

Stormwater in a Liveable City

Towards an Evidence Based Policy Framework

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CRC for
Water Sensitive Cities



An Australian Government Initiative



Stormwater in a Liveable City

- Define the stormwater system
- Stormwater impacts and their mitigation
- Understand Liveability
- Explore potential contributions of stormwater to liveability
- Regulating liveability?

Sources/ Catchment

Private Property

- Residential
- Commercial
- Industrial

Roofs

- rainwater

Paved areas

- Driveways, parking
- Paths
- Other

Public Property

- Road systems
- Community facilities
- Public buildings

Public buildings

- Roofs
- Paved areas

Paved areas

- Streets, roads
- Footpaths
- parking
- Other

Transfer/ conveyance

Local Drainage Systems (Local Government)

- Drains
 - Open
 - Piped
- Overland flow paths

Catchment > 60 Ha

Melbourne Water Drainage Systems

- Drains
 - Open
 - Piped
- Overland flow paths

Property Boundary

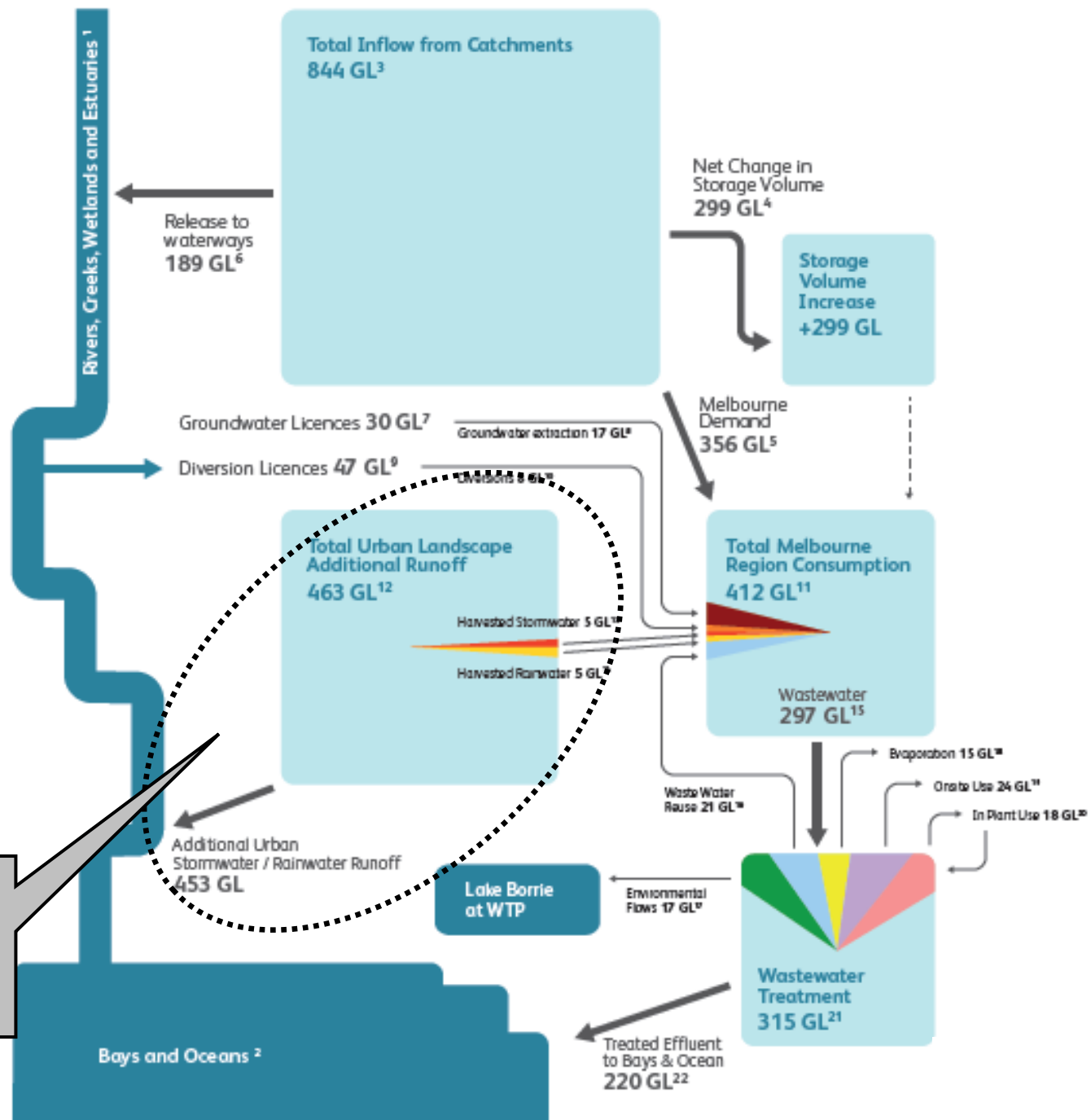
Discharge

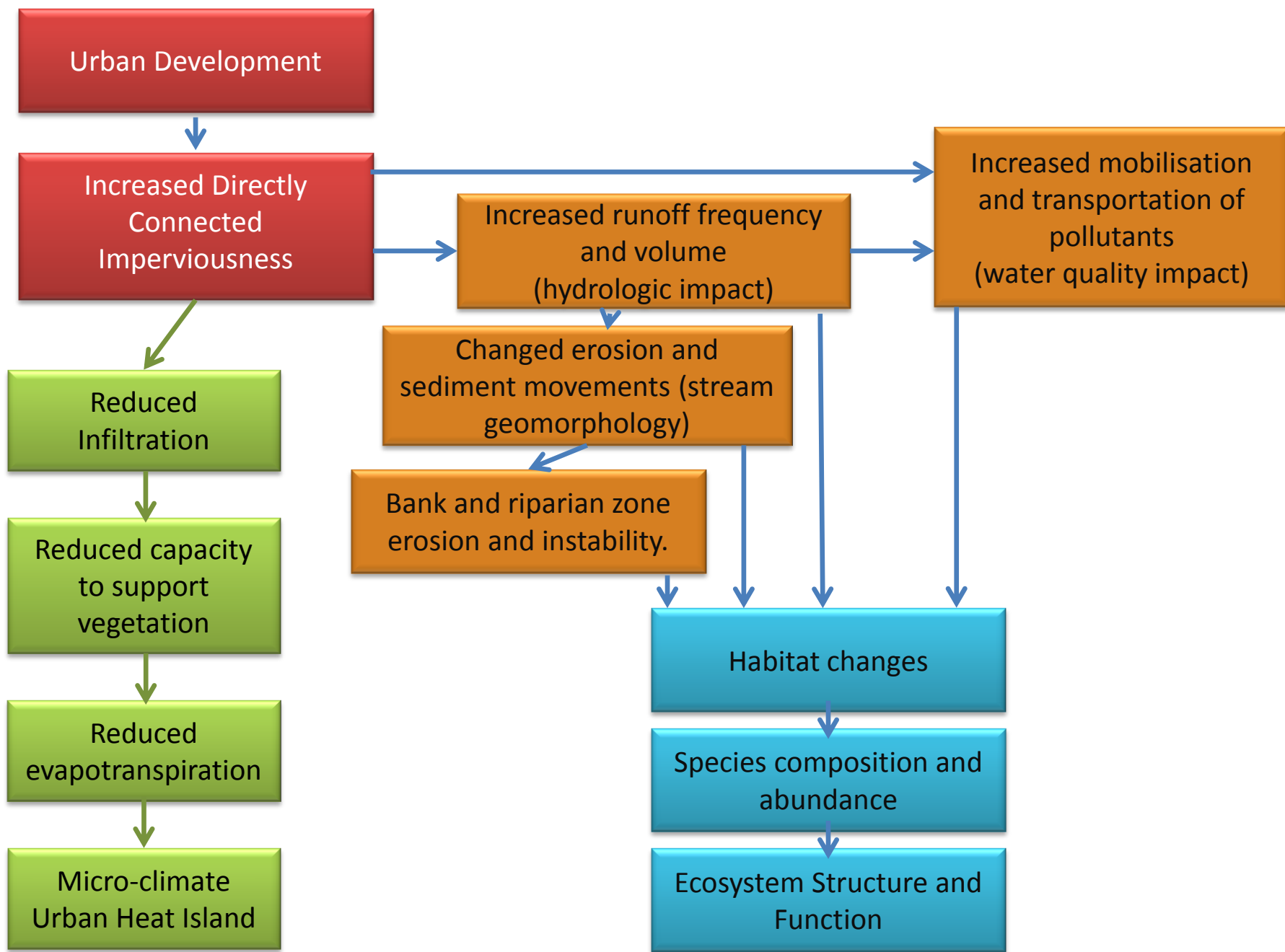
Urban Waterways

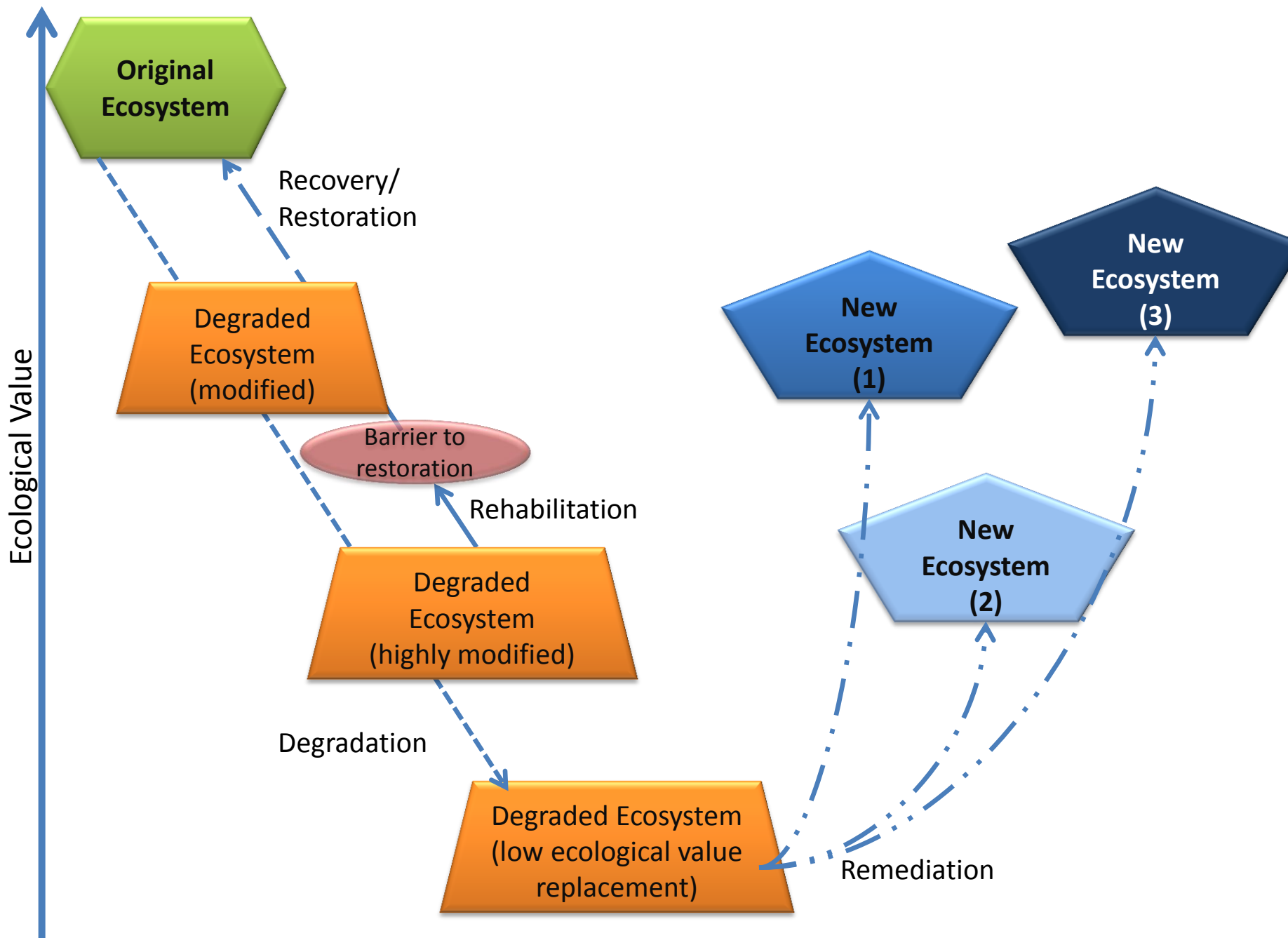
Infiltration

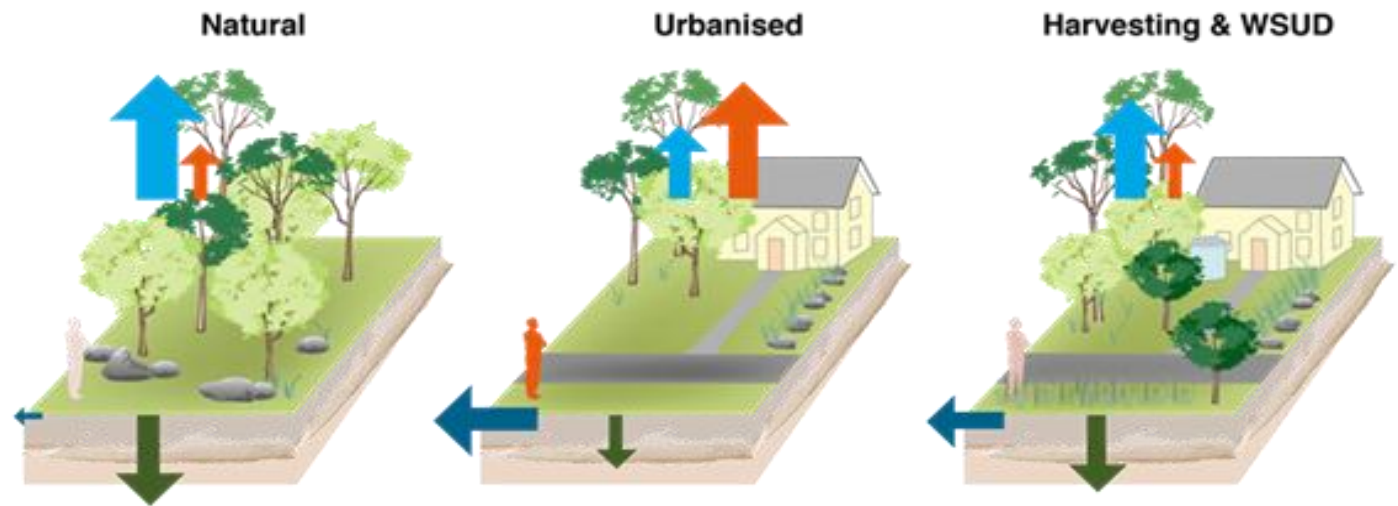
Urban Stormwater System

Based on 2010 Calendar year data where available and related data.









Stream channel form and biodiversity			
Groundwater recharge	High	Low	Moderate
Evapotranspiration	High	Low	Moderate
Atmospheric heating and heat storage in buildings	Natural	Hotter	Closer to natural
Human thermal comfort	Neutral	Hot	Slightly warm
Surface runoff	Low and infrequent	High and frequent	Infrequent and moderate
Stream hydrology	Natural	'Peaky'	Moderated (both high flows and low flows)
Riparian vegetation	Intact	Degraded	Restored
Channel form	Natural	Severely degraded	Uncertain (may need intervention)

Stormwater management - more than stream health

- Stormwater management can improve stream ecology
 - Harvesting to remove stormwater peaks
 - Infiltration/release to restore base flows
- Other benefits?
 - Landscape aesthetics
 - Microclimate
- What else?
 - Quality of life?
 - Liveability?

What is Liveability?

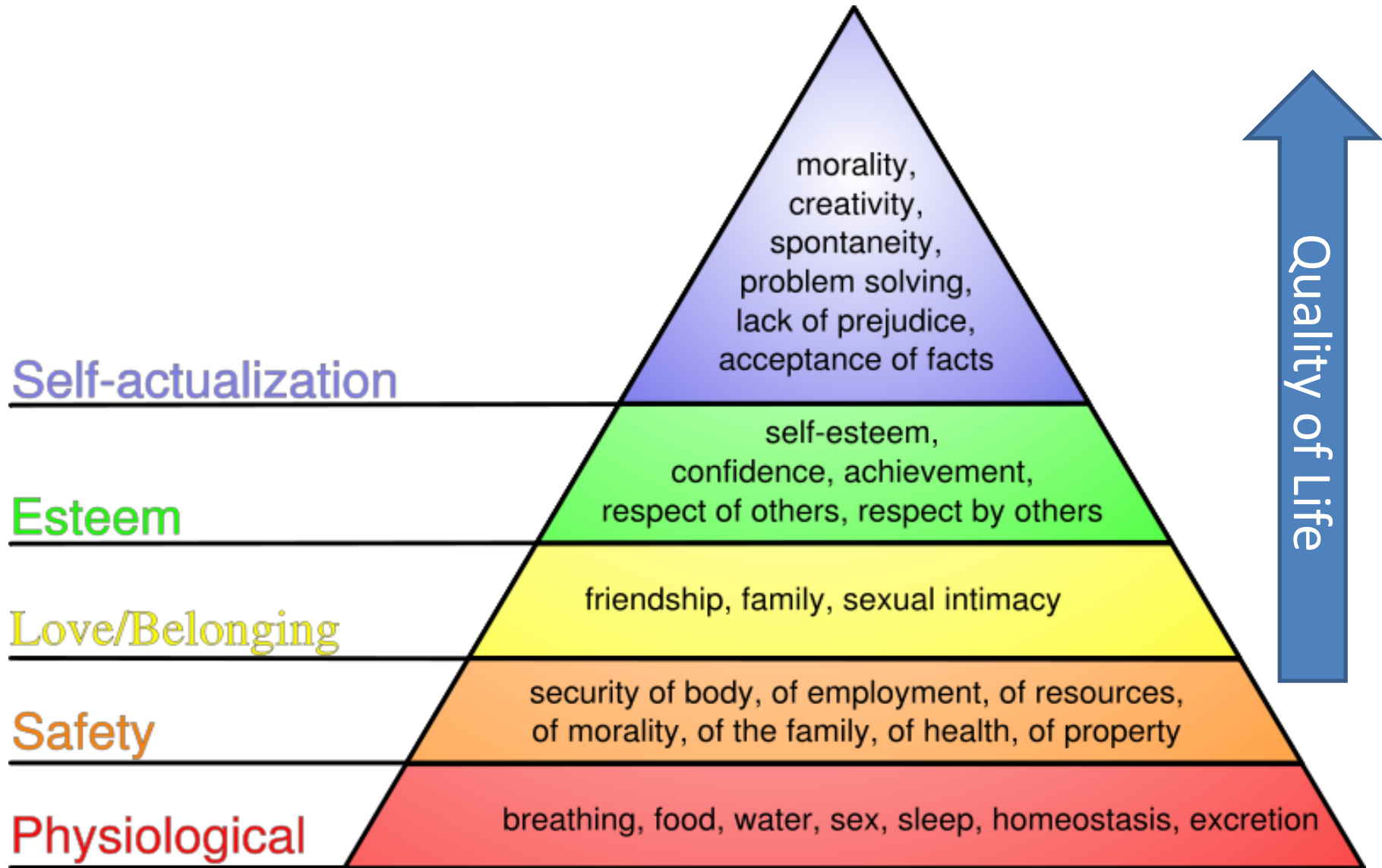
Liveability reflects the wellbeing of a community and comprises the many characteristics that make a location a place where people want to live now and into the future.

Victorian Competition and Efficiency Commission (2008)

Liveability includes

- Bio-Physical characteristics of a place
- Social environment and interactions
- Anthropocentric (human centred)
- Quality of life, human wellbeing
- Link between human wellbeing and their environment (bio-physical and social)
- satisfaction of needs/wants → wellbeing → liveability

Maslow's Hierarchy of Needs



Liveability

– *meeting societal needs*

Existence

Physical and Material
Needs

Satisfaction/
Progression

Frustration/
Regression

Relatedness

Social interaction and
relationships

Satisfaction/
Progression

Frustration/
Regression

Growth

Self-esteem and Self
Actualisation

Alderfer's Existence Relatedness Growth
(ERG) Needs Theory



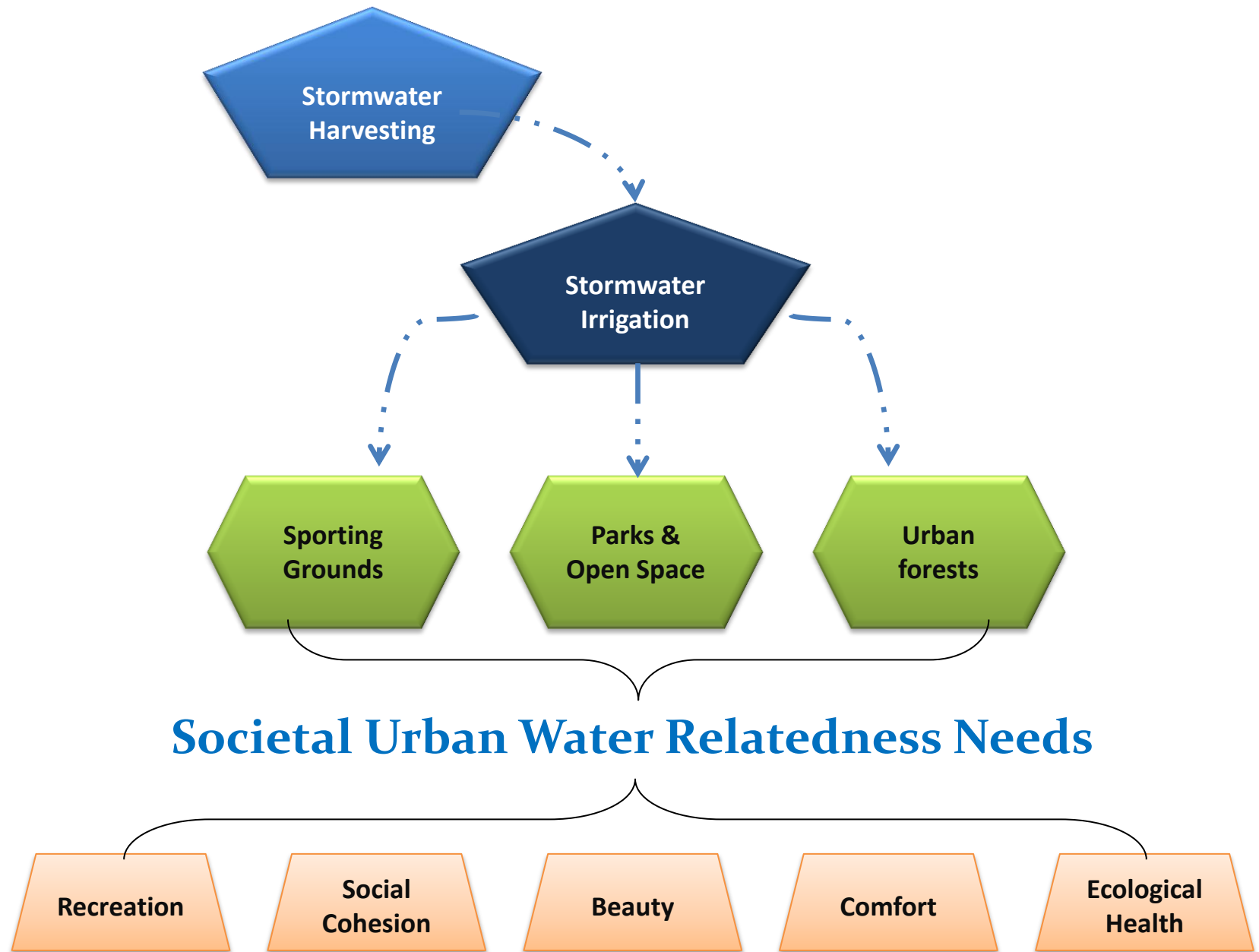
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Stormwater and Existence Needs

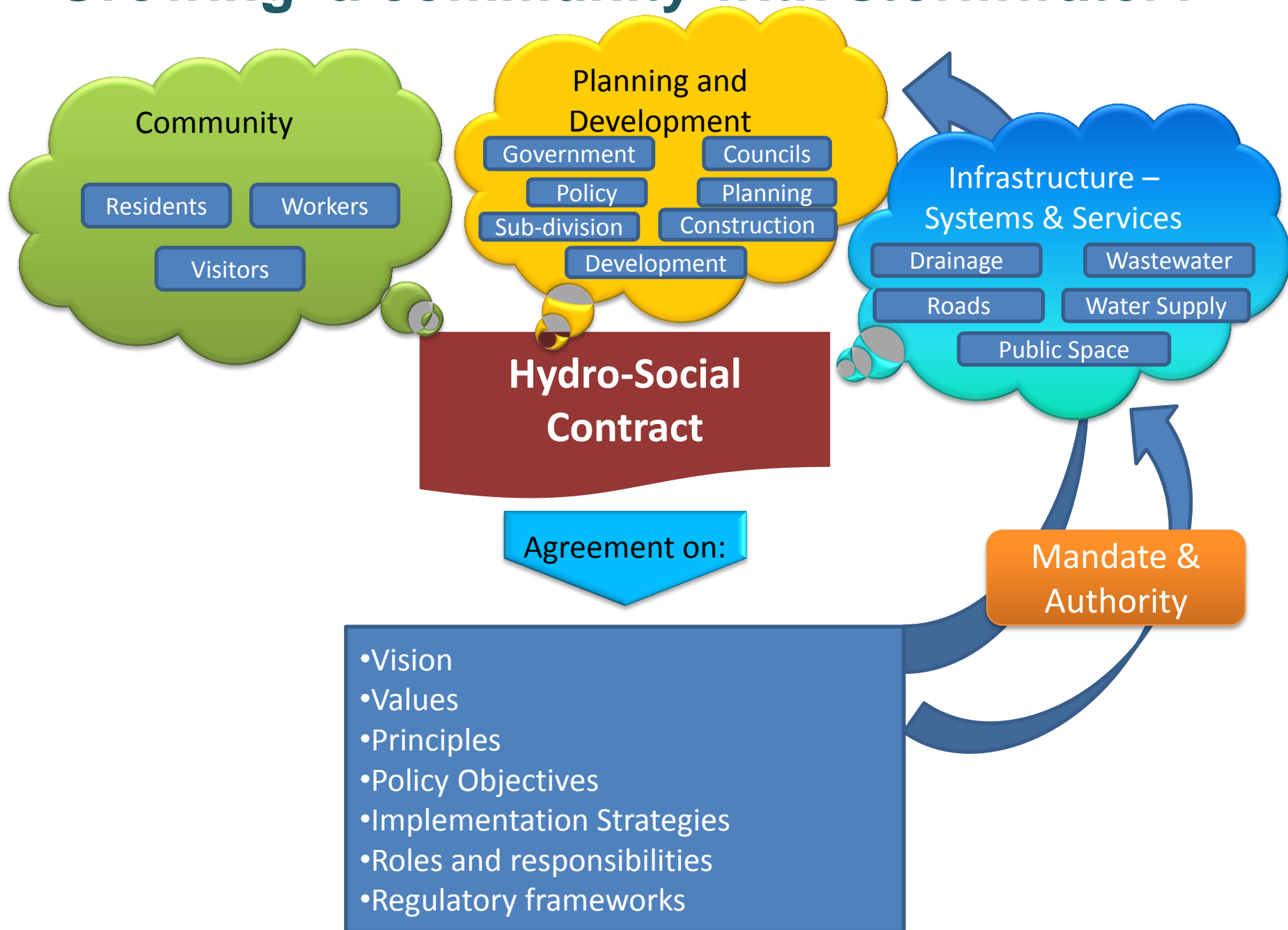
Existence	Physical and material needs	Drinking Water	Water savings through replacement of mains water by stormwater
		Non-drinking Water	Stormwater as a fit for purpose water source
		Public Health	<ul style="list-style-type: none"> • Containment and treatment of contaminated stormwater • Urban design and municipal works – sporting grounds, public spaces and places
		Public Safety	Urban design and municipal works – drainage and flood control
		Property Protection	Urban design and municipal works – drainage and flood control
		Economic activity	<ul style="list-style-type: none"> • Jobs and investment in urban design and municipal works • Creation of a resource that supports water dependant industries

Stormwater and Relatedness Needs

Relatedness	Social interaction and inter-personal relationships	Recreation	Urban design and municipal works – irrigated sporting grounds
		Social Cohesion	Urban design and municipal works – irrigated vegetated public spaces and places
	Societal-environmental inter-relationships	Beauty	Urban design and municipal works – irrigated vegetated urban landscapes and streetscapes
		Comfort	Microclimate & heat moderation – urban design and municipal works – irrigated vegetated public spaces and places
		Ecological health	<ul style="list-style-type: none"> • Externalities – stormwater runoff regime • Within urban catchments – urban design and municipal works – public spaces and places

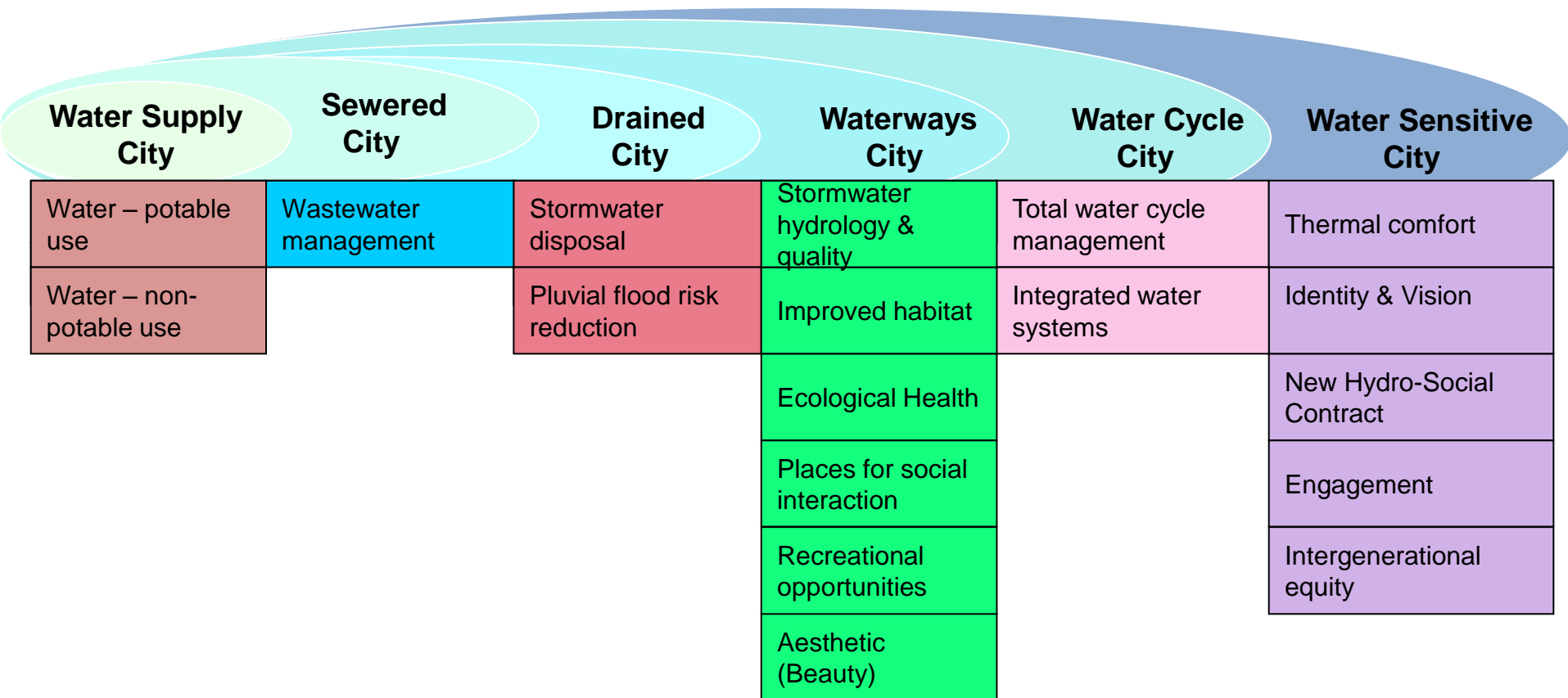


Growing a community with stormwater?



Stormwater and Growth Needs

Growth	Societal self-esteem and self-actualisation	Identity	Urban design and municipal works – public spaces and places
		Purpose and Ambition	<ul style="list-style-type: none">• Hydro-social contract renewal• Governance and community engagement
		Control and Independence	<ul style="list-style-type: none">• Hydro-social contract renewal• Governance and community engagement
		Equity and Social justice	<ul style="list-style-type: none">• Outcome focused regulatory controls• Consumer/community ‘watchdog’
		Intergenerational equity	<ul style="list-style-type: none">• Outcome focused regulatory controls• Consumer/community ‘watchdog’



Existence

- Secure water supplies
- Public health
- Public safety
- Property protection
- Economic activity

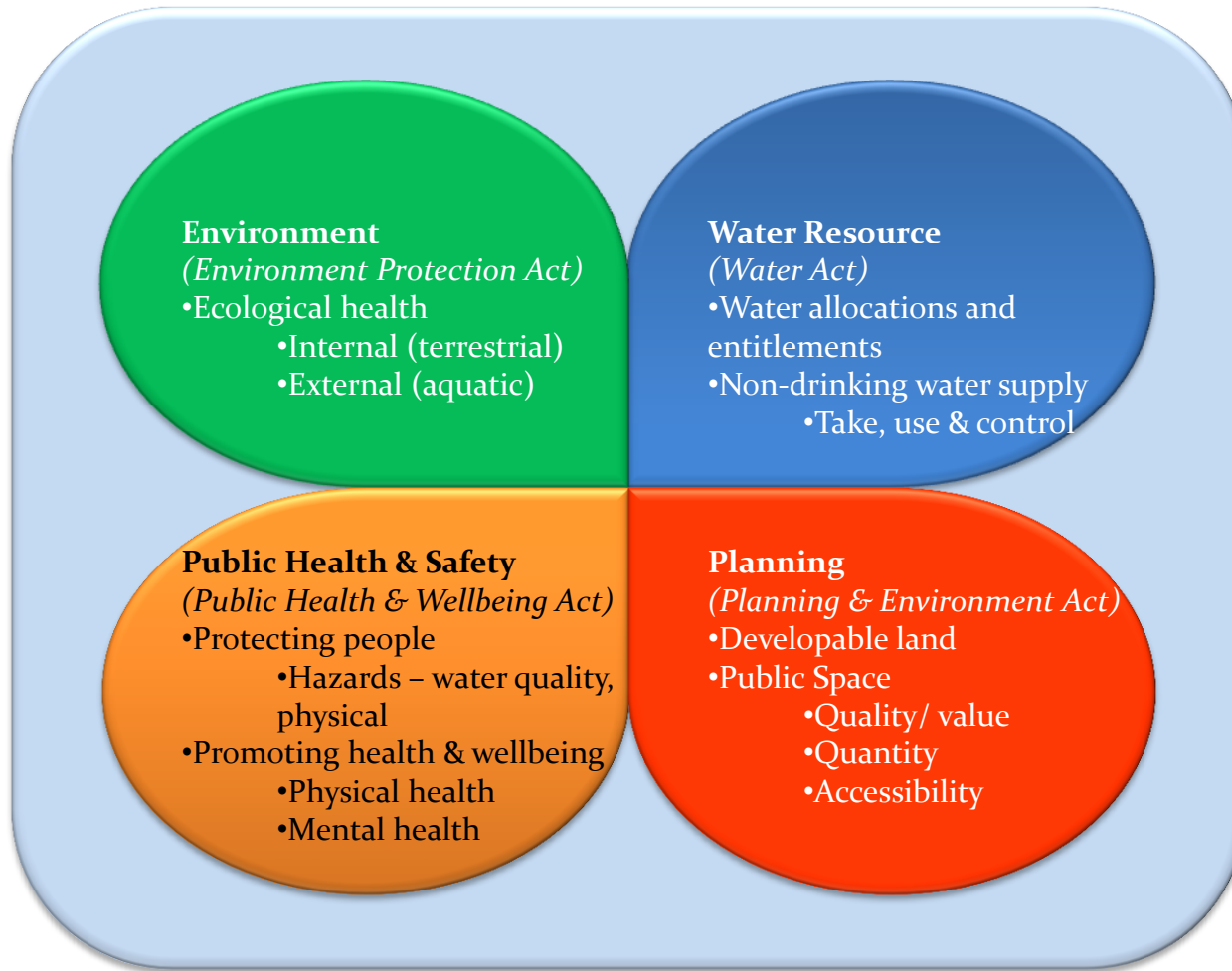
Relatedness

- Recreation
- Social cohesion
- Beauty
- Comfort
- Ecological health

Growth

- Achievement
- Identity
- Purpose
- Control & Independence
- Equity & Social justice
- Intergenerational equity

Regulating for Liveability?

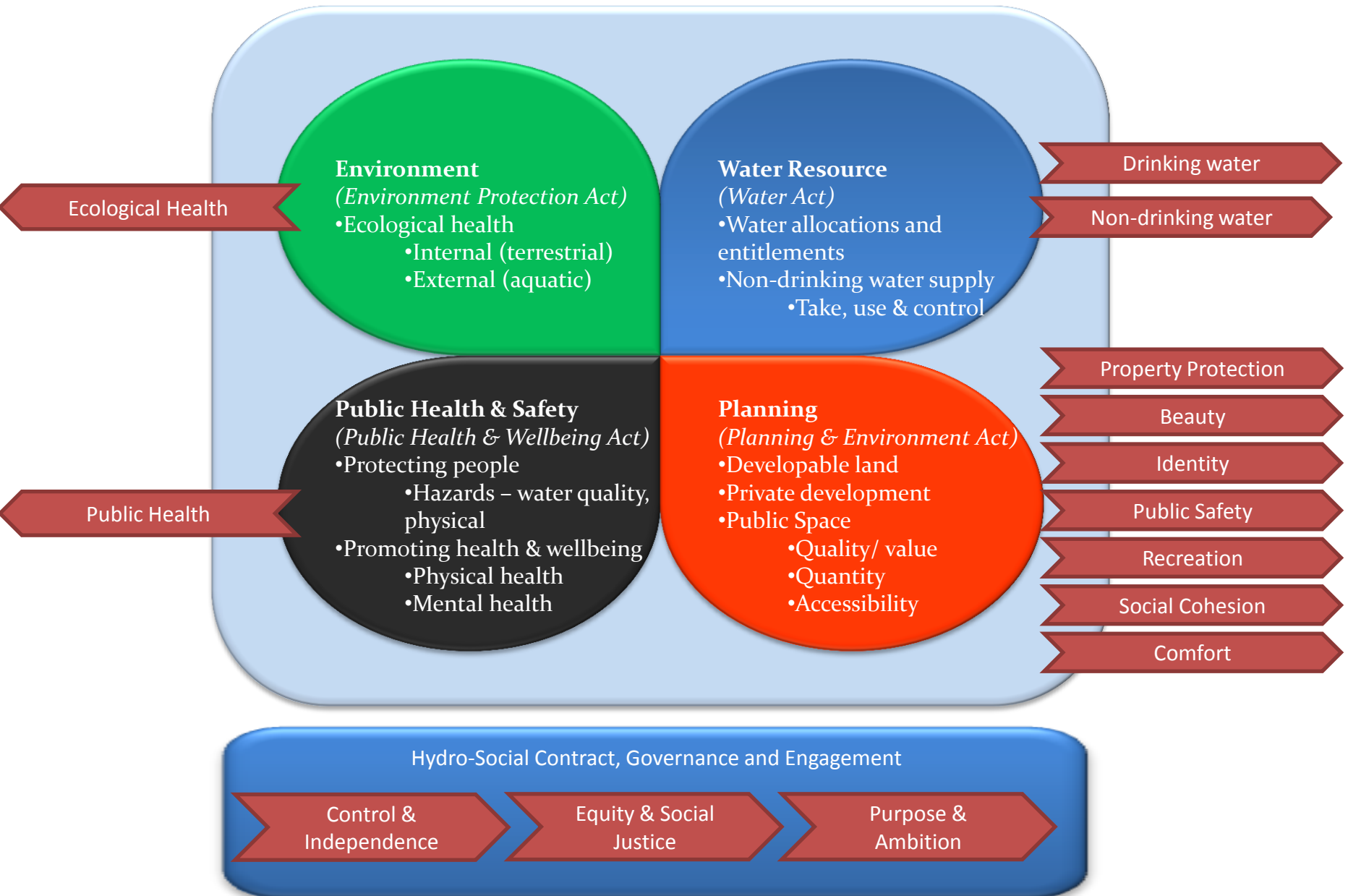


Victoria's legislative framework for urban development and water services



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Societal Urban Water Needs and Victoria's legislation



Conclusions

- Liveability is multi-dimensional
 - separate but inter-related components
 - Societal needs
 - Bio-physical and social dimensions
 - Range of tangible and intangible outcomes
- Stormwater can contribute to a range of society's needs and wants:
 - Physical and material – Existence Needs
 - Social and societal-environment interactions – Relatedness Needs
 - Self esteem and self actualisation – Growth Needs
- Legislation and Regulation – specific to particular dimensions of liveability
- Hydro-social contract – role of community in policy and strategic planning

