

Maintenance Planning

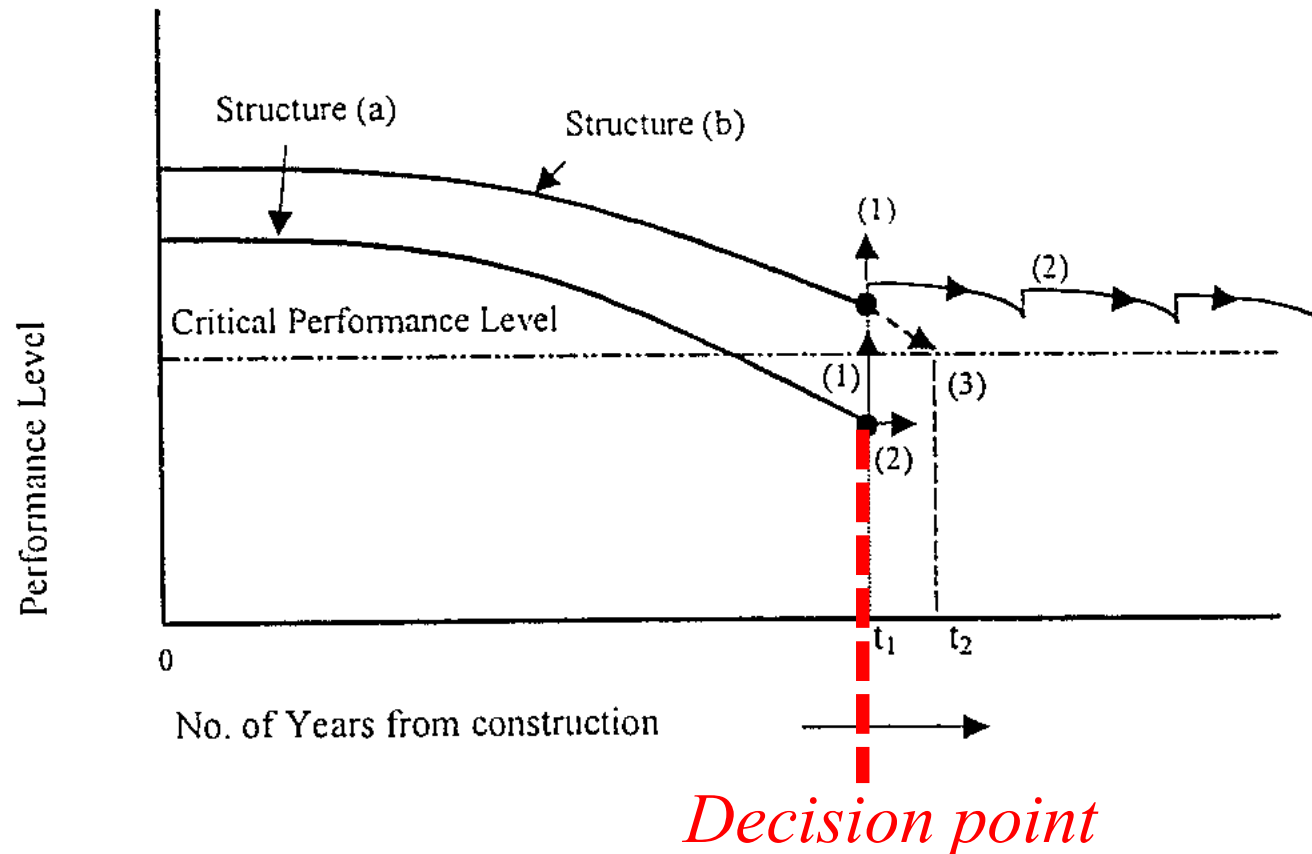
Maintenance strategies

- Enhancement
a strategy that enhances the condition or performance of the structures stock and includes upgrading
- Steady state
a strategy that maintains the current condition and performance of the structures stock
- Managed Deterioration
a strategy that aims to manage and control the deterioration of the highway structures so that condition may deteriorate but not fall below a predefined condition and/or performance level.

Maintenance Planning

- Inputs include:
 - Inspection, testing and monitoring data (condition/performance)
 - Data from assessment of structure (if structure is sub-standard)
 - Other, i.e. emergencies, incidents (bridge strikes, floods, etc)
- Use whole-life assessment concept
 - Derive time-dependent performance profile
 - Consider different maintenance options and their costs
 - Evaluate their effect on performance profile
 - Present range of costed options for bidding purposes
- Network level decision made using bid prioritisation tools
- Optimum decision for network does not necessarily coincide with optimum decision for any particular structure

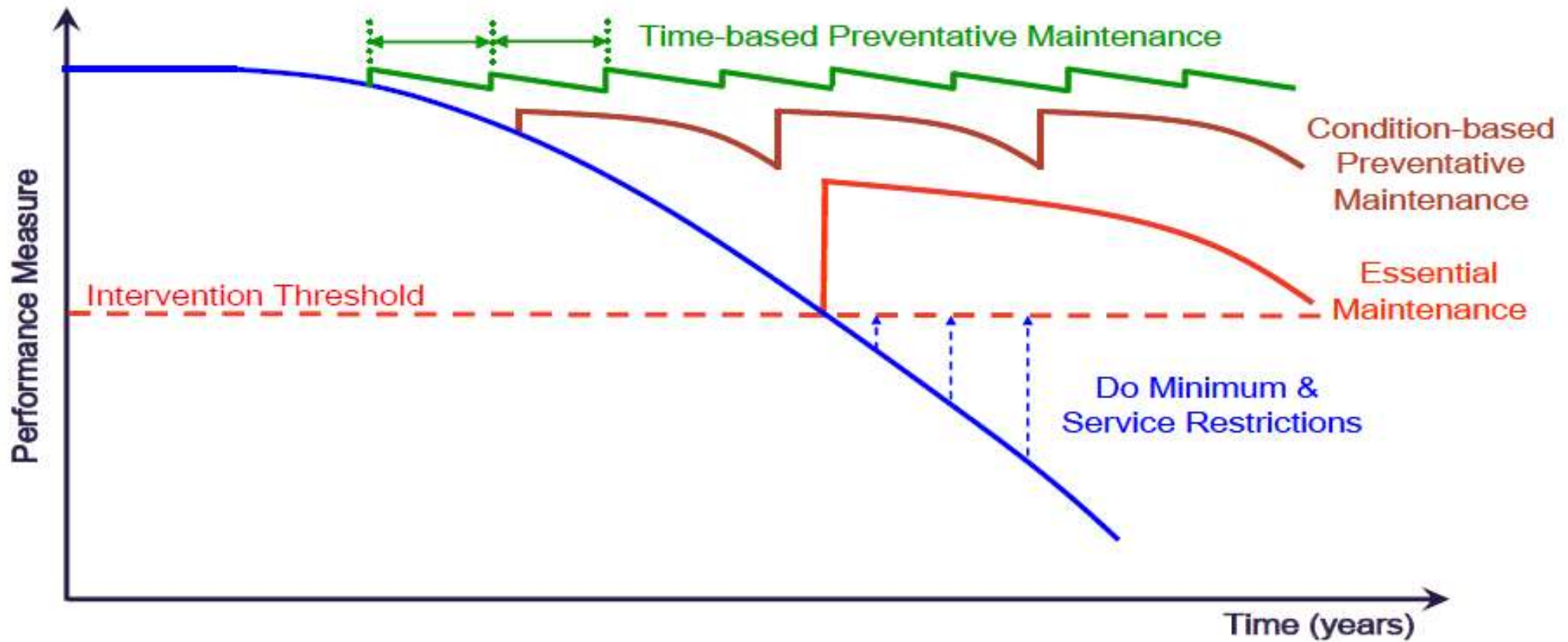
Maintenance planning based on whole-life performance



Structure (a): 1 – strengthen now 2 – apply interim measures

Structure (b): 1 – strengthen now 2 – apply preventative maintenance now
3 – do nothing now, replace later

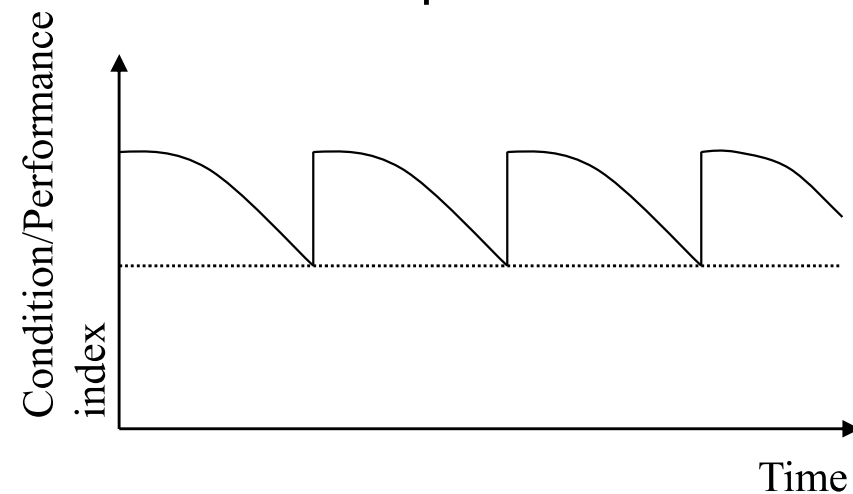
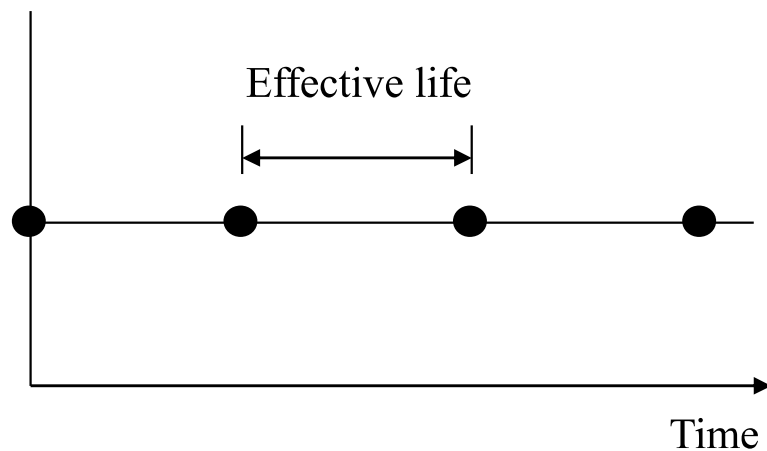
Maintenance planning based on whole-life performance



Frangopol and co-workers, 2000 -

Generation of Maintenance plans

- Time-based
 - Relatively easy to implement
 - Expensive
- Condition-based
 - More realistic
 - Requires field data to establish trends
- Performance-based
 - Realistic
 - Requires field data
 - Requires link between 'condition' and 'performance'



Condition vs. Performance

- **Condition** Rating describes the influence of a defect on a member or the bridge as a whole
- It is subjective and depends on the ability and experience of the inspector
- **Performance** is the ability of the asset to provide the required level of service to its users
- The link between Condition Rating and Structural Adequacy/Performance is not straightforward
 - good overall condition but ‘minor’ defect exists on a member whose failure may cause bridge collapse
 - poor visual condition but bridge is over-designed and can carry full assessment load

Maintenance planning

