



Solution pathways and adaption techniques

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Session overview

Introduction and context : 5 minutes

Sli.do: 5 minutes

Developing an adaptive plan methodology: 25 minutes

Conclusion and questions: 10 minutes



London 2100



- The backbone of London's sewerage infrastructure was built in 1865.
- The population of London in 1865 was approximately 2 million people.
- The population of London is currently nine million people.
- London's population could be 15.5 million people by 2100.

London's wastewater system is immense and complex and any changes will be difficult to and take a long time to implement.

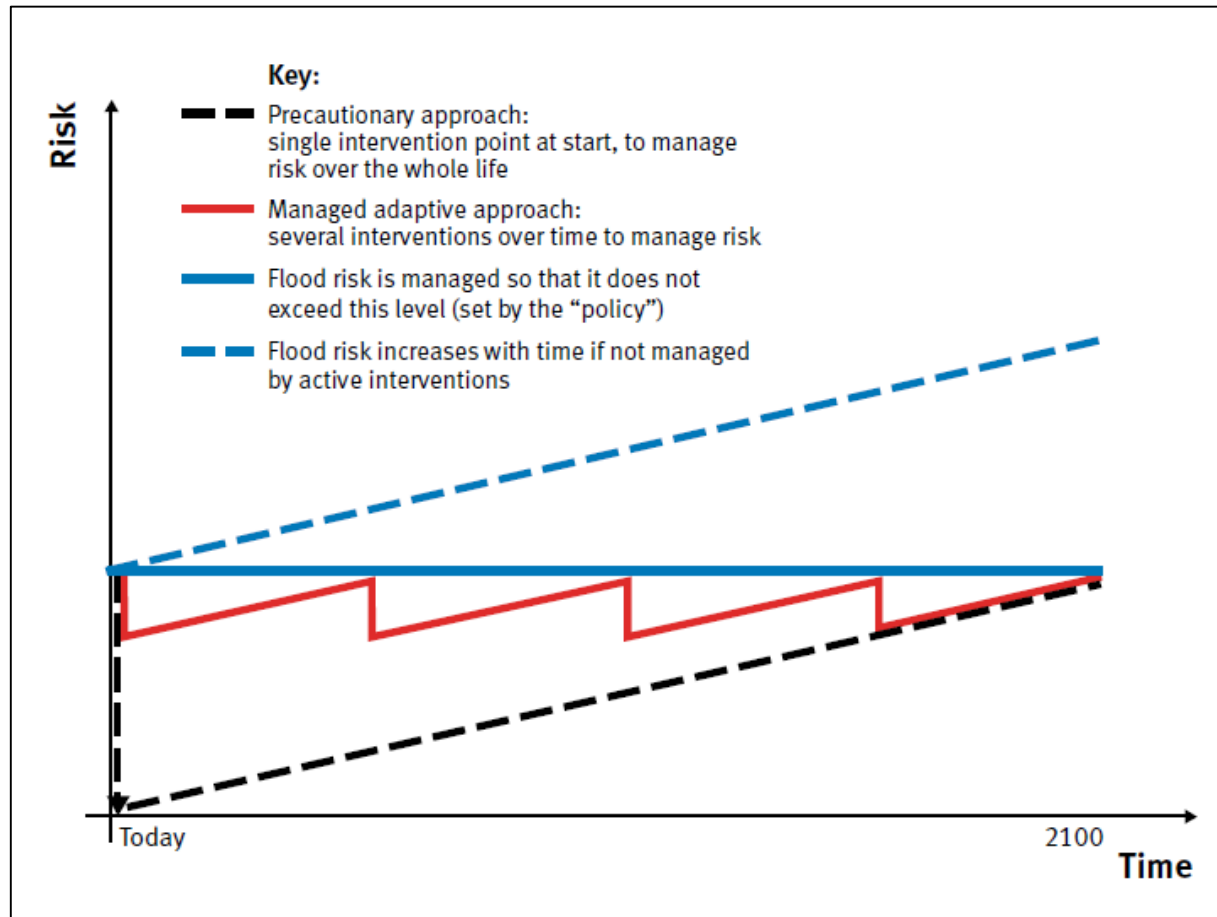




2100

**NOT UNDER
CONSIDERATION
AS AN OPTION**

Adaptive plan risk management



Environment Agency, Managing flood risk through London and the Thames estuary
TE2100 Plan (November 2012)



Sli.do.

Q1. How familiar are you with adaptive planning techniques?

Q2. Do you think you will use adaptive planning techniques in the development of your DWMP?

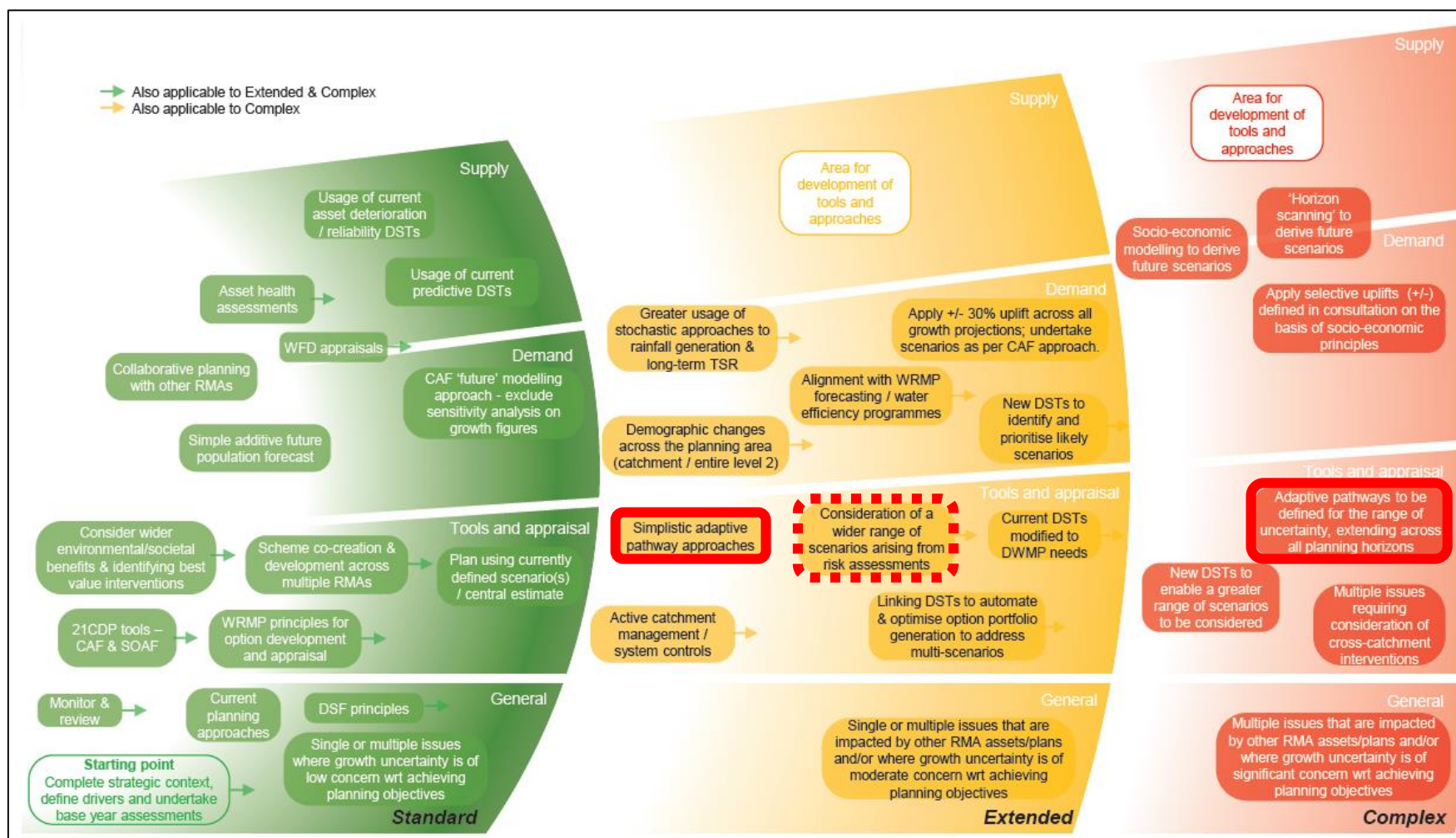
Q3. Do you feel you have the data you need to plan beyond 25 years?

Q4. What do you think will be the biggest barrier to implementing an adaptive plan? - Wordcloud

Please ask questions on Sli.do throughout the session. I will try to answer as many as I can at the end.



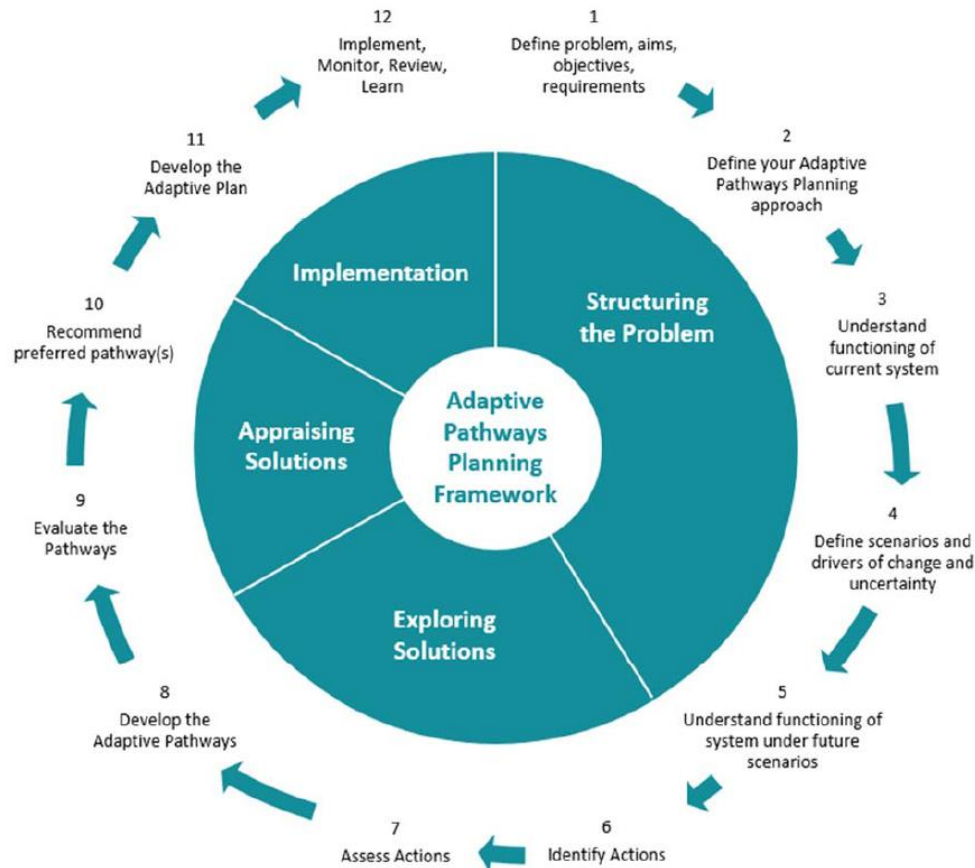
DWMP and adaptive pathway approaches



Water UK, 2018, A framework for the production of DWMPs Appendix C, p16



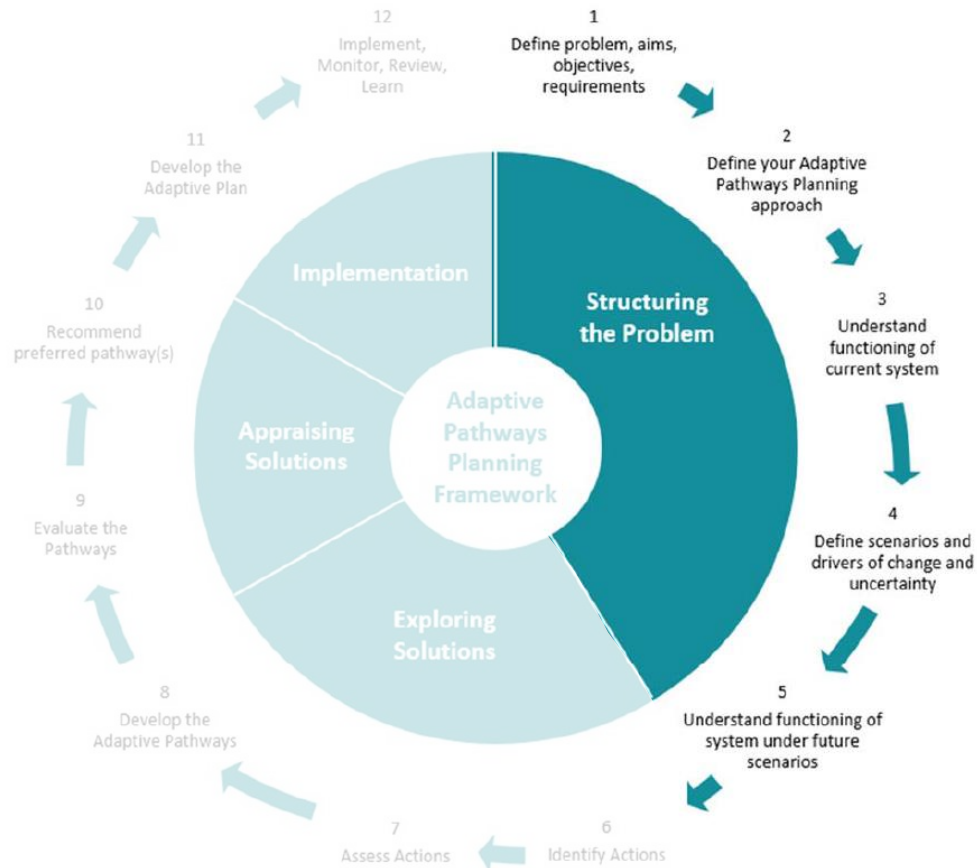
Building an adaptive plan in 12 steps



GHD, 2018. Adaptive Pathway Planning Guidance, Melbourne, Australia: GHD (Prepared for Melbourne Water)



Building an adaptive plan – Structuring the problem



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Structuring the problem

Step 1: Define Problem, aims, objectives, requirements – can be used for network or process assets

Step 2: Define your Adaptive Pathways Planning approach.

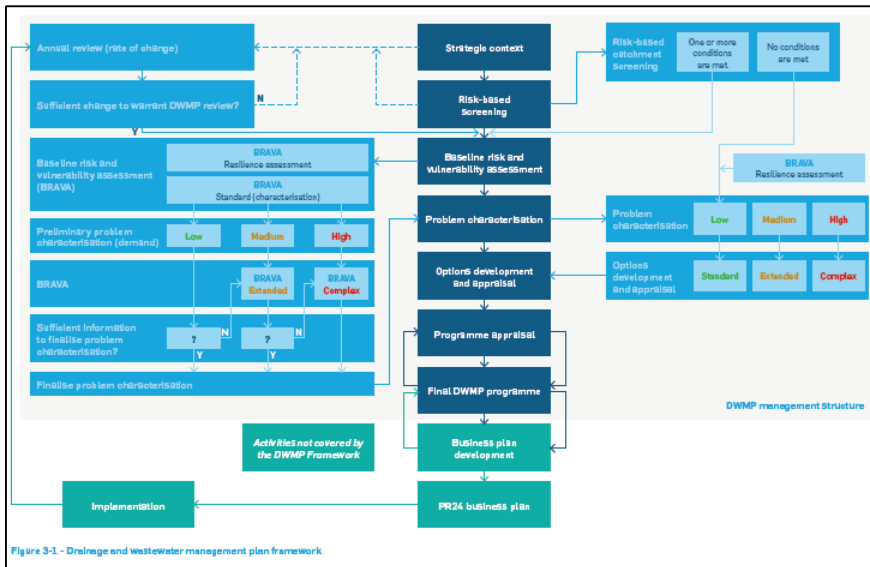
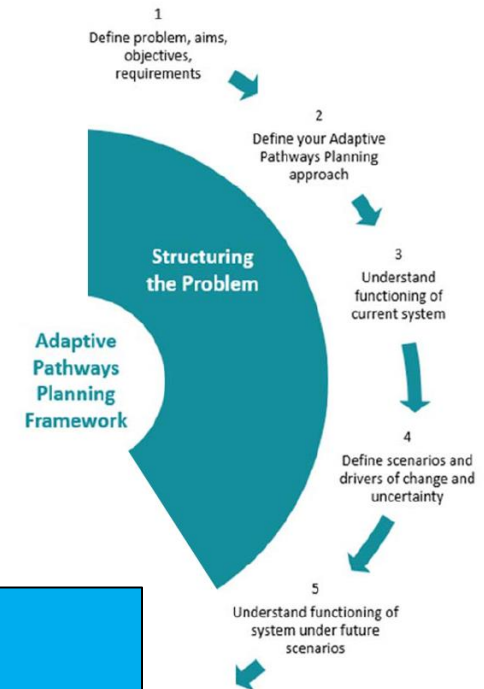


Figure 3-1 - Drainage and wastewater management plan framework

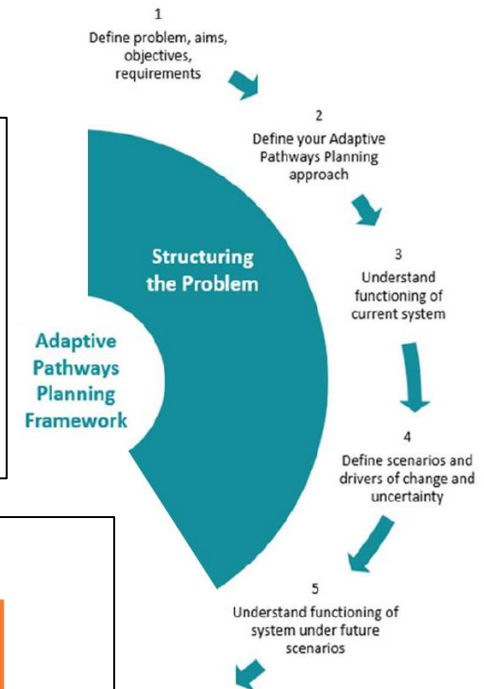
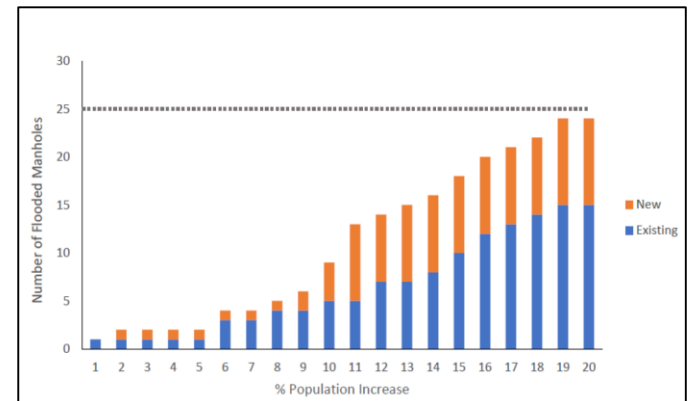
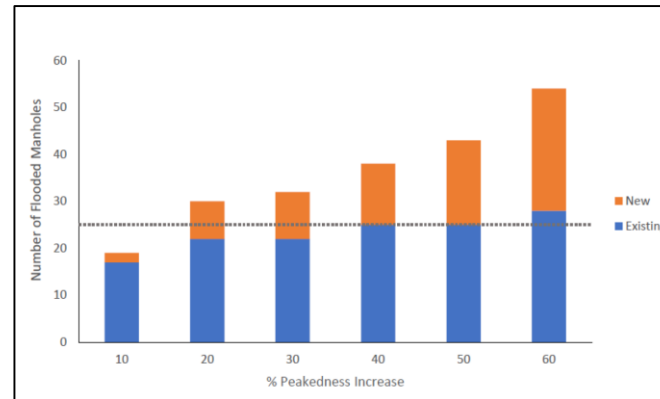
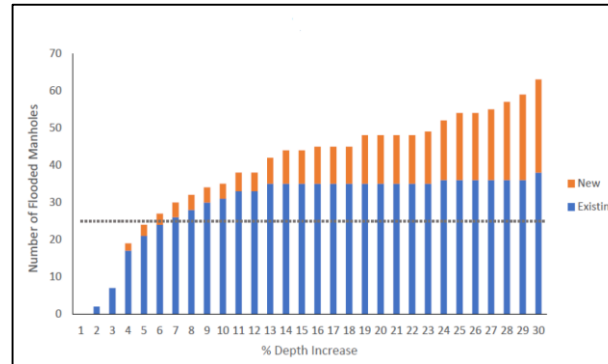
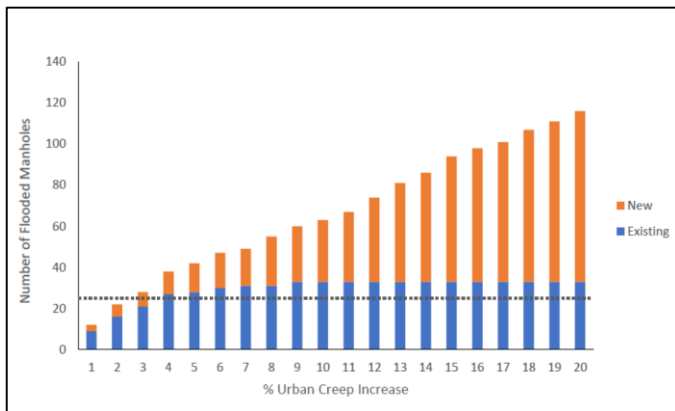


Structuring the problem

Step 3: Understand functioning of current system. – Use CAF or Resilience metric.

Step 4: Define scenarios and drivers of change and uncertainty

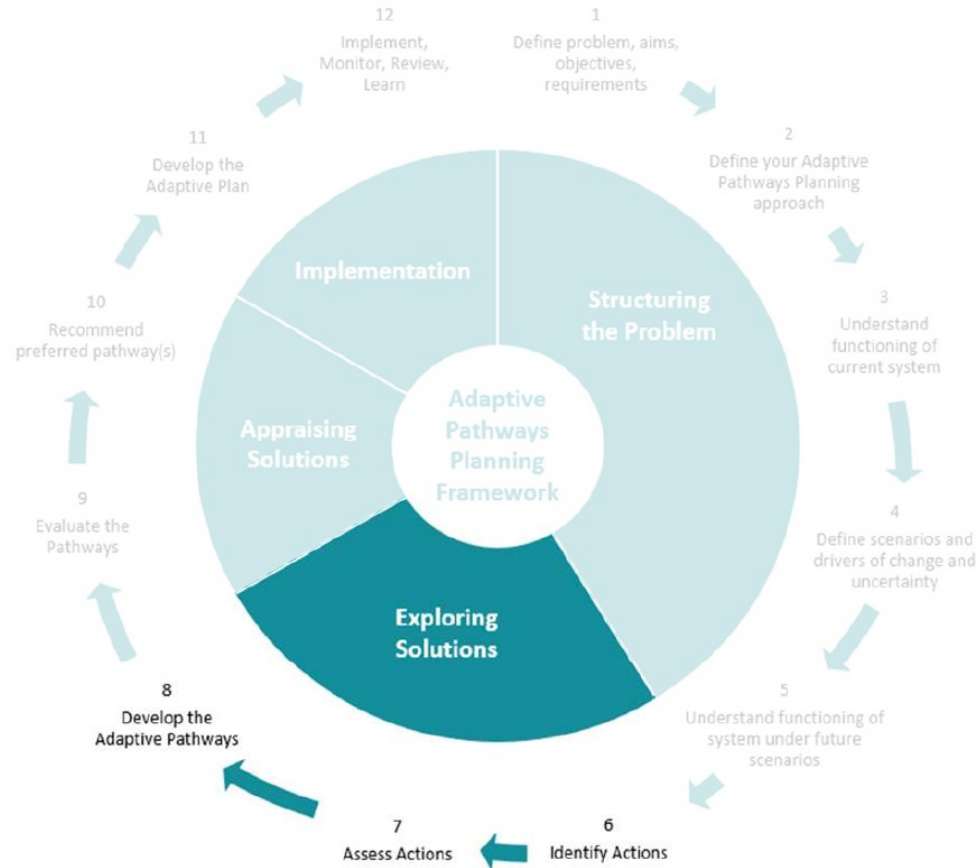
Step 5: Understand functioning of system under future scenarios



G.Vrazalis, M.Dasilva, E.Woodger, F.Babovic, A.Mijic, (2018) Critical review of DMDU methodologies for long term systems planning



Building an adaptive plan – Exploring Solutions

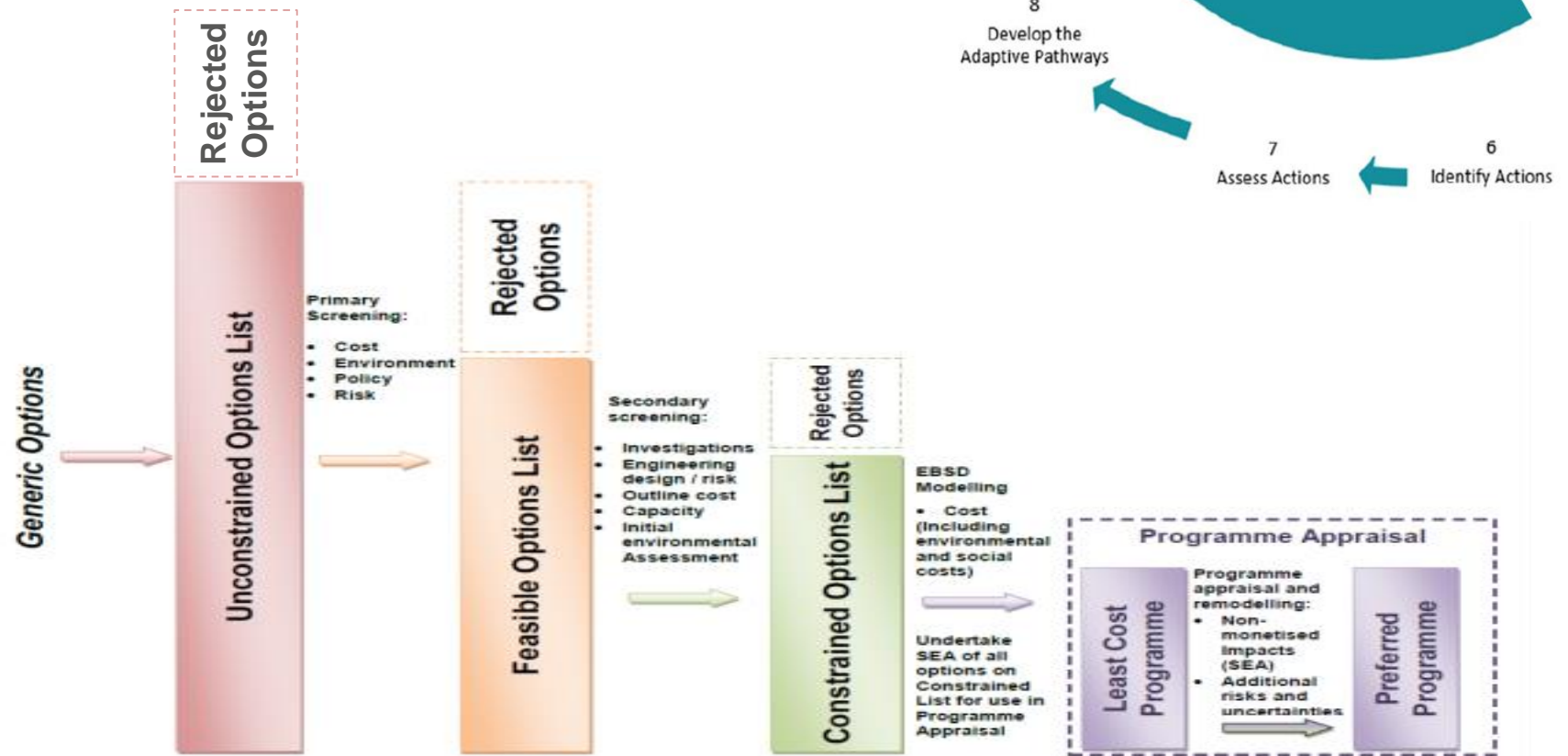


GHD, 2018. Adaptive Pathway Planning Guidance, Melbourne, Australia: GHD (Prepared for Melbourne Water)



Exploring solutions

Step 6: Identify Actions

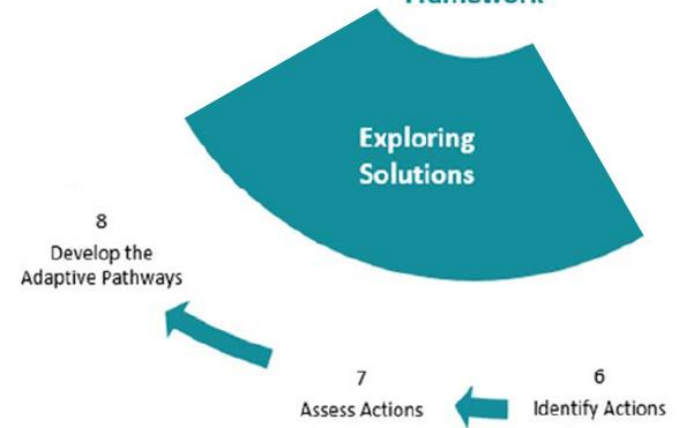


London2100 unconstrained options report taken from WRMP 14



Exploring solutions

Adaptive
Pathways
Planning
Framework

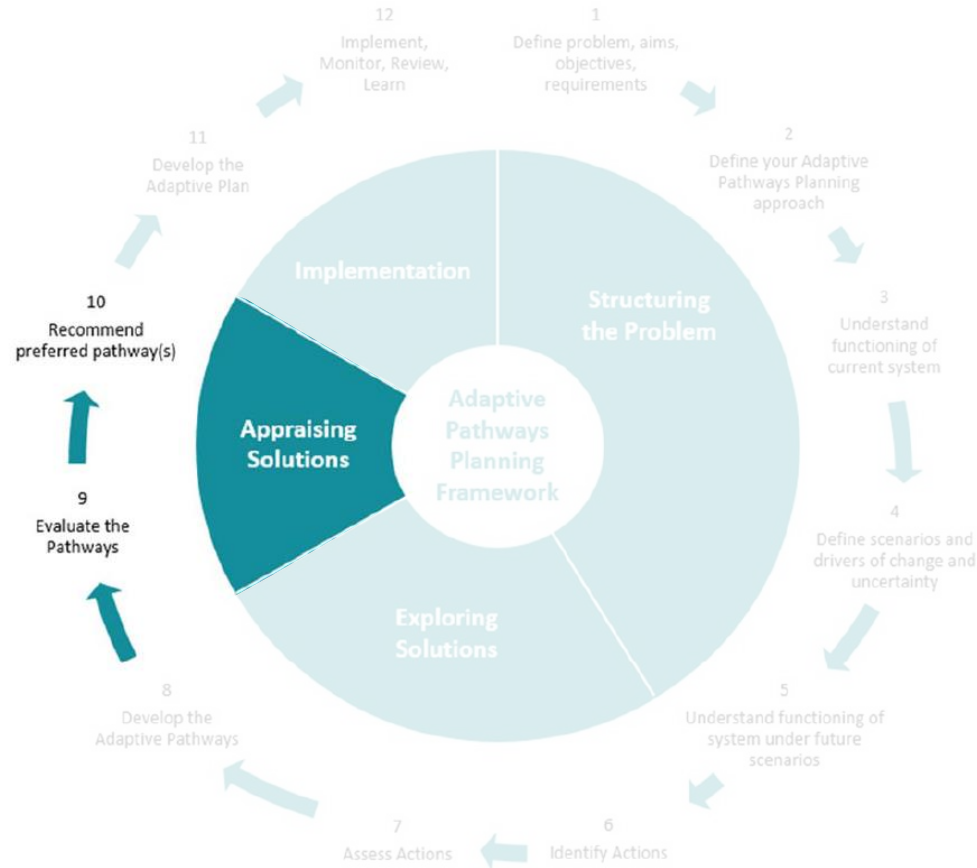


Strategy number	AMP7 SuDS programme	SuDS in Highway + GOS	Property Level Surface Water Reduction - targeted	Property Level Surface Water Reduction – non targeted	New Surface Water Network	Tunnel	Additional Rainfall Intensity allowed (percentage intensity)
1	4	8					12
2	4		7				11
3	4			1			5
4	4				5		9
5	4	7	7				18
6	4	5	7		5		21
7	4	8	6		5	22	45
8	4					25	29
9	4		6			24	34
10	4						4

How modelling outputs will be presented.
Shown as example only.



Building an adaptive plan – Appraising Solutions



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Appraising solutions

Step 9: Evaluate the Pathways

Step 10: Recommend preferred pathway(s)

10
Recommend
preferred pathway(s)

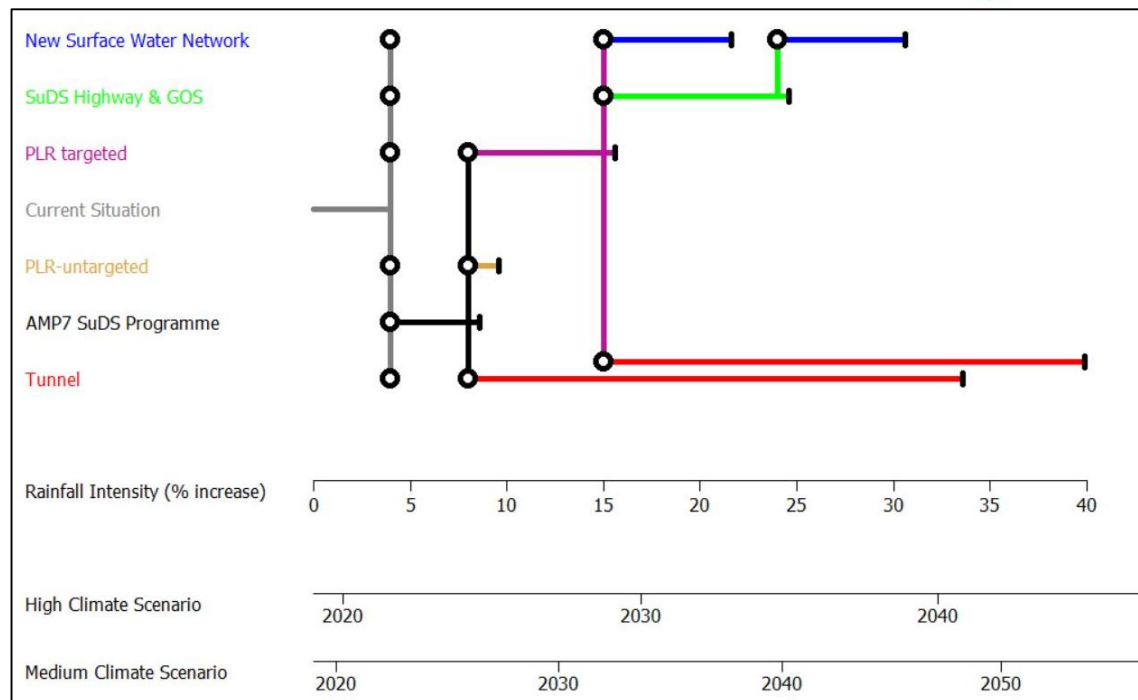


9
Evaluate the
Pathways



Appraising
Solutions

Adaptive
Pathways
Planning
Framework

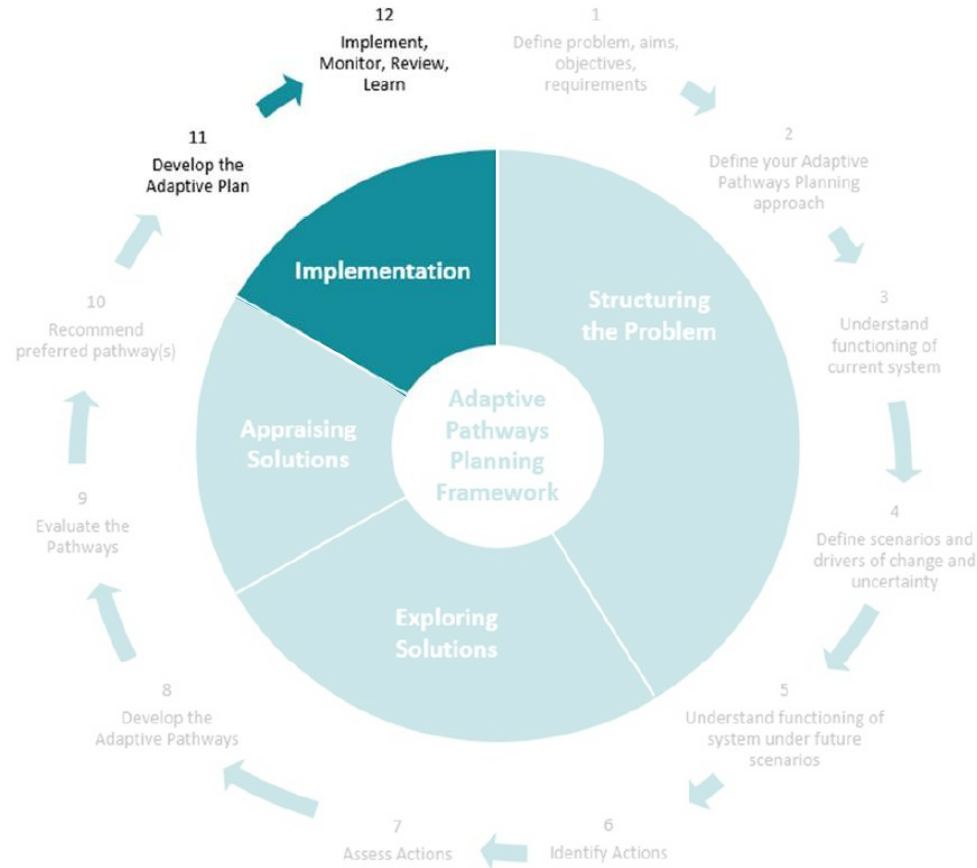


Made using Pathway Generator (Deltares)

How modelling outputs will be presented. Shown as example only.



Building an adaptive plan - Implementation



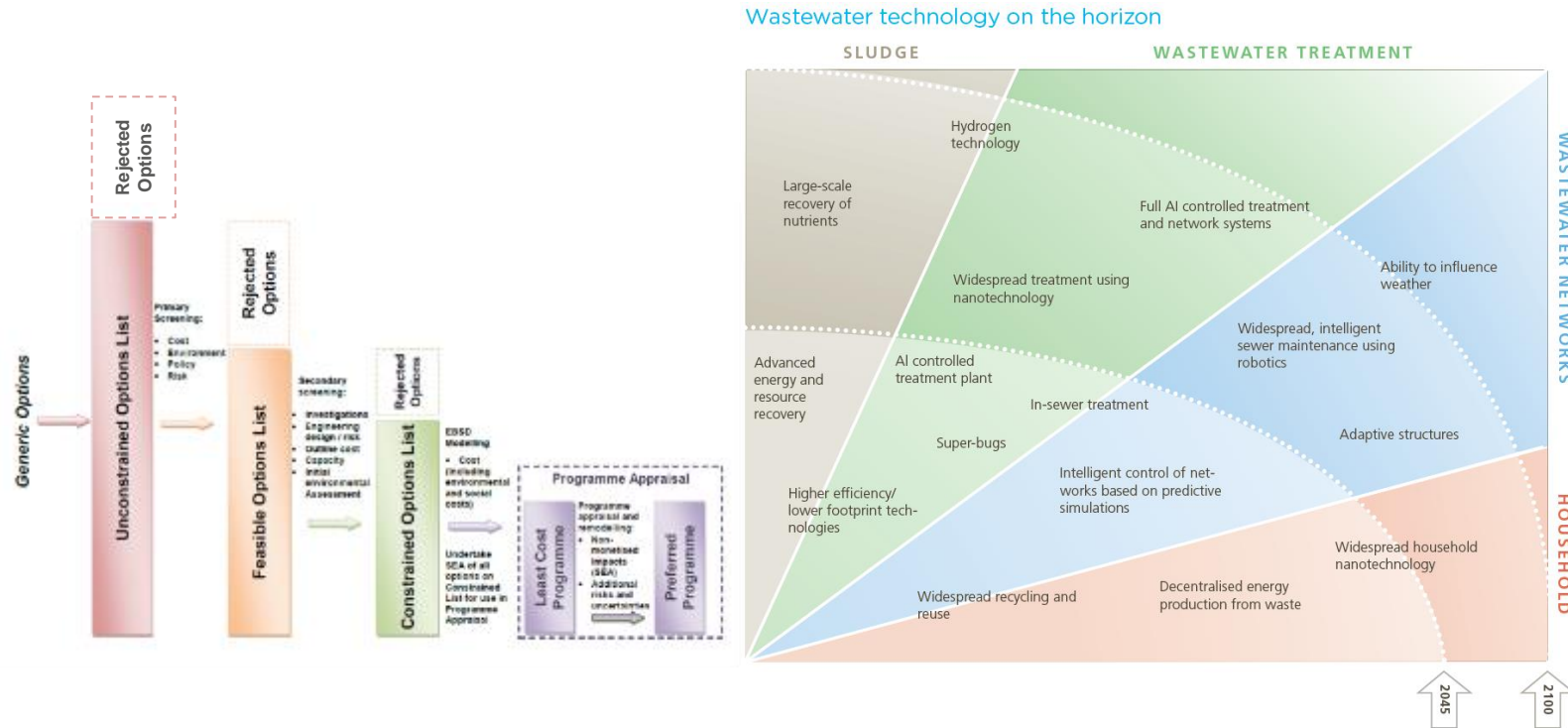
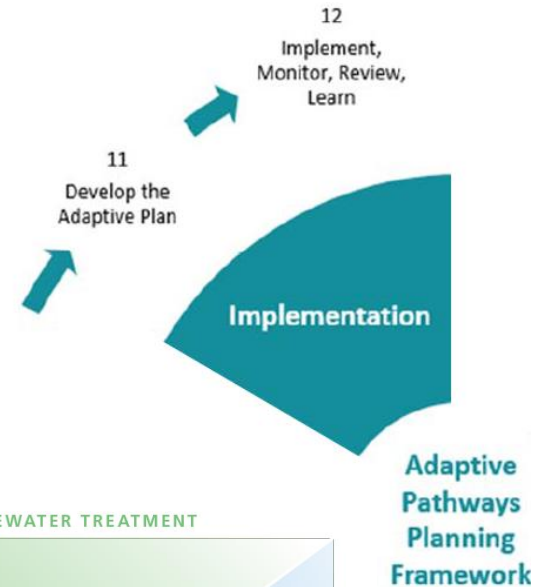
GHD, 2018. Adaptive Pathway Planning Guidance, Melbourne, Australia: GHD (Prepared for Melbourne Water)



Implementation

Step 11: Develop the Adaptive Strategy or Plan

Step 12: Implement, Monitor, Review, Learn



Building an adaptive plan in 12 steps



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Reflections & Questions

- When implementing on large catchments options are more likely to be general. For small catchments and process assets will be more specific.
- This technique is great for stakeholder engagement.
- Although a lot of effort is going into RBCS and BRAVA (rightfully) we should start thinking now about how adaptive planning will be incorporated into our DWMP.

