6 Guiding delivery - next steps: well maintained roads and rights of way

Council Plan priorities 2011-2014: well managed assets; making places easier to reach; a resilient economy; rich, diverse and protected environments

"Transport infrastructure assets in many cases represent an authority's single biggest asset."

Department for Transport, Local Transport Plan Guidance 2009

Derbyshire's highway information group has made significant advances in the management of highway data over the last three to five years. The Council has collected data regarding its highways assets, and has been developing a hierarchical approach to the network. This hierarchical approach involves ranking roads in accordance, not just with national standards, but also their usage and importance to the local community. In turn, this helps us to maintain them on a more strategic basis.

Derbyshire's aims in this next LTP period are to define and sustain levels of service on a hierarchical basis, to improve condition and consistency, to reduce the number of assets and make those we have deliver more for less. We will also take the opportunity to make more effective use of the network by examining and supporting routes to better meet the needs of the County and its visitors, and the budgets of the County Council.

6.1 Maintenance priorities

At a time when cuts in council budgets are likely to be with us for a significant part of this LTP period, the ability to better prioritise expenditure and to make the most efficient use of resources in areas of network improvements and maintenance is of key value.

Targeting maintenance improvements

In the last two years, we have captured better information about all of the highways assets and have integrated these into the systems used to manage the highways. The information is now accessible to all staff at their desktop and in a mapped form, providing everyone involved in managing the network with a complete understanding of the needs and effects of intervention

Brierlow Bar carriageway repairs. Before. After.

works. This information is constantly being updated and will provide opportunities for more joined up thinking in the provision of services, in particular the maintenance of our assets and providing a consistent approach.

The council will continue to capture and make use of condition surveys in managing the network. Highways, and in particular roads, benefit from an annual survey based on national criteria, which provides both invaluable information for maintaining the network as well as providing information with which to benchmark the County's performance regarding monitoring expenditure versus performance/satisfaction. Over the next few years, the knowledge developed regarding other highways assets will enable the entire network to be more effectively managed. Early pilots are in hand to develop better management of road gullies to provide data-targeted interventions based on knowledge on frequency of silting. The future emphasis will be on using life cycles, condition surveys and better data.

A57 at Glossop.

The Rights of Way Improvement Plan (RoWIP) priorities will help target maintenance of Public Rights of Way (PRoW) and the Greenway network. Resources will be directed where routes are in greatest need of repair, or have the potential to benefit the greatest number of users e.g. in and around urban areas, to provide direct access between settlements or to provide access into the surrounding countryside. The needs of users and the maintenance issues which put them off using the Public Rights of Way and the Greenway network are identified during the RoWIP consultation process. Maintenance methods and use of surfacing materials should be in keeping with ecological surroundings and landscape character of the area; protection and benefits for wildlife and heritage will be incorporated wherever possible. The Council will need to take account of the effect of increased levels of rainfall and incorporate adequate drainage infrastructure which should be appropriately maintained.

Improving public satisfaction

The use of asset management principles to deliver improved use of resources and levels of service will help to meet increasing demand for public satisfaction. Surveys have been carried out to examine more specifically what aspects of maintenance will increase levels of satisfaction. Improving the understanding of what levels of service can realistically be expected is a challenge for the authority. In an urban situation this is a simpler task as there are more options for travel to work, leisure or health. However, in a rural shire county there are more isolated communities, less options for local work, and leisure and health facilities require a larger network to be maintained. This places a greater demand on budgets and increases the criteria to be considered when prioritising future maintenance.

Developments in asset management and Geographic Information Systems (GIS) now provide the ability to:
- weigh up many different criteria (e.g. importance of road, sole access for community, level of use, school/bus route, Heavy Goods Vehicle route, and environmental criteria),
- set differing levels of service based on the hierarchy of the network to prioritise future needs,
- cost these over a longer period to maintain essential links, as well as those that can be considered desirable.

A multi criteria analysis of these will therefore determine the most effective scheme for improvement and maintenance of the network.

Improving understanding of levels of service

Linked to this will be more clarity about the levels of service that can be provided to meet public satisfaction. These levels of service will have set interventions based on safety thresholds and on funding. Where possible, it may be the level of service provided is appropriate to the usage, which may result in more essential routes receiving a higher level of maintenance. Delivering this will also require Derbyshire to take a more strategic, longer term view of resources, identifying the effects of budgets and asset funding and this may lead to rationalisation of some asset groups.

Work has been ongoing to develop levels of service that deliver the safety requirements that the Council is expected to meet but also provide the serviceability that the user expects. By using the hierarchy, the Council will be able to deliver services appropriate to the level of hierarchy, its usage and importance in meeting user needs.

Environmental improvements

The Environmental Services Department has developed and implemented an Environmental Management System (EMS) to assist in meeting legal requirements and policy commitments and to achieve continual improvement in environmental performance. The EMS is an integral part of managing our activities, establishing objectives, setting controls and taking action to improve our environmental performance. The department's EMS gained certification for meeting the requirements of the International Standard BS EN ISO 14001 in 2002. Since then, it has been checked twice yearly by external auditors to ensure that it continues to meet the standard.

Reducing carbon dioxide emissions through street lighting, and improving resilience to and reducing disruption caused by climate change in terms of flooding management are described in the next section as 'core business.'

Table 3: Derbyshire County Council's highways assets

Asset	Km	No.	Accuracy
Road Length	5,250		High
Footway Length	4,200		Estimated
Public Rights of Way Length	5,176	9,300	High
Greenway (off road) Length	299		High
Cycleway Length	50		Estimated
Highway Drains	525		Estimated
Manholes		5,850	Estimated
Gullies		131,000	As Surveyed
Gully Connections	650		Estimated
Pumping Stations		5	High
Kerbs	3,750		Interim-awaiting complete results from survey
Safety Fencing	110		As Surveyed
Pedestrian Guard Railing	25		As Surveyed
Road Bridges		825	High
Footbridges		55	Medium
Retaining Walls	450		Estimated
Culverts		220	Medium
Signal Heads		5,500	High
Electronic Warning Signs		50	High
Safety Cameras		100	High
Street Lights		87,000	High
Illuminated Signs		7,300	As Surveyed
Illuminated Bollards		2,650	As Surveyed
Lighting Cable	1,000		Estimated
Bollards/Hazard Markers		22,400	As Surveyed
Warning Signs		21,250	As Surveyed
Regulatory Signs		31,050	As Surveyed
Direction Signs		8,200	As Surveyed
Services/Tourist Signs		1,150	As Surveyed
AA/RAC Signs		7,250	As Surveyed
Parking Signs		850	As Surveyed
Bus/Cycle/Pedestrian Signs		2,250	As Surveyed
Longitudinal Lining	7,200		As Surveyed
Yellow Lining	4,100		As Surveyed
Special Road Markings		29,900	As Surveyed
Hatched Markings	200		As Surveyed
Transverse Lining	380		As Surveyed
Road Studs		353,250	As Surveyed
PRoW Signs		5,350	As Surveyed
Bus Stops		5,500	As Surveyed
Bus Shelters		1,550	As Surveyed
Speed Cushions		850	As Surveyed
Road Humps		2,350	As Accuracy
Raised Junctions		70	As Surveyed
Traffic Islands		1,500	As Surveyed

6.2 Maintenance - core business

Derbyshire maintains an extensive asset base associated with the transport and, in particular, the highway network. These assets all combine to provide a safe and accessible network for daily use in our social and economic lives.

Asset management approach - highways assets

The carriageway is the County's largest asset and an extensive footway network is in use on a daily basis. The length of the PRoW network is also significant for Derbyshire. The County's entire assets are presented in Table 3 (see page 30).

Given the extent of network and assets, the task of maintaining them on a day-to-day basis, and ensuring that they are all capable and able to deliver their part is not an enviable task. The recent Asset Inventory Survey has highlighted the need to take a fresh look at the assets:

- What they are.
- Why they are there.
- When they need maintaining.
- How much they cost.
- Where they are.
- Who do they benefit?

Levels of service will become key to the Council's "localism" agenda in agreeing the maintenance levels that can be provided to meet public satisfaction. Adopting the asset management principles outlined in the Transport Asset Management Plan and, in particular, the longer term view of life cycle plans, costs and models enables a realistic understanding of the County's needs over the next 15 years.

Carriageways will continue to be the main priority in providing transport corridors, although footways need to be given greater priority in terms of restoring their effectiveness, if Derbyshire is to achieve an increase in healthier travel habits, including walking. Works are in hand to identify areas of footway across the County that are significant in use, potentially busy routes, and those that are in frequent use resulting in the ability to concentrate effort where the demand requires it. Similar hierarchical strategies are already in place for carriageways and are being refined.
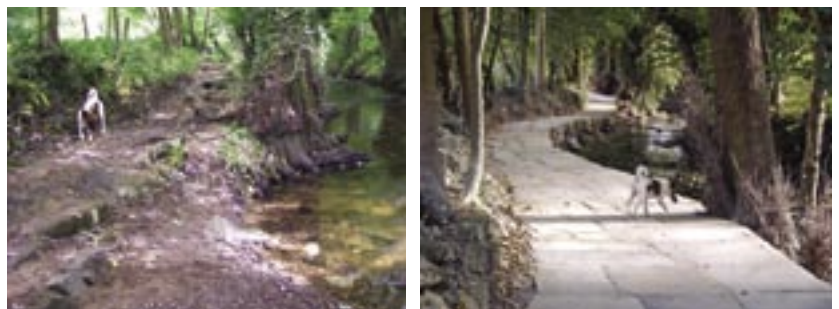

Swarkestone Bridge.

Structures

Supporting the highway network itself are many crucial structures (e.g. bridges, retaining walls). New systems are enabling these assets to be analysed to develop appropriate life cycle plans for future maintenance. In many cases, these structures are key to supporting small communities in the rural areas of Derbyshire as well as maintaining economic links on the more strategic routes. Many are also of historic interest that require consideration to conserve and enhance their historic importance.

Rights of Way Improvement Plan

The RoWIP provides actions to improve the maintenance and management of the existing PRoW and Greenway network, making access to these lanes safe for all potential users. The Council aims to continue to improve the percentage of the PRoW network that is open and available for use. The management of recreational

Rights of Way improvement scheme at Ashover, before and after.

motorised vehicles in the countryside using the network of non classified highways and Byways Open to All Traffic is an ongoing issue in terms of environmental impacts. Information about infrastructure on PRoW in the County (such as bridges, stiles, gates, fingerposts, waymarker posts etc.) is mapped and recorded on an associated database to help with the ongoing management of the network.

Street lighting - reducing carbon dioxide emissions and light pollution

The issue of street lighting has recently been raised in debates on switching off/dimming and the use of new technologies. The County Council maintains a significant network of street lights/ street lit carriageways, ranging from residential to town centre strategic routes and many of these areas are lit for highway safety reasons, which also contributed to raised personal safety levels as well as improved amenity.

The Council has, over the last 40 years, delivered significant improvements in the lighting network, contributing to road safety and greater personal security. Rising costs in energy and the imposition of carbon taxes place the lighting network at risk due, principally, to the costs required to support it. Many councils have taken action by turning off street lights after midnight and others have been more draconian. Derbyshire is plotting a centre line course through this difficult process by carrying out a number of pilot studies to consider the benefits of differing approaches.

Street lighting maintenance.

Despite this, the next few years will certainly see some changes in the current regimes, with dimming or switch offs being considered where practical, supported by changes to lanterns to use more energy efficient lighting systems. Through all of this, the Council will carry out further public consultation and consider safety issues; this will involve the identification of key parts of the network where lighting contributes most to safety and security. It will also consider landscape character and consider enhancing or preserving darker skies.

The previously referred to hierarchy and Levels of Service will form a part of these deliberations as will the use of materials and technology, promoting the maximum life cycles of each of our lighting assets. Not only will street lighting be affected, but the illumination of signs will be an area requiring a more economic approach, and this may lead to the introduction of more effective signing to reduce energy costs.

Winter Service - Global Positioning System approach

The Council has introduced Global Positioning System (GPS) enabled salting/gritting routes, allowing routes to be matched more to the demands of the network and the severity of the weather, allowing for simple route changes and vehicle tracking to improve service delivery. It has also identified the locations of all salt/grit bins, allowing a more effectively managed support process to both County and District/Parish facilities and is using the hierarchical approach to roads to identify key areas of footway usage where additional winter maintenance will assist in supporting pedestrian/public transport access when conditions reduce the use of the private motor vehicle. In particular, access to railway stations is important, as trains continue to run in wintry weather.

Minimising damage to the environment

As previously described in section 6.1, the Environmental Services Department has implemented an EMS to achieve continual improvement in environmental performance.

Improving public satisfaction with maintenance

Improving public satisfaction with maintenance has been identified as a priority and will be factored into decisions made about the best technical methods of asset management.

Flooding management

The Flood and Water Management Act (2010) places a new requirement on the Council to take responsibility for managing flooding arising from surface water throughout the County. European regulations require that the Council prepares flood risk assessments. The Council has started this work, which will be updated every six years. The aim of the Act and regulations is to enable a better management of surface water across the County, but particularly where it has an effect on people's daily lives or places people at risk.

Flooding at Willington.

Over the next few years, the Council will work with the planning authorities to develop more sustainable means of disposing of surface water for new developments, and will develop a register of assets that are either beneficial or detrimental to the management of surface water so that these assets can be better monitored and controlled.

6.3 Maintenance opportunities

Spending money wisely - with lower budgets

Strategies for maintaining the transport network have benefited from infrastructure funding based on historic costs. A reduction in budget will result in the need to revisit the way in which budgets have been developed to rationalise the maintenance of the network so as to provide deliverable levels of service based on zero based budgets (i.e. no assumptions are made about the continuation of previous allocations for budget areas; everything included in the budget must be considered and justified).

A national shift to a more asset based management system of budgets has coincided with major steps forward in Derbyshire in visualising data in Geographical Information System (GIS) format. Significant improvements in technology have resulted in changes from listing data in tables, to allowing all assets and their estimated/known age and condition to be viewed in map based images along with condition data collected by machine and visual inspection.

Zero based budgets will identify the required allocation for each year and interrogation of the asset/GIS database will provide the locations. Furthermore, this approach enables not only the areas of treatment to be identified, but for works to be grouped in areas and combine contracts for different assets, resulting in savings in both the design and construction as well as addressing all of the assets in the vicinity of the scheme. Visualising the asset in GIS also provides desk-top access to the information, enabling more work to be prepared in the office, therefore reducing business mileage.

These advancements are enabling Derbyshire to take advantage of opportunities that were previously cumbersome using reported data rather than live information. The assets collected as part of the Asset Inventory Survey have been loaded into the Council's integrated asset management systems, providing details of the network and its associated assets on a layer-by-layer basis. This information is updated and comprises not only the assets but condition information, conservation areas, network hierarchy, areas of deprivation and the schemes included in the annual Service Plan. Additional information has been added to show assets at risk, and all of this information can be sorted and sifted to develop individual views and scenarios. The information enables a desktop analysis of maintenance and improvement schemes and is hyperlinked to a video of the network, enabling cost savings in the initial stages of scheme identification.

The visualisation offers the opportunity to plan works to identify other assets which would benefit from maintenance

or replacement and to carry out more work that needs doing, as well as allowing works to be grouped by the contractor into area contracts, thus saving money and improving efficiencies.

Driving down the overall costs of maintenance can also be achieved by directing Heavy Goods Vehicle (HGV) routes, understanding the key routes they use and developing 'no go areas' where a reduction in HGV traffic will result in a reduction in damage to minor roads. Investigations and pilot projects are considering how this can be achieved by using Derbyshire's asset inventory to inform the use of satellite navigation.

HGV alternative route management.

Supporting local journeys

The hierarchical approach to the network is likely to expand over the next few years to take more account of vehicle flows, importance in linking communities, school routes, bus routes, employment corridors, access to hospitals, shops and leisure.

Environmental improvements
Consolidation of the network: removing unnecessary infrastructure

The recent survey to collect more information on the Council's assets enables not just a valuation exercise but provides information on the vast quantity of assets that have accumulated over the years. As time passes, the regulations and standards applying to some of these assets have changed, and they may no longer be required or could be relocated to better effect. The aim of the next five to 10 years is to review these assets and, if necessary, remove them, providing a network that is fit for purpose and contains the assets necessary to deliver the correct level of service to the user and enhance all our landscapes, townscapes and heritage assets.

The effects of these reviews will be a consolidation of the network, not extending responsibilities.

Improving the local streetscape

One of the criticisms of the maintenance work undertaken by the Council is that there are often repeat visits for further work to be undertaken to other assets. Clearly this means that the streetscape is often a combination of assets in various states of repair. The aims over future years are to instigate corridor/area repairs by joining up works to manage more efficient contracts. An 'inspect and fix' approach entails visiting streets and fixing all the problems, with emergency responses for Category 1 potholes being handled separately. Using the integrated systems the Council is developing, it is possible to look at the condition of all of the assets in an area or street and approach the planned maintenance by undertaking a little more than we used to, but to leave an area improved and without the need for a return visit for some time. Not only will this improve the streetscape, but using the information collected on assets will enable desktop studies to determine whether all of the existing assets are required or are located to provide maximum effect. Reviewing assets, in particular signs, is one of the Council's aims for this LTP period.

Habitats, vegetation and species

One of the benefits of the move to a more GIS (Geographic Information Systems) orientated management system for the transport network is the additional information that can be viewed at the desktop. Highways maintenance and improvements often take place in areas where certain habitats are protected (e.g. European Special Areas of Conservation and Special Protection Areas), and there are many locally important habitats and species that would benefit from similar protection (e.g. linked with Local Biodiversity Action Plans). There may also be opportunities to

Otter ledges to reduce wildlife road casualties.

link up habitats using transport corridors. Adding this information to the integrated asset management system will enable all schemes to be viewed alongside key information relating to protected habitats and consequently enable the correct measures to be taken for their protection.

Road verge reserves have been identified in partnership with the Peak District National Park Authority, the Highways Agency and voluntary groups. These reserves have their own tailored management protection to increase the possibilities that biodiversity interest is maintained and enhanced.

Integrated Asset Management Systems

Overall, the aim over this LTP period will be to develop better information to make more transparent, fact based decisions from which to manage the network. The information has a key role in enabling highway engineers and traffic technicians to do their job more effectively, but has an equal place in providing better information for the highway user. Providing information about our assets may be a two-way process, enabling faults to be reported on assets or roads/footways and providing feedback on progress; the aim is to develop these options as part of the integrated asset management systems.

6.4 Maintenance long-term projects

Derbyshire is seeking to drive its maintenance programmes for a more strategic holistic view of the County as follows:

Carriageway - subject to a multi-criteria analysis to prioritise the works based on hierarchy, need, and safety.

Footway - identify footway throughout the County and key features that are likely to be accessed by the public, particularly in edge of town/villages and more rural locations, i.e. public house, church, bus stop, school, etc. Once the network is established, schemes will be derived and prioritised based on a similar hierarchy process as above. The results of this being that some unused and/or little used rural footways may be downgraded to unsurfaced.

Signs - risk assess the need for new or additional signs and review signage by desk study for consistency, appropriateness and continuity of direction signing.

Heavy goods vehicles - Capture speed and HGV prohibition area by polygon and extend/reduce limits to provide consistent and manageable areas subject to orders that will benefit maintenance strategies. Progress the provision of better data to Satellite Navigation Systems on routes unsuitable for HGVs.

Lines - review by desk study in conjunction with street lighting proposals to ensure that safety can be maintained if lights are dimmed or switched off.

Safety fences - review conditions and need against national criteria before treating, consider alternatives to safety fencing not required by standards; produce a rolling programme of repair for remaining safety fences.

Signals - review use of existing installations as traffic patterns change through demographics/new routes/planning changes.

Gullies - develop knowledge by collecting data to drive a more effective intelligence led cleansing approach to take account of changing patterns in rainfall and intensity.

High visibility lining on the A57.

Drains - integrate drainage into the models being developed to manage flood water.

Produce a prioritised list of those rights of way in most need of surface improvements or which benefit the most users.

6.5 Guiding delivery - sources of evidence

In guiding delivery of well maintained roads and rights of way, we will use many sources of evidence.
Examples are as follows:

- Derbyshire transport challenges.
- Asset inventory, including map-based images and sort and filter queries.
- Condition data.
- Traffic flows and Hierarchy.
- Rights of Way Improvement Plan and Greenway Strategies.
- Environmental data, including environmental sensitivity mapping.
- Public surveys (e.g. Citizens, Panels, Rights of Way consultations).
- Flood risk assessment.
- Public reports/complaints.
- Local Access Forums.
- Links to the National Cycle Network.
- Expansion of the road hierarchy to include linking communities, school routes, bus routes, access to hospitals etc.
- Improvement and Scrutiny reviews.
- Best Practice advice.

6.6 What we want to achieve in five years

- Define and sustain levels of service on a hierarchical basis.
- Improve condition and consistency of treatment.
- Pursue an asset management approach for all our assets.
- Reduce the number of assets e.g. sign review.
- A more economic approach to lighting.
- Corridor/area-based repairs.
- Develop deterioration models and scenario planning to test strategies and risk.
- Improve our landscapes, townscapes and setting of heritage assets.
- Evidence that environmental issues have been considered in the procurement of materials used for maintenance.
- Develop cost depreciation models for all assets to forecast future budgetary requirements.
- Improve the proportion of the Public Rights of Way network that is open and available for use (paths correctly signposted from the road, with well maintained surfaces and structures, including the cutting back of intrusive vegetation and efficient removal of obstructions).