



Sustainable Cities – a model for its application

GBCSA Conference – October 2011

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A roving South African.....

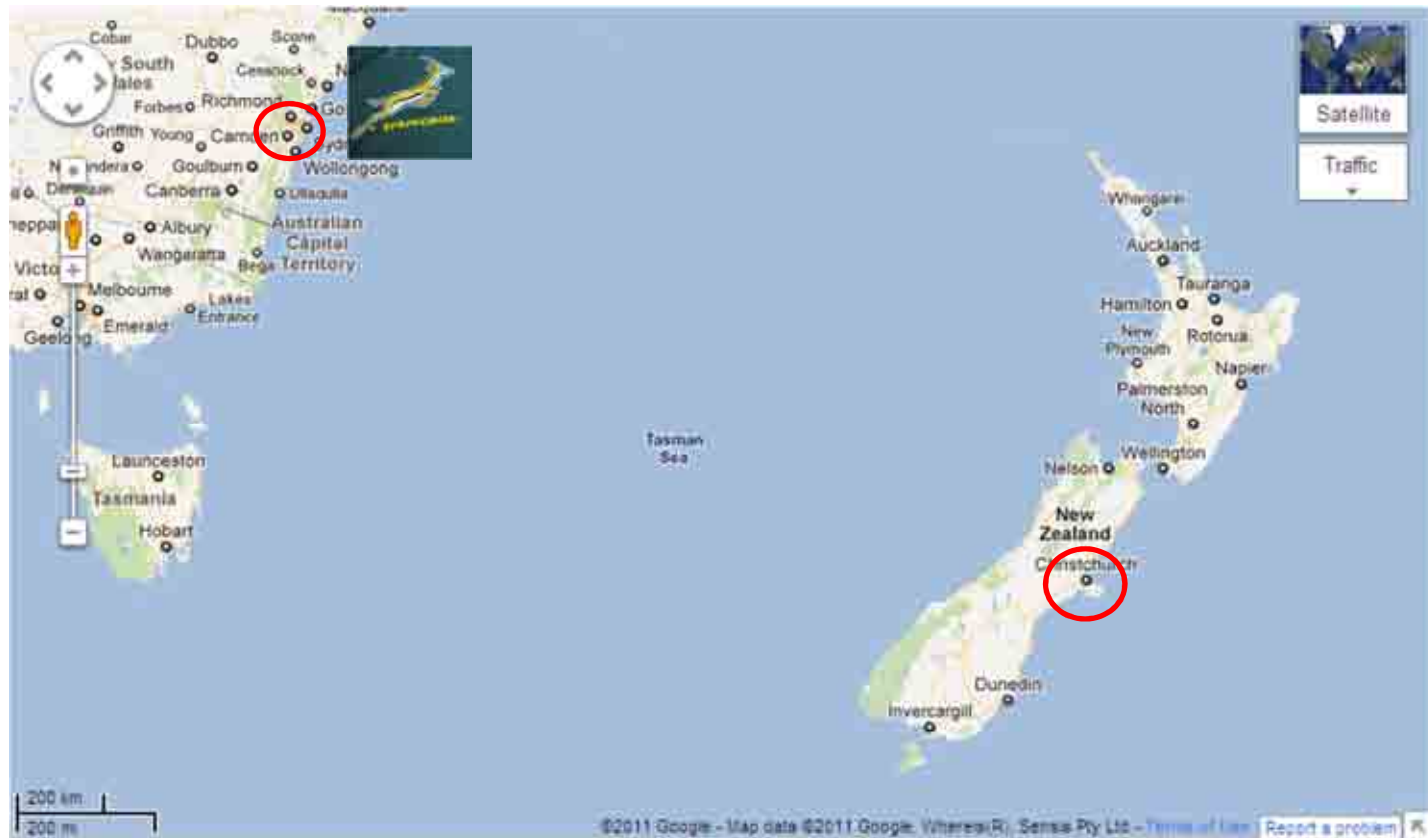


What am I going to talk about?

- Christchurch – the almost total rebuild of a city
- Lephalale – meeting the challenges of a regional growth area
- The common challenges faced in these situations
- A model that reflects these common challenges
- The application of this model in guiding solutions in these situations

Christchurch New Zealand

The Event



Christchurch New Zealand

The Event

- 4 Sept 2010. 7.1 magnitude earthquake, epicentre 40 km from CBD at 11km depth, moderate building damage
- 22 Feb 2011. 6.3 magnitude earthquake, epicentre 10 km SE of CBD at 5km depth, 181 fatalities
- As of yesterday 8871 quakes since 4 September 2010



Christchurch New Zealand

The Impacts

Liquifaction



Infrastructure Damage



Housing Damage



Buildings



Christchurch New Zealand

The Impacts



- 181 fatalities
- Up to 20 000 homes to be demolished – out of total stock of 145 000
- Up to 80% of CBD buildings to be demolished
- Up to 500 heritage buildings to be demolished
- Reconstruction cost forecast at US\$23B

Christchurch New Zealand

The Opportunity

Our Central City will be home to a thriving cosmopolitan community who cherish their past, celebrate its unique and engaging vibe and embrace its bold commitment to urban sustainability. It will be a place of both energy and refuge, a city in a garden, with a distinctive modern urban identity.

Draft Christchurch City Council Central City
Plan. Aug 2011



Lephalale, Limpopo

The Situation



- **Resources** - Hosts 40% of South Africa's coal reserves, including the Grootgeluk Mine (Exxaro)
- **Electricity generation** - Hosts the 4,000MW Matimba Power Station
- **Tourism** – vibrant ecotourism industry with 29 nature reserves, 1200 bed
- Current population 115 000
- 64% of households earn less than R800/month
- Literacy levels below country average

Lephalale, Limpopo

The Situation



- Medupi Power Station – 4 800 MW involving an R80B investment over 6 years
- About 10 000MW additional generation required out of the Waterberg Coal Field by 2026
- R9B expansion of Grootgeluk mine and establishment of others to support Eskom
- Sasol’s potential coal to liquid plant (Sasol Mafutha) and associated mining operations
- Potential Anglo-Coal gas extraction opportunity

Lephalale, Limpopo

The Opportunity



- Lephalale has been identified as a National Development Node
- Opportunity to dramatically improve social and hard infrastructure to support this growth
- Opportunity to ensure social inclusion and economic upliftment of all residents – earning capacity, literacy
- Can create a world class governance structure that is capable of managing the change

Lephalale, Limpopo

The Opportunity

VISION

“To act as a catalyst to facilitate and integrate development and growth within the municipality in order to address the needs and improve the quality of life of all members of our community”

Extract Lephalale IDP Review 2011/2012

Are there Commonalities in the Challenges Faced?

- There are interacting and competing priorities
- There exist complex political relationships
- Environmental protection is an important issue in supporting ecotourism and liveability
- Redevelopment of both urban areas requires a long term perspective - but solutions need to be provided quickly
- The situation is emotionally charged
- Governance structure may not be in place to deal with the situations
- Comprehensive stakeholder engagement and support is required
- Funding challenges – substantial cost burden with private sector involvement critical
- Positive growth prospects with strong stakeholder optimism

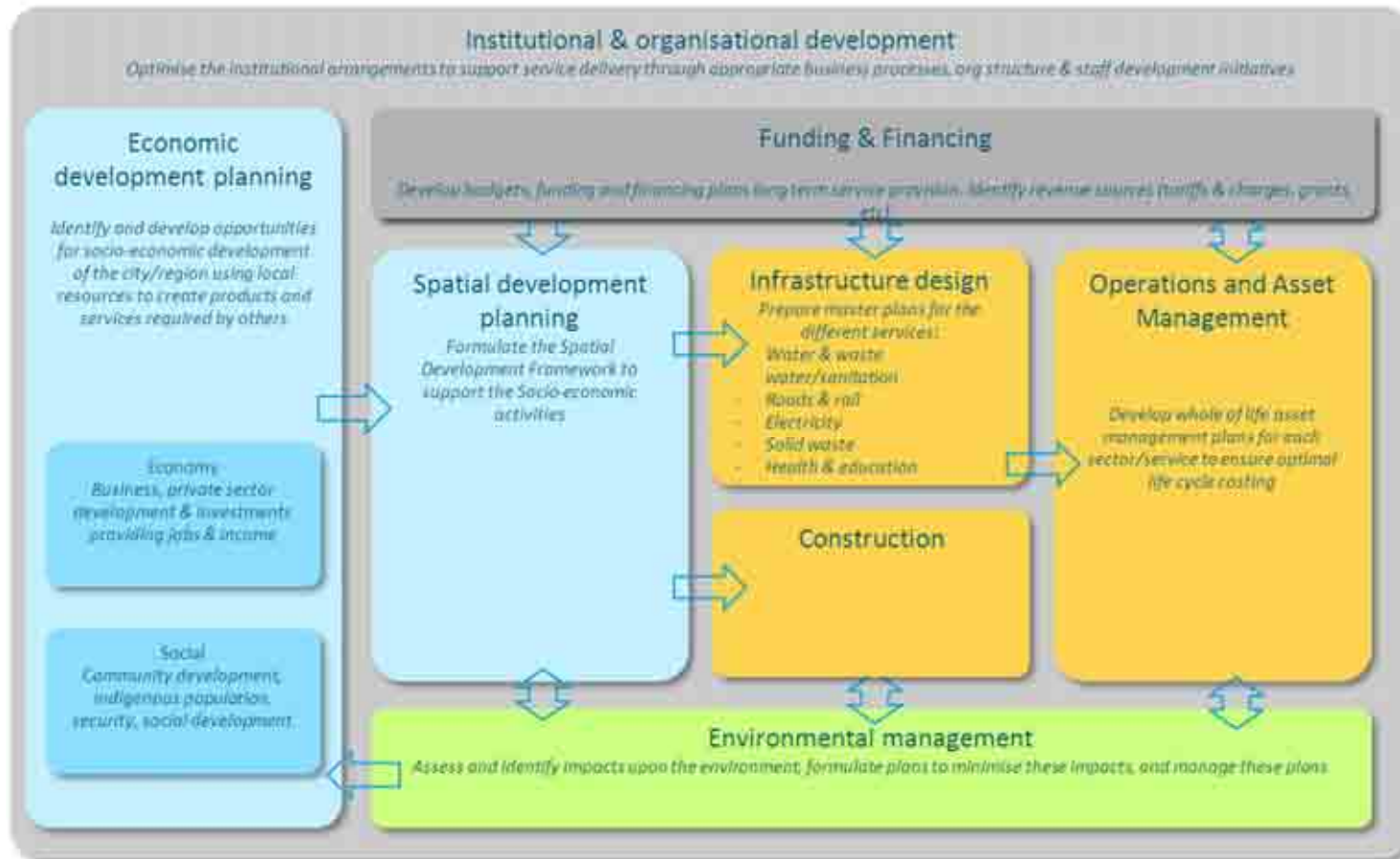
A Model to Draw this Together

Melbourne Principles – aligns with Agenda 21, Millennium Goals etc

- Long-term vision
- Economic and social security
- Recognise the intrinsic value of natural ecosystems
- Enable communities to minimise their ecological
- Use systems thinking
- Build on the distinctive characteristics of cities
- Empower people and foster participation
- Enable cooperative networks to work towards a common future.
- Use of environmentally sound technologies and effective demand management.
- Encourage accountability, transparency and good governance

Using These Principles

Integrated Cities Model



Application of the Model - Lephalale

- Stakeholder workshops to define the vision and the objectives
- Specific projects and their needs
- Used that to forecast socio-economic changes
- Employment growth, population growth, household numbers etc
- Through the above and an understanding of project locations and needs, current infrastructure condition and settlements patterns, we could define growth nodes

Projects	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	21-25	26-30
Current Households	6400												
Grootegeluk Expansion		800											
Sekoko Coal Mine		71	44	26	23	36							
Medupi Power Station			300	300	300								
Other Exxaro projects					300								
Exxaro Thabametsi						1000	1000			1000			
Thabametsi IPP								200	200		200		
Exxaro Export Mine												4000	
Exxaro Project H													2300
Subtotal direct new jobs/year		871	344	326	623	1036	1000	200	200	1000	200	4000	2300
Secondary (indirect) jobs		581	229	217	415	691	667	133	133	667	133	2667	1533
Total new jobs/year		1452	573	543	1038	1727	1667	333	333	1667	333	6667	3833
Permanent households/year	6400	1277	505	478	914	1519	1467	293	293	1467	293	5867	3373
Natural growth	64	64	77	83	89	99	115	130	134	139	155	159	254
Cumulative total households	6400	7741	8310	8866	9862	11471	13036	13444	13868	15469	15901	21922	29009
Population excl contractors	26400	31766	34040	36262	40250	46682	52143	53775	55470	61875	63603	87688	116036
Contractors managerial	500	500	500	500	500	500	500	500	500	500	500	500	500
Contractors semi/unskilled	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Squatter families	200	200	200	200	200	200	0	0	0	0	0	0	0
Permanent Res Units Required	7100	8441	9010	9566	10562	12171	13536	13944	14368	15969	16401	22422	29509
Res space required ha	462	549	586	622	687	791	880	906	934	1038	1066	1457	1918
Other space requirements	462	549	586	622	687	791	880	906	934	1038	1066	1457	1918
Total space requirements	923	1097	1171	1244	1373	1582	1760	1813	1868	2076	2132	2915	3836

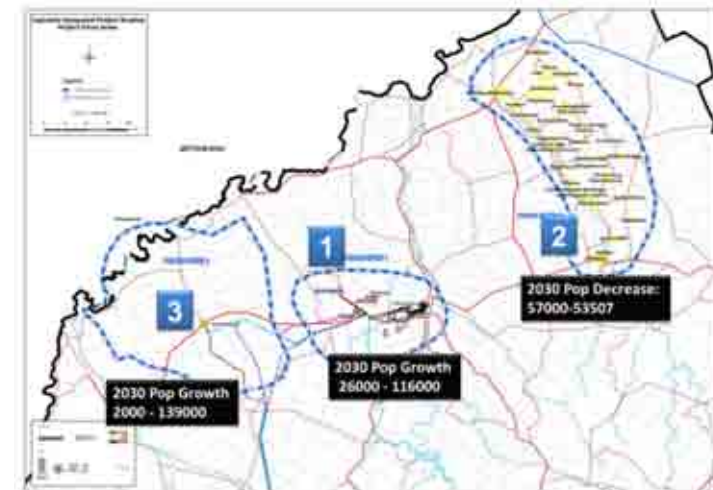
It is assumed that managerial contractors will bring their families. Although they are single persons, they are also counted as households to determine the number of permanent residential units required

Semi and unskilled contractors are counted as single persons without their families. Single quarters should be provided for them

Squatter families are counted as households and are included in the total number of permanent residential units required

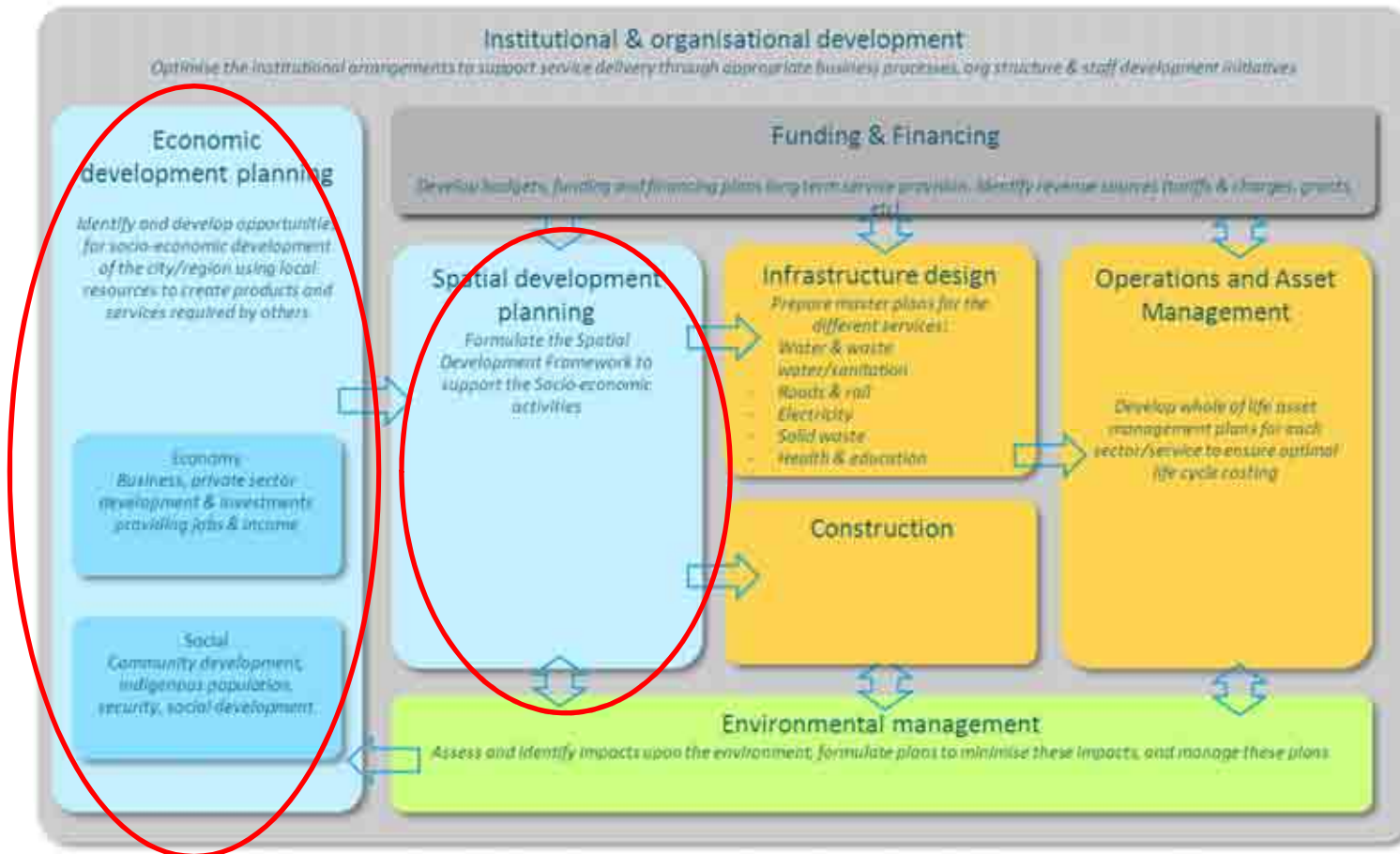
An average erf size of 650m² per household is assumed

It is assumed that total space requirement will be twice as much as residential space needs



Using These Principles

Aurecon Integrated Cities Model



Using These Principles

Aurecon Integrated Cities Model



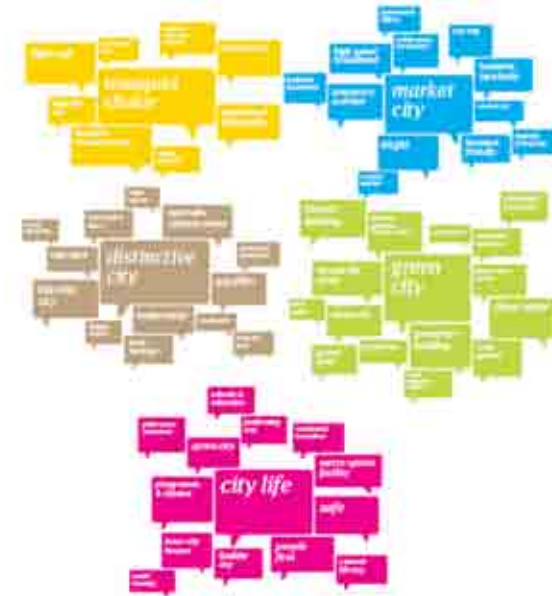
Application of the Model - Lephalale

- Findings
 - Comprehensive development plan developed addressing all major issues
 - New urban area to be developed – to satisfy housing need
 - Substantial infrastructure backlog – water, sanitation and housing as priorities – identified potential public and private funding sources
 - Multi-stakeholder decision process required
 - Institutional arrangements – Joint Dev Comm, double the Municipality staff



Application of the Model - Christchurch

- Defined the values – Share an Idea process
- Defined the socio-economic conditions required for reinvestment
- Essential infrastructure, CBD rebuild, planning certainty



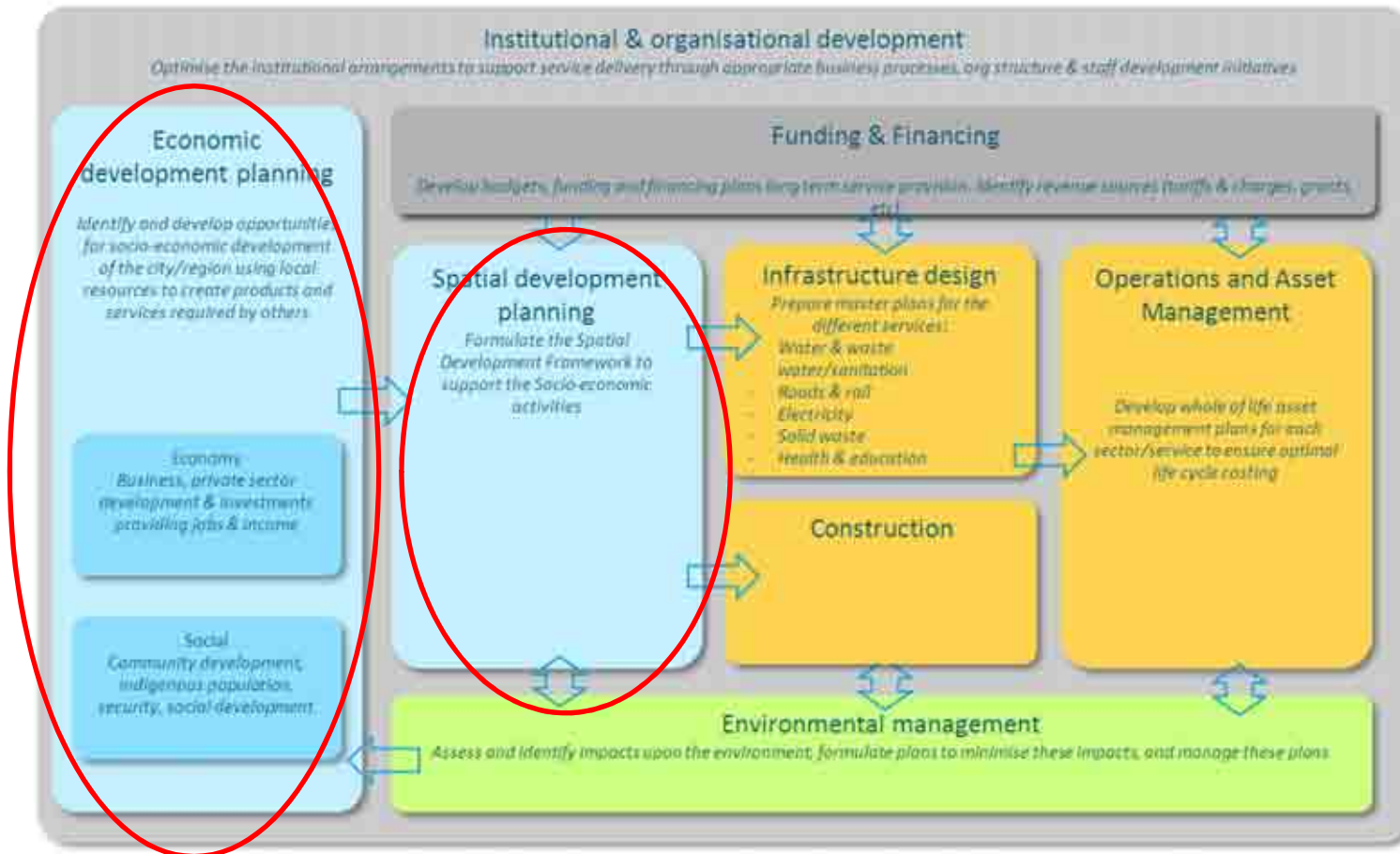
Application of the Model - Christchurch



- Urban development plan – which defined the impact zones and identified new urban areas

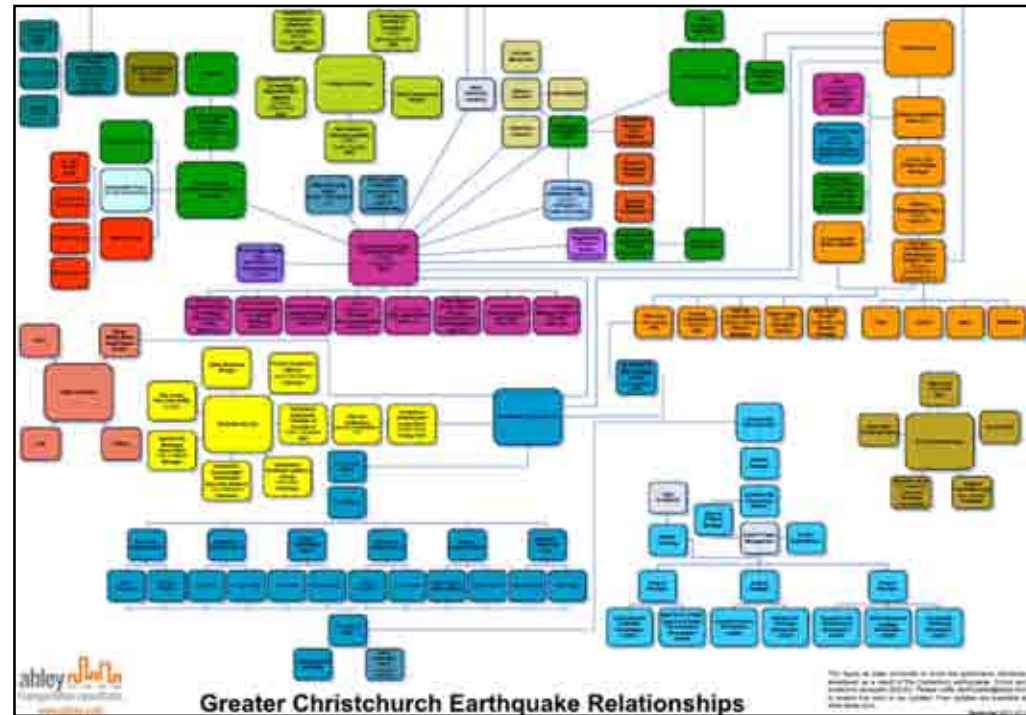
Using These Principles

Aurecon Integrated Cities Model



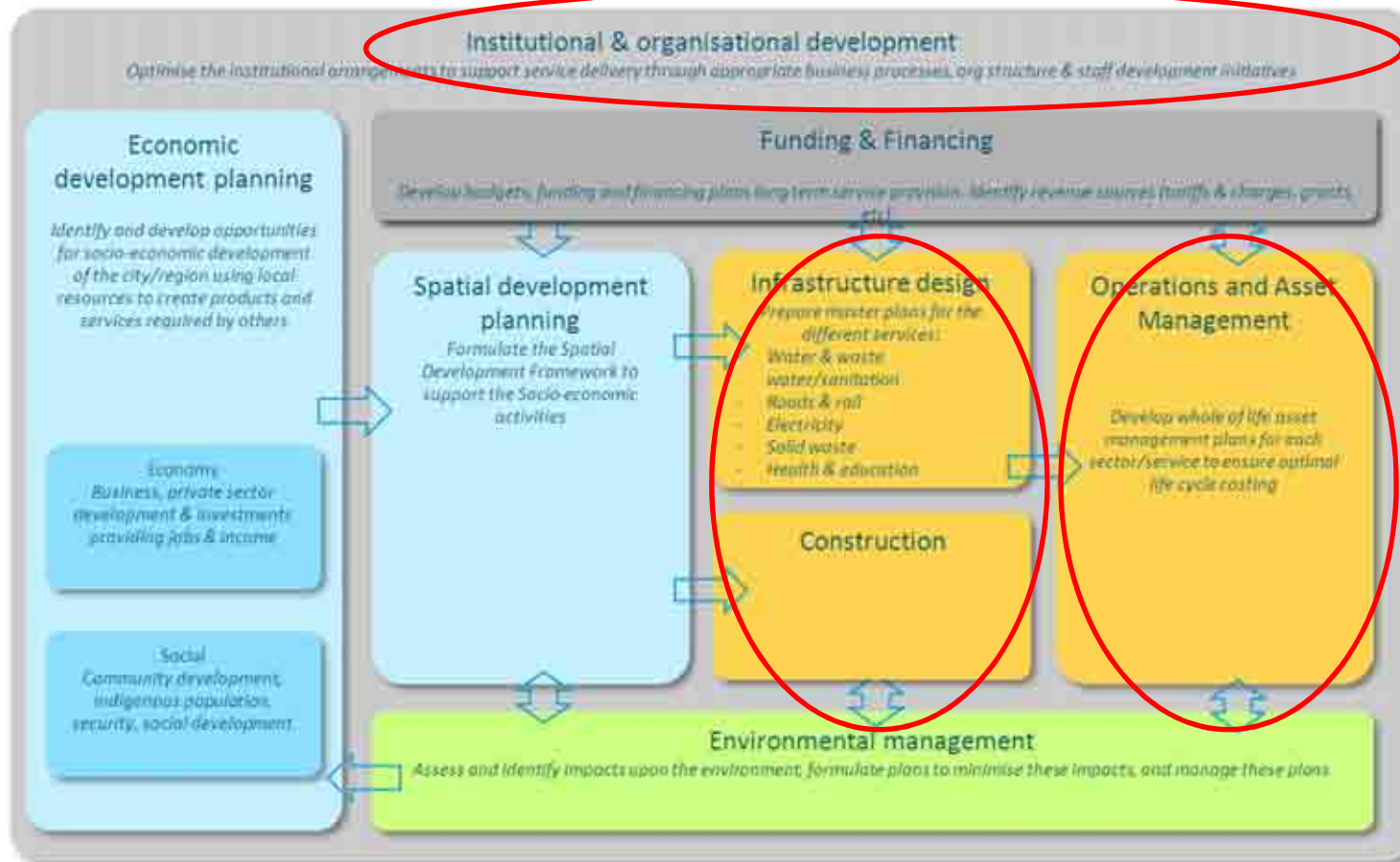
Application of the Model - Christchurch

- Infrastructure Projects - Catalytic Projects
 - Light rail
 - Metro sports hub
 - Christchurch Hospital
 - Central Library
 - Convention Centre
 - Earthquake Memorial
- Address asset management
- Governance structure definition



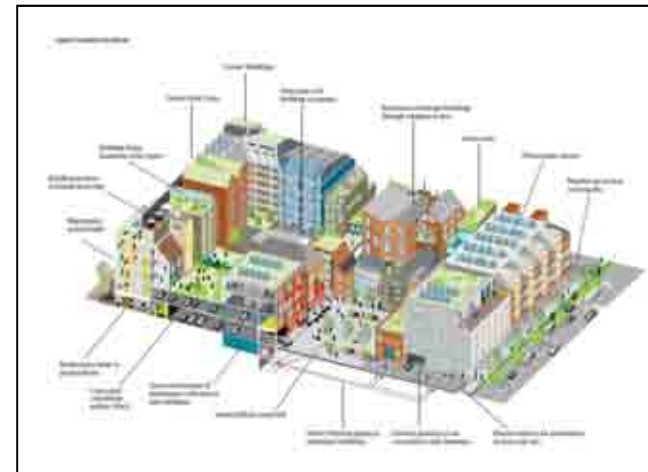
Using These Principles

Aurecon Integrated Cities Model



Application of the Model - Christchurch

- Findings
 - Housing provision is a major priority
 - Creation of jobs outside the construction sector
 - CBD rebuild
 - Bolstering the emotional resilience of the population through quick decisions focused on quality of life
 - Organisational capacity and design critical for success
 - Developing conditions for private investment



In Conclusion

- Seemingly very different urban development situations have some common challenges
- Consistently those challenges are around managing competing demands, institutional arrangements/governance, clearly defining infrastructure needs, costing of that infrastructure, funding arrangements,
- We can create models, using sustainable principles, that describe a process of addressing these challenges in a logical and evidence based manner
- These models offer direction to city managers
- Encourage you to think about how you integrate innovative building designs in the context of such a model