ENGINEERING STAFF REPORT

Agenda Date	March 14, 2019
Title	Division Street NE Tree Removal
TO:	Salem Parks and Recreation Advisory Board (SPRAB)
FROM:	Kristin Retherford, Urban Development Director Allen Dannen, P.E., Assistant City Engineer
SUBJECT:	Removal of Street Trees on 400 block of Division Street NE
ISSUE:	Shall the Salem Parks and Recreation Advisory Board (SPRAB) allow the removal of existing street trees on the 400 block of Division Street NE between Liberty Street NE and High Street NE for construction of transportation improvements associated with the new Salem Police Station?
RECOMMENDATION:	Allow the removal of 16 of the existing 20 street trees on the 400 block of Division Street NE between Liberty Street NE and High Street NE for construction of transportation improvements associated with the new Salem Police Station.
SUMMARY:	Riverfront Downtown Urban Renewal funds have been appropriated through the City's capital improvement planning and budget process for construction of traffic, pedestrian, bicycle, lighting, streetscape, and community space improvements in the vicinity of the new Salem Police Station. These improvements will support and enhance the Police Station and the surrounding neighborhood. Proposed improvements on the 400 block of Division Street NE between Liberty Street NE and High Street NE will convert existing parallel parking on both sides of the street to angle parking. The conversion of the parking spaces will require the removal of 16 of the existing 20 street trees on the block. Eleven new street trees will be added and four of the existing trees will be protected during construction.

Background:

- Transportation improvements associated with the new Police Station project are planned in order to provide visitor parking, accommodate access to the new facility, and enhance the local neighborhood by improving pavement, lighting, landscaping, pedestrian, and bicycle facilities. Improvements include converting existing streets to two-way traffic on Liberty Street NE between Division Street NE and Marion Street NE and on Division Street NE between Commercial Street NE and Liberty Street NE (See Attachment 1). These traffic changes will be accompanied by a new traffic signal at the intersection of Liberty Street NE and Division Street NE and signal modifications at the intersections of Commercial Street NE with Division Street NE and Liberty Street NE with Marion Street NE.

- New designated bike lanes will be added to both sides of Liberty Street NE between Union Street NE and the Mill Creek Bridge, resulting in a reduction of available on-street parking on that portion of Liberty Street NE. The proposed transportation improvements also include changes to convert existing parallel parking on Division Street NE between Commercial Street NE and High Street NE to angle parking. These parking revisions would require the removal of existing street trees. Existing

street trees adjacent to the Police Station site on the north side of Division Street NE and west side of Liberty Street NE have already been removed in accordance with SRC Section 86.090.d in order to accommodate construction of the new building and make room for parking revisions that will provide visitor parking for the Police Station.

- On December 14, 2018, City Staff presented the proposed offsite improvements to SPRAB. In response to Staff's presentation, the Board expressed concerns regarding the removal of the existing street trees on the 400 block of Division Street NE between Liberty Street NE and High Street NE. Staff conveyed the Board's concerns to the design team and changes were made to the proposed design which identified four of the existing street trees for protection during construction of the improvements. SPRAB was updated as to the design changes during a follow-up presentation on January 10, 2019. In light of the concerns raised by SPRAB and other members of the public, the Public Works Director has decided to refer the matter of street tree removal on Division Street NE between Liberty Street NE and High Street NE to be decided by SPRAB at this public meeting. An information report on this matter was also provided to City Council on January 28, 2019.

Applicable Regulations:

- SRC Section 86.050(c) allows the Public Works Director to refer decisions relating to permitting to SPRAB at his sole discretion. The Director informed staff on January 2, 2019, that the issue of removal of the existing street trees on the 400 block of Division Street NE between Liberty Street NE and High Street NE would be referred to SPRAB. SRC Section 86.090(d)(3) states that no appeals of decisions related to removal by the City shall be allowed. Therefore, SPRAB's decision on this matter will be final.

- Regulation of removal of trees on City property is provided by SRC 86, the City Tree Code. Section 86.050(b) considers City projects to be in compliance with the permitting requirements provided in the chapter if they comply with applicable design standards and input sought by the City Urban Forester according to City Administrative Rules.

- City of Salem Public Works Administrative Rule 109.500.002.3(f) provides that City projects be designed to protect and preserve City trees to the maximum extent practicable; the City Urban Forester shall be contacted on a case-by-case basis to make recommendations for City projects.

Discussion:

- The proposed transportation improvements associated with the new Police Station project include a number of changes to the existing parking configuration on Division Street NE and Liberty Street NE. The police facility will not have any onsite visitor parking.

- Cumulatively, there are approximately 58 on-street parking spaces on the blocks where the proposed parking improvements are planned. The current design would accommodate 68 on-street parking spaces for a net gain of 10 spaces. 31 angle parking spaces on Division Street NE between Commercial Street NE and Liberty Street NE will be available for use by visitors to the new Police Station within close proximity of the facility. If the proposed parking changes on Division Street NE between Liberty Street NE and High Street NE are not implemented, there will be a

net loss of one parking space in the vicinity of the new Salem Police Station when the project is complete.

- In order to accommodate the proposed improvements on the 400 block of Division Street NE between Liberty Street NE and High Street NE, 16 out of 20 existing street trees (tree nos. 1-4, 8 and 9, and 11-20 as numbered on Attachment 2) will need to be removed. The most current version of the landscaping plans for the project include tree wells and landscaped bulb-out areas to accommodate the protection of four existing street trees (tree nos. 5, 6, 7, and 10) and the planting of 11 new street trees.

- The City's downtown is seeing a significant amount of new development, including new housing. Downtown zoning requires one parking space for each housing unit. More than 200 residential units are proposed, and due to site constraints and costs, developers will be looking to the City's downtown parking resources to assist in meeting the increased parking requirements. In addition, a hotel development and redevelopment opportunities for the vacant Nordstrom Building and Saffron/UGM properties may increase the demand for parking resources in the area. These changes in our downtown landscape will bring hundreds of regular new visitors and residents to our downtown and significantly increase demand for existing parking spaces.

- The boundary for the Downtown Parking District is just south of the new police facility, but within the Riverfront-Downtown Urban Renewal Area (RDURA). As the location of the new police station is outside of the Downtown Parking District, it is precluded from using the Marion Parkade as a solution for the development's parking needs. Businesses within the Parking District boundary pay an annual parking tax to support free customer parking and partially fund the maintenance and operations of the parking garages in the district. Parking regulations are different in the downtown with 3-hour time restrictions and regulations that prohibit employees, volunteers, and jurors from parking on-street. Individuals not wanting to purchase parking permits often park on-street in the proximal areas outside of the Parking District, which includes Division Street NE. As downtown redevelopment continues, the neighborhood will not necessarily be able to rely on the Marion Parkade, or other facilities, to ease the local parking demand.

- The improvements on Division Street NE between Liberty Street NE and High Street NE are being designed to protect and preserve City trees to the maximum extent practicable while balancing the aforementioned considerations for the proposed transportation improvements (Attachment 2). The proposed streetscape improvements including sidewalks, pedestrian lighting, and planting areas are being designed to maintain consistency with the current and proposed streetscape standards for the neighboring downtown area. The proposed street trees will be selected from the City's Street Tree List, linearly spaced, and located away from existing and proposed utilities and infrastructure in accordance with Division 006 of the City's Design Standards.

- The existing street trees have multiple branches lower than six feet above ground level, include species that are inappropriately located beneath overhead utility lines and are inadequately spaced according to the Streets Design Standards set forth in

Division 006. One existing tree (tree no. 12) on the north side of the 400 block of Division Street NE is located within five feet of an underground gas line and three of the other existing trees (tree nos. 18, 19 and 20) are located within 10 feet of the existing sanitary sewer line on the northeast end of the block. Planting areas where the new street trees will be located will exceed the minimum area outlined in the proposed standards. The existing trees are inadequately spaced to accommodate adequate pedestrian lighting. The proposed new trees and lighting will be spaced according to standards. The existing sidewalks on the 400 block of Division Street NE are four feet wide, which is narrower than the five-foot minimum required in SRC 803 and the six foot minimum recommended in the streetscape standards. The new sidewalks on Division Street will meet or exceed the recommended six-foot standard.

- The City Urban Forester provided an initial assessment of the condition of the existing street trees affected by the project. The following is a summary of the Urban Forester's assessment:

  There are twenty existing street trees (tree nos. 1-20) on the 400 block of Division Street NE between Liberty Street NE and High Street NE. Six of these trees are in an irreversible state of decline (tree nos. 5, 8, 9, and 18-20). The sixteen Hornbeam trees (tree nos. 1-10 and 15-20) are mature with little evidence of crown expansion with some evidence of senescence. The three Zelkova (tree nos. 11, 13, and 14) fronting the MAPS Credit Union are young and are of a variety that will not likely grow into the overhead power lines.

  Of the ten existing trees (tree nos. 1-10) on the south side of the 400 block of Division Street NE, there are three Hornbeam trees (tree nos. 5, 8, and 9) that are in fair – poor condition with either crown dieback or the impact of power line clearance stress. None of these trees pose an imminent risk of whole tree failure. As these three trees continue to decline, they will most likely lose internal scaffold limbs one at a time.

  Of the ten existing trees on the north side of the 400 block of Division Street NE (tree nos. 11-20), the three trees on the easternmost end (tree nos. 18, 19, and 20) are either fair – poor or poor. While they do not pose a high risk, they are in an irreversible state of decline. The Green Ash (tree no. 12) at the west end (fronting MAPS Credit Union) has been topped for power line clearance. However, the Ash will be repeatedly topped for line clearance as the water sprouts continue to grow toward the powerlines.

- In order to supplement the initial assessment provided by the City's Urban Forester, the Public Works Director directed staff to retain a certified arborist to provide a more detailed assessment of all 20 trees on the 400 block of Division Street NE between Liberty Street NE and High Street NE. The complete report from Mountain View Tree Service of Salem is attached (Attachment 3). In summary, the Mountain View Report indicates that the majority of mature trees on the south side of Division Street NE (tree nos. 1-10) have an estimated risk time frame of three to seven years. The arborist describes weak limbs and trunk unions among other contributing factors to the declining health of the trees. Pruning is recommended to

maintain the health of nearly all trees on both the north and south sides of Division Street NE, and in four cases (tree nos. 2, 5, 8, and 20), complete tree removal is recommended due to various reasons including poor health, improper size for the allotted space (tree no. 5), and damage to the trunk and stems of one particular tree (tree no. 8) that has caused significant decay to the overall structure of the tree.

Alternative Designs:

- Because it is preferable not to remove large, mature street trees where possible, the project team studied design alternatives that might allow more of the existing street trees to be preserved. The addition of angle parking requires construction of a new curb on both sides of Division Street. The required width of vehicle travel lanes and parking areas would locate the new curb near the center of the existing street trees on both sides of the street. While it might be possible to shift the position of the curb a few feet north or south within the existing street right-of-way, the construction of the new curb would still be too near the trees for them to survive the construction. Three other design alternatives were also evaluated:
  1) adding angle parking on only one side of the street;
  2) shortening the proposed improvement to only providing angle parking on the western half of the block between Liberty Street NE and the mid-block alley entrances; or
  3) Constructing the new curb around the existing street trees so that they could be preserved in place with angle parking only provided in the spaces between the trees.

  a. *Limit Improvements to One Side of the Street*: In this option, angle parking would be provided on the north side of the street and parallel parking would be preserved in its current configuration on the south side. This option would still require the removal of ten existing street trees (tree nos. 11-20) on the north side of the street with ten (tree nos. 1-10) on the south side preserved. With new angle parking on the north side of the street and existing parallel parking on the south side of the street, there would be a total of 27 parking spaces available on the block for a net gain of six spaces. One advantage of the proposed design to provide angle parking on both sides of the street allows construction of the new curbs at an elevation where new pavement can be laid over the existing concrete street. However, maintaining the existing curb location on the south side of the street eliminates the ability to effectively overlay the existing concrete section and would require removal and replacement at a substantial cost in order to restore the driving surface to an adequate condition.

  b. *Limit Improvements to the Western Half of the Block*: This option would provide angle parking only on the western half of the block between Liberty Street NE and the mid-block alley entrances. Eight of the 20 existing street trees (tree nos. 1-4 and 11-14) would be removed with this option and a total of 28 parking spaces would be available for a net gain of seven spaces. As with the previous option, maintaining the existing curb location east of the alley would prevent restoration of the existing concrete street without substantial additional cost for removal and replacement.

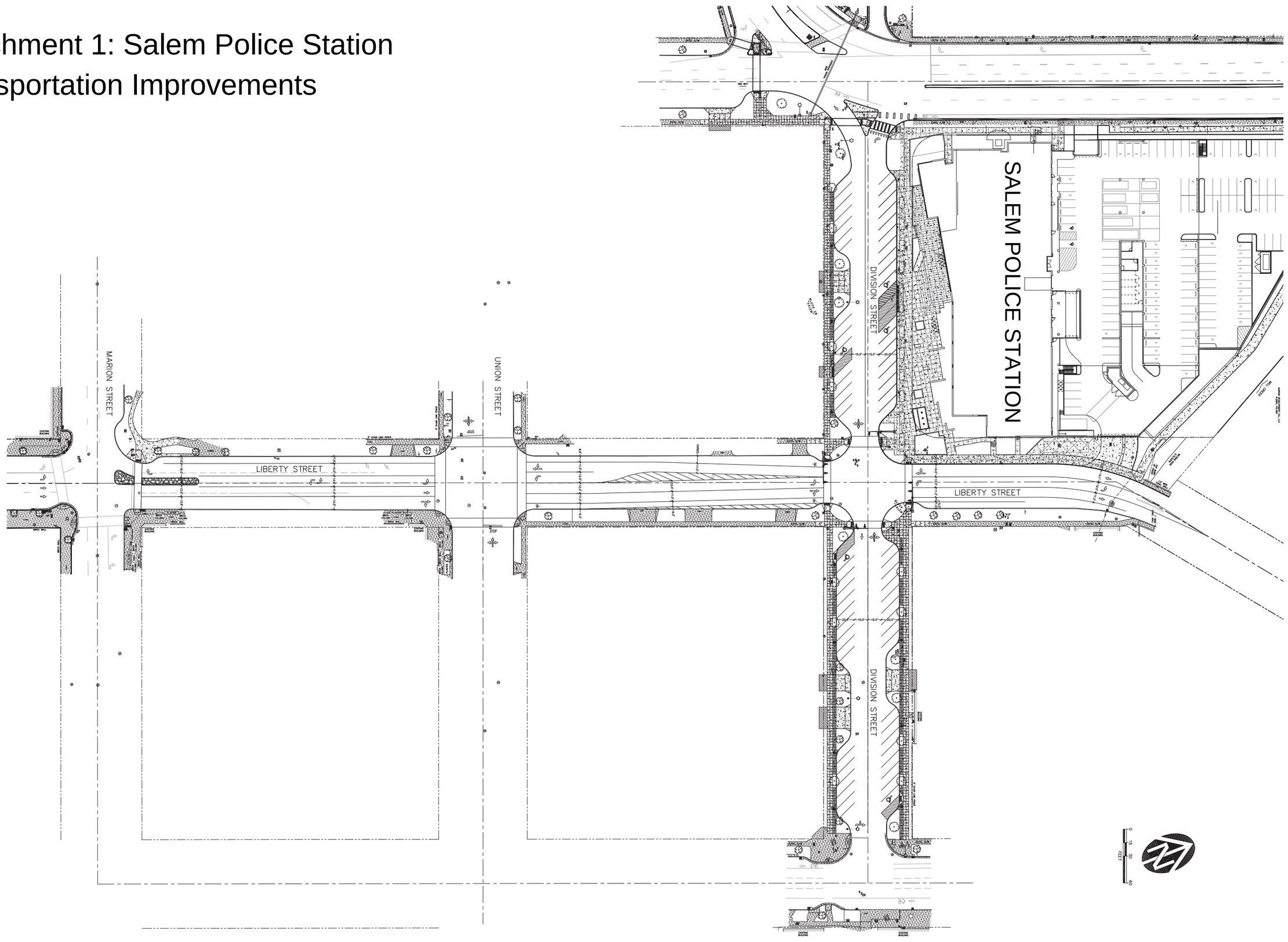
c. *Limit Angle Parking Improvements to Allow Preservation of Existing Trees*: This option would essentially meander the curbline between the existing and proposed locations to preserve all of the existing trees and allow angle parking where it fits in between. In order to preserve all existing trees, there would only be room for approximately 15 angle parking spaces for a net loss in parking. In addition, this option would be more costly due to similar issues with improving the existing concrete street section and the additional length of curb required.

ATTACHMENTS: (list & number)

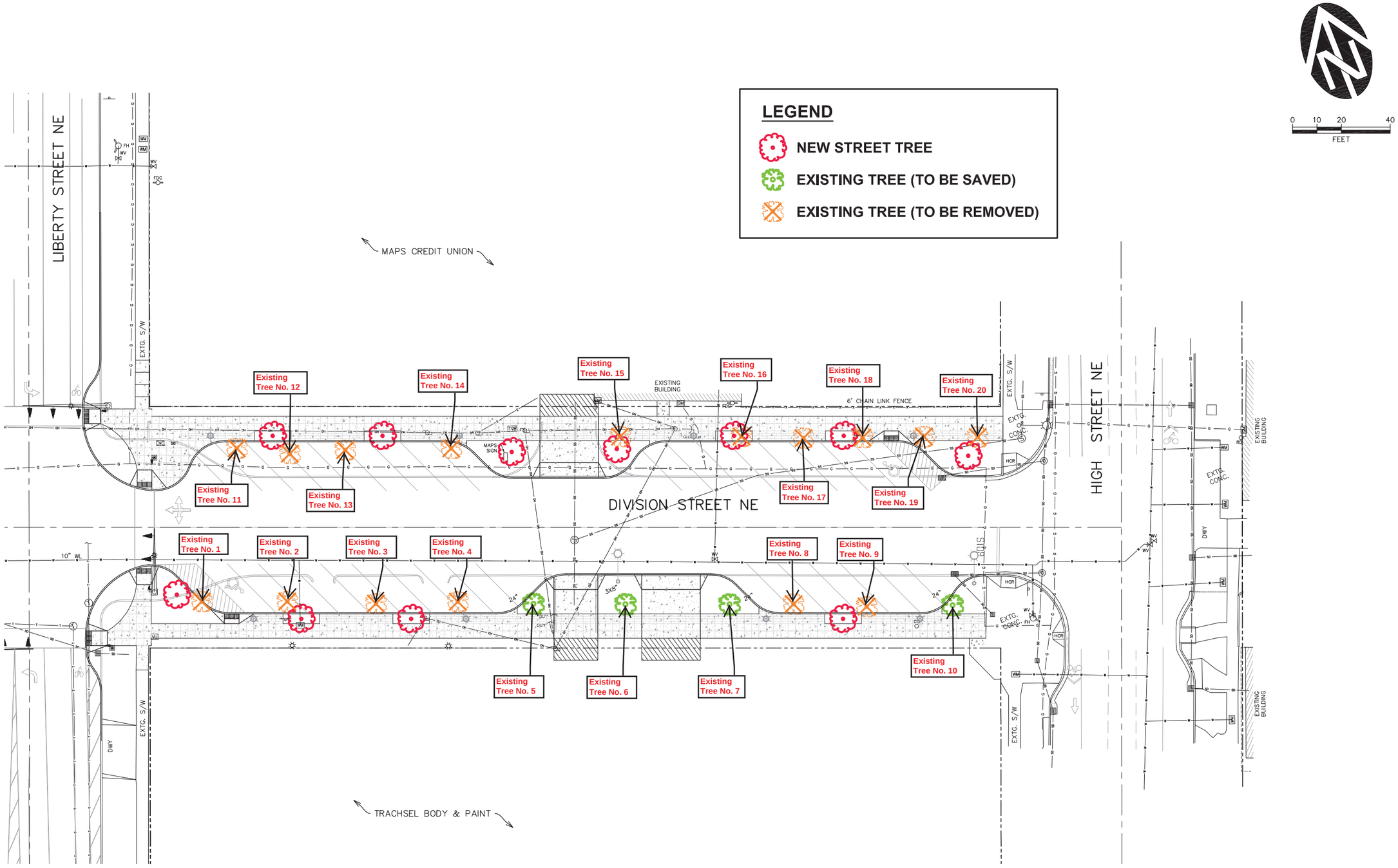
1. Salem Police Station Transportation Improvements
2. 400 block of Division Street NE between Liberty and High Street NE
3. Tree Assessment Reports

SUBMITTED BY: Luke Gmazel, PE, Project Manager

Attachment 1: Salem Police Station Transportation Improvements



Attachment 2: 400 block of Division Street NE between Liberty and High Street NE



Attachment 3: Tree Assessment Reports

Division Street Tree Assessment Summary* - 400 Block of Division Street NE between Liberty Street NE and High Street NE

Prepared by: Luke Gmazel, PE, City of Salem, Public Works – Engineering Division **Date Prepared: 3-8-19**

Tree Number	Species	City Urban Forester's General Condition Assessment	Certified Arborist's Description Notes/Risk Time Frame	Certified Arborist's Recommendation	Woody Duke's Inspection Report
1	Hornbeam, Upright	Fair; Deadwood, wet-wood	Deadwood, weakly attached limbs/3-5 years	Risk mitigation pruning, crown cleaning and crown/weight reduction pruning.	Tree T: A small center stem of 7-inches in diameter is dead but the rest of the tree is unaffected.
2	Hornbeam, Upright	Fair; Deadwood	Deadwood, weakly attached limbs, weak stem union/5-6 years	Weight reduction and possible cabling to reduce risk of weakly attached stem. Complete removal if pruning is insufficient.	Tree S: Many inside dead stems to 3-inches but no major stems are negatively affected.
3	Hornbeam, Upright	Fair; Deadwood	Deadwood, weakly attached limbs, weak stem union/3-5years	Weight reduction and risk mitigation pruning.	Tree R: See notes for Tree P. Many inside dead stems to 3-inches but no major stems are negatively affected.
4	Hornbeam, Upright	Fair; Deadwood	Deadwood, weakly attached limbs, decay in large cut wounds/3-5years	Weight reduction and risk mitigation pruning.	Tree Q: See notes for Tree P. Many inside dead stems to 4-inches but no major stems are negatively affected.
5	Hornbeam, Upright	Fair – Poor; Deadwood, powerline clearance, decay in trunk	Decay from utility pruning cuts, over-weighted, decay and weak attachment at trunk/5-10 years	Weight reduction pruning. Removal should be considered due to improper tree size for space and poor health.	Tree P: Trees P, Q, and R are planted close enough together that their crowns are blended. They are okay if left alone but the removal of any exposing one or more that may remain will leave misshaped trees. Tree has been severely pruned for clearance of power lines. Tree should be retained even though it has been pruned this way.
6	Hornbeam, Upright	Fair; Deadwood	Deadwood, conflicting limbs, ivy/3-7 years	Ivy removal, crown cleaning/risk mitigation pruning.	Tree O: Unable to measure diameter due to ivy. Carefully remove ivy.
7	Hornbeam, Upright	Fair; Deadwood	Deadwood, weakly attached limbs, weak attachment/union at the trunk, ivy/3-5 years	Weakly attached trunk should have crown and weight reduction pruning performed. Risk mitigation pruning should be performed in remaining crown.	Tree N: See notes for Tree K. Unable to measure diameter due to ivy. Carefully remove ivy.
8	Hornbeam, Upright	Fair – Poor; Dieback and deadwood	Vandalism and poor pruning have caused wounds with decay, dead/weakly attached limbs, trunk wound decay, ivy/3-5 years	Damage to trunk and stems has caused significant decay to structure. Crown reduction and risk mitigation pruning should be performed. Removal should be considered if risk remains unacceptable.	Tree M: See notes for Tree K. Many areas of dead bark and stem injuries. Deadwood in center-north portion of the crown with broken stubs and missing bark. Tree is the second-worse condition on the block. Tree condition is fair with 40% affected by these problems. Removal and replanting recommended due to poor health.
9	Hornbeam, Upright	Fair- Poor; Dieback and deadwood	Peeling/dying bark, deadwood, poorly attached limbs, weak stem attachment, ivy/3-7 years	Risk mitigation, weight reduction pruning and ivy removal.	Tree L: See notes for Tree K. Unable to measure diameter due to ivy. Deadwood to 5-inches diameter in upper center of tree with no central leaders affected. Carefully remove ivy.
10	Hornbeam, Upright	Fair; Deadwood	Conflicting limbs, deadwood, soil compaction, decay at scaffold limb removal/3-7 years	Soil de-compaction and/or mulch, ivy removal.	Tree K: Trees K, L, M and N are planted close enough together that their crowns are blended. They are okay if left alone but the removal of any exposing one or more that may remain will leave misshaped trees. Carefully remove ivy.
11	Zelkova	Good	Bark inclusion/15 years	No mitigation needed at this time.	Tree A: Difficult to determine condition, dormant buds at time of inspection, approximately 20% thinning required.
12	Ash, Green	Fair; Line Clearance Topped – Many Sprouts	Utility pruning has stressed tree producing water sprouts and large wounds/5-10 years	Weight reduction pruning, restoration pruning.	Tree B: Removal recommended due to violation of SRC Chapter 86.
13	Zelkova	Good	Over-weighted, weakly attached limbs, co-dominant union in the trunk/5-10+ years	Structural and weight reduction pruning.	Tree C: Difficult to determine condition, dormant buds at time of inspection, approximately 20% thinning required.
14	Zelkova	Good	Deadwood, poorly attached limbs, co-dominant stems/10+ years	Risk mitigation and weight reduction pruning, cabling.	Tree D: Difficult to determine condition, dormant buds at time of inspection, approximately 20% thinning required.
15	Hornbeam, Upright	Fair; Deadwood and cavity with decay	Deadwood, weakly attached limbs, cavity in trunk/10 years	Risk mitigation, weight reduction and line-clearance pruning, monitor trunk cavity.	Tree E: Trees F, G, H and I are planted close enough together that their crowns are blended. They are okay if left alone but the removal of any exposing one or more that may remain will leave misshaped trees.
16	Hornbeam, Upright	Fair; Deadwood and cavity with decay	Deadwood and conflicting limbs, weak trunk union/7-10 years	Risk mitigation, weight reduction and line-clearance pruning.	Tree F: See notes for Tree E. Roots have lifted one abutting edge of one sidewalk panel 2-inches.
17	Hornbeam, Upright	Fair; Tight limb attachment, weeping, cavity	Deadwood, weakly attached limbs, cavity in trunk/5-10 years	Risk mitigation and weight reduction pruning.	Tree G: See notes for Tree E. Roots have lifted one abutting edge of one sidewalk panel 1-inch.
18	Hornbeam, Upright	Fair – Poor; Deadwood and cracks in scaffolds joints	Deadwood, dead/weak limb attachments, weak stem union, dying bark/5 years	Risk mitigation pruning, bracing.	Tree H: See notes for Tree E.
19	Hornbeam, Upright	Fair – Poor; Deadwood, decay in trunk, cracks in scaffolds joints	Deadwood, dead/weak limb unions, weak stem union/5-7 years	Risk mitigation pruning, bracing.	Tree I: See notes for Tree E.
20	Hornbeam, Upright	Poor; Advanced center dieback, trunk decay	Dieback in crown, dead/weak limb unions, dying/weak stem union/3 years	Risk mitigation pruning. Significant dieback in crown indicates poor health, removal should be considered.	Tree J: Tree is 90% dead. Almost no live buds are evident and there are stems that have broken off and bark is being shed. There is no indication as to why this tree died. Removal and replanting recommended due to poor health.

*All information compiled from City's Urban Forester's assessment report, Woody Dukes' Inspection Report and ISA Basic Tree Risk Assessment Forms provided by Mountain View Tree Service LLC

City Urban Forester's Division Street Tree Assessment

Number	Direction	Location	Placement	Species	General Condition	Comments
1	South side	400 blk	1st Tree W - E	Hornbeam, upright	Fair	Deadwood, wetwood
2	South side	400 blk	2st Tree W - E	Hornbeam, upright	Fair	Deadwood
3	South side	400 blk	3st Tree W - E	Hornbeam, upright	Fair	Deadwood
4	South side	400 blk	4st Tree W - E	Hornbeam, upright	Fair	Deadwood
5	South side	400 blk	5st Tree W - E	Hornbeam, upright	Fair - Poor	Deadwood, Powerline clearance, decay in trunk
6	South side	400 blk	6st Tree W - E	Hornbeam, upright	Fair	Deadwood
7	South side	400 blk	7st Tree W - E	Hornbeam, upright	Fair	Deadwood
8	South side	400 blk	8st Tree W - E	Hornbeam, upright	Fair - Poor	Dieback and deadwood
9	South side	400 blk	9st Tree W - E	Hornbeam, upright	Fair - Poor	Dieback and deadwood
10	South side	400 blk	10st Tree W - E	Hornbeam, upright	Fair	Deadwood
11	North Side	400 blk	1st Tree West to East	Zelkova	Good	
12	North Side	400 blk	2nd Tree W - E	Ash, Green	Fair	Line Clearance Topped - Many Sprouts
13	North Side	400 blk	3rd Tree W - E	Zelkova	Good	
14	North Side	400 blk	4th Tree W - E	Zelkova	Good	
15	North Side	400 blk	5th Tree W - E	Hornbeam, Upright	Fair	Deadwood & cavity with decay
16	North Side	400 blk	6th Tree W - E	Hornbeam, Upright	Fair	Deadwood & cavity with decay
17	North Side	400 blk	7th Tree W - E	Hornbeam, Upright	Fair	Tight limb attachment, weeping, cavity
18	North Side	400 blk	8th Tree W - E	Hornbeam, Upright	Fair - poor	Deadwood & cracks in scaffolds joints
19	North Side	400 blk	9th Tree W - E	Hornbeam, Upright	Fair - poor	deadwood, decay in trunk, cracks in scaffolds joints
20	North Side	400 blk	10th Tree W - E	Hornbeam, Upright	Poor	Advanced center dieback, trunk decay

Basic Tree Risk Assessment Form

Client City of Salem Date 2/12/19 Time 12:30

Address/Tree location Division Street, South side, First from Liberty Tree no. 1 Sheet 1 of 2e

Tree species Hornbeam dbh 30" Height 40' Crown spread dia. 50'

Assessor(s) JV/MK Tools used Diameter tape **Time frame** 3-5yr

Target Assessment

Target number	Target description	Target protection	Target zone: Target within drip line	Target zone: Target within 1x Ht.	Target zone: Target within 1.5 x Ht.	Occupancy rate (1–rare 2 – occasional 3 – frequent 4 – constant)	Practical to move target?	Restriction practical?
1	Pedestrians	None	Y	Y	Y	2	N	N
2	Vehicles	None	Y	Y	Y	4	N	N
3	Fence	None	Y	Y	Y	4	N	N
4								

Site Factors

History of failures None **Topography** Flat ☒ Slope ☐ _____% **Aspect** _____

Site changes None ☒ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe _____

Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☐ Pavement over roots ☒ 65 % Describe Road, Sidewalk, Parking

Prevailing wind direction W **Common weather** Strong winds ☐ Ice ☐ Snow ☐ Heavy rain ☐ Describe _____

Tree Health and Species Profile

Vigor Low ☐ Normal ☒ High ☐ **Foliage** None (seasonal) ☒ None (dead) ☐ Normal ____% Chlorotic ____% Necrotic ____%

Pests/Biotic None **Abiotic** None

Species failure profile Branches ☒ Trunk ☒ Roots ☐ Describe Weak Limb and Trunk unions

Load Factors

Wind exposure Protected ☐ Partial ☐ Full ☒ Wind funneling ☐ _____ **Relative crown size** Small ☐ Medium ☐ Large ☒

Crown density Sparse ☐ Normal ☐ Dense ☒ **Interior branches** Few ☐ Normal ☒ Dense ☐ **Vines/Mistletoe/Moss** ☐ _____

Recent or expected change in load factors No

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☐ LCR 82.5 %

Dead twigs/branches ☒ 15 % overall Max. dia. 3"

Broken/Hangers Number 8 Max. dia. 3"

Over-extended branches ☐

Pruning history

Crown cleaned ☐ Thinned ☐ Raised ☒

Reduced ☐ Topped ☐ Lion-tailed ☐

Flush cuts ☐ Other _____

Deadwood, weakly attached limbs — Condition(s) of concern _____

Part Size 1-3" Fall Distance 6-20

Load on defect N/A ☐ Minor ☒ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☐ Possible ☐ Probable ☒ Imminent ☐

Cracks ☒ Neutral plane fractures Lightning damage ☐

Codominant ☒ _____ Included bark ☐

Weak attachments ☐ _____ Cavity/Nest hole ____% circ.

Previous branch failures ☐ _____ Similar branches present ☐

Dead/Missing bark ☐ Cankers/Galls/Burls ☐ Sapwood damage/decay ☐

Conks ☐ Heartwood decay ☐ _____

Response growth _____

Condition(s) of concern _____

Part Size _____ Fall Distance _____

Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☐ Possible ☐ Probable ☐ Imminent ☐

— Trunk —

Dead/Missing bark ☐ Abnormal bark texture/color ☐

Codominant stems ☒ Included bark ☒ Cracks ☐

Sapwood damage/decay ☐ Cankers/Galls/Burls ☐ Sap ooze ☐

Lightning damage ☐ Heartwood decay ☐ Conks/Mushrooms ☐

Cavity/Nest hole ____% circ. Depth _____ Poor taper ☐

Lean ____° Corrected? _____

Response growth _____

Condition(s) of concern None

Part Size _____ Fall Distance _____

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

— Roots and Root Collar —

Collar buried/Not visible ☐ Depth _____ Stem girdling ☐

Dead ☐ Decay ☒ Conks/Mushrooms ☐

Ooze ☐ Cavity ☐ ____% circ.

Cracks ☐ Cut/Damaged roots ☒ Distance from trunk 1'

Root plate lifting ☐ Soil weakness ☐

Response growth 1/2-1"

Condition(s) of concern None

Part Size _____ Fall Distance _____

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization

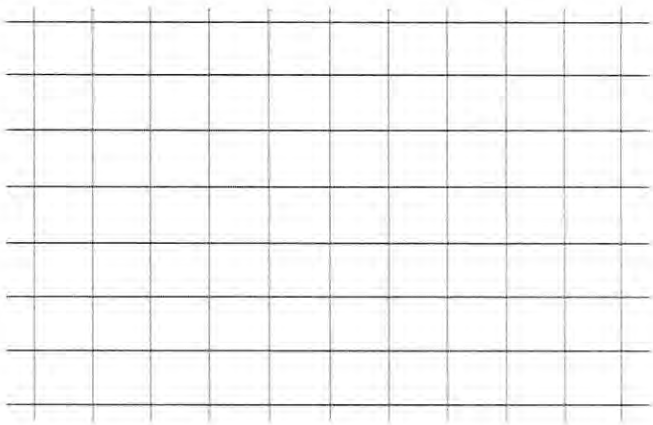
Target (Target number or description)	Tree part	Condition(s) of concern	Likelihood: Failure: Improbable	Likelihood: Failure: Possible	Likelihood: Failure: Probable	Likelihood: Failure: Imminent	Likelihood: Impact: Very low	Likelihood: Impact: Low	Likelihood: Impact: Medium	Likelihood: Impact: High	Likelihood: Failure & Impact (from Matrix 1): Unlikely	Likelihood: Failure & Impact (from Matrix 1): Somewhat	Likelihood: Failure & Impact (from Matrix 1): Likely	Likelihood: Failure & Impact (from Matrix 1): Very likely	Consequences: Negligible	Consequences: Minor	Consequences: Significant	Consequences: Severe	Risk rating (from Matrix 2)
1	Limb	Dead, weak attachment			X			X			X					X			L
2					X				X			X				X			L
3					X				X			X				X			L

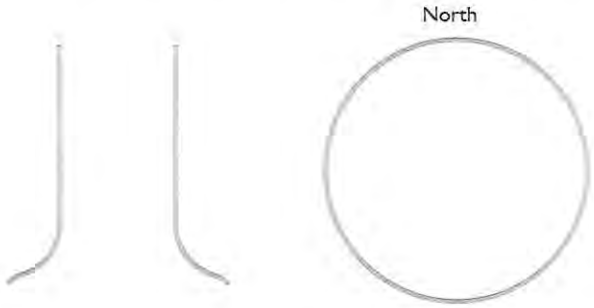
Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impact			
	Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low





Notes, explanations, descriptions

Dead wood, conflicting, and weakly attached limbs should be removed.
Crown reduction on west side would reduce risk of over weighted/extended limbs from failing.

Mitigation options

1. Risk mitigation — **Residual risk** Low
2. Crown cleaning — **Residual risk** Low
3. Crown/weight reduction pruning — **Residual risk** Low
4. _____ — **Residual risk** _____

Overall tree risk rating Low ☒ Moderate ☐ High ☐ Extreme ☐

Overall residual risk None ☐ Low ☒ Moderate ☐ High ☐ Extreme ☐ **Recommended inspection interval** 3 years

Data ☐ Final ☒ Preliminary **Advanced assessment needed** ☒ No ☐ Yes-Type/Reason _____

Inspection limitations ☒ None ☐ Visibility ☐ Access ☐ Vines ☐ Root collar buried Describe _____

ISA Basic Tree Risk Assessment Form

Client City of Salem Date 2/12/2014 Time 1:15
Address/Tree location Division ST, South side, Second from Liberty Tree no. 2 Sheet 2 of 20
Tree species Hornbeam dbh 32" Height 40' Crown spread dia. 40'
Assessor(s) JV/MK Tools used Diameter Tape Time frame 5-10 yr

Target Assessment

Target number	Target description	Target protection	Target zone: Target within drip line	Target zone: Target within 1x Ht.	Target zone: Target within 1.5x Ht.	Occupancy rate (1–rare 2–occasional 3–frequent 4–constant)	Practical to move target?	Restriction practical?
1	Pedestrians	None	X	X	X	2	Yes	No
2	Vehicles	None	X	X	X	4	No	No
3								
4								

Site Factors

History of failures None
Topography Flat ☒ Slope ☐ _____% Aspect _____
Site changes None ☒ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe Sidewalk, road
Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☐ Pavement over roots ☒ 40 % Describe _____
Prevailing wind direction W Common weather Strong winds ☐ Ice ☐ Snow ☐ Heavy rain ☐ Describe _____

Tree Health and Species Profile

Vigor Low ☐ Normal ☒ High ☐ Foliage None (seasonal) ☒ None (dead) ☐ Normal ____% Chlorotic ____% Necrotic ____%
Pests/Biotic None Abiotic None
Species failure profile Branches ☒ Trunk ☒ Roots ☐ Describe weak limb/trunk unions

Load Factors

Wind exposure Protected ☐ Partial ☒ Full ☐ Wind funneling ☐ _____ Relative crown size Small ☐ Medium ☐ Large ☒
Crown density Sparse ☐ Normal ☐ Dense ☒ Interior branches Few ☐ Normal ☒ Dense ☐ Vines/Mistletoe/Moss ☐ _____
Recent or expected change in load factors No

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☐ LCR 82 %
Dead twigs/branches ☒ 10 % overall Max. dia. 4"
Broken/Hangers Number 7 Max. dia. 2"
Over-extended branches ☐
Pruning history
Crown cleaned ☐ Thinned ☐ Raised ☒
Reduced ☐ Topped ☐ Lion-tailed ☐
Flush cuts ☐ Other _____
Deadwood Condition(s) of concern _____
Part Size 1-4 Fall Distance 6-10'
Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐
Likelihood of failure Improbable ☐ Possible ☐ Probable ☒ Imminent ☐

Cracks ☐ _____ Lightning damage ☐
Codominant ☒ _____ Included bark ☒
Weak attachments ☒ North side Cavity/Nest hole ____% circ.
Previous branch failures ☐ _____ Similar branches present ☐
Dead/Missing bark ☐ Cankers/Galls/Burls ☒ Sapwood damage/decay ☐
Conks ☐ Heartwood decay ☐ _____
Response growth _____
Condition(s) of concern _____
Part Size _____ Fall Distance _____
Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☐
Likelihood of failure Improbable ☐ Possible ☐ Probable ☐ Imminent ☐

— Trunk —

Dead/Missing bark ☐ Abnormal bark texture/color ☐
Codominant stems ☒ Included bark ☒ Cracks ☐
Sapwood damage/decay ☐ Cankers/Galls/Burls ☐ Sap ooze ☐
Lightning damage ☐ Heartwood decay ☐ Conks/Mushrooms ☐
Cavity/Nest hole 10 % circ. Depth 3" Poor taper ☐
Lean ____° Corrected? _____
Response growth _____
Condition(s) of concern weak stem union
Part Size 18" Fall Distance 4-40'
Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☐
Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

— Roots and Root Collar —

Collar buried/Not visible ☐ Depth _____ Stem girdling ☐
Dead ☐ Decay ☐ Conks/Mushrooms ☐
Ooze ☐ Cavity ☐ ____% circ.
Cracks ☐ Cut/Damaged roots ☐ Distance from trunk _____
Root plate lifting ☐ Soil weakness ☐
Response growth _____
Condition(s) of concern None
Part Size _____ Fall Distance _____
Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☐
Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization

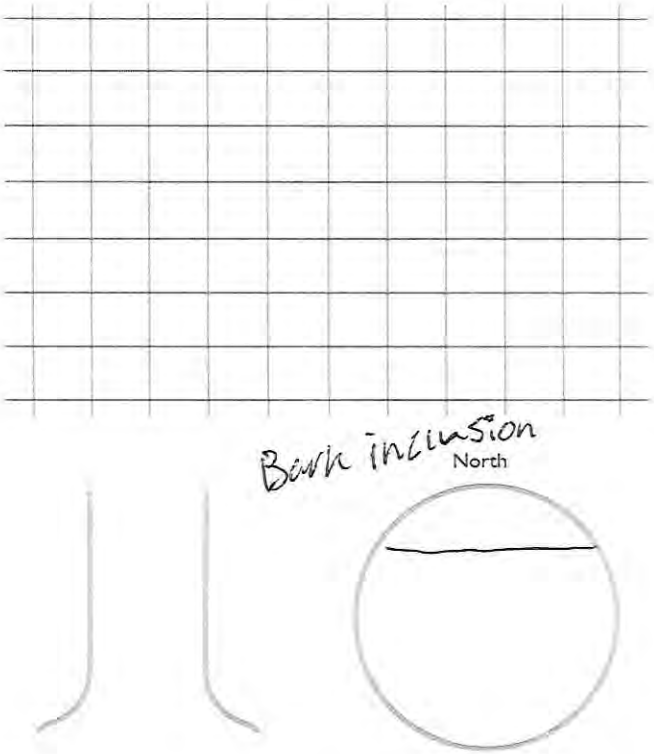
Target (Target number or description)	Tree part	Condition(s) of concern	Likelihood: Failure: Improbable	Failure: Possible	Failure: Probable	Failure: Imminent	Impact: Very low	Impact: Low	Impact: Medium	Impact: High	Failure & Impact (from Matrix 1): Unlikely	Failure & Impact: Somewhat	Failure & Impact: Likely	Failure & Impact: Very likely	Consequences: Negligible	Consequences: Minor	Consequences: Significant	Consequences: Severe	Risk rating (from Matrix 2)
1	Limbs	Dead / weakly attached			X			X			X					X			L
2					X			X			X					X			L
1	Trunk	weak stem union		X				X			X						X		L
2				X						X		X					X		M

Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impact: Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure: Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low



Notes, explanations, descriptions

Weight reduction and possibly cabling should be utilized to reduce risk of weakly attached stem. Deadwood, conflicting, and weakly attached limbs should be removed. Removal may be needed if pruning is insufficient.

Mitigation options

1. Weight reduction Pruning — **Residual risk** Low
2. Risk Mitigation pruning — **Residual risk** Low
3. Cabling — **Residual risk** Low
4. Removal — **Residual risk** None

Overall tree risk rating Low ☐ Moderate ☒ High ☐ Extreme ☐

Overall residual risk None ☒ Low ☒ Moderate ☐ High ☐ Extreme ☐ **Recommended inspection interval** 3 years

Data ☐ Final ☒ Preliminary **Advanced assessment needed** ☒ No ☐ Yes-Type/Reason _____

Inspection limitations ☒ None ☐ Visibility ☐ Access ☐ Vines ☐ Root collar buried Describe _____

ISA Basic Tree Risk Assessment Form

Client City of Salem Date 02/13 Time 1:50

Address/Tree location Division Street, South side: third from Liberty Tree no. 3 Sheet 3 of 20

Tree species Horn beam dbh 25" Height 40' Crown spread dia. 40'

Assessor(s) JV/MK Tools used Diameter Tape Time frame 3-5YR

Target Assessment

Target number	Target description	Target protection	Target zone: Target within drip line	Target zone: Target within 1x Ht.	Target zone: Target within 1.5x Ht.	Occupancy rate (1–rare, 2–occasional, 3–frequent, 4–constant)	Practical to move target?	Restriction practical?
1	Pedestrians	None	Y	Y	Y	2		
2	Vehicles	None	Y	Y	Y	4		
3	Structure	None	Y	Y	Y	4		
4	Power Lines	None	N	Y	Y			

Site Factors

History of failures None Topography Flat ☒ Slope ☐ _____ % Aspect _____

Site changes None ☒ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe _____

Soil conditions Limited volume ☒ Saturated ☐ Shallow ☐ Compacted ☐ Pavement over roots ☒ ~25 % Describe Road, Sidewalk,

Prevailing wind direction W Common weather Strong winds ☐ Ice ☐ Snow ☐ Heavy rain ☐ Describe _____

Tree Health and Species Profile

Vigor Low ☐ Normal ☒ High ☐ Foliage None (seasonal) ☒ None (dead) ☐ Normal % Chlorotic ____% Necrotic ____%

Pests/Biotic None Abiotic None

Species failure profile Branches ☒ Trunk ☒ Roots ☐ Describe _____

Load Factors

Wind exposure Protected ☐ Partial ☒ Full ☐ Wind funneling ☐ _____ Relative crown size Small ☐ Medium ☒ Large ☐

Crown density Sparse ☐ Normal ☐ Dense ☒ Interior branches Few ☐ Normal ☒ Dense ☐ Vines/Mistletoe/Moss ☐ _____

Recent or expected change in load factors _____

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☐ LCR 82 %

Dead twigs/branches ☒ 10 % overall Max. dia. 2"

Broken/Hangers Number 6 Max. dia. 2"

Over-extended branches ☐

Pruning history

Crown cleaned ☐ Thinned ☐ Raised ☒

Reduced ☐ Topped ☐ Lion-tailed ☐

Flush cuts ☐ Other _____

Cracks ☐ _____ Lightning damage ☐

Codominant ☒ _____ _____ Included bark ☒

Weak attachments ☒ Cavity/Nest hole ____% circ.

Previous branch failures ☐ _____ Similar branches present ☐

Dead/Missing bark ☐ Cankers/Galls/Burls ☐ Sapwood damage/decay ☐

Conks ☐ Heartwood decay ☐ _____

Response growth _____

Dead wood and weakly attached limbs condition(s) of concern _____

Part Size 1-3" Fall Distance 6-20'

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☐ Possible ☐ Probable ☒ Imminent ☐

Part Size _____ Fall Distance _____

Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☐ Possible ☐ Probable ☐ Imminent ☐

— Trunk —

Dead/Missing bark ☐ Abnormal bark texture/color ☐

Codominant stems ☒ Included bark ☒ Cracks ☐

Sapwood damage/decay ☐ Cankers/Galls/Burls ☐ Sap ooze ☐

Lightning damage ☐ Heartwood decay ☐ Conks/Mushrooms ☐

Cavity/Nest hole ____ % circ. Depth _____ Poor taper ☐

Lean ____° Corrected? _____

Response growth _____

Condition(s) of concern West trunk weakly attached

Part Size ~18" Fall Distance 5'-35'

Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☒

Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

— Roots and Root Collar —

Collar buried/Not visible ☐ Depth _____ Stem girdling ☐

Dead ☐ Decay ☐ Conks/Mushrooms ☐

Ooze ☐ Cavity ☐ ____% circ.

Cracks ☐ Cut/Damaged roots ☒ Distance from trunk 1'-2'

Root plate lifting ☐ Soil weakness ☐

Response growth 1/4-1/2"

Condition(s) of concern None

Part Size _____ Fall Distance _____

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization

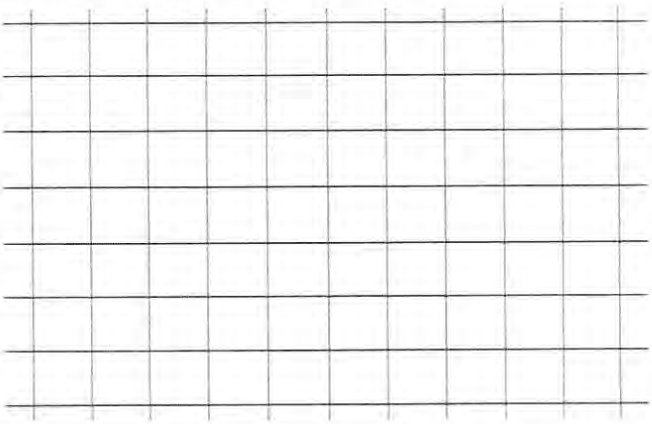
Target (Target number or description)	Tree part	Condition(s) of concern	Likelihood: Failure: Improbable	Failure: Possible	Failure: Probable	Failure: Imminent	Impact: Very low	Impact: Low	Impact: Medium	Impact: High	Failure & Impact (from Matrix 1): Unlikely	Failure & Impact: Somewhat	Failure & Impact: Likely	Failure & Impact: Very likely	Consequences: Negligible	Consequences: Minor	Consequences: Significant	Consequences: Severe	Risk rating (from Matrix 2)
1	Limbs	Dead/weakly attached			X			X			X					X			L
2&3					X				X			X				X			L
4					X		X				X					X			L
1	Trunk	weakly attached		X					X		X						X		L
2				X					X		X						X		L

Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impact			
	Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low



Notes, explanations, descriptions

Dead wood and weakly attached limbs should be removed.
Weight reduction pruning should be performed to reduce risk of failure.

Mitigation options

1. weight reduction pruning — **Residual risk** _____
2. Risk mitigation pruning — **Residual risk** _____
3. _____ — **Residual risk** _____
4. _____ — **Residual risk** _____

Overall tree risk rating Low ☒ Moderate ☐ High ☐ Extreme ☐

Overall residual risk None ☐ Low ☒ Moderate ☐ High ☐ Extreme ☐ **Recommended inspection interval** _____

Data ☐ Final ☒ Preliminary **Advanced assessment needed** ☒ No ☐ Yes-Type/Reason _____

Inspection limitations ☒ None ☐ Visibility ☐ Access ☐ Vines ☐ Root collar buried Describe _____

ISA Basic Tree Risk Assessment Form

Client City of Salem Date 02/13/19 Time 12:40
Address/Tree location Division Street, South Side, Fourth from Liberty Tree no. 4 Sheet 4 of 20
Tree species Hornbeam dbh 34" Height 40' Crown spread dia. 40
Assessor(s) JV/MK Tools used Diameter tape **Time frame** 3-5 yrs

Target Assessment

Target number	Target description	Target protection	Target zone: Target within drip line	Target zone: Target within 1 x Ht.	Target zone: Target within 1.5 x Ht.	Occupancy rate (1–rare, 2–occasional, 3–frequent, 4–constant)	Practical to move target?	Restriction practical?
1	Pedestrians	None	Y	Y	Y	2	N	N
2	Vehicles	None	Y	Y	Y	4	N	N
3	Power and communication lines	None	Y	Y	Y	4	N	N
4								

Site Factors

History of failures None **Topography** Flat ☒ Slope ☐ _____ % **Aspect** _____
Site changes None ☒ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe _____
Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☐ Pavement over roots ☒ 25 % Describe Road, side walk.
Prevailing wind direction W **Common weather** Strong winds ☐ Ice ☐ Snow ☐ Heavy rain ☐ Describe _____

Tree Health and Species Profile

Vigor Low ☐ Normal ☒ High ☐ **Foliage** None (seasonal) ☒ None (dead) ☐ Normal ____ % Chlorotic ____ % Necrotic ____ %
Pests/Biotic None **Abiotic** None
Species failure profile Branches ☒ Trunk ☒ Roots ☐ Describe weak limbs and trunk unions

Load Factors

Wind exposure Protected ☐ Partial ☒ Full ☐ Wind funneling ☐ _____ **Relative crown size** Small ☐ Medium ☒ Large ☐
Crown density Sparse ☐ Normal ☐ Dense ☒ **Interior branches** Few ☐ Normal ☐ Dense ☒ **Vines/Mistletoe/Moss** ☐ _____
Recent or expected change in load factors None

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☐ LCR 82 %
Dead twigs/branches ☒ 20 % overall Max. dia. 3"
Broken/Hangers Number 10 Max. dia. 2"
Over-extended branches ☐
Pruning history
Crown cleaned ☐ Thinned ☐ Raised ☒
Reduced ☐ Topped ☐ Lion-tailed ☐
Flush cuts ☐ Other _____

Cracks ☐ _____ Lightning damage ☐
Codominant ☒ _____ Included bark ☒
Weak attachments ☒ _____ Cavity/Nest hole 10 % circ.
Previous branch failures ☐ _____ Similar branches present ☐
Dead/Missing bark ☐ Cankers/Galls/Burls ☐ Sapwood damage/decay ☐
Conks ☐ Heartwood decay ☒ _____
Response growth _____

Decay in large cut wounds
Condition(s) of concern Dead wood and conflicting limbs

Part Size 14" Dia Fall Distance 4-35'
Load on defect N/A ☐ Minor ☐ Moderate ☒ Significant ☐
Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

Part Size _____ Fall Distance _____
Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐
Likelihood of failure Improbable ☐ Possible ☐ Probable ☒ Imminent ☐

— Trunk —

Dead/Missing bark ☐ Abnormal bark texture/color ☐
Codominant stems ☒ Included bark ☒ Cracks ☐
Sapwood damage/decay ☐ Cankers/Galls/Burls ☐ Sap ooze ☒
Lightning damage ☐ Heartwood decay ☒ Conks/Mushrooms ☐
Cavity/Nest hole ____ % circ. Depth _____ Poor taper ☐
Lean ____° Corrected? _____
Response growth _____
Condition(s) of concern _____
Part Size 14" Dia Fall Distance 4-35'
Load on defect N/A ☐ Minor ☐ Moderate ☒ Significant ☐
Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

— Roots and Root Collar —

Collar buried/Not visible ☒ Depth _____ Stem girdling ☐
Dead ☐ Decay ☐ Conks/Mushrooms ☐
Ooze ☐ Cavity ☐ ____ % circ.
Cracks ☐ Cut/Damaged roots ☒ Distance from trunk 5'
Root plate lifting ☐ Soil weakness ☐
Response growth 1/2"
Condition(s) of concern None

Part Size _____ Fall Distance _____
Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐
Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization

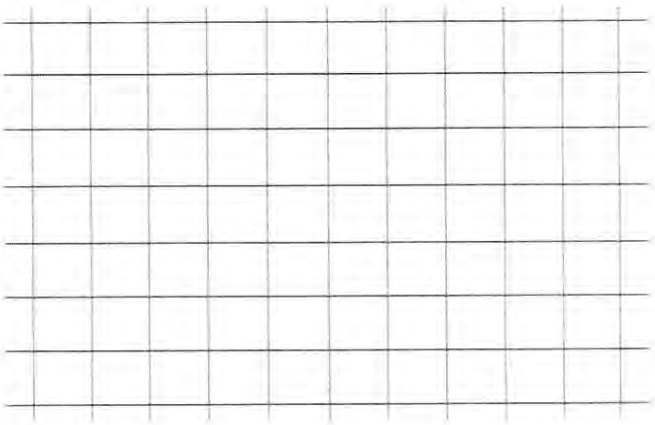
Target (Target number or description)	Tree part	Condition(s) of concern	Likelihood: Failure: Improbable	Failure: Possible	Failure: Probable	Failure: Imminent	Likelihood: Impact: Very low	Impact: Low	Impact: Medium	Impact: High	Likelihood: Failure & Impact (from Matrix 1): Unlikely	Failure & Impact: Somewhat	Failure & Impact: Likely	Failure & Impact: Very likely	Consequences: Negligible	Consequences: Minor	Consequences: Significant	Consequences: Severe	Risk rating (from Matrix 2)
1	Limb	Dead/weakly attached			X			X			X					X			L
2					X			X			X					X			L
2	Trunk			X						X		X					X		M
3				X					X		X							X	L

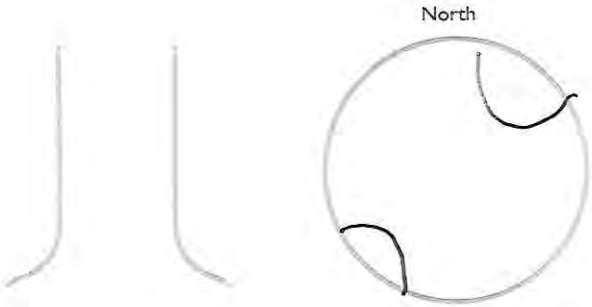
Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impact			
	Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low





Notes, explanations, descriptions

Weight reduction pruning should be performed on weakly attached trunk.
Deadwood, conflicting limbs, and weakly attached limbs should be removed.

Mitigation options

1. Weight reduction — **Residual risk** Low
2. Risk mitigation — **Residual risk** Low
3. _____ — **Residual risk** _____
4. _____ — **Residual risk** _____

Overall tree risk rating Low ☐ Moderate ☒ High ☐ Extreme ☐

Overall residual risk None ☐ Low ☒ Moderate ☐ High ☐ Extreme ☐ **Recommended inspection interval** 2 year

Data ☐ Final ☒ Preliminary **Advanced assessment needed** ☒ No ☐ Yes-Type/Reason _____

Inspection limitations ☐ None ☐ Visibility ☐ Access ☐ Vines ☒ Root collar buried Describe _____

ISA Basic Tree Risk Assessment Form

Client City of Salem Date 02/13/19 Time 2:16

Address/Tree location Division Street, South Side, Fifth from Liberty Tree no. 5 Sheet 5 of 20

Tree species Hornbeam dbh 25" Height 25' Crown spread dia. 34'

Assessor(s) JV / MK Tools used Diameter Tape Time frame 5-10 yrs

Target Assessment

Target number	Target description	Target protection	Target zone: Target within drip line	Target zone: Target within 1x Ht.	Target zone: Target within 1.5x Ht.	Occupancy rate (1–rare 2–occasional 3–frequent 4–constant)	Practical to move target?	Restriction practical?
1	Pedestrians	N	Y	Y	Y	2	N	N
2	Vehicles	N	Y	Y	Y	4	N	N
3	Communication lines	N	Y	Y	Y	4	N	N
4								

Site Factors

History of failures None Topography Flat ☒ Slope ☐ _____% Aspect _____

Site changes None ☒ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe _____

Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☐ Pavement over roots ☐ 65 % Describe Driveway, Sidewalk, Road

Prevailing wind direction W Common weather Strong winds ☐ Ice ☐ Snow ☐ Heavy rain ☐ Describe _____

Tree Health and Species Profile

Vigor Low ☐ Normal ☒ High ☐ Foliage None (seasonal) ☒ None (dead) ☐ Normal ____% Chlorotic ____% Necrotic ____%

Pests/Biotic None ? Abiotic None

Species failure profile Branches ☒ Trunk ☒ Roots ☐ Describe Weak limb and trunk unions

Load Factors

Wind exposure Protected ☐ Partial ☒ Full ☐ Wind funneling ☐ _____ Relative crown size Small ☒ Medium ☐ Large ☐

Crown density Sparse ☐ Normal ☐ Dense ☒ Interior branches Few ☐ Normal ☐ Dense ☒ Vines/Mistletoe/Moss ☐ _____

Recent or expected change in load factors Fast growing response growth from pruning

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☒ LCR 76 %

Dead twigs/branches ☐ 0 % overall Max. dia. _____

Broken/Hangers Number 0 Max. dia. _____

Over-extended branches ☐

Pruning history

Crown cleaned ☐ Thinned ☐ Raised ☒

Reduced ☐ Topped ☒ Lion-tailed ☐

Flush cuts ☒ Other Utility pruning

Response sprouts from utility pruning

Part Size 1/2-3" Fall Distance _____

Load on defect N/A ☐ Minor ☒ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Cracks ☐ _____ Lightning damage ☐

Codominant ☐ _____ Included bark ☐

Weak attachments ☐ _____ Cavity/Nest hole ____% circ.

Previous branch failures ☐ _____ Similar branches present ☐

Dead/Missing bark ☐ Cankers/Galls/Burls ☐ Sapwood damage/decay ☐

Conks ☐ Heartwood decay ☐ _____

Response growth _____

Condition(s) of concern Decay from utility pruning cuts

Part Size 1-5" Fall Distance 12-25'

Load on defect N/A ☐ Minor ☒ Moderate ☒ Significant ☐

Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

— Trunk —

Dead/Missing bark ☐ Abnormal bark texture/color ☐

Codominant stems ☒ Included bark ☒ Cracks ☐

Sapwood damage/decay ☐ Cankers/Galls/Burls ☐ Sap ooze ☐

Lightning damage ☐ Heartwood decay ☒ Conks/Mushrooms ☐

Cavity/Nest hole 2 % circ. Depth 1-3" Poor taper ☐

Lean 0 ° Corrected? _____

Response growth _____

Condition(s) of concern Decay

Part Size 12" Dia Fall Distance 5-25'

Load on defect N/A ☐ Minor ☐ Moderate ☒ Significant ☐

Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

— Roots and Root Collar —

Collar buried/Not visible ☒ Depth 1-3" Stem girdling ☐

Dead ☐ Decay ☐ Conks/Mushrooms ☐

Ooze ☐ Cavity ☐ ____% circ.

Cracks ☐ Cut/Damaged roots ☐ Distance from trunk _____

Root plate lifting ☐ Soil weakness ☐

Response growth _____

Condition(s) of concern _____

Part Size _____ Fall Distance _____

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization

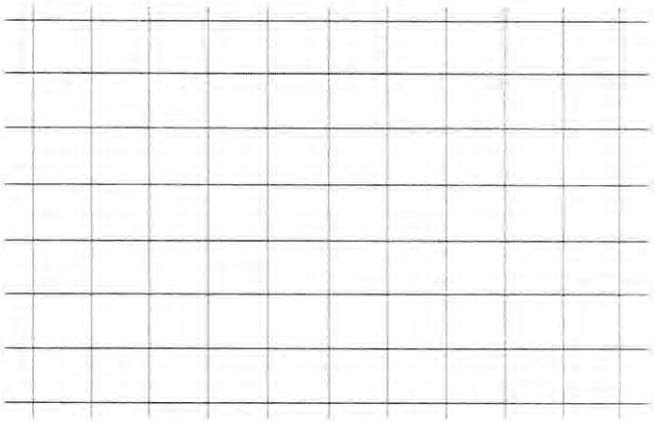
Target (Target number or description)	Tree part	Condition(s) of concern	Likelihood: Failure: Improbable	Failure: Possible	Failure: Probable	Failure: Imminent	Impact: Very low	Impact: Low	Impact: Medium	Impact: High	Failure & Impact (from Matrix 1): Unlikely	Somewhat	Likely	Very likely	Consequences: Negligible	Minor	Significant	Severe	Risk rating (from Matrix 2)
1	Limbs	overweighted	X						X		X					X			L
2			X						X		X					X			L
3	Trunk	weak attachment		X					X		X						X		L

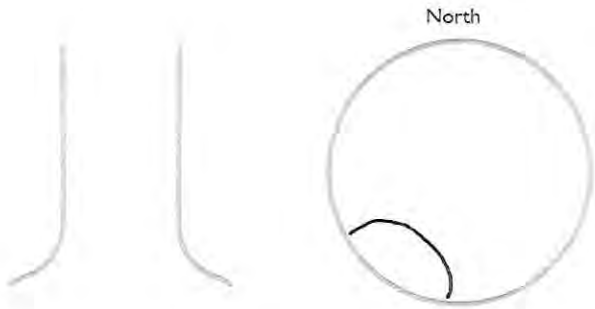
Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impact: Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure: Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low





Notes, explanations, descriptions

Weight reduction pruning should be performed on weakly attached / overweighted limb. Removal should be considered, due to improper tree size for space and poor health

Mitigation options

1. weight reduction — **Residual risk** _____
2. Removal — **Residual risk** _____
3. _____ — **Residual risk** _____
4. _____ — **Residual risk** _____

Overall tree risk rating Low ☐ Moderate ☒ High ☐ Extreme ☐

Overall residual risk None ☒ Low ☒ Moderate ☐ High ☐ Extreme ☐ **Recommended inspection interval** 1 year

Data ☐ Final ☒ Preliminary **Advanced assessment needed** ☐ No ☐ Yes-Type/Reason _____

Inspection limitations ☒ None ☐ Visibility ☐ Access ☐ Vines ☒ Root collar buried Describe _____

ISA Basic Tree Risk Assessment Form

Client City of Salem Date 02/13/'19 Time 3:00
Address/Tree location Division Street, Southside, Sixth from Liberty Tree no. 6 Sheet 6 of 20
Tree species Hornbeam dbh: 2/14/8/13/10" Height 35' Crown spread dia. 34'
Assessor(s) JV/MK Tools used DBH Tape Time frame 3-7 yrs

Target Assessment

Target number	Target description	Target protection	Target zone: Target within drip line	Target zone: Target within 1x Ht.	Target zone: Target within 1.5 x Ht.	Occupancy rate (1–rare 2–occasional 3–frequent 4–constant)	Practical to move target?	Restriction practical?
1	Pedestrians	None	Y	N	N	3	N	N
2	Vehicles	None	Y	N	N	2	N	N
3	Communication	None	N	N	N	4	N	N
4								

Site Factors

History of failures None Topography Flat ☒ Slope ☐ _____% Aspect _____
Site changes None ☒ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe _____
Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☐ Pavement over roots ☑ 65 % Describe Road, sidewalk,
Prevailing wind direction W Common weather Strong winds ☐ Ice ☐ Snow ☐ Heavy rain ☐ Describe _____

Tree Health and Species Profile

Vigor Low ☐ Normal ☒ High ☐ Foliage None (seasonal) ☒ None (dead) ☐ Normal ____% Chlorotic ____% Necrotic ____%
Pests/Biotic Ivy Abiotic None
Species failure profile Branches ☒ Trunk ☒ Roots ☐ Describe _____

Load Factors

Wind exposure Protected ☐ Partial ☒ Full ☐ Wind funneling ☐ _____ Relative crown size Small ☐ Medium ☒ Large ☐
Crown density Sparse ☐ Normal ☒ Dense ☐ Interior branches Few ☐ Normal ☒ Dense ☐ Vines/Mistletoe/Moss ☐ _____
Recent or expected change in load factors None

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☐ LCR 80 %
Dead twigs/branches ☒ 5 % overall Max. dia. 2"
Broken/Hangers Number 3 Max. dia. 1"
Over-extended branches ☐
Pruning history
Crown cleaned ☒ Thinned ☒ Raised ☒
Reduced ☐ Topped ☐ Lion-tailed ☐
Flush cuts ☐ Other _____
Dead wood, Conflicting limbs Condition(s) of concern _____
Part Size 1-2" Fall Distance 5-20'
Load on defect N/A ☐ Minor ☒ Moderate ☐ Significant ☐
Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Cracks ☐ _____ Lightning damage ☐
Codominant ☐ _____ Included bark ☐
Weak attachments ☐ _____ Cavity/Nest hole ____% circ.
Previous branch failures ☐ _____ Similar branches present ☐
Dead/Missing bark ☐ Cankers/Galls/Burls ☐ Sapwood damage/decay ☐
Conks ☐ Heartwood decay ☐ _____
Response growth _____
Condition(s) of concern _____
Part Size _____ Fall Distance _____
Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☐
Likelihood of failure Improbable ☐ Possible ☐ Probable ☐ Imminent ☐

— Trunk —

Dead/Missing bark ☐ Abnormal bark texture/color ☐
Codominant stems ☒ Included bark ☐ Cracks ☐
Sapwood damage/decay ☐ Cankers/Galls/Burls ☐ Sap ooze ☐
Lightning damage ☐ Heartwood decay ☐ Conks/Mushrooms ☐
Cavity/Nest hole ____% circ. Depth _____ Poor taper ☐
Lean ____° Corrected? _____
Response growth _____
Condition(s) of concern Partially obscured (Ivy)
Part Size _____ Fall Distance _____
Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐
Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

— Roots and Root Collar —

Collar buried/Not visible ☒ Depth _____ Stem girdling ☐
Dead ☐ Decay ☐ Conks/Mushrooms ☐
Ooze ☐ Cavity ☐ ____% circ.
Cracks ☐ Cut/Damaged roots ☐ Distance from trunk _____
Root plate lifting ☐ Soil weakness ☐
Response growth _____
Condition(s) of concern Ivy covered, competing
Part Size _____ Fall Distance _____
Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☐
Likelihood of failure Improbable ☐ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization

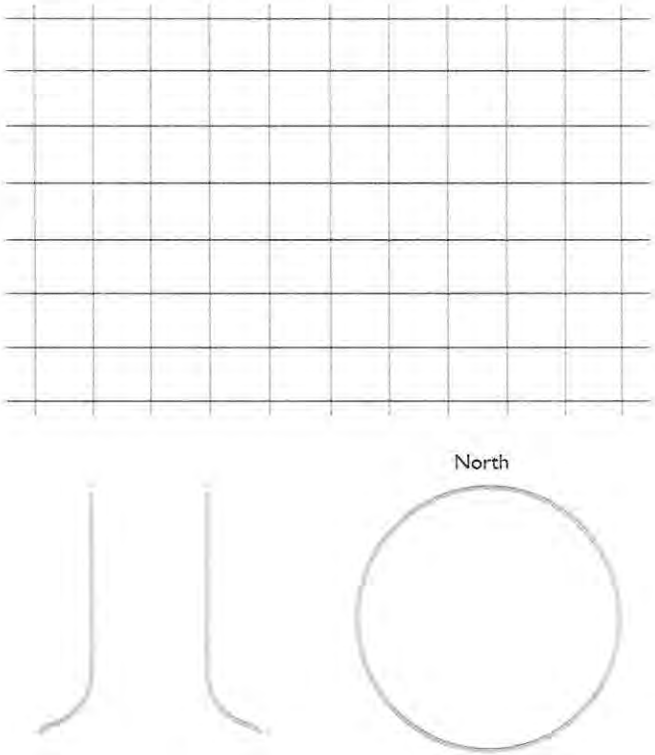
Target (Target number or description)	Tree part	Condition(s) of concern	Likelihood: Failure: Improbable	Likelihood: Failure: Possible	Likelihood: Failure: Probable	Likelihood: Failure: Imminent	Likelihood: Impact: Very low	Likelihood: Impact: Low	Likelihood: Impact: Medium	Likelihood: Impact: High	Likelihood: Failure & Impact (from Matrix 1): Unlikely	Likelihood: Failure & Impact (from Matrix 1): Somewhat	Likelihood: Failure & Impact (from Matrix 1): Likely	Likelihood: Failure & Impact (from Matrix 1): Very likely	Consequences: Negligible	Consequences: Minor	Consequences: Significant	Consequences: Severe	Risk rating (from Matrix 2)
1	Limbs	Dead. Conflicting			X			X			X					X			L
2					X			X			X					X			L

Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impact			
	Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low



Notes, explanations, descriptions

Deadwood & hangers in crown should be removed to reduce risk. IVY should be removed to improve health of tree & reduce competition for water and nutrients.

Mitigation options

1. IVY removal — **Residual risk** None
2. Crown cleaning / risk mitigation — **Residual risk** Low
3. _____ — **Residual risk** _____
4. _____ — **Residual risk** _____

Overall tree risk rating Low ☒ Moderate ☐ High ☐ Extreme ☐

Overall residual risk None ☐ Low ☒ Moderate ☐ High ☐ Extreme ☐ **Recommended inspection interval** _____

Data ☐ Final ☒ Preliminary **Advanced assessment needed** ☐ No ☐ Yes-Type/Reason _____

Inspection limitations ☐ None ☐ Visibility ☐ Access ☒ Vines ☒ Root collar buried Describe _____

ISA Basic Tree Risk Assessment Form

Client CITY OF Salem Date 02/13/19 Time 3:51

Address/Tree location Division Street, South side, seventh from Liberty Tree no. 7 Sheet 1 of 20

Tree species Hornbeam dbh 9"/8"/10"/9" Height 30' Crown spread dia. 32

Assessor(s) JV/MK Tools used Diameter tape Time frame 3-5 yrs

Target Assessment

Target number	Target description	Target protection	Target zone: Target within drip line	Target zone: Target within 1x Ht.	Target zone: Target within 1.5 x Ht.	Occupancy rate (1–rare, 2–occasional, 3–frequent, 4–constant)	Practical to move target?	Restriction practical?
1	Pedestrians	None	Y	Y	Y	2	N	N
2	Vehicle	None	Y	Y	Y	4	N	N
3	Communication Line	None	N	Y	N	4	N	N
4								

Site Factors

History of failures None **Topography** Flat ☒ Slope ☐ ____% **Aspect** ____

Site changes None ☒ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe ____

Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☐ Pavement over roots ☒ 70 % Describe Driveway, Sidewalk, road

Prevailing wind direction W **Common weather** Strong winds ☐ Ice ☐ Snow ☐ Heavy rain ☐ Describe ____

Tree Health and Species Profile

Vigor Low ☐ Normal ☒ High ☐ **Foliage** None (seasonal) ☒ None (dead) ☐ Normal ____% Chlorotic ____% Necrotic ____%

Pests/Biotic IVY **Abiotic** None

Species failure profile Branches ☒ Trunk ☒ Roots ☐ Describe Weak limb & Trunk unions

Load Factors

Wind exposure Protected ☐ Partial ☒ Full ☐ Wind funneling ☐ ____ **Relative crown size** Small ☐ Medium ☒ Large ☐

Crown density Sparse ☐ Normal ☐ Dense ☒ **Interior branches** Few ☐ Normal ☒ Dense ☐ **Vines/Mistletoe/Moss** ☐ ____

Recent or expected change in load factors None

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☐ LCR 76 %

Dead twigs/branches ☒ 5 % overall Max. dia. 2"

Broken/Hangers Number 3 Max. dia. 1"

Over-extended branches ☐

Pruning history

Crown cleaned ☐ Thinned ☒ Raised ☒

Reduced ☐ Topped ☐ Lion-tailed ☐

Flush cuts ☐ Other ____

Dead wood, weakly attached limbs — Condition(s) of concern

Part Size 1-3" Fall Distance 7-25'

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☐ Possible ☐ Probable ☒ Imminent ☐

Cracks ☐ ____ Lightning damage ☐

Codominant ☒ ____ Included bark ☒

Weak attachments ☒ ____ Cavity/Nest hole ____% circ.

Previous branch failures ☐ ____ Similar branches present ☐

Dead/Missing bark ☐ Cankers/Galls/Burls ☐ Sapwood damage/decay ☐

Conks ☐ Heartwood decay ☐ ____

Response growth ____

Part Size ____ Fall Distance ____

Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☐ Possible ☐ Probable ☐ Imminent ☐

— Trunk —

Dead/Missing bark ☐ Abnormal bark texture/color ☐

Codominant stems ☒ Included bark ☒ Cracks ☐

Sapwood damage/decay ☐ Cankers/Galls/Burls ☒ Sap ooze ☐

Lightning damage ☐ Heartwood decay ☐ Conks/Mushrooms ☐

Cavity/Nest hole ____% circ. Depth ____ Poor taper ☒

Lean ____° Corrected? ____

Response growth ____

Condition(s) of concern weak union

Part Size ~17" Diameter Fall Distance 3-30'

Load on defect N/A ☐ Minor ☐ Moderate ☒ Significant ☐

Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

— Roots and Root Collar —

Collar buried/Not visible ☒ Depth ____ Stem girdling ☐

Dead ☐ Decay ☐ Conks/Mushrooms ☐

Ooze ☐ Cavity ☐ ____% circ.

Cracks ☐ Cut/Damaged roots ☐ Distance from trunk ____

Root plate lifting ☐ Soil weakness ☐

Response growth ____

Condition(s) of concern IVY covered

Part Size ____ Fall Distance ____

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization

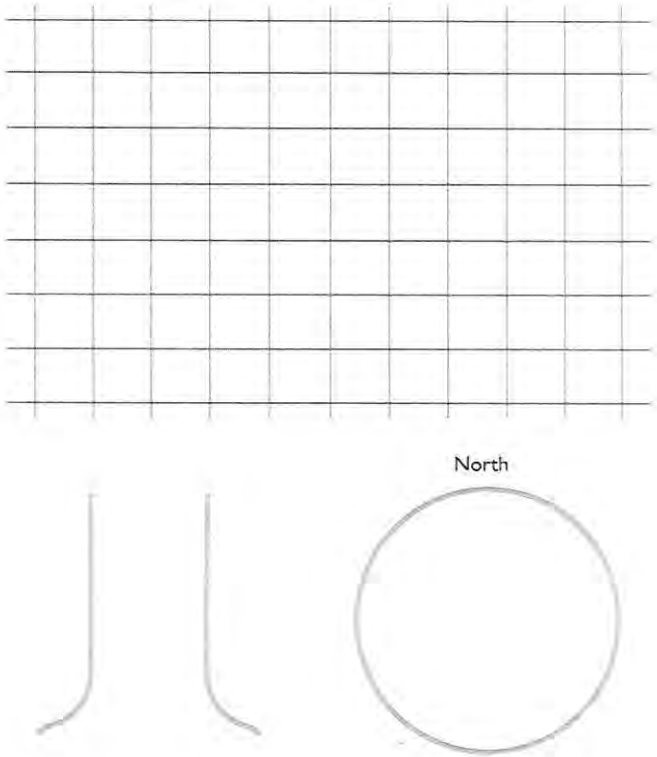
Target (Target number or description)	Tree part	Condition(s) of concern	Likelihood: Failure: Improbable	Failure: Possible	Failure: Probable	Failure: Imminent	Impact: Very low	Impact: Low	Impact: Medium	Impact: High	Failure & Impact (from Matrix 1): Unlikely	Somewhat	Likely	Very likely	Consequences: Negligible	Minor	Significant	Severe	Risk rating (from Matrix 2)
1	Limbs	Dead, Weakly attached			X			X			X				X				L
2					X			X			X				X				L
1	Trunk	Weak attachment/union		X				X			X						X		M
3				X					X		X					X			L

Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impact			
	Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low



Notes, explanations, descriptions

Weakly attached trunk should have crown & weight reduction pruning performed.
Risk mitigation pruning should be performed in remaining crown

Mitigation options

1. Crown reduction — **Residual risk** Low
2. Risk mitigation — **Residual risk** Low
3. _____ — **Residual risk** _____
4. _____ — **Residual risk** _____

Overall tree risk rating Low ☐ Moderate ☒ High ☐ Extreme ☐

Overall residual risk None ☐ Low ☒ Moderate ☐ High ☐ Extreme ☐ **Recommended inspection interval** 2 Years

Data ☐ Final ☒ Preliminary **Advanced assessment needed** ☒ No ☐ Yes-Type/Reason _____

Inspection limitations ☐ None ☐ Visibility ☐ Access ☒ Vines ☒ Root collar buried Describe _____

ISA Basic Tree Risk Assessment Form

Client City of Salem Date 02/13/'19 Time 4:15

Address/Tree location Division Street, South Side, Eighth from Liberty Tree no. 8 Sheet 8 of 20

Tree species Hornbeam dbh 8/6/10/10" Height 27' Crown spread dia. 35'

Assessor(s) JV / MK Tools used Diameter Tape **Time frame** 3-5 Yrs

Target Assessment

Target number	Target description	Target protection	Target zone: Target within drip line	Target zone: Target within 1 x Ht.	Target zone: Target within 1.5 x Ht.	Occupancy rate (1–rare 2–occasional 3–frequent 4–constant)	Practical to move target?	Restriction practical?
1	Pedestrians	None	Y	Y	Y	2	N	N
2	Vehicles	None	Y	Y	Y	4	N	N
3	Structure (Building)	None	N	Y	Y	4	N	N
4								

Site Factors

History of failures None **Topography** Flat ☒ Slope ☐ _____ % **Aspect** _____

Site changes None ☒ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe _____

Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☐ Pavement over roots ☒ 40 % Describe Walkway, road, driveway

Prevailing wind direction W **Common weather** Strong winds ☐ Ice ☐ Snow ☐ Heavy rain ☐ Describe _____

Tree Health and Species Profile

Vigor Low ☒ Normal ☐ High ☐ **Foliage** None (seasonal) ☒ None (dead) ☐ Normal _____ % Chlorotic _____ % Necrotic _____ %

Pests/Biotic Ivy, Pedestrians **Abiotic** None

Species failure profile Branches ☒ Trunk ☒ Roots ☐ Describe Weak limb & trunk unions

Load Factors

Wind exposure Protected ☐ Partial ☒ Full ☐ Wind funneling ☐ _____ **Relative crown size** Small ☐ Medium ☒ Large ☐

Crown density Sparse ☒ Normal ☐ Dense ☐ **Interior branches** Few ☐ Normal ☒ Dense ☐ **Vines/Mistletoe/Moss** ☐ _____

Recent or expected change in load factors Recent Thinning (1-2 years ago)

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☐ LCR 76 %

Dead twigs/branches ☒ 15 % overall Max. dia. 2"

Broken/Hangers Number 2 Max. dia. 2"

Over-extended branches ☐

Pruning history

Crown cleaned ☐ Thinned ☒ Raised ☒

Reduced ☐ Topped ☐ Lion-tailed ☐

Flush cuts ☒ Other _____

Vandalism & poor pruning has caused wounds with decay.

Part Size _____ Fall Distance N/A

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Cracks ☐ _____ Lightning damage ☐

Codominant ☐ _____ Included bark ☐

Weak attachments ☐ _____ Cavity/Nest hole ____ % circ.

Previous branch failures ☐ _____ Similar branches present ☐

Dead/Missing bark ☐ Cankers/Galls/Burls ☐ Sapwood damage/decay ☐

Conks ☐ Heartwood decay ☐ _____

Response growth _____

Condition(s) of concern Dead & weakly attached limbs.

Part Size 2" Fall Distance 6-25'

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☒

Likelihood of failure Improbable ☐ Possible ☐ Probable ☒ Imminent ☐

— Trunk —

Dead/Missing bark ☒ Abnormal bark texture/color ☒

Codominant stems ☒ Included bark ☒ Cracks ☐

Sapwood damage/decay ☒ Cankers/Galls/Burls ☒ Sap ooze ☐

Lightning damage ☐ Heartwood decay ☒ Conks/Mushrooms ☐

Cavity/Nest hole ____ % circ. Depth _____ Poor taper ☐

Lean ____ ° Corrected? _____

Response growth _____

Condition(s) of concern Wound decay

Part Size _____ Fall Distance _____

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☒

Likelihood of failure Improbable ☒ Possible ☐ Probable ☒ Imminent ☐

— Roots and Root Collar —

Collar buried/Not visible ☒ Depth _____ Stem girdling ☐

Dead ☐ Decay ☐ Conks/Mushrooms ☐

Ooze ☐ Cavity ☐ ____ % circ.

Cracks ☐ Cut/Damaged roots ☐ Distance from trunk _____

Root plate lifting ☐ Soil weakness ☐

Response growth _____

Condition(s) of concern Ivy covered

Part Size _____ Fall Distance _____

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization

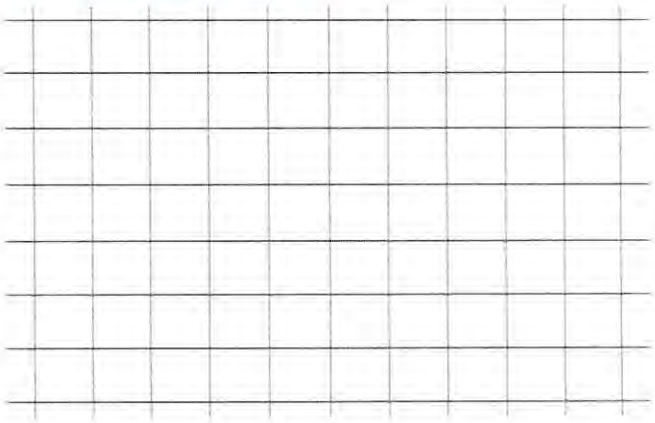
Target (Target number or description)	Tree part	Condition(s) of concern	Likelihood: Failure: Improbable	Failure: Possible	Failure: Probable	Failure: Imminent	Impact: Very low	Impact: Low	Impact: Medium	Impact: High	Failure & Impact (from Matrix 1): Unlikely	Failure & Impact: Somewhat	Failure & Impact: Likely	Failure & Impact: Very likely	Consequences: Negligible	Consequences: Minor	Consequences: Significant	Consequences: Severe	Risk rating (from Matrix 2)
1	Limbs	Dead, weakly attached			X			X			X					X			L
1	Trunk	Weak attachment			X			X			X					X			L
2					X					X			X				X		H
3					X					X			X			X			M

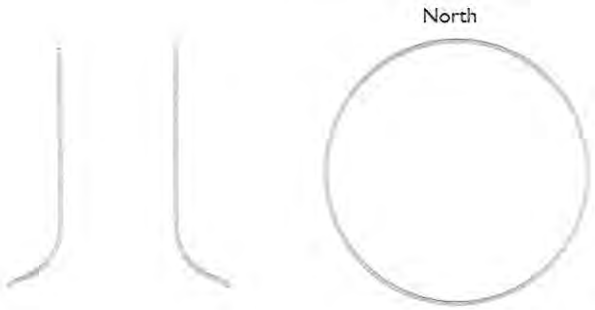
Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impact			
	Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low





Notes, explanations, descriptions
Damage to Trunk & Stems has caused significant Decay to Structure. Crown reduction and risk Mitigation pruning should be performed To reduce risk. Removal should be considered if risk remains unacceptable.

Mitigation options

1. Crown Reduction — **Residual risk** Low
2. Risk Mitigation Pruning — **Residual risk** Low
3. Removal — **Residual risk** None
4. _____ — **Residual risk** _____

Overall tree risk rating Low ☐ Moderate ☐ High ☒ Extreme ☐

Overall residual risk None ☒ Low ☒ Moderate ☐ High ☐ Extreme ☐ **Recommended inspection interval** 1 Year

Data ☐ Final ☒ Preliminary **Advanced assessment needed** ☒ No ☐ Yes-Type/Reason _____

Inspection limitations ☐ None ☐ Visibility ☐ Access ☒ Vines ☐ Root collar buried Describe _____

ISA Basic Tree Risk Assessment Form

Client City of Salem Date 02/14/19 Time 1:00

Address/Tree location 12th Division Street, South side, North from Liberty Tree no. 9 Sheet 9 of 20

Tree species Hornbeam dbh 10/10/8/6/10" Height 25' Crown spread dia. 36'

Assessor(s) JV / MK Tools used Tape measure Time frame 3-7 years

Target Assessment

Target number	Target description	Target protection	Target zone: Target within drip line	Target zone: Target within 1x Ht.	Target zone: Target within 1.5x Ht.	Occupancy rate (1–rare 2–occasional 3–frequent 4–constant)	Practical to move target?	Restriction practical?
1	Pedestrians	None	Y	Y	Y	2	N	N
2	Vehicle	None	Y	Y	Y	4	N	N
3	Structure (Building)	None	Y	Y	Y	4	N	N
4								

Site Factors

History of failures None **Topography** Flat ☒ Slope ☐ _____% **Aspect** _____

Site changes None ☒ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe _____

Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☐ Pavement over roots ☒ 25 % Describe Sidewalks, Road

Prevailing wind direction W **Common weather** Strong winds ☐ Ice ☐ Snow ☐ Heavy rain ☐ Describe _____

Tree Health and Species Profile

Vigor Low ☐ Normal ☒ High ☐ **Foliage** None (seasonal) ☒ None (dead) ☐ Normal ____% Chlorotic ____% Necrotic ____%

Pests/Biotic Ivy **Abiotic** None evident

Species failure profile Branches ☒ Trunk ☐ Roots ☐ Describe Weak limb & trunk unions

Load Factors

Wind exposure Protected ☒ Partial ☐ Full ☐ Wind funneling ☐ _____ **Relative crown size** Small ☐ Medium ☒ Large ☐

Crown density Sparse ☐ Normal ☒ Dense ☐ **Interior branches** Few ☐ Normal ☐ Dense ☒ **Vines/Mistletoe/Moss** ☐ _____

Recent or expected change in load factors Crown raised recently (~1-3 years)

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☐ LCR 76 %

Dead twigs/branches ☒ 10 % overall Max. dia. 4"

Broken/Hangers Number 3 Max. dia. 1"

Over-extended branches ☐

Pruning history

Crown cleaned ☐ Thinned ☐ Raised ☒

Reduced ☐ Topped ☐ Lion-tailed ☐

Flush cuts ☐ Other _____

Condition(s) of concern Peeling/dying bark, Dead wood & poorly attached limbs

Part Size 1-3" Fall Distance N/A

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Cracks ☐ _____ Lightning damage ☐

Codominant ☒ _____ Included bark ☒

Weak attachments ☐ _____ Cavity/Nest hole ____% circ.

Previous branch failures ☐ _____ Similar branches present ☐

Dead/Missing bark ☒ Cankers/Galls/Burls ☒ Sapwood damage/decay ☐

Conks ☐ Heartwood decay ☐ _____

Response growth _____

Condition(s) of concern heavy stem (South. over building) with weak attachment.

Part Size 20" diameter Fall Distance 3-20'

Load on defect N/A ☐ Minor ☐ Moderate ☒ Significant ☐

Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

— Trunk —

Dead/Missing bark ☒ Abnormal bark texture/color ☒

Codominant stems ☒ Included bark ☒ Cracks ☐

Sapwood damage/decay ☐ Cankers/Galls/Burls ☒ Sap ooze ☐

Lightning damage ☐ Heartwood decay ☐ Conks/Mushrooms ☐

Cavity/Nest hole ____% circ. Depth _____ Poor taper ☐

Lean ____° Corrected? _____

Response growth _____

Condition(s) of concern Weak stem attachment

Part Size 20" Dia Fall Distance 3-20'

Load on defect N/A ☐ Minor ☐ Moderate ☒ Significant ☐

Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

— Roots and Root Collar —

Collar buried/Not visible ☒ Depth _____ Stem girdling ☐

Dead ☐ Decay ☐ Conks/Mushrooms ☐

Ooze ☐ Cavity ☐ ____% circ.

Cracks ☐ Cut/Damaged roots ☐ Distance from trunk _____

Root plate lifting ☐ Soil weakness ☐

Response growth _____

Condition(s) of concern Ivy covered

Part Size _____ Fall Distance _____

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization

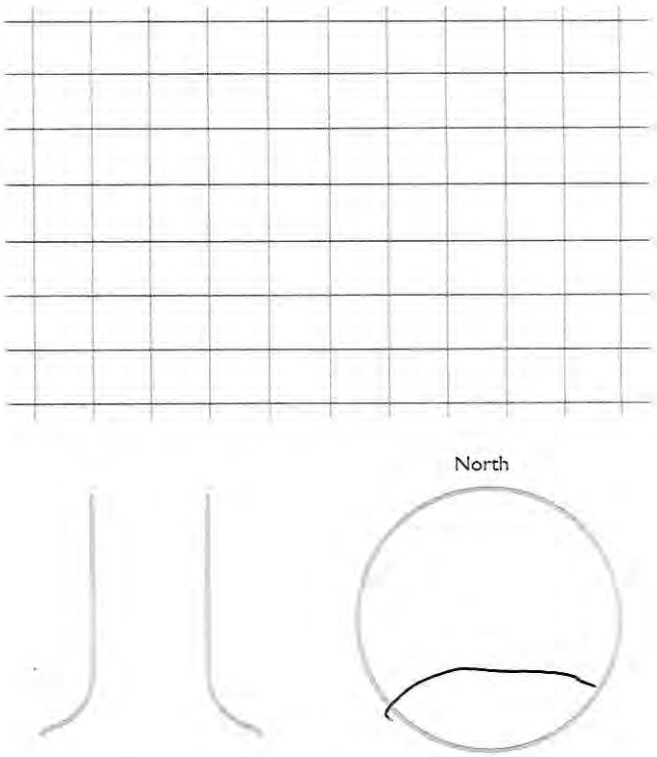
Target (Target number or description)	Tree part	Condition(s) of concern	Likelihood: Failure: Improbable	Failure: Possible	Failure: Probable	Failure: Imminent	Likelihood: Impact: Very low	Impact: Low	Impact: Medium	Impact: High	Failure & Impact (from Matrix 1): Unlikely	Somewhat	Likely	Very likely	Consequences: Negligible	Minor	Significant	Severe	Risk rating (from Matrix 2)
1	Limbs	Dead, weak attachments			X			X			X					X			L
2	Trunk	Weak union	X							X	X						X		L
3				X						X		X					X		M

Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impact			
	Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low



Notes, explanations, descriptions

Trunk union with included bark may fail. Dead wood, conflicting limbs, and poorly attached limbs should be removed. Ivy should be removed to improve health.

Mitigation options

1. Risk Mitigation Pruning — **Residual risk** Low
2. Weight reduction Pruning — **Residual risk** Low
3. Ivy removal — **Residual risk** Low
4. _____ — **Residual risk** _____

Overall tree risk rating Low ☐ Moderate ☒ High ☐ Extreme ☐

Overall residual risk None ☐ Low ☒ Moderate ☐ High ☐ Extreme ☐ **Recommended inspection interval** 2 years

Data ☐ Final ☒ Preliminary **Advanced assessment needed** ☐ No ☐ Yes-Type/Reason _____

Inspection limitations ☐ None ☐ Visibility ☐ Access ☒ Vines ☐ Root collar buried Describe _____

ISA Basic Tree Risk Assessment Form

Client City of Salem Date 02/14 Time 1:30
Address/Tree location Tree no. 10 Sheet 10 of
Tree species Hornbeam dbh 16/8/16/8" Height 30' Crown spread dia. 36'
Assessor(s) JV / MK Tools used Tape measure Time frame 3-7 yr

Target Assessment

Target number	Target description	Target protection	Target zone: Target within drip line	Target zone: Target within 1x Ht.	Target zone: Target within 1.5x Ht.	Occupancy rate (1–rare 2–occasional 3–frequent 4–constant)	Practical to move target?	Restriction practical?
1	Pedestrians	None	Y	Y	Y	2	N	N
2	Vehicles	None	Y	Y	Y	4	N	N
3	Structure (Building)	None	N	Y	Y	4	N	N
4								

Site Factors

History of failures None Topography Flat ☒ Slope ☐ ____% Aspect ____
Site changes None ☒ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe ____
Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☒ Pavement over roots ☒ 30 % Describe sidewalk, road
Prevailing wind direction W Common weather Strong winds ☐ Ice ☐ Snow ☐ Heavy rain ☐ Describe ____

Tree Health and Species Profile

Vigor Low ☐ Normal ☒ High ☐ Foliage None (seasonal) ☒ None (dead) ☐ Normal % Chlorotic ____% Necrotic ____%
Pests/Biotic IVY Abiotic None
Species failure profile Branches ☒ Trunk ☒ Roots ☐ Describe weak limbs and trunk unions

Load Factors

Wind exposure Protected ☐ Partial ☒ Full ☐ Wind funneling ☐ ____ Relative crown size Small ☐ Medium ☒ Large ☐
Crown density Sparse ☒ Normal ☐ Dense ☐ Interior branches Few ☐ Normal ☒ Dense ☐ Vines/Mistletoe/Moss ☐ ____
Recent or expected change in load factors Thinning / raising (1-3 years ago)

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☐ LCR 80 %
Dead twigs/branches ☒ 5 % overall Max. dia. 1"
Broken/Hangers Number 1 Max. dia. 1"
Over-extended branches ☐
Pruning history
Crown cleaned ☐ Thinned ☒ Raised ☒
Reduced ☐ Topped ☐ Lion-tailed ☐
Flush cuts ☐ Other ____
Cracks ☐ ____ Lightning damage ☐
Codominant ☒ ____ Included bark ☐
Weak attachments ☐ ____ Cavity/Nest hole ____% circ.
Previous branch failures ☐ ____ Similar branches present ☐
Dead/Missing bark ☐ Cankers/Galls/Burls ☐ Sapwood damage/decay ☐
Conks ☐ Heartwood decay ☐ ____
Response growth ____

Condition(s) of concern: overhanging limbs, deadwood
Part Size 1/2-3" Fall Distance 10-20'
Load on defect N/A ☐ Minor ☒ Moderate ☐ Significant ☐
Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

Condition(s) of concern ____
Part Size ____ Fall Distance ____
Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☐
Likelihood of failure Improbable ☐ Possible ☐ Probable ☐ Imminent ☐

— Trunk —

Dead/Missing bark ☐ Abnormal bark texture/color ☐
Codominant stems ☒ Included bark ☒ Cracks ☐
Sapwood damage/decay ☐ Cankers/Galls/Burls ☒ Sap ooze ☐
Lightning damage ☐ Heartwood decay ☐ Conks/Mushrooms ☐
Cavity/Nest hole ____% circ. Depth ____ Poor taper ☐
Lean ____° Corrected? ____
Response growth ____
Condition(s) of concern scaffold limb removed, decay
Part Size 5.5" Fall Distance N/A
Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐
Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

— Roots and Root Collar —

Collar buried/Not visible ☒ Depth ____ Stem girdling ☐
Dead ☐ Decay ☐ Conks/Mushrooms ☐
Ooze ☐ Cavity ☐ ____% circ.
Cracks ☐ Cut/Damaged roots ☒ Distance from trunk 10'
Root plate lifting ☐ Soil weakness ☐
Response growth ____
Condition(s) of concern soil compaction, IVY compaction
Part Size N/A ____ Fall Distance N/A
Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐
Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization

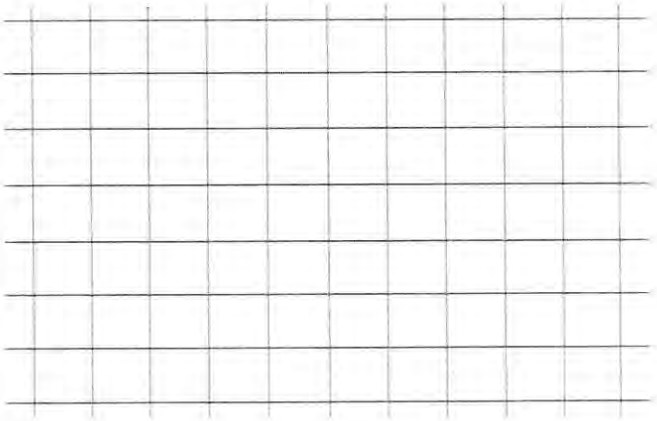
Target (Target number or description)	Tree part	Condition(s) of concern	Likelihood: Failure: Improbable	Likelihood: Failure: Possible	Likelihood: Failure: Probable	Likelihood: Failure: Imminent	Likelihood: Impact: Very low	Likelihood: Impact: Low	Likelihood: Impact: Medium	Likelihood: Impact: High	Likelihood: Failure & Impact (from Matrix 1): Unlikely	Likelihood: Failure & Impact (from Matrix 1): Somewhat	Likelihood: Failure & Impact (from Matrix 1): Likely	Likelihood: Failure & Impact (from Matrix 1): Very likely	Consequences: Negligible	Consequences: Minor	Consequences: Significant	Consequences: Severe	Risk rating (from Matrix 2)
1	Limbs	Dead			X			X			X					X			L
2					X			X			X					X			L

Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impact			
	Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low



Notes, explanations, descriptions

Small diameter dead wood is low risk.
Soil compaction is likely causing stress for tree.
IVY should be removed to improve health of tree, and reduce competition for water and nutrients.

Mitigation options

1. IVY removal — **Residual risk** None
2. Soil decompaction &/or mulch — **Residual risk** None
3. _____ — **Residual risk** _____
4. _____ — **Residual risk** _____

Overall tree risk rating Low ☒ Moderate ☐ High ☐ Extreme ☐

Overall residual risk None ☐ Low ☒ Moderate ☐ High ☐ Extreme ☐ **Recommended inspection interval** _____

Data ☐ Final ☒ Preliminary **Advanced assessment needed** ☒ No ☐ Yes-Type/Reason _____

Inspection limitations ☐ None ☐ Visibility ☐ Access ☒ Vines ☐ Root collar buried Describe _____

ISA Basic Tree Risk Assessment Form

Client City of Salem Date 2/19/2019 Time 9:50 am

Address/Tree location Division Street, North Side, Closest to Liberty Tree no. 11 Sheet 11 of 20

Tree species Zelkova dbh 8/6" Height 18' Crown spread dia. 21'

Assessor(s) JV / MK Tools used Diameter tape Time frame 15yrs

Target Assessment

Target number	Target description	Target protection	Target zone: Target within drip line	Target zone: Target within 1x Ht.	Target zone: Target within 1.5x Ht.	Occupancy rate (1 – rare, 2 – occasional, 3 – frequent, 4 – constant)	Practical to move target?	Restriction practical?
1	Pedestrians		✓	✓	✓	3	No	No
2	Parked Vehicles		✓	✓	✓	4	No	No
3								
4								

Site Factors

History of failures No **Topography** Flat ☒ Slope ☐ _____ % **Aspect** _____

Site changes None ☒ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe _____

Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☐ Pavement over roots ☒ 20 % Describe Sidewalk, Road

Prevailing wind direction W **Common weather** Strong winds ☐ Ice ☐ Snow ☐ Heavy rain ☐ Describe _____

Tree Health and Species Profile

Vigor Low ☐ Normal ☐ High ☒ **Foliage** None (seasonal) ☒ None (dead) ☐ Normal ____% Chlorotic ____% Necrotic ____%

Pests/Biotic None **Abiotic** None

Species failure profile Branches ☒ Trunk ☐ Roots ☐ Describe Weak branch unions

Load Factors

Wind exposure Protected ☐ Partial ☒ Full ☐ Wind funneling ☐ _____ **Relative crown size** Small ☐ Medium ☒ Large ☐

Crown density Sparse ☐ Normal ☒ Dense ☐ **Interior branches** Few ☐ Normal ☒ Dense ☐ **Vines/Mistletoe/Moss** ☐ _____

Recent or expected change in load factors None

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☒ LCR 67%

Dead twigs/branches ☐ ____% overall Max dia. _____

Broken/Hangers Number _____ Max. dia. _____

Over-extended branches ☐

Pruning history

Crown cleaned ☐ Thinned ☐ Raised ☒

Reduced ☐ Topped ☐ Lion-tailed ☐

Flush cuts ☐ Other _____

None Condition(s) of concern _____

Part Size _____ Fall Distance _____

Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Cracks ☐ _____ Lightning damage ☐

Codominant ☒ _____ Included bark ☒

Weak attachments ☐ _____ Cavity/Nest hole ____% circ.

Previous branch failures ☐ _____ Similar branches present ☐

Dead/Missing bark ☐ Cankers/Galls/Burls ☐ Sapwood damage/decay ☐

Conks ☐ Heartwood decay ☐ _____

Response growth _____

Condition(s) of concern _____

Part Size _____ Fall Distance _____

Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☐ Possible ☐ Probable ☐ Imminent ☐

— Trunk —

Dead/Missing bark ☐ Abnormal bark texture/color ☐

Codominant stems ☒ Included bark ☒ Cracks ☐

Sapwood damage/decay ☐ Cankers/Galls/Burls ☐ Sap ooze ☐

Lightning damage ☐ Heartwood decay ☐ Conks/Mushrooms ☐

Cavity/Nest hole ____% circ. Depth _____ Poor taper ☐

Lean 5° Corrected? _____

Response growth _____

Condition(s) of concern Stem Union

Part Size 8/6" Fall Distance 4'-18'

Load on defect N/A ☐ Minor ☐ Moderate ☒ Significant ☐

Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

— Roots and Root Collar —

Collar buried/Not visible ☐ Depth _____ Stem girdling ☐

Dead ☐ Decay ☐ Conks/Mushrooms ☐

Ooze ☐ Cavity ☐ ____% circ.

Cracks ☐ Cut/Damaged roots ☐ Distance from trunk 1'

Root plate lifting ☐ Soil weakness ☐

Response growth 1"

Condition(s) of concern _____

Part Size _____ Fall Distance _____

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization

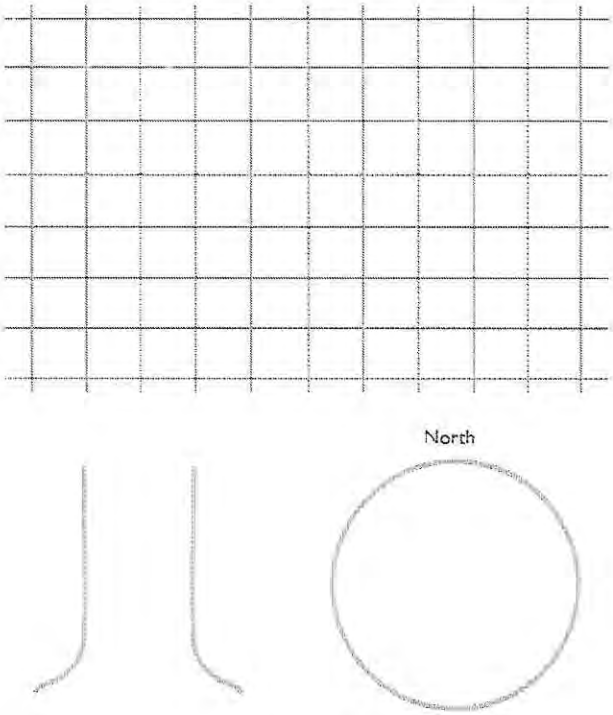
Target (Target number or description)	Tree part	Condition(s) of concern	Likelihood: Failure: Improbable	Failure: Possible	Failure: Probable	Failure: Imminent	Impact: Very low	Impact: Low	Impact: Medium	Impact: High	Failure & Impact (from Matrix 1): Unlikely	Somewhat	Likely	Very likely	Consequences: Negligible	Minor	Significant	Severe	Risk rating (from Matrix 2)
1	Trunk	Bark inclusion	X					X			X					X			low
2			X					X			X					X			low

Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impact			
	Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low



Notes, explanations, descriptions

Co-dominant stems have bark inclusion that may develop into structural weakness. Currently in good health with low likelihood of failure.

Mitigation options

1. None Needed — **Residual risk** low
2. _____ — **Residual risk** _____
3. _____ — **Residual risk** _____
4. _____ — **Residual risk** _____

Overall tree risk rating Low ☒ Moderate ☐ High ☐ Extreme ☐

Overall residual risk None ☐ Low ☒ Moderate ☐ High ☐ Extreme ☐ **Recommended inspection interval** 5 yrs

Data ☐Final ☒Preliminary **Advanced assessment needed** ☒No ☐Yes-Type/Reason _____

Inspection limitations ☒None ☐Visibility ☐Access ☐Vines ☐Root collar buried Describe _____

ISA Basic Tree Risk Assessment Form

Client City of Salem Date 2/19/2019 Time 10:45

Address/Tree location Division Street, North Side, Second to Liberty Tree no. 12 Sheet 12 of 20

Tree species Ash dbh 15" Height 28' Crown spread dia. 30'

Assessor(s) JV / MK Tools used Diameter tape Time frame 5-10

Target Assessment

Target number	Target description	Target protection	Target zone: Target within drip line	Target zone: Target within 1x Ht.	Target zone: Target within 1.5x Ht.	Occupancy rate (1 – rare, 2 – occasional, 3 – frequent, 4 – constant)	Practical to move target?	Restriction practical?
1	Pedestrians	None	Y	Y	Y'	2	No	No
2	Vehicles	None	Y	Y	Y	4	No	No
3								
4								

Site Factors

History of failures No Topography Flat ☒ Slope ☐ ____% Aspect ____

Site changes None ☒ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe ____

Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☐ Pavement over roots ☒ 30 % Describe Sidewalk, Road

Prevailing wind direction W Common weather Strong winds ☐ Ice ☐ Snow ☐ Heavy rain ☐ Describe ____

Tree Health and Species Profile

Vigor Low ☐ Normal ☒ High ☐ Foliage None (seasonal) ☒ None (dead) ☐ Normal ____% Chlorotic ____% Necrotic ____%

Pests/Biotic None Abiotic None

Species failure profile Branches ☐ Trunk ☐ Roots ☐ Describe None

Load Factors

Wind exposure Protected ☐ Partial ☒ Full ☐ Wind funneling ☐ ____ Relative crown size Small ☒ Medium ☐ Large ☐

Crown density Sparse ☐ Normal ☒ Dense ☐ Interior branches Few ☐ Normal ☐ Dense ☒ Vines/Mistletoe/Moss ☐ ____

Recent or expected change in load factors Partial topping for power line clearance

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☒ LCR 55 %

Dead twigs/branches ☐ 0 % overall Max. dia. ____

Broken/Hangers Number ____ Max. dia. ____

Over-extended branches ☐

Pruning history

Crown cleaned ☐ Thinned ☐ Raised ☒

Reduced ☒ Topped ☐ Lion-tailed ☐

Flush cuts ☐ Other utility pruned

Utility pruning has stressed tree, producing water sprouts and large wounds.

Part Size 1/2 - 2" Fall Distance 20'

Load on defect N/A ☐ Minor ☒ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Cracks ☐ ____ Lightning damage ☐

Codominant ☒ ____ Included bark ☐

Weak attachments ☐ ____ Cavity/Nest hole ____% circ.

Previous branch failures ☐ ____ Similar branches present ☐

Dead/Missing bark ☐ Cankers/Galls/Burls ☐ Sapwood damage/decay ☐

Conks ☐ Heartwood decay ☐ ____

Response growth water sprouts

Condition(s) of concern ____

Part Size ____ Fall Distance ____

Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☐ Possible ☐ Probable ☐ Imminent ☐

— Trunk —

Dead/Missing bark ☐ Abnormal bark texture/color ☐

Codominant stems ☒ Included bark ☐ Cracks ☐

Sapwood damage/decay ☐ Cankers/Galls/Burls ☐ Sap ooze ☐

Lightning damage ☐ Heartwood decay ☐ Conks/Mushrooms ☐

Cavity/Nest hole ____% circ. Depth ____ Poor taper ☐

Lean ____° Corrected? ____

Response growth ____

Condition(s) of concern None

Part Size ____ Fall Distance ____

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

— Roots and Root Collar —

Collar buried/Not visible ☐ Depth ____ Stem girdling ☐

Dead ☐ Decay ☐ Conks/Mushrooms ☐

Ooze ☐ Cavity ☐ ____% circ.

Cracks ☐ Cut/Damaged roots ☒ Distance from trunk 3'

Root plate lifting ☐ Soil weakness ☐

Response growth ____

Condition(s) of concern None

Part Size ____ Fall Distance ____

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization

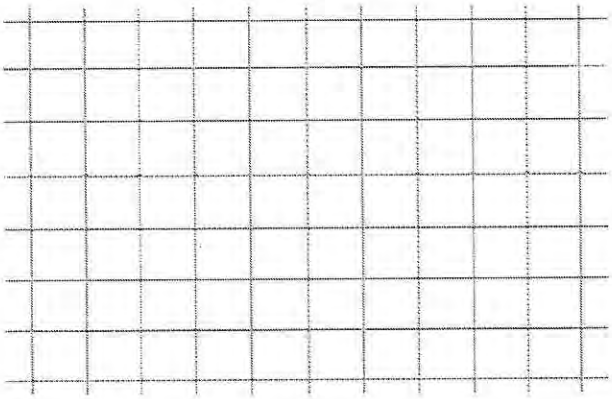
Target (Target number or description)	Tree part	Condition(s) of concern	Likelihood: Failure: Improbable	Failure: Possible	Failure: Probable	Failure: Imminent	Impact: Very low	Impact: Low	Impact: Medium	Impact: High	Failure & Impact (from Matrix 1): Unlikely	Failure & Impact: Somewhat likely	Failure & Impact: Likely	Failure & Impact: Very likely	Consequences: Negligible	Consequences: Minor	Consequences: Significant	Consequences: Severe	Risk rating (from Matrix 2)
1	limbs	Decay, water Sprout weight	X						X		X					X			low
2			X						X		X					X			low
1	Trunk	co-dominant	X						X		X						X		low
2			X						X		X						X		low

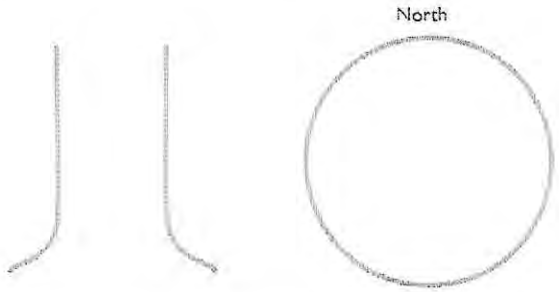
Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impact			
	Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low





Notes, explanations, descriptions

Vigorous water sprouts and large wounds may lead to limb and/or stem failure. currently low risk of failure.

Mitigation options

1. weight reduction pruning — **Residual risk** low
2. Restoration Pruning — **Residual risk** low
3. _____ — **Residual risk** _____
4. _____ — **Residual risk** _____

Overall tree risk rating Low ☒ Moderate ☐ High ☐ Extreme ☐

Overall residual risk None ☐ Low ☒ Moderate ☐ High ☐ Extreme ☐ **Recommended inspection interval** 3 yrs

Data ☐ Final ☒ Preliminary **Advanced assessment needed** ☒ No ☐ Yes-Type/Reason _____

Inspection limitations ☒ None ☐ Visibility ☐ Access ☐ Vines ☐ Root collar buried Describe _____

ISA Basic Tree Risk Assessment Form

Client City of Salem Date 2/19/2019 Time 11:15

Address/Tree location Division Street, North Side, Third from Liberty Tree no. 13 Sheet 13 of 20

Tree species Zelkova dbh 13" Height 20' Crown spread dia. 35'

Assessor(s) JV / MK Tools used Diameter Tape Time frame 5-10+ yrs

Target Assessment

Target number	Target description	Target protection	Target zone: Target within drip line	Target zone: Target within 1x Ht.	Target zone: Target within 1.5x Ht.	Occupancy rate (1 – rare, 2 – occasional, 3 – frequent, 4 – constant)	Practical to move target?	Restriction practical?
1	Pedestrians	None	✓	✓	✓	2	No	No
2	Vehicles	None	✓	✓	✓	4	No	No
3								
4								

Site Factors

History of failures No Topography Flat ☒ Slope ☐ ____% Aspect ____

Site changes None ☒ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe ____

Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☐ Pavement over roots ☒ 30 % Describe Sidewalk, Road

Prevailing wind direction W Common weather Strong winds ☐ Ice ☐ Snow ☐ Heavy rain ☐ Describe ____

Tree Health and Species Profile

Vigor Low ☐ Normal ☐ High ☒ Foliage None (seasonal) ☒ None (dead) ☐ Normal ____% Chlorotic ____% Necrotic ____%

Pests/Biotic None Abiotic None

Species failure profile Branches ☒ Trunk ☐ Roots ☐ Describe weak branch unions

Load Factors

Wind exposure Protected ☐ Partial ☒ Full ☐ Wind funneling ☐ ____ Relative crown size Small ☐ Medium ☒ Large ☐

Crown density Sparse ☐ Normal ☐ Dense ☒ Interior branches Few ☐ Normal ☐ Dense ☒ Vines/Mistletoe/Moss ☐ ____

Recent or expected change in load factors None

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☐ LCR 70 %

Dead twigs/branches ☐ ____% overall Max. dia. ____

Broken/Hangers Number ____ Max. dia. ____

Over-extended branches ☐

Pruning history

Crown cleaned ☐ Thinned ☐ Raised ☒

Reduced ☐ Topped ☐ Lion-tailed ☐

Flush cuts ☐ Other ____

Condition(s) of concern ____

Part Size ____ Fall Distance ____

Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☐ Possible ☐ Probable ☐ Imminent ☐

Cracks ☐ ____ Lightning damage ☐

Codominant ☒ ____ Included bark ☒

Weak attachments ☒ ____ Cavity/Nest hole ____% circ.

Previous branch failures ☐ ____ Similar branches present ☐

Dead/Missing bark ☐ Cankers/Galls/Burls ☐ Sapwood damage/decay ☐

Conks ☐ Heartwood decay ☐ ____

Response growth ____

Condition(s) of concern several co-dominant limbs with included bark.

Part Size 2-5" Fall Distance 7-18'

Load on defect N/A ☐ Minor ☐ Moderate ☒ Significant ☐

Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

— Trunk —

Dead/Missing bark ☐ Abnormal bark texture/color ☐

Codominant stems ☒ Included bark ☐ Cracks ☐

Sapwood damage/decay ☐ Cankers/Galls/Burls ☐ Sap ooze ☐

Lightning damage ☐ Heartwood decay ☐ Conks/Mushrooms ☐

Cavity/Nest hole ____% circ. Depth ____ Poor taper ☐

Lean ____° Corrected? ____

Response growth ____

Condition(s) of concern None

Part Size ____ Fall Distance ____

Load on defect N/A ☐ Minor ☐ Moderate ☒ Significant ☐

Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

— Roots and Root Collar —

Collar buried/Not visible ☐ Depth ____ Stem girdling ☐

Dead ☐ Decay ☐ Conks/Mushrooms ☐

Ooze ☐ Cavity ☐ ____% circ.

Cracks ☐ Cut/Damaged roots ☒ Distance from trunk 3'-4'

Root plate lifting ☐ Soil weakness ☐

Response growth 1/4" - 1/2"

Condition(s) of concern ____

Part Size ____ Fall Distance ____

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization

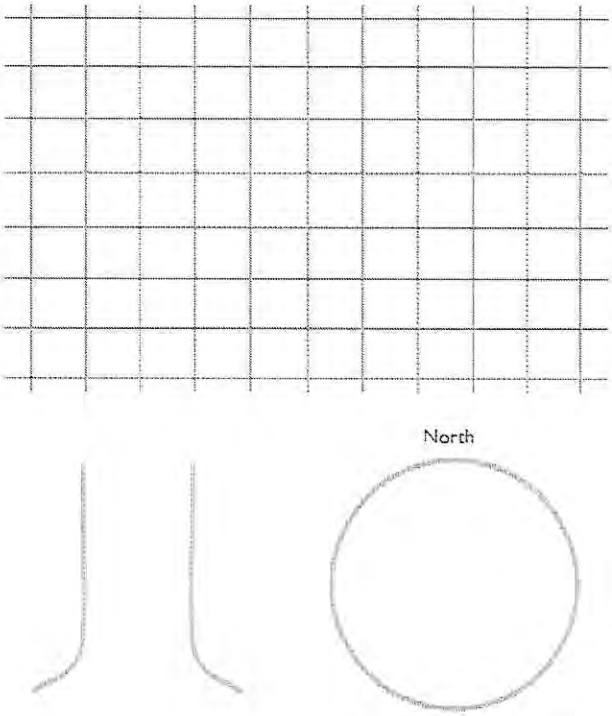
Target (Target number or description)	Tree part	Condition(s) of concern	Likelihood: Failure: Improbable	Failure: Possible	Failure: Probable	Failure: Imminent	Impact: Very low	Impact: Low	Impact: Medium	Impact: High	Failure & Impact (from Matrix 1): Unlikely	Somewhat	Likely	Very likely	Consequences: Negligible	Minor	Significant	Severe	Risk rating (from Matrix 2)
1	Limbs	overweighted / weak attachment		X				X			X					X			low
2			X						X		X					X			low
1	Trunk	co-dominant union	X						X		X						X		low
2			X						X		X						X		low

Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impact			
	Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low



Notes, explanations, descriptions

Poor structure on North side of crown from included bark and redundant limbs could lead to limb failure.

Mitigation options

1. Structural Pruning — **Residual risk** low
2. weight reduction pruning — **Residual risk**
3. — **Residual risk**
4. — **Residual risk**

Overall tree risk rating Low ☑ Moderate ☐ High ☐ Extreme ☐

Overall residual risk None ☐ Low ☑ Moderate ☐ High ☐ Extreme ☐ **Recommended inspection interval**

Data ☐Final ☑Preliminary **Advanced assessment needed** ☒No ☐Yes-Type/Reason

Inspection limitations ☒None ☐Visibility ☐Access ☐Vines ☐Root collar buried Describe

Basic Tree Risk Assessment Form

Client City of Salem Date 2/19/2019 Time 1:15pm

Address/Tree location Division Street, North Side, Fourth from Liberty Tree no. 14 Sheet 14 of 20

Tree species Zelkova dbh 12" Height 25' Crown spread dia. 35'

Assessor(s) JV / MK Tools used Diameter Tape **Time frame** 10+ yrs

Target Assessment

Target number	Target description	Target protection	Target zone: Target within drip line	Target zone: Target within 1x Ht.	Target zone: Target within 1.5x Ht.	Occupancy rate (1–rare 2–occasional 3–frequent 4–constant)	Practical to move target?	Restriction practical?
1	Pedestrians	None	✓	✓	✓	2	No	No
2	Vehicles	None	✓	✓	✓	4	No	No
3								
4								

Site Factors

History of failures No **Topography** Flat ☑ Slope ☐ ____% **Aspect** ____

Site changes None ☒ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe ____

Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☐ Pavement over roots ☒ 30 % Describe Sidewalk, Road

Prevailing wind direction W **Common weather** Strong winds ☐ Ice ☐ Snow ☐ Heavy rain ☐ Describe ____

Tree Health and Species Profile

Vigor Low ☐ Normal ☒ High ☐ **Foliage** None (seasonal) ☒ None (dead) ☐ Normal ____% Chlorotic ____% Necrotic ____%

Pests/Biotic None **Abiotic** None

Species failure profile Branches ☒ Trunk ☐ Roots ☐ Describe weak branch unions

Load Factors

Wind exposure Protected ☐ Partial ☒ Full ☐ Wind funneling ☐ ____ **Relative crown size** Small ☐ Medium ☐ Large ☒

Crown density Sparse ☐ Normal ☒ Dense ☐ **Interior branches** Few ☐ Normal ☒ Dense ☐ **Vines/Mistletoe/Moss** ☐ ____

Recent or expected change in load factors None

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☐ LCR 68 %

Dead twigs/branches ☒ 5 % overall Max. dia. 2"

Broken/Hangers Number 5 Max. dia. 1"

Over-extended branches ☐

Pruning history

Crown cleaned ☒ Thinned ☐ Raised ☒

Reduced ☐ Topped ☐ Lion-tailed ☐

Flush cuts ☐ Other ____

Dead Wood Condition(s) of concern Poorly Attached limbs

Part Size ½-2" dia Fall Distance 8-15'

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☐ Possible ☐ Probable ☒ Imminent ☐

Cracks ☐ ____ Lightning damage ☐

Codominant ☒ ____ Included bark ☐

Weak attachments ☒ ____ Cavity/Nest hole ____% circ.

Previous branch failures ☐ ____ Similar branches present ☐

Dead/Missing bark ☐ Cankers/Galls/Burls ☐ Sapwood damage/decay ☐

Conks ☐ Heartwood decay ☐ ____

Response growth ____

Part Size 1"-2" dia Fall Distance 10'-15'

Load on defect N/A ☐ Minor ☒ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

— Trunk —

Dead/Missing bark ☐ Abnormal bark texture/color ☐

Codominant stems ☒ Included bark ☒ Cracks ☐

Sapwood damage/decay ☐ Cankers/Galls/Burls ☐ Sap ooze ☐

Lightning damage ☐ Heartwood decay ☐ Conks/Mushrooms ☐

Cavity/Nest hole ____% circ. Depth ____ Poor taper ☐

Lean ____° Corrected? ____

Response growth ____

Condition(s) of concern Codominant stems

Part Size ____ Fall Distance ____

Load on defect N/A ☐ Minor ☐ Moderate ☒ Significant ☐

Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

— Roots and Root Collar —

Collar buried/Not visible ☐ Depth ____ Stem girdling ☒

Dead ☐ Decay ☐ Conks/Mushrooms ☐

Ooze ☐ Cavity ☐ ____% circ.

Cracks ☐ Cut/Damaged roots ☐ Distance from trunk ____

Root plate lifting ☐ Soil weakness ☐

Response growth ____

Condition(s) of concern Possible Stem girdling

Part Size 2"+ Fall Distance ____

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization

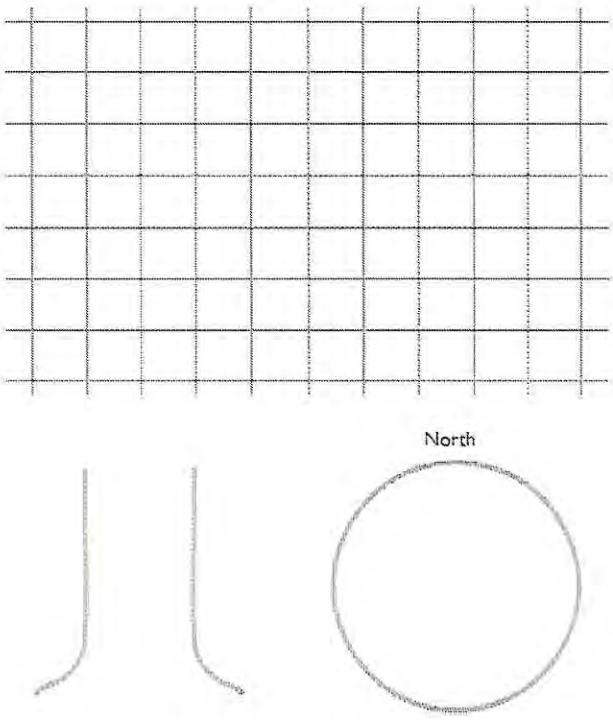
Target (Target number or description)	Tree part	Condition(s) of concern	Likelihood: Failure: Improbable	Failure: Possible	Failure: Probable	Failure: Imminent	Impact: Very low	Impact: Low	Impact: Medium	Impact: High	Failure & Impact (from Matrix 1): Unlikely	Failure & Impact: Somewhat	Failure & Impact: Likely	Failure & Impact: Very likely	Consequences: Negligible	Consequences: Minor	Consequences: Significant	Consequences: Severe	Risk rating (from Matrix 2)
1	Limbs	Co-dominant stems		X				X			X					X			low
2				X						X		X					X		Moderate

Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impact			
	Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low



Notes, explanations, descriptions

Co-dominant trunk union has bark inclusion and may eventually fail. Deadwood should be removed.

Mitigation options

1. Weight reduction pruning — **Residual risk** low
2. Risk mitigation pruning — **Residual risk** low
3. Cabling — **Residual risk** low
4. _____ — **Residual risk** _____

Overall tree risk rating Low ☐ Moderate ☒ High ☐ Extreme ☐

Overall residual risk None ☐ Low ☒ Moderate ☐ High ☐ Extreme ☐ **Recommended inspection interval** 3 yrs

Data ☐ Final ☒ Preliminary **Advanced assessment needed** ☒ No ☐ Yes-Type/Reason _____

Inspection limitations ☒ None ☐ Visibility ☐ Access ☐ Vines ☐ Root collar buried Describe _____

ISA Basic Tree Risk Assessment Form

Client City of Salem Date 2/19/2019 Time 1:50 pm

Address/Tree location Division Street, North Side, Fifth from Liberty Tree no. 15 Sheet 15 of 20

Tree species Hornbeam dbh 26" Height 35' Crown spread dia. 38'

Assessor(s) JV / MK Tools used Diameter Tape **Time frame** 10 yrs

Target Assessment

Target number	Target description	Target protection	Target zone: Target within drip line	Target zone: Target within 1x Ht.	Target zone: Target within 1.5x Ht.	Occupancy rate (1 – rare, 2 – occasional, 3 – frequent, 4 – constant)	Practical to move target?	Restriction practical?
1	Pedestrians	None	✓	✓	✓	2	No	No
2	Vehicles	None	✓	✓	✓	4	No	No
3	Structure	None	✓	✓	✓	4	No	No
4	Power line	None	✓	✓	✓	4	No	No

Site Factors

History of failures No **Topography** Flat ☒ Slope ☐ ____ % **Aspect** ____

Site changes None ☒ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe ____

Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☐ Pavement over roots ☒ 70 % Describe Sidewalk, Road, Driveway

Prevailing wind direction W **Common weather** Strong winds ☐ Ice ☐ Snow ☐ Heavy rain ☐ Describe ____

Tree Health and Species Profile

Vigor Low ☐ Normal ☒ High ☐ **Foliage** None (seasonal) ☒ None (dead) ☐ Normal ____ % Chlorotic ____ % Necrotic ____ %

Pests/Biotic None **Abiotic** None

Species failure profile Branches ☒ Trunk ☒ Roots ☐ Describe Weak limb and trunk unions

Load Factors

Wind exposure Protected ☐ Partial ☒ Full ☐ Wind funneling ☐ ____ **Relative crown size** Small ☐ Medium ☒ Large ☐

Crown density Sparse ☐ Normal ☐ Dense ☒ **Interior branches** Few ☐ Normal ☐ Dense ☒ **Vines/Mistletoe/Moss** ☐ ____

Recent or expected change in load factors No

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☐ LCR 77 %

Dead twigs/branches ☒ 5 % overall Max. dia. 2"

Broken/Hangers Number ____ Max. dia. ____

Over-extended branches ☐

Pruning history

Crown cleaned ☐ Thinned ☐ Raised ☒

Reduced ☐ Topped ☐ Lion-tailed ☐

Flush cuts ☐ Other ____

Dead wood Condition(s) of concern Limbs with Weak attachments

Part Size 1"-2" dia Fall Distance 6'-20'

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☐ Possible ☐ Probable ☒ Imminent ☐

Cracks ☐ ____ Lightning damage ☐

Codominant ☒ ____ Included bark ☐

Weak attachments ☒ ____ Cavity/Nest hole ____ % circ.

Previous branch failures ☐ ____ Similar branches present ☐

Dead/Missing bark ☐ Cankers/Galls/Burls ☐ Sapwood damage/decay ☐

Conks ☐ Heartwood decay ☐ ____

Response growth ____

Part Size 1"-4" dia Fall Distance 6'-20'

Load on defect N/A ☐ Minor ☐ Moderate ☒ Significant ☐

Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

— Trunk —

Dead/Missing bark ☐ Abnormal bark texture/color ☐

Codominant stems ☒ Included bark ☒ Cracks ☐

Sapwood damage/decay ☒ Cankers/Galls/Burls ☐ Sap ooze ☐

Lightning damage ☐ Heartwood decay ☒ Conks/Mushrooms ☐

Cavity/Nest hole 4 % circ. Depth 3" Poor taper ☐

Lean ____° Corrected? ____

Response growth ____

Condition(s) of concern 2 cavities in trunk, bark inclusion

Part Size 26" Fall Distance 3'-35'

Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☒

Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

— Roots and Root Collar —

Collar buried/Not visible ☐ Depth ____ Stem girdling ☐

Dead ☐ Decay ☐ Conks/Mushrooms ☐

Ooze ☐ Cavity ☐ ____ % circ.

Cracks ☐ Cut/Damaged roots ☐ Distance from trunk ____

Root plate lifting ☐ Soil weakness ☐

Response growth ____

Condition(s) of concern None

Part Size ____ Fall Distance ____

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization

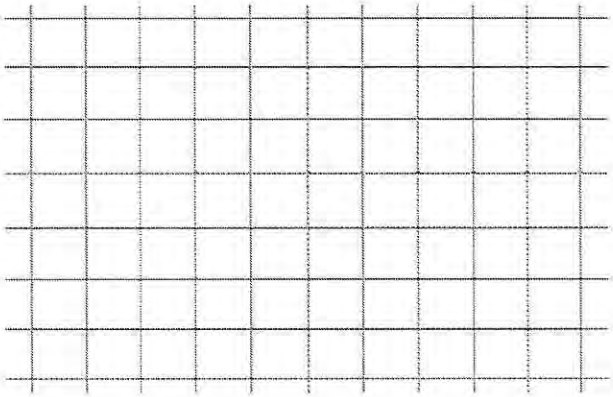
Target (Target number or description)	Tree part	Condition(s) of concern	Likelihood: Failure: Improbable	Failure: Possible	Failure: Probable	Failure: Imminent	Impact: Very low	Impact: Low	Impact: Medium	Impact: High	Failure & Impact (from Matrix 1): Unlikely	Somewhat	Likely	Very likely	Consequences: Negligible	Minor	Significant	Severe	Risk rating (from Matrix 2)
1	Limbs	Dead, weak attachments		X				X			X					X			low
2				X					X		X					X			low
3, 4				X				X			X						X		low
1	Trunk	Weak attachment		X				X			X						X		low
2				X					X		X						X		low
3, 4				X						X		X					X		Moderate

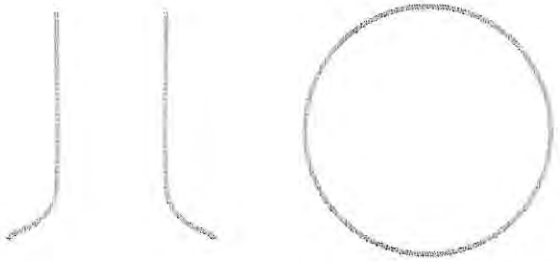
Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impact			
	Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low





Notes, explanations, descriptions
Poorly attached limbs/stems should have weight reduction performed to reduce risk of failure. Crown should be trimmed for line clearance and deadwood should be removed. Cavity in trunk should be monitored.

Mitigation options

1. Risk mitigation pruning — **Residual risk** low
2. Weight reduction pruning — **Residual risk** low
3. line clearance pruning — **Residual risk** low
4. _____ — **Residual risk** _____

Overall tree risk rating Low ☐ Moderate ☒ High ☐ Extreme ☐

Overall residual risk None ☐ Low ☒ Moderate ☐ High ☐ Extreme ☐ **Recommended inspection interval** 1 yr

Data ☐ Final ☒ Preliminary **Advanced assessment needed** ☒ No ☐ Yes-Type/Reason _____

Inspection limitations ☒ None ☐ Visibility ☐ Access ☐ Vines ☐ Root collar buried Describe _____

ISA Basic Tree Risk Assessment Form

Client City of Salem Date 2/19/2019 Time 2:30 pm
Address/Tree location Division Street, North Side, Sixth from Liberty Tree no. 16 Sheet 16 of 20
Tree species Hornbeam dbh 25"/11" Height 35' Crown spread dia. 36'
Assessor(s) JV / MK Tools used Diameter Tape **Time frame** 7-10 yrs

Target Assessment

Target number	Target description	Target protection	Target zone: Target within drip line	Target zone: Target within 1x Ht.	Target zone: Target within 1.5x Ht.	Occupancy rate (1 – rare, 2 – occasional, 3 – frequent, 4 – constant)	Practical to move target?	Restriction practical?
1	Pedestrians	None	✓	✓	✓	2	No	No
2	Vehicles	None	✓	✓	✓	4	No	No
3	Structure	None	✓	✓	✓	4	No	No
4	Power line	None	✓	✓	✓	4	No	No

Site Factors

History of failures No **Topography** Flat ☒ Slope ☐ ____% **Aspect** ____
Site changes None ☒ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe ____
Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☐ Pavement over roots ☒ 40 % Describe Sidewalk, Road, Parking lot
Prevailing wind direction W **Common weather** Strong winds ☐ Ice ☐ Snow ☐ Heavy rain ☐ Describe ____

Tree Health and Species Profile

Vigor Low ☐ Normal ☒ High ☐ **Foliage** None (seasonal) ☒ None (dead) ☐ Normal ____% Chlorotic ____% Necrotic ____%
Pests/Biotic None **Abiotic** None
Species failure profile Branches ☒ Trunk ☒ Roots ☐ Describe Weak limb and trunk unions

Load Factors

Wind exposure Protected ☐ Partial ☒ Full ☐ Wind funneling ☐ ____ **Relative crown size** Small ☐ Medium ☒ Large ☐
Crown density Sparse ☐ Normal ☐ Dense ☒ **Interior branches** Few ☐ Normal ☐ Dense ☒ **Vines/Mistletoe/Moss** ☐ ____
Recent or expected change in load factors No

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☐ LCR 83 %
Dead twigs/branches ☒ 5 % overall Max. dia. 2"
Broken/Hangers Number ____ Max. dia. ____
Over-extended branches ☐
Pruning history
Crown cleaned ☐ Thinned ☐ Raised ☒
Reduced ☐ Topped ☐ Lion-tailed ☐
Flush cuts ☐ Other ____
Dead wood and Conflicting limbs Condition(s) of concern
Part Size 1"-2" dia Fall Distance 8'-20'
Load on defect N/A ☐ Minor ☒ Moderate ☐ Significant ☐
Likelihood of failure Improbable ☐ Possible ☐ Probable ☒ Imminent ☐

Cracks ☐ ____ Lightning damage ☐
Codominant ☒ ____ Included bark ☒
Weak attachments ☒ ____ Cavity/Nest hole ____% circ.
Previous branch failures ☐ ____ Similar branches present ☐
Dead/Missing bark ☐ Cankers/Galls/Burls ☐ Sapwood damage/decay ☐
Conks ☐ Heartwood decay ☐ ____
Response growth ____
Limbs with weak attachments Condition(s) of concern
Part Size 1"-4" dia Fall Distance 8'-20'
Load on defect N/A ☐ Minor ☐ Moderate ☒ Significant ☐
Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

— Trunk —

Dead/Missing bark ☒ Abnormal bark texture/color ☐
Codominant stems ☒ Included bark ☒ Cracks ☐
Sapwood damage/decay ☐ Cankers/Galls/Burls ☐ Sap ooze ☐
Lightning damage ☐ Heartwood decay ☐ Conks/Mushrooms ☐
Cavity/Nest hole 5 % circ. Depth 3" Poor taper ☐
Lean ____° Corrected? ____
Response growth ____
Condition(s) of concern Weak trunk union, missing bark
Part Size 25"/11" Fall Distance 3'-35'
Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☒
Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

— Roots and Root Collar —

Collar buried/Not visible ☐ Depth ____ Stem girdling ☐
Dead ☐ Decay ☐ Conks/Mushrooms ☐
Ooze ☐ Cavity ☐ ____% circ.
Cracks ☐ Cut/Damaged roots ☒ Distance from trunk 3'
Root plate lifting ☒ Soil weakness ☐
Response growth ____
Condition(s) of concern None
Part Size ____ Fall Distance ____
Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐
Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization

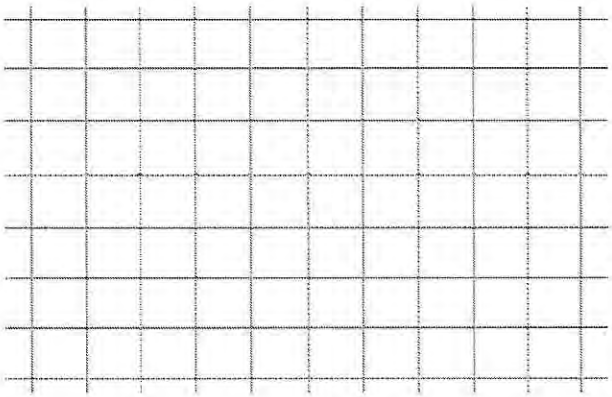
Target (Target number or description)	Tree part	Condition(s) of concern	Likelihood: Failure: Improbable	Failure: Possible	Failure: Probable	Failure: Imminent	Impact: Very low	Impact: Low	Impact: Medium	Impact: High	Failure & Impact (from Matrix 1): Unlikely	Failure & Impact: Somewhat	Failure & Impact: Likely	Failure & Impact: Very likely	Consequences: Negligible	Consequences: Minor	Consequences: Significant	Consequences: Severe	Risk rating (from Matrix 2)
1	Limbs	Dead, weak attachments		X				X			X					X			low
2				X				X			X					X			low
3, 4				X				X			X						X		low
1	Trunk	weak attachments		X				X			X						X		low
2				X					X		X						X		low
3, 4				X						X		X					X		Moderate

Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impact			
	Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low



Notes, explanations, descriptions

Poorly attached limbs / stems should have weight reduction performed to reduce risk of failure. Crown should be trimmed for line clearance and deadwood should be removed. Cavity in trunk should be monitored.

Mitigation options

1. Risk Mitigation Pruning — **Residual risk** low
2. Weight Reduction Pruning — **Residual risk** low
3. Line clearance pruning — **Residual risk** low
4. _____ — **Residual risk** _____

Overall tree risk rating Low ☐ Moderate ☒ High ☐ Extreme ☐

Overall residual risk None ☐ Low ☒ Moderate ☐ High ☐ Extreme ☐ **Recommended inspection interval** 2 yrs

Data ☐ Final ☒ Preliminary **Advanced assessment needed** ☒ No ☐ Yes-Type/Reason _____

Inspection limitations ☒ None ☐ Visibility ☐ Access ☐ Vines ☐ Root collar buried Describe _____

ISA Basic Tree Risk Assessment Form

Client City of Salem Date 2/19/2019 Time 3:15

Address/Tree location Division Street, North Side, Seventh from Liberty Tree no. 17 Sheet 17 of 20

Tree species Hornbeam dbh 16/12/8/11/11" Height 35' Crown spread dia. 32'

Assessor(s) JV / MK Tools used Diameter Tape Time frame 5-10 yr

Target Assessment

Target number	Target description	Target protection	Target zone: Target within drip line	Target zone: Target within 1x Ht.	Target zone: Target within 1.5x Ht.	Occupancy rate (1 – rare, 2 – occasional, 3 – frequent, 4 – constant)	Practical to move target?	Restriction practical?
1	Pedestrians	None	✓	✓	✓	2	No	No
2	Vehicles	None	✓	✓	✓	4	No	No
3	Fence	None	✓	✓	✓	4	No	No
4	Power line	None	✓	✓	✓	4	No	No

Site Factors

History of failures No Topography Flat ☒ Slope ☐ ____ % Aspect ____

Site changes None ☒ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe ____

Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☐ Pavement over roots ☒ 40 % Describe Sidewalk, Road, parking lot

Prevailing wind direction W Common weather Strong winds ☐ Ice ☐ Snow ☐ Heavy rain ☐ Describe ____

Tree Health and Species Profile

Vigor Low ☐ Normal ☒ High ☐ Foliage None (seasonal) ☒ None (dead) ☐ Normal ____% Chlorotic ____% Necrotic ____%

Pests/Biotic None Abiotic None

Species failure profile Branches ☒ Trunk ☒ Roots ☐ Describe weak limb and trunk unions

Load Factors

Wind exposure Protected ☐ Partial ☒ Full ☐ Wind funneling ☐ ____ Relative crown size Small ☐ Medium ☐ Large ☐

Crown density Sparse ☐ Normal ☒ Dense ☐ Interior branches Few ☐ Normal ☒ Dense ☐ Vines/Mistletoe/Moss ☐ ____

Recent or expected change in load factors No

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☐ LCR 83 %

Dead twigs/branches ☒ 10 % overall Max. dia. 3"

Broken/Hangers Number ____ Max. dia. ____

Over-extended branches ☐

Pruning history

Crown cleaned ☐ Thinned ☐ Raised ☒

Reduced ☐ Topped ☐ Lion-tailed ☐

Flush cuts ☐ Other ____

Deadwood Condition(s) of concern Limbs with weak attachments

Part Size 1"-3" dia Fall Distance 8'-20'

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☐ Possible ☐ Probable ☒ Imminent ☐

Cracks ☐ ____ Lightning damage ☐

Codominant ☐ ____ Included bark ☐

Weak attachments ☒ ____ Cavity/Nest hole ____% circ.

Previous branch failures ☐ ____ Similar branches present ☐

Dead/Missing bark ☐ Cankers/Galls/Burls ☐ Sapwood damage/decay ☐

Conks ☐ Heartwood decay ☐ ____

Response growth ____

Part Size 1"-4" Fall Distance 8'-20'

Load on defect N/A ☐ Minor ☒ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

— Trunk —

Dead/Missing bark ☐ Abnormal bark texture/color ☐

Codominant stems ☒ Included bark ☐ Cracks ☐

Sapwood damage/decay ☐ Cankers/Galls/Burls ☐ Sap ooze ☐

Lightning damage ☐ Heartwood decay ☐ Conks/Mushrooms ☐

Cavity/Nest hole 2 % circ. Depth 3" Poor taper ☐

Lean ____° Corrected? ____

Response growth ____

Condition(s) of concern 18" cavity on south side

Part Size 11" Fall Distance 20'-30'

Load on defect N/A ☐ Minor ☐ Moderate ☒ Significant ☐

Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

— Roots and Root Collar —

Collar buried/Not visible ☐ Depth ____ Stem girdling ☐

Dead ☐ Decay ☐ Conks/Mushrooms ☐

Ooze ☐ Cavity ☐ ____% circ.

Cracks ☐ Cut/Damaged roots ☐ Distance from trunk ____

Root plate lifting ☒ Soil weakness ☐

Response growth ____

Condition(s) of concern None

Part Size ____ Fall Distance ____

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization

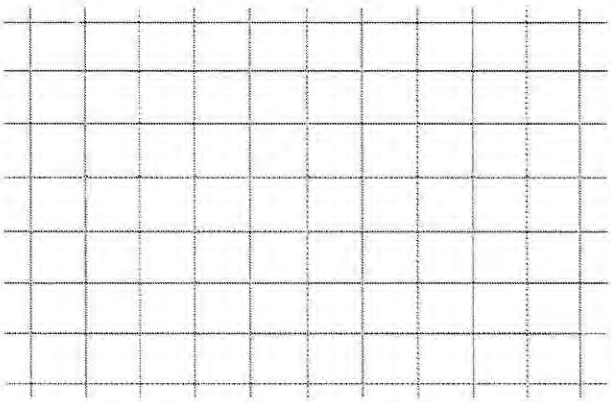
Target (Target number or description)	Tree part	Condition(s) of concern	Likelihood: Failure: Improbable	Failure: Possible	Failure: Probable	Failure: Imminent	Impact: Very low	Impact: Low	Impact: Medium	Impact: High	Failure & Impact (from Matrix 1): Unlikely	Somewhat	Likely	Very likely	Consequences: Negligible	Minor	Significant	Severe	Risk rating (from Matrix 2)
1	Limbs	Dead, weak attachments			X				X			X				X			low
2					X				X			X				X			low
3					X				X			X				X			low

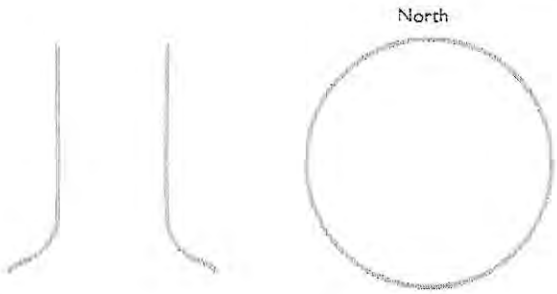
Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impact			
	Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low





Notes, explanations, descriptions

Co-dominant trunks have adequate attachment angles, however weight reduction pruning will increase longevity. Deadwood, conflicting limbs, and weakly attached limbs should be removed.

Mitigation options

1. Risk Mitigation Pruning — **Residual risk** low
2. Weight Reducting Pruning — **Residual risk** low
3. _____ — **Residual risk** _____
4. _____ — **Residual risk** _____

Overall tree risk rating Low ☒ Moderate ☐ High ☐ Extreme ☐

Overall residual risk None ☐ Low ☒ Moderate ☐ High ☐ Extreme ☐ **Recommended inspection interval** 3 yrs

Data ☐ Final ☒ Preliminary **Advanced assessment needed** ☒ No ☐ Yes-Type/Reason _____

Inspection limitations ☒ None ☐ Visibility ☐ Access ☐ Vines ☐ Root collar buried Describe _____

ISA Basic Tree Risk Assessment Form

Client City of Salem Date 2/19/2019 Time 3:35pm
Address/Tree location Division Street, North side, Eighth From Liberty Tree no. 18 Sheet 18 of 20
Tree species Hornbeam dbh 12"/13"/12" Height 25' Crown spread dia. 30'
Assessor(s) JV / MK Tools used Diameter Tape **Time frame** 5 yrs

Target Assessment

Target number	Target description	Target protection	Target zone: Target within drip line	Target zone: Target within 1x Ht.	Target zone: Target within 1.5 x Ht.	Occupancy rate (1 – rare, 2 – occasional, 3 – frequent, 4 – constant)	Practical to move target?	Restriction practical?
1	Pedestrians	None	✓	✓	✓	2	No	No
2	Vehicles	None	✓	✓	✓	4	No	No
3	Fence	None	✓	✓	✓	4	No	No
4	Power line	None	✓	✓	✓	4	No	No

Site Factors

History of failures No **Topography** Flat ☒ Slope ☐ ____% **Aspect** ____
Site changes None ☒ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe ____
Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☐ Pavement over roots ☒ 40 % Describe Sidewalk, Road, parking lot
Prevailing wind direction W **Common weather** Strong winds ☐ Ice ☐ Snow ☐ Heavy rain ☐ Describe ____

Tree Health and Species Profile

Vigor Low ☒ Normal ☐ High ☐ **Foliage** None (seasonal) ☒ None (dead) ☐ Normal ____% Chlorotic ____% Necrotic ____%
Pests/Biotic None **Abiotic** None
Species failure profile Branches ☒ Trunk ☒ Roots ☐ Describe weak limb and trunk unions

Load Factors

Wind exposure Protected ☐ Partial ☒ Full ☐ Wind funneling ☐ ____ **Relative crown size** Small ☐ Medium ☒ Large ☐
Crown density Sparse ☒ Normal ☐ Dense ☐ **Interior branches** Few ☒ Normal ☐ Dense ☐ **Vines/Mistletoe/Moss** ☐ ____
Recent or expected change in load factors No

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☐ LCR 68 %
Dead twigs/branches ☒ 15 % overall Max. dia. 3"
Broken/Hangers Number 1 Max. dia. 1"
Over-extended branches ☐
Pruning history
Crown cleaned ☐ Thinned ☐ Raised ☒
Reduced ☐ Topped ☐ Lion-tailed ☐
Flush cuts ☐ Other ____
Deadwood Condition(s) of concern ____
Part Size 1"-3" Fall Distance 7'-15'
Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐
Likelihood of failure Improbable ☐ Possible ☐ Probable ☒ Imminent ☐

Cracks ☐ ____ Lightning damage ☐
Codominant ☒ ____ Included bark ☐
Weak attachments ☒ ____ Cavity/Nest hole ____% circ.
Previous branch failures ☐ ____ Similar branches present ☐
Dead/Missing bark ☒ Cankers/Galls/Burls ☒ Sapwood damage/decay ☐
Conks ☐ Heartwood decay ☐ ____
Response growth ____
Condition(s) of concern ____
Part Size ____ Fall Distance ____
Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☐
Likelihood of failure Improbable ☐ Possible ☐ Probable ☐ Imminent ☐

— Trunk —

Dead/Missing bark ☒ Abnormal bark texture/color ☐
Codominant stems ☒ Included bark ☒ Cracks ☐
Sapwood damage/decay ☐ Cankers/Galls/Burls ☒ Sap ooze ☐
Lightning damage ☐ Heartwood decay ☐ Conks/Mushrooms ☐
Cavity/Nest hole 5 % circ. Depth 30" Poor taper ☐
Lean ____° Corrected? ____
Response growth 3"
Condition(s) of concern Weak stem union, dying bark
Part Size 12"/13"/12" Fall Distance 2'-25'
Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☒
Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

— Roots and Root Collar —

Collar buried/Not visible ☐ Depth ____ Stem girdling ☐
Dead ☐ Decay ☐ Conks/Mushrooms ☐
Ooze ☐ Cavity ☐ ____% circ.
Cracks ☐ Cut/Damaged roots ☐ Distance from trunk ____
Root plate lifting ☐ Soil weakness ☐
Response growth ____
Condition(s) of concern None
Part Size ____ Fall Distance ____
Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐
Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization

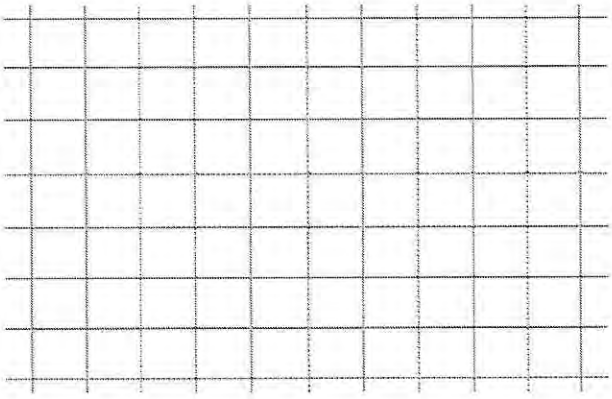
Target (Target number or description)	Tree part	Condition(s) of concern	Likelihood: Failure: Improbable	Failure: Possible	Failure: Probable	Failure: Imminent	Impact: Very low	Impact: Low	Impact: Medium	Impact: High	Failure & Impact (from Matrix 1): Unlikely	Failure & Impact: Somewhat	Failure & Impact: Likely	Failure & Impact: Very likely	Consequences: Negligible	Consequences: Minor	Consequences: Significant	Consequences: Severe	Risk rating (from Matrix 2)
1	Limbs	Dead, weak attachments			X				X			X				X			low
2					X				X			X				X			low
3					X				X			X				X			low
1	Trunk	Weak union		X					X		X						X		low
2				X					X		X						X		low
3,4				X					X		X					X			low

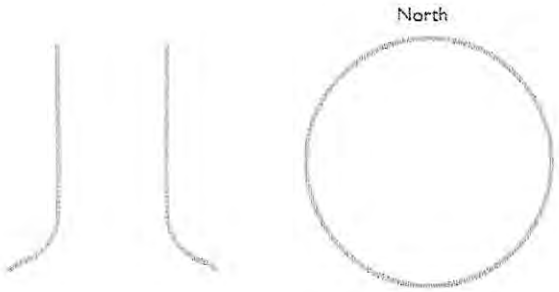
Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impact			
	Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low





Notes, explanations, descriptions
Trunk union with bark inclusion may eventually fail. Some canker is found on areas of trunk. Deadwood, conflicting limbs, and weakly attached limbs should be removed.

Mitigation options

1. Risk mitigation pruning — **Residual risk** low
2. Bracing — **Residual risk** low
3. _____ — **Residual risk** _____
4. _____ — **Residual risk** _____

Overall tree risk rating Low ☒ Moderate ☐ High ☐ Extreme ☐

Overall residual risk None ☐ Low ☒ Moderate ☐ High ☐ Extreme ☐ **Recommended inspection interval** 3 yrs

Data ☐ Final ☒ Preliminary **Advanced assessment needed** ☒ No ☐ Yes-Type/Reason _____

Inspection limitations ☒ None ☐ Visibility ☐ Access ☐ Vines ☐ Root collar buried Describe _____

ISA Basic Tree Risk Assessment Form

Client City of Salem Date 2/19/2019 Time 4:15

Address/Tree location Division Street, North Side, nineth from Liberty Tree no. 19 Sheet 19 of 20

Tree species Hornbeam dbh 13/12/12 Height 25' Crown spread dia. 30'

Assessor(s) JV / MK Tools used Diameter Tape Time frame 5-7

Target Assessment

Target number	Target description	Target protection	Target zone: Target within drip line	Target zone: Target within 1 x Ht.	Target zone: Target within 1.5 x Ht.	Occupancy rate (1–rare 2–occasional 3–frequent 4–constant)	Practical to move target?	Restriction practical?
1	Pedestrians	None	✓	✓	✓	2	No	No
2	Vehicles	None	✓	✓	✓	4	No	No
3	Fence	None	✓	✓	✓	4	No	No
4	Power Line	None	✓	✓	✓	4	No	No

Site Factors

History of failures None **Topography** Flat ☒ Slope ☐ ____% **Aspect** ____

Site changes None ☒ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe ____

Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☐ Pavement over roots ☒ 40 % Describe Sidewalk, Road, Parking lot

Prevailing wind direction W **Common weather** Strong winds ☐ Ice ☐ Snow ☐ Heavy rain ☐ Describe ____

Tree Health and Species Profile

Vigor Low ☒ Normal ☐ High ☐ **Foliage** None (seasonal) ☒ None (dead) ☐ Normal ____% Chlorotic ____% Necrotic ____%

Pests/Biotic None **Abiotic** None

Species failure profile Branches ☒ Trunk ☒ Roots ☐ Describe Weak limb unions

Load Factors

Wind exposure Protected ☐ Partial ☒ Full ☐ Wind funneling ☐ ____ **Relative crown size** Small ☐ Medium ☒ Large ☐

Crown density Sparse ☒ Normal ☐ Dense ☐ **Interior branches** Few ☒ Normal ☐ Dense ☐ **Vines/Mistletoe/Moss** ☐ ____

Recent or expected change in load factors NO

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☐ LCR 68 %

Dead twigs/branches ☒ 5 % overall Max. dia. 2"

Broken/Hangers Number 0 Max. dia. ____

Over-extended branches ☐

Pruning history

Crown cleaned ☐ Thinned ☐ Raised ☒

Reduced ☐ Topped ☐ Lion-tailed ☐

Flush cuts ☐ Other ____

Weak limb ~~unions~~ unions Condition(s) of concern Deadwood

Part Size 1-5" Fall Distance 7-25'

Load on defect N/A ☐ Minor ☐ Moderate ☒ Significant ☐

Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

Cracks ☐ ____ Lightning damage ☐

Codominant ☒ ____ Included bark ☒

Weak attachments ☒ ____ Cavity/Nest hole ____% circ.

Previous branch failures ☐ ____ Similar branches present ☐

Dead/Missing bark ☒ Cankers/Galls/Burls ☐ Sapwood damage/decay ☐

Conks ☐ Heartwood decay ☐ ____

Response growth ____

Part Size 1-3" Fall Distance 7-20

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☐ Possible ☐ Probable ☒ Imminent ☐

— Trunk —

Dead/Missing bark ☒ Abnormal bark texture/color ☐

Codominant stems ☒ Included bark ☒ Cracks ☐

Sapwood damage/decay ☐ Cankers/Galls/Burls ☐ Sap ooze ☐

Lightning damage ☐ Heartwood decay ☐ Conks/Mushrooms ☐

Cavity/Nest hole 3 % circ. Depth 2" Poor taper ☐

Lean ____° Corrected? ____

Response growth ____

Condition(s) of concern weak stem union

Part Size 12/26" Fall Distance 2-25'

Load on defect N/A ☐ Minor ☐ Moderate ☒ Significant ☐

Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

— Roots and Root Collar —

Collar buried/Not visible ☐ Depth ____ Stem girdling ☐

Dead ☐ Decay ☐ Conks/Mushrooms ☐

Ooze ☐ Cavity ☐ ____% circ.

Cracks ☐ Cut/Damaged roots ☒ Distance from trunk 1.5'

Root plate lifting ☐ Soil weakness ☐

Response growth 1/2"

Condition(s) of concern None

Part Size ____ Fall Distance ____

Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐

Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization

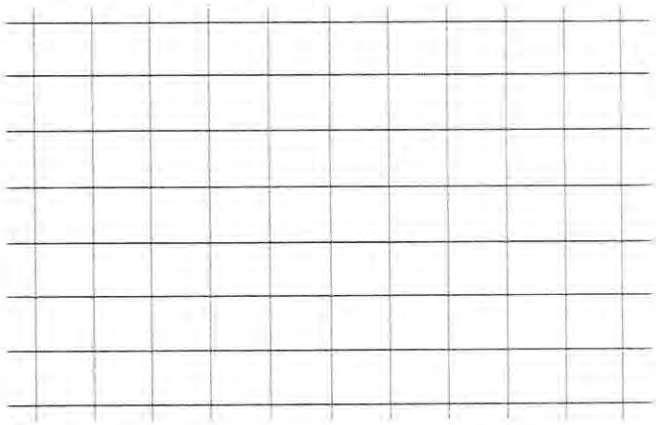
Target (Target number or description)	Tree part	Condition(s) of concern	Likelihood: Failure: Improbable	Likelihood: Failure: Possible	Likelihood: Failure: Probable	Likelihood: Failure: Imminent	Likelihood: Impact: Very low	Likelihood: Impact: Low	Likelihood: Impact: Medium	Likelihood: Impact: High	Likelihood: Failure & Impact (from Matrix 1): Unlikely	Likelihood: Failure & Impact (from Matrix 1): Somewhat likely	Likelihood: Failure & Impact (from Matrix 1): Likely	Likelihood: Failure & Impact (from Matrix 1): Very likely	Consequences: Negligible	Consequences: Minor	Consequences: Significant	Consequences: Severe	Risk rating (from Matrix 2)
1	Branch	Dead			X			X			X					X			L
2		Poorly attached			X				X		X					X			L
3 & 4				X	X			X			X					X			L
1	Trunk	Weak union		X					X		X						X		L
2				X					X		X						X		L
3 & 4				X					X		X						X		L

Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impact			
	Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low



Notes, explanations, descriptions

Weak stem unions with included bark may eventually fail. Dead wood, conflicting limbs, & weakly attached limbs should be removed.

Mitigation options

1. Risk mitigation Pruning — **Residual risk** Low
2. Bracing — **Residual risk** Low
3. _____ — **Residual risk** _____
4. _____ — **Residual risk** _____

Overall tree risk rating Low ☒ Moderate ☐ High ☐ Extreme ☐

Overall residual risk None ☐ Low ☒ Moderate ☐ High ☐ Extreme ☐ **Recommended inspection interval** _____

Data ☐ Final ☒ Preliminary **Advanced assessment needed** ☒ No ☐ Yes-Type/Reason _____

Inspection limitations ☒ None ☐ Visibility ☐ Access ☐ Vines ☐ Root collar buried Describe _____

ISA Basic Tree Risk Assessment Form

Client City of Salem Date 2/19/2019 Time 5:00
Address/Tree location Tree no. 20 Sheet 20 of 20
Tree species Hornbeam dbh 16/10/24 Height 20' Crown spread dia. 33
Assessor(s) JV/MK Tools used Diameter Tape Time frame 3 yr

Target Assessment

Target number	Target description	Target protection	Target zone: Target within drip line	Target zone: Target within 1 x Ht.	Target zone: Target within 1.5 x Ht.	Occupancy rate (1 – rare, 2 – occasional, 3 – frequent, 4 – constant)	Practical to move target?	Restriction practical?
1	Pedestrians	None	✓	✓	✓	2	NO	NO
2	Vehicles	None	✓	✓	✓	4	NO	NO
3	Fence	None	✓	✓	✓	4	NO	NO
4	Power line	None	✓	✓	✓	4	NO	NO

Site Factors

History of failures None Topography Flat ☒ Slope ☐ ____% Aspect ____
Site changes None ☒ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe ____
Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☒ Pavement over roots ☒ 70 % Describe Sidewalk, road
Prevailing wind direction W Common weather Strong winds ☐ Ice ☐ Snow ☐ Heavy rain ☐ Describe ____

Tree Health and Species Profile

Vigor Low ☒ Normal ☐ High ☐ Foliage None (seasonal) ☒ None (dead) ☐ Normal ____% Chlorotic ____% Necrotic ____%
Pests/Biotic None Abiotic None
Species failure profile Branches ☒ Trunk ☒ Roots ☐ Describe Weak unions

Load Factors

Wind exposure Protected ☐ Partial ☒ Full ☐ Wind funneling ☐ ____ Relative crown size Small ☒ Medium ☐ Large ☐
Crown density Sparse ☒ Normal ☐ Dense ☐ Interior branches Few ☐ Normal ☐ Dense ☒ Vines/Mistletoe/Moss ☐ ____
Recent or expected change in load factors NO

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☐ LCR 68 %
Dead twigs/branches ☒ 35 % overall Max. dia. 4
Broken/Hangers Number 4 Max. dia. 2"
Over-extended branches ☐
Pruning history
Crown cleaned ☐ Thinned ☐ Raised ☒
Reduced ☐ Topped ☐ Lion-tailed ☐
Flush cuts ☐ Other ____
Dieback in crown Condition(s) of concern weak limb unions
Part Size 1-4" Fall Distance 10-20
Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐
Likelihood of failure Improbable ☐ Possible ☐ Probable ☐ Imminent ☐

Cracks ☐ ____ Lightning damage ☐
Codominant ☒ ____ Included bark ☒
Weak attachments ☒ ____ Cavity/Nest hole ____% circ.
Previous branch failures ☐ ____ Similar branches present ☐
Dead/Missing bark ☐ Cankers/Galls/Burls ☐ Sapwood damage/decay ☐
Conks ☐ Heartwood decay ☐ ____
Response growth ____
Part Size 1-3" Fall Distance 10-20'
Load on defect N/A ☐ Minor ☐ Moderate ☒ Significant ☐
Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

— Trunk —

Dead/Missing bark ☒ Abnormal bark texture/color ☐
Codominant stems ☐ Included bark ☒ Cracks ☐
Sapwood damage/decay ☒ Cankers/Galls/Burls ☐ Sap ooze ☐
Lightning damage ☐ Heartwood decay ☐ Conks/Mushrooms ☐
Cavity/Nest hole 5 % circ. Depth ____ Poor taper ☐
Lean ____° Corrected? ____
Response growth ____
Condition(s) of concern Dying bark, weak stem union
Part Size 10-24" Fall Distance 2-20'
Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☒
Likelihood of failure Improbable ☐ Possible ☒ Probable ☐ Imminent ☐

— Roots and Root Collar —

Collar buried/Not visible ☒ Depth ____ Stem girdling ☐
Dead ☐ Decay ☐ Conks/Mushrooms ☐
Ooze ☐ Cavity ☐ ____% circ.
Cracks ☐ Cut/Damaged roots ☐ Distance from trunk ____
Root plate lifting ☐ Soil weakness ☐
Response growth ____
Condition(s) of concern None
Part Size ____ Fall Distance ____
Load on defect N/A ☒ Minor ☐ Moderate ☐ Significant ☐
Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization

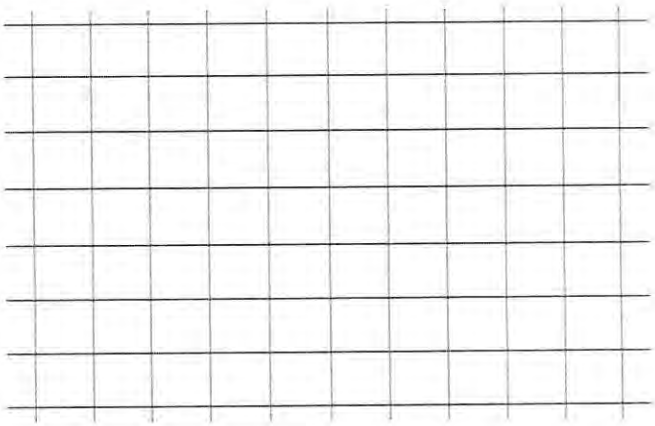
Target (Target number or description)	Tree part	Condition(s) of concern	Likelihood: Failure: Improbable	Likelihood: Failure: Possible	Likelihood: Failure: Probable	Likelihood: Failure: Imminent	Likelihood: Impact: Very low	Likelihood: Impact: Low	Likelihood: Impact: Medium	Likelihood: Impact: High	Likelihood: Failure & Impact (from Matrix 1): Unlikely	Likelihood: Failure & Impact (from Matrix 1): Somewhat	Likelihood: Failure & Impact (from Matrix 1): Likely	Likelihood: Failure & Impact (from Matrix 1): Very likely	Consequences: Negligible	Consequences: Minor	Consequences: Significant	Consequences: Severe	Risk rating (from Matrix 2)
1	Branch	Dead / Poorly attached				X		X				X				X			L
2						X		X				X				X			L
3 & 4						X		X				X				X			L
1	Trunk	Weak union		X				X			X						X		L
2				X					X		X						X		L
3 & 4				X					X		X						X		L

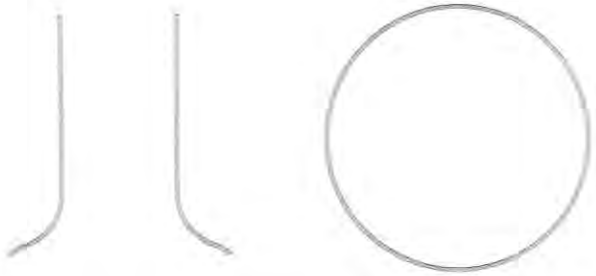
Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impact: Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure: Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low





Notes, explanations, descriptions
Significant die back in crown indicates poor health. Removal should be considered. Weakly attached trunk unions may eventually fail.

Mitigation options
1. Risk mitigation pruning — **Residual risk** Low
2. Removal. — **Residual risk** Low
3. _____ — **Residual risk** _____
4. _____ — **Residual risk** _____

Overall tree risk rating Low ☒ Moderate ☐ High ☐ Extreme ☐

Overall residual risk None ☐ Low ☒ Moderate ☐ High ☐ Extreme ☐ **Recommended inspection interval** 6 Month

Data ☐ Final ☒ Preliminary **Advanced assessment needed** ☒ No ☐ Yes-Type/Reason _____

Inspection limitations ☐ None ☐ Visibility ☐ Access ☐ Vines ☒ Root collar buried Describe _____