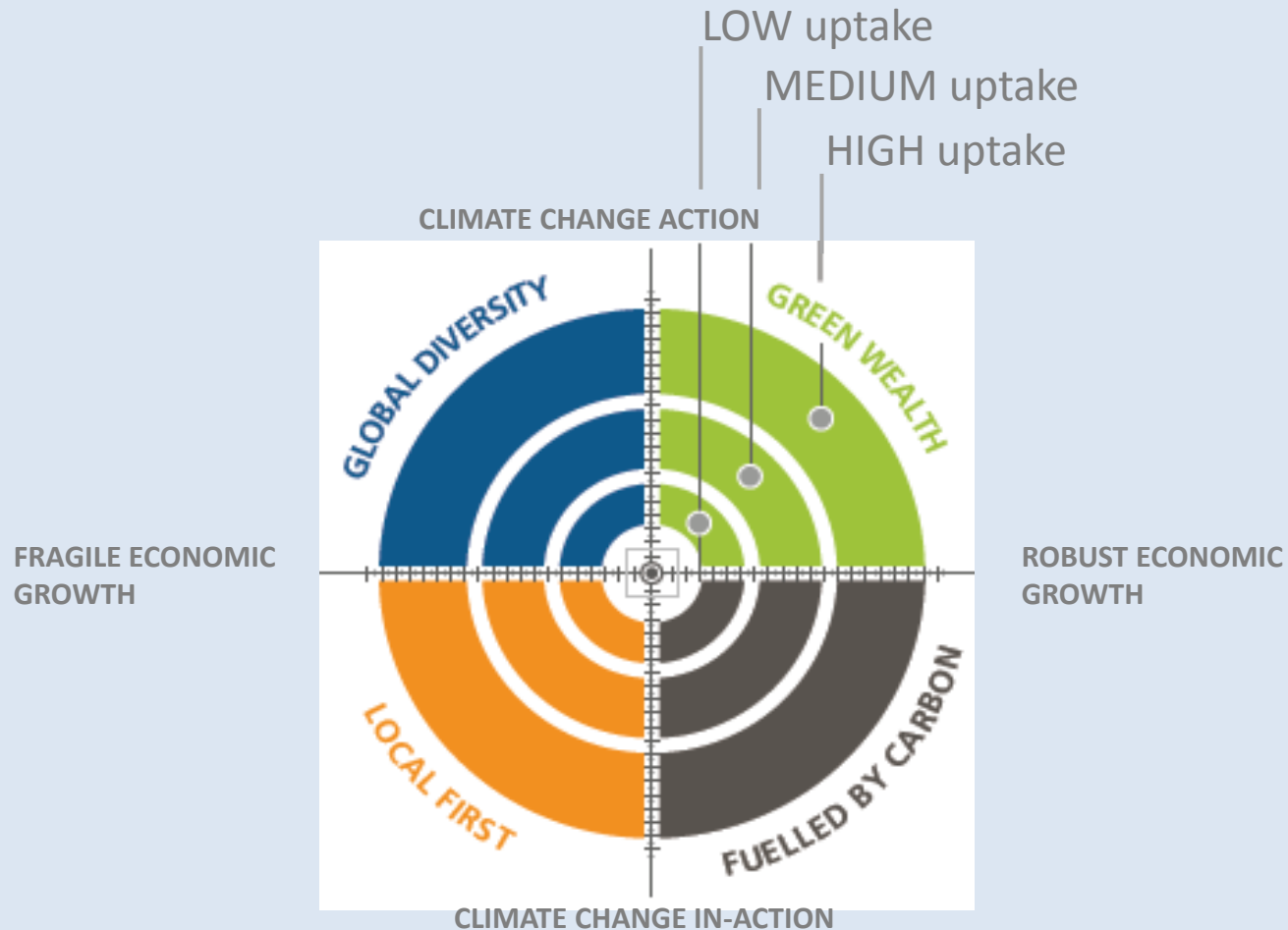
1. Pragmatist and realist filter
 - it will come when it comes and we'll deal with it then
2. Positive Creative filter
 - there is reason and opportunity to meet the challenge and we can deal with it
3. Ideological filter
 - it involves ideology or geopolitical positions we can or cannot buy into

Scenario Chart – Story Lines

Another framework for assessing megatrends

Story Line	Disposition	Key Features
Global Diversity	<i>Positive</i>	Some countries do well, some struggle Diverse solutions to everything Bilateral rather than global agreements
Local First	<i>Pessimistic</i>	Fragile economies, wealth disparities High debts, protectionism, R&D decreases Negative self-enforcing cycles Extremism flourishes, migration to avoid hardship,
Green Wealth	<i>Optimistic</i>	Effective CO2 emissions reductions Strong economic growth based on low carbon technology Rare minerals fully recycled, global security improves
Fuelled by Carbon	<i>Pessimistic</i>	Free market forces overriding governance Short term exploitation rather than long term goals Energy and resources not seen as limited Future generations left to deal with legacies Bilateral agreements rather than global governance

Scenario Chart – aid to assess Megatrends



Ref: Det Norse Veritas, Technological Forecast 2010 to 2020

Part 4: Wanneroo

Long Range Strategic Planning for
City of Wanneroo

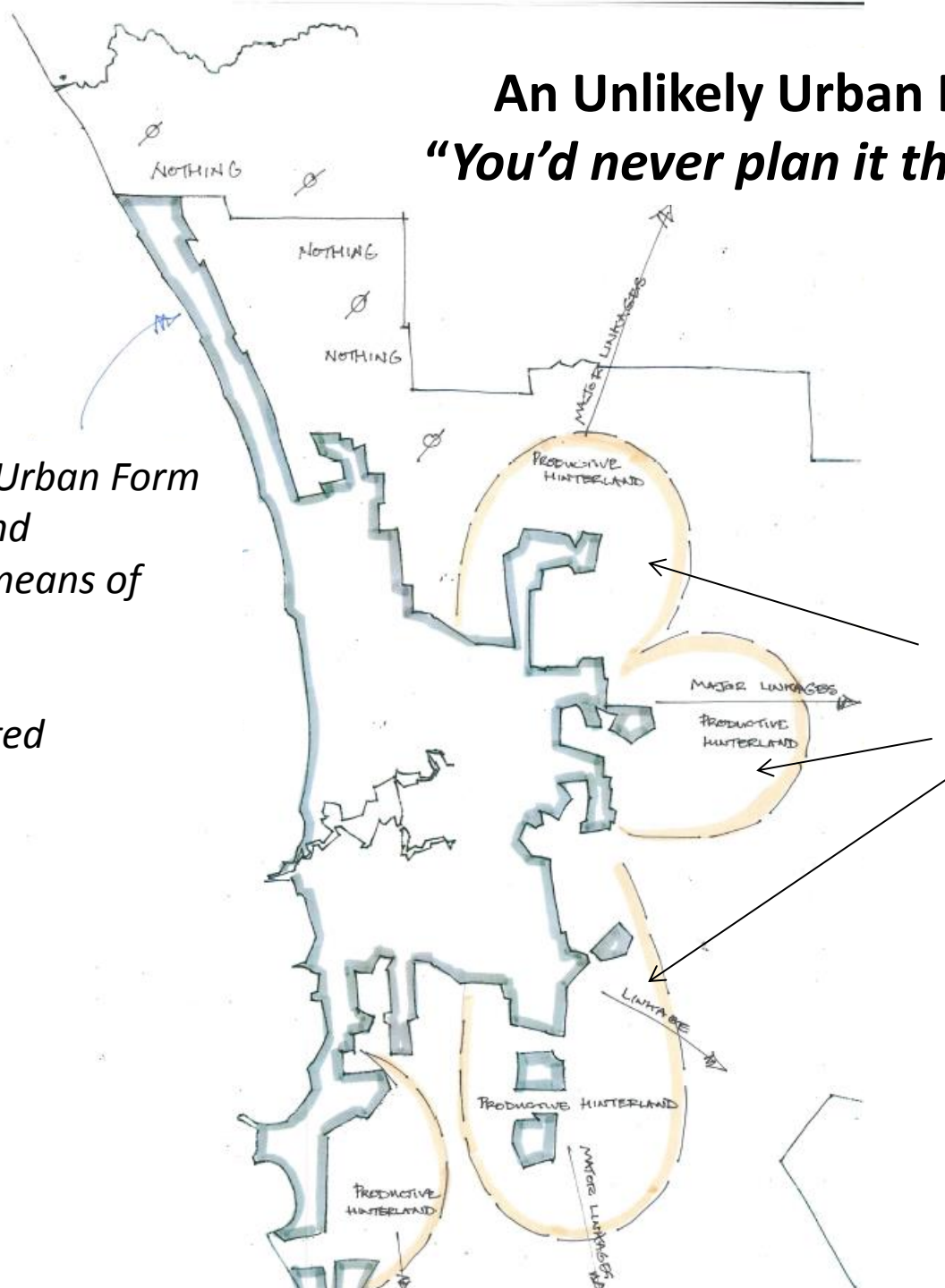
(Going past the current mind-sets)

An Unlikely Urban Form?

"You'd never plan it that way!"

A problematic Urban Form

- No hinterland
- No 'visible means of support'
- No linkages
- Not connected

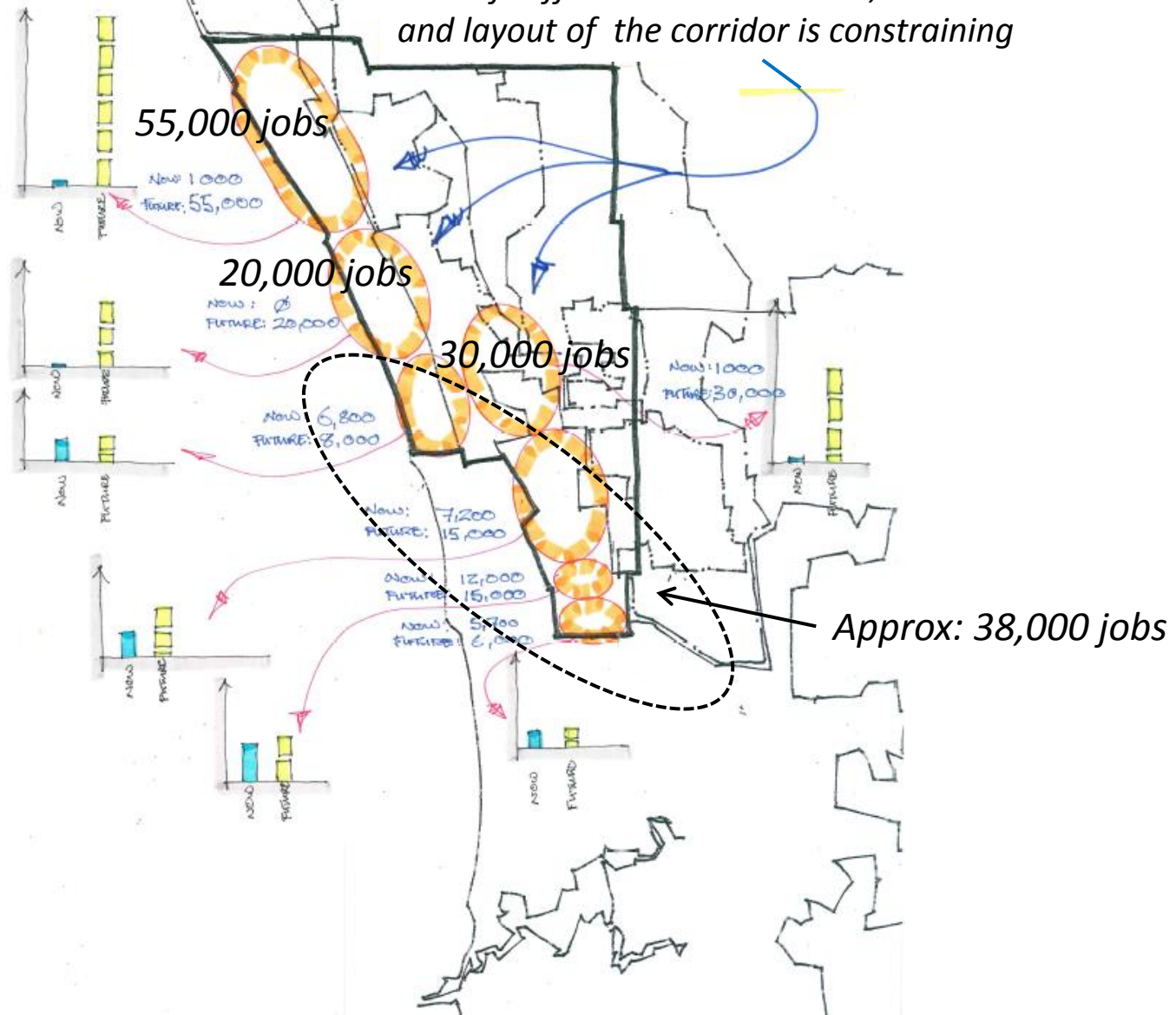


Economically productive
hinterlands to other urban
corridors

Future Employment Intentions

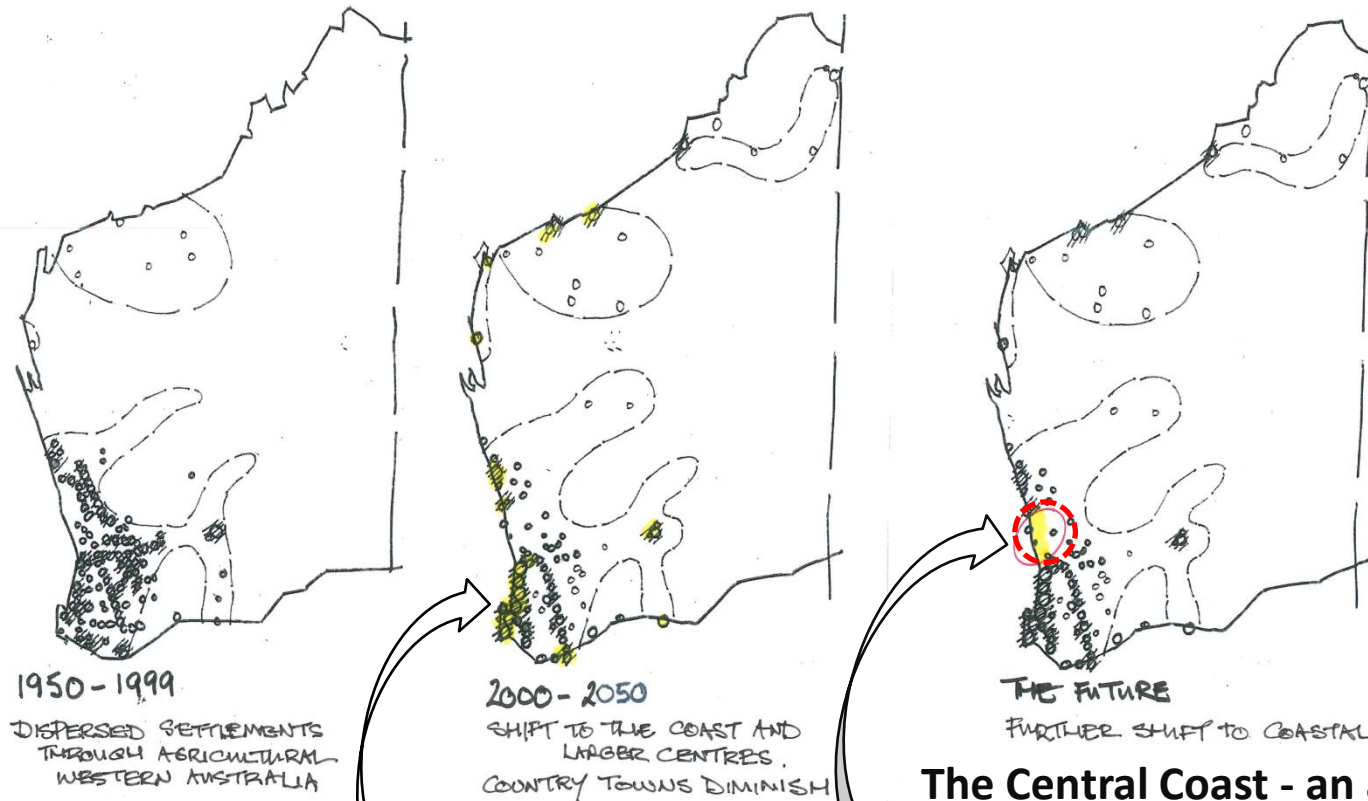
How is this going to be achieved?

Lack of sufficient area – context, dimensions and layout of the corridor is constraining



A Compelling Shift in Settlement Patterns?

(Ref: State Planning Strategy 2050)



***No doubt about it
– a shift to the
coast....***

**The Central Coast - an as yet unrealised
focus for:**

- coastal zone development
- next wave of investment

**Next major land development shift in
WA?**

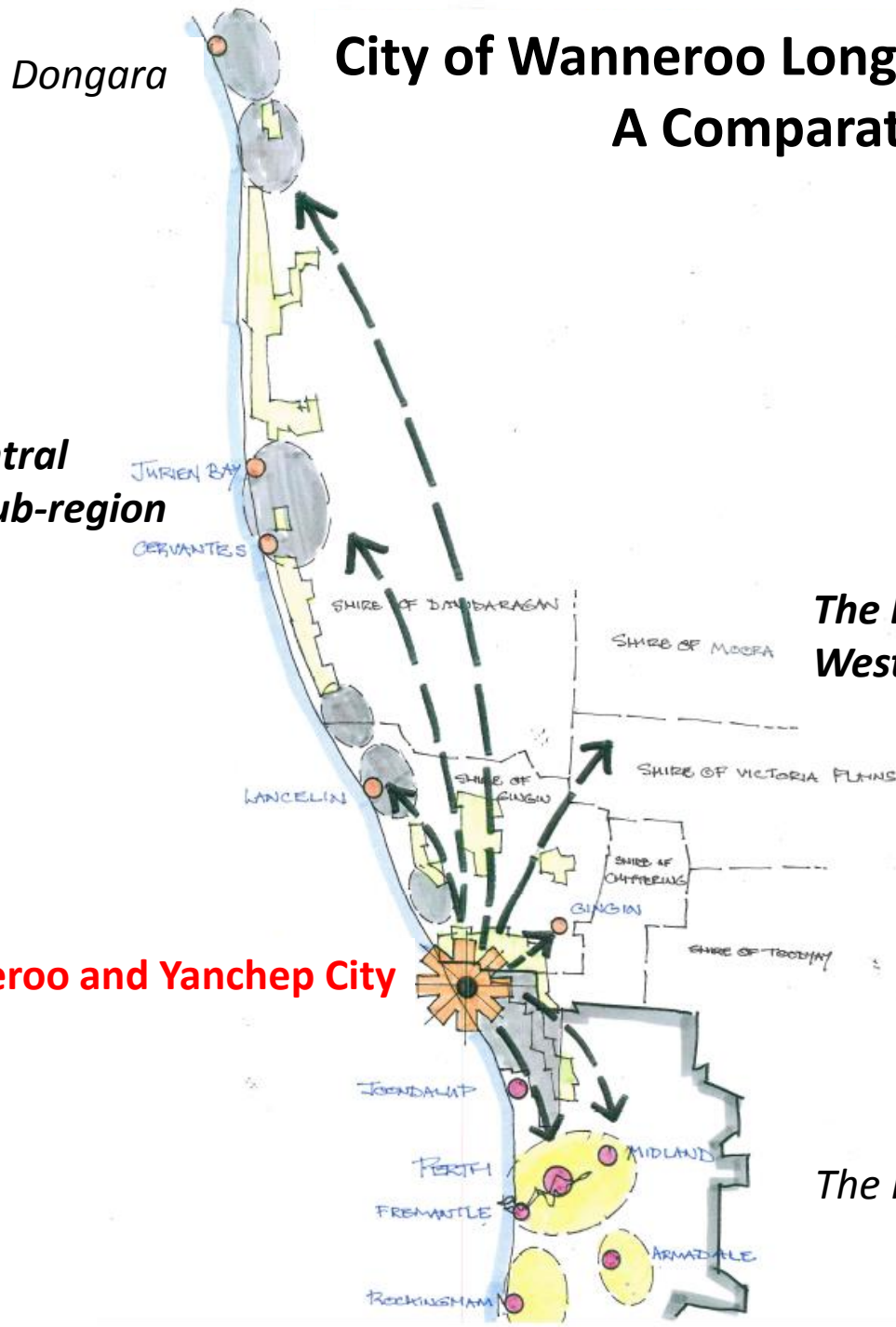
City of Wanneroo Long Term Strategic Position A Comparative Advantage?

**The Central
Coast sub-region**

**The Lower Mid-West and
Western Wheatbelt**

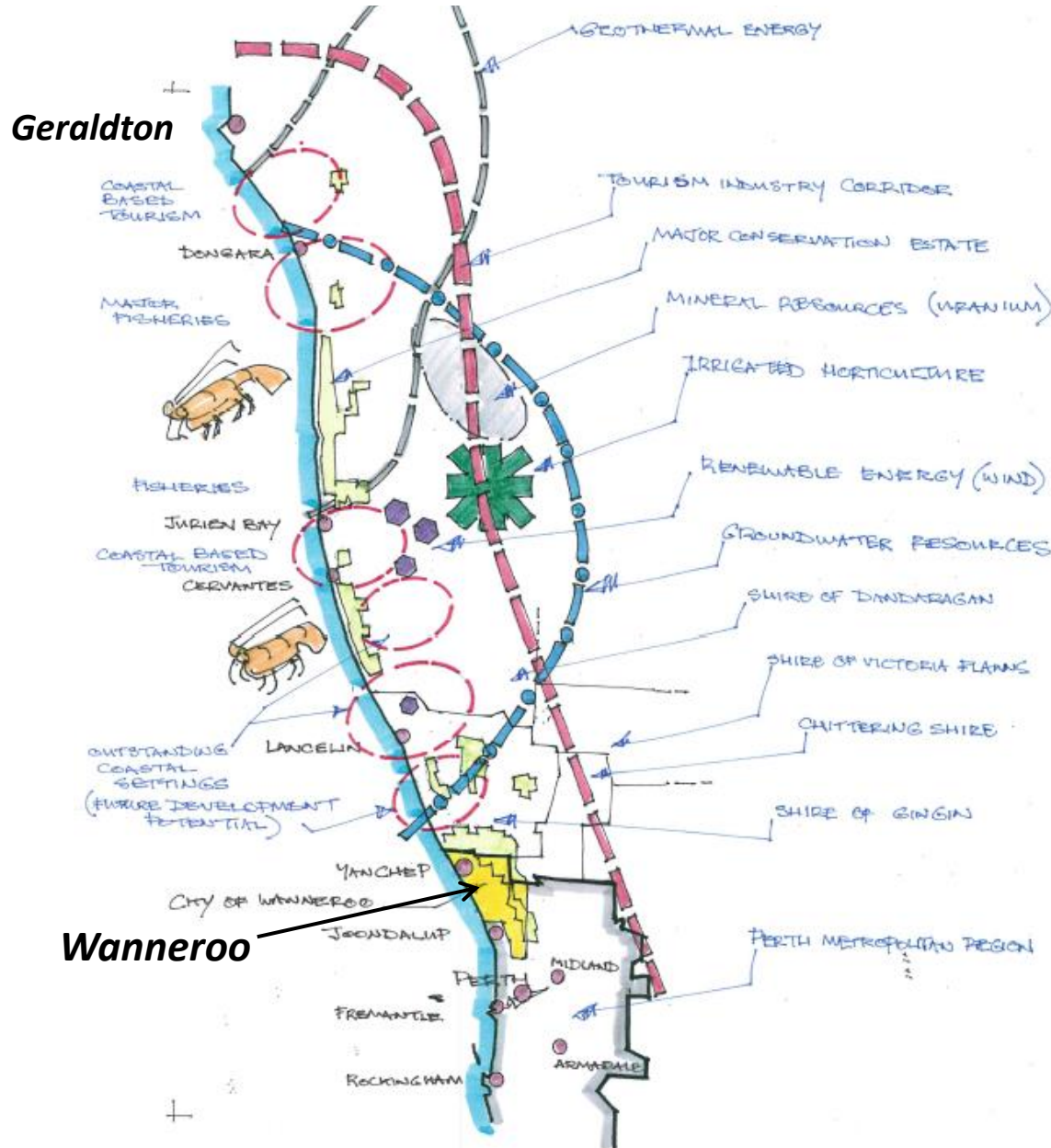
Wanneroo and Yanchep City

The Perth Metropolitan Region



Central Coast and Lower-Mid-West Region

A region of Resources and Opportunity



21st Century Indian Ocean City Concept



Looking at the challenges... ...a Constraining Geography

State Forest 65

*No room to move?
No room to expand?*

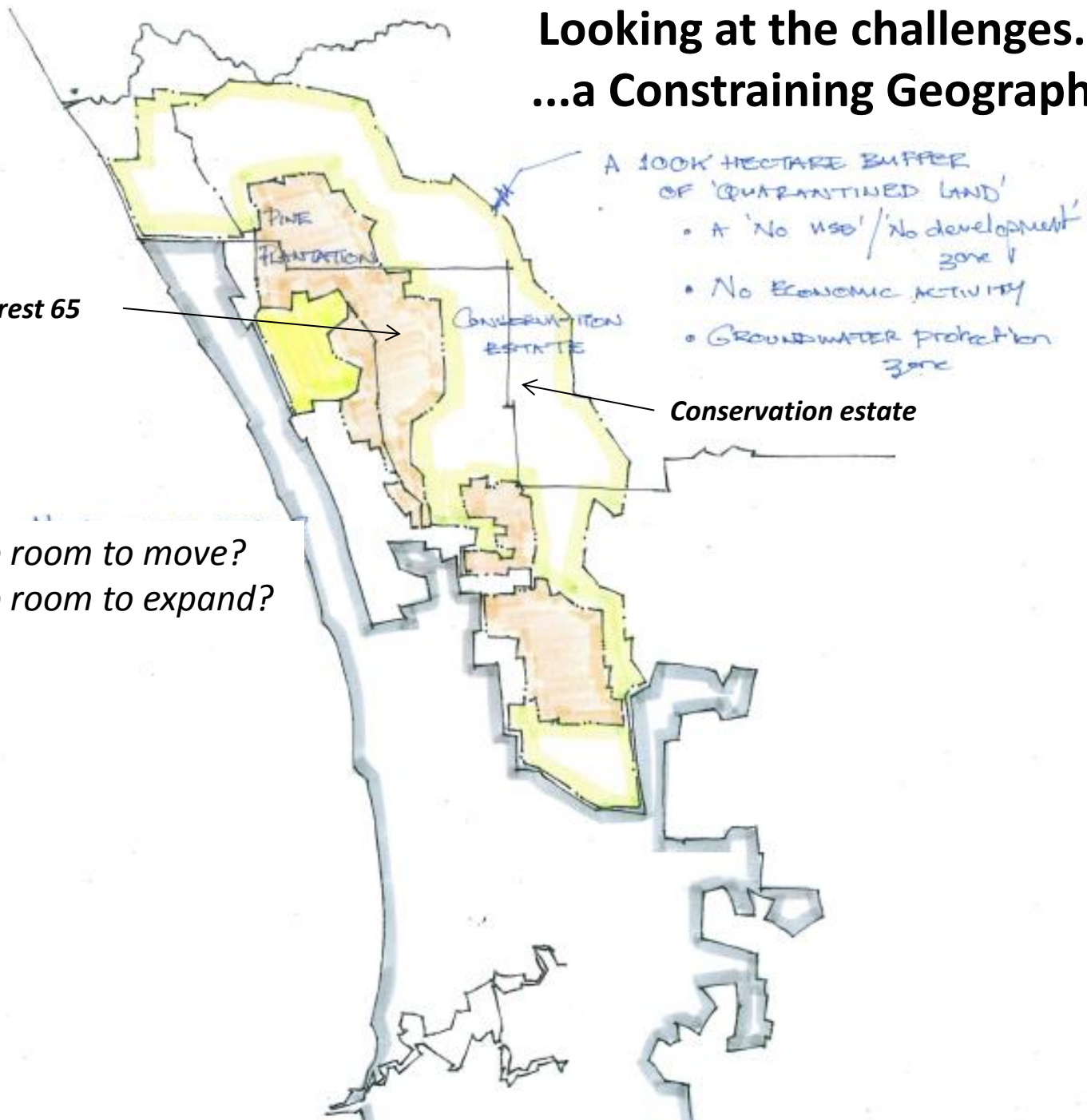


Fig 1: Constraints to Development

(Ref: Corridor Review Study, 1988)

Indicates the degree of constraint affecting Wanneroo – and imperative to protect the Gnangara Mound

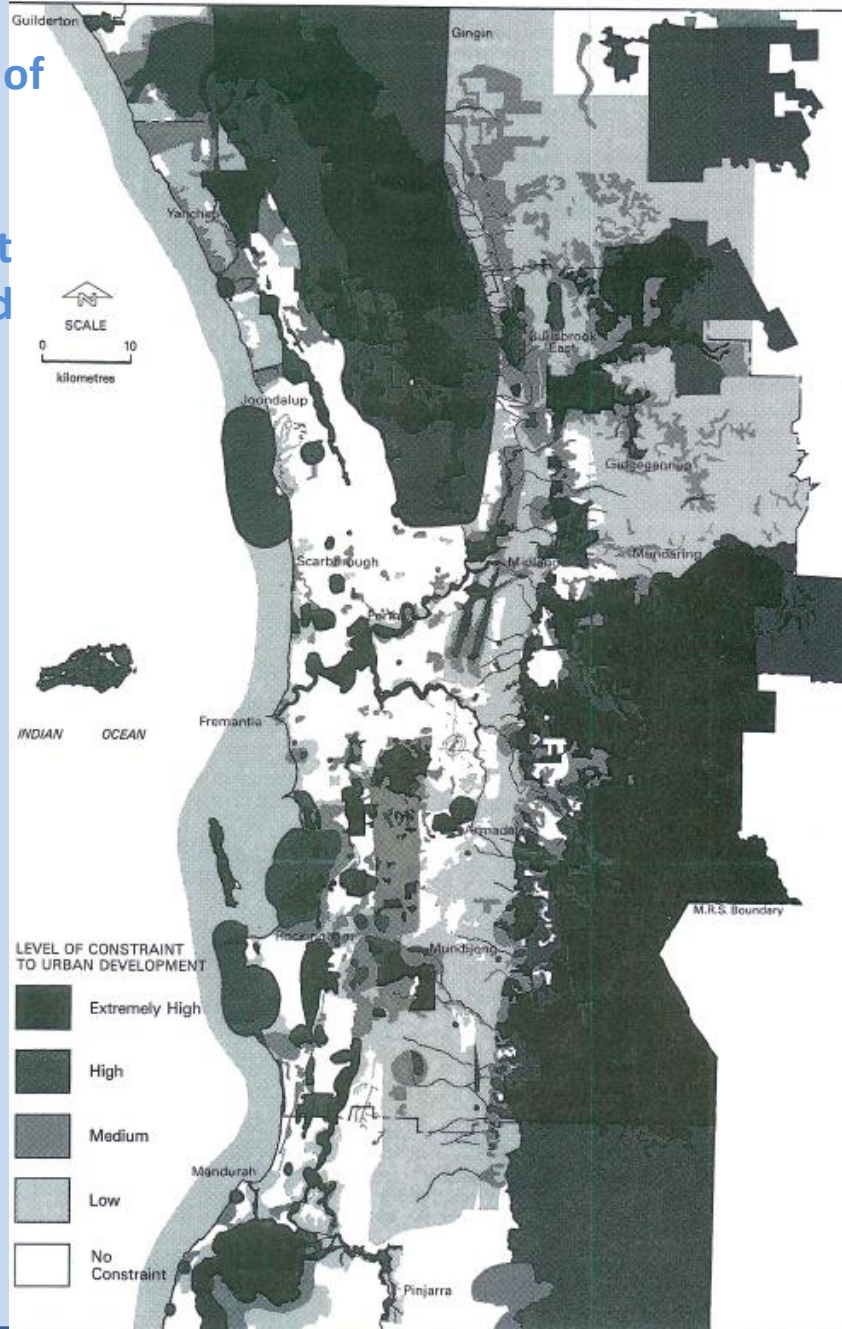
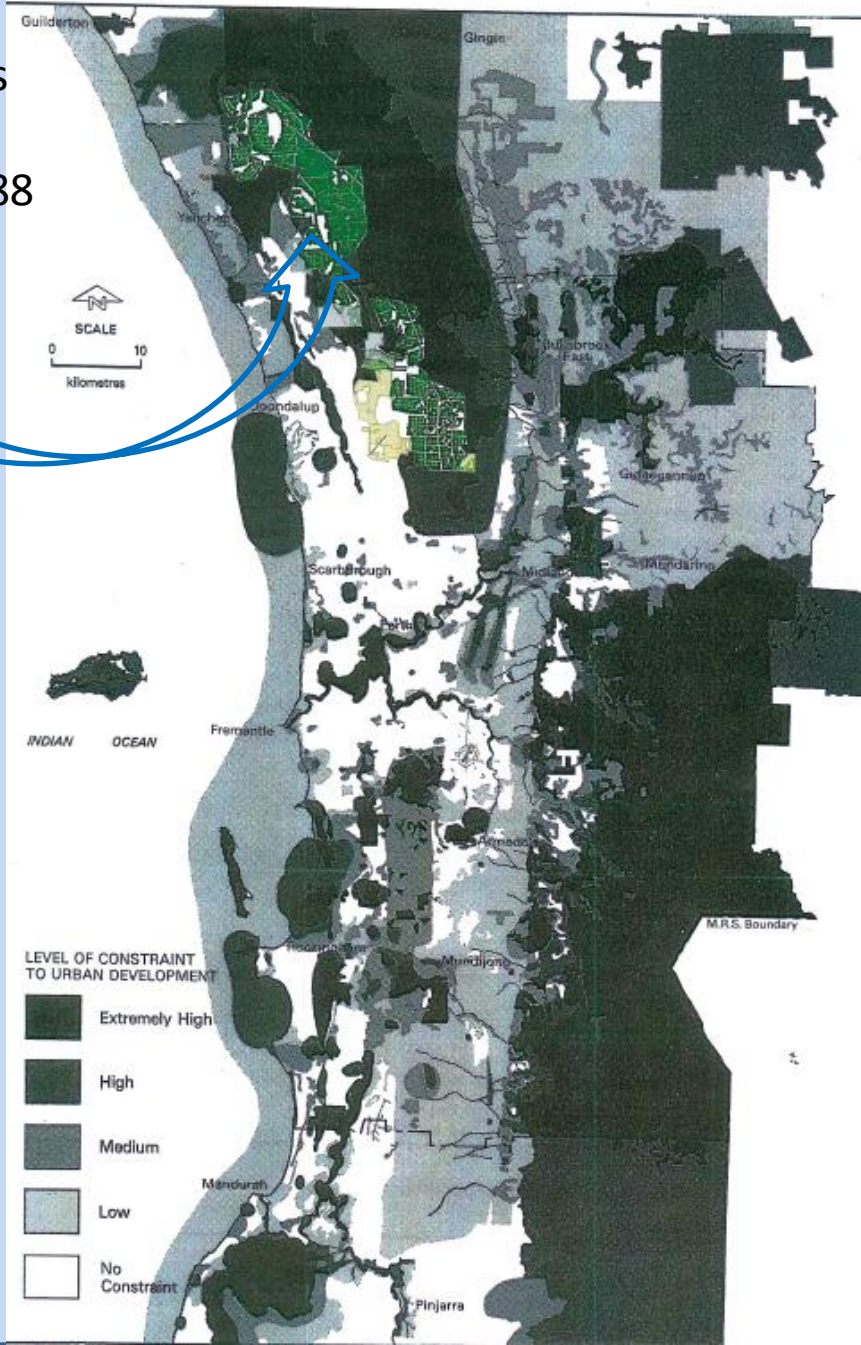


Fig 2: Constraints to Development + Pine Plantations

Note: How much was
Pine Plantation – a
standing 'crop' in 1988
But now being
removed...



A Significantly Flawed Strategic Urban Setting

Physical barrier
(approx 75,000 ha)

Sterilized land area
(approx 25,000 ha)

• APPROX 75,000 HA
CONSERVATION
RESERVE

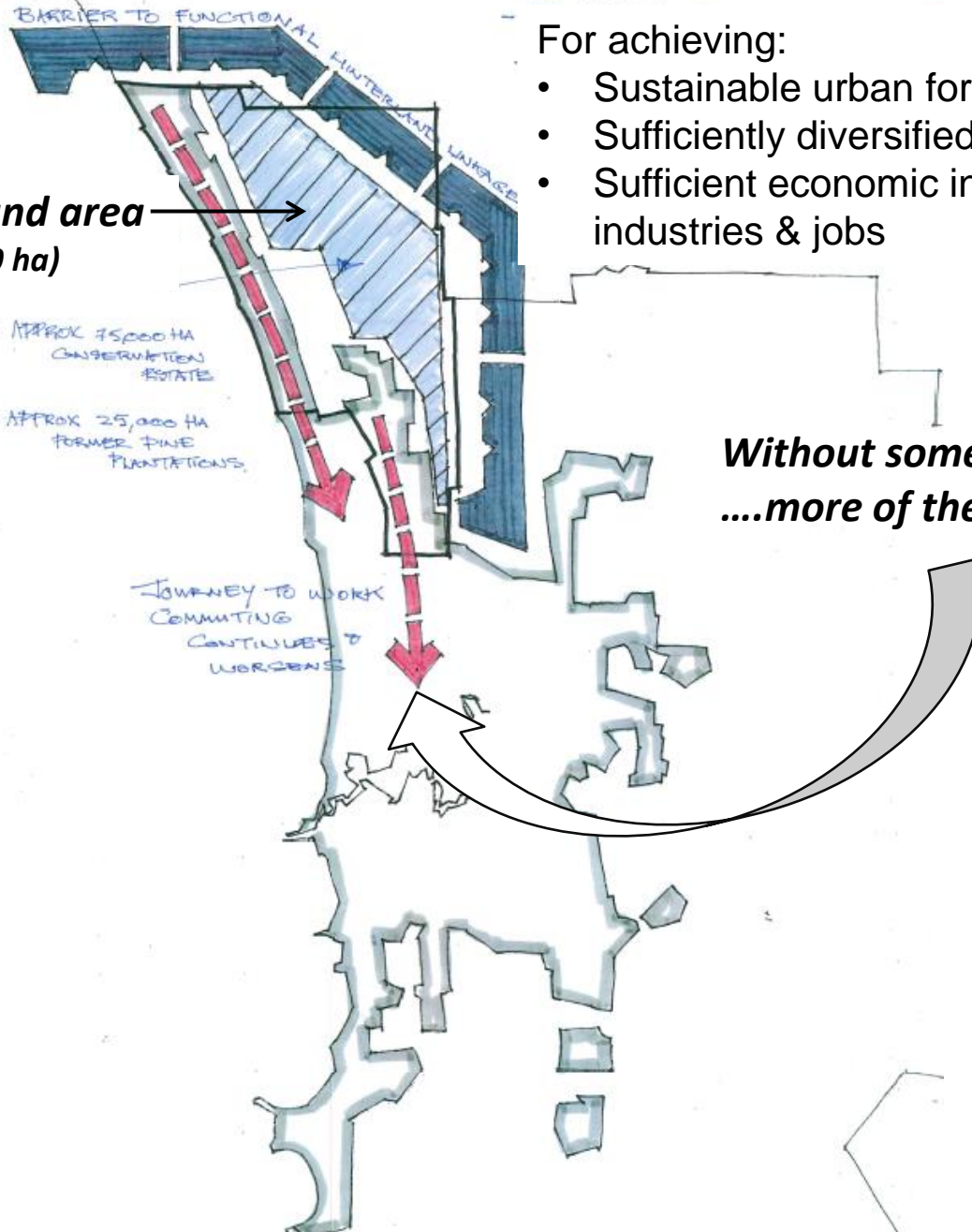
• APPROX 25,000 HA
FORMER PINE
PLANTATIONS

• JOURNEY TO WORK
COMMUTING
CONTINUES TO
WORSENE

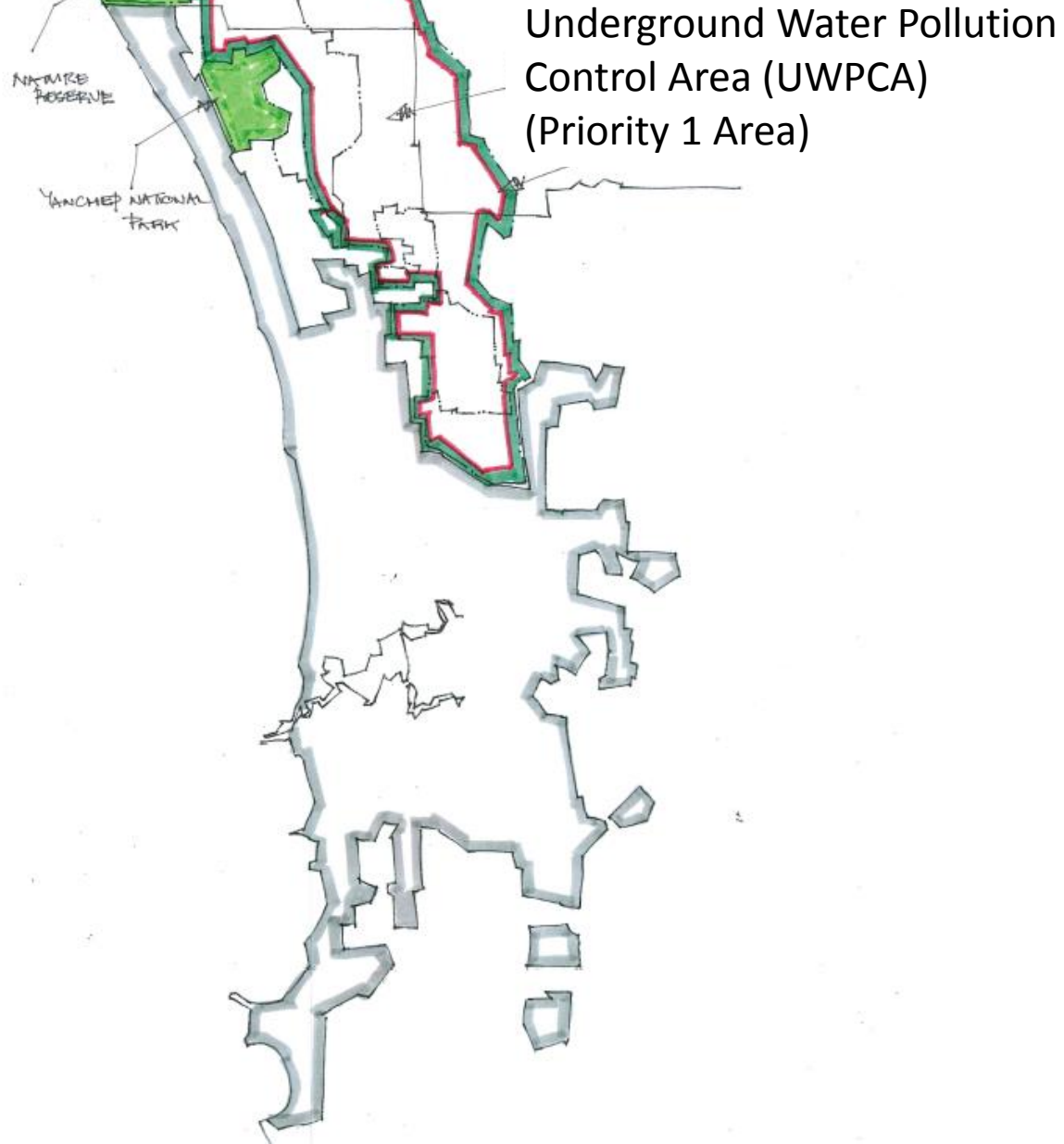
For achieving:

- Sustainable urban form & function
- Sufficiently diversified land use mix
- Sufficient economic investment, productive industries & jobs

**Without some big solutions....
....more of the same on the cards?**



A Well Meant Statutory Constraint *(but getting past its Use-By Date?)*



Is There Potential to Modify These Constraints?

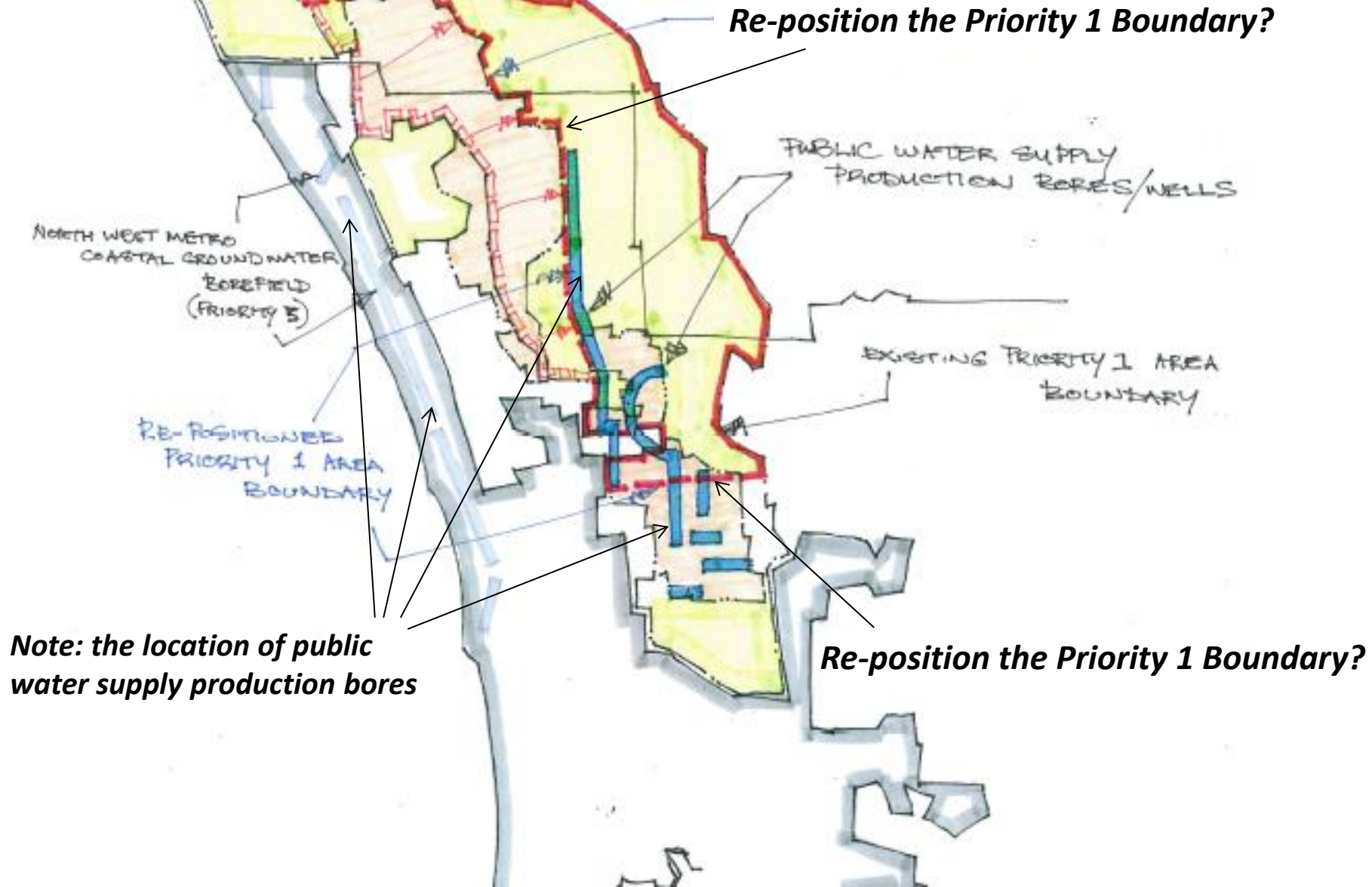
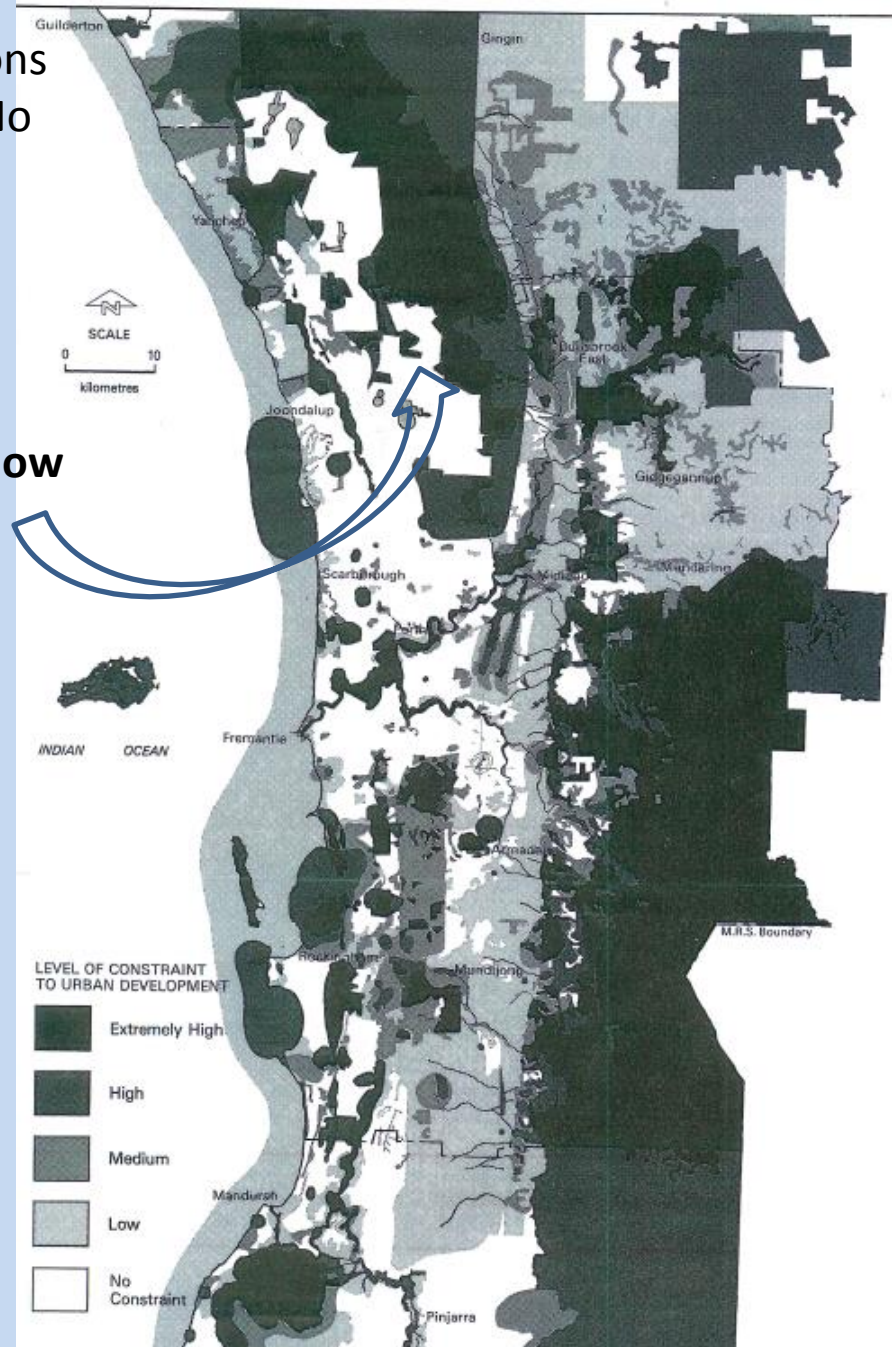


Fig 3: Revised 21st Century Constraints to Development

Former pine plantations should be deemed “No Constraint” in themselves
And without a solid reason for protecting groundwater, overall constraint should be **low**

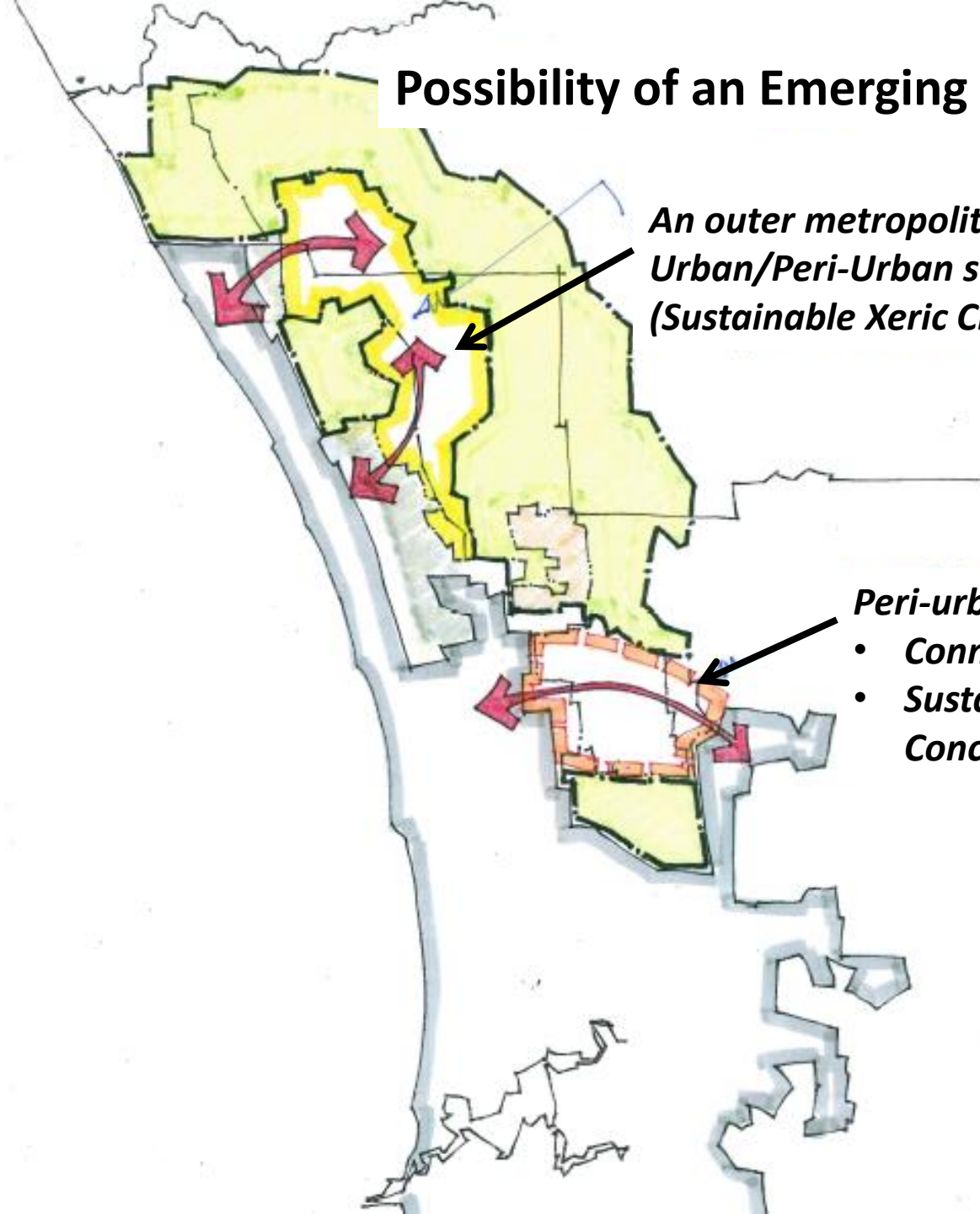


Possibility of an Emerging Peri-Urban Form?

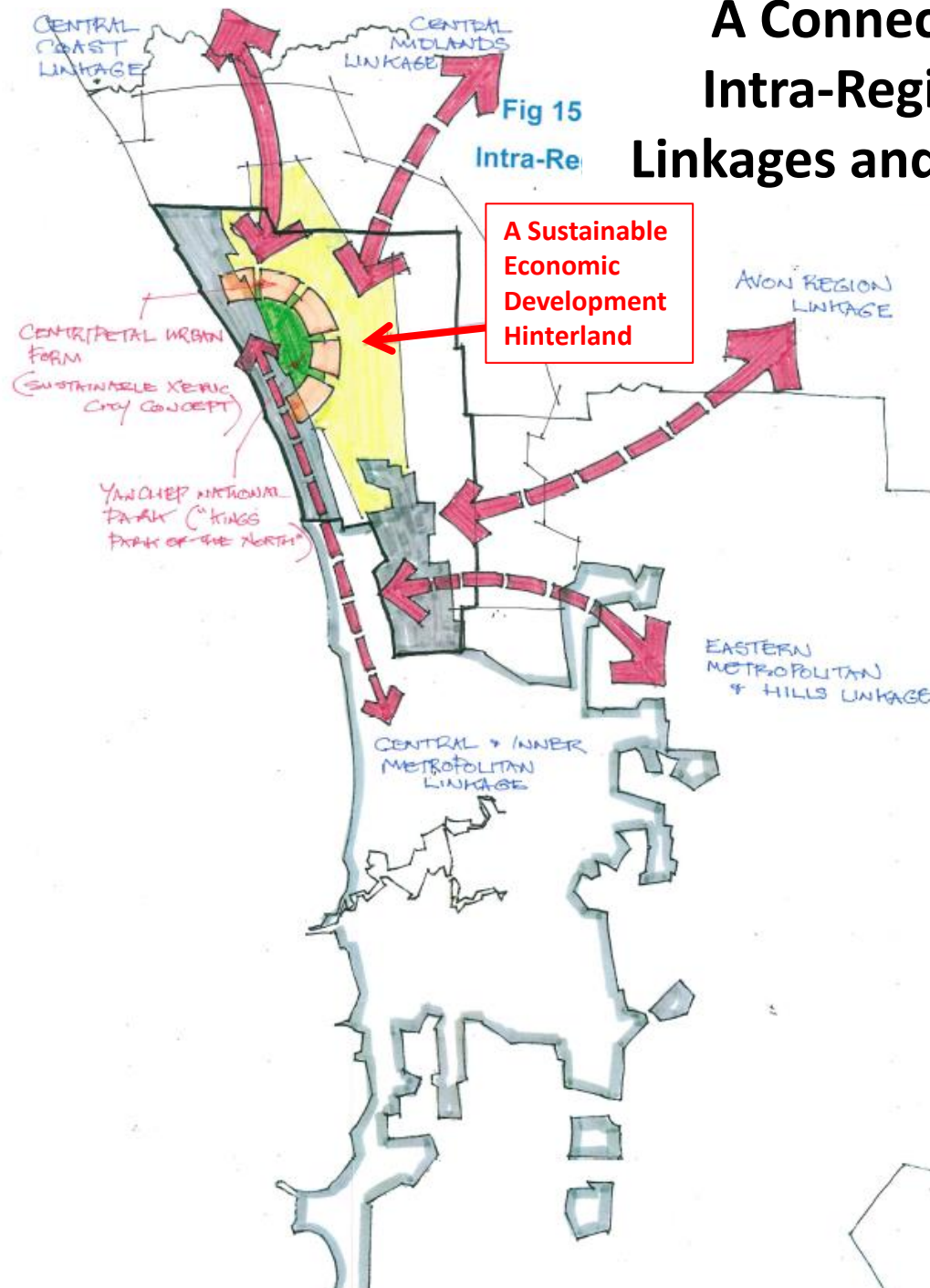
*An outer metropolitan Centripetal
Urban/Peri-Urban structure
(Sustainable Xeric City Concept)*

Peri-urban Consolidation

- *Connection and linkages*
- *Sustainable Xeric City
Concept*



A Connected Wanneroo: Intra-Regional Functional Linkages and Economic Activity



Future Urban Density Gradients? (The Legitimacy of Geographic Position...)

Sustainable Urban 2 (in the longer term)

- SUSTAINABLE URBAN 2:
- HIGH DENSITY URBAN FORM
 - 'OUTER' SATELLITE CITY
 - 'GATEWAY' CITY TO ECONOMIC HINTERLAND
 - CENTRAL COAST
 - CENTRAL MIDLANDS

A current Strategic Planning conundrum

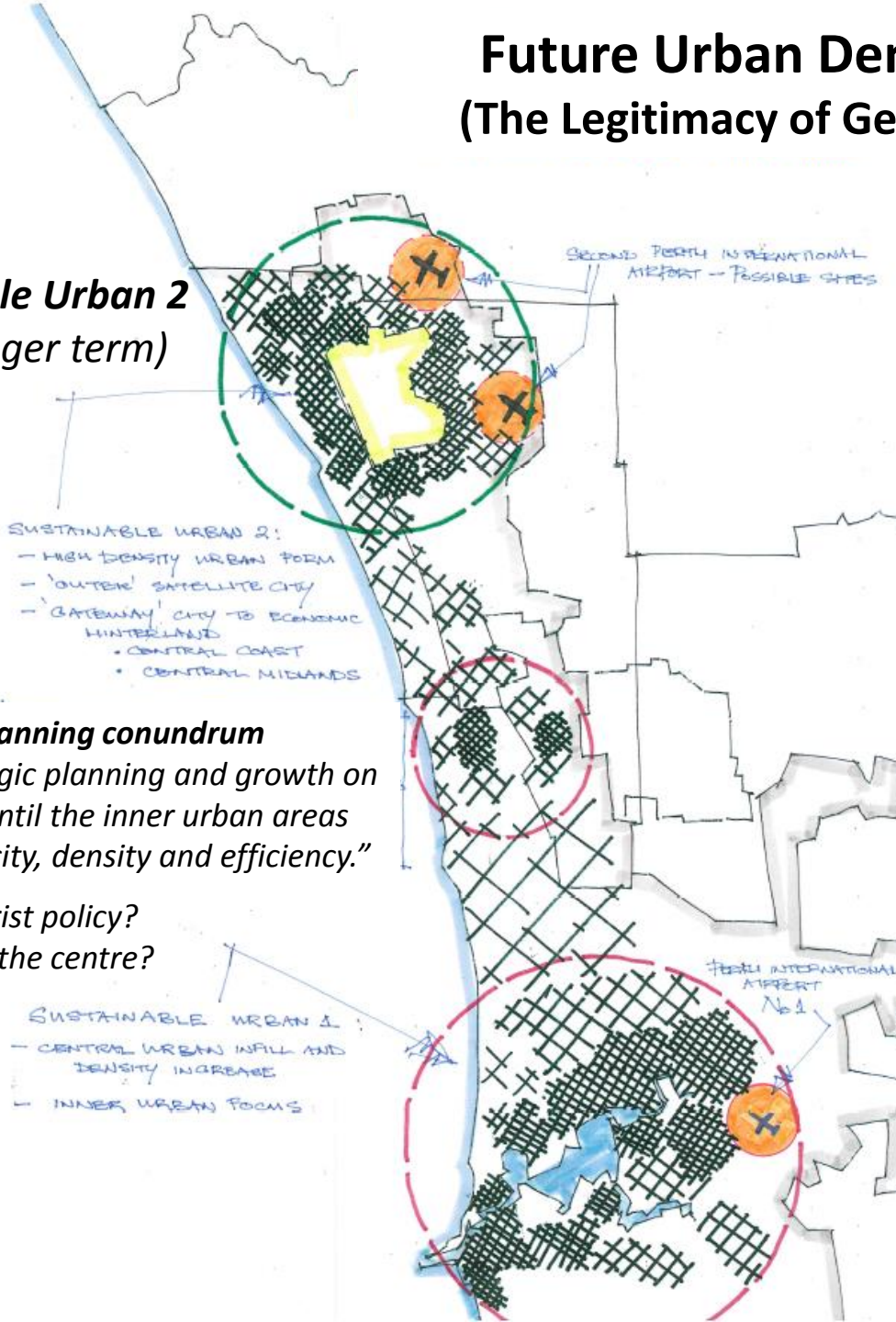
"No long range strategic planning and growth on the urban periphery until the inner urban areas are at optimum capacity, density and efficiency."

A tyranny of centrist policy?

A world view from the centre?

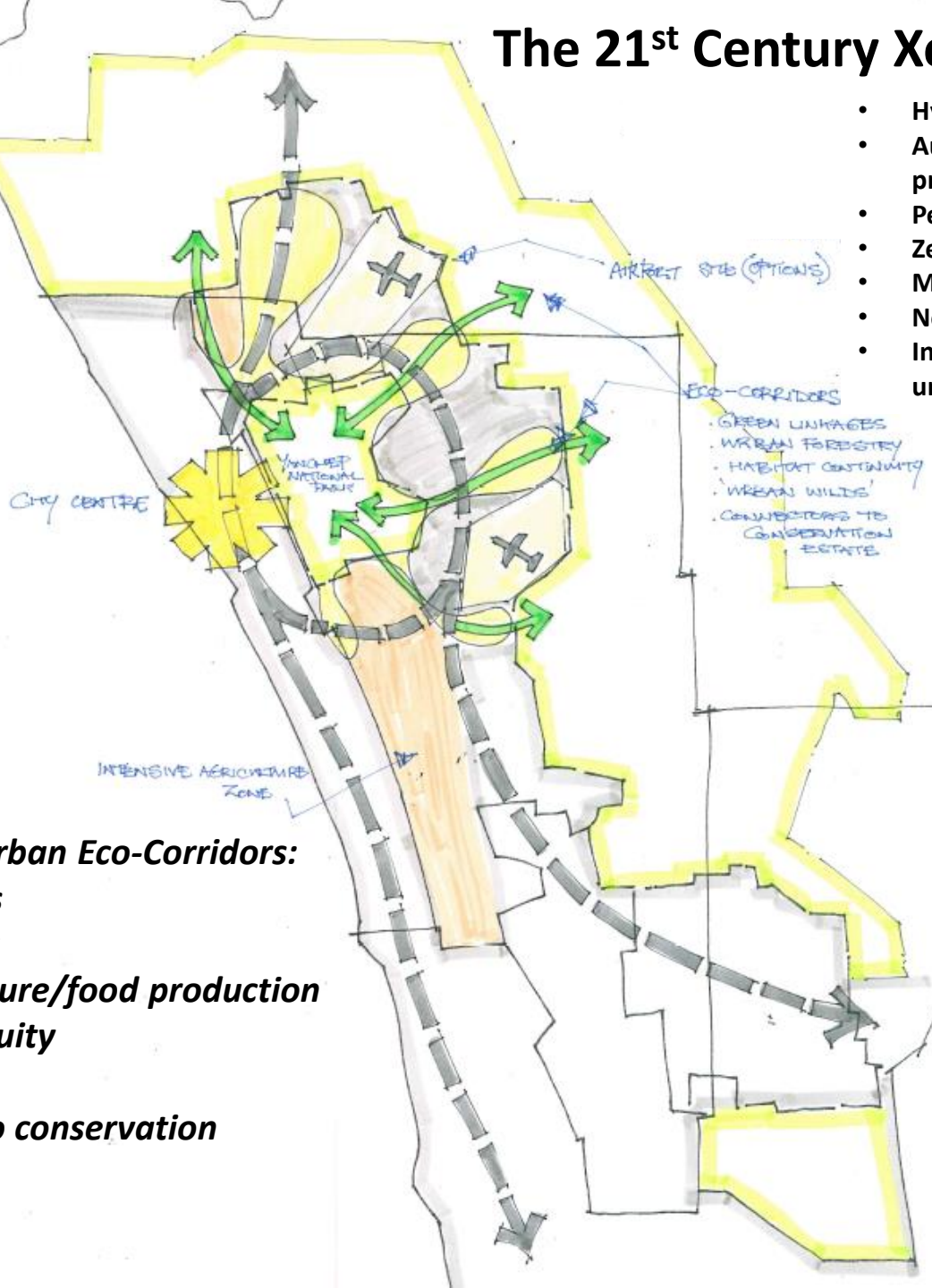
- SUSTAINABLE URBAN 1:
- CENTRAL URBAN INFILL AND DENSITY INCREASE
 - INNER URBAN FOCUS

Sustainable Urban 1 (in the shorter term)



The 21st Century Xeric City Concept

- Hydro-zone planning
- Automated public-private vehicle precincts
- Ped-shed walkability
- Zero waste and emission targets
- Max water re-use/recharge design
- Non-polluting land use
- Intensely managed urban/non-urban water cycle

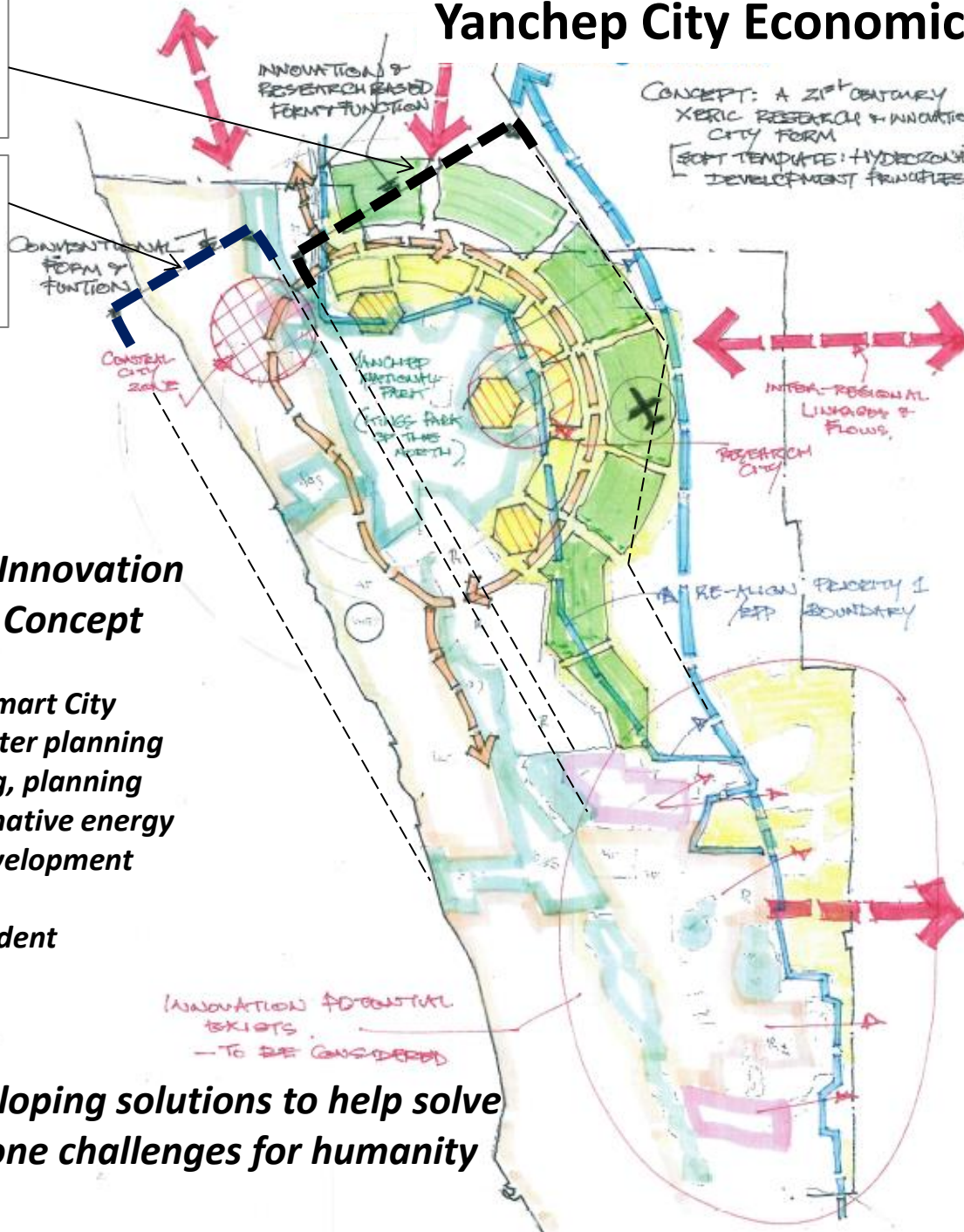


Urban and Non-Urban Eco-Corridors:

- *Green linkages*
- *Urban forestry*
- *Urban agriculture/food production*
- *Habitat continuity*
- *Urban wilds*
- *Connectivity to conservation estate*

Research and Innovation
'living laboratory' urban &
non-urban (agribusiness)
form and function

Conventional urban corridor form and function, with progressive innovation and applying Smart City principles



- *'next generation' Smart City*
- *'soft template' master planning*
- *hydro-zone thinking, planning*
- *renewable & alternative energy*
- *new design and development principles*
- *desalination dependent*

Key Concept: developing solutions to help solve world-wide arid zone challenges for humanity

Thank you