A vital part of implementing and maintaining an Asset Management approach is through the use of Asset Management Systems to provide information on location and performance of highway infrastructure assets and support decision making and reporting. Knowledge of the asset, its condition and its performance is vital for making the right investment decisions, as well as for demonstrating to senior decision makers and stakeholders the overall investment requirements. Below is a diagram that illustrates the components that make up typical Highway Asset Management Systems.

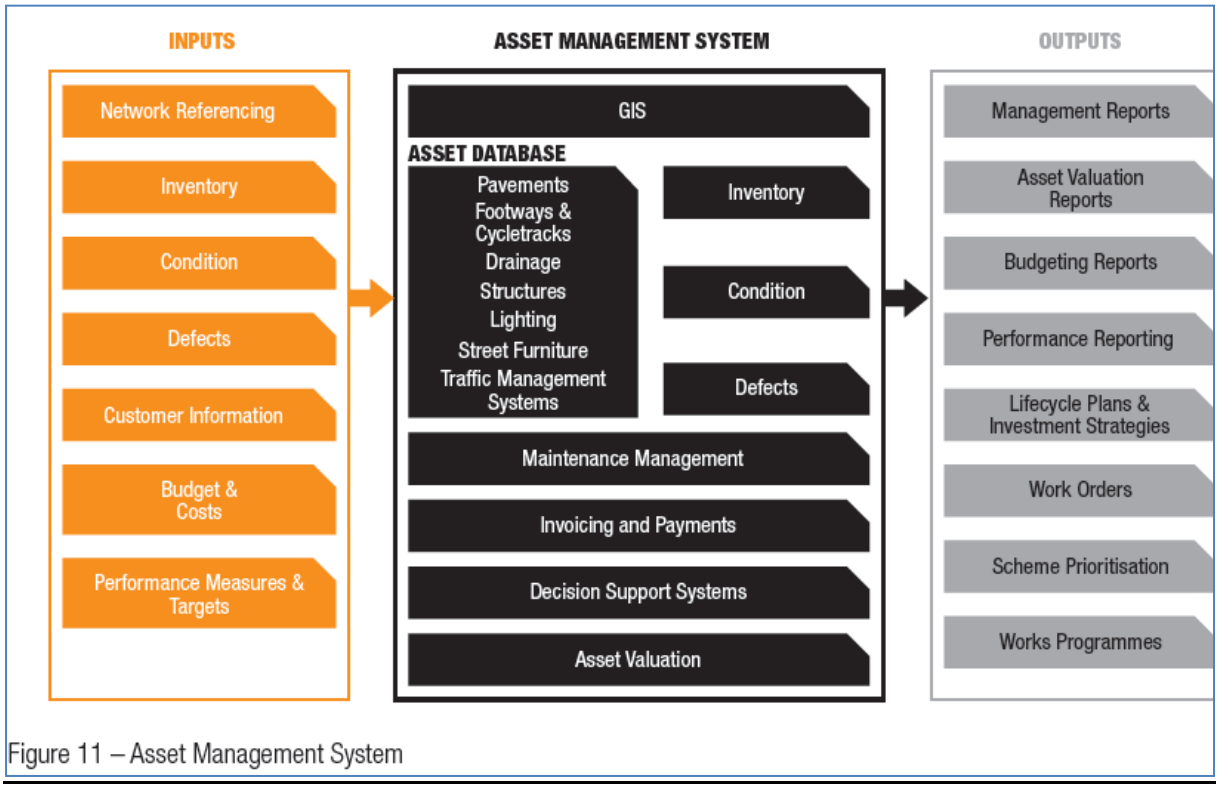


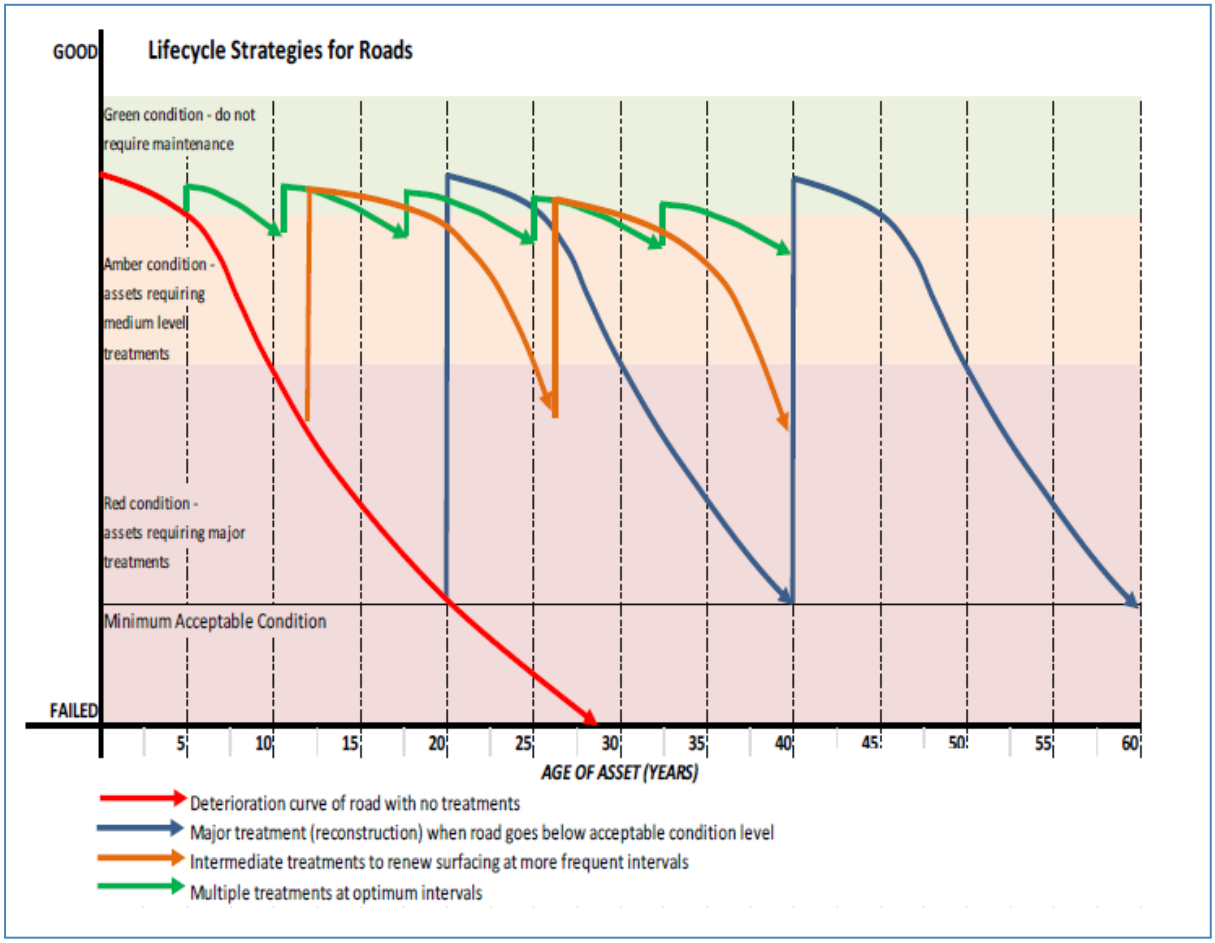
Figure 11 – Asset Management System

Taken from HMEP Highway Infrastructure Asset Management Guidance Document page 83

Definition of Asset Management

The simplest way to describe a highways asset management approach to maintenance is explained in the Asset Management Plan for Brent, and an extract from the plan is shown below. The red line demonstrates a typical deterioration curve for a road.

Fig 1 – Lifecycle Treatment Strategies for Roads taken from the Highway Asset Management Plan for Brent section 1.3 page 8



The red line shows how a typical carriageway deteriorates from when it's constructed.

- A roads total life span is approximately 25 – 30 years.
- After approximately 10 - 15 years it deteriorates to the point where it needs surface treatment.
- After 20 - 30 years it reaches a condition where it requires full reconstruction.
- In Wiltshire costs for major resurfacing and reconstruction work (blue line) of a typical 7 metre wide county road is **£665,000** per km.
- For a typical inlay treatment replacing the surface layer of the carriageway (orange line) costs average out **£158,000** per km.
- For surface dressing (green line) the average cost in Wiltshire is **£50,000** per km.

The blue line above represents a 'worst first' approach where you wait until the road reaches failure and carry out full or major reconstruction to return it to 'new' condition. The orange line approach requires carrying out resurfacing of the wearing course every 15 years or so at an approximate cost of £158,000 per km. The green line in the graph represents the 'optimum' approach involving a combination of surface dressing and thin surfacing at an average cost of £50,000 per km. These figures and the treatment strategies in the graph above are represented in the table below which illustrates how using asset management software with asset modelling capabilities can help implement optimum treatment strategies on the road network.

Fig 2. Lifecycle Treatment Strategy Indicative Costs per km (not adjusted for inflation)

	Lifecycle Treatment Strategy Costs		
Age of Asset Years	**Wait until Failure (blue line)**	**Partial Lifecycle Planning (orange line)**	**Optimum Lifecycle Planning (green line)**
5			
10			£50,000
15		£158,000	
20	£665,000		£50,000
25			
30		£158,000	
35			£158,000
40	£665,000		
45		£158,000	£50,000
50			
55			£50,000
60	£665,000	£158,000	
65			
70			£158,000
75		£158,000	
80	£665,000		£50,000
85			
90		£158,000	£50,000
95			
100	£665,000		
Total Costs	**£3,325,000**	**£948,000**	**£616,000**

Lifecycle Treatment Strategies

The example above demonstrates the main principles of highway asset management, and the longer term cost savings that can be obtained by good asset management. At present Wiltshire Council has the software technology to partially deliver the above but the process can be time consuming. The use of the latest Highway Asset Systems should be utilised to inform maintenance and strategic decision making.

Wiltshire Council currently uses a combination of two approaches for major maintenance site selection. Assessing outputs from SCANNER (measures surface condition of the highway) surveys and using local knowledge from highway engineers to recommend sites for treatment and treatment strategies. The surface dressing programme, which is considered

an ‘optimal’ treatment due to the relatively low cost and the ability to treat greater lengths of network quickly, is developed using a combination of condition data analysis and local knowledge. This process can be improved further through the use of asset modelling techniques.

The main problem with this approach is that without the ability to analyse highway condition in greater detail the Council is potentially missing areas of the road network where intervening now with cost effective surface treatments would improve and prolong the life of the asset for a much lower cost than allowing it to deteriorate past the optimum point in its lifecycle.

Road Deterioration Modelling

At present most highways asset management modelling work involves the use of standardised deterioration models which assume roads deteriorate in a linear fashion. There have been huge advances in software modelling tools that enables highway authorities to produce local deterioration models using their own historical condition data and project that deterioration trend into the future. Embracing this technology will give Wiltshire Council a much greater understanding of the potential condition of its asset in the future and to optimise its forward programme of works and scheme selection to deliver cost effective schemes at the right time in a roads lifecycle. This has the potential to allow budgets to go much further and greatly improve maintenance decisions and scheme selection, with consequent long term improvements in road conditions.

Financial Modelling

Advances in software enable authorities to carry out financial modelling of its assets. It enables users to run scenarios that analyse network condition both current and projected and provide outputs on what effect certain spending will have on asset condition. For example, scenarios can be run to determine how much money needs to be spent by road class in order to arrest deterioration across the network, or to improve road condition. If budgets are cut the authority will have the ability to assess what impact that will have on asset condition.

As part of this exercise Wiltshire Council will endeavour to seek added value through procuring an Asset Management System that can enable the strategic asset modelling described above.