Appendix 2F – Life Cycle Management Plan – Traffic Management Systems

Introduction

Traffic management (including junctions, crossings and signals) refers to the act of traffic control to separate conflicting traffic by the division of time, within the available road space, in a safe, efficient and equitable manner.

Signals are also used to provide safe passage for non-vehicular traffic across roads.

Gloucestershire County Council is responsible for nearly 400 Junctions and Crossings within the county except those on the motorway and trunk road network: these installations come under the stewardship of National Highways.

Condition

The overall condition of these assets is Steady, with detailed condition information held about our assets.

The assets are routinely inspected in line with our Highway Safety Inspection Manual and the Well Managed Highway Infrastructure Code of Practice and Traffic Signals Regulations form the basis for design and maintenance of these assets. The public can also report asset issues via FixmyStreet, the online Contact Form or, in an emergency, via the telephone.

In respect of traffic signal maintenance the Council also complies with the relevant codes of practice, particularly the Code of Practice for the Management of Electronic Traffic Equipment (2011), and technical memoranda as incorporated into the Design Manual for Roads and Bridges.

The Life Cycle

Creation/Acquisition: Acquisition of Traffic Management Systems is normally associated with the taking up of maintenance responsibilities following new developments through the adoption process (for example a new school). The development control team using Section 38 or 106 legal agreements normally manage this process, however additional assets may also be acquired as a result of road layout redesign etc.
Operations/Maintenance – Operate and maintain the Assets on a routine basis.
Upgrade or Renew: - Replace and renew based on condition, safety or visibility issues. This includes lineage within resurfacing schemes.
Disposal/Decommission: Assets are replaced rather than disposed. Changes in road layout design may see some existing systems removed and disposed of.

Deterioration

Units deteriorate generally through:
- Age
- Corrosion/rusting
- Metal fatigue/cracking
- Vandalism
- Canine urine
- Vehicular strikes

- Ground conditions
- Gritting/Salting
- Grass cutting
- Specific design problems
- Technical obsolescence

Standstill and Backlog Costs

Various models exist to determine the Standstill and Backlog costs. The Standstill cost is how much needs to be spent every year in order to maintain the asset in the condition it's in today (plus inflation). The Backlog cost is how much you would need to spend to return the whole asset to very good condition. The following figures represent the latest data for structures:

- Standstill - £3.5M Capital
- Backlog - £35.5M Capital

A small amount of funding from the revenue budget is available for Reactive/Cyclical repairs to assets.

Approach

The design life of a signal-controlled junction typically ranges between 15 and 25 years, depending on factors such as traffic volume, environmental conditions, and the quality of initial materials and construction. During this period, regular maintenance is crucial to ensure optimal operation and to address wear and tear.

Beyond the design life, upgrades or replacements might be required, particularly if traffic demands or technology standards evolve significantly. Recent capital investment has been approximately twice the standstill amount (2024/25) which has enabled the asset condition to be defined as steady.

Future Developments

The future of traffic control systems is looking increasingly innovative and tech-driven. Here are some key developments to be considered:

- Smart Traffic Lights: These adaptive systems use real-time data from sensors to adjust signal timings based on traffic conditions, reducing congestion and improving flow.
- Connected Vehicles: Vehicle-to-Infrastructure (V2I) communication allows vehicles to share data with traffic management systems, enabling smoother traffic flow and better safety measures.
- Pedestrian Detection Systems: Advanced sensors and AI monitor pedestrian movements, enhancing safety at crossings and reducing vehicle-pedestrian collisions.
- Dynamic Speed Signs: These electronic signs adjust speed limits based on traffic, weather, or road conditions, improving safety and efficiency.
- Cooperative Intersection Management: Vehicles and infrastructure exchange data to optimize traffic signal regulation and improve intersection operations.