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Systematic Planning of Adaptation Options for Pluvial Flood Resilience

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Different elements of infrastructure and the built environment vary in their ability to quickly adapt to changing circumstances. Furthermore, many of the slowest, and often largest infrastructure adaptations, offer the greatest improvements to system performance.

In the context of de-carbonation of individual buildings Brand (1995) identified six potential layers of adaptation based on their renewal times ranging from daily to multi-decadal time scales. Similar layers exist in urban areas with regards to Water Sensitive Urban Design (WSUD) and pluvial flood risk. These layers range from appliances within buildings to changes in the larger urban form. Changes in low-level elements can be quickly implemented, but are limited in effectiveness, while larger interventions occur at a much slower pace but offer greater benefits as a part of systemic change.

In the context of urban adaptation this multi-layered approach provides information on how to order urban adaptations. This information helps to identify potential pathways by prioritising relatively quick adaptations to be implemented in the short term while identifying options which require more long term planning with respect to both uncertainty and flexibility. This information is particularly critical in the evolution towards more resilient and water sensitive cities (Brown, 2009).

Several potential adaptation options were identified ranging from small to large-scale adaptations. The time needed for the adaptation to be implemented was estimated and curves representing the added drainage capacity per year were established. The total drainage capacity added by each option was then established. This methodology was utilised on a case study in the Cranbrook Catchment in the North East of London. This information was able to provide insight on how to best renew or extend the life of critical ageing infrastructure.