



## **Strategic Tree Risk Management**

### **‘A Defendable System’**

A report on the proposed development and implementation of a defendable tree risk management system for trees on land managed by Harrogate Borough Council.

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Appendix 1: Photographic record of one recent tree failure (Oct. 2004) involving a tree growing on Harrogate Borough Council land

## 1.0 Introduction - The Need for a System

- 1.1 Amongst the numerous hazards that may be associated with trees, their potential for whole or partial failure onto either people or property attaches greatest concern. Mechanical failure in trees are often attributable to recognisable 'defects', but even an apparently sound specimen can fail in exceptionally strong winds. There is one means of achieving absolute safety from tree failure and that is to remove all trees that might conceivably fall on someone or their property. Such an approach would be unacceptable to most people given the immense contribution that trees make to our environment. However, people and property need an acceptable level of protection, which can be achieved through a reasonable system of assessment and remedial action. The current system in place at Harrogate Borough Council is considered reasonable in some areas, but is open to claims of negligence in others. This report details the need for a defensible tree risk management system that encompasses all trees under Council control and the resources required for its implementation.
- 1.2 Consultation with the Corporate Improvement Officer, Department Of Corporate Policy and Improvement, has revealed a current unacceptable level of risk associated with the Council's tree assets, where there is no current defensible system in place. However, projections made with this system in place have shown that this level of risk would be greatly reduced. Risk Matrix figures are laid out at **Appendix 5**, and will be expanded upon verbally if required.

## 2.0 Legal Requirements

- 2.1 Under General Liability, the Council has a 'Duty of Care' to its 'neighbours' with regards to the regular inspection and hazard abatement of its tree stock. This duty is laid down in the Occupiers Liability Acts of 1957 & 1984, the Highways Act 1980 (especially section 130), The Miscellaneous Provisions Act 1976 'Dangerous Trees and Excavation' and Health & Safety at Work Etc Act 1974 (for bystanders sec 3(1)). Criminal Liability can be pursued under Section 3 of The Health and Safety at Work Act 1974, where there is a general duty of care at Common Law to take reasonable care to avoid injury to your neighbour. Offences under section 33 of the HSWA 1974 can result in fines of up to £20,000 if pursued in Magistrates' Court or be unlimited if pursued in Crown Court. A breach of that duty may give rise to a claim of negligence from the injured party. In an extreme case this may also lead to the officer or officers involved facing manslaughter charges or civil action by relatives of the injured party. In the case of trees, negligence may arise by the omission of the owner to take sufficient care of a tree and to deal reasonably with hazards that were **foreseeable**. Under Civil Liability, person(s) can be found negligent if harm is caused or the potential for harm to occur is allowed to arise due to neglect or **'faults not being remedied within a reasonable amount of time'**.
- 2.2 In the landmark case of 1998 – *Chapman v London Borough of Barking & Dagenham* (where a falling limb resulted in a van driver being rendered a paraplegic) the judge remarked that *'foreseeability of danger can only be assessed, allowing timely remediation, if the hazardous thing (tree) is*

assessed' i.e. without inspecting a tree, one is not in a position to know whether or not it poses a foreseeable danger. This case resulted in the first **£1 million** fine for damages being awarded in relation to the failure of a tree against the Local Authority.

- 2.3 The Director of Resources has advised that if a claim were made, our claim handlers would need to demonstrate that we take 'reasonable' care in terms of inspection, maintenance and record keeping. This is similar to the approved code for dealing with safe memorials and the procedures in place before the recent accident in Grove Road Cemetery.

### **3.0 The Current System at HBC**

- 3.1 Prior to 1999 there was no pro-active tree inspection regime in place. Issues were dealt with as and when they arose and there was the likelihood that many potential hazards would go unnoticed. Currently, such a system, or lack of one, would be considered negligent. In 1999 a system was developed for the systematic inspection of trees situated beside the highway. The system involved the employment of a student to undertake a tree-by-tree inspection. This was funded by existing resources within the Parks budget. The highway trees within our area of management (Harrogate & Knaresborough) were split into 4 areas with one area being inspected each year. This system should have resulted in each highway tree being inspected once every 4 years, however the inspection programme has been subject to changes dependant upon availability of staff and other high priority works requests.

#### **3.2 Shortcomings in Current System:**

3.2.1 There are a number of shortcomings within the current system. They can be summarised as follows:

- The system does not recognise different levels of risk e.g. Large, ageing trees overhanging busy town centre streets are inspected as periodically as smaller trees in quiet suburban streets.
- The competency of the inspector could have been called into question. The students employed were usually part way through their college courses and were not as such qualified at the time of the inspection. Whilst there is no strict criteria in regard to the level of qualifications / experience necessary, The Arboricultural Association state in their guidance note 'a guide to qualifications and careers in arboriculture' that a level 3 qualification may be suitable for a 'tree survey assistant'.
- The current system is entirely dependent on funding from the existing 'external contractors' budget. This budget is drawn upon for all other tree related contracts and has little flexibility for such a project. Currently standing at just 17K, other demands on these funds have resulted in the postponement of the survey last year and allowed only partial completion this year.

- The current system only encompasses the trees growing beside the highway in Harrogate & Knaresborough. There are many thousand more trees situated on Harrogate Borough Council land that do not receive any systematic inspection. These trees, which are located in Parks, Open Spaces, Housing Gardens, Cemeteries and Woodlands, could pose a potential, foreseeable risk to members of the public. The Council therefore has a duty to maintain them in a safe condition. As the judge in the '*Chapman v Barking & Dagenham Council*' case noted that the danger can only be assessed if the hazardous tree itself is assessed. The Council would not be able to defend itself against claims of negligence in the event of such a failure.

### 3.3 Recent Cases

- 3.3.1 In order to highlight the apparent shortcomings of the current system, a recent incident is worth considering (Photographs taken at the time can be seen in **Appendix 1**).
- 3.3.2 In October this year, a large limb of an Ash tree, situated on Council Housing managed land, collapsed on top of a car. The limb smashed through the sunroof and buckled the passenger seat. The car was written off. Thankfully the car was parked at the time and nobody was present. As far as I am aware, there are no records of the tree ever being inspected yet there were obvious indicators in terms of decay that would have highlighted its condition had an inspection taken place.
- 3.3.3 A recent case that hit the headlines involving a Local Authority involved Birmingham City Council. In 2002 the Council were fined £150,000 for breaching section 3(1) of the Health and Safety at Work Act after three people were killed by a falling tree. The Council were also ordered to pay £56,000 in costs and may now face civil action from the families of those who died. A news item regarding the case is documented in **Appendix 2**.
- 3.3.4 This case is included in the 'National Tree Fatality Database'. A database listing deaths and serious injuries caused by trees between 1998 to 2003. A table showing these figures is shown in **Appendix 3**.
- 3.3.5 ***At a recent conference dedicated to this issue it was stated that since 2002, trees have killed and injured more people than any other field of Local Authority responsibility.***

## 4.0 The Defendable System Explained

### 4.1 Sources of information

#### 4.1.1 The proposed system is based on numerous sources of information including:

- Current published literature and guidelines

- Seminars by national and international Arboricultural Associations
- Training and information from the council's Highways Dept. and current insurer, St Paul's.

4.1.2 A list of these sources can be found in the Bibliography on page 15.

## 4.2 Regularity of Inspections

4.2.1 A reasonable cycle for inspection is largely dependent on a number of factors including the size of the tree, its species, age, health, structure and its potential target should it fail. My research of the available literature has indicated that the maximum reasonable period between inspections should be 5 years. This figure is also taken from the *Trunk Road Maintenance Manual* (1999). As the perceived risk factor increases the period between inspections should decrease. It is generally accepted (and recommended in the *Trunk Road Maintenance Manual*) that a mature tree beside a busy road should be inspected annually. It is therefore possible to categorise each site by carrying out a general risk assessment.

## 4.3 Risk Assessment / Prioritising

4.3.1 The assessment of tree risk is made up of the following three components and a Current Risk Matrix and Projected Risk Matrix, based on the risk associated with not having a 'Defendable Tree Risk Management System' in place as opposed to having one in place are outlined at **Appendix 5**:

1. The likelihood of failure of the tree or part of it
2. The 'value' of the targets present (persons, property etc)
3. The severity of impact should failure occur

4.3.2 Taking these points into consideration whilst using the parameters given in 4.2, it is possible to categorise the councils' tree stock into different priority levels. The system that has been developed is as follows:

- ty 1: way trees in busy areas e.g. town centre, trunk roads
- ty 2: way trees on secondary, residential roads. Trees on housing land. Trees in high use parks, cemeteries and high use areas of woodland.
- ty 3: in low use areas of parks and public open spaces
- ty 4: in woodlands away from public use areas

4.3.3 The format of the inspection itself also reflects the level of risk whilst considering the time and resources. Inspecting and detailing every individual tree within a woodland or large park would be a massive undertaking with actual costs far outweighing potential benefits. The current industry thinking suggests that existing potential hazards in such areas could be assessed adequately in a less comprehensive format. The survey will use the following two inspection formats:

Format 1: A thorough ground based survey of individual trees (including identification tags) for all Priority 1 & 2 trees.

Format 2: A basic ground based survey of all trees within a certain area of a site (each would be individually inspected but not tagged or individually identified on the survey sheet). A record stating that 'all trees within the group' had been assessed would be made. All trees requiring remedial work would be identified on a map and schedule. This would be used on some priority 2 trees (non highway) and all priority 3 & 4 trees.

#### 4.4 Size of trees to be inspected

4.4.1 Research from the United States from documented tree failures has established that most failures occur in trees with a trunk diameter greater than 15cm. Most municipal authorities only include trees of a greater size within their inspection regimes. This would appear to be a reasonable and straightforward means of identifying which trees to include in a defensible system. I would suggest that even the trees that have not yet reached this size would also be viewed in a cursory way during the inspection programme and any particular defects would be identified.

#### 4.5 The Inspector

4.5.1 It is true to say that the information gained during an inspection is only as good as the inspector. Another saying is 'garbage in, garbage out'. It is important therefore that the competence of the inspector is of a high enough standard to withstand scrutiny potentially in a court of law. As mentioned in paragraph 3.1 previous inspections have relied upon the knowledge of students who had yet to complete their qualifications and may have had limited experience in recognising defects in trees. The Arboricultural Association have developed a guideline for qualifications in Arboriculture that states that a level 3 qualification in Arboriculture may be suitable for a 'Tree Survey Assistant'.

#### 4.6 Carrying out Identified Works

4.6.1 The validity of this system is wholly dependent upon the identified remedial works being undertaken within the recommended timeframe. To ignore a hazard or not deal with it within a reasonable period of time once it has been identified would be grossly negligent. It is therefore essential that the system incorporates a clear follow-on procedure that starts at the inspection, leads on to the remedial work then on to a confirmation that the hazard has been reasonably dealt with before returning to the next inspection date. In order for this to happen, it is essential that the necessary resources are available for the work to be undertaken. This is likely to lead to a number of changes in the current system of work scheduling. The current schedule of works is a combination of reactive works in regard to general enquiries

and pre-planned street tree works identified by the existing survey. In order for a defensible tree risk management plan to function within existing operational resources, I would recommend that the following systematic approach be implemented:

- All work recommended by the inspection system are completed within the recommended timeframe if at all possible.
- Pro-active work e.g. street tree maintenance (usually carried out on a street by street basis), is second in priority as it is seen as a useful mechanism for reducing large numbers of complaints whilst minimising the potential for failure in the trees that are considered the highest risk. Other works that have time limits on them such as woodland thinning works may also fall into this category.
- All other work e.g. general enquiries for work not considered necessary for safety reasons could be carried out when and if resources allow.

4.6.2 There can be no argument that public safety is the primary responsibility when considering the management of the council's tree stock. Although this system may have an effect on current resource allocation, I believe such a priority-based system is essential for a fair and legally defensible policy.

#### 4.7 Record Keeping

4.7.1 When the council receives a claim for damages it is important to know the history of previous inspections and any work carried out. It is therefore essential that clear concise records are kept of all inspections, recommendations, subsequent works and dates for re-inspections. There are numerous data capture tools and software packages available that will greatly reduce paperwork, speed up downloading and allow easy access to existing records. It is envisaged that a system compatible with ArcView, the council's new Geographical Information System (GIS) should be purchased to allow the system to function efficiently.

#### 4.8 Failure Log

4.8.1 A failure log will be included as part of the system. It is important to record events as soon as practicable after they occur. Such information is important for identifying the cause of the failure and can help in prevention of similar incidents in future. The log will be updated after all storm occurrences and other events such as one off failures or incidents involving trees.

#### 4.9 Review & Audit

4.9.1 A full review of the system by an independent and suitably qualified person should be carried out after one year of its implementation. This review should assess the system critically and report its findings to the head of the section. If the review recommends fundamental changes to the system then a further report will be taken to Corporate Management



Team (CMT).

## 5.0 Quantified Tree Risk Assessment of Individual or Groups of Trees

5.1 In addition to the proposed defensible system, HBC currently uses a system known as Quantified Tree Risk Assessment (QTRA). This is a system that we pay a license for, which allows the user to quantify any associated risk or probability of whole or partial tree failure of any tree(s) under the management of the Harrogate Borough Council.

5.2 QTRA allows for most tree defects to be identified and assessed by a skilled arboricultural inspector. There has never previously been any evaluation methodology that enables the inspector to quantify risk in this way, where risks associated with the retention of trees can be compared with a broadly acceptable level of risk.

5.3 If absolute safety from tree failure were achievable, society would almost certainly find the cost in terms of tree losses unacceptable. In this regard, Paine (1971) suggests that:

*'It is high time that we admit we cannot achieve complete safety – and still provide a desirable product – any more than industry can'.*

5.4 To manage old trees and their younger successors responsibly with regards to both safety and associated tree values, there is a need to quantify tree failure hazards and any associated risk so that the risk can be kept within acceptable or reasonable limits.

5.5 The Quantified Tree Risk Assessment system not only significantly reduces the influence of assessor subjectivity upon the outcome of the risk assessment, it also applies structure to the assessment procedure, requiring detailed assessment of the tree only where there is a significant likelihood of unacceptable risk. The Quantified Tree Risk Assessment is an expansion of concepts proposed by Paine (1971), Helliwell (1990 & 1991) and Matheny and Clark (1994), with the software package being compatible with the computer management systems outlined within this report.

5.6 For members of the public who have a risk imposed on them 'in the wider interest' HSE (Health and Safety Executive) would set this limit at **1/10,000** per annum (Health and Safety Executive 1996).

5.7 The Risk of Harm is quantified by using the following formula:

<b>Probability Ratio:</b>	Target Value	x	Impact Potential	x	Probability of Failure	=	<b>Risk of Harm</b>
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## 6.0 The Proposed System for HBC

6.1 Highway Trees

6.1.2 All of the trees classified as highway trees and currently managed by HBC have been divided into two categories of 'priority' These are

identified as follows (Inspection Forms & Key can be seen in **Appendix 4**):

Included	y	ction regime	ction Form	Number
es (over minimum size*) situated beside the highway in Harrogate & Knaresborough		es to receive a detailed inspection annually	ES	No STRM 1M
aining trees (over minimum size) not included in Priority 1		es to receive a detailed inspection once every 3 years	ES	No STRM 2M

## 6.2 Trees on Council Housing Land

Included	y	ction Regime	ction Form	Number
es (over minimum size) situated on land managed by Housing Dept		es to receive general inspection once every 3 years	YES	ote 6.21

6.2.1 Each individual housing site or area (e.g. Dene Park) will have an individual map. Trees identified as requiring remedial work will be marked on the map and detailed on the inspection form.

## 6.3 Parks & Open Spaces

Included	y	ction Regime	ction Form	No
es (over minimum size) in high use parks & open spaces (see appendix for list)		inspected once every 3 years	YES	ote 6.21
es (over minimum size) in low use parks & open spaces (see appendix for list)		inspected once every 4 years	YES	ote 6.21

## 6.4 Cemeteries

Included	y	ction Regime	ction Form	No
es (over minimum size) in council managed Cemeteries		inspected once every 3 years	YES	ote 6.21

## 6.5 Woodlands

Included	y	ction regime	ction form	No
es (over minimum size) situated within falling distance of public areas inc highways, footpaths and recreation areas		inspected once every 3 years	YES	ote 6.21
es (over minimum size) situated away from public use areas		ral inspection of areas once every 5 years	YES	ote 6.21

**Note:** In certain situations, large trees situated within parks, woodlands or growing beside busy highways within cemetery boundaries should be inspected on a more regular basis. This should be determined during their first cycle of inspections and such trees would be included in the regime for 'Highways' (see 6.1).

## **7.0 Existing Resources**

### **7.1 Staff**

7.1.1 The arboricultural section currently operates with 5 full time staff. There are two office-based staff who manage all tree related issues within the district. The remaining three staff carry out the field work and are based at the central nursery. The current demands on officer time has resulted in there being little time for inspections beyond responding to customer enquiries. The field based team of three are also considered to be fully committed in terms of current work loads. In order for the work generated by this system to be completed on time, the minimum number of operational staff must remain at least at the current level. At the time of writing, it is envisaged that the existing number of operational staff will be able to cover the work generated by this system with alterations to the current prioritising of works (pro-active as opposed to re-active). This issue will need to be re-assessed once the system has been in operation for a period of time. If necessary a follow up report will be brought to CMT on this issue.

### **7.2 Budgets**

7.2.1 Existing budget resources available for such a system are inadequate. As mentioned in paragraph 3.1 the only existing funds available for the current inspection regime are entirely dependent on other essential contract work not arising. Even when the funds have been available, the coverage of the inspections have been inadequate and the expertise of the inspector may be called into question.

## **8.0 Financial Implications**

### **8.1 Staff Resources**

8.1.1 With knowledge of the location and rough numbers of existing trees on council owned and managed land, I have divided the areas up with consideration for potential risk being the primary factor. Based on the system detailed in sections 4.0 & 6.0, I have estimated the time necessary for undertaking the inspections as follows:

- Highways – 80 days per year (based on trials undertaken in 2004)
- Parks & Open spaces – 55 days (based on inspection of 1/3 to 1/4 of sites per year)
- Housing – 70 days (based on inspection of 1/3 of sites per year)

- Cemeteries – 5 days per year
- Woodlands – 10 days per year

8.1.2 This system will allow for **all** trees to be inspected at least once every 5-year period. This is the generally accepted maximum cyclic period for the inspection of trees owned by Local Authorities. This figure is taken from the *Trunk Road Maintenance Manual* (1999). This workload roughly equates to a single full time position as a 'Tree Inspector'. I would recommend that the salary for such a position, after taking the existing structure into consideration, should be set at Scale 4 (up to £21,910 for the 2005/06 financial period), There will also be an additional cost for advertising the position of approximately £1000 plus essential car user allowance costs of up to £1974 per annum (£990 per annum lump sum + £984 mileage costs based on the user driving a vehicle over 1200cc and driving 2400 miles per annum).

## 8.2 I.T. Costs

8.2.1 With consideration for efficiency in data capture, record keeping and continuity of the system, a suitable computer based software package is recommended. There are numerous 'tree based' systems on the market that can be adapted to fit our specific requirements. The Arboricultural section has carried out research in this area looking at packages that are compatible with the existing IT systems allowing GIS, GPS (Geographical Positioning System) and digital image technology. I would estimate that a suitable package such as 'Treewise' including a hand held data capture device will have an initial cost of approx £7K with an annual service / update cost of approx £500. The head of Information, Technology and Development has indicated that he has circulated a copy of the report within ITD (on the 27/09/2005) and will let me have their comments in due course. However, the Director of Resources has confirmed that the one-off software purchase costs can be met from the IT reserve.

## 8.3 Costs

8.3.1 I have calculated that the total cost of this system for its first year will be in the region of £30,130 falling to around £24,380 in subsequent years.

	<b>Total First Year</b>	<b>Annual On-Going Costs</b>
Ongoing Costs	£	£
<b>New Post – Tree Inspector</b>		
• Advertising the post:	1,000	
• Salary* (2005/06):	19,656	21,910
• Essential Car User Allowance:	1,974	1,974
<b>Software</b>		
• IT: Software Service/update:	500	500
<b>Total recurring Costs:</b>	<b>23,130</b>	<b>24,384</b>

<b>One-off software purchase costs</b>	<b>7,000</b>	
	<b>30,130</b>	<b>24,384</b>

\* Costs are shown at 2005/06 levels. First year salary costs are shown at bottom of grade (Scale 4). Ongoing costs shown at top of grade.

8.3.2 I believe that it is important to place these figures into context by considering that the probable claim from the one limb failing from one tree (as noted in the 'recent case') may cost the council or its insurers around £20K. **It may also be worth noting that the Health & Safety Executive places an estimated value on one person's life at approximately £1 million.**

#### 8.4 Funding Proposals

8.4.1 Implementing a strategic tree risk management system will have benefits for a number of departments within the council. Primarily there are significant tree populations on land managed by DCS (Parks & Housing Land) and DDS. The current operational systems have numerous flaws that could potentially leave the council open to claims of negligence and subsequent financial loss.

8.4.2 Parks & Housing have recently undergone a restructure and are now contained within the Department of Community Services (DCS). As such, the calculations are based on their funding arrangements remaining separate for the time being. However, these figures could be combined to reflect a single funding figure at a later date.

8.4.3 It is only fair to expect that those departments who stand to benefit from the system should share in the necessary funding required to implement it. By dividing the expected costs of running the system by the percentage of time spent on the trees from each department we arrive at the following figures.

Department	Responsible for trees in:	Days	As a %	Yearly Cost (£)	Total Cost thereafter (£)
DCS (DCS)	Woodlands/ Parks	70	32%	7,420	7,803
DCS (DCS)*	Housing land	70	32%	7,420	7,803
	Streets/Highways/Urban areas	80	36%	8,326	8,778
<b>TOTAL:</b>				<b>£23,130</b>	<b>£24,384</b>

\* Chargeable to Housing Revenue Account.

**Breakdown per Department for 1<sup>st</sup> Year Costs**

**S (DCS)**

It is proposed that 50% of the costs (£3,902) be met from the Arboricultural budget provision for student placement within the 'external contractors' revenue budget (£17,000).

If 100% of costs had to be funded from within the existing budgets this would prove very problematic and involve service cut backs as the budget situation within Parks is now proving very difficult to balance and provide the same level of service. This is due to there being no increases in budget for several years on areas such as external contractors, materials and seasonal and agency staff. In addition, the service is having to absorb other costs outside of its control. The effect of this is that the service is gradually being eroded year on year and standards are beginning to slip. This is going to be further exacerbated next year with a large increase in the cost for agency staff due to the agencies having to raise their charge to take account of the minimum wage legislation.

In addition the budget lines for items such as seating, bins, resurfacing of footpaths have been reduced so much over the years there are not the funds available to meet the maintenance requirements. To give an example, the budget for maintenance of footpaths is £3,000. When you consider the many miles of footpaths we are responsible for you can see the difficulties we are encountering.

Consequently within the general parks budgets there is no obvious area where the budgets can be cut further to fund this scheme. This may change once the work on "Resource Reallocation" has been completed and decisions taken on whether to reduce standards or cut parts of the service but until that work is undertaken it is very difficult to identify opportunities to make saving without affecting permanent staff employment.

Areas which could be considered include grants to outside agencies such as the Parish's. These include grass-cutting grants (budget £12,760) and grants towards the provision of parish play areas (budget £15,000). However in the past there has been a reluctance to reduce these.

In addition it could be possible to reduce further the arboricultural external contractors budget line (£17,000) but this would mean there were greatly reduced resources available should there be a need to employ contractors after or during a storm etc.

Finally other areas that could be considered include:

Security (Reduce the hours of the ranger) (£16,980).

Payment to external contractors within the playground budget (£56,480).

Grounds Maintenance Seasonals (£72,790 - this will lead to a reduction in standards during the summer months).

Reduction in level of provision of games facilities in Parks – i.e. tennis, pitch & putt etc.

<b>PLANTING (DCS)</b>	These costs can be met from the existing Housing Revenue Account Horticultural Maintenance budget. If inspections and/or reactive requests for work mean the budget is exceeded this will be met from within HRA possibly from offsetting savings from within the Horticultural Maintenance budget.
<b>DEVELOPMENT SERVICES</b>	funded either from the NYCC Highway Maintenance Budget or as a growth item (refer to paragraphs 8.5, 8.6 & 8.7 of this report).

8.4.4 The following table presents the 'worst-case' potential budget implication, based on staff salary calculated at top of grade.

<b>Budget</b>	<b>Cost (£)</b>	<b>Potential Budget Growth (£)</b>
GENERAL FUND		
Parks (DCS)	7,803	3,902
Highways (DDS)	8,778	8,778
<b>TOTAL</b>	<b>16,581</b>	<b>12,680*</b>

\* These costs may be reduced by any offsetting savings agreed within the Parks & Open Spaces budget and/or any additional income offered by North Yorkshire County Council.

Housing costs are to be met from within existing Housing Revenue Account budgets.

8.5 It has been suggested by the Head of Transport, Department of Development Services, that due to the lack of funding from NYCC for the survey of highway trees within Harrogate Borough, the costs for funding the highway portion of the survey could be dealt with as a growth item. The Head of Transport has stated:

8.5.1 *'I'm not sure of how this can be progressed. As you may know our highway maintenance budget has already been reduced by 1.25% in real terms as part of NYCC's Gershon savings. This amounts to about £32k and we can look forward to a similar reduction in future years. £10k on top of this will make life very difficult. NYCC have said that they will not give us any extra funding for the surveys. As I see it the tree survey work is important and it ought to be done. However, funding it from highway maintenance means we will have less to spend on works identified from safety inspections. This will increase our liabilities in terms of 'trips and slips' claims. I've no alternative suggestions to make. Legally, it cannot be funded from on-street income. Should it be dealt with as a growth item or, since it will reduce our insurance liabilities, from the insurance reserve?'*

8.6 The Chief Engineer, Highways, HBC has further spoken to NYCC on this issue. His response is outlined below:



8.6.1 *'I've spoken to Alastair McNicol at NYCC, **RE:** the subject of tree inspections. He has confirmed that the County will be formulating a County wide tree survey policy in the near future. Until that is prepared and a uniform approach agreed for the whole of the County, he is reluctant to allow us to enter into an independent tree survey regime funded from the Basic Maintenance budget.'*

Further, following a telephone conversation between the Chief Engineer and myself on the 16<sup>th</sup> September 2005, the Chief Engineer stated;

*'I have spoken to NYCC, who have stated that it is envisaged that their County wide tree survey Policy will be up and running by the 1<sup>st</sup> April 2006. **However, it was suggested that the highway inspector appointed by NYCC to undertake the tree inspections would not have any formal qualifications in Arboriculture'**.*

8.7 However, it has been stated by the Council's Principal Conveyancer that as 'agents' to NYCC, Harrogate Borough Council would be liable for any tree related injuries or claims resulting from whole or partial tree failure of any of its highway or street trees. The Principal Conveyancer has stated:

8.7.1 *'I am concerned that having identified the shortcomings we cannot simply ignore these just because NYCC choose to . If we are responsible for tree maintenance on their behalf we will have a degree of responsibility even if we tell them that we are not doing the inspections...'*

Further;

*'.....if an accident were to happen, HBC would no doubt be called into question particularly as it has identified the shortcomings and if it were aware that NYCC were not doing their bit.'*

## 9.0 Conclusions

9.1 Trees, by their very nature can present a hazard to people and property. Trees kill and injure more people than any other area of Local Authority responsibility. Many potential hazards can be detected by recognisable defects allowing remedial work to remove the hazard. Harrogate Borough Council, as managers of a large tree stock, have a 'Duty of Care' to protect its citizens and their property from foreseeable hazards. Failure to do so may lead to claims of negligence.

9.2 Tree defects can only be assessed through inspection by competent, industry trained and qualified arborists. It has been suggested that the person appointed by NYCC to undertake the highway tree survey would not carry any formal qualification in Arboriculture (*paragraph 8.6.1*). In my opinion this would be an unacceptable solution to the current issue in the form of being both uneconomical and undermining the professionalism of the arboricultural industry. Both my assistant and myself, who carry professional and industry related qualifications and attach over 15 years experience from within the industry, would be reluctant to accept the recommendations for any tree works from a

non-industry surveyor without first inspecting the subject tree. As such, I anticipate that quite a significant amount of our time would be taken up re-inspecting surveyed trees, which I feel would defeat the whole object of the survey programme.

- 9.3 Since beginning my appointment with Harrogate Borough Council (April 2005), I have undertaken a number of site visits where, by pure chance only, 3 'dangerous' trees have been identified that would not normally have been picked up on the current tree survey programme or within what would be thought of as being a reasonable period of time. If these trees had not been identified this year, I would not be confident in stating that they would have stayed standing upright for a further 12 months. If projections are made based on the number of 'dangerous' trees I have identified (3 trees out of approx. 100 site visits) out of the number of trees under HBC management (approximately 8000 in total), I would estimate that there may be as many as **240** 'dangerous' trees located with the HBC boundaries. It would be fair to assume that some of these 'dangerous' trees will be located within 'High Target' areas.
- 9.4 The current tree risk management system operated by Harrogate Borough Council is considered fragmented and open to claims of negligence. The vast majority of its tree stock receives no systematic inspection. In order to offer reasonable protection to the public, a more comprehensive management system is required. The basis for such a system is detailed in this report.
- 9.5 Existing resources inhibit the implementation of a defensible tree risk management system. Further, the financial implications of implementing this system are considered minimal when compared to potential injury related claims resulting from tree failure.
- 9.6 The strategic tree risk management system will result in a more pro-active tree service delivery for the Harrogate Borough Council by helping to free up time that is currently spent on re-active tree requests and site visits, allowing for more time to be dedicated to other areas. This would be in line with the Council's Best Value practice on providing an economic, efficient and effective service delivery.

## **10.0 Recommendations**

- 10.1 It is recommended that a strategic tree risk management system is put in place as soon as is practical.
- 10.2 The system should be comprehensive in its cover of the existing council tree stock and be seen to provide reasonable protection for anyone who may be at risk.
- 10.3 It is recommended that in order for such a system to be implemented and with consideration for existing resources, a full time position is created for a suitably industry qualified and experienced 'Tree Inspector'.
- 10.4 The funding necessary to implement and maintain the system should be shared between the departments who manage the land where the trees exist.
- 10.5 Once in place, the system should be monitored and receive 'peer' review in

order to maintain its effectiveness.

## **11.0 Bibliography**

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## **12.0 Appendices**

### **Appendix 1**

Photographic record of one recent tree failure (Oct. 2004) involving a tree growing on Harrogate Borough Council land.

### **Appendix 2**

BBC News report of a case involving Birmingham City Council.

### **Appendix 3**

National Tree Fatality Database: Deaths & Injuries, England 1998 to 2003.

### **Appendix 4**

Tree inspection forms and key.

### **Appendix 5**

Risk Matrix: Current Status & Projections.

## Appendix 1

### Photographic record of one recent tree failure (Oct. 2004) involving a tree growing on Harrogate Borough Council housing land.

#### Picture 1:

Showing large limb that failed from an Ash tree, which was located on land owned by DHH.



#### Picture 2:

Showing extensive damage to a vehicle, including the buckling of the passenger seat, as a direct result of the limb failure.



#### Picture 3:

Showing a fungal bracket known as 'Dryads Saddle', responsible for the failure of the tree limb.

This bracket would have been identified during an on-going survey programme and the tree would have been removed as a high priority works request.



## **Appendix 2**

### **BBC News Report 'Archive'**

**16th. July 2002**

#### **COUNCIL FINED OVER TREE DEATHS**

Birmingham City Council has been fined £150,000 for breaching health and safety laws after three people were crushed to death by a falling tree. Kenneth Davis, 56, his 79-year-old mother Ellen, and postman Alan Poole, 59, died when the 15-tonne ash tree fell on their vehicles in Kings Heath. Birmingham Crown Court also ordered the council to pay costs of £56,000.

## Appendix 3

### National Tree Fatality Database: Deaths (37) & Injuries, England, January 1998-2003

#### 1998 (3)

- Essex: 1 person killed, 1 seriously injured
- Devon: 1 person killed
- Cornwall: 1 person killed

#### 1999 (6)

- Bedford: young boy seriously injured
- Stoke: 1 person killed
- M53: 1 person killed, several injured, 1 seriously
- Birmingham: 3 killed

#### 2000(10)

- Leicestershire: 1 person seriously injured
- Northamptonshire: young boy killed
- Surrey: 2 people killed
- Hampshire: 2 people killed, 1 seriously injured
- Somerset: 1 person killed
- West Country: 2 people killed, 1 seriously injured
- Shropshire: 2 killed, 1 seriously injured
- Essex: 1 person seriously injured

#### 2001 (4)

- Staffordshire: 4 people killed
- Berkshire: motorist seriously injured

#### 2002 (11)

- Yorkshire: 2 people killed
- Norfolk: young boy killed
- Norfolk: man killed in his garden (tree on verge)
- Suffolk: young boy killed in wheelchair
- Shropshire: 11 year old girl killed, mother and sister seriously injured
- Oxford: woman killed in car, 2 younger sisters injured
- Brecon: man killed in car
- Somerset: man killed on motor cycle
- Berkshire: taxi driver seriously injured
- Shipton and Manchester: 2 people killed after being trapped in their cars by falling trees
- Kent: Man and baby seriously injured in van by falling tree
- South London: couple killed in car by falling branch

#### 2003 (2)

- Surrey: school girl killed, 5 other injured by wind thrown trees
- Richmond: young boy killed by large, falling branch

## Appendix 4

### Tree Survey Forms & Key

<b>Inspected By</b>		PC AG <u>PT</u>				<b>Date</b> 26 / 01 / 2005						
<b>Owner</b>		<u>Highway</u> Parks Open-Space Housing										
<b>Tree No:</b>			<b>Tag No: 4573</b>									
<b>Species</b>		Sycamore										
<b>Location /Street Address</b>		O/S 26 Leeds Road, Harrogate										
<b>Height:</b> 15 M			<b>DBH:</b> 70 CM				<b>Spread:</b> 12 M					
<b>Size Band</b>		S1 (0-5m)		S2 (5-10m)		<u>S3 (10-15m)</u>		S4 (15-20m)		S5 (20m+)		
<b>Condition</b>		Dead		Poor		Moderate		Good ✓		Excellent		
<b>Age Class</b>		Young		Semi Mature				Mature ✓		Over Mature/ Senescent		
<b>Pollarded</b>		Y/N		<b>Estimated Time Required for Works</b> 2 Hrs								
<b>Base type</b>		Tree pit		Soil		Tarmac		✓ Paving		Concrete		
<b>Damage caused</b>		Pavement		Road		Kerbs		Wall				
		Council House		Private House		Tree Pit		N/A ✓				
<b>Action</b>		FR	CL-B	CS	CH	SS	PO	FP	EP	OHB	CL	CT
		CB	CR	CC	RP	<u>DW</u>	CI	SL	PH	RS	RT	AT
		CL-F	CL-V	WT		MW	NA	MO	RE	CL-SL		CT-CW
<b>ULE</b>		>10	10+	20+	✓ 30+	40+	50+	60+	80+	100+		
<b>Works Priority:</b>		<b>URGENT</b>		<b>HIGH</b> ✓		<b>MEDIUM</b>		<b>LOW</b>		<b>NO ACTION</b>		
<b>WHY</b>		Maintenance Fell		Maintenance Prune		Safety Fell		Safety Prune ✓		Legal/ Nuisance		
<b>Programme</b>		Spring Summer Autumn Winter		2005 2005 ✓ 2005 2004/05			2006 2006 2006 2006			2007 2007 2007 2007		
<b>Area Priority:</b>		<b>Priority 1</b> ✓			<b>Priority 2</b>			<b>Priority 3</b>		<b>Priority 4</b>		

<b>ROOT:</b>
<b>STEM:</b> Vehicle damage at 0.5 metres.
<b>CROWN:</b> Deadwood over highway.



**Woodland / Parks Tree Survey Sheet**

**Site: Pinewoods Woodland**

**Date of Inspection: 26/01/2005**

1 Tree/Tag No.	2 Species	3 Age	4 Cond.	5 Height (M)	6 Crown Width (M)	7 DBH (cm)	8 Comments	9 Maintenance / Recommendations	10 Priority
T1	Oak	M	G	13	9	50	Large dead branch over footpath. Tree marked with orange cross.	Remove Deadwood	H
T2	Beech	SM	D	10	7	35	Dead tree located adjacent to seating area	Fell	U
<b>Inspected By:</b> PC AG <u>PT</u>									

## Key to Tree Survey Forms

<b>FR</b>	Fell, remove	<b>CT</b>	Crown Thin by...%	<b>RS</b>	Remove stake	<b>CL</b>	Crown Lift
<b>CS</b>	Chip Stump	<b>CB</b>	Crown Balance	<b>RT</b>	Remove tie	<b>CT-CW</b>	Crown Thin (CABLE/WIRES)
<b>CH</b>	Chemical Stump treatment	<b>CR</b>	Crown Reduce	<b>MO</b>	Monitor	<b>CL-F</b>	Crown Lift (FOOTPATHS)
<b>PO</b>	Pollard at...metres	<b>CC</b>	Crown Clean	<b>PH</b>	Prune back from phone wires	<b>CL-V</b>	Crown Lift (VEHICLES)
<b>FP</b>	Formative prune	<b>RP</b>	Replacement Planting	<b>AT</b>	Adjust Stake and tie	<b>CL-SL</b>	Crown Lift (STREET LAMPS)
<b>EP</b>	Remove epicormics	<b>DW</b>	Remove deadwood	<b>WT</b>	Water tree	<b>CL-B</b>	Crown Lift (BUILDINGS)
<b>OHB</b>	Prune back overhanging branches	<b>CI</b>	Cavity Inspection	<b>MW</b>	Miscellaneous Works as specified		
<b>SL</b>	Prune back from Street Light	<b>RE</b>	Re-inspect	<b>NA</b>	No action		

### Age Range

Age Range refers to the physiological maturity of the tree.

Age Range is rated according to the following categories:

Young	< 20% of the trees estimated expected life-span in its location.
Semi Mature	20% – 50% of the trees estimated expected life-span in its location.
Mature	51% - 80% of the trees estimated expected life-span in its location.
Over-mature/ Senescent	> 80% of the trees estimated expected life-span in its location.

### Condition

Condition is an amalgamation of health and structure and provides an overall rating for each tree. For example, a tree with a good health rating and a poor structure rating would be accorded a condition rating of Fair or Poor.

Condition is rated according to the following categories:

Good/Excellent	Sound tree in good health
Moderate	Sound tree requiring only minor remedial work or in early stress
Poor	A tree requiring major remedial works or suffering excessive stress, but where the cost of remedial works

may not be justified by the life span and contribution of the tree.

Dead                      Diseased, Dying, Dead or Dangerous

***Priority***

Priority pertains to the time frame within which remedial works should be undertaken.  
*Priority is rated according to the following categories:*

N/A	Remedial works are not required
Low	Remedial works should be carried out within 36 months
Medium	Remedial works should be carried out within 24 months
High	Remedial works should be carried out within 12 months
Urgent	Remedial works should be carried out as soon as possible

## Appendix 5

### Methodology for Determining Risk Score Without the Defendable Tree Risk Management System in Place

Decision	Risk Ref	Description of risk	Severity	Frequency	Exposure	Total Risk Score	Consequences	Action Taken (controls currently in place)
Do Nothing - retain existing arrangements	O1	Fail to recognise different levels of risk and reflect in inspection programme (3.1.1)	10	8		18	Large ageing trees in busy town centres inspected as often as smaller trees in quiet suburban areas.	Develop and implement a defendable tree risk management system.
Adopt Defendable System	D1		6	3		9		
Do Nothing - retain existing arrangements	O2	Inspections carried out by under qualified officer (3.1.1)	8	7		15	Increases potential for not identifying problems, at all or in early stages.	Develop and implement a defendable tree risk management system.
Adopt Defendable System	D2		8	3				
Do Nothing - retain existing arrangements	O3	Lack of dedicated funding for inspections (3.1.1)	8	9		17	Postponement and / or partial completion of survey. Some trees remain uninspected. Inspection regime called into question. Ultimately, incident, damage, negligence.	Develop and implement a defendable tree risk management system.
Adopt Defendable System	D3		6	3		9		
Do Nothing - retain existing arrangements	O4	Limited scope: many trees not included in inspection programme (3.1.1)	8	9		17	Council fails in its duty to maintain. Ultimately, incident, damage, claim of negligence.	Develop and implement a defendable tree risk management system.

Adopt Defendable System	D4		8	3	11		
Do Nothing - retain existing arrangements	O5	Landmark case 1998 re foreseeable danger (2.2)	9	10	19	Foreseeable hazard not foreseen. No defence to negligence claim.	Develop and implement a defendable tree risk management system.
Adopt Defendable System	D5		6	3	9		
Do Nothing - retain existing arrangements	O6	A tree with an identifiable defect is not inspected, the defect is not identified and the tree fails.	10	5	15	Loss of life, injury, damage to property. Failed duty of care. No insurance. Negligence (no defence). Significant financial cost. Criminal prosecution.	Develop and implement a defendable tree risk management system.
Adopt Defendable System	D6		6	2	8		

# CORPORATE RISK MANAGEMENT

## RISK MATRIX A:

Current risk categories with no Defendable Tree Risk Management System in place

*Date: Sept. 2005*

<b>LIKELIHOOD (FREQUENCY)</b>	V Likely	10							O5		
		9					O3, O4				
	ProbableHigh	8							O1		
		7					O2				
	UnlikelyLow	6									
		5							O6		
		4									
		3									
		2									
		1									
		1	2	3	4	5	6	7	8	9	10
		Negligible		Marginal		Significant		Critical		Catastrophic	
<b>SEVERITY (IMPACT)</b>											

Green:       Acceptable

Amber:       Tolerable

Red:               Unacceptable

**CORPORATE RISK MANAGEMENT**

**RISK MATRIX B:**

*Projected risk categories with Defendable Tree Risk Management System in place*

**Date: Sept. 2005**

<b>LIKELIHOOD (FREQUENCY)</b>  Unlikely V. Unlikely  Possible High	10					
	9					
	8					
	7					
	6					
	5					
	4					
3				D1, D3 O5	D2, D4	

	2				D6					
	1									
		1	2	3	4	5	6	7	8	9
<p style="text-align: center;">Negligible      Marginal      Significant      Critical      Catastrophic</p> <p><b>SEVERITY (IMPACT)</b></p>										

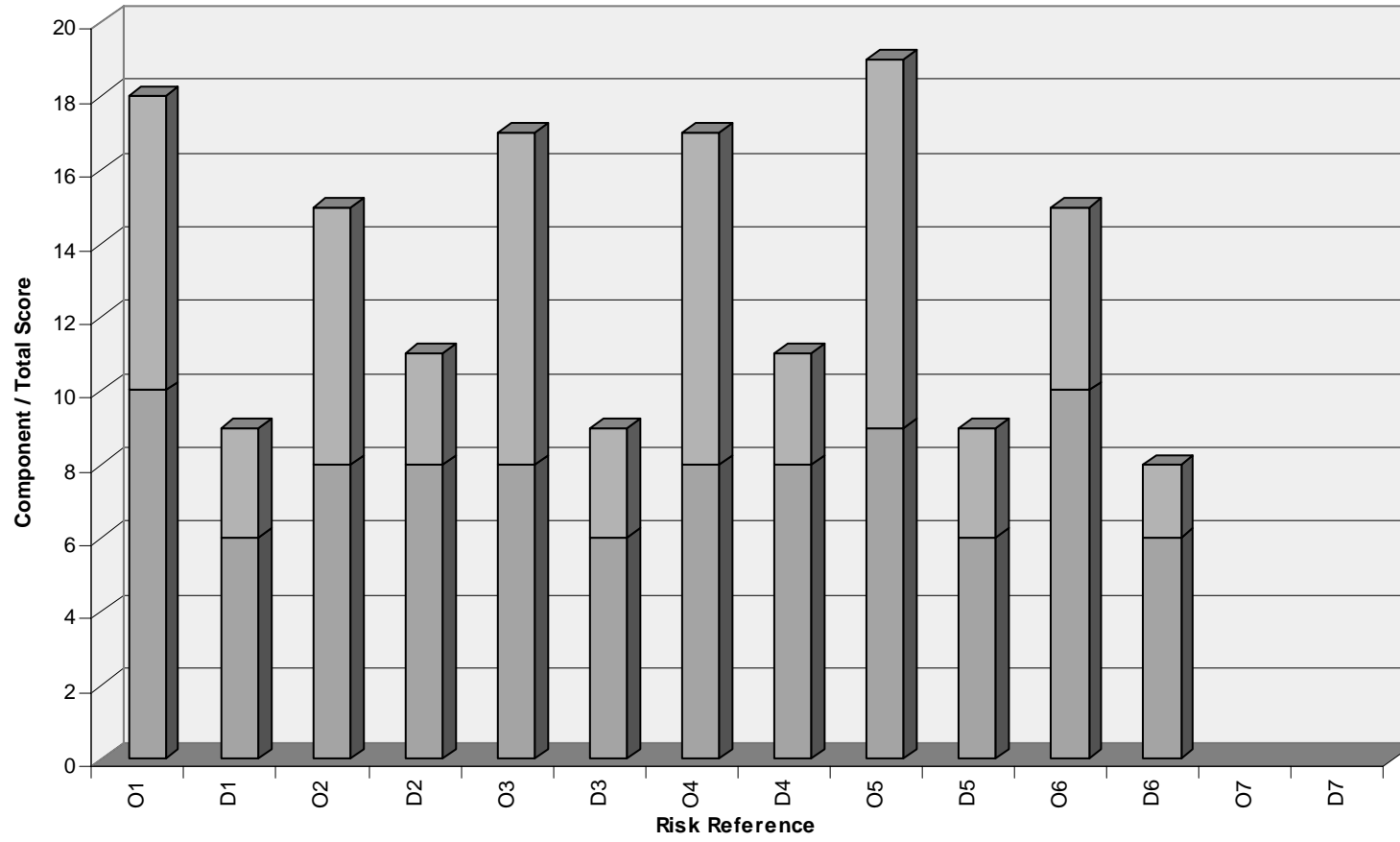
Green:            Acceptable

*Amber:        Tolerable*

Red:            Unacceptable



### Risk Register Defendable Tree Risk Management System



Severity Frequency Exposure