METHODOLOGY

How a tree risk assessment is structured

Tree risk assessment is a defined arboricultural discipline with established protocols. Understanding the structure helps anyone responsible for trees in a public space evaluate what an assessment can and cannot tell them.

The Arborist Team 8 min read

Trees in public, commercial, and institutional spaces sit near people, vehicles, and structures. A tree failure can have safety, legal, and operational consequences. Tree risk assessment is the arboricultural discipline that estimates the likelihood and consequence of such failures, and recommends mitigation.

The most widely adopted international framework is the International Society of Arboriculture's Tree Risk Assessment Qualification (TRAQ), grounded in the ISA Best Management Practices for Tree Risk Assessment. This article describes the structure of an assessment under that framework. It is not a substitute for qualified assessment, which requires training and certification.

The three components of risk

Tree risk is distinct from tree health. A healthy tree on a remote part of a property poses limited risk because no target sits beneath it. A heavily decayed tree over an empty space may pose less risk than a moderately stressed tree over a school entrance.

Risk under TRAQ has three components:

- **Likelihood of failure.** The probability that a part of the tree — branch, stem, root system, or whole tree — fails within a defined time period.
- **Likelihood of impact.** Given a failure, the probability that the failed part reaches a target such as a person, vehicle, or structure.
- **Consequences of impact.** The severity of the outcome if impact occurs.

The three components combine into an overall risk rating. None are observable directly. Each is estimated by a trained assessor against defined matrices.

Three levels of assessment

TRAQ defines three levels of assessment, each suited to different situations.

Level 1 is a limited visual assessment. The assessor observes the tree from a distance, typically while walking or driving past, and looks for obvious defects. This level suits large tree populations where individual assessment is impractical — citywide canopies, large industrial estates, kilometres of avenue trees. It is the fastest level. It identifies gross structural problems.

Level 2 is a basic assessment. The assessor conducts a 360-degree inspection of the tree from ground level, examining the root collar, trunk, major branches, and canopy. Simple tools may be used — a probe, a mallet, sometimes binoculars. Level 2 is the standard inspection level for managed tree populations on a defined cycle.

Level 3 is an advanced assessment. Where Level 2 cannot reach a confident conclusion, Level 3 brings in instruments: sonic tomography, resistance drilling, root crown excavation, aerial inspection by climbing or drone. Level 3 is more resource-intensive and is typically reserved for high-value or high-target trees where additional certainty supports the decision.

A structured programme uses the three levels in combination: Level 1 across the broad canopy, Level 2 on a defined cycle for managed populations, and Level 3 on the subset of trees where it changes a decision.

What a Level 2 assessment examines

A Level 2 assessment is structured around a checklist of observable conditions, organised by tree part.

Root system and root collar

Root issues are a leading cause of whole-tree failure and are difficult to assess from above ground. The assessor examines for lifted soil or cracks at the base, fungal fruiting bodies (which can indicate active decay), girdling roots, recent root severance from construction, cavities at the root collar, and changes in trunk lean over time.

Stem and trunk

Trunk-level conditions include visible decay, cavities, large wounds, included bark in branch unions, splits, cracks, embedded objects, lightning scars, and conks. The significance of each depends on size relative to the trunk, location, and progression.

Scaffold branches and canopy

Branch-level conditions include deadwood, weak attachments, codominant stems with included bark, cracks, decay at branch unions, end-weight on long lateral branches, and canopy asymmetry that suggests structural imbalance.

Site context

The conditions around the tree affect interpretation of observed defects. Recent construction in the root zone, soil compaction from vehicle traffic, drainage changes, utility trenching, and the removal of nearby trees that previously provided wind protection all alter how a defect is likely to progress.

> *A risk rating combines what is observed on the tree with the targets that sit beneath it and the conditions of the site. Each is part of the assessment.*

What an assessment establishes

A Level 2 assessment identifies observable conditions, rates likelihood of failure within a defined time period, identifies the targets at risk, produces a risk rating, and recommends mitigation. It may flag trees that require Level 3 follow-up.

An assessment does not predict the timing of a specific failure. Internal decay can be present without external symptoms in some species and soil conditions, which is part of why TRAQ specifies inspection on cycles. An assessment reduces and documents risk; it does not eliminate it.

The assessment also serves as the documentary record that the duty of care was discharged, which is relevant if an incident later occurs and the question of prior knowledge is raised.

Mitigation

For each tree rated above the action threshold, the assessment specifies a mitigation. The standard options, in increasing order of intervention:

- **Monitoring.** Re-inspection at a defined interval to track whether the condition is progressing.
- **Pruning.** Removal of deadwood, reduction of end-weight on long branches, and treatment of weak attachments.
- **Cabling and bracing.** Mechanical support for codominant stems or weak unions where the tree's value supports retention.
- **Target modification.** Changes to what sits beneath the tree — relocating a parking spot, redirecting a footpath, cordoning off an area in high-wind seasons.
- **Removal.** Where risk cannot be reduced to acceptable levels through other means.

Inspection cycles

The output of a single assessment is current at the time of inspection and ages with the tree and the site. A defined inspection cycle — annually for high-target trees, every two to three years for moderate-target trees, every five years for low-target trees, with re-inspection triggered by major weather events — keeps the risk picture current over time.

The cycle itself, once defined, governs the programme. The individual assessments are its execution.

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FURTHER READING International Society of Arboriculture (isa-arbor.com) · ISA Best Management Practices: Tree Risk Assessment