Likelihood of Failure (A)

1 – <u>Improbable</u>: Not likely to fail under normal weather conditions
- *Minor branch dieback < 2" dia.*
- *Minor defects or wounds < 20% of tree*

2 – <u>Possible</u>: Failure could occur, but is unlikely under normal weather conditions
- *Stem decay w/in safe shell limits*
- *Defects affecting 30-40% circumference*
- *Crown damage: decid.<50%, conf.<30%*
- *Co-dominant leaders with included bark*
- *Girdling roots <40% of circumference*
- *Root damage, <40% of total # or roots*

3 – <u>Probable</u>: Failure maybe expected under normal weather conditions
- *Cracks in contact with soil*
- *Decay exceeding safe shell limits*
- *Defects affecting >40% of circumference*
- *Crown damage: decid.>50%, conf.>30%*
- *Weak branch union with crack or decay*
- *Girdling root >40% circumference*
- *Root damage >40%*
- *Leaning tree, recent root breakage*
- *Standing dead w/out significant defects*

4 – <u>Imminent</u>: Failure has started or most likely to occur in the near future
- *Stem decay exceeding safe shell limits*
- *Cracks with branch split in half*
- *Defects affecting >40% of circumference*
- *Extensive decay of roots >40%*
- *Broken hangers in crown >3 inches*
- *Dead trees with decay, cracks, hangers*
- *Leaning tree hung up in adjacent tree*

Likelihood of Target Impact (B)

1 – <u>Very Low</u>: The chance of the failed tree or branch impacting the target is remote
- *tree or part that would fall away from street, sidewalk or public area*

2 – <u>Low</u>: It is not likely that the failed tree or part will impact the target
- *tree or part fall into adjacent tree or structure, target is protected*

3 – <u>Medium</u>: The failed tree or part may or may not impact the target with equal likelihood.
- *tree or part would fall into target zone area or partially impact the target*

4 – <u>High</u>: The failed tree or part will most likely impact the target
- *tree or part will fall into target zone area*

CTC Tree Risk Assessment, Version 16.2

Consequences of Failure (C)

1 – <u>Negligible</u>: No personal injury, low-value property damage, disruption can be easily mitigated

2 – <u>Minor</u>: Minor personal injury, low to moderate property damage, small disruption to activities

3 – <u>Significant</u>: Personal injury, moderate to high value property damage, considerable activity disruption

4 – <u>Severe</u>: Serious personal injury or death, damage to high value property, disruption of important activities

Target (D)

1 – <u>Low Use</u>: Low to moderate length of time in the target zone, *rare visitation in target area*

2 – <u>Moderate Use</u>: Moderate to high length of time in the target zone, *occasional visitation*

3 – <u>High Use</u>: Long to very long length of time in the target zone, *present in target area for large portion of the day*

4 – <u>Very High Use</u>: very high length of time in the target zone, *constant presence in target area*

Species (E)

1 – <u>Low</u>: Small ornamental or evergreen, *e.g., plum, river birch, Gambel oak, pinyon/juniper*

2 – <u>Moderate</u>: Medium-sized tree, *e.g., aspen, crab, honeylocust, walnut, ponderosa pine*

3 – <u>High</u>: Large-sized tree, *e.g., green ash, hackberry, American elm, Colorado spruce*

4 – <u>Very High</u>: Large sized tree with branching or internal wood issues, *e.g., cottonwood, Siberian elm, silver maple, silver/white poplar, globe & golden willow*

Action (F)

1 – <u>Reevaluate next inspection cycle</u>: Determined after discussions with tree owner

2 – <u>Reevaluate next growing season</u>:

3 – <u>Mitigation</u>: Any action applied to tree to reduce risk, *e.g., pruning, cabling, bracing*

4 – <u>Remove</u>: Inform the tree owner how quickly the tree should be removed

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Classes	Risk Value	Rating Criteria
Likelihood of Failure	1	**Improbable**
	2	**Possible**
	3	**Probable**
	4	**Imminent**

Improbable (1) – The tree or branch is not likely to fall during normal weather conditions and may not fail in many severe weather conditions within the specified time frame.
> Examples:
> - Minor <2" diameter branch or crown dieback
> - Minor <20% defects or wounds in branches, trunk or root collar

Possible (2) – Failure could occur, but is unlikely during normal weather conditions within the specified time frame.
> Examples:
> - Stem decay within safe shell limits (1" of sound wood for each 6 inches of shell diameter)
> - Cracks without decay
> - Defects affecting 30-40% of the tree's circumference
> - Crown damage or breakage: hardwoods <50%, pines <30%
> - Weak branch union, major branch or co-dominant stem with included bark
> - Stem girdling roots, <40% of circumference with compressed wood
> - Root damage, <40% of roots damaged within the critical root zone

Probable (3) – Failure may be expected under normal weather conditions within the specified time frame.
> Examples:
> - Stem decay or cavity at or exceeding safe shell (1" of sound wood for each 6 inches of shell diameter)
> - Cracks in contact with soil or other defects
> - Defects affecting >40% of the tree's circumference
> - Crown damage or breakage: hardwoods >50%, pines >30%
> - Weak branch union with crack or decay
> - Stem girdling roots, >40% of circumference with compressed wood
> - Root damage, >40% or roots damaged within the critical root zone
> - Leaning tree with recent root breakage or soil mounding, crack or extensive decay
> - Dead tree – standing dead tree **without** other significant defects

Imminent (4) – Failure has started or is most likely to occur in the near future, even if there is no significant wind or increased load. This is a rare occurrence for a risk assessor to encounter, and it may require action to protect people from harm.
> Examples:
> - Stem decay exceeding safe shell limits **and** severe crack
> - Cracks when a stem or branch is split in half
> - Defects affecting >40% of circumference or critical root zone **and** extensive decay or cracks
> - Weak branch union with crack **and** decay
> - Leaning tree with recent root breakage or soil mounding **and** a crack or extensive decay
> - Leaning tree hung up or caught in adjacent tree
> - Branches with a crack or hanging branches >3 inches
> - Dead trees: standing dead **with** other defects such as cracks, hangers, extensive decay or root damage
> - Visual obstruction
> - Physical obstruction of pedestrian or vehicular traffic

Classes	Risk Value	Rating Criteria
Likelihood of Target Impact	1	**Very Low**
	2	**Low**
	3	**Medium**
	4	**High**

Very Low (1) – The chance of the failed tree or branch impacting the specified target is remote. The failure may be in a low use area, or within a moderate use area on the opposite side of regular usage.
Example:

- Branches or parts of the tree that would fall away from a sidewalk or street, into an open area with no human exposure or impacting targets with little value

Low (2) – It is not likely that the failed tree or branch will impact the target. The failure may be in a low use area, or within a moderate use area in the presence of other trees or structures protecting valued targets.
Example:

- Branches or parts of the tree that would fall into adjacent trees or away from the assessed tree, or a constant target that is well protected from the assessed tree

Medium (3) – The failed tree or branch may or may not impact the target, with nearly equal likelihood.
Example:

- Branches or parts of the tree that would fall into the target zone near or partially impact the target, or a constant target that is not protected from the assessed tree

High (4) – The failed tree or branch will most likely impact the target. The failure will fully impact valued targets.
Example:

- Branches or parts of the tree that would fall onto the target zone

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2

Classes	Risk Value	Rating Criteria
Consequences of Failure and Impact	1	**Negligible**
	2	**Minor**
	3	**Significant**
	4	**Severe**

Negligible (1) – low-value property damage or disruption that can be replaced or repaired, and do not involve personal injury

    Examples:

- Fencing
- Understory plantings
- Storage sheds
- Individual residence utility hookups

Minor (2) – low to moderate property damage or a small disruption to traffic or communication or other utilities on a neighborhood basis

Significant (3) – property damage of moderate-to-high value, considerable disruption, or personal injury

Severe (4) – serious personal injury or death, damage to high-value property, or disruption of important activities

Tree Risk Assessment Definitions

COLORADO TREE COALITION

Classes	Risk Value	Rating Criteria
Target	1	**Low Use**
	2	**Moderate Use**
	3	**High Use**
	4	**Very High Use**

Low Use (1) – is low or moderate length time of human exposure within the impact zone of the rated tree. This includes the actual period of time spent (occupied) in relationship to a given time period used for all targets. Concern should begin with human activity, followed by value of non-human targets.

Transportation	Occupancy	Tree Resource
Bicycle paths	Business districts	High pollen species
Local streets	Churches	Low risk species
Social trails	Commercial districts	Newly planted trees
	High density housing	Restricted root zones
	Pocket parks	Surface roots

Moderate Use (2) – is moderate to high length time of human exposure within the impact zone of the rated tree. This includes the actual period of time spent (occupied) in relationship to a given time period used for all targets. Concern should begin with human activity, followed by value of non-human targets.

Transportation	Occupancy	Tree Resource
Collector streets	Bus stops	Anecdotal failure patterns
Developed trails	Drive through campgrounds	Anecdotal high maintenance
Local detour routes	High density neighborhoods	Construction within root zone
Pedestrian paths	Neighborhood parks	High maintenance trees
School crosswalks	Public safety area	Moderate risk species
Traffic lights	Recreational centers	Obstructed traffic signs
		Obstructed visibility
		Root conflicts
		Thorns

High Use (3) – is high to very high length time of human exposure within the impact zone of the rated tree. This includes the actual period of time spent (occupied) in relationship to a given time period used for all targets. Concern should begin with human activity, followed by value of non-human targets.

Transportation	Occupancy	Tree Resource
Arterial streets	Medical offices	Recent underground construction
Detour routes	Picnic area	Edge trees
Snow routes	Playgrounds	Forest cutouts
Maintained trails	Recreation centers	High risk species
Traffic signs	Schools	Problem tree species
	Sports fields	

Very High Use (4) – is very high length time of human exposure within the impact zone of the rated tree. This includes the actual period of time spent (occupied) in relationship to a given time period used for all targets. Concern should begin with human activity, followed by value of non-human targets.

Roadway	Use	Tree Resource
Emergency access routes	Emergency/medical facilities	Confirmed failure patterns
Handicap access areas	High density populations	Confirmed high maintenance
Main Street	Paid permitted use	Construction within root plate
School Zones	Regional parks	Historical storm damage
	Senior housing/centers	Over-mature trees
		Past risk report history
		Very high risk species

Tree Risk Assessment Definitions

Version 16.2

Classes	Risk Value	Rating Criteria
Species	1	**Low**
	2	**Moderate**
	3	**High**
	4	**Very High**

Low (1) – trees that are naturally low (size) growing, strong branching habits, and have a good ability to compartmentalize defects.

Examples:

Alder, Mountain	Juniper	Peach	Plum
Birch, River	Maple	Pine	
Cherry	Amur	Bristlecone	
Goldenrain Tree	Rocky Mountain	Mugo	
Hawthorn spp	Oak, Gambel	Pinon	
		Limber	

Moderate (2) – medium (size) growing trees, good branching habits, and have a good ability to compartmentalize defects.

Examples:

Apple spp	Horse Chestnut	Pine	Walnut
Aspen, Quaking	Hornbeam, spp	Austrian	Black
Birch	Lilac, Japanese Tree	Lodgepole	English
Paper	Linden, Littleleaf	Ponderosa	Willow
Weeping	Mountain Ash	Scots	Corkscrew
White	Mulberry spp	Planetree	
Crabapple, spp	Oak	Redbud	
Douglas-Fir	Red	Russian Olive	
Fir, White	White	Sycamore	
Honeylocust	Ohio Buckeye	Tree-of-Heaven	

High (3) – large (size) growing trees, moderate branching habits, and have a fair ability to compartmentalize defects.

Examples:

Ash	Hackberry	Pear, Ornamental	Spruce
Green	Locust, Black	Poplar	Colorado
White	Maple	Bolleana	Engelmann
Catalpa	Norway	Lombardy	Norway
Coffeetree, Kentucky	Red		White
Elm	Sugar		Willow
American			Black
English			
Rock			

Very High (4) – large (size) growing trees, poor branching habits, and have a poor ability to compartmentalize defects.

Examples:

Cottonwood	Elm, Siberian	Willow	Willow
Lanceleaf	Linden, American	Crack	Weeping
Narrowleaf	Maple, Silver	Globe	White
Plains		Golden	
Siouxland	Poplar, Silver/White	Peachleaf	
Hybrid			

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Classes	Risk Value	Rating Criteria
Action	1	**Re-evaluate Next Inspection Cycle**
	2	**Re-evaluate Next Growing Season**
	3	**Mitigation**
	4	**Remove**

Re-evaluate Next Inspection Cycle (1) – usually an agreed upon time frame during communication between evaluation team and the client, put cycle in years (e.g., one, two, five, etc.) unless otherwise agreed upon with client.

Re-evaluate Next Growing Season (2) – usually within the middle of the growing season of the year following inspection. This will allow the assessor to observe health conditions of the tree such as live crown and twig growth.

Mitigation (3) – the process of diminishing the risk without removing the entire tree.

Remove (4) – remove the tree when current mitigation procedures are unlikely to diminish the risk, inform the tree owner