CRC for **Water Sensitive Cities**

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Project A4.3
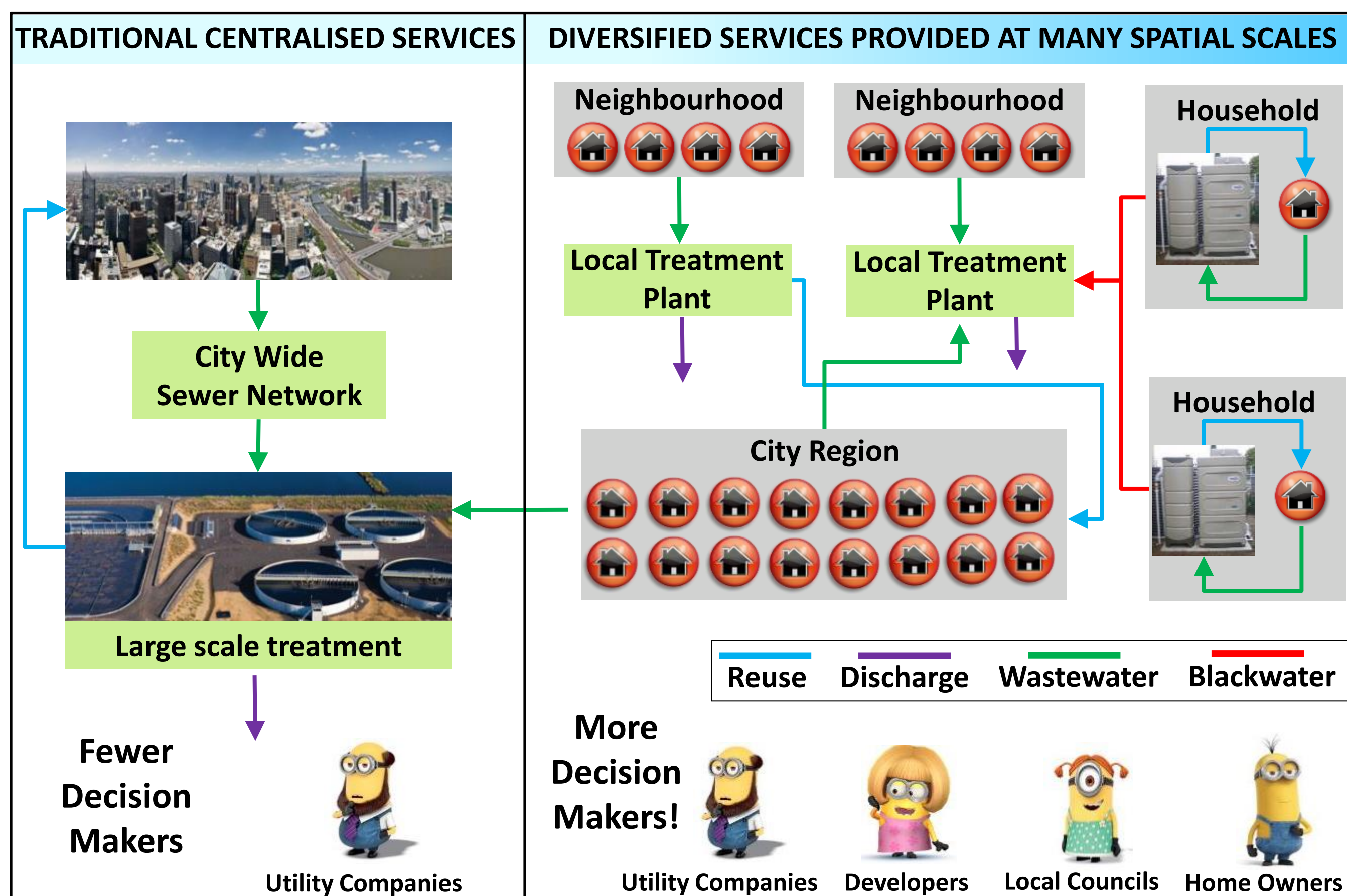Socio-technical modelling tools to examine urban water management scenarios

Tapping into Localised Wastewater Reuse

What are the effects of providing local scale wastewater treatment and reuse services and how can they be better understood?

TRADITIONAL CENTRALISED SERVICES	DIVERSIFIED SERVICES PROVIDED AT MANY SPATIAL SCALES

City Wide Sewer Network

Large scale treatment

Fewer Decision Makers

Utility Companies

Neighbourhood

Neighbourhood

Household

Local Treatment Plant

Local Treatment Plant

City Region

Household

Reuse   Discharge   Wastewater   Blackwater

More Decision Makers!

Utility Companies   Developers   Local Councils   Home Owners

Shift from traditional services to wastewater management strategies that use tools at many spatial scales to achieve city wide objectives

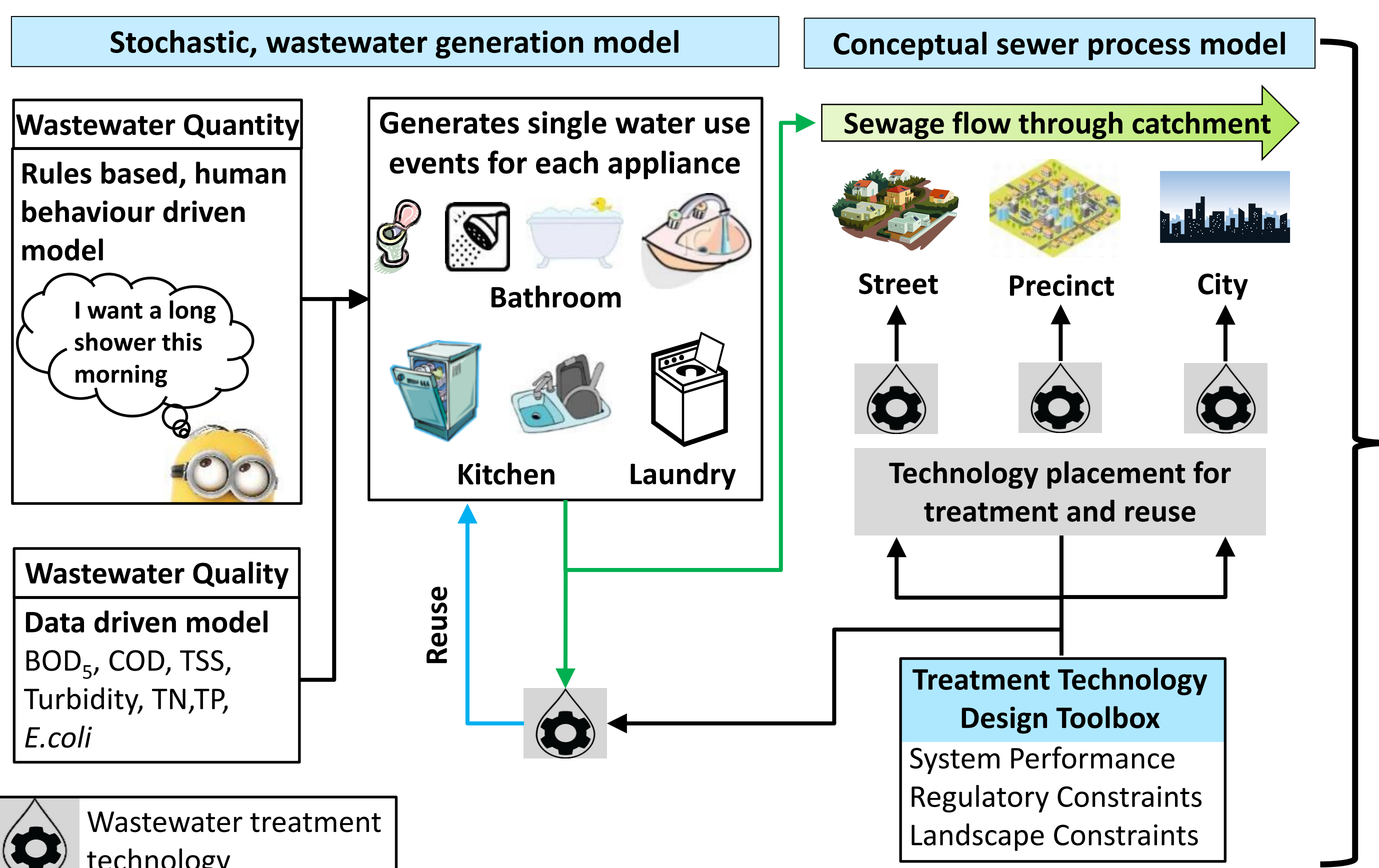## Challenges for Long Term Planning

1. **More people making decisions** on when and how wastewater is treated for recycling or discharge.

2. **More choices** in how we set up long term wastewater management strategies for a city.

3. **More upstream influences.** For example:

   - Changes in how people use water; AND

   - Use of local wastewater treatment and recycling technologies.

   This WILL impact the performance of our sewers and influence the types of treatment infrastructure we use downstream.

   WE need tools to allow for better scenario analysis of wastewater management strategies.

Wastewater Management Support Model

How will it work?

Stochastic, wastewater generation model

Conceptual sewer process model

Wastewater Quantity

Rules based, human behaviour driven model

I want a long shower this morning

Generates single water use events for each appliance

Bathroom

Kitchen   Laundry

Reuse

Wastewater Quality

Data driven model
BOD_5, COD, TSS, Turbidity, TN, TP, *E.coli*

Wastewater treatment technology

Sewage flow through catchment

Street   Precinct   City

Technology placement for treatment and reuse

Treatment Technology Design Toolbox
System Performance
Regulatory Constraints
Landscape Constraints

Model Features:

1. **Create and test the performance of many wastewater treatment and recycling scenarios.**

   - Test different regulatory conditions set by decision makers.

   - Test influence of upstream water use behaviour and appliance efficiency.

   - Test impact of household treatment and recycling systems on downstream technologies.

2. **Uses an iterative approach** – implement changes (e.g. technology uptake) and observe changes (e.g. sewage pollution characteristics) **over time.**

3. **Identify pathways** to achieve diversified wastewater management strategies while still **maintaining service requirements.**