APPENDIX 1

Thurrock Highway Maintenance and Network Management: Policy Guidance and Standards

Part 1: Highway Maintenance

February 2012

Table of Contents

1 Background

1.1 Introduction

This document comprises Part 1 of Thurrock Council's revised *Highway Maintenance and Network Management: Policy Guidance and Standards*, and focuses on the highway maintenance element. **Appendix A** outlines in more detail the areas of highway network management which will be included in Part 2, covering the operation and improvement of the highway.

This will supersede the current range of policy guidance and standards for highway maintenance and management that is currently used by the Council and its contractors. Largely inherited from Essex County Council prior to Thurrock Council gaining unitary status, they have served the Council well, but are now in need of revision following a stream of recent changes, including new national legislation, the publication of the Thurrock Transport Strategy 2008 – 2021, and the need to be flexible in view of the need to reduce the national financial deficit.

Well Maintained Highways, the 2005 Code of Practice for Highway Management plus the *Well Maintained Highways Complementary Guidance 2010* combined provide a set of recommendations for highway maintenance practice[1]. They comprise a framework of guidance and standards about the maintenance service. However, the Code of Practice is not mandatory but instead reflects the need for local discretion and diversity in service provision. Such flexibility is central to recognising that local service users' priorities will differ, as will the levels of funding available to different authorities.

The level of funding available to Thurrock will be a major factor in delivering Part 1 of *Highway Maintenance and Network Management in Thurrock*. The Government has said that reducing the deficit is the most urgent issue facing Britain today. That is why it has committed to a significant acceleration in the reduction of the deficit over the course of the 2010 to 2015 Parliament. It is probable that funding will remain low for some time afterwards. The Code of Practice is based on the assumption that available funding for highway maintenance will continue to provide some flexibility for authorities to pursue a regime of assessment and rational planning of programmes and priorities. In the short to medium term, however, it is very likely that funding will be much reduced compared to that which was available when the Code of Practice was prepared in 2005. Reduced funding will be reflected in the standards and prioritisation adopted and delivered on the ground.

This document, Part 1 Thurrock's *Highway Maintenance and Network Management,* sets out Thurrock Council's approach to setting the standards for the highways ~~maintenance service. This is i~~n accordance with statutory duties (**Section 1.2),** whilst

[1] Practitioners should also refer to *Sustainable Highways – A Short Guide* produced by TRL in 2006, a daughter document to *Well Maintained Highways* and to *Well Lit Highways, Code of Practice for Highway Lighting Management.*

implementing the philosophy of the Code of Practice and reflecting local priorities and circumstances. This document therefore provides guidance on the strategic planning and management of highway maintenance, within the context of local and national policy. It does not simply repeat the Codes of Practice, nor is it intended as a detailed technical reference for all aspects of highway maintenance, repeating technical guidance that is available elsewhere. Indeed, for detailed information on the delivery of maintenance activities, such as how to carry out inspections or how to record data, practitioners should refer to the latest plethora of technical documentation available.

Instead it complements the Codes of Practice, focusing on how to prioritise and target maintenance activity in Thurrock and achieve defined standards of safety, serviceability and sustainability. This is intended to help with on-going decision making, such as formulating an annual programme of schemes. Whilst there is considerable local discretion in setting standards of service and priorities, maintenance practice does operate within a legal framework and needs to deliver statutory obligations of the Council. Wherever priorities and standards set out in Part 1 of *Highway Maintenance and Network Management* differ from those in the Code of Practice, those in this document will take precedence.

This document has been developed with a view to minimising the need to revise it too often, such as annually to reflect changes to annual budgets. Instead, it will be subject to a brief review every year to verify its fitness for purpose, and a more thorough revision every three to five years.

1.2 Legal Framework

Much of highway maintenance activity is based upon statutory powers and duties. In addition to a general Duty of Care to users and the community to maintain the highway in a condition fit for its purpose, there are a number of specific pieces of legislation which provide the basis for powers and duties relating to highway maintenance.

1.2.1 Highways Act 1980

The *Highways Act 1980* sets out the main duties of highway authorities in England and Wales. It is the statutory duty of the highway authority to maintain that part of the highway defined as being maintainable at public expense. This duty is consolidated in Section 41 of the Highways Act 1980. Under Section 56 of the Act any person may apply to the courts for an order requiring the highway authority to take remedial action in cases of alleged non-repair by that authority that may also face action for damages resulting from failure to maintain the highway. Section 58 of the Act provides that in the event of an action it shall be a defence to show that the road was kept in a reasonable state of repair having regard for the traffic using it, the standard of maintenance appropriate to its use and public safety.

Section 150 of the Act requires the highway authority to clear obstructions from the highway resulting from the accumulation of snow or from the falling down of banks

on the side of the highway, or from any other cause. Section 41 of the Highways Act was amended to expressly include snow and ice in a Highway Authority's statutory duty to maintain the highway.

1.2.2 Traffic Management Act 2004

The *Traffic Management Act 2004* introduced a number of provisions. The most important feature of the Act is Section 16(1) which establishes a new duty for local traffic authorities 'to manage their road network with a view to achieving, so far as may be reasonably practicable, having regard to their other obligations and policies, the following objectives:

- Securing the expeditious movement of traffic on the authority's road network;
- Facilitating the expeditious movement of traffic on road networks for which another authority is the traffic authority.

Section 31 of the Act specifically states that the term 'traffic' includes pedestrians, so the duty requires the council to consider all road users.

1.2.3 Maintenance and Management of Public Rights of Way

Thurrock Council has a duty under the *Wildlife and Countryside Act 1981* and the *Highways Act 1980* to maintain and keep the definitive map and statement of Public Rights of Way (PROW) and to ensure that ways are adequately signposted, maintained and free from obstruction.

The *Countryside and Rights of Way Act 2000* (Section 60) introduced a new duty for authorities to prepare Rights of Way Improvement Plans (ROWIPs). The ROWIP should provide an assessment of the need to which rights of way meet the present and future needs of the public; an assessment of the opportunities provided by local rights of way for exercise and recreation; and an assessment of the accessibility of local rights of way to all members of the community.

1.2.4 Road Traffic Act 1988

This provides a duty for highway authorities to promote road safety, including a requirement to undertake accident studies and take such measures as appear appropriate to prevent such accidents occurring.

1.2.5 The Environmental Protection Act 1981

This provides a framework of legislation relating to environmental and countryside issues with which highway maintenance operations must comply

1.2.6 Climate Change Act 2008

The Climate Change Act 2008 makes the UK the first country in the world to have a legally binding long-term framework to cut carbon emissions. It also creates a framework for building the UK's ability to adapt to climate change.

1.2.7 Disability Discrimination Act (DDA)

The Disability Equality Duty (DED) covers everything public sector organisations do, including policy making and services that are delivered to the public. People who work in the public sector have to consider the impact of their work on disabled people, and take action to tackle disability inequality.

1.2.8 The Noxious Weeds Act 1959

This Act places a responsibility on the highway authority to take action to inhibit the growth and spread of injurious weeds growing within the highway. Weed spraying operations are regulated by the Environment Agency and also by the Health and Safety Commission Code of Practice. The Weeds Act covers:

- Spear thistle
- Creeping or field thistle
- Curled dock
- Broad leaf dock
- Common ragwort

1.2.9 The Wildlife and Countryside Act 1981

This specifies control of certain plants such as giant hogweed or Japanese knotweed. The Ragwort Act 2003 and associated code of practice gives further information on treating the growth of this weed.

There are other items of legislation that are very specific to certain aspects of maintenance practice, such as the use of herbicides. The practitioner is advised to check the latest legislation.

1.3 Policy Framework

This Section summarises the key objectives and policies of Thurrock Council, especially as described in the *Thurrock Transport Strategy 2008-2021* and the contribution that maintenance can make.

1.3.1 Sustainable Community Strategy

The *Thurrock Sustainable Community Strategy* (SCS) was prepared and approved in February 2007 by the Thurrock Local Strategic Partnership, Shaping Thurrock. The SCS outlines a simplified strategic approach and highlights the future vision for the Borough to 2021. It is envisaged that 'Thurrock will be the location of choice – a place where people thrive and prosper, where residents can access services that will make a difference; and where development is sustainable and supports our new and existing communities as they regenerate and grow'.

The SCS contains five priorities related to the overarching vision. The three priorities within the SCS that are relevant to maintenance practice are:

- To ensure a safe, clean and green environment
- To encourage and promote job creation and economic prosperity

- To provide and commission high quality and accessible services that meet, wherever possible, individual needs

In addition, the SCS has identified a number of outcomes. Again, maintenance practice will help to achieve some of these, including:

- Our streets and parks will be clean and well maintained
- More residents will be using Thurrock's high quality and well connected green spaces
- More homes and businesses will have reduced their carbon emission and Thurrock will be better prepared for the impact of climate change
- The natural environment will be protected, enhanced and celebrated
- Roads, public transport networks and housing will be enhanced so that local people have better access to employment opportunities, other amenities

1.3.2 Thurrock Transport Strategy: 2008 to 2021

The *Thurrock Transport Strategy 2008 to 2021* supports the SCS and comprises the strategy element of the statutory Local Transport Plan. It also has a number of transport specific objectives that are supported by maintenance practices, including:

- To increase levels of walking and cycling, especially where health benefits would be greater
- To continue increasing public transport patronage
- To encourage a modal shift away from the private car to walking, cycling and public transport, especially to work and school
- To improve bus user satisfaction
- To reduce carbon dioxide emissions from transport
- To reduce vulnerability to the impacts of climate change
- To reduce the number of people killed or seriously injured in road traffic collisions
- To create a safer environment for road users, especially those who are more vulnerable

To meet these and other objectives, the Thurrock Transport Strategy has five thematic strategies concerning accessibility, congestion, safety, air quality and climate change, and regeneration.

The thrust of the accessibility strategy is to improve accessibility by walking, cycling and public transport to services. Key policies include:

- The creation of a network of core walking and cycling routes (see **Map 1, Appendix C)** Improving the safety of vulnerable road users such as pedestrians and cyclists and mitigating safety concerns that act as barriers to the use of these modes
- Incorporating the needs of people with mobility impairments or with disabilities

The strategy for tackling congestion will be to deliver a targeted programme of measures to encourage a modal shift to more sustainable modes of transport such

as walking and cycling, and improve the efficiency of the transport network. Key policies include:

- The development of a network of high quality inter-urban public transport routes
- A modal shift towards walking, cycling and public transport
- Improved network efficiency

Improving air quality and mitigating/ adapting to climate change will be achieved by supporting modal shift and then reducing emissions from those vehicles still operating, as well as reducing Thurrock's vulnerability to climate change. Key policies include:

- Transport measures that reduce both greenhouse gas and air pollution emissions will be prioritised
- Mitigating the adverse impacts of freight operations by reducing emissions from Heavy Goods Vehicles in Thurrock
- When undertaking transport improvements, including maintenance schemes, the Council will integrate climate change adaptation measures into design to ensure that vulnerability to the transport network from climate change is minimised

The safety strategy, whilst aiming to reduce casualties where people are killed or seriously injured on the Thurrock road network, will take a broader and proactive approach, aiming to reduce road danger and improve personal security and thereby promote modal shift and community regeneration. Key policies include:

- A priority will be safety around schools
- Integrating road safety into all work programmes, including maintenance
- Using Killed or Seriously Injured accidents to help prioritise road safety interventions
- Creating a safer environment for pedestrians and cyclists

The regeneration strategy is largely integrated into the other thematic areas, particularly in terms of social and economic regeneration. However, key policies related to environmental regeneration are:

- When designing and implementing transport improvements the Council will ensure they contribute to the quality of the public realm and the integrity of its historic and cultural setting
- When designing and implementing transport improvements the Council will ensure they contribute to the protection and enhancement of habitats and biodiversity, the integrity of water quality, and the preservation and enhancement of the landscape

In autumn 2009, Small Fish strategy consultants undertook a study to identify Economically Important Routes in Thurrock as part of the Implementation Plan element of the Local Transport Plan. This study identified where the adverse impact of congestion on the economy could be expected to be much greater than similar levels of congestion on other routes. The identification of Economically Important Routes took into account:

- Levels of commuting
- Levels of HGV activity
- The existing road network hierarchy
- The location of current and future major employment areas/ town centres
- Their regional economic importance

Thurrock's Economically Important Routes are shown at **Map 3, Appendix C**.

2 Prioritisation

There are clearly a number of factors that have a call on the limited funding for maintenance. This chapter explains how the required works are prioritised. Priorities for maintenance works and inspections are informed by:

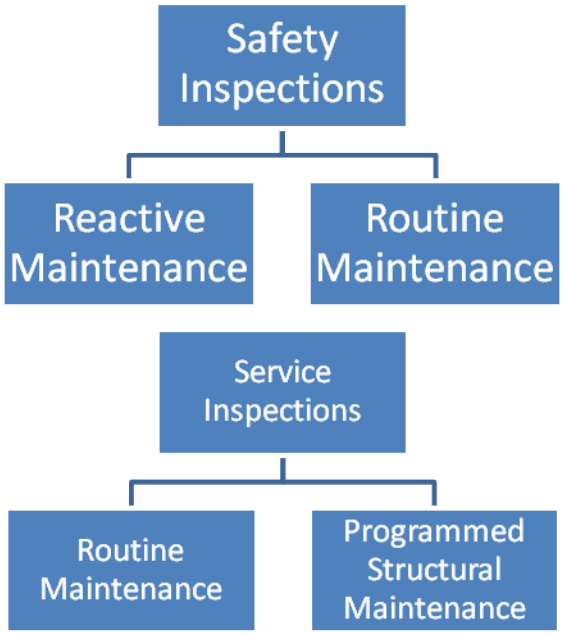
- Risk assessments and safety (following safety inspections, see **Chapter 3**)
- The serviceability and condition of the highway asset (outcome of service inspections/ condition surveys, **Chapter 4**)
- LTP policies and priorities (see also **Section 2.6**)
- Feedback from highway users and the public

Maintenance programmes are therefore prioritised, reviewed and updated annually with reference to new condition data, changes in budgets, changes in LTP priorities or policies, changes to levels of service, and changes to community priorities.

It is useful at the start of this Chapter to show briefly the different types of inspections or surveys and the type of maintenance to which they relate. This will help the non-expert reader understand the prioritisation better. A glossary of terms at **Appendix B** provides definitions for the various terminologies.

Condition surveys (see **Chapter 4**) aim to identify structural issues and therefore always lead to structural maintenance if any maintenance intervention is required. Safety and service inspections are shown in Figure 1 below.

Figure 1: Service and Safety Inspections



It can be seen that safety inspections can inform both reactive maintenance and routine maintenance, whilst service inspections inform both routine maintenance and programmed structural maintenance.

2.1 Serviceability and Condition of the Highway Asset

The condition of the highway asset can be determined by three factors:

- Safety, such as the presence of surface defects (see above)
- Serviceability, such as the ride quality of the road
- Sustainability, such as the noise characteristics of the road

The maintenance regime, whether dealing with potholes, structural repairs to footways, or replacing streetlights, is largely driven by asset condition. Maintenance works are either:

- Reactive, such as being prompted by the presence of a dangerous pothole that needs immediate attention
- Part of a consistent schedule, such as an annual cleaning of signs,
- Specifically programmed, such as to improve the structural condition of a road so as to preserve the efficiency and value of the network, or
- Winter service – Pre/Post-treatment of the highway against snow/ice, and the clearance of snow.

Knowing the overall condition, in contrast to simply whether or not they are safe, of roads, footways, bridges and other important assets is essential when programming highway maintenance works. Surface scanning and investigation works are utilised along with other techniques to make sure that limited funds are spent in the most effective manner.

In order to support the Local Transport Plan and funding decisions, the council is developing a Transport Asset Management Plan (TAMP) to provide the framework for how transport assets are maintained. The TAMP provides a means for the council to understand the value and liability of its existing assets.

2.2 Risk Management

The management of highway maintenance, including establishing regimes for inspection, setting standards for condition, determining priorities and programmes for effective asset management, and procuring the service, should all be undertaken against a clear understanding and assessment of the risk and consequences involved.

Risk, in this context, is the possibility of an accident happening. The possibility of an accident can never be eliminated, but it can be managed. To help manage risk it is measured in terms of impact and likelihood. Risk management is a process that identifies, assesses, and manages the potential risk in order to provide reasonable assurance regarding the achievement of a safe transport network.

Maintenance should also support other transport and wider objectives. The transport network enables people to travel, which introduces the risk of accidents. It would be self-defeating, however, to reduce the risk of accidents at the cost of preventing people from travelling. The need to make the transport network safe therefore needs to be balanced against the needs and objectives of other policy areas, such as accessibility, congestion and enhancing the natural environment. This will need to be reflected in the inspection regimes and risk management practices.

Nevertheless, the Council should be fully aware of defects with potential serious consequences and so safety inspections will in general take priority over other inspection related demands on available resources. Safety inspections will need to identify defects in the transport network, especially which could potentially have hazardous consequences. Such dangerous defects will always take priority as the Council needs to meet its statutory duty.

Practicing a risk management approach, the frequency of inspection will need to prioritise key elements of the transport network, such as roads with high volumes of traffic, roads with high traffic speeds, and footways with high pedestrian flows. The acceptability of particular defects will also vary, depending on the potential consequences. A tripping hazard on a quiet footway presents a much lower risk than the same defect on a core walking route. This approach will need to be embedded into the safety inspection regime, as outlined in **Chapter 3**.

2.3 Reactive Maintenance

Maintenance practice has a number of implications for safety. Transport infrastructure defects can lead to a range of risks and hazards, including: reduced skidding resistance, standing water due to poor drainage, and tripping hazards on footways. In general, safety is considered the highest priority for maintenance practice.

Where a defect is assessed as having serious consequences for the safety of the transport network, making it safe will need to have priority over other objectives and considerations, as explained above. This tends to be reactive maintenance. This means that it is not part of a schedule but instead requires prompt attention. Safety objectives relating to fulfilling minimum statutory duties is the highest priority for the maintenance service and must be met. The cost of undertaking this work must take first call on the maintenance budget and should be seen as the absolute minimum service level.

2.4 Routine Maintenance

Routine maintenance should, where it represents best value for money, follow a consistent and structured approach to scheduling and prioritisation, rather than being solely reactive. That is, it should be part of a *routine*. The budget setting cycle should take account of the relative priorities of reactive and scheduled works and seek to increase the proportion of work that is scheduled. This should lead to a

corresponding decrease in reactive maintenance in the longer term. So maintenance practice should where appropriate aim to reduce the need for reactive maintenance by improving service inspections or introducing proactive treatments as budgets allow.

Routine maintenance which forms part of a consistent schedule rather than being reactive is primarily for the purpose of providing defined standards of network serviceability, maximising availability, reliability, integrity and quality. The scheduling can be determined from:

- The regular treatment of a part of the network, such as the planned bulk changing of streetlights every so many years
- Lower risk defects (Category 2 defects; see **Chapter 3**) identified during safety inspections that do not require urgent attention
- Issues identified during service inspections
- User requests.

Priorities and programmes need to be determined for all types of routine maintenance and consideration given to combining a number of operations into a co-ordinated programme. The other type of intervention that is planned is called structural maintenance.

2.5 Structural Maintenance

Structural maintenance needs are usually identified either through service inspections or condition surveys. Structural maintenance is undertaken in the interests of providing a sustainable outcome, seeking to minimise cost over time, or to add community value to the network or the environment. It can also be for safety purposes to improve skidding resistance. Whilst programmed structural maintenance schemes may be more expensive than routine programmed or reactive treatments they can be designed to have a lower whole life cost, therefore providing value for money in the longer term.

Thurrock Council will, when resources are available, move towards a structural maintenance approach that is underpinned by a model of deterioration of the network. This divides the highway network into three groups of roads based on their measured condition and makes use of a traffic light system to separate out the categories.

Red roads are sections of roads which are in the worst condition, their level of deterioration, especially their structural deterioration, exceeds a nationally recognised ‘threshold level’ beyond which sections of road are deemed ‘not in good condition’. Treatment of roads is aimed at restoring them to ‘good condition’.

Amber roads are sections of road which although not in as bad condition as the red sections are close to red ‘threshold level’. If left untreated, these sections of road will deteriorate into the red category. As the structural integrity of these roads is relatively sound their average cost of treatment is substantially less than that

required to treat red sections of road. Treatment of these roads is aimed at arresting deterioration. The council will therefore move towards giving a greater priority to roads in amber condition.

Green roads are roads that are in relatively good condition. They will require some treatment to make sure they stay in good condition but this will be at lower cost and aimed at prolonging their life.

2.6 Policy Priorities

Maintenance is important for all of the Local Transport Plan objectives, for example:

Safety – maintenance practice can impact on road safety, including accidents and safety concerns that might inhibit modal shift, as well as personal security such as through the availability and quality of street lighting after dark.

Congestion – maintenance practice can help to promote modal shift by improving conditions for pedestrians and cyclists, and improve network efficiency such as through careful programming and coordination of maintenance works, especially on key routes so as to minimise congestion and disruption. It can also reduce the likelihood of incidents on important routes.

Climate change and air quality – maintenance practice can reduce emissions in a number of ways, such as:

- In-situ recycling to reduce lorry movements
- Recycling of materials to reduce the need for the quarrying of primary aggregates and the associated processing and transportation of raw materials
- Eco-driver training for maintenance staff
- Use of low emission/ fuel efficient maintenance vehicles. This measure will work to inform freight vehicles drivers of ways to improve fuel economy and reduce emissions through better driving practices
- Adapting to climate change, such as through flood prevention measures

Accessibility – maintenance practice can help accessibility by helping to create good conditions for pedestrians and cyclists, and taking into account the needs of people with disabilities.

Regeneration – Maintenance practice can support environmental regeneration, including through: recycling materials and so reducing the need for land take, reducing street clutter, protecting and enhancing habitats and biodiversity such as in verges, using appropriate materials in areas of cultural heritage, and helping to avoid noise and water pollution.

Maintenance practice is already informed by wider considerations, such as the level of pedestrian activity and whether a road is a bus or HGV route. Whilst this is important, it will be increasingly important to take this a step further and integrate

this approach with the need to support actual and specific policies in the Local Transport Plan.
The following sections consider the impact, especially in terms of prioritisation, that the objectives and policies in the Local Transport Plan will have on maintenance practice.

2.7 Street Lighting and Traffic Signals

Street lighting repairs and improvements should be focused particularly on the Core Walking and Cycling Routes (**Map 1, Appendix C**) in order to further improve conditions for pedestrians and cyclists. This will work to reduce the fear of crime on these parts of the transport network, with a view to encouraging a modal shift towards these modes, especially after dark.

When maintaining street lights and traffic signals, conventional bulbs should be replaced with longer-life, lower energy options to reduce lifetime costs and CO_2 emissions. It is also important to ensure that street lighting in Conservation Areas contributes to the integrity of historic and cultural settings. This means that when replacing street lights in Conversation Areas as part of the maintenance regime, consultation should be undertaken with the Sustainability Team to determine the type of street light that would be most appropriate to the historic character and setting of the area.

2.8 Drainage

A significant proportion of the Borough is within Flood Risk Zone 3 (high probability of flooding) as shown in **Map 6, Appendix C**. The frequency and severity of this risk is likely to increase as climate change impacts bring about significant increases in precipitation, storm surges and sea level rise. As well as causing congestion and economic disruption, flooding incidents on the transport network can have safety implications and over time are likely to cause structural deterioration of the surrounding highway. Safety might be particularly compromised by standing water on key routes, such as those with high traffic speeds. In maintenance terms, this is likely to mean an increasing need to reduce flooding incidents by more proactive service inspections and improving drainage, especially in flood risk areas (see **Chapter 4**).

Due to the high risk of flooding, an initial audit to identify drains and their condition across the Borough should be undertaken in order to identify drainage improvements required for delivery in the longer term. This audit should also be used to provide a baseline assessment that will inform the roll out of an on-going drainage service inspection regime. This inspection regime should be combined with safety inspections, where practicable, to reduce costs, and should give particular attention to locations that are susceptible to risk of flooding, especially those on Economically Important Routes and inter-urban bus routes within Flood Risk Zone 3. Additional priority should also be given to flooding that causes the pollution of

roadside watercourses that constitute part of the council's biodiversity action plans or other environmentally sensitive areas.

To accord with the inspection regime, priority for drainage maintenance, clearance and/or improvements should be given to locations that are susceptible to risk of flooding, especially those on Economically Important Routes and inter-urban bus routes that are also within Flood Risk Zone 3 (**Map 4, Appendix C**). This is in order to minimise flood risk and economic disruption to the transport network by ensuring the flow and diversion of water away from these transport networks.

When creating new drainage systems, consideration should also be given to delivering Sustainable Drainage Systems (SUDs) in those locations that have been identified as appropriate through the Thurrock Green Infrastructure Framework Plan. These can be found in **Map 5, Appendix C**.

2.9 Carriageway Maintenance

First and foremost, the structural condition of the highway asset is a major consideration, but prioritisation should be informed by other factors. Those road assets requiring structural maintenance that are within Flood Zone 3 and are also part of the network of Economically Important Routes or inter-urban bus routes (**Map 4, Appendix C**) should be seen as a priority of a high order when decisions are being made about programming.

Although of a lesser priority, structural road maintenance programming needs to take into account roads that are in poor condition and that are part of the network of Economically Important Routes that are outside of the Flood Risk Zone (**Map 3, Appendix C**). These routes typically have high traffic flows and any substantive defect is therefore likely to have an adverse impact on a greater number of vehicles, as well as have a disproportionate impact on the wider economy.

When structural road maintenance is carried out anywhere within Flood Risk Zone 3 (**Map 6, Appendix C**), road surfacing materials and drainage should be utilised in order to improve the resilience of the transport network to flooding and to minimise the economic disruption to the transport network that flood events cause.

Other considerations for structural road maintenance will include the skid resistance of a carriageway, which will need to be greater on certain parts of the transport network, notably on bends and the approaches to junctions and pedestrian crossings, as well as in the vicinity of schools where there is an increased chance of children dashing into the road in places away from formal pedestrian crossings.

Where carriageway cycle lanes are provided, particular attention will be required with respect to drainage gullies, valve covers, and inspection chambers to ensure they do not pose a heightened risk or deterrent to cyclists. Road gully gratings should be the flat type and laid within a defined vertical distance of the road surface. Where others exist, a programme of replacement should be prepared.

It is also important to ensure that structural road maintenance in Conservation Areas contributes to the integrity of historic and cultural settings, and this would include Conversation Areas. This means, that when maintaining and repairing roads in Conversation Areas as part of the maintenance regime, consultation should be undertaken with the Sustainability Team to determine the type of surfacing materials that would be most appropriate to the historic character and setting of the area.

Wherever running surfaces are to be renewed or resurfaced during highway maintenance activities, the option of a lower noise surface should be evaluated, and in cases where there would be a significant benefit to the local community they should be carefully considered. The priorities will be roads of 30mph or over that pass through residential areas.

Pothole repairs will be given extra priority along inter-urban bus routes, Economically Important Routes (**Map 3, Appendix C**) and on-road core cycle routes. This will improve both road safety and journey experience, and in the case of cycle routes should support modal shift. On the road network repairing potholes may also mitigate the effects of some road noise as vehicles hit potholes.

When undertaking structural and to a lesser extent routine road maintenance schemes, there will be a need to avoid causing congestion, particularly on inter-urban bus routes and Economically Important Routes. To that end, large scale maintenance projects should be limited to school holidays or other off-peak times where practicable, in order to minimise disruption and reduce congestion incidents related to road works.

Finally, Road traffic accident data, especially accidents involving vulnerable road users or Killed or Seriously Injured casualties, should be used to help prioritise programmed maintenance works. Other safety-related incidents should also be used to help prioritise the programmed maintenance works.

2.10 Footway Maintenance

First and foremost, the structural condition of the highway asset is a major consideration, but prioritisation should be informed by other factors. Those footway assets requiring structural maintenance that are within Flood Zone 3 and are also part of the network of Core Walking and Cycling Routes (**Maps 1 and 6, Appendix C**) should be given a priority of a high order.

Although of a lesser priority, structural footway maintenance should also be focused on those parts of the network of Core Walking and Cycling Routes (**Map 1, Appendix C**) and are in poor condition but outside of Flood Risk Zone 3. These routes will typically have high flows of pedestrians and cyclists and any substantive defect is therefore likely to have an adverse impact on a greater number of people, which may detract form the safety and attractiveness of these routes.

When structural footway maintenance is carried out anywhere within Flood Risk Zone 3 (**Map 6, Appendix C**) only road surfacing materials and drainage should be utilised in order to improve the resilience of the sustainable transport network to flooding. This should help to improve the journey experience for pedestrians and cyclists and further encourage a shift towards these modes.

It is also important to ensure that structural footway maintenance in Conservation Areas contributes to the integrity of historic and cultural settings. This means, that when maintaining and repairing footways in Conversation Areas as part of the maintenance regime, consultation should be undertaken with the Sustainability Team to determine the type of surfacing materials that would be most appropriate to the historic character and setting of the area. In general however, slabbed and small element paving footways will only be maintained in urban central areas, shopping streets and where the construction suits the environment of a conservation area or other sensitive area. Other slabbed footways will be replaced with macadam unless third party funding is available to meet the difference between the cost of macadam and slab relaying.

The safety inspection regime will also need to give special consideration to Core Walking and Cycling Routes. This will work to further improve conditions for pedestrians and cyclists, with a view to encouraging a shift towards these modes. The Thurrock Transport Strategy makes these integral to promoting modal shift to walking and cycling and aims to make these attractive routes, including by reducing perceived safety concerns. The routes are therefore likely to see an increase in pedestrian and cycle traffic, which may increase the risk.

Footway routine maintenance will be especially important on Core Walking and Cycling Routes (**Map 1, Appendix C**) in order to improve both safety and journey experience. Keeping footways and cycle ways in good repair along core routes will further improve conditions for pedestrians and cyclists, with a view to encouraging a modal shift towards these modes.

Some parts of the transport network have high usage by some of the more vulnerable road users, such as children, those with mobility problems or elderly people. Defects are therefore likely to represent an increased hazard in the vicinity of schools, hospitals, retirement homes and sheltered housing. It will be particularly important around these sites to eliminate tripping hazards.

All structural footway maintenance should make increased use of recycled aggregates to reduce the need for quarrying primary aggregates and will increasingly recycle in-situ to reduce transport and hence CO_2 emissions. Reasons to the contrary should demonstrably outweigh the benefits of this practice.

Finally, all new infrastructure and services must comply with the Disability Discrimination Act (DDA) and maintenance of existing infrastructure and services

should ensure the delivery of access for the disabled through the following measures:

- Implementing, as part of structural maintenance works, dropped kerbs and accessible crossing points, especially on core walking routes and other footways in the vicinity of GP surgeries, hospitals, residential care and nursing homes, sheltered housing and community facilities
- Prioritising tripping hazards in the vicinity of hospitals, GP surgeries, nursing homes and residential care homes, sheltered housing, and community facilities.

2.11 Public Rights of Way

Maintenance regimes need to promote the ease of use of the Public Rights of Way network. Standard cutting programmes will be carried out on an annual basis in addition to reactive maintenance. In addition to asset condition, priority for action will be where Public Rights of Way comprise parts of the Core Walking or Cycling routes, or the council's Greengrid network.

2.12 Structures

Priority for the bridge strengthening programme should be given to those bridges in need of strengthening that are on Economically Important Routes. Further prioritisation for strengthening, if required, can be given to bridges serving freight facilities and with large proportions of Heavy Goods Vehicles. Bridges that require structural maintenance based on condition surveys *and* which need strengthening should be given extra priority in the interests of value for money.

Retaining walls and embankments will be improved where condition is poor and where their collapse would cause a hazard or severe disruption to the transport network. Prioritisation of these works will take into account whether any impact will be on Economically Important Routes (**Map 3, Appendix C**) or inter-urban bus routes. Economically Important Routes typically have high traffic flows and any substantive defect is therefore likely to have an adverse impact on a greater number of vehicles as well as the economic competitiveness and productivity of Thurrock. The safety inspection regime will need to give special consideration to Economically Important Routes and strategic routes, as well as main distributor roads.

2.13 Signage

Ensuring that new signage can withstand higher wind speeds will be a priority on Economically Important Routes, as well as strategic routes and main distributor roads. There will also be a need to consider whether signs are no longer needed and this should be carried out as part of the maintenance inspection regime. Such an approach will help to reduce signage clutter and improve the streetscene, as well as reduce future maintenance costs.

This will be a priority in:

- 20mph zones where the risk will be lower and where streetscene improvements are an integral part of the implementation
- Rural areas where there is a need to reduce their urbanisation
- Key regeneration areas of the Thurrock Urban Area such as Grays town centre, Lakeside and the riverside.

2.14 Verges and Trees

Highway verges and the wider 'soft estate' have implications for conservation and biodiversity. Management of these areas requires specialist advice. A balance needs to be sought between safety, amenity, nature conservation and value for money.

All verges should be maintained in an appropriate environmental manner, particularly in respect of nature conservation value. The maintenance approach should be based upon the following principles:

- Appropriate mowing (depending on flora/fauna present). This includes the timing of cutting operations on all verges to take account of the flowering and seeding of wild flower plant species
- No unnecessary inputs (herbicides etc.)
- Identified designated sites of nature conservation value or other biologically rich verges will be managed with an appropriate regime
- The need for some verges to undergo no routine cutting where this is a benefit to wildlife and its habitat
- Management of trees, including in urban areas, will take account of landscape and environmental considerations

The Thurrock Sustainability Team should be consulted before maintenance works to verges and trees are carried out, particularly in and around designated nature conservation sites (including landscape management plans and biodiversity action plans) or where it comprises part of Thurrock's Greengrid network (see **Map 5, Appendix C**). Where sites with national or international nature conservation designations are within or adjacent to the highway boundary, advice should also be sought from Natural England. Where they are adjacent to a Local Wildlife Site advice should also be sought from Essex Wildlife Trust.

Where there is a conflict between a clear need to preserve road safety and the need to preserve the natural habitats which exist within roadside verges, in terms of both plant and wildlife, the need to maintain safe visibility for all categories of road user will be accorded priority. However, care will need to be taken to avoid excessive visibility inviting higher traffic speeds, which in turn will compromise road safety. Safety is therefore likely to take priority only at visibility splays and other key parts of the network.

There will also be an increasing need to ensure that maintenance regimes can cope with the increased cutting of verges that may arise from an extended growing season as a result of climate change. One way that this will be achieved is by ensuring that new planting schemes are designed to cope with climate change, and

require minimal on-going maintenance. Where feasible, new planting should be both draught and flood resistant

2.15 Summary

The principles and priorities in this chapter will be reflected in the following chapters, such as through the frequencies of safety and service inspections, the acceptability of defects, the need to move towards additional service inspections, etc. The priorities will also ultimately be used to help determine annual programmes of work.

3 Defects and Safety Inspections

The Council undertakes a system of regular highway safety inspections of all its adopted highways in order to comply with its statutory duty to maintain highways in accordance with Section 41 of the Highways Act 1980, and to provide a special defence under Section 58 of the Act (see **Section 1.2.1**). This allows the Council to provide defence against actions brought by third parties for damages resulting from failure to maintain the highway provided there is an efficient and effective highway inspection regime and that thorough and detailed inspection records are kept plus that there is a reasonable system for repair and maintenance.

Safety inspections are designed to identify all defects likely to create danger or serious inconvenience to users of the network or the wider community. The risk of danger is identified by a highways inspector on site, and the defect categorised in terms of an appropriate priority response. The establishment of an effective regime of inspection, assessment and recording is a key component of highway maintenance. This regime also provides the basic condition data for the development of maintenance programmes.

An effective safety inspection regime has clearly defined:

- Inspection frequencies
- Items to be recorded
- Degree of defect
- Assessment of risk
- Nature of response

These will be covered in turn in the following sections.

3.1 Inspection Frequency

The frequency of safety inspection relates to the relative importance of the feature and the category or function of road. Some additional ad hoc inspections of specific defects will be required in response to reports or complaints from the Police, other organisations and the public, as a result of minor incidents or extreme weather conditions. Wherever possible, different types of inspections (safety and service inspections for example) will be carried out simultaneously. To support this aim, the Council will develop an area-based approach to inspections.

The following tables generally show a range of inspection frequencies. The lower end frequencies are the absolute minimum frequencies at which safety inspections should be carried out. This lower end of the frequency range defines a minimum level of service and aims to satisfy basic safety requirements: It is imperative that this level of frequency is met. It will be noticed that the inspection frequency never drops to less than annual. The higher end of the range represents the level of frequency the Council would like to achieve, if the resources were available, in order

to keep on top of defects to, or deficiencies in, the highway network for reasons relating more to serviceability, customer satisfaction and sustainability.

It will be noticed in the following tables that the inspection frequency also varies according to the characteristics of that part of the highway network. This can be determined by factors such as the function of the road or the policy context.

3.1.1 Carriageways

The frequency of safety inspections on carriageways shall be carried out in accordance with **Figure 2** below.

Figure 2: Minimum frequency of safety inspections on carriageways

Description	Category	Frequency of inspection
Level 1 routes – Strategic non-trunk roads, Economically Important Routes and inter-urban bus routes	2	6 times per annum
Level 1 routes - Main distributor roads	3(a)	6 times per annum
Level 1 routes - Secondary distributor roads	3(b)	6 times per annum
Level 2 routes - Link roads	4(a)	2 times per annum
Level 3 routes - Local access roads	4(b)	Once per annum

3.1.2 Cycleways/ core cycle routes

The frequency of safety inspections on cycleways shall be carried out in accordance with **Figure 3** below.

Figure 3: Minimum frequency of safety inspections on cycleways

Description	Category	Frequency of inspection
On carriageway cycleways	A	As for carriageways, with the exception that all implemented core cycle routes in the Thurrock Urban Area[2] will be inspected at least 2 times per annum
Implemented core cycle routes that are remote from carriageway within the Thurrock Urban Area	B	2 times per annum
All other cycleways that are remote from carriageway outside Thurrock Urban Area		Once per annum
Cycle trails	C	Once per annum

[2] The Thurrock Urban Area is defined as between the A13 and the River Thames north to south and between Chadwell St Mary/ Tilbury and Purfleet east to west.

3.1.3 Footways

The frequency of safety inspections on footways shall be carried out in accordance with **Figure 4** below.

Figure 4: Minimum frequency of safety inspections on footways

Description	Category	Frequency of inspection
Primary walking routes/ implemented core walking routes and core cycling routes that use footways	1	6 times per annum
Secondary walking routes	2	2 times per annum
Link footway	3	Once per annum
Local access footway	4	Once per annum

For **Figure 2 to 4**, additional safety inspections shall be carried out in response to:

- Reports or complaints from Essex Police and other organisations
- Community concern, namely reports or complaints from members of the public
- Minor incidents
- Extreme weather conditions

All claims, incident data and Road Traffic Accident data should be used to aid the decision making process on inspection frequencies to improve targeting of resources.

Furthermore, inspection frequencies may be increased on certain routes if there is a demonstrable need. This could apply to the following types of routes:

- Access routes (carriageway, cycle routes and footways) to hospitals/ schools
- Winter service routes
- Bus routes under route specific Quality Bus Partnerships or similar partnership agreements

3.2 Investigatory Levels and Risk Identification

Highway defects will be managed on the basis of risk. Any potential defect for which the investigatory level is reached or exceeded is to be identified as a risk that needs to be investigated further. The list of highway inventory to be observed for possible defects and the defect investigatory levels are shown in **Figure 5**.

Figure 5: Investigatory Levels

Item number	Highway description	Defect	Investigatory level
1	Carriageways over 20mph (20mph or under in parentheses). Includes on/ over	Pothole/ spiralling	50mm depth (60mm depth) 75mm across in any horizontal direction

Item number	Highway description	Defect	Investigatory level
	structures): • Central island • Central reservation • Hard shoulder • Crossover (central reserve) • Lay-by	Ridge, rutting, hump	50mm (60mm)
		Depression/ sunken cover	50mm (60mm)
		Gap/ crack	50mm depth (60mm) >20mm width
2	Cycle routes (including on/ over structures) Includes: • Kerbs • Edgings • Channels • Verge	Pothole/ spiralling	20mm depth (75mm across in any horizontal direction)
		Ridge, rutting, hump	20mm
		Depression/ sunken cover	20mm
		Gap/ crack	20mm depth (>20mm width)
3	Footways[3] – core walking/ primary walking routes (including on structures, and ramps/ stairs on structures) Includes: • Kerbs • Edgings • Channels • Verge	Trip/ pothole/ sunken cover	15mm depth (75mm across in any horizontal direction)
		Rocking slab/ block	15mm vertical movement
		Open joint	15mm depth (100mm x 50mm horizontally)
4	Footways – others (including on structures, and ramps/ stairs on structures) Includes: See 3 above	Trip/ pothole/ sunken cover	20mm depth (75mm across in any horizontal direction)
		Rocking slab/ block	20mm vertical movement
		Open joint	20mm depth (100mm x 50mm horizontally)
5	Kerbs (including on structures)	Misaligned/ chipped/ cracked	50mm horizontally
		Loose/ rocking	20mm vertically
		Missing	Defect present or not
6	Verges	Sunken area adjacent to and running parallel with carriageway edge	Depth 150mm

[3] This category will also include footways in the vicinity of GPs, hospitals and nursing/ residential care homes, and around community facilities

Item number	Highway description	Defect	Investigatory level
		Sunken area adjacent to and running parallel with footway edge	Depth 100mm
7	Iron works Includes: • Manholes • Catchpit • Gullies • Kerb outlet • Utilities covers and frames	Gaps within framework (other than designed by manufacturer)	50mm carriageway 20mm footway 20mm cycle route
		Level difference within framework	20mm
		Rocking covers	20mm vertical movement
		Cracked/ broken covers	Defect present or not
		Worn/ polished covers	Defect present or not
		Missing covers	Defect present or not
8	Flooding (including structures)	Standing water 2.5 hours after rainfall ceased, 1.5m from edge of carriageway	Defect present or not
		Substantial running water across carriageway likely to adversely affect the safety of highway users	Defect present or not
		Substantial running water across footway likely to adversely affect the safety of highway users	Defect present or not
		Property inundation	Defect present or not
9	Drainage Includes: • Culvert • Highway ditch Filter drain • Grip • Gully • Piped grip / kerb offlet	Substantial standing water adjacent to edge of carriageway likely to adversely affect the safety of highway users	Defect present or not
		Blocked gully (silted above outlet)	Defect present or not
		Collapsed/ blocked/ settled items or systems	Defect present or not
10	Road markings	Faded or worn markings	70% of surface area or less remains

Item number	Highway description	Defect	Investigatory level
			effective
11	Road studs	Missing and hole left in carriageway	Defect present or not
		Displaced item on carriageway	Defect present or not
		Defective item	Defect present or not
12	Signs/ bollards/ lights/ traffic signals Includes: • Signs • Bollards • Illuminated signs • Pedestrian crossing lights • Lighting columns • Wall mounted street lighting • All other lighting units • Traffic signals • Traffic signal installation • Traffic signal furniture	Damaged or misaligned item causing a hazard	Defect present or not
		Missing item causing hazard	Defect present or not
		Lights/ signals not operating	Defect present or not
		Correctly/ malfunctioning signals pointing the wrong way	Defect present or not
		Signal lamp failure	Defect present or not
		Exposed wiring or damage which could result in cables exposed	Defect present or not
		Missing door to lamp column	Defect present or not
		Item missing	Defect present or not
		Item obscured/ dirty/ faded	Defect present or not
13	Safety fencing and barriers Includes: • Fences and barriers • Pedestrian guardrails • Safety fencing • Boundary walls and fences	Item damaged or misaligned causing a hazard	Defect present or not
		Unstable item or section	Defect present or not
14	Hedges and trees	Unstable tree causing danger of collapse onto highway	Defect present or not
		Overhanging tree leading to loss of height clearance over carriageway, footway or cycle way	<2.1m over footways <2.4m over cycle ways <5.1m over carriageways

Item number	Highway description	Defect	Investigatory level
15	Highways general	Street furniture missing/ damaged likely to cause a hazard	Defect present or not
		Oil/ debris/ mud/ stones and gravel likely to cause a hazard	Defect present or not
		Obstructions in the highway	Defect present or not
		Obstructed sight lines	Defect present or not
		Ramps in carriageway to aid vehicular movement	Defect present or not
		Footway damage caused by vehicular access where no vehicle crossing	Defect present or not
		Scaffolding likely to cause a hazard	Defect present or not
		Skips likely to cause a hazard	Defect present or not
		Unprotected building materials on the highway	Defect present or not
		Abandoned vehicles likely to cause a hazard	Defect present or not
16	Other dangers to the public	Anything else considered dangerous	Dangerous item present or not
17	Carriageways and cycleways over/ on structures (see also 1 and 2 above)	Surface slippery	Defect present or not
		Failure of carriageway/ cycle way joints	Presence of loose materials/ bolts and so on that potentially could become dangerous missiles
		Subsidence of carriageway/ cycleway adjacent to structure	Defect present or not
18	Flooding regarding structures (see also 8 above)	Blockage of waterway resulting in flooding of adjacent properties or ground	Defect present or not
		Flooded subways following pump failure/drain blockages	Defect present or not

Item number	Highway description	Defect	Investigatory level
19	Parapets on structures	Displaced, and missing components through damage and theft – rail, mesh, posts, bolts, and so on.	Defect present or not
20	Vandalism of structures	Deliberate damage, offensive graffiti, or fire damage	Defect present or not
21	Deterioration damage to bridge structures	Concrete, bricks and other material fallen from structure	Defect present or not
		Water leakage from structure	Defect present or not
22	Bridge strikes: Superstructure (Bridge deck impacts) Substructure (Pier & column impacts)	Damage	Defect present or not
23	Bridge signs: Weight restrictions Low clearances Width restrictions	Missing, damaged or obscured	Defect present or not

With regard to defects specified in the above table, particularly those covered under the "highway general" heading, many are the responsibility of individuals or organisations and not the highway authority. If urgent action is required the inspector shall take the necessary steps required to make the defect safe and shall then pass on the relevant information to the section or department or organisation which is responsible for overseeing that particular activity.

3.3 Risk Management

Once a defect has been identified and recorded, the risk it presents needs to be established. This document is for guidance only and the risks contained in the register are based on the highest assumed risk attributable to the type of defect, position and assessed type of usage. Local knowledge could assess the risk differently. The position of the defect on the carriageway is also of significance and will inform the assessment. Furthermore, it should be remembered that ultimately priorities outlined in **Chapter 2** will influence the programming of defects for remedial action.

Nevertheless, the basic principles for risk impact and probability in the register are:

- The greater the extent of the defect, the greater the impact
- The greater the traffic flow, the higher the probability

Clearly other factors, such as traffic speed, will have a key bearing on any assessment of the severity of the impact. Similarly, other factors will bear on the probability, such as the location on the highway of the defect. The training of inspectors and their expert judgement will be critical during this phase of the work.

The impact of a risk should it become an incident will be quantified on a scale of 1 to 4 as follows:

- Little or negligible impact
- Minor or low impact
- Noticeable impact
- Major, high or serious impact

The probability of a risk occurring will be quantified on a scale of 1 to 4 as follows:

- Very low
- Low
- Medium
- High

The risk factor for a particular risk will be based on the product of the risk impact and the risk probability, as shown in **Figure 6**.

Figure 6: Risk Assessment

Impact	**Probability**			
	Very low (1)	**Low (2)**	**Medium (3)**	**High (4)**
Little or negligible (1)	1	2	3	4
Minor or low (2)	2	4	6	8
Noticeable (3)	3	6	9	12
High (4)	4	8	12	16
Response category	Review condition at next inspection	2(Low Priority)	2(Potholes) & 2(High Priority)	1

As shown in **Figure 7**, defects are defined in two categories:

- Category 1 – those that require urgent or prompt attention because they represent an immediate or imminent hazard or because there is a risk of short-term structural deterioration, including potholes greater than 50mm in depth.

  Category 1 defects should be repaired/ made safe at the time of inspection, if reasonably practicable. In this context, making safe may constitute displaying warning notices, or using cones or barriers to protect the public from the defect. If it is not possible to correct or make the defect safe at the time of inspection, temporary or permanent repairs should be undertaken within 2 working days, but not more than 72 hours. The timescale for carrying out the

permanent repair will be dependent upon the status of the defect following completion of the temporary repair.

Where defects with potentially serious consequences for network safety are made safe by means of temporary signing or repair, a special inspection regime should be implemented to ensure that the signing or repair is maintained until a permanent repair can be undertaken.

- Category 2 – all other defects, and are really mostly about serviceability and so generally fit into programmes or less urgent repair, including certain potholes less than 50mm in depth. These defects have been sub-divided into categories of Potholes, High Priority and Low Priority.
    - Category 2 (Potholes) – these are potholes less than 50mm deep that are expected to become Category 1 within 3 months, if not repaired. The target is to complete a permanent repair within 90 days.
    - Category 2 (High Priority) – these are defects that are expected to become Category 1 within 3 months, if not repaired. The target is to complete a permanent repair within 90 days.
    - Category 2 (Low Priority) – these are defects that are expected to become Category 1 within 12 months, if not repaired. Repair of these defects is to be undertaken as resources become available, or be included within a planned maintenance programme.

Figure 7: Response Times[4]

Risk factor category	Response time
Category 1	Make safe or repair within 72 hours
Category 2(Potholes)	Repair within 90 days
Category 2(High Priority)	Repair within 90 days
Category 2(Low Priority)	Repair as resources become available, or include within a planned maintenance programme, or schedule more detailed inspection, or review condition at next inspection

The register incorporates defects which may not be the responsibility of the highway authority such as utility trench reinstatements and iron works, as well as hazards caused by third parties such as obstructions in the highway or dangerous scaffolding. Although the inspector must ensure that all relevant information is notified directly to the third party concerned or to the appropriate person or section dealing with the matter, they must also satisfy themselves that the authority's obligations in respect of duty of care are fully met. This means that when such hazards are deemed dangerous, the inspector or maintenance engineer must ensure that the site is made safe within the required time by the council or its contractors.

The reactive maintenance regime for street lighting faults differs to the response times shown in **Figure 7** above, and should generally follow the guidance provided in *Well Lit Highways*, the relevant Code of Practice. For Thurrock, the standard will be that faults shall be attended to and repaired within seven days unless otherwise agreed with the Area Lighting Engineer. Typical standard response times will be:

- Emergency fault/ Road Traffic Accident – 2 hours
- Non-emergency faults requiring the replacement of mandatory traffic signs, illuminated traffic bollards, belisha beacons, and school flashing warning signs including those made safe as emergency faults – 24 hours
- Non-emergency faults requiring the removal from apparatus of any offensive and/or racist graffiti – 24 hours
- Unlit street light, removal of other graffiti or apparatus, non-emergency faults requiring the replacement of complete unit of apparatus or components of the apparatus, – 7 days

4 Condition, Service Inspections and Standards

Many of the defects identified by safety inspections are rated as category 2, and so primarily about serviceability rather than considered dangerous. These are then programmed accordingly. Other maintenance works that get programmed arise out of service inspections or condition surveys.

[4] Street lighting may differ

Well Maintained Highways recommends a move toward proactive service inspections rather than just simply safety inspections. The purpose being to intervene earlier at a point in the asset deterioration cycle such that overall the intervention is better value for money; a stitch in time saves nine.

Whether or not to carry out service inspections, and the extent of those inspections, is entirely discretionary. Thurrock Council intends only to carry out or move towards service inspections where there is a clear value for money benefit. Currently, service inspections or condition surveys are carried out for carriageways, footways, bridges, Public Rights of Way, street lighting and verges only. The aim is to extend this approach to drainage, as outlined in **Section 4.6**.

4.1 Carriageways and Footways

The most significant financial investments in highway maintenance are the repairing, reconditioning and reconstruction of highway pavements, in particular those of carriageways. Condition surveys identify the current condition of the network and from this both long-term and short-term maintenance funding decisions can be made. Repeatable machine surveys allow trend analysis to be used to confirm the original decisions, assess rates of deterioration and allow for changes to be made in strategy and approach as a result of the changing network condition. Condition data is not a replacement for sound engineering knowledge, but simply an enhancement to it

The Council is committed to targeting maintenance in order to maximise resources, and the results of the surveys provide valuable information about surface and structural condition which highlights the areas of greatest need. Results from condition surveys enable:

- Sections of carriageway/footway that require further or detailed investigations to be identified with a view to implementing remedial maintenance measures
- Engineers to use the information to support their local maintenance planning process and engineering knowledge
- Data to be used in higher level decision making such as budget setting.

The Council aims to carry out condition surveys on the network, as shown in **Figure 8**. The survey methods currently used include:

- Coarse visual inspections (CVI)
- Detailed visual inspections (DVI)
- Skidding resistance survey (Scrim)
- Machine-based surface condition surveys (SCANNER)
- National Road Maintenance Condition Survey (NRMCS)

The frequency may vary depending on available resources, which will be determined annually. Ideally, survey should be carried out at the higher end of the frequency range. Surveys at the lower end of the frequency range should not be continued for long as it may result in higher costs in the long term as required structural works may not get programmed in a timely way.

Figure 8: Condition surveys

Asset	Survey method	Coverage	Frequency	Data used for
Principal carriageways	Scrim	50-100%	Annually, so 100% every 1-2 years. Also as informed by skidding accidents	Identifying sites where skidding resistance is below a defined level (see **Figure 9**)
Principal carriageways	CVI, Scanner	50-100% for each method	Annually, so 100% every1-2 years	Identifying sites for potential maintenance funding needs
B and C carriageways	CVI, Scanner	50-100% for each method	Annually, so 100% every1-2 years	Identifying sites for potential maintenance funding needs
Unclassified carriageways that are part of implemented core cycle routes	CVI	33-50%	Annually, so 100% every 2/3 years	Identifying sites for potential maintenance funding needs
Other unclassified carriageways	CVI	33%	Annually, so 100% coverage every 3 years	Identifying sites for potential maintenance funding needs
Classified network	NRMCS	Various sites	Annually	Identifying sites for potential maintenance funding needs
Category 1 and 2 footways (see **Figure 4**)	DVI	33-50%	Annually, so 100% every 2/3 years	Identifying sites for potential maintenance funding needs

For the purposes of assessing skid resistance on the council's road network, the investigatory levels set out in the *Design Manual for Roads and Bridges: HD28/04 Skid Resistance* will be applied, see **Figure 9** which has been replicated from that document.

Figure 9: Skid Resistance

Description	Investigatory level at 50km/h					
	0.30	0.35	0.40	0.45	0.50	0.55
Dual carriageway						
Single carriageway						
Approaches to and across minor and major junctions, approaches to roundabouts						
Approaches to pedestrian crossings and other high risk situations						
Roundabout						
Gradient 5-10% longer than 50m						
Gradient >10% longer than 50m						
Bend radius <500m – dual carriageway						
Bend radius <500m – single carriageway						

The darker shading indicates the range of investigatory level that will be used for roads carrying significant traffic levels, as suggested in the Design Manual for Roads and Bridges. In addition, for Thurrock the dark shading investigatory level will be used for the following parts of the network:

- Economically Important Routes
- Implemented core cycle routes
- In the vicinity of schools

The light shading indicates a lower investigatory level that will be appropriate in lower risk situations, such as low traffic levels or where the risks present are well mitigated and a low incidence of accidents has been observed. Exceptionally, a higher or lower investigatory level may be assigned if justified by the observed accident record and local risk assessment.

4.2 Lighting

Lighting systems will be subject to a process of preventative maintenance carried out on a cyclical basis to help reduce or eliminate failures and to ensure the system is operating at its intended design outputs. Cyclic maintenance is the main tool in the management of preventative maintenance, forestalling poor performance and failure of the installation. A well-designed cyclic maintenance programme will help to prevent the performance of the installation falling below the designed level; will identify any mechanical, structural, electrical or optical work necessary to maintain or increase the life of the installation; reduce the incidence of faults by preventative maintenance; and check that the installation is safe.

The four main areas for cyclical maintenance are:

- Programmed electrical inspection and testing. This covers all aspects of testing public lighting equipment and the associated cabling

- Programmed structural inspections and testing. This covers visual inspections of non-metallic columns, signs and bollards, and the non-destructive testing of steel columns. The data is used to inform replacement plans and the next programme of testing
- Programmed group lamp replacement and cleaning. The approaches to bulbs are either to replace them when they fail (burn to extinction) or carry out group lamp replacement ("bulk clean and change"), under which all lamps of a particular type in a particular area or street are replaced (and the luminaires, photocells etc. cleaned) at the same pre-defined time. It has traditionally been accepted that group lamp replacement is the most cost effective approach
- Programmed painting

Figure 10: Lighting surveys

Type of maintenance	Frequency
Electrical testing	Every six years
Structural – visual inspections	Every three years
Structural – non-destructive testing of steel columns	Every six years
Bulk clean and change	To be carried out at the relevant burning hours/ time scale for the type of lamps in use, where funding allows
Painting	As required to maintain structural integrity of the column.

If there are insufficient resources for the above programme maintenance works, the bulk changing programme will be suspended and a reactive approach will be adopted. However, this will not apply to illuminated traffic signs and bollards. Due to the legal requirements for the illumination of certain traffic signs, the minimum service will be a bulk replacement for illuminated traffic signs and bollards. Furthermore, if funding permits, a limited programme of bulk replacements could be followed taking account of the need for lighting:

- Around crime hotspots
- In town centres
- Around car parks
- On inter-urban bus routes
- On Economically Important Routes
- On Core Walking and Cycling Routes
- Around other sensitive areas such as hospitals

Where a reactive maintenance approach is adopted, this should not be continued for too long as the costs will be higher in the longer term.

Cleaning, whether of street lights, bollards etc. will be carried out at the same time as bulk replacement. If reactive maintenance (burn to extinction), cleaning will be

carried out at replacement. Cleaning will also take place as a result of safety inspections and associated risk assessment.

Opportunities will be sought to reduce the lighting maintenance burden. In the short term, the Council will investigate lighting switch off between certain hours, such as midnight and 5am. This will reduce maintenance demands as the bulbs will last longer (other benefits include lower energy costs and reduced CO_2 emissions). It will also consider the cost benefits of using longer-life bulbs when undertaking group lamp replacement. In the medium term the Council will move towards lower energy lighting, such as LED bulbs, as the affordability becomes more attractive. These bulbs use 50%-90% less energy than conventional bulbs, therefore saving a similar amount of CO_2. Although more expensive at the outset, the payback period of LED bulbs is likely to be relatively short as the cost will be offset by on-going energy cost savings. Additionally, LED bulbs can last up to 12 years. This will significantly minimise the on-going maintenance costs of the street lighting and traffic signal programme.

4.3 Bridges

All bridges will have a general inspection every three years. Principal inspections will be undertaken on a needs basis, based on the outcome of the general inspections, with priority given to those bridges on primary and principal routes, especially Economically Important Routes, and other identified major bridges (such as where HGV flows are high).

All bridges requiring maintenance will be subject to a risk assessment before funding is allocated. Whilst priority will normally be given to improving and maintaining structures on Economically Important Routes and the Principal road network, funding will also be allocated on a needs approach. Old style post and rail parapets will be replaced as and when funding permits. Further detail is in the relevant Code of Practice.

4.4 Verges

The Figure below sets out the details of numbers of cuts per year assuming average growth rates. Limited additional cutting may be required at times of exceptional growth when road safety may become a factor.

Figure 11: Verge Maintenance

Location description	Standard of grass cutting
Urban areas: sections of road subject to speed limits of 30mph or less, and primarily at visibility splays, sight lines and traffic signs.	Full highway verge width – one cut a year. Additional cuts may be undertaken, based on risk assessments, when grass exceeds 150mm height. Particular consideration should be given to visibility splays, sight lines and traffic signs.
Rural verges: sections of road subject to	Full highway verge width – one cut a

Location description	Standard of grass cutting
speed limits greater than 30mph, and primarily at visibility splays, sight lines and traffic signs	year. Additional localised cutting may be undertaken where required for safety reasons. Particular consideration should be given to visibility splays, sight lines and traffic signs
Verges that are part of the Thurrock Greengrid network/ biodiversity action plans/ environmental management plans, or in/ adjacent to local/ national nature conservation designations	Single cut of first 1 metre swathe in the Spring plus other cuts at other times of the year timed to benefit particular plants, to encourage a diversity of grassland plants and prevent overgrowth of scrub. Other arrangements might be required to align with other environmental plans, including no routine cutting or just cutting in spring

4.5 Public Rights of Way

Maintenance of the Public Rights of Way network in Thurrock follows a proactive managed approach. The proactive inspection and maintenance programme covers 20% of the network each year on a rolling programme basis. Survey data assesses whether they are easy to use by members of the public. This approach ensures the identification of works for inclusion in scheduled works programmes. The programming of work is detailed in the *Rights of Way Improvement Plan*.

4.6 Drainage

Large swathes of Thurrock are in Flood Risk Zone 3. The need for good drainage in Flood Risk Zone 3 is important as there will be an increase in flood incidents. Floods cause inconvenience and safety issues, but also long term structural damage to the highway, potentially resulting in disproportionate costs overall. Given the vulnerability to flooding in Thurrock there is a need to move towards a more proactive inspection regime for drainage.

Drainage systems will be inspected in accordance with **Figure 12** below.

Figure 12: Drainage Service Inspection Regime

Drainage element	Frequency
Gullies, catchpits, interceptors, soakaways, manholes, kerb offlets, culverts less than 915mm diameter, piped drainage, grips, ditches and outfalls	Inspected, where practicable, with highway safety inspections. Maintained reactively to address highway drainage problems. Frequencies will vary, depending on susceptibility of location to flooding risk.

Ad hoc service inspections may be taken in the event of reports of flooding being received from the public or the emergency services.

4.7 Other parts of the highway

The following asset groups will not receive any form of proactive detailed service inspection but will be covered by the routine safety inspections and a reactive approach will be taken to rectifying problems:

- Embankments
- Trees and hedges
- Traffic signals[5]
- Road markings, signs, and road studs
- Safety fences

In the short to medium term, it is unlikely that such proactive service inspections will be affordable; especially as the value for money benefits seem more marginal. Some local highway authorities do currently carry out proactive maintenance practices, such as replacing all traffic signal bulbs every six months. However, some of these efforts, such as with the example given, could be considered both a poor use of resources and environmentally unsustainable.

[5] Bulk changes may be implemented at traffic signals in the vicinity when a light is being replaced in a signal in response to a defect or fault.

5 Winter Service

The Winter Service comprises operations to apply salt or other de-icing materials to the highway in anticipation of, or to assist in the removal of, snow or ice. This also includes the use of snow ploughs in the removal of snow.

The winter maintenance service covers the monitoring of weather conditions to determine when ice and/or snow are likely to affect the adopted public highway. If ice and/or snow are anticipated the service covers the application of de-icing materials to the identified roads to prevent ice forming. Where ice and/or snow have formed on the highway it also includes treating the identified roads to assist in making them safer to use.

It is important to note that due to funding availability and the level of specialist plant and staff that have to be maintained on standby for infrequent weather events it is not practicable to provide the service to all parts of the network and ensure/guarantee that all running surfaces are kept free from ice or snow including those parts of the network that receive treatment.

It is therefore important to prioritise routes for treatment, either for precautionary treatment or to treat actual ice or snow. Which routes get treated will depend on many factors, such as funding and the availability of salt. This is detailed in the Winter Maintenance Plan which is up-dated annually and operates in accordance with the latest Code of Practice.

Appendix A: Further Review of Highway Policy Guidance and Standards

This document will ultimately comprise Part 1 of Thurrock Council's comprehensive *Policy Guidance and Standards for Highway Maintenance and Network Management*. Part 2 will focus on highway network management, especially the operation and improvement of the highway, and is likely to include the following policy areas. Depending on level of detail required it may be necessary to produce a volume 2 and volume 3. In which case the higher priority items will form Volume 2 and the remainder will be prepared as a volume 3.

Primary Highway Management Area	Secondary Highway Management Area
Access restrictions	General vehicular access Heavy commercial vehicle access
Accident cluster sites	Site selection Accident score
Bus Lanes and Bus Gates	Permitted vehicles
Bus stops	Bus stop provision
Cycling facilities	Width standards Advance cycle stop lines
Drainage	Soakaways
Events on the highway	Temporary road closures Unauthorised encampments
Fencing and guard railing	Pedestrian guard railing Safety fencing
Gating orders	Legislation Criteria Review period
Highway charge	Charges Commuted Sums Costs of licences
Kerbing	Provision
Miscellaneous	Abandoned vehicles on the highway Banners across the highway Festive lights and decorations over the highway Memorials and floral tributes on the highway Mirrors on the highway Mud on the highway Pedestrian dropped kerbs Religious symbols on the highway Tables and chairs on the highway Trading on the highway Third party funding of highway features Unauthorised lay-bys

Primary Highway Management Area	Secondary Highway Management Area
	Vehicular accesses Vehicles advertised for sale on the highway
Oversail	Cranes Signs
Parking	Responsibility and objectives Waiting restrictions Access protection Designated parking bays Disabled parking bays Heavy commercial vehicles Verge Parking
Pedestrian crossings	Crossing type
Road adoptions	Adoption Inspections Parking controls Surety Industrial estate roads Making up of private streets
Road closures	Temporary road closures Alternative routes Stopping up of the highway
Road markings and studs	Standards Provision Studs Conservation areas
Safety Audit	Standard
School Crossing Patrols	Provision Remit Privately-funded School Crossing Patrols Criteria
Speed limits	Application of policy 20 mph speed limits Temporary speed limits
Street furniture	Bollards and marker posts Hanging baskets Planters, litter bins and seats
Street lighting	Provision of lighting
Traffic calming	Design Features
Traffic signs	Design Interactive signs School flashing amber lamps Sign posts Signing to business or retail premises Temporary direction signs to commercial

Primary Highway Management Area	Secondary Highway Management Area
	events Temporary direction signs to community events Temporary direction signs to new housing developments Tourist signing Unauthorised signs Warning signs
Traffic signals	Provision New installations
Traffic regulation orders	Procedure Private roads Temporary traffic orders
Trees on the highway	Planting on the highway New developments
Verges	Provision Planting

Appendix B: Glossary of Terms

Asset Management: A strategic approach that identifies the optimal allocation of resources for the management, operation, preservation and enhancement of infrastructure, to meet the needs of current and future customers

Authority: All forms of national and local authority having a responsibility for maintenance of the highway

Backlog: The work needed to arrest deterioration and restore the network to a pre-defined condition, which is then maintained at a steady state

Bridleway: A Public Right of Way open to all traffic except motorised vehicles and motorcycles

Byway: A Public Right of Way open to all traffic including motorists and motorcyclists

Carriageway: Facilities used by motor vehicles, motorcyclists and cyclists

Cycle Route: Collective term for all segregated facilities used by cyclists

Footway: Segregated surfaced facilities used by pedestrians which is immediately adjoining a carriageway

Footpath: A highway over which the public have a right of way on foot only – excludes motor vehicles, horses, carriages and cycles (meaning a type of Public

Highway: Collective term for publicly maintained facilities laid out for all types of user, and includes for the purpose of this document, roads and streets

Investigatory Level: The standard of asset condition below which the need for treatment should be considered

Maintenance Type: The nature of planned maintenance response, for example reactive, routine or programmed

Maintenance Category: The nature of maintenance work undertaken, for example, cleansing, patching, resurfacing etc.

Network Management: A plan that sets out how the network should be managed to meet the requirements of the Traffic Management Act and improve co-ordination between stakeholders in delivering works programmes

Programmed Maintenance: providing larger schemes primarily of resurfacing, reconditioning or reconstruction to a planned schedule

Public Right of Way (PROW): A way over which the public have a right to pass and re-pass. By convention excludes roads normally used by motor vehicles

Reactive Maintenance: Responding to inspections, complaints or emergencies

Regulatory Maintenance: Inspecting and regulating activities of others (much of this work will be undertaken by the Traffic Manager under the new statutory duty for network management)

Remote Footway: Segregated surfaced facility used by pedestrians not immediately adjoining a carriageway

Road: See highway

Routine Maintenance: Providing works or services to a regular consistent schedule, generally for cleaning and landscape maintenance

Safety Inspection: Inspections to identify all defects likely to create danger or serious inconvenience to users or the wider community

Service Inspection: Inspections to identify all defects likely to compromise serviceability

Service Request: Communication seeking information, inspection or maintenance activity

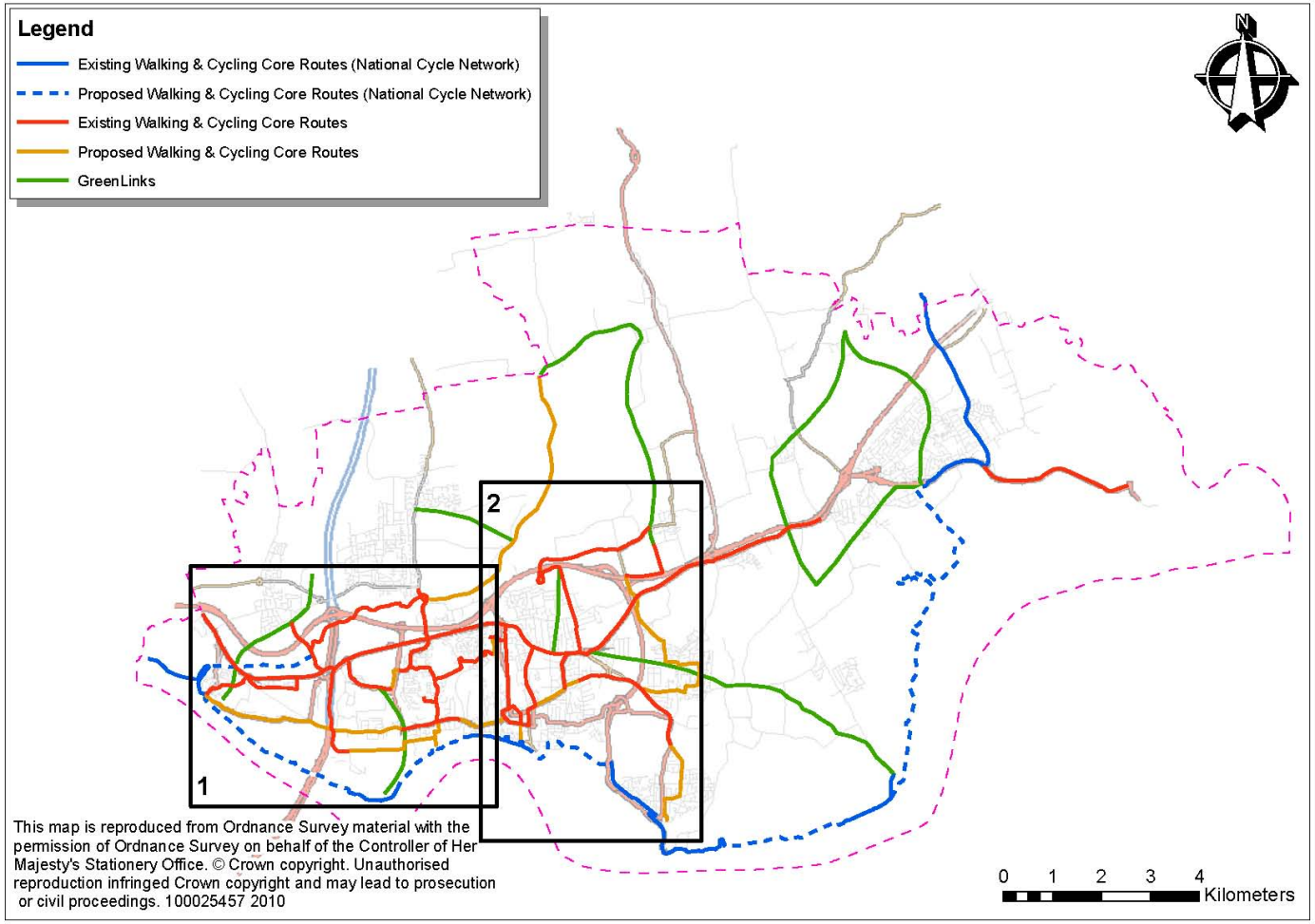
Street Lighting: A system of lighting illuminating streets, footways, footpaths, cycle tracks and pedestrian subways open to public access

Structural Condition: A number in the range 0 to 100 which defines the Index relative condition of the highway. Higher numbers reflect increasing deterioration

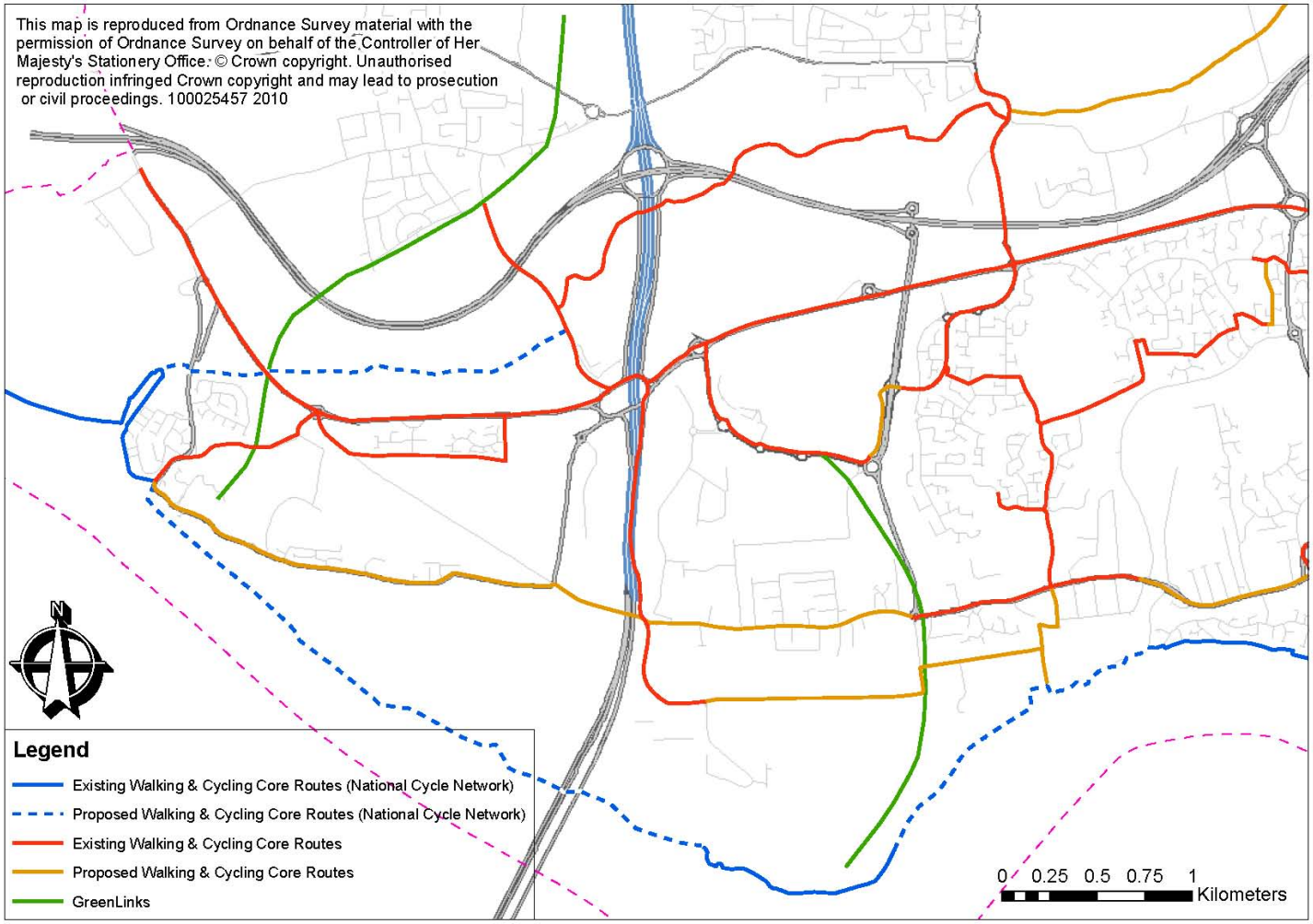
Winter Service or Winter Maintenance: Providing salting and clearance of snow and ice

Appendix C: Maps

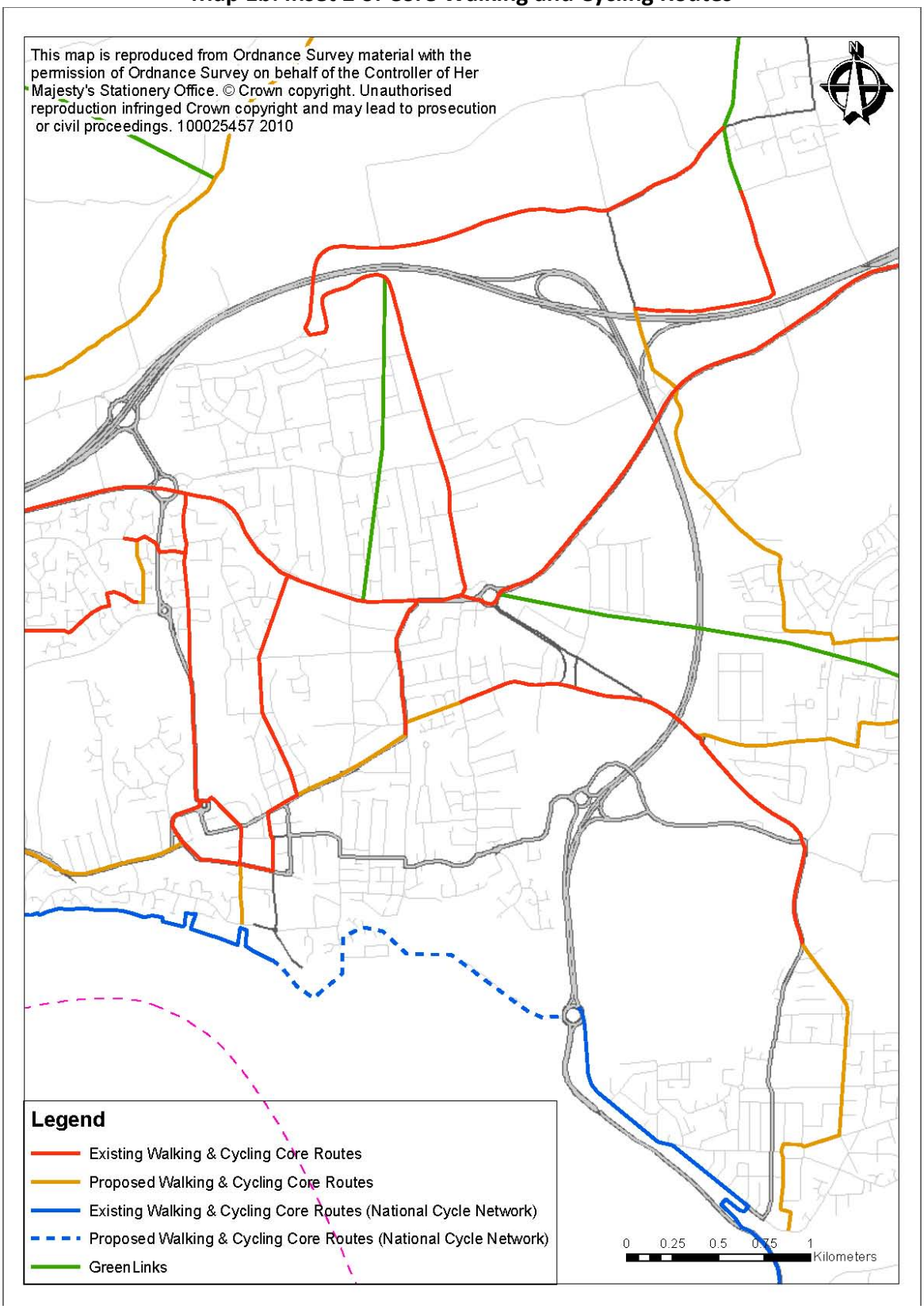
Map 1: Thurrock Core Walking and Cycling Routes



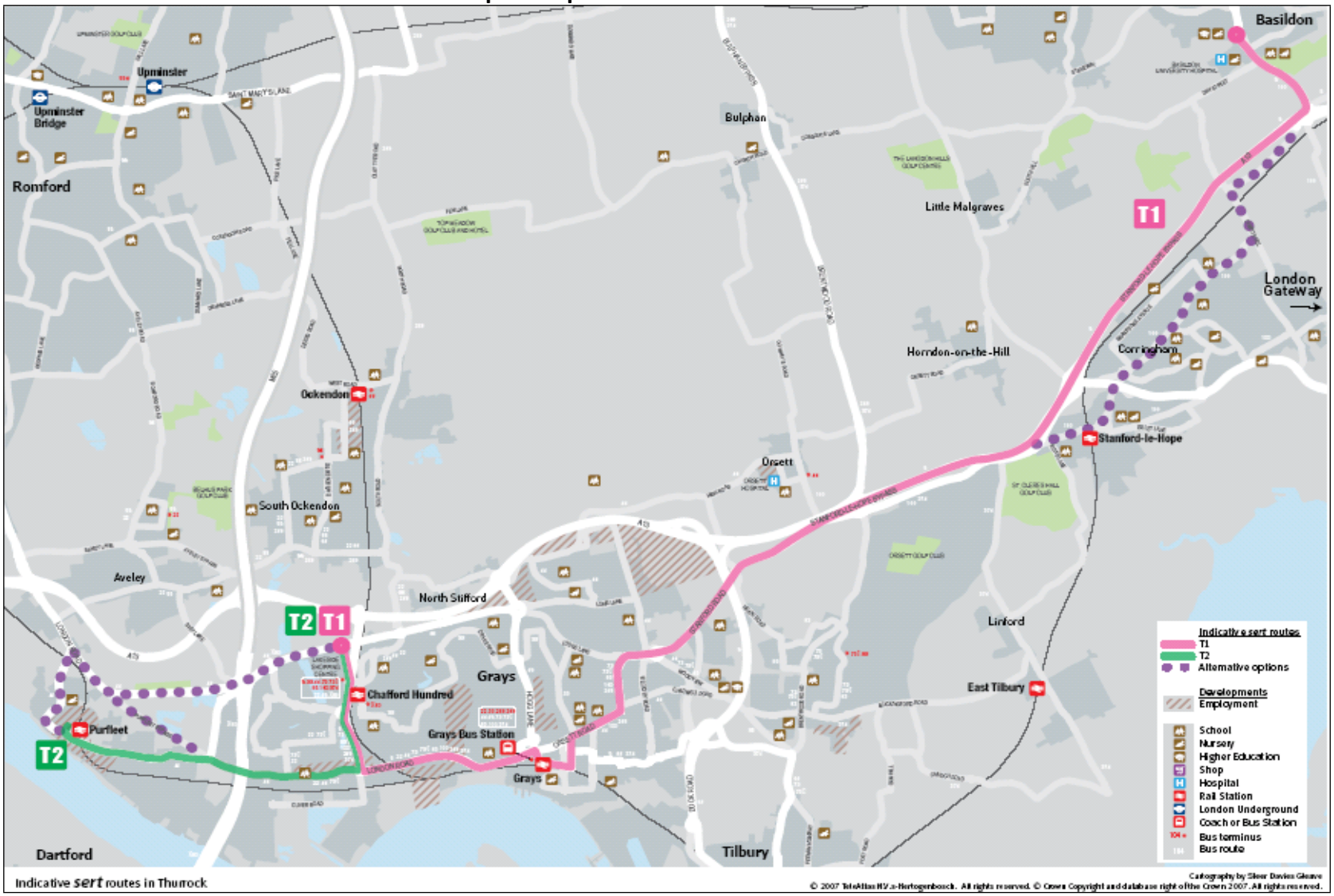
Map 1a: Inset 1 of Core Walking and Cycling Routes



Map 1b: Inset 2 of Core Walking and Cycling Routes

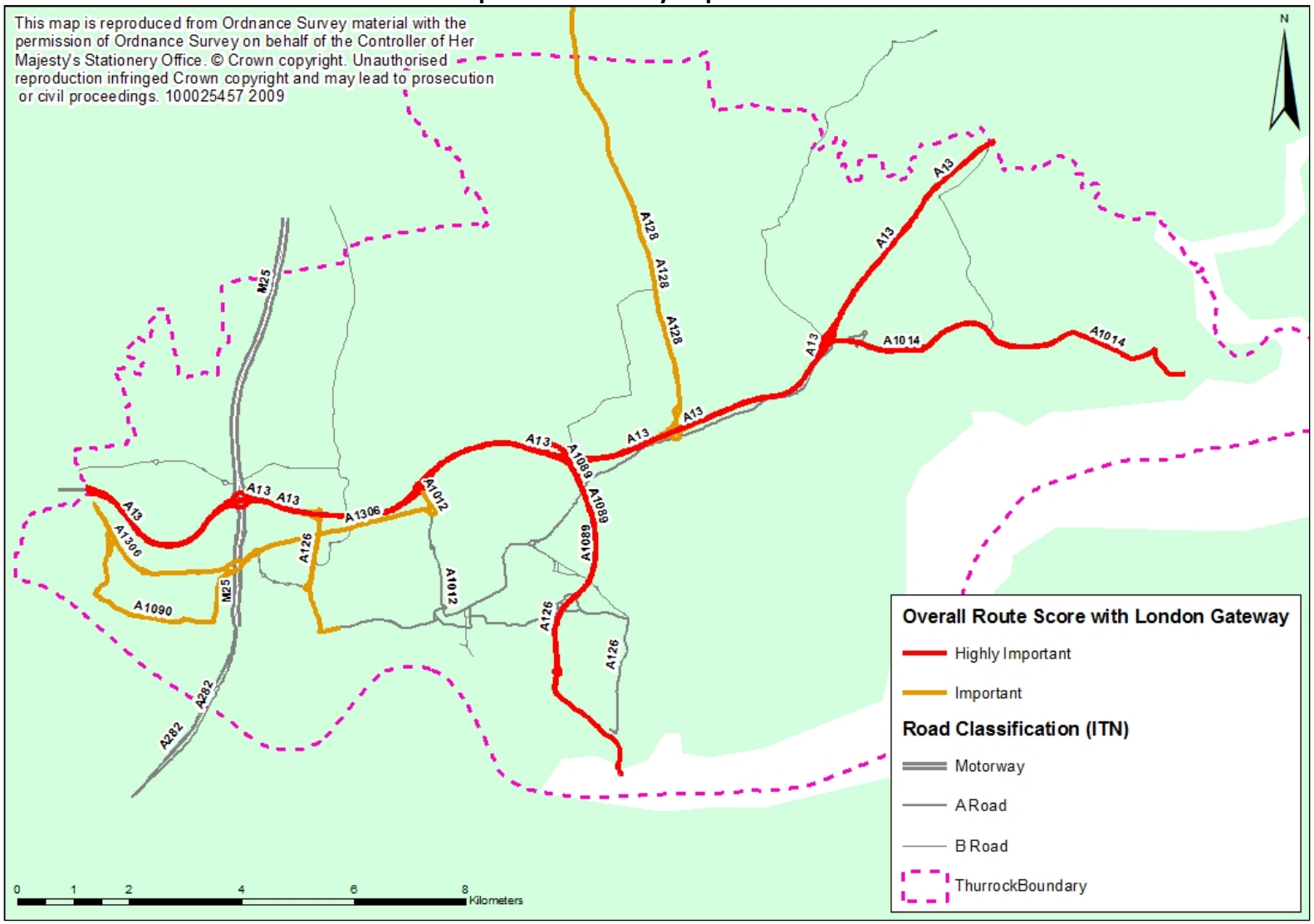


Map 2: Proposed SERT Route in Thurrock

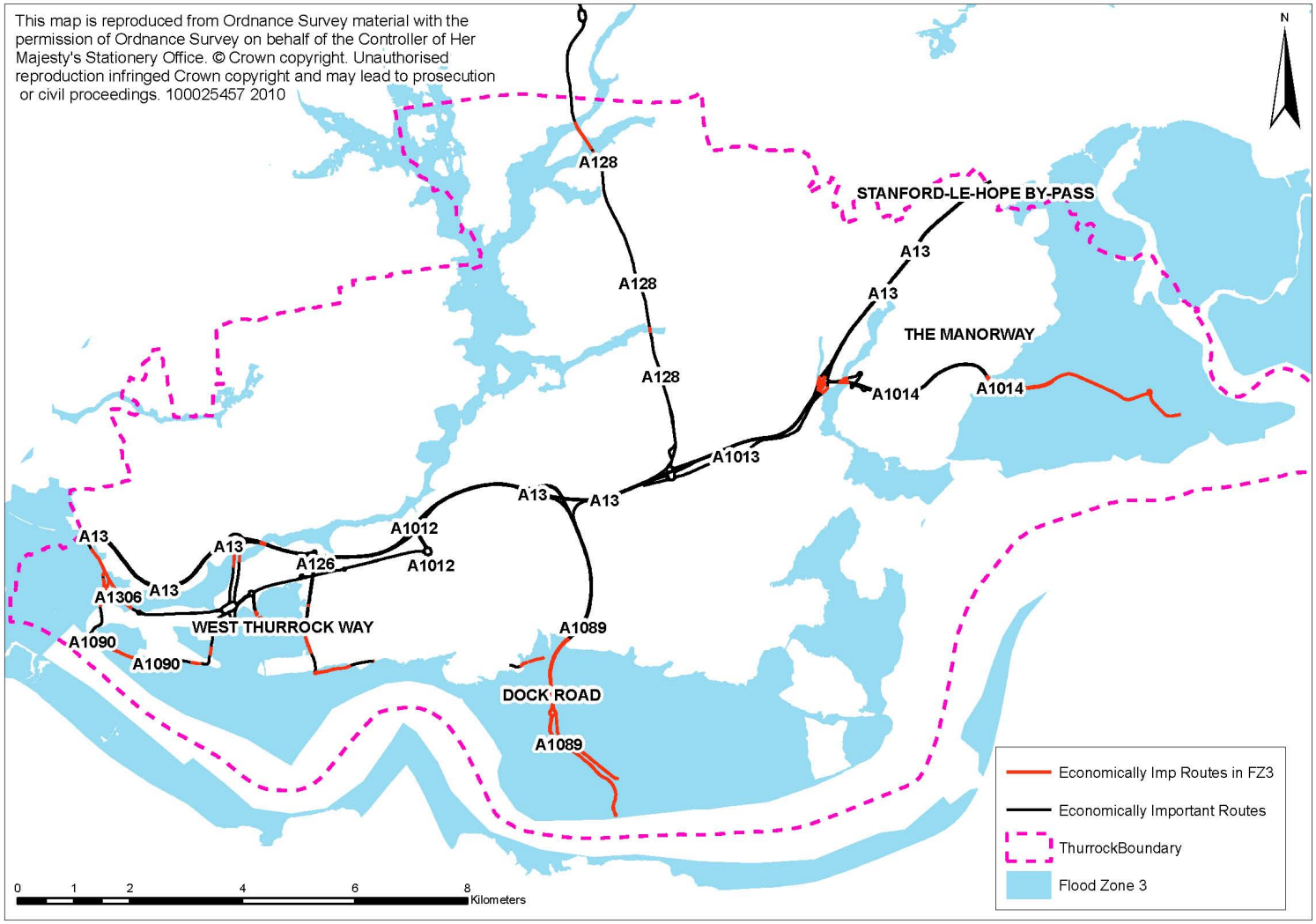


Source: South Essex Rapid Transport, http://www.sert.org.uk/area.asp

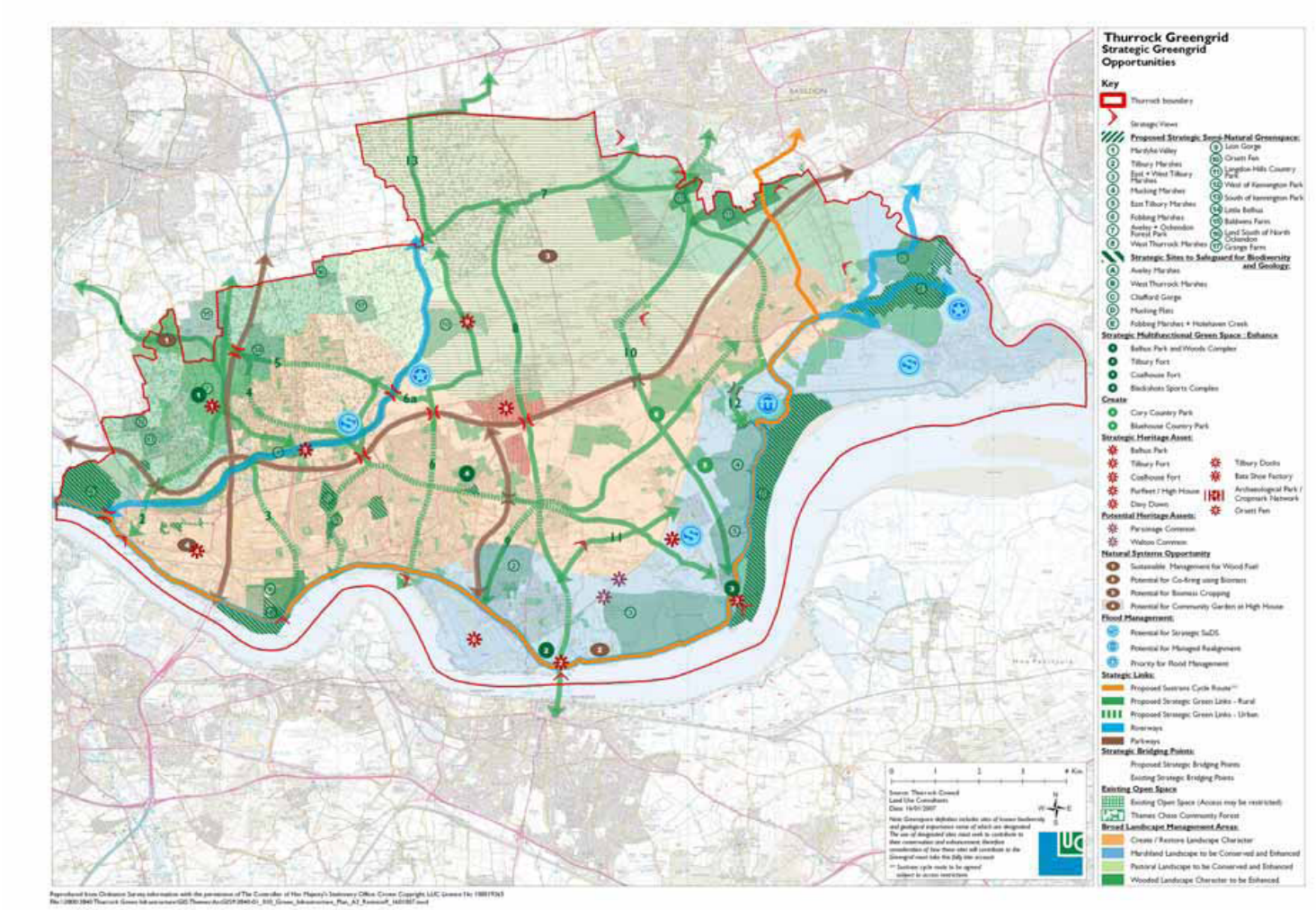
Map 3: Economically Important Routes



Map 4: Economically Important Routes within Flood Risk Zone 3

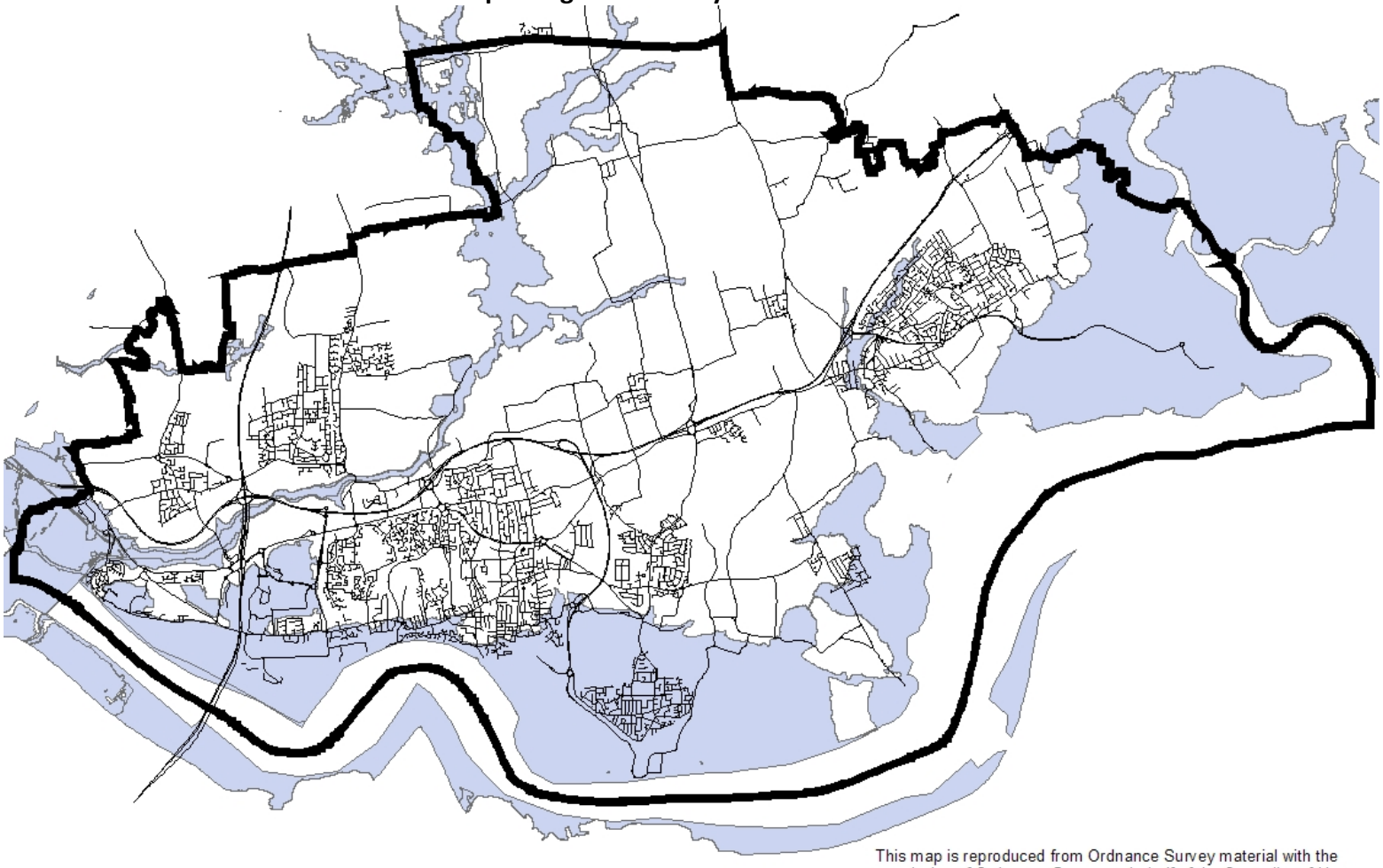


Map 5: Thurrock Greengrid Strategic Opportunities for Sustainable Drainage Systems



Source: Thurrock Council, Green Infrastructure Framework Plan

Map 6: High Probability Flood Risk Zone 3



Flood Risk Zone 3