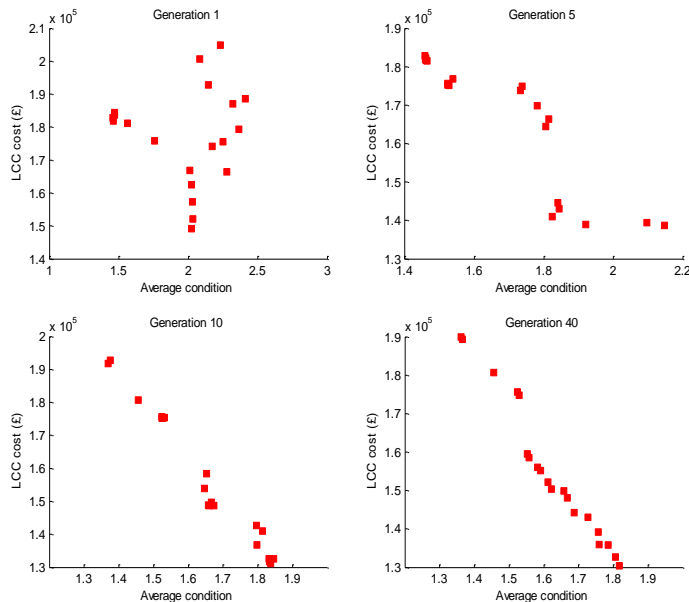


Bridge Maintenance Optimisation



Background

Many different strategies can be selected to maintain the bridge. Each will have different associated costs and deliver different benefits in terms of the future asset state.



Optimisation process: for PN model using Markov model as an initial solution) each generation shows the average asset condition and WLCC for different maintenance policies.

Objective

Identify optimum maintenance policies result in the ‘best’ average asset condition with lowest WLCC.

Variables	Apply to	Value range
Inspection period	Asset	1:1:16 years
Opportunistic maintenance	Asset	0,1 (enabled, disabled)
Maintenance schedule	Element	4, 2, 1, 0.5 times per year
Intervention options	Element	1, 2, 3, 4
Servicing interval (painting interval for metal element)	Element	1:1:16 years
Minor repair delay time	Element	6,12,18,24 months
Major repair delay time	Element	6,12,24,36 months
Renewal delay time	Element	6:6:48 months

Maintenance policies variables



	Hybrid optimisation	Normal optimisation
Converged generation	18 gens	28 gens
Total time taken	24.5 hours	31.1 hours