



## CARRIAGEWAY MAINTENANCE

**15.1** The condition of the network in West Yorkshire has generally been deteriorating over many years. Our vision is to reverse this trend, improving the riding quality and safety of the highway surface and increasing its structural strength to a level which compares with the top 25% of highway authorities, while co-ordinating schemes with other highway initiatives to achieve the maximum benefit from the investment.

### Objectives

**15.2** The objectives for carriageway maintenance have been agreed as:

- to improve safety;
- to improve the strength of the carriageway;
- to promote accessibility;
- to contribute to an efficient economy;
- to promote integration;
- to protect the environment.

### Strategy

**15.3** The strategy to achieve each of our objectives is:

Improving safety by:

- implementing pro-active policies to identify defects and carry out resulting safety and routine maintenance repairs;
- implementing responsive policies to repair roads and pavements when stakeholders raise concerns, including repairing pavement trips and filling in potholes within 24 hours;
- reducing the percentage of the network failing SCRIM investigatory levels over a period of five years;
- collecting UKPMS condition data for all of the network over a period of five years and carry out maintenance to all sites with a condition index in excess of 70;
- the creation of a safer and more inviting environment for pedestrians and pedal and motor cyclists (and to provide specific facilities and features in schemes) by promoting the maintenance of pavements and the strip at the edge of the road.

Improving the strength of the carriageway by:

- monitoring the structural condition of the network and carry out maintenance to arrest deterioration and ensure, where applicable, that the network will continue to be able to carry heavy traffic flows;
- managing the network asset to ensure that strengthening work is carried out at the right time to minimise the whole life cost of maintaining the infrastructure;
- reducing the percentage of the network with negative residual life to 10% over a period of five years.

## HIGHWAY NETWORK MAINTENANCE

---

Improving accessibility:

- improving access for disabled people, for example by the inclusion of dropped kerbs at main crossing points and raised kerbs at bus stops whenever maintenance work is carried out.

Contributing to an efficient economy by:

- creating an attractive, well maintained highway environment through the promotion of good maintenance policy, contributing to urban renewal and to help attract new businesses to industrial and commercial areas which are increasingly showing signs of dereliction;
- implementing maintenance designs which are appropriate to the style of the area and which will help to promote tourism by the enhancement of the street scene.

Improving integration by:

- co-ordination with road safety schemes, bridge and wall maintenance and public transport initiatives;
- giving significant bus routes priority in the allocation of funds for structural maintenance and integrating maintenance with schemes for the provision of bus lanes, gateways and guideways.

Protecting the environment by:

- using appropriate materials to complement the appearance of West Yorkshire Conservation Areas when works are carried out;
- using maintenance treatments which reduce the long-term reliance on quarrying new materials, disposing of existing materials to landfill sites and minimise the use of road transport of construction materials.

**15.4** To ensure the effectiveness of all aspects of the Plan, the objectives and strategy apply not only to the Principal Road Network where maintenance is funded through the settlement, but also to the District roads maintained from revenue funding.

**15.5** The challenge is to keep the network safe, responding to the public's expectation that minor defects will be repaired quickly, while preserving the strength of the network by carrying out reconstruction schemes.

**15.6** The overall condition of the network is now so poor that a large proportion of funding needs to be spent on short-term solutions. The strategy has however been developed to balance all objectives within the available budget.

### Condition Assessment

**15.7** Consistent, reliable, comparable condition data is an essential foundation for the strategy. Preparations are well advanced for implementation of the UK Pavement Management System (UKPMS). This is a welcomed major development and close joint working between authorities is now part of the regular routine. Each Authority is collecting condition data in accordance with the UKPMS rules and parameters.

### Network Condition

**15.8** Assessment results indicate that the West Yorkshire network is well below the national average condition. It is therefore considered appropriate that the backlog of strengthening work should be reduced to less than 10% of the network length.

**15.9** In addressing the need for a safe highway surface, and recognising that the public are concerned about visual defects

rather than network strength, carriageway defects over 40mm deep and footway defects over 20mm are dealt with within 24 hours of being identified.

**15.10** Test results show that some 20% of the network is below skid resistance standard. On the bends, the approach to junctions and other similar locations, where a greater skid resistance is required, some 80% of the network fails to meet standards.

### Priorities and Scheme Selection

**15.11** The programme needs to balance expenditure between surface treatment, resurfacing and reconstruction to produce a long-term improvement in the strength of the network while still addressing preventative maintenance and routine safety work. Maintenance works are planned to minimise cost over time. Areas with minimal residual life, but otherwise showing no signs of distress, are given a lower priority in an economic best value approach.

**15.12** The proposals for each site are primarily considered in terms of their priority, based on condition assessment. Sections are linked together, wherever appropriate, to create a holistic approach to each route. The proposals are co-ordinated with other works identified in the Plan to fully tackle the problems and deliver the objectives.

### Principal Road Maintenance Requirements

**15.13** All the Districts share a common problem concerning the condition of their A class roads (Principal Roads). The surveys carried out by Highway Authorities in England show that an average 15% have no residual life. However, in West Yorkshire the best is only 27% and the worst is 51%

**15.14** If adequate funding does not continue to be made available the network condition will continue to deteriorate. To reduce the proportion of the network with zero residual life to approximately 10% over a 5-year period will require strengthening of more than 35% of the network or 60 km per year. The estimated cost is £18m per year.

**15.15** Given the results from skid resistance assessments and a budget, which reflects needs, an expanded programme to restore skid resistance could be implemented. This could be addressed with a 5-year surface dressing programme costing over £2m. However, nearly 30% of the network fails to meet the higher skid resistance standards required for the approaches to crossings and roundabouts. A programme of high skid resistant surfacing to treat half of these sites over a period of 5 years would cost an estimated £6m.

### Highway Maintenance Revenue Programme

**15.16** Local Transport Plan settlement monies cover only the structural maintenance of carriageways on Principal Roads. The effect of ring fencing this finance, and the reduction in the Government's revenue allocations, has increased the pressure on funding of maintenance on the district roads.

**15.17** Highway maintenance has a significant contribution to make towards the implementation and subsequent maintenance of features introduced to the highway in support of the Plan strategies. However, the cost of maintaining this greater part of the network is funded from revenue, including:

- the proper maintenance of pavements and road edges as an essential element of the strategy to encourage more walking and cycling;
- addressing the structural damage caused by local bus services on local roads, particularly on housing estates;
- maintaining the environment with the increasing pressure to include high specification materials and casualty/speed reduction features;
- regular and expensive renewal of carriageway markings and coloured and anti-skid surfacings;
- the regular replacement and repair of features such as refuges, kerb build outs and bollards which are often located in particularly vulnerable locations;
- addressing repairs on streets with road humps and cushions - features which increase the requirement for carriageway resurfacing by concentrating damage in very concentrated narrow wheel tracks and then requiring more expensive repairs due to the need to hand lay around them.

**15.18** The role of these features in casualty reduction, encouraging the use of other modes of transport and in improving the environment is vital. However, the resulting pressure on revenue maintenance does need to be recognised in Government calculations.

### Structural Maintenance of Pavements and Roads

**15.19** The increase in the highway network length resulting from new developments and highway improvement schemes has most impact on the Districts' road lengths. While network length is reflected in the Government's calculations, this is of little consequence when the increase is not reflected in budget growth.

**15.20** The Government's calculations fail to properly account for the increase in the use of maintenance intensive features and high cost materials. This results in an overall reduction in the area of maintenance work that can be completed for the same money and reduces the effectiveness of other initiatives.

**15.21** Revenue budgets also need to address the increase in level of damage the road network suffers both from a lack of strength and a lack of carriageway width, particularly on the older parts of the network and where there is no off-street provision for parking. This is resulting in considerable damage as vehicles over-ride the pavements, breaking flags and damaging verges.

**15.22** The National Road Maintenance Condition Survey has indicated that the gap between maintenance requirements and available funding on the non-principal road network has again widened with many roads in critical need of major maintenance work.

**15.23** While the recommendations of the Code of Good Practice have been adopted, the resources available are insufficient to ensure that the defined standards are achieved and systematic prioritisation is an essential element to work programming.

### Highways Act and NRASWA Functions

**15.24** There is an increasing expectation by the public that the Highway Authorities will take a pro-active role in managing the work of the Utilities. This is compounded by the Utilities reducing their costs by outsourcing more and more of their work and some apparent unwillingness to programme mains renewals in advance of maintenance works.

**Reducing Third Party Claims**

**15.25** The public is increasingly aware of their recourse to litigation whenever an accident occurs on highway land. The Authorities want the introduction of the Woolf protocol in the handling of claims to become a positive tool that will assist them in dealing quickly with valid claims and to repudiate those claims where the Authority has acted in a fully responsible manner.

**STREET LIGHTING**

**15.26** The provision of effective street lighting is an essential element of the Highway Maintenance Strategy.

**Objectives**

**15.27** The objectives for the maintenance and enhancement of our street lighting installations are:

Maintain the lighting installation:

- to maximise the number of lighting units which are working as planned;
- to ensure the structural stability of existing units;
- to achieve a level of lighting consistent with current standards;
- to ensure the electrical integrity and safety of existing units.

Contribute to a safe and secure night time environment:

- as a crime prevention measure, and in particular to reduce the risk and the perception of risk of personal assault and harassment;
- to reduce the risk of collision between road users (to see and be seen);
- to reduce the risk of collision or accidents from road users' inability to clearly see potential hazards on the

highway (e.g. footway trips, potholes, etc.);

- to manage the use of energy;
- to ensure that all new highway schemes have street lighting that meets the relevant standards.

**Strategy**

**15.28** All the Districts carry out a programme to change lamps on a two or three year cycle, on an area basis, for units where the occurrence of random failure is likely to increase beyond this period. The transparent outer cover and the optical reflective surface are cleaned at the same time to maximise the effectiveness of the light output. In some Districts, lamps with a longer burning life are permitted to 'burn to extinction' or have a longer block change cycle of up to 6 years. The block change strategy is supported by systems for the identification and repair of random failures.

**15.29** Revenue monies also fund:

- maintenance and replacement of obsolete / end of life equipment;
- ad hoc replacement on an individual basis of vandalised and impact damaged equipment;
- minor community safety / enhanced lighting schemes and road safety schemes;
- energy costs and repair to street lighting energy supply equipment.

**15.30** Maintenance strategies are evolving using the benefits of new technology. Systems are being developed to manage the asset and to deliver improved service delivery. New types of lamps and energy efficient control gear are currently being evaluated. They are more expensive, but could be suitable for use on new installations.

### Implications

**15.31** Street lighting improvements form an integral part of the delivery of the Plan objectives as part of:

- safer routes to schools;
- road safety, casualty reduction schemes;
- community safety / enhanced lighting schemes;
- highway improvement and capital maintenance schemes;
- transport initiatives to encourage modal change.

**15.32** The public concern about the need for good lighting is potentially a major factor in choice of travel mode when making journeys in the hours of darkness. Personal safety considerations affect the decisions people make. Adequate street lighting is an essential part of safety and transport schemes.

**15.33** The current level of funding of street lighting is inadequate to meet the identified need to maintain, replace and improve the network and to satisfy public aspirations. Hence alternative sources of funding are being investigated. There is an immediate need for an increase in street lighting funding to enable the most urgent problems to be tackled.

**15.34** There is a serious safety risk if a column in critical condition collapses. However, the level of funding for maintenance replacements and renewals, including those that occur as a result of other schemes, is not enough to even keep pace with the current rate of deterioration of the lighting stock. With many columns now reaching the end of their safe working life, despite maintenance strategies such as steel oversleeving of concrete columns, there is a current liability of about £56 million with a continuing liability of £6 million per

annum to ensure the existing situation does not deteriorate.

**15.35** This is not a bidding issue according to Local Transport Plan guidance, however, revenue funding cannot support the sums involved. Neither PFI, nor revenue streams generated by advertising on lamp columns, are yielding sufficient revenue. To address this national problem the Street Lighting Parliamentary Working Group recently indicated the need for street lighting replacements to be funded from capital. For this reason a bid has been included for lighting column replacement.

### BRIDGES AND HIGHWAY STRUCTURES

**15.36** Our aim is to provide a bridge and highway structure stock of suitable standard to allow the safe and efficient movement of people and goods with minimum adverse effect on the environment.

#### Objectives

**15.37** In line with achieving our primary objective of maintaining a safe and efficient transport infrastructure for all users, the specific objectives for bridges and highway structures maintenance and strengthening are:

- all highway structures must be able to safely carry appropriate traffic including pedestrians and cyclists and where required, abnormal loads;
- all highway structures must be visually acceptable to the community;
- user disruption should be kept to the minimum;
- preventative maintenance should be carried out adequately and rigorously so that backlogs of sub-standard bridges and structures will not build up;
- materials used should be chosen so that

they minimise the depletion of natural resources, maximise the use of waste materials, and minimise the emission of harmful gases and their by-products to the environment;

- structures and their components should be designed in such a way that they may be easily maintained and provide flexibility for future generations to modify them for modes of use that cannot yet be envisaged;
- to plan and manage available resources to ensure their economic, efficient, and effective use.

### Strategy

**15.38** The achievement of the objectives will be progressed through:

- completion of the Bridge Assessment Programme;
- assessment of the risks associated with undertaking monitoring of a structure prior to the introduction of other interim measures;
- provision, where possible, of interim measures to permit the passage of 40 tonne vehicles across Principal road bridges;
- assessment of the risks associated with diverting traffic elsewhere when weight restrictions are under consideration;
- prioritising the strengthening of highway structures with emphasis on Primary Route Network bridges which carry the heaviest flows of HGV traffic;
- liaison with other disciplines to ensure co-ordinated approach to route management;
- giving appropriate consideration in prioritisation of strengthening to important public transport routes which if closed or restricted would cause serious disruption to passengers and operators;
- ensuring that bridges on other routes that provide essential access routes to industrial and commercial premises,

which without HGV access could not function, are given appropriate priority;

- liaison and co-ordination of strengthening programmes locally and regionally with other bridge owners to ensure a consistent approach to the assessment and strengthening of Primary Route Network and key secondary route bridges.

### Assessments



Bridge maintenance and the associated traffic management measures.

**15.39** All districts have programmed to complete the assessments of Council owned, Railtrack, British Rail Property Board and British Waterways bridges by the end of 2000/01. The assessment of private structures is programmed for completion in 2001/02, except in Leeds where completion is programmed for 2002/03.

**15.40** Following completion of the assessment programme for 40 tonne vehicles, a steady state programme of assessments is proposed on the basis that all of the highway structures stock will be assessed or have previous assessments reviewed on a 15 year cycle.

### Monitoring and Interim Measures

**15.41** Following an assessment failure of a highway structure, one or more of the following measures is implemented:

- the implementation of a structural monitoring regime to ensure the safety of highway and other users;
- the introduction of appropriate traffic management measures;
- temporary propping of the structure;
- where appropriate, further more rigorous assessment of the structure.

### Strengthening

**15.42** Up to May 2000, 148 bridges had been strengthened in West Yorkshire. The focus of this has been to ensure that the Primary Route Network and the Principal roads are capable of carrying 40 tonne vehicles. However, there are many weak structures which are neither on the Primary Route Network nor on Principal roads but which have a very low assessed load carrying capacity and which require strengthening.

**15.43** Problems are experienced when load carrying capacities of less than 17 tonnes are identified; as this precludes use by most fire engines, buses, refuse vehicles etc. In the majority of cases the imposition of permanent or even temporary weight restrictions would prevent reasonable access and delivery of essential services to sections of the community and to local industry.

**15.44** It is recognised that it may not be economically viable, environmentally acceptable or necessary for all structures to be capable of carrying 40 tonne vehicles. Each structure is therefore critically examined in accordance with the strategy to ascertain:

- whether it is essential to carry out strengthening;
- if suitable interim measures can be applied;
- if a weight limit can be applied either short term or long term;
- if necessary, the bridge can be closed and a suitable alternative route found either short term or long term;
- the load carrying capacity to which the bridge is required to be strengthened.

**15.45** Burr walls and retaining walls form a major part of the County's highway structures stock and run to several hundred kilometres across the county. Identification and assessment of these walls has identified the need for significant expenditure over the coming years.

### Maintenance of Structures

**15.46** In addition to the programme for strengthening highway structures there is also an increasing need for structural maintenance works in order to sustain the structures stock. The importance of structural maintenance work has been highlighted in both the Highways Agency paper 'Performance Objectives, Indicators and Targets for the Maintenance of Highway Structures' and the CSS Bridges Group report 'Funding for Bridge Maintenance'. In particular the latent problems associated with under-funding of structural maintenance work are stressed.

**15.47** Broadly in line with the recommendations of the above documents, the estimated required annual expenditure on structural maintenance is 0.85% of the Gross Replacement Cost of the structures stock. This is split into 0.35% spent on preventative work and the remaining 0.5% spent on essential work.

**15.48** Preventative work is seen as the most effective way of keeping the costs of replacement and rehabilitation of the structures stock at a manageable and steady level. General Inspections are carried out at least every two years in order that routine and preventative maintenance can be identified before the problem develops to require more costly essential maintenance.

**15.49** Principal Inspections, which involve a detailed examination of all surfaces of the structure, are being carried every six years. These often recommend further Special Inspections to look at specific areas of concern, which in turn lead to preventative or essential maintenance. Funding for this activity is included in the programme.

