Hertfordshire County Council Highways Tree Management Strategy

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Executive Summary

The Hertfordshire County Council Highway Service (hereafter referred to as Highways) is responsible for a large tree inventory of over 225,000 trees that provide visual amenity, health benefits, and ecosystem services. The benefits of the Highways tree stock have been assessed to have a total capital value to residents of Hertfordshire of over £1bn.

This Highway Tree Management Strategy is a supporting document to the Hertfordshire County Council Tree & Woodland Strategy and is designed to:

-Provide an overview of Highways tree assets.

-Detail the practical management considerations for Highways trees.

-Outline procedures to mitigate risks posed by trees.

-Provide guidance for stakeholders.

-Set ambitions for conserving and expanding the Highways tree stock.

This strategy applies to all trees under the ownership/management of Hertfordshire's Highways Service, as well as any privately-owned trees that pose an unreasonable risk[1] to the highway and its users.

This strategy also informs the planning and design of tree planting schemes for new and improved highways as set out in the Place & Movement Planning and Design Guide for Hertfordshire (P&MPDG), as well as other published guidance, such as BS5837-2012 and NJUG (Vol 4).

Introduction

Following on from the endorsement and implementation of the first highway tree strategy in 2013, Highways has continued to champion the environmental, cultural, aesthetic, and economic value of the highway tree stock. Highways prioritises tree management so as to better conserve the multiple benefits of urban trees.

Trees improve our air through removing pollutants, protect watercourses, reduce the urban heat island effect, save energy, improve physical and mental wellbeing, and provide biodiversity, habitat, and climate resilience functions. The climate crisis will have a significant negative impact on Hertfordshire's green infrastructure through increased heat, drought, and introduction of new tree pests and diseases. It is Highways' aim to manage

[1] Common Sense Risk Management of Trees (ntsgroup.org.uk)

the urban forest to secure the benefits trees provide for both present and future residents and visitors of Hertfordshire.
In doing this, Highways contributes to Hertfordshire County Council's visions for a cleaner greener environment for our residents and help them live healthy and fulfilling lives[2].

This revised strategy will lay out our sustainable tree management approach aiming to:

- Protect, improve, and expand the highway tree stock by setting ambitions which align with the Hertfordshire County Council's existing strategies, including the Hertfordshire County Council Corporate Plan 2022-2025, Hertfordshire County Council Tree and Woodland Strategy (including the Tree Resilience and Recovery Strategy for Hertfordshire), and Sustainable Hertfordshire Strategy.

- Act as a reference document for trees managed both directly by Highways and under agency agreement[3]

- Provide reference for developers alongside the Place and Movement Design Guide document.

This strategy will be reviewed annually by Highways arboricultural officers to capture minor changes, with a full review every five years to capture changes in legislation, policy, or best practice and ways of working.

Ambitions

Highways aims to conserve and expand the urban forest[4] and the ecosystem benefits they provide to create a cleaner and greener environment, promote healthy and fulfilling lives for residents, and contribute to sustainable and responsible growth throughout the county. We aim to do this through the following ambitions:

1. Increase the carbon storage potential of the Highways tree stock by preserving large trees on the highway network and plant species capable of growing to a large size in appropriate locations.

[2] Our County of Opportunity 2022-2025 (hertfordshire.gov.uk)
[3] Hertfordshire County Council has contractual agreements with several district councils whereby they undertake tree management on our behalf, including tree surveys and tree safety works. The trees are still the ultimate responsibility of Highways.
[4] What is the urban forest? - Forest Research

2. Increase the potential for air pollution removal and mitigation and rainwater interception by conserving existing canopy cover and planting trees in low canopy cover areas and areas of poor air quality.

3. Strive for an urban forest that is resilient to climate change and new pests and diseases by planting trees from a diverse range of genera.

4.Continue to proactively maintain and manage highways trees for the benefit of Hertfordshire's residents and boost the public image of urban trees.

Tree Stock Overview

Highway Tree Stock Overview

In total Highways are responsible for over 225,000 trees across built-up residential areas, high speed road verges, and the rural road network. Table 1 shows how these trees are spread across the districts. As the urban forest is a living asset, the true figure of trees under Highways management will be constantly changing.
The maintenance of these trees is principally managed by two mechanisms, directly by Highways or under agency agreement by District and Borough Councils.

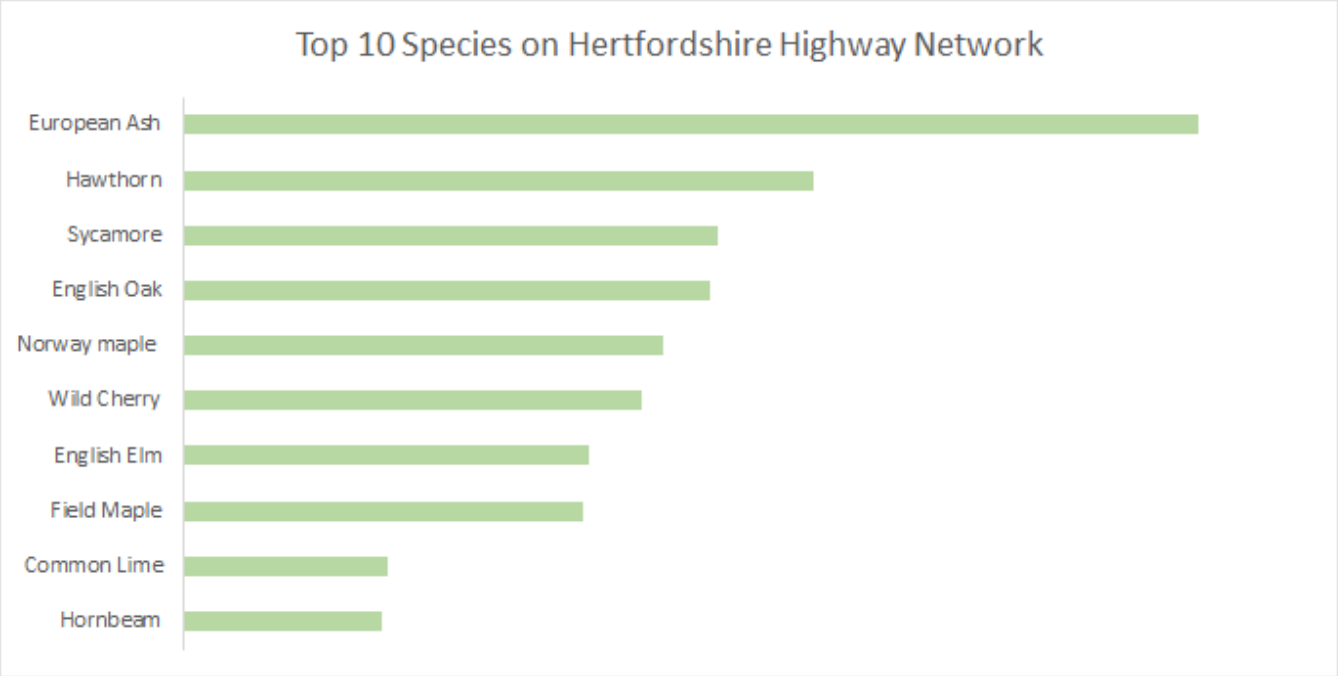
Table 1: Tree figures broken down by district (correct at time of publishing, subject to change).

District	Total Number of Highways Trees (correct as of Oct 2023)	Of which are managed under Agency Agreement
Broxbourne	19,471	N/A
Dacorum	12,611	N/A
East Herts	26,688	N/A
Hertsmere	24,765	N/A
North Herts	23,197	9,885
St Albans	31,975	12,955 plus 7,189 in tree groups
Stevenage	14,952	14,620
Three Rivers	25,119	N/A
Watford	5,587	5,283
Welwyn Hatfield	13,341	11,908
Trees in tree groups	28,225	N/A
Total:	225,931	61,840

Tree Diversity

Tree species diversity increases overall resilience in the face of various environmental stress-inducing factors. A more diverse treescape is better able to deal with possible changes in climate or pest and disease impacts. With more diverse tree populations, the likelihood that all trees will be vulnerable to a particular threat is lower and therefore a smaller proportion detrimentally affected. The tree population within Highways' stewardship represents a rich community of trees given that many of these are trees lining transportation networks, with 295 species identified. Tree species from around the world are represented in Hertfordshire's tree inventory. Most of the species are native to Europe and Asia. The most common tree species is Ash (*Fraxinus excelsior*), followed by Hawthorn (*Crataegus monogyna*), Sycamore (Acer pseudoplatanus), and Oak (*Quercus robur)* respectively.

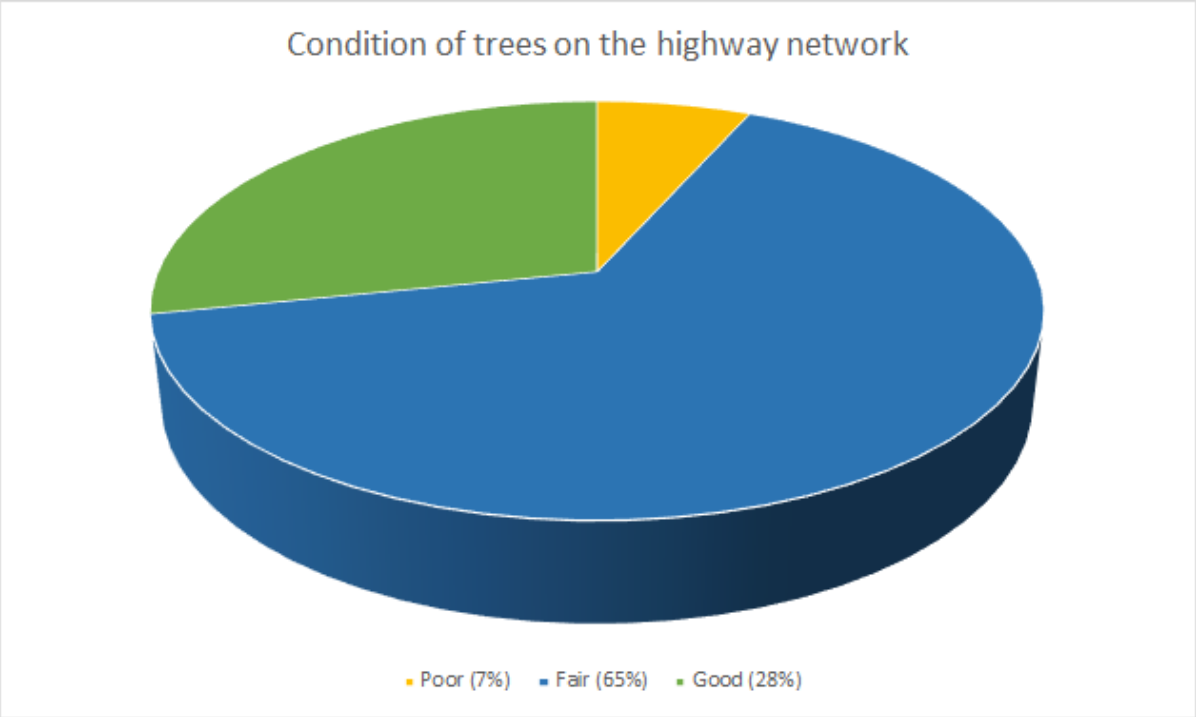
Fig. 1 Graph showing the ten most abundant species on Hertfordshire's Highways.



Tree Condition

A healthy tree implies a good level of leaf area to provide ecosystem benefits. Analysis of the tree inventory indicates that just over 93% of trees with condition recorded have been assessed to have a condition of Fair-Good by a qualified arboricultural surveyor (it is important to note that an assessment of "Poor" condition does not necessarily mean an unsafe tree). This would suggest that the vast proportion of the highways tree stock are not in decline and are actively contributing ecosystem services.

Fig. 2 Chart showing breakdown of trees for which we have condition data.



Benefits

Trees and woodlands can be significant landscape features providing multiple ecological services as well as an array of benefits to human health and wellbeing. In July 2021 an i-Tree Eco report provided tangible quantifications of some ecological services of the Highways tree stock. While not all the benefits trees and woodlands provide can be monetarised yet, understanding how they are contributing economically allows us to better communicate and promote the benefits of trees across disciplines and professions, and provides context for our approach to managing their risks.

Carbon capture

Increasing levels of carbon dioxide in the atmosphere is a key driver of climate change. Trees photosynthesise in sunlight, a process by which carbon dioxide and water are converted into oxygen and glucose in the leaves. Further chemical reactions convert this glucose to cellulose which is a key component of wood tissue and enables carbon storage in trees.

Highways trees store 10,200 tonnes of carbon which is valued at £2,617,848. There is an annual carbon sequestration (the conversion and storage of atmospheric carbon dioxide

as woody tissues) of 506 tonnes per year, equivalent to 1,856 tonnes of carbon dioxide, with an associated value of £129,949.

Across Hertfordshire's highways 6.2% of trees are *Acer platanoides* (Norway Maple) which make up the majority of large trees (Diameter at breast height of 30-45cm) on the network. Due to their larger sizes, Norway maples on the highway provide the greatest amount of carbon storage, with more than 16% of all carbon sequestered each year. Planting larger growing species in sustainable locations provides greater potential for future carbon storage.

Water

Many deciduous trees have wide flat leaves which are effective at catching and slowing rain drops as they fall through the tree canopy. This interception of rainfall slows down the flow rate of rainfall to the ground which can help to reduce the risk of flash flooding[5].

After rainfall, water in the tree canopy evaporates reducing the amount of water reaching the ground. Highways trees reduce the surface water run off by 21,704m^3 per year, reducing pressure on highway surface water drainage systems and avoiding flood damage. The estimated value of reduced water runoff provided by Highways trees is £24,959 per year. The benefit of this is largely focused in Stevenage, as many of the largest trees (many of which are Norway Maple) on the network are located here, and a larger tree results in increased avoided rainwater runoff. This highlights the importance of conserving large trees across Hertfordshire and planting species capable of growing to a large size.

Air quality

Vehicles which use fossil fuels emit air pollutants, comprising of carbon monoxide, ozone, nitrogen dioxide, sulphur dioxide, and particulate matter less than 2.5 microns (PM2.5), which are harmful to the environment and human health.

Highways trees remove 11.13 tonnes of these pollutants each year with an associated annual value of £131,428. Of particular note is the fact that the removal of PM2.5 by Highways trees provides 60% of this annual value through reduced healthcare costs. This demonstrates the importance of planting tree species that have been shown to be the most efficient in removing particulate pollution, such as London Plane, Norway Maple, Oak, and other large broadleaved trees.

[5] Loss of trees increases storm water runoff in Atlanta, Soltis D, Water engineering and management 144, (1997)

Amenity value

Trees contribute to the landscape and can be significant features in their own right. The amenity value of trees has been calculated using Capital Asset Value for Amenity Trees (CAVAT)[6]. CAVAT uses a replacement value approach based on planting costs and is adjusted for location and other tree factors. CAVAT is designed as an asset management tool for public trees and provides a monetary value, the CAVAT value for Highways trees in Oct 2023 was £1,005,911,403.

Property values

Residential properties located close to green public open spaces[7] and trees[8] typically have increased property value. Trees can increase property value by 7-15% and it is common for larger trees to increase property values more.

Health and well-being

In addition to cleaner air, which is better for health, the presence of trees makes for a more pleasant environment in which people can undertake physical activity, improving personal health and fitness. Patients recovering in hospitals with a view of trees have improved recovery rates[9]. Individuals living in urban areas with more green space have lower mental distress and higher well-being[10].

Air temperature

Urban areas are often affected by the urban heat island effect where air temperatures are higher than surrounding rural areas. Green infrastructure, especially trees, can reduce the effects of urban heat islands through transpiration and by providing shade [11]. Equally, in the winter these same trees lose their leaves and allow sun light through to warm towns in the winter and act as wind breaks.

Biodiversity

While the habitat of veteran trees is irreplaceable, younger trees also have important habitat for flora and fauna. Cavities and openings within trees can provide safe refuge for

[6] Capital Asset Valuation of Amenity Trees (CAVAT), Chris Neilan, (2010)
[7] CABE, 2005, Does money grow on trees?
[8] Trees and Design Action Group, 2010, No Trees No Future.
[9] https://nhsforest.org/evidence-benefits
[10] White MP, Alcock I, Wheeler BW, Depledge MH., 2013, Would you be happier living in a greener urban area? A fixed-effects analysis of panel data. Psychol Sci. 2013 Jun;24(6):920-8.
[11] Vaz Monteiro M, Handley P, Morison J and Doick K, 2019. The role of urban trees and greenspaces in reducing urban air temperatures. Forestry Commission.

nesting birds. Bats and other mammals can also use cavities as well as cracks and crevices in the bark. While deadwood in trees is often seen as a safety concern it can be a valuable habitat for invertebrates. The bark of trees on branches and the main stem can host a variety of mosses, lichens, and bryophytes, some of which are very sensitive to effects of air pollution.

In addition to being refuge for flora and fauna, trees also provide a rich source of food as they are a source of nectar for pollinating insects (which in turn feed other animals) and they provide fruit for birds and mammals.

Threats to Highway Trees

Risk to the Highways Tree Stock

This strategy has demonstrated the value of highways trees, though the urban forest is not a guaranteed asset. Urban and rural trees alike are facing numerous stressors and other threats to their longevity. As custodians of the highways tree stock, Highways aims to mitigate the negative agents acting on trees and prepare for future threats.

Climate change

Hertfordshire County Council declared a climate emergency in July 2019 and has subsequently developed the Sustainable Hertfordshire Strategy[12]. A changing climate is likely to have profound effects on the tree stock:

- Hotter and drier summers will increase the stress on trees as drought conditions become more frequent.
- Warmer winters will result in trees coming into leaf and flowering earlier in the year. This means young foliage will be more susceptible to frost damage and flowers may open before the emergence of insect pollinators.
- Wetter winters increases the likelihood of soils being waterlogged, which can lead to tree decline via asphyxiation of the root tissues and reduced soil integrity. They also increase the prevalence of tree pests and diseases overwintering that would otherwise be killed/slowed by cold temperatures.
- Increased extreme weather events which can increase the risk of flooding and trees being damaged by strong winds

[12] https://www.hertfordshire.gov.uk/microsites/sustainable-hertfordshire/media/sustainable-hertfordshire-strategy-2020-2.7mb.pdf

Tree Pests and Diseases:

Climate change and increased global movement of trees and plant goods has resulted in the introduction of new tree pests and diseases to the UK. These pests and diseases can result in significant damage and reduced survival to Hertfordshire's tree populations. Many tree pests or diseases target a narrow range of tree species, and often it is trees that are already under stress that first succumb to infections. As a result, a healthy and genetically diverse urban forest is the best way to limit the impact of these new tree pathogens and to secure the benefits trees provide.

The two most significant issues affecting Hertfordshire's highway trees are currently Ash Dieback (caused by the fungus *Hymenoscyphus fraxineus*)[13][14] and the Oak Processionary Moth (*Thaumetopoea processionea*)[15].

Ash Dieback

Highways Ash trees in Hertfordshire are already being affected by Ash Dieback (ADB) and currently there are no effective options to prevent or treat infection. The rate of progression of the disease varies from tree to tree; younger saplings may be killed in a single growing season while healthy mature trees may resist the disease for many years before they are overwhelmed. There are also signs that a small proportion of UK Ash trees will show resistance to ADB either through genetic traits or environmental factors.

The Ash tree (*Fraxinus excelsior*) is the most common species of tree on Hertfordshire's highways (approximately 13%[16]) with 75% of those trees being smaller younger trees. As a result, their decline is likely to be rapid and will have a significant impact on the biodiversity, visual character, and carbon sequestration potential of the highway network.

The decline of highways Ash trees also poses an additional safety concern for users of the highway network. As Ash trees are infected in increasing numbers it can be expected that Highways will experience a rise in the amount of dead or dangerous trees that require intervention. A significant strain on revenue is predicted to keep major A-roads and trunk roads safe in the coming years.

In response to the spread of ADB throughout the highway tree stock, Highways will:

[13] www.forestresearch.gov.uk/tools-and-resources/fthr/pest-and-disease-resources/ash-dieback-hymenoscyphus-fraxineus/

[14] https://treecouncil.org.uk/guidance-resources/ash-dieback-action-plan-toolkit-for-england-and-wales/

[15] www.forestresearch.gov.uk/tools-and-resources/fthr/pest-and-disease-resources/oak-processionary-moth-thaumetopoea-processionea/

[16] D. Hill and C Vaughan-Johncey, 2020, i-Tree Eco Stratified Inventory Report, Hertfordshire County Highways

-Use a 3 year cyclical programme of tree surveys to identify areas where ADB is present within the highways tree stock and monitor the progress of the disease throughout the county via targeted annual ADB surveys.

-Assess risks posed by infected highways Ash trees and highlight “hot spots” where trees are in more serious decline from ADB. This information will be used to prioritise works, and secure resources for managing higher risk areas.

- Use in-house survey data and national research to plan for the future of Highways tree stock and predict and prepare for resource and operational pressures that may arise due to increased management of trees with ADB.

Oak Processionary Moth

The Oak Processionary Moth (OPM) is a specific pest of Oak trees that was inadvertently imported into London in 2005 and has since been spreading out of the capital and into the home counties. There are now a notable number of OPM infestations in Hertfordshire each year, with 600 reported sightings in 2021.

OPM poses a human health risk as the caterpillars are covered in hairs that cause irritation of skin, eyes and throat in humans and animals upon contact.

OPM caterpillars can also defoliate Oak trees, leaving them stressed and more susceptible to other diseases such as Acute Oak Decline. When combined with stresses associated with ongoing climate change, this has negative implications for the future health of Hertfordshire’s Oak population.

Given the risks to the public, Highways will work alongside stakeholders such as Forest Research and highways term contractors to identify, report, and manage infestations of OPM.

OPM nests will be removed according to their location and subsequent risk to public health. Higher risk locations where OPM nests may be actively removed include:

-Any nests below 3m height on trees beside pedestrian footways.

-Any nest that has fallen to ground level / at the base of the tree.

-Nests in trees alongside high-use pedestrian routes such as walking route to schools and town centres.

Future Risks

It is difficult to accurately predict how climate change and new tree pathogens may affect the future tree stock of Hertfordshire’s highway network, but it is possible to be adaptable and prepared for change. Highways will:

-Continually review and revise our ADB and OPM management objectives and practices in line with up-to-date guidance and research.
-Be flexible in our ADB and OPM response so that it is rapidly adaptable as further information becomes available regarding highways ADB and OPM management.
-Only plant trees in Highways land that are sourced from nurseries with rigorous Biosecurity measures that are Plant Healthy Certified.
-Work with HCC Tree Health Officer to ensure Highways colleagues and contractors keep up with relevant CPD, and monitor emerging biohazards, biosecurity issues, or pests and diseases.

Removal requests

While most trees are highly valued by the public, Highways receives frequent requests for trees to be removed.

A large proportion of highways trees are in built up areas and are in close proximity to residential and commercial properties and so complaints are made for issues such as leaf fall, shading, safety, or subsidence. Expanding development, utility installation, and lack of road and footway space are other pressures that lead to requests for otherwise healthy trees to be removed.

Highways takes a balanced approach to managing its trees in a sustainable manner for the benefit of all stakeholders. This is detailed in the highway tree management section of this document.

Risks to Users of the Highway

While trees provide many obvious benefits, they also pose a level of risk to users of the highway network. No tree is completely free of risk as even a completely healthy tree may fail given an unfortunate set of circumstances. Many of the factors that contribute to the failure of a tree are tricky to identify with an untrained eye, as things like internal fungal decay or poorly formed branch unions are often very hard to see. Highways use highly qualified and experienced arboricultural surveyors to assess the tree stock as they are better able to notice the subtle clues that suggest a tree is at an increased risk of failure. However, with appropriate management and inspection, the risk of trees causing harm on the highway is very low[17].

[17] Common sense risk management of trees, National Tree Safety Group, Forestry Commission, (2011)

Highways Tree Risk Management

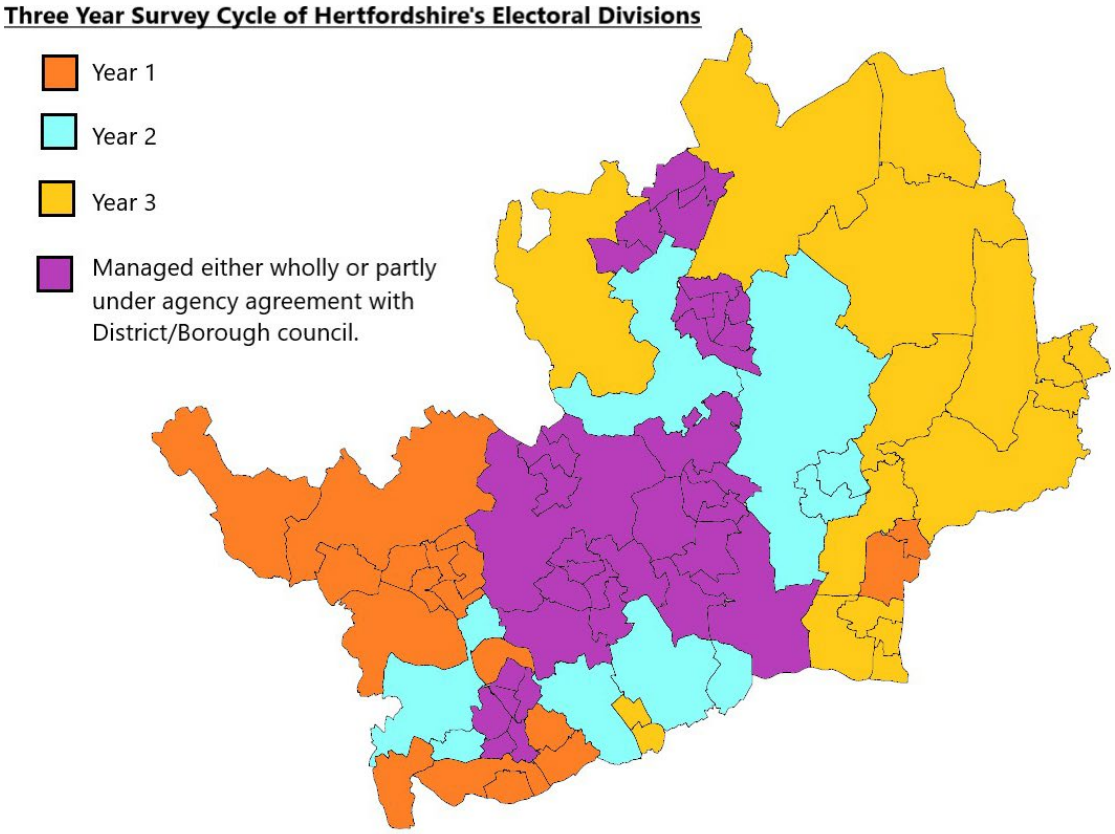
As previously mentioned, no tree is completely free of risk to users of the highway network. This section summarises our approach to actively managing the highways tree stock to reduce risk and promote tree health. Further detail can be found in Appendix A.

Under the Highways Act (1980) Hertfordshire County Council as a highway authority has a statutory duty to maintain its highways for use by the public and have the power to carry out work on third party trees in order to make the highway safe. This includes ensuring trees are not obstructing the highway or presenting an unreasonable risk to users of the highway. Highways therefore has a strategic framework for the management of the highway tree stock, whether directly managed by Highways or managed on its behalf under agency agreement with district and borough councils.

Highways undertakes tree work principally to maintain the health and safety of trees on highways managed verges. To effectively manage and maintain our tree stock it is important that publicly funded resources are applied in a rational way, based on an assessment of risk. As such, where tree works are not risk related, they will not be prioritised and there are certain scenarios where Highways will not carry out tree works at all (see Appendix B).

Highways has a programme of planned and reactive tree inspections which allows it to:

- Identify trees that potentially pose a risk to the highway.
- Provide a county-wide picture of the relative health of the tree stock.
- Defend insurance claims brought against Hertfordshire County Council.
- Target tree planting and management on an area-by-area basis to better expand and connect urban treescapes.



Given the large number of highway trees in Hertfordshire, their inspection needs to be prioritised so as to focus resources on those that pose the highest risk. Therefore, Highways maintained land containing trees is divided on a proportionate risk-based approach into three 'Tree Risk Zones', based on the likelihood of people and property coming into contact with potentially hazardous trees. In summary, high-risk zones e.g. built up urban centres and busy roads, will be subject to more thorough and pro-active inspection than low-access rural areas.

Table 2: Summary of Tree Risk Management Zones in Hertfordshire

Tree Risk zone	Site/Zones examples	Inspection type	Inspector Qualification	Inspection frequency
High	Primary Route, Main Distributor, Secondary Distributor, Link Road, Local Access Road. (See Appendix C for further detail) Major roads and urban areas within 30mph speed limit. Areas within falling distance	**Full** ground-based visual tree assessment.	Experienced arboricultural surveyor holding LANTRA Professional Tree Inspection certificate and a Level 4	At least once every three years as well as reactive inspections.

	of busy and moderately-used public roads, railways, neighbouring properties, amenity areas and car-parks. Pedestrian areas within urban areas		Arboricultural qualification (or equivalent) as a minimum.	
Medium	Minor Road Occasional traffic and infrequently used The rural road network linking the urban areas between towns and cities. Cycleways and moderately-used public rights of way if maintained by Hertfordshire Highways (I.e. not maintained by Countryside and Rights of Way).	**Camera assisted driven risk assessments** or walked risk assessments.	Highways inspectors with LANTRA Basic Tree Inspection qualification.	At least annually
Low	Access is not foreseeable Highway maintained land not within proximity to roads. highway trees not within falling distance of roads, property, or public rights of way.	Full ground-based visual tree assessment.	Experienced Arboricultural surveyor or by Highways arboricultural officers depending on issue raised.	Reactive

As with inspections, tree works are also based on urgency, potential harm, and resources. High-priority safety works generated from the recommendations of both programmed and reactive inspections are carried out by the highways term contractor to mitigate risk.

Highways Tree Removals

Highways do not remove trees that are considered to be healthy and contributing positively to the Highway environment. Highways will only remove trees on the advice of our own arboriculturists, if a select set of criteria are met.

Circumstances in which we may decide to fell a tree:

- Where a health and safety defect can only be addressed through removal, such as a loss of structural integrity due to death, disease, or decay.
- The tree has naturally reached the end of its life expectancy and has limited remaining contribution to the urban forest.
- The tree is proven by a claimant to be causing significant and ongoing structural damage to buildings (as proven by the building owner).
- The tree is proving obstructive to or is substantially damaging the footway, cycleways, or carriageway and no alternative engineering solution exists.
- In the event a tree is in conflict with any statute legislation or other e.g. Equality Act 2010 / Highways Act 1980/ Town and Country Planning Act 1990
- As part of highway improvement schemes where suitable mitigation is provided, impact on amenity is minimal (under £20,000 as a CAVAT value), and results in a net gain or overall improvement in tree cover and biodiversity on publicly maintained highway verge (as determined by Highways arboricultural officers and arboricultural advisors in collaboration with Highways Development Management colleagues).
- Trees which are clearly of a size and species that is inappropriate to their situation (as determined by Highways arboricultural officers and arboricultural advisors).

In line with Hertfordshire County Council's dropped kerb policy, Highways do not remove trees to facilitate dropped kerbs/vehicle crossovers[18]

In assessing development proposals or highway improvement schemes, there is a general presumption against the removal of trees.

Where developments/highway schemes require and have agreement to the felling of trees (as determined by the County Council), the Council will seek compensation from any external organisation responsible for significant damage to, or removal of any council owned tree/s to the value as calculated by the Capital Asset Value for Amenity Trees (CAVAT).

Communications Protocol

Highways are committed to proactive communication through a range of channels. Information regarding tree works, news, storm damage alerts, and general information about Highways tree management is available through Hertfordshire County Council's website[19] and social media channels[20].

Prior to any programmed tree removal we carry out the following communication process to inform residents where trees are to be removed:

- Tree considered for removal is marked with spray paint by the surveyor at time of inspection.
- Properties in closest proximity to the tree (the property the tree is outside, plus the adjacent two properties and the corresponding properties on the opposite side of the street) are notified of the removal by letter.
- Physical notice is placed on the tree with a URL code for link to inspection details.
- Local Members and district tree officers are notified by email of all the trees to be removed within their ward under a safety related works program.

[18] Dropped Kerbs Policy (hertfordshire.gov.uk)
[19] www.hertfordshire.gov.uk
[20] Instagram : Hertfordshire County Council (@hertscc) • Instagram photos and videos
Twitter: Hertfordshire County Council (@hertscc) / Twitter
Facebook: Hertfordshire County Council | Facebook

See Appendix A for further information on the communications process within highways tree management.

In line with the Environment Act (2021), we consult the public on street tree removals where a tree is **not** exempt from consultation (See Appendix D). The consultation process involves a notice of intent to remove the tree going up on the tree(s) in question, and also a survey being posted on the Hertfordshire County Council website for 28 days. After this 28 day period Highways arboricultural officers will review the public responses alongside any arboricultural considerations and make an appropriate decision as to whether to remove the tree. A notice of our decision will then be posted on the tree(s) and online for a further 28 days prior to the tree being removed (if this is our decision)[21].

Private Trees

The duty of care to keep highways users safe under the Highways Act also applies to private landowners. Wherever private trees are in close proximity to the highway, it is the responsibility of the landowner to take proactive measures to assess and promote tree health. If a tree poses a foreseeable risk to highways users it is the landowner's responsibility to mitigate this risk through remedial tree work or tree removal. If Highways led surveys identify private vegetation that requires urgent safety works the landowner will be informed where possible so they can take appropriate action. If they fail to do so, Highways has the power to enter property and carry out work at the landowner's expense under section 154 of the Highways Act (1980) and the Local Government (Miscellaneous Provisions) Act 1976.

Veteran Tree Management

Hertfordshire's highway network is fortunate to host numerous veteran[22] trees, particularly in the rural network where trees have had ample space and have avoided the pressures of urban expansion. However, veteran trees can still thrive in the built environment with the right care. Through programmed surveys (as mentioned in the previous section) and reactive surveys, Highways is committed to identifying and protecting significant trees on the network.

[21] Duty to Consult - Guidance for Local Authorities - FINAL.docx (theihe.org)

[22] A veteran tree is a tree which due its significant age, size or condition, provide high cultural, landscape, or nature conservation value.

When veteran trees pose a potential hazard to users of the highway we will explore options so as to mitigate risk without the need for removal where at all possible. Where significant intervention is deemed necessary, roadside veteran trees may be heavily reduced to a central stem with a few short structural branches (monolith). This removes the tree canopy and reduces risk to road users whilst retaining an amount of standing dead wood and habitat. Highways will also use habitat creation techniques on these trees, including coronet cuts and plunge cuts that create habitat boxes.

Highways takes a flexible and adaptive approach to managing these high value trees. This includes intermediate surveys / increased survey frequency on veteran trees in the high-risk zone (see Appendix C), as well as procuring detailed decay detection surveys and/or static load tests to inform long-term management recommendations to promote their health and longevity.

Insurance Claims

While there are many benefits to bringing trees and people closer together, the natural processes of trees can also have detrimental impacts on surrounding people and property.

Trees can damage buildings, fences, walls, and other forms of infrastructure both directly and indirectly. Direct action includes damage as a result of the pressures exerted by radial growth of roots or another part of a tree, whilst indirect action includes things like subsidence damage due to trees extracting water from the sub-soil.

Urban trees are a highly valuable public asset and whenever damage is alleged to be caused by highway trees, each case will be reviewed with a robust, consistent, and fair evidence-based approach.

This means when assessing claims of damage Highways require thorough evidence before we will investigate what action, if any, is appropriate. In decision-making, Highways will take in to account the value of the tree, and the extent of damage and liability. Where a particularly valuable tree is involved, more evidence may be required before remedial action is taken. The use of CAVAT (Capital Asset Value for Amenity Trees) allows

Highways to value trees implicated in insurance claims and is used to inform decision making.

Damage to walls and fences

If a tree on Hertfordshire Highway managed land is found to be causing damage to a neighbouring property we will investigate and take action as appropriate. It is often possible to rebuild or repair garden walls and fences to take account of adjacent trees. This can be achieved in a number of ways; for example, by installing a section of railing or bridging foundations around the base of a tree. Where trees are believed to be causing damage to walls or fences, we will normally only consider tree removal if the wall or fence is irreplaceable and of exceptional importance - e.g. a retaining wall or of historical interest - or if there is a risk to public safety in leaving the tree in situ which cannot otherwise be mitigated.

Damage to paths

It is often possible to repair paths to take account of adjacent trees and tree roots. Where roots protrude, they can be root pruned, or the path re-laid around the tree with flexible materials such as tarmac to provide a smooth surface. Where trees are causing damage to footways, we will not normally consider tree removal except where there is a risk to public safety that cannot otherwise be mitigated.

Damage to drains

Tree roots are able to enter drain pipes which are already damaged but trees rarely create the initial damage[23]. The presence of roots within pipes is therefore a secondary issue and the primary issue is the condition of the pipe which the pipe owner should repair. As trees are a secondary issue, pruning or removal of the tree would not address the underlying issue and so we do not offer this.

Subsidence

Where shrinkable soils are situated below building foundations, tree roots can extract moisture and cause uneven sinking or movement of the property. Where subsidence implicates a Highways tree the typical evidence that would be expected to be provided by the claimant at their expense includes:

[23] Tree Roots and Underground Pipes (trees.org.uk)

- Structural engineers report including BRE damage category[24].
- Level monitoring or crack monitoring readings for 12 months minimum,
- Bore hole, trial pit, and root analysis reports.
- Soils Analysis
- Arboriculture Report with all vegetation identified

Miscellaneous damage

Fallen trees and branches may cause direct damage. As mentioned in the previous section, Highways takes a proactive approach to managing tree risk and this reduces the risk of trees having whole or partial failure. Where a tree or branch has failed due to inclement weather conditions any claim should be directed to the claimant's household or motor insurance in the first instance. Where failure has occurred and harm has been caused, the following information is required of the claimant at their expense:

- Photographic evidence of the vegetation.
- Evidence of the damage caused.
- Hertfordshire county council claim form (available from the County Council's website) completed with relevant information.

Public Events and Tree Adornment

Highways is occasionally approached with requests from third parties wanting to carry out miscellaneous work on or around Highways trees for public occasions or to enhance/decorate their premises. These requests are assessed case by case by Highways tree officers and/or another relevant Hertfordshire County Council representative.

Where items are being attached to Highways trees e.g. floodlights, festoon lighting, signs, or decorations, they must be attached with a non-permanent method which is not in any way invasive to the tree. Depending on the proposed installation, traffic management may be required and a licence for the works from Network Management. Highways must approve an appropriate Arboricultural Method Statement prior to works.

[24] The Building Research Establishment have categorised cracking/damage in buildings into five levels of severity with 1 being minimal and 5 being significant structural damage.

Dropped Kerb Applications

In line with the Hertfordshire County Council Dropped Kerb Policy, Highways do not remove trees for the purposes of installing new dropped kerbs or vehicle cross overs.

Planting

As stewards of the urban forest, Highways has a desire to expand and increase tree canopy cover across the county.

Due to the climate crisis, tree planting in the UK has been receiving increased attention from government, the media, and the public eye as a possible means of slowing environmental change. As a result, Highways receives many requests for planting from the public and stakeholders, on top of an existing large programme of planting.

In line with the county council's tree and woodland strategy[25], Highways will sustainably increase the canopy cover across the highway network. Over the next four years (2023-2027) we have committed to:

- Establishing at least 10km of new hedgerows and 10 Ha of linear woodlands on the county council's highway estate; subject to comprehensive on-site evaluations to ground-truth and support desk-top assessment.

- Where appropriate, establishing at least 100 new trees on the county council's highway estate in each urban ward which has a tree canopy cover of below 15% (of the total ward area), subject to on-site gap analysis to confirm viable planting opportunities.

Given the increasing number of trees being planted in the highway network, thorough consideration needs to be given to specifying each tree in each location so as to protect them and the benefits they provide for future generations. All tree planting on Highways land is carried out in accordance with BS 8545:2014 Trees from nursery to independence in the landscape.

[25] Hertfordshire County Council Tree and Woodland Strategy

Tree planting design and establishment

When undertaking tree planting it is essential that the location is appropriate as trees are not readily moved once established. Additionally, planting trees in unsustainable locations can result in them having drastically shorter lifespans, which can increase rather than reduce atmospheric carbon and pollution.

Post planting maintenance is essential to ensure successful tree establishment. A critical part of the care of newly planted trees is regular and copious watering to promote growth of a robust root system to carry them into maturity. This often takes several growing seasons. Highways trees are covered by a watering and maintenance programme for their first three years of growth after planting

Guidance on the planning, design and early maintenance of tree planting schemes for new and improved highways is set out in Part 3, Chapter 10 and Part 4, Chapter 9 of the Place & Movement Planning and Design Guide for Hertfordshire (P&MPDG)[26] [27].

Replacement trees

Occasionally it is unavoidable that trees need to be removed for various reasons, including highway improvement and tree safety. Highways is committed to replacing trees removed from the urban environment. Wherever possible, trees are replaced in the same location they are removed from once the previous stump has been ground out. In these situations, Highways endeavours to plant the same or similar species to the removed tree. Where a tree is removed from an inappropriate location for planting, or is of a species that does not suit the locality, Highways may instead plant a different species of tree and/or plant the tree in an alternative location in the highway network.

New trees

To meet Hertfordshire's objective of increasing canopy cover, Highways does not just replace felled trees, but plants in a large number of new locations each year. Some new trees are planted in ad-hoc locations as requested by the public, council members, or on the back of larger planting initiatives such as the 2022 Queen's Green Canopy. However much of the new planting carried out by Highways is strategically prioritised based on the following considerations:

[26] Place & Movement Planning and Design Guidance for Hertfordshire Part 3
[27] Place & Movement Planning and Design Guidance for Hertfordshire Part 4

- Low canopy cover – urban areas with less than 15%canopy cover will be prioritised.
- Clean air and population health - Highways will prioritise tree planting in areas ranked as Highest Risk and High/Medium risk (red areas as shown in figure x) as defined by our internal clean air and health prioritisation tool. The Clean Air and Health Prioritisation tool collates data from a range of health sources including those with a specific clean air focus. The data from each indicator is scored individually at Lower Social Output Area (LSOA) scale before a weighting is applied and the scores combined. The combined scores are then ranked by quintile to provide a list of LSOAs which are deemed highest priority for action through those considered to be low priority for action. The data sources used to create the ranking system include:
    - Proximity to air quality management areas[28] (AQMAs which are areas where national legal pollution levels are exceeded) – the closer to an AQMA the higher the score,
    - PM2.5 concentration[29] – the higher the concentration the higher the score,
    - Index of Multiple Deprivation[30] (an index taking factors which enable the identification of the most and least deprived areas in the county) – the more deprived an area the higher the score,
    - ACORN health 'Wellbeing' data[31] (a national data set where health characteristics of communities is explored) – the more health deprived the (lower) the score
    - Population number[32] – the larger the population the higher the score,
    - Number of sensitive receptors to poor air quality[33] – the more receptors (health and educational settings) the higher the score,
    - Congestion points[34] - identifies congestion points based on 2015/2016 Traffic Master Teletrac data – the more congested points within the area the higher the score.
    - Canopy cover – the lower the canopy cover the higher the score.
- Defragmentation – planting will be undertaken to link fragmented green infrastructure, improve green corridors, and boost biodiversity.

[28] DEFRA UK AIR: air information resource as of January 2022: AQMAs interactive map (defra.gov.uk)

[29] DEFRA UK AIR: air information resource, Background Mapping data for local authorities – 2018: Background Mapping data for local authorities - 2018 - Defra, UK

[30] English Indices of deprivation 2019: Ministry of Housing, Communities and Local Government, 2019

[31] ACORN Wellbeing data: Copyright CACI 2021

[32] Population data: Office for National Statistics, Population Mid Year Estimates, 2020

[33] Number of sensitive receptor locations: taken from internal mapping systems and includes HCC owned schools, GP surgeries, hospital sites and pharmacies on our database

[34] Congestion points taken from internal HCC systems – Uses Trunk, Primary and Secondary roads and compares average speeds against registered speed limit on approaches to junctions. Data is at Dec 2020

- Maintaining and improving aesthetic value of street scenes and urban areas.

Selecting species for a future climate

Global warming and the heating effect of highly concreted areas means many urban trees experience conditions that are far drier and hotter than their species is adapted to. As the climate crisis continues, eastern England (I.e. Hertfordshire) will be subject to weather conditions akin to that of southern Europe. Subsequently, native UK tree species planted along the highway network will be subject to unprecedented heat and drought stress and may not reach their full lifespan.

Where appropriate, Highways may decide to select non-native species[35] that are already acclimatised to warm dry climates so that the urban forest is more resilient and canopy cover is secured for the future.

Engagement

Highways has an annual tree planting programme and all requests for new trees will be considered in developing the programme.

Due to the operationally hazardous nature of planting trees in the highway, involving community volunteers in tree planting is not usually possible. Equally, the sourcing, planting, and maintenance of highways trees must all be carried out by qualified professionals given the safety implications for users of the highway. Highways will however encourage and support communities to water highways trees once planted where this is safe for the public to do so.

Where planting suggestions from the public and/or Members have been accepted, all planting design must be written or approved by Highways Arboricultural Officers to ensure that the new trees are appropriate for the location. All planting of trees will be undertaken by the county council's highway term contractor.

[35] Non-native species will be sourced from a Plant Healthy accredited nursery and will either be UK grown or have relevant phytosanitary certificates / plant passports.

Working with Utilities Operators

As previously mentioned, Highways will not grant consent for trees to be removed unless significant damage to property is occurring, or they pose a foreseeable risk to the public. All retained trees need to be adequately protected during works. Measures to protect these trees should follow the best practice principles set out in both BS 5837 Trees in Relation to Construction Recommendations (2012), and NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (2007). These are broadly summarised below:

- Only hand excavation is to take place within the root protection areas (RPA) of retained trees unless supervised by a qualified arboriculturist.
- Vehicles and other operations that could result in soil compaction are to be excluded from the RPA.
- Roots above 25mm diameter will not be severed, pruned, or shaved without prior approval from a qualified arboriculturist.
- No materials or soils are to be stored within the RPA of the retained trees.
- Oil, bitumen, cement or other material that is potentially injurious to trees will not be stacked or discharged within 10m of a tree stem.
- Allowance will be made for the slope of ground to prevent materials running towards the tree.
- Wide or tall loads etc. should not come into contact with retained trees. Banksperson should supervise transit of vehicles where they are in close proximity to retained trees.
- No fires will be lit where flames are anticipated to extend to within 5m of tree foliage, branches or trunk, taking into consideration wind direction and size of fire.
- Notice boards, telephone cables or other services will not be attached to any part of a retained tree.
- No roots will be left uncovered if exposed during the removal of existing surface materials. They will be wrapped and wetted as soon as possible to minimise the risk of drying out and dying.

In the event that retained trees are terminally damaged due to non-compliance of the above, or removed without prior authorisation, Highways will pursue replacement planting equal to the CAVAT value of the affected trees.

Appendices

Appendix A: Detailed Tree Management Process/Methodology

High Risk Zone

All highway trees within the High-risk zone will be inspected at least once every three years. Inspections will be carried out by a qualified arboriculturist (with LANTRA Professional Tree Inspection qualification and Level 4 Diploma in Arboriculture as a minimum, or other appropriate qualification as confirmed by Hertfordshire County Council arboricultural officers) using a digital platform for plotting and recording the following attributes for each tree:

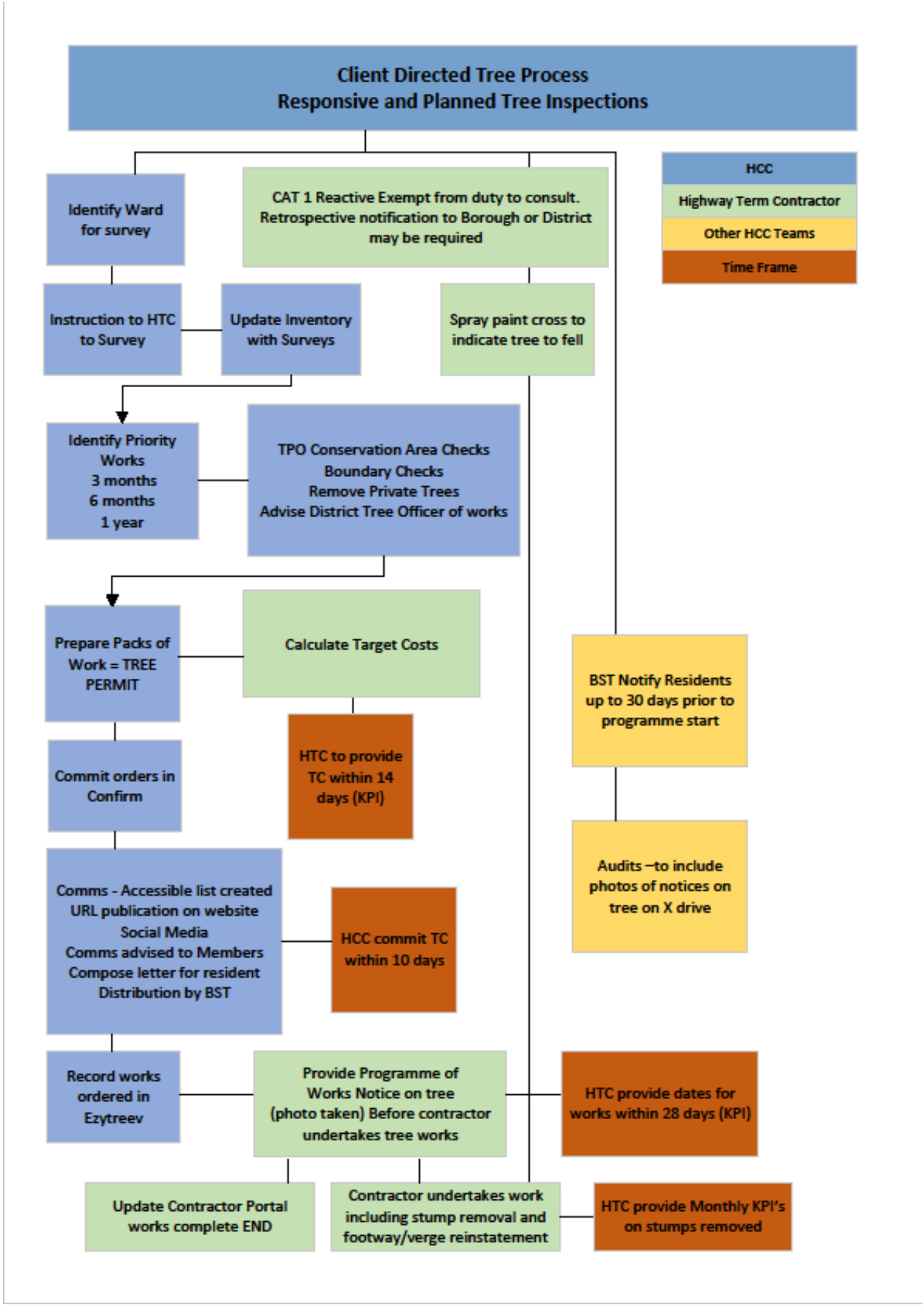
- Time and date of inspection
- Tree Species
- Grid reference of tree location
- Age class
- Height
- Spread
- Stem diameter at 1.5m
- Surrounding Site features
- Risk features
- Condition
- Recommendations for safety related works
- Priority
- Name of inspector

All cyclical tree inspections will be carried out by a qualified inspector from ground level using visual tree assessment methodology (VTA), physical probing and mallet resonance sounding. Where more detail is required to make informed decisions an aerial inspection or further decay testing can be commissioned were appropriate.

All trees surveyed showing no notable external signs of defect will be surveyed within the following three years from that date, the tree record will be updated by the inspector with

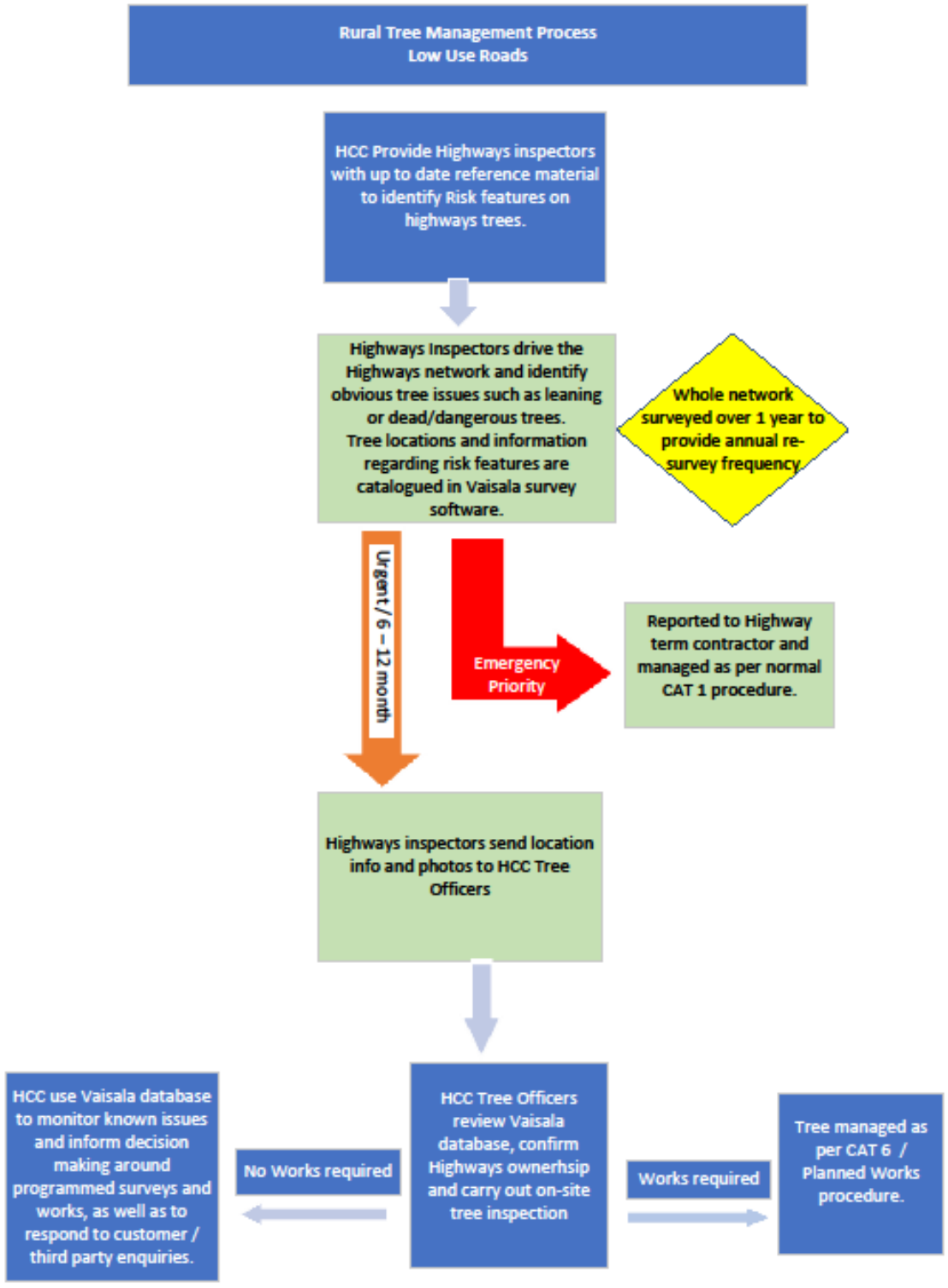
‘no safety related works required’. Where a highly valuable tree (ecological, landscape and visual character) shows a risk feature but does not yet require intervention as assessed by our arboricultural surveyors, an intermediate inspection can be programmed for monitoring/assessment purposes.

Any tree identified during the cyclical surveying process that is considered to pose an immediate danger to surrounding structures or area users shall receive attention to make them safe. This attention shall be processed with immediate effect to ensure the tree and the area is made safe within 24 hours under the Cat 1 process.



Medium Risk Zone / Rural Road Network

Rural roads and other medium risk roads will be subject to an annual inspection by highways inspectors using Camera-assisted drive-through risk assessments to pick up faults in the road surfacing, markings, signage and other highways assets including trees. Inspectors are provided with basic training (LANTRA Basic Tree Inspection) and reference material to be able to identify urgent tree hazards in the verges of rural roads as part of their normal inspection routine. This includes obviously dead or dangerous trees, or trees with poor structural integrity. GPS technology allows the locations of these trees to be marked and escalated for further detailed inspection by Highways arboricultural officers. Any tree found to pose a foreseeable hazard to users of the highway or footway will be assessed further and managed according to the same priority categories for trees in High-Risk Zones as stated above.


Rural Tree Management Process
Low Use Roads
HCC Provide Highways inspectors with up to date reference material to identify Risk features on highways trees.
Highways Inspectors drive the Highways network and identify obvious tree issues such as leaning or dead/dangerous trees. Tree locations and information regarding risk features are catalogued in Vaisala survey software.
Whole network surveyed over 1 year to provide annual re-survey frequency
Urgent / 6 – 12 month
Emergency Priority
Reported to Highway term contractor and managed as per normal CAT 1 procedure.
Highways inspectors send location info and photos to HCC Tree Officers
HCC Tree Officers review Vaisala database, confirm Highways ownerhsip and carry out on-site tree inspection
No Works required
HCC use Vaisala database to monitor known issues and inform decision making around programmed surveys and works, as well as to respond to customer / third party enquiries.
Works required
Tree managed as per CAT 6 / Planned Works procedure.

Appendix B: Examples of when Highways does not carry out tree work.

Due to resource constraints and the value of public trees, Highways will not carry out works for the following reasons:

- Lack of Light/excessive shading
- Trees obstructing views
- Telephone wires caught up in trees
- Trees interfering with TV or satellite signal
- Trees affecting solar panels
- Fallen leaves
- Poisonous fruit
- Personal Medical complaints
- Bird droppings
- Sap/honeydew on surfaces or vehicles
- Fallen fruit
- Wild animals/insects
- Tree blossom
- Removal of trees to allow installation of dropped kerbs or vehicle charging points
- Removal of trees to facilitate demolition or construction.

Appendix C: Highway Road Classification

High Risk Zone

Primary Route

Routes for fast-moving long-distance traffic with little frontage access or pedestrian traffic. Speed limits are usually in excess of 40 mph and there are few junctions. Pedestrian crossings are either segregated or controlled and parked vehicles are generally prohibited.

Main Distributor

Urban – distribute traffic within towns and around town centres. Link town centres and main industrial areas to the primary route network.

Rural – connect main towns in Herts with the Primary Route Network (PRN) and link neighbouring towns within the PRN grid

Secondary Distributor

Urban – connect important urban neighbourhoods to each other and to the main distributor roads. They form the distributor routes through large residential areas.

Rural – connect the important rural settlements to each other and to the main distributor network

Link Road

Urban – residential or industrial inter-connecting roads with 30mph speed limits, often with random pedestrian movements and uncontrolled parking.

Rural – roads that link smaller villages to the distributor roads

Local Access Road.

Urban – predominantly estate roads which give access to properties

Rural – predominantly country lanes which give
access to adjacent land.

Appendix D: Exemptions from the duty to consult

Under the wording of s115 of the Environment Act (2021) Hertfordshire County Council (referred to below as "the authority") are not required to consult on the removal of street trees in the following instances:

- The street tree has a diameter not exceeding 8 centimetres (measured over the bark, at a point 1.3 metres above ground level),

-The authority considers that the street tree is dead.

-The authority considers that the street tree is required to be felled by virtue of an order under the Plant Health Act 1967, or under any enactment on the basis that the tree is dangerous.

-The authority considers that the street tree is required to be felled in order to comply with:

(i)a duty to make reasonable adjustments in the Equality Act 2010 because the tree is causing an obstruction (see section 20 of that Act), or

(ii)a duty in section 29 of that Act (prohibitions on discrimination etc in the provision of services) because the tree is causing an obstruction, or

-The felling of the street tree is required for the purpose of carrying out development authorised by:

(i)planning permission granted under section 70, 73, 76D, 77 or 79 of the Town and Country Planning Act 1990, or

(ii)outline planning permission granted under section 92 of that Act.