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	Page
Summary	1
Introduction	2
Policy	3
Plan	4
Passive Assessment	5
Active Assessment	6
Risk Reduction Work	7

Appendices

Zones of High Confluence	A1
Drive-by Assessment	A2
Traffic Management Plan	A3
Obvious Tree Risk Features	A4
Summer Branch Drop	A5
What is VALID?	A6

1 Our tree risk-benefit management strategy

At a glance
Why and how we're going to manage the risk from our trees and branches falling

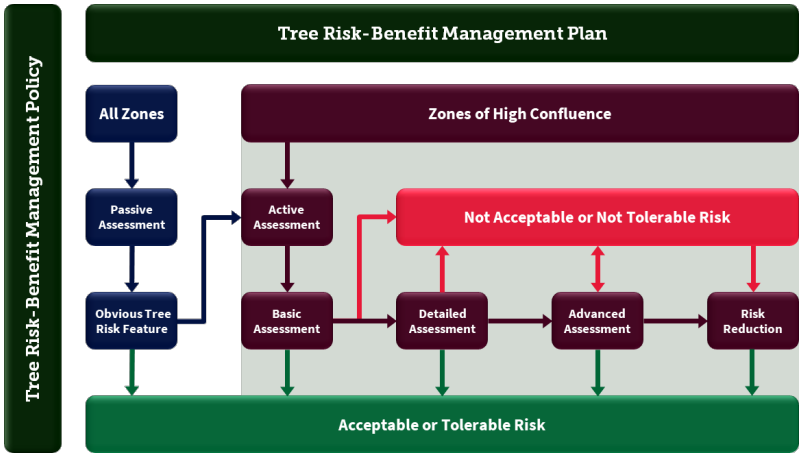
1 This flowchart shows the structure of our Tree Risk-Benefit Management Strategy. Everything follows from the **Policy**. The Policy sets out our position on trees, their benefits, and the risks. In brief, our Policy says;

- Trees give us many benefits that we need
- The overall risk from trees and branches falling is extremely low
- We can't remove the risk entirely. Trees are living structures that sometimes shed branches or fall during severe weather
- We have a duty of care to be reasonable, proportionate, and reasonably practicable when managing the risk
- We're going to manage the risk to an Acceptable or Tolerable level

The **Plan** explains how we'll carry out the Policy. We're going to manage the risk by **Passive Assessment** in all zones of use. And **Active Assessment** in **Zones of High Confluence** (high use and large trees).

The Strategy at a glance

2



1.1 Passive Assessment

Picking up on Obvious Tree Risk Features you can't help but notice

3 Passive Assessment is simply picking up on **Obvious Tree Risk Features** you can't help but notice as you got about your daily routine. Passive Assessment is our most valuable risk management tool. We carry it out in all zones of use, day in day out.

1.2 Active Assessment | Basic > Detailed > Advanced

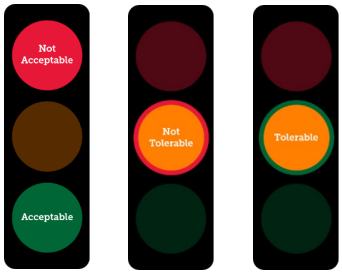
Trained assessors looking to find risks that might not be Acceptable or Tolerable

4 Active Assessment is where we have trained assessors looking for risks that might not be Acceptable or Tolerable. Active Assessment has 3 levels to it that increase in depth of evaluation. The 3 levels are, Basic > Detailed > Advanced. We carry out Active Assessment in Zones of High Confluence every 5 years.

1.3 Risk objectives & Risk ratings

Risk ratings are as easy to understand as traffic lights

5 VALID has applied 'ISO 31000 - Risk Management' and the 'Tolerability of Risk Framework' (ToR) to tree risk-benefit management and assessment, which we've adopted. In ISO risk terms, our 'objectives' are to grow, maintain, and conserve trees because of the many benefits they give us that we need. And, to manage the risk from tree failure to an Acceptable or Tolerable level. We have four easy-to-understand traffic light coloured risk ratings to show how we'll manage the risk.



Red **Not Acceptable** risks will be reduced to an Acceptable level

Amber **Not Tolerable** risks will be reduced to an Acceptable level, but with a lower priority than red Not Acceptable risks

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Green **Acceptable** risks will not be reduced

2 What is a tree risk-benefit management strategy?

This is why and how we're going to manage the risk from our trees and branches falling

6 Trees give us many benefits we need. But, they're natural structures that sometimes fall over or shed branches. This usually happens because of severe weather, or they have an obvious risk feature. This Tree Risk-Benefit Management Strategy explains why and how we're going to manage the risk from our trees and branches falling.

It's written in plain English

7 We've written the Strategy in plain language, using contractions like 'we're', so it's easy to read and understand. We've also looked to cut the waffle. Each section is no longer than one page. The sidebar on the right shows the page number and the title of each section.

The left-hand columns are summary headlines

8 You should be able to make sense of the strategy by just reading the summary headline in the left-hand column. If you want to know more, read the text to the right of the summary.

We'll review every 5 years

9 We're going to review our Strategy in 5 years. In the meantime, we'll keep an eye on how it's being carried out. If we need to make any adjustments before the planned review, we'll record it in the appendices.

If someone is killed or seriously injured by a tree we'll review our Strategy

10 In the extremely unlikely event that a tree kills or seriously injures someone, we'll investigate the accident and review our Strategy. After the review, if we find we can improve the Strategy, we will.

2.1 What's in the strategy?

The Policy sets out our position

11 It begins with the Policy. This is the key document from which everything else follows. The Policy is our position statement that lays out the 'what' and 'why' of the strategy. It explains what the context is, and why we're going to manage the risk of trees and branches falling to an Acceptable or Tolerable level.

The Plan explains how we're going to carry out the Policy

12 The Plan is the 'how'. It describes how we're going to carry out the Policy. All the other sections that come after the Plan are further details, to make it clear what we're going to do about managing the risk.

2.2 If you'd like to know more

13 The following are some of key publications on which we've built this Strategy, and additional information which might interest you.

Tree Benefits
There are plenty and we need them

14 **Trees of all Trades** from Halifax Regional Municipality, Canada, is a great 5 minutes video. It explains many of the benefits urban trees give us in an easy to grasp and entertaining way.

15 The UK's **National Tree Safety Group**'s (NTSG), **Common Sense Risk Management of Trees** has an extensive literature review on page 84.

Tree Risk
The overall risk is extremely low

16 The **NTSG** is the first organisation to publish a nationally recognised approach to tree risk management. **Common Sense Risk Management of Trees** sets out the basic principles for managing tree risk in the public interest. There are several other useful publications on their website. They include the NTSG's Position Statement, and research into the risk of death or injury in the UK.

17 The **Risk and Regulation Advisory Council** was set up to help policy-makers and the public fight the poor handling of public risk in the UK. Its work has ended, but many valuable reports, guides, and tools are available in its archive.

18 The **Tolerability of Risk Framework**, is a key part of our decision making. As is **ISO 31000 - Risk Management**.

19 **Public Safety and Risk Assessment** is a rational analysis of 'health and safety'. It explains the risk-benefit approach.

20 **The Failure of Risk Management** is a very practical and hands-on guide to make risk management decisions.

3 Establishing the context

Trees give us many benefits that we need

21 The more obvious benefits that trees give us are visual beauty in the landscape, wood, and the various crops they produce. Wildlife habitat, pollution filtering, and reducing weather and climate change effects are additional values. Trees also have important social value as part of our culture, history, or because they commemorate an important event. As if all these benefits aren't enough. There's an ever-expanding body of scientific evidence that shows trees are essential for our physical health, mental wellbeing, and quality of life.

The overall risk to us from trees and branches falling is extremely low

22 Compared to other everyday risks we readily accept, the overall risk to us from branches or trees falling is extremely low. Our annual risk of being killed or seriously injured is less than one in a million. That's so low, we're at greater risk driving on about a 400km/250mi round trip to visit friends for a weekend than from branches or trees falling over an entire year. Given the number of trees we live with, and how many of us pass them daily, being killed or injured by a tree is a rare event; one that usually happens during severe weather.

We can't be an insurer of nature or eliminate the risk from trees

23 Of course, we can't be an insurer of nature. Trees are living structures that sometimes shed branches or fall during severe weather. Since we need the many benefits from trees, we have to accept we can't remove all of the risk. Leaves, bark, cones, nuts, fruits, and small diameter deadwood regularly fall from trees. This natural debris is an Acceptable or Tolerable risk.

3.1 Duty of care

Reasonable Proportionate Reasonably practicable

24 We have a duty of care to manage the risk from our trees. The duty also says we should be reasonable, proportionate, and reasonably practicable when managing the risk. That means there's a balance we need to strike between the many benefits trees provide, the risk, and the costs of managing the risk. By taking a balanced approach, we don't waste resources by reducing risk - and losing benefits - when the risk is already Acceptable or Tolerable.

We all have a responsibility to make reasonable decisions

25 We're all expected to act reasonably and responsibly. We can manage our exposure to the higher risk from tree failure during severe weather by not going outside. If we go out during severe weather, we're choosing to accept some of the risk.

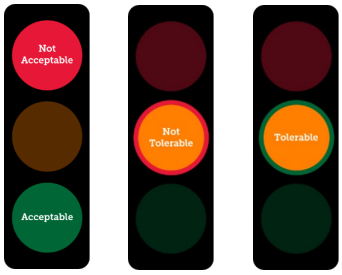
3.2 Risk tolerance

What's an Acceptable or Tolerable level of risk from our trees?

26 The Tolerability of Risk Framework (ToR) is an internationally recognised approach to making risk management decisions. It's used by duty holders where they manage a risk that's imposed on the public. ToR defines Broadly Acceptable and Unacceptable levels of risk. Between these levels is a region where the risk is Tolerable if it's 'as low as reasonably practicable' (ALARP). Put simply, ALARP means the risk is Tolerable if the costs of the risk reduction are much greater than the value of the risk reduction.

3.3 Risk objectives & Risk ratings

Risk ratings are as easy to understand as traffic lights



27 VALID has applied 'ISO 31000 - Risk Management' and the 'Tolerability of Risk Framework' (ToR) to tree risk-benefit management and assessment, which we've adopted. In ISO risk terms, our 'objectives' are to grow, maintain, and conserve trees because of the many benefits they give us we need. And, to manage the risk from tree failure to an Acceptable or Tolerable level. We have four easy-to-understand traffic light coloured risk ratings to show how we'll manage the risk

Red	**Not Acceptable** risks will be reduced to an Acceptable level
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Amber	**Tolerable** risks will not be reduced, but may require an increased frequency of assessment than green Acceptable risks
Green	**Acceptable** risks will not be reduced

4 Establishing our context

Reasonable Proportionate Reasonably practicable

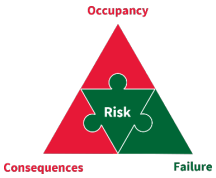
28 This Plan, and following sections, explain how we're going to carry out our **Policy**. We're taking a reasonable, proportionate, and reasonably practicable approach to manage the benefits from trees, so the risk is Acceptable or Tolerable.

We have many trees to manage with limited resources

29 Shire City covers an area of 500mi², and we have over 50 000 trees as individuals, groups, and woodlands, to manage with limited resources. Our trees provide around $100 million worth of benefits. We have 2 Urban Foresters who are **Validators**. They carry out **Passive** and **Active Assessment**. 50 team members, who spend a lot of time working outside, are **Basic Validators**. They carry out Passive Assessment, and Active Assessment at a Basic level when needed. All our people have a copy of the **Obvious Tree Risk Features Guide** and they carry out Passive Assessment.

4.1 Zones of High Confluence (high use + large trees)

A typical Zone of High Confluence Tree Risk-Benefit Assessment



30 We're most likely to find any risks that aren't Acceptable or Tolerable where we have a combination of high use, in all weathers, and large trees. We call these **Zones of High Confluence**. They're zones where the highest categories of Likelihood of Occupancy and Consequences merge; Likelihood of Failure being the third part of the risk. The image on the left shows a mature tree in a Zone of High Confluence. Here, we have a Very High Likelihood of Occupancy. And a large tree, with many benefits, that has Very High Consequences if it fell. The tree has a Very Low Likelihood of Failure, and risk is Acceptable.

4.2 Passive Assessment & Active Assessment

Passive Assessment in all zones of use

31 We manage the risk with Passive Assessment in all zones of use, which we carry out day to day.

Active Assessment in Zones of High Confluence every 5 years

32 We're going to manage the risk with Active Assessment in Zones of High Confluence every 5 years. Because the overall risk is extremely low, and we're carrying out Passive Assessment, day in day out. Active Assessment every year, or every few years, isn't a reasonable, proportionate or reasonably practicable approach to managing the risk.

We'll increase the frequency of Active Assessment when necessary

33 We'll assess trees more frequently than 5 years when a Detailed Assessment has recommended it. If there's an outbreak of a disease. Or where a general decline in vitality is affecting a population of trees.

4.3 Risk rating limitations

Risk ratings are limited by the level of assessment

34 Risk ratings have limitations that depend on the level of assessment at which they're made. For instance, when we carry out Passive Assessment or Active Assessment at a Basic level. If there are no Obvious Tree Risk Features, the risk is Acceptable at that level of assessment. A Detailed or an Advanced Assessment is a more thorough evaluation than a Passive or Basic Assessment. They might find features that weren't apparent at lower levels of assessment, and the risk could be higher. However, carrying out a higher level of assessment, with the additional costs, when there's no obvious feature to trigger it isn't reasonable, proportionate, or reasonably practicable. These risk rating limitations make sense in the same way as your doctor not sending you to a hospital for further tests. At more additional cost. Unless you have symptoms to trigger a higher level of examination.

4.4 Severe weather

We'll be vigilant after storms as part of Passive Assessment

35 If a severe weather warning is forecast, where we can, we'll close the entrances to our parks. Once the severe weather has passed, all our personnel will keep an eye out for Obvious Tree Risk Features as part of Passive Assessment.

You can take some responsibility for your own risk

36 Most deaths and injuries from tree failure happen during or just after severe weather. When a severe weather warning is forecast, you can manage your exposure to the higher risk by not going out, and by being watchful just after.

5 What is Passive Assessment?

Picking up on Obvious Tree Risk Features you can't help but notice

37 When a tree has a risk that might not be Acceptable or Tolerable it'll usually have an **Obvious Tree Risk Feature** you can't help but notice. Passive Assessment is simply picking up on these obvious features when we pass by trees whilst going about our day-to-day routines.

Trees with the highest risk are the easiest to find

38 Passive Assessment is a multi-layered, high volume, and low effort approach to managing the risk. Any trees with a risk that's not Acceptable or Tolerable are most likely to be picked up by Passive Assessment long before Active Assessment. Passive Assessment is our most valuable risk management asset because:

- Trees with the highest risk are the easiest to find
- Anyone can do it, from trained assessors to members of the public
- It's happening in all zones of use, day in day out, at no additional cost
- Higher use zones are being assessed more frequently than lower use zones because they're visited more often
- We're doing it after storms when trees that are damaged might now have a risk that's not Acceptable or Tolerable

Passive Assessment tree alerts escalate to Active Assessment > Basic

39 When we get a tree alert from Passive Assessment. We'll increase the level of evaluation to **Active Assessment** at a Basic level, by a Validator.

5.1 Our people & contractors

Our people passively assess thousands of trees every week

40 In line with ISO 31000 guidelines and principles, to manage the risk at all levels of our organisation, we carry out Passive Assessment. People in our organisation and contractors we use pass thousands of trees that we manage every week. All these trees are being passively assessed, day in day out.

41 The quality and quantity of Passive Assessment varies depending on who's carrying it out and how they're doing it. For example, Passive Assessment by Validators is higher in quality, but lower in quantity than the rest of the team, and the public. Passive Assessment on foot is higher in quality than when driving, but lower in quantity. Here's how various levels of Passive Assessment quality and quantity work daily at the frontline of how we manage tree risk, with examples.

42 **Validators** - Provide the greatest level of Passive Assessment quality because they're the most highly trained and qualified. They're passively assessing trees they drive by, or walk past, whilst carrying out their work. Driving to a site visit on a high use road, a Tree Officer can't help but notice a tree has a lean it previously didn't.

43 **Basic Validators** - Are trained to recognise Obvious Tree Risk Features they come across as they go about their daily duties. Checking playground equipment, a Ranger can't help but notice a broken hanging branch over a low use footpath, after a recent storm.

44 **Arborist Contractors** - Let us know about trees they happen along that may need a closer look when they're out there working. Climbing in a tree, an Arborist can't help but notice a large crack on top of a branch in a neighbouring tree that overhangs a moderate use suburban road.

45 **Other Personnel** - The highest level of Passive Assessment quantity comes from the rest of our team. They have a copy of the Obvious Tree Risk Features guide. We encourage them to let us know about trees they come across that concern them. On the way to grab some lunch, one of our Admin can't help but notice a split that's recently appeared in the trunk of a city centre street tree.

5.2 The public

Let us know if you think any of our trees might be dangerous

46 You can download an easy to understand 'Obvious Tree Risk Features' guide to help you work out whether a tree might need a closer look, **here**.

6 What is Active Assessment?

Trained assessors looking for risks that are not Acceptable or Tolerable

47 Active Assessment is when we're looking for risks that might not be Acceptable or Tolerable. It's also triggered when **Passive Assessment** has picked up a tree that needs a closer look. Or there's some concern about the risk from a tree. We may carry out Active Assessment when we've had a tree work application.

Active Assessment has 3 levels Basic > Detailed > Advanced

48 Active Assessment has 3 levels to it that increase in depth of evaluation. The 3 levels are Basic > Detailed > Advanced.

49 **Validators** carry out Basic and Detailed Assessments. Their contribution to an Advanced Assessment will depend on the equipment used.

50 **Basic Validators** can carry out Basic Assessments to find trees that might need a closer look. They don't make risk rating decisions, but can flag emergency work.

6.1 Basic Assessment

Finding the few trees where the risk might not be Acceptable or Tolerable

51 At a Basic level of assessment, we're looking for trees with obvious features where the risk might not be Acceptable or Tolerable. Occasionally, we'll come across trees that need **emergency work**. When Passive Assessment or a Basic Validator picks up a tree that needs a closer look, it's a Validator who decides whether to take the assessment level from Basic up to Detailed. Validators can also recognise features that might increase the likelihood of failure. They may evaluate these features with VALID's Tree Risk App, and carry out a Detailed Assessment when uncertain about the risk.

Assessments are made from easily accessible ground

52 We assess trees from easily accessible ground, by foot, bike, or from a vehicle. If we need a closer look from inaccessible ground, we'll arrange an Advanced Assessment.

We won't remove vegetation unless there's an Obvious Tree Risk Feature

53 We won't remove climbing plants, undergrowth, basal epicormic growth, or cut hedgerows to get a closer look unless there's an Obvious Tree Risk Feature. It's only if we find any of these risk features the costs of removing vegetation, and loss of their habitat benefits, are justified.

The trees or what they could fall on and the type of assessment will be recorded

54 Trees, or what they could fall on, and the type of assessment will be recorded. For example, in a park, we might plot and record that we've assessed individual or groups of trees on foot. Whereas, if there are many trees beside a road, we'll record that we've assessed the road.

No Obvious Tree Risk Features The risk is Acceptable

55 If a tree doesn't have a feature to trigger carrying out a Detailed Assessment, the risk is Acceptable at this Basic level of assessment.

6.2 Detailed Assessment

We do a Detailed Assessment when a tree needs a closer look

56 We'll carry out a Detailed Assessment on trees that need a closer look after a Basic Assessment. Because we have a tree work application. There's concern from the public about a tree. Or we want to show what the risk is on a tree.

57 The assessment is done from ground level using VALID's Tree Risk App.

We'll produce a report

58 The App prints a one side report. The report includes the risk rating, risk review year, risk reduction work (if necessary), and any general management advice. When risk reduction work is necessary, we'll record when it's completed.

6.3 Advanced Assessment

Large and important trees might be worthy of more effort and cost

What we'll do depends on the tree

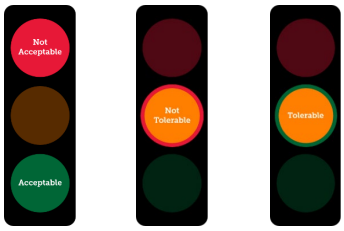
59 If we need more information about the likelihood of failure, we'll carry out an Advanced Assessment. Often, we'll do this because we have a valuable tree which has noticeable decay. The tree may have significant strength loss and we want to find out whether the tree is strong enough. If the costs of an Advanced Assessment are great, we'll decide whether the tree has enough value and future benefits to justify the costs.

Getting into the tree or onto difficult to access ground

60 Advanced Assessments include aerial evaluations to take a closer look at the upper stem and branches. Or to get a closer look at a tree on difficult ground to access.

7 Risk ratings & risk reduction priorities

We'll prioritise risk reduction work and be practical about it



61 Risk reduction work will be given the highest priority where it's an emergency. Outside of that, we'll deal with the highest risks first and carry out the work in a sensible order to make the best use of our budget.

Red **Not Acceptable** risks will be reduced to an Acceptable level

Amber **Not Tolerable** risks will be reduced to an Acceptable level, but with a lower priority than red Not Acceptable risks

Amber **Tolerable** risks will not be reduced but may require an increased frequency of assessment than green Acceptable risks

Green **Acceptable** risks will not be reduced

7.1 Emergency work

Emergency work will be given the highest priority

62 If a tree has a very high likelihood of failure and it's in a high use zone, these Not Acceptable risks are 'emergency work'. We'll get a tree crew there as soon as we can to deal with any emergency work.

7.2 What we're going to do

First, we'll take stock so we can be cost effective

63 Outside of emergencies, where we can, we'll not start risk reduction work until we've carried out all our planned Active Assessments. That way, we'll know how much risk reduction work there is, where it is, and how much of our tree management budget we need to spend on it. This will help us prioritise the work, and coordinate it with other tree maintenance so we can plan it in a practical and cost-effective way.

7.3 Not Acceptable risks

Risks that are Not Acceptable will be dealt with first

64 We'll make Not Acceptable risk reduction work the priority. However, we'll do this work pragmatically. For example, we won't send a tree crew from one side of our operating area to another to carry out work where they spend more time travelling than doing the work. We also have to deal with other risks from trees, such as low branches, obscured road signs, and sightlines. If it means we can get more done with our tree budget, we're going to coordinate this kind of risk reduction work with tree failure risk reduction work.

7.4 Not Tolerable risks

Other risk reduction will be coordinated with routine work

65 Where possible, risk reduction work for risks that are Not Tolerable will be organised alongside other tree maintenance works. If there's not enough budget to carry out the risk reduction and other maintenance works, we'll prioritise risk reduction.

7.5 Budget limitations

If we have budget limitations we'll explain them

66 If we don't have enough budget to carry out all the risk reduction work, we'll record why. Any remaining work will be rolled over to the next budget.

7.6 Review

Contractor meetings will be held every month to monitor works

67 We will meet our contractors every month and monitor how risk reduction work priorities are being carried out. If we can make any improvements in our work priorities, they will be made here.

Shire City Municipal District Council

Appendices | Tree Risk-Benefit Management Strategy

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Zones of High Confluence	A1
Drive-by Assessment	A2
Traffic Management Plan	A3
Obvious Tree Risk Features	A4
Summer Branch Drop	A5
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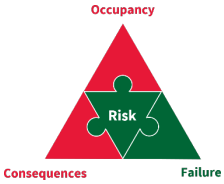
1 What is a Zone of High Confluence?

A typical zone of high confluence



68 We're most likely to find any risks that aren't Acceptable or Tolerable where we have a combination of high use, in all weathers, and large trees. We call these 'Zones of High Confluence'. They're zones where the highest categories of Likelihood of Occupancy and Consequences merge; Likelihood of Failure being the third part of the risk. The image on the left shows a mature tree in a Zone of High Confluence. Here, we have a Very High Likelihood of Occupancy. And a large tree, with many benefits, that has Very High Consequences if it fell. The tree has a Very Low Likelihood of Failure, and risk is Acceptable.

1.1 Zones of High Confluence - Measurements

What we mean by 'High use' in zoning

69 When we work out Zones of High Confluence, the term 'high use', spans the Very High and High Likelihood of Occupancy categories in VALID's risk model. For roads, this is where traffic is 1400 or more vehicles a day.

70 For people, it's an average of someone passing every minute between 7am – 7pm, Monday to Friday. Which is around 1200 a day.

71 We zone train or tram lines as high use.

What we mean by 'High Consequences' in zoning

72 The term 'high consequences', are trees that have a stem diameter of 50cm/20in or more. That's because we're most likely to find risks that are not Acceptable or Tolerable in these larger trees.

1.2 Zones of highest occupancy (high use)

Typical high use zones

73 Roads you'd think of as being busy. Combinations of traffic and people are urban areas rich with offices, shops, bars, and restaurants. Shopping centres and markets are in this category as well. In and immediately around schools, colleges, universities, hospitals, transport stations and stops, sports stadiums, and many pedestrian crossings, also qualify. Lastly, where events are held, emergency service access, and campsites.

1.3 Zones of High Confluence maps

Our zones of high confluence are marked on maps

74 The following maps illustrate our Zones of High Confluence. We're managing the risk in all zones with Passive Assessment, day in day out. We'll carry out an Active Assessment in these zones every 5 years.

2 What is a Drive-by Assessment?

An Active Assessment at a Basic level from a vehicle

75 A Drive-by is a Basic **Active Assessment** carried out from a moving vehicle. The aim is to find trees with Obvious Tree Risk Features where the risk might not be Acceptable or Tolerable. We'll get a **Validator** to carry out an Active Assessment on these trees. Trees that aren't picked out for a Detailed Assessment are Acceptable risks at this Basic level of assessment.

2.1 Trees assessed from both directions

We'll drive both sides of the road

76 Sometimes, a tree risk feature can be obvious when driving towards it from one direction, and not obvious when driving from the other direction. To reduce the likelihood of missing these trees, we'll drive by them in both directions.

2.2 The setup

The assessment team is one spotter and one driver

77 Each assessment team comprises a spotter and a driver. The spotter will be trained to at least a **Basic Validator** level. Where possible, the driver will also be trained to recognise Obvious Tree Risk Features. Occasionally, the spotter will be a Validator.

Traffic control will be provided

78 We'll use a traffic control vehicle to work with the assessment team's vehicle and follow the **Traffic Management Plan**.

2.3 Carrying out the assessment

Maximum speed is 50kph/30mph in zones of high confluence

79 Whilst assessing, the maximum speed we'll drive, is 50kph/30mph, though on average it will be much less.

Assessment speed is variable

80 The speed of the assessment vehicle will be variable and depend on the spotter. When there are many trees, or they're approaching an obvious risk feature, they'll likely ask the driver to slow down. The spotter will do this so they have more time to take in what they're looking at. It'll also allow them to stop, if they can, and not have driven too far past the tree they want to take a closer look at.

Only stop if the risk is acceptable

81 In zones where the Traffic Management Plan says the risk is acceptable to do so, the assessment team will stop. When the spotter is a Basic Validator, they'll take photos and record the tree for a Validator to decide whether a Detailed Assessment needs to be carried out. If the spotter is a Validator, they'll make that decision. When vegetation needs removing, or access is too difficult, we'll organise the work necessary to get a closer look at the tree.

Trees on the opposite side of the road are noted

82 If a tree with an obvious risk feature is on the opposite side of the road, it'll either be geolocated to be picked up when that side of the road is assessed. Or when the other side of the road has already been driven, the tree will be photographed and recorded for a Validator to decide whether a Detailed Assessment needs to be carried out.

If the assessment team can't stop they'll geolocate the tree

83 Where the Traffic Management Plan says the risk is too high to stop, trees will be geolocated. We'll plan to carry out a closer look at these trees.

Outside zones of high confluence

84 When carrying out Passive Assessment from a vehicle in other zones than those of high confluence. If a team member spots an Obvious Free Risk Feature, they'll take photos and record the tree for a Validator to decide whether a Detailed Assessment needs to be carried out.

3 Traffic management & tree risk-benefit assessment

This is how we're going to manage the risk of a traffic accident when we're assessing tree risk

85 Carrying out tree risk-benefit assessments on roads has a much higher risk of an accident than the risk from trees and branches falling. This is how we're going to manage that risk when we carry out **Drive-by Assessments**. Or when a Validator needs to complete a Detailed Assessment on a roadside tree when there's no footpath.

4 When might a tree be dangerous?

Trees with the highest risk are the easiest to spot

Be watchful after storms

86 When a tree has a risk that might not be Acceptable or Tolerable, it'll usually have an obvious tree risk feature you can't help but notice. If you come across a tree with anything like these obvious features, it should be looked at by an Arborist (tree expert) who's been trained in tree risk assessment.

4.1 Root failure

Storms can break tree roots without blowing them over

Signs to look out for are

Change in angle of the trunk
Large cracks in the soil
Hump in the ground on one side

87


4.2 Hanging branches

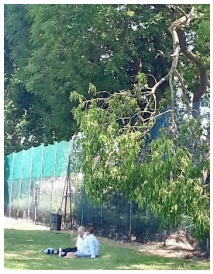
Don't forget to look up

Branches can break during storms and still hang on

Sometimes they can get stuck up there for quite a while

88



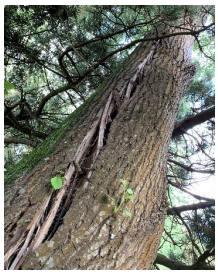
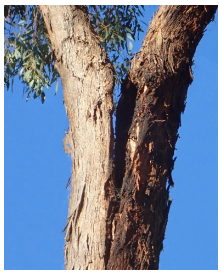


4.3 A crack or split into the wood, beyond the bark

When trees bend and twist in storms the wood can split and crack

Vertical cracks in the bark are just the tree growing well there's no need to worry

89


4.4 Decline & death

To stay healthy and strong trees need 'solar panel' leaves to make food

When trees suffer they often have much less leaf cover and many dead branches

Standing dead trees have great habitat benefits but need checking

90



4.5 Decay fungi fruiting bodies

To decay fungi these 'fruits' are like apples to an apple tree

Decay fungi and trees mostly live happily together creating essential habitat for wildlife

Fungi can sometimes 'eat' too much wood and weaken the tree

91



Photographs
Jake Miesbauer, Michael Richardson, Roy Finch, Mark Hartley, Rick Milson
Andrew Benson, David Abrahams, Felicity Cloake & Wilf, Jack Prynn, David Humphries

5 All you need to know about the risk from SBD

Taking a reasonable proportionate and reasonably practicable approach

92 This guide looks at what Summer Branch Drop (SBD) is. Fact checks the risk. Reviews what we currently know and don't know. Then provides you with some risk management advice.

5.1 What is SBD?

Branches that unexpectedly fail after hot dry weather

93 SBD is a very loose term for branches on mature trees that have no obvious tree risk features, which unexpectedly fail after a period of hot dry weather.

5.2 Fact-checking the risk

The overall risk is mind-bogglingly low

94 Compared to other everyday risks that we readily accept, the overall risk from SBD is mind-bogglingly low. From the data[1] [2] we have, the annual risk of death or serious injury is less than one in one hundred million. That's so low, we're at greater risk for the few minutes it takes to cover about 5km/3mi on a drive, than we are from SBD over a whole year.

5.3 What we know and what we don't know

There's no agreement about what SBD is or what it's called

95 Perhaps because the overall risk from SBD is so mind-bogglingly low, it's not been very well researched. There's no agreement about what SBD is, or even what it's called - it's also known as Sudden Branch Drop and Sudden Limb Drop. SBD is most commonly used as a catch-all term to describe branch failure when wind or extensive decay doesn't appear to be an obvious explanation.

There's no agreement about the critical factors that trigger branch failure

96 In the published literature[3] [4], there's no agreement about what causes of SBD. There's no agreement about how hot and dry it needs to be, and for how long; or if humidity plays a role. Or whether the branch has to be horizontal or if its length is a critical factor. There's no agreement either about what time of day it's likely to happen, and if rain is required. Or even if the branch has to be free of obvious tree risk features.

5.4 Species profiling and a lack of obvious risk features

Many tree species can suffer from SBD

97 In the literature, SBD has been recorded on the following species; Ash, Beech, Cedar, Corymbia, Elm, Fig, Eucalyptus, Giant Sequoia, Horse Chestnut, Liquidambar, Oak, Pine, Plane, Poplar, Silver Maple, Sweet Chestnut, Tree of Heaven, Willow. There are probably more species not yet recorded.

We can't tell which branches will or will not fail

98 Branches that might fail because of SBD, on trees that don't have a history of it, lack any obvious tree risk features. This means an Arborist can't tell the difference between branches that have a high likelihood of failure from those that have a low likelihood of failure, before they fail.

5.5 Managing the risk

Unless a tree has a history of SBD the risk is Acceptable

99 If our trees don't have a history of SBD, even at the times of the year when it's most likely to happen, the risk is Acceptable. That means there's no need for us to reduce the risk any further. If any of our trees have a history of SBD, we'll reduce the risk to an Acceptable level by lowering occupancy or pruning.

Do''t put up warning signs like this

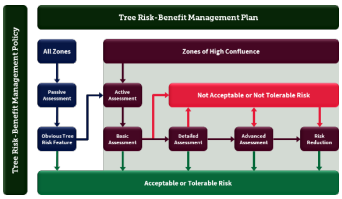
100 Warning signs are unnecessary, or not effective. If a tree has no history of SBD, they're unnecessary because the risk is Acceptable. If a tree has a history of SBD, and the risk is not Acceptable or Tolerable, warning signs are not an effective way to manage the risk. They don't pass liability on to a visitor. And we won't be able to demonstrate signs altered visitor behaviour, and level of occupancy, so much the risk was reduced to an Acceptable or Tolerable level. Also, in the extremely unlikely event of someone being killed or injured. It'd be easy for a claimant to make a case we could've managed the risk better, by planting undergrowth, fencing the tree off, or pruning it.

Want to know more about SBD and risk from tree failure?

101 **1 National Tree Safety Group | Risk Research**
2 List of Deaths From Falling Tree Parts in Australia
3 Sudden Branch Drop: A Case for Closer Inspection
4 Summer Branch Drop | Arboricultural Research Note

6 Simpler • Clearer • Smarter

The Strategy at a glance



102 Whether you manage or assess tree risk, we're here to help make your life less complicated and more effective.

103 From Strategy to App, we've got all your bases covered with the first complete tree risk-benefit management system. By taking out bafflegab (vague and ambiguous words) and numberwang (questionable maths that you can easily get wrong) from tree risk, we've made it...

104 "***Uncomplicated...intuitive...simpler...clearer...smarter***"

105 This is what Duty Holders, Arborists, and other team members who we've trained as Basic Validators are all saying. They're some words you'll likely use to describe how you feel after you've validated your approach to tree risk.

6.1 Tree risk-benefit management

Reasonable
Proportionate
Reasonably practicable

106 Whether you're a Government Agency, Landowner, or Homeowner you have a duty of care to manage the risk from your trees falling or dropping branches. To fulfil your duty, you should be reasonable, proportionate, and reasonably practicable about managing the risk to an Acceptable or Tolerable level.

107 VALID's got your back here with our full range of ISO 31000 compliant and common sense **Tree Risk-Benefit Management Strategies**. As part of our not-for-profit goals, we've released all the strategies under a creative commons license. That means they're *free* and open to *everyone*. **Validators** can help you customise your strategy. Or, they have an abbreviated *Validator Strategy* that covers you and them.

6.2 Tree risk-benefit assessment

VALID has been stress-tested to breaking point

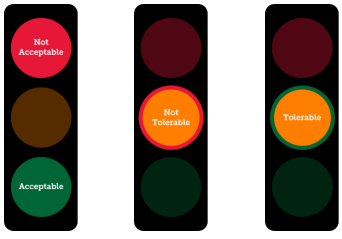
108 Risk-benefit assessments are carried out under the protective umbrella of our Tree Risk-Benefit Management Strategy. The Strategy does more than 95% of your assessments for you. When you need to carry out a *Detailed Assessment,* you'll use our super smart and intuitive **Tree Risk App**.

109 We've built the engine of the App with a Professor of Natural Hazards & Risk Science. The Professor's an internationally distinguished expert in this field. He's test-driven the model to breaking point:

> *"We have stress-tested VALID and didn't find any gross, critical sensitivities. In short, the mathematical basis of your approach is sufficiently robust and dependable for any practical purpose."*
>
> Willy Aspinall
> Cabot Professor in Natural Hazards & Risk Science
> University of Bristol

6.3 Tree risk ratings

Risk ratings are as easy to understand as traffic lights



110 Yes, it really is that clear and easy to understand. There's no confusion about what vague and ambiguous words or complicated numbers mean. We have four easy-to-understand traffic light coloured risk ratings.

Red	Not Acceptable risks will be reduced to an Acceptable level
Amber	Not Tolerable risks will be reduced to an Acceptable level, but with a lower priority than red Not Acceptable risks
Amber	Tolerable risks will not be reduced but may require an increased frequency of assessment than green Acceptable risks
Green	Acceptable risks will not be reduced

6.4 Tree risk-benefit management advice & training

Visit our Training page
Or get in touch for help

111 We work with Duty Holders to help them manage the risk and benefits from their trees. We also train Arborists to become **Validators**. And personnel who spend a lot of time outside, who aren't Arborists, to be **Basic Validators**.