EIGHTH REGIONAL 3R FORUM IN ASIA AND THE PACIFIC

NEXT GENERATION 3R TECHNOLOGIES FOR MANAGING WASTE

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SOFTWARE FOR SUSTAINABLE CITIES PLANNING

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HOW MANY EARTHS DO WE NEED ?

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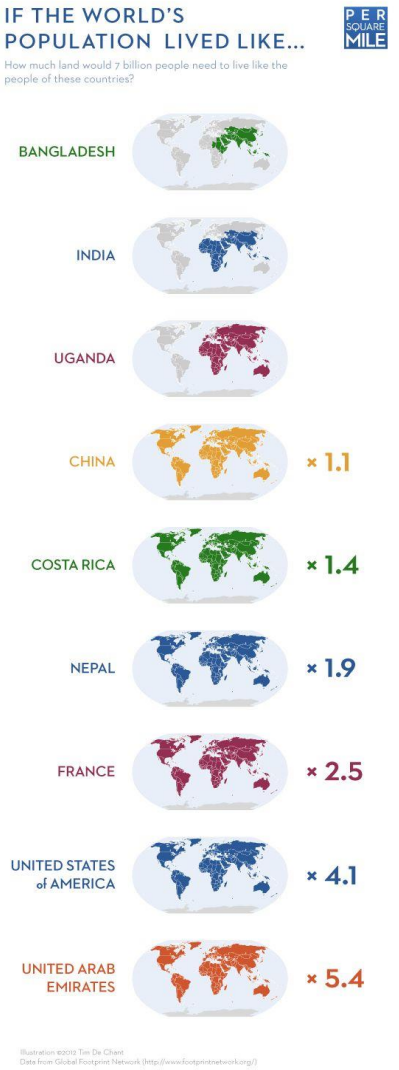
ECOLOGICAL FOOTPRINT

Ecological footprint (countries of one million people or more)		
Country	**Footprint per person**	**How many Earths?**
Kuwait	8.9 global hectares	5.1
Australia	8.3	4.8
United Arab Emirates	8.1	4.7
Qatar	7.0	4.0
United States of America	6.8	3.9
Canada	6.6	3.8
Sweden	6.5	3.8
Bahrain	6.2	3.6
Trinidad and Tobago	6.0	3.5
Singapore	5.9	3.4



Source: GFN (2011 data)

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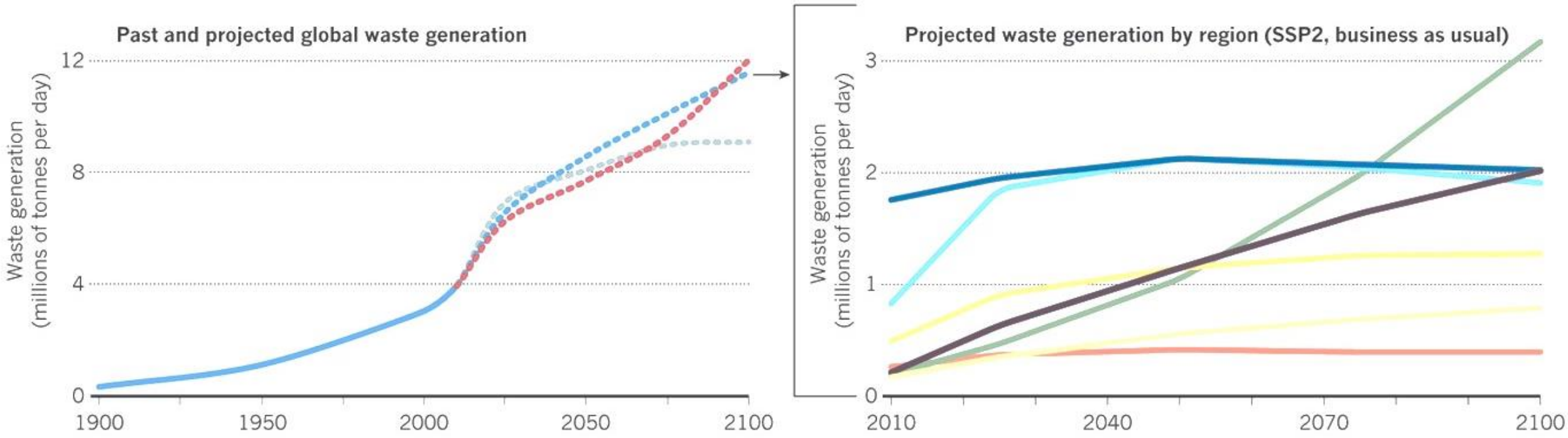
GLOBAL WASTE PRODUCTION

Three projections to 2100 for waste generation spell very different futures. In the first Shared Socioeconomic Pathway[9] scenario (SSP1), the 7-billion population is 90% urbanized, development goals are achieved, fossil-fuel consumption is reduced and populations are more environmentally conscious. SSP2 is the 'business-as-usual' forecast, with an estimated population of 9.5 million and 80% urbanization. In SSP3, 70% of the world's 13.5 billion live in cities and there are pockets of extreme poverty and moderate wealth, and many countries with rapidly growing populations.

SSP1 SSP2 SSP3

*Organisation for Economic Co-operation and Development

Sub-Saharan Africa
East Asia and Pacific
Europe and central Asia
South Asia
Latin America and the Caribbean
Middle East and North Africa
High-income and OECD* countries



Source: nature.com

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3R / CE PRINCIPLES ARE WELL KNOWN

1

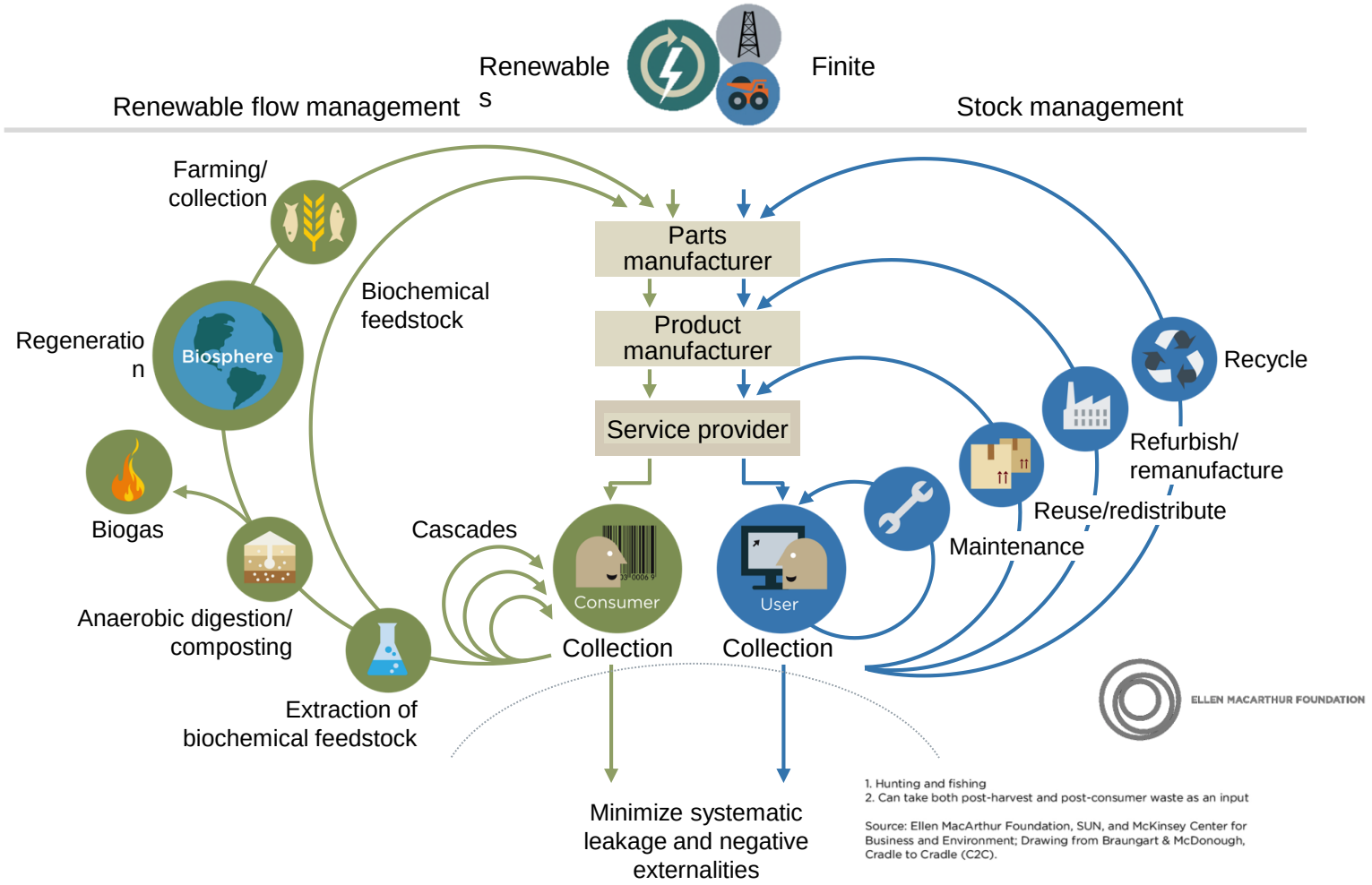
Serve and enhance natural capital by controlling finite stocks and balancing renewable resource flows

2

Optimise resource yields by circulating products and materials at the highest utility at all times in both the technical and biological cycles.

3

Foster system effectiveness by revealing and designing out negative externalities.



But implementing them have always been hard and slow

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IN THE MEANWHILE

The breathtaking pace of digital innovation - AI, ML, BD…

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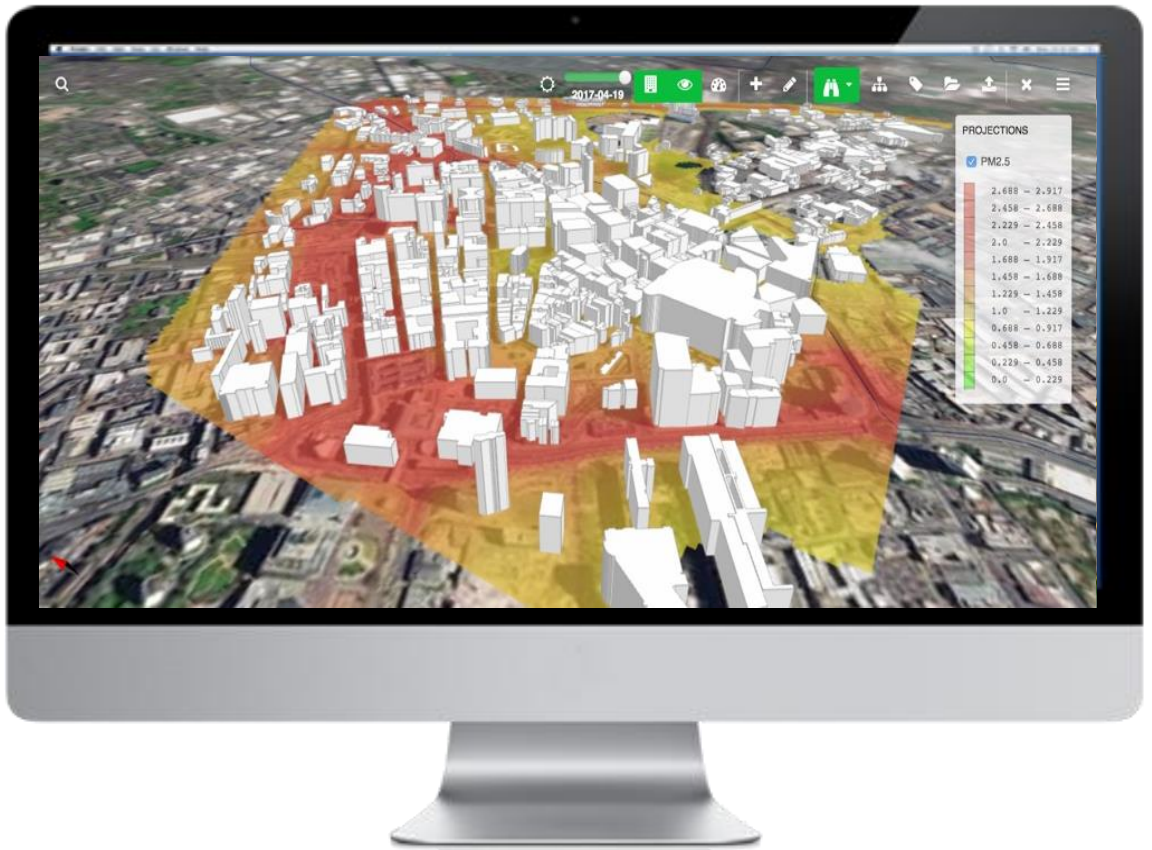
WE ARE NOW ABLE TO PREDICT ENVIRONMENTAL DAMAGE



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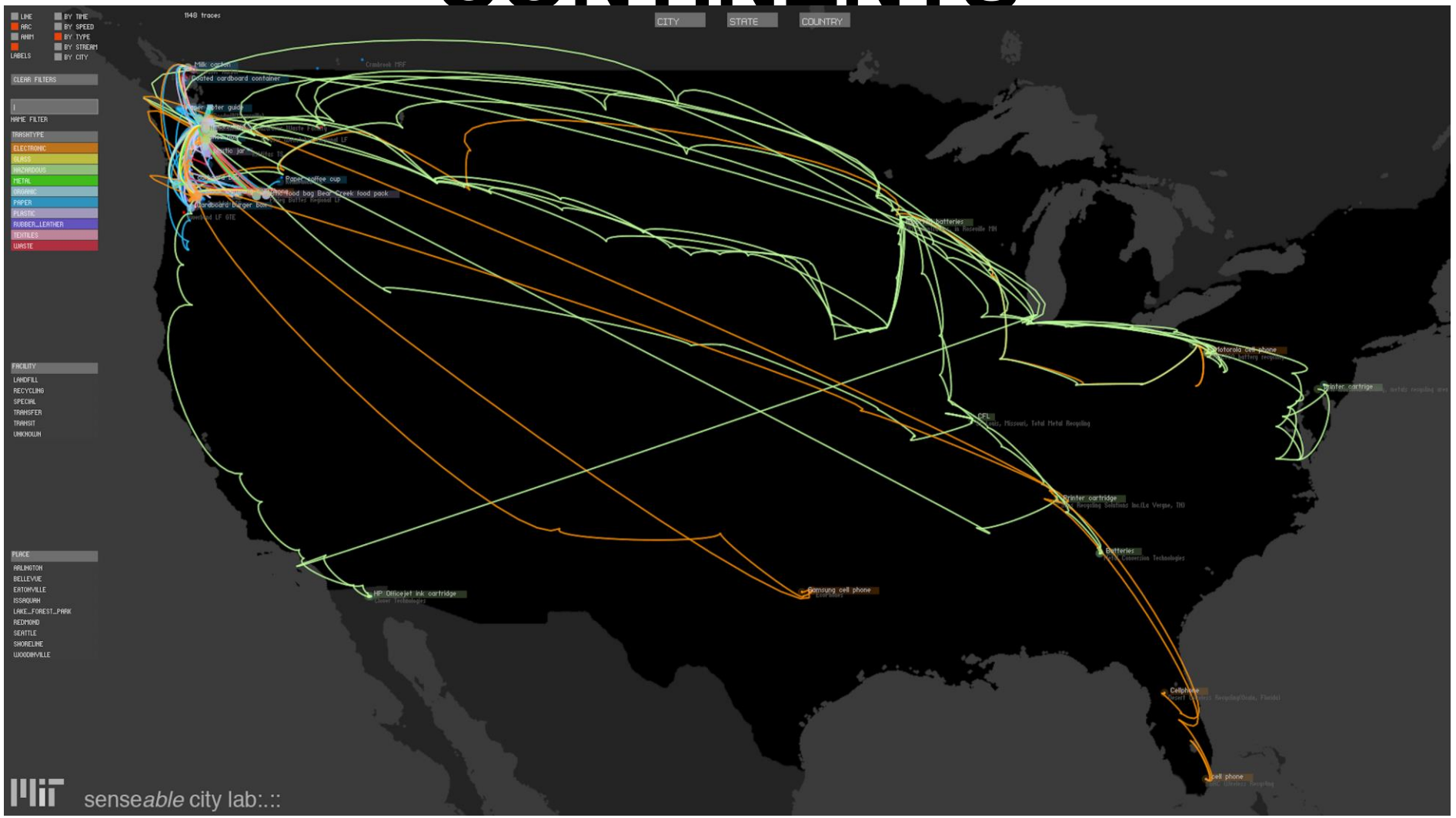
AND TRACK OUR TRASH ACROSS CONTINENTS



Source : Senseable City Lab. MIT

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But we have yet to realize the full potential of Information Communication Technology in reducing waste

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TECHNOLGY AS ENABLER OF REGENERATIVE ECONOMY

…keeping products, components and materials at their highest utility and value, at all times, for an extended period of time

…eliminating the concept of waste, with materials ultimately re-entering the economy, efficiently at end of use as valuable technical or biological nutrients

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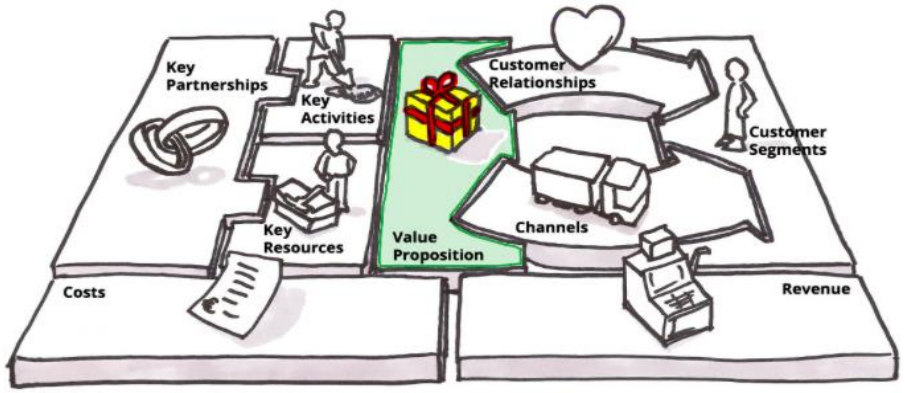
DRIVERS FOR CHANGE

The new urban matrix and the green regulatory environment

FUTURE CITIES

1. CONNECTED
2. AUTOMATED
3. SHARED
4. ENVIRONMENTALLY FRIENDLY

Pace of technology innovation



Acceptance of new business models

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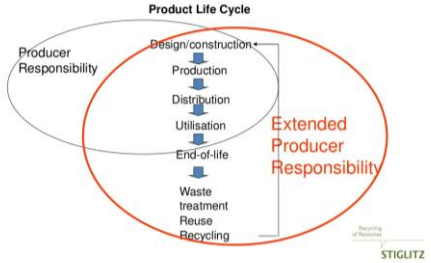
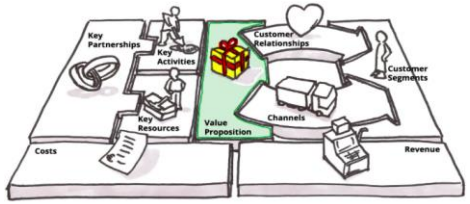
DIGITAL IDEAS THAT DRIVES DOWN WASTE

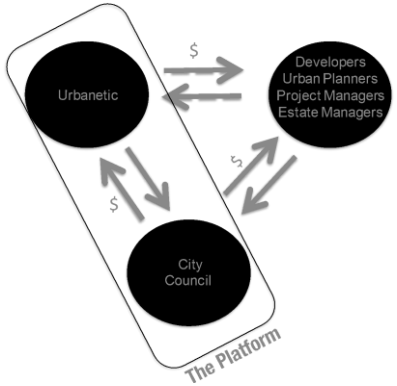
Preserve and enhance natural capital

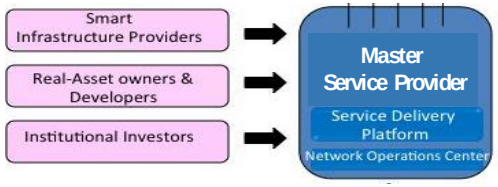
Optimize resource yields

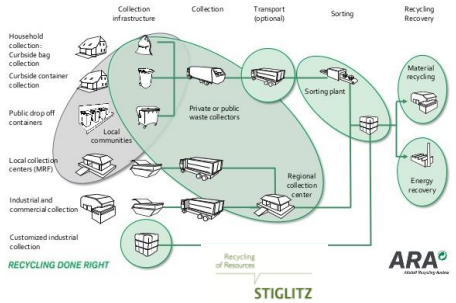
Foster System effectiveness

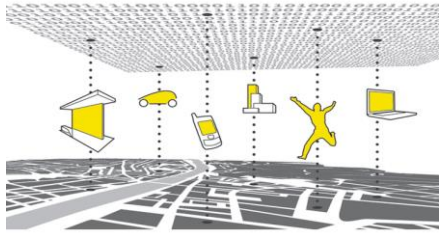












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THE ReSOLVE FRAMEWORK

ReGENERATE
Regenerate and restore natural capital

EXPLORE
Select new resources and technologies

SHARE
Maximize asset utilisation

VIRTUALISE
Avoid resource use and deliver utility virtually

OPTIMISE
Optimise system performance

LOOP
Keep products and materials in productive cycles

SOURCE: Adopted from: 'Growth Within: a circular economy vision for a competitive Europe', Ellen MacArthur Foundation, SUN, McKinsey Center for Business and Environment

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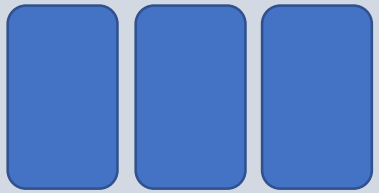
PUTTING THE IDEAS IN A FRAMEWORK

AN ENGAGED COMMUNITY

CITY ADMINISTRATION

CITY INFO-STRUCTURE



BUSINESS ENTERPRISES

THE BUILT AND THE NATURAL ENVIRONMENT

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BUT THERE ARE CHALLENGES TO OVERCOME

Willingness to share data

Lack of investment in public infrastructure And utility services

Lack of experience and leadership

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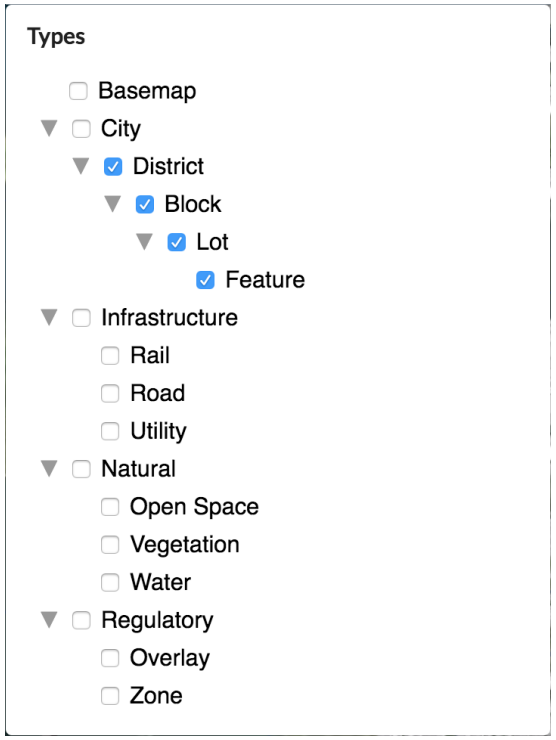
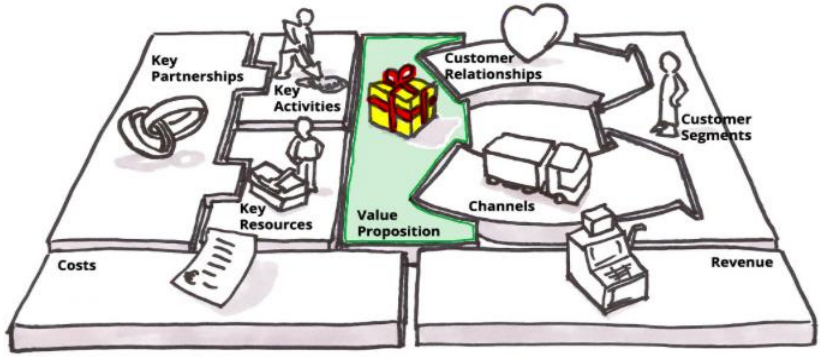
RECOMENDATIONS FOR ZERO WASTE MISSION AND SWACHH BHARAT



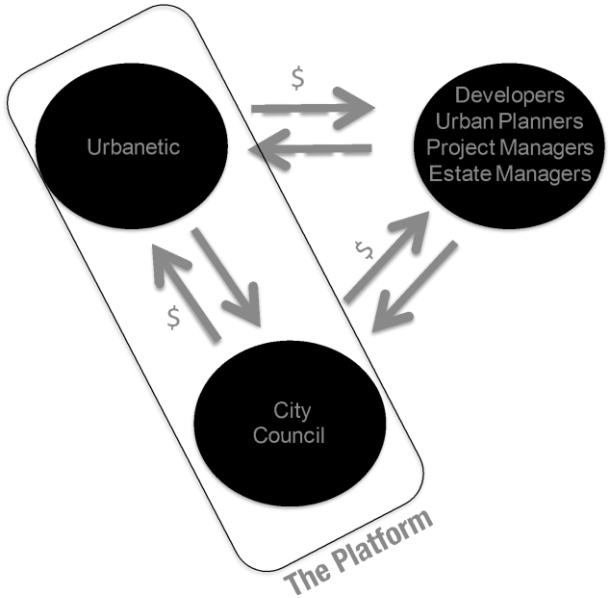
BUILD A CENTRAL CITY DATA INFOSTRUCTURE AND SHARE

SPATIAL + NON-SPATIAL

https://data.melbourne.vic.gov.au/
https://www.onemap.sg/home/



ADOPT NEW BUSINESS MODELS IN CITIES



DESIGN IMPLEMENT AND MONITOR PROJECTS AND PARTNERSHIPS

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THANK YOU

NEXT GENERATION 3R TECHNLOGIES FOR MANAGING WASTE

WWW.URBANETIC.NET