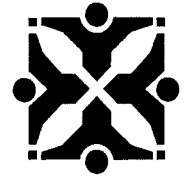


City of Columbia

701 East Broadway, Columbia, Missouri 65201



Agenda Item Number: REP 90-15

Department Source: Parks and Recreation

To: City Council

From: City Manager & Staff

Council Meeting Date: 9/8/2015

Re: Hazardous Tree Removal Report: Stephens Lake Park

Documents Included With This Agenda Item

Council memo

Supporting documentation includes: Images, Basic Tree Risk Assessment Forms

Executive Summary

The Columbia Parks & Recreation Department is requesting Council approval to remove three hazardous trees at Stephens Lake Park due to their current state of decline and the hazard potential for park users. These trees are dying and despite efforts of staff will not survive. All three trees present a high risk of public safety, as portions of each tree crown have expired and each tree is located within high use areas frequented by park users. The first tree is a Silver Maple located near the southeast corner of Riechmann Pavilion. It qualifies as a large tree due to its 46-inch Diameter at Breast Height (DBH) and is suggested for removal due an increasing amount of deadwood throughout the tree. The second tree is a Honeylocust located on the north side of the park adjacent to the hard surface trail. The tree has a 49-inch DBH and has less than 30% living crown due to mature age and drought stress from the summer of 2012. The final tree is another Honeylocust located in the northwest corner of the park along the hard surface trail and has a 31-inch Diameter at Breast Height. The tree has shown continuous decline for five years and has a high potential to drop large limbs onto the fitness trail and East Walnut Street. Copies of the Tree Risk Assessment Forms and photos are included with the report.

Discussion

In February of 2009, the Columbia Parks & Recreation Department was asked by the City Council to develop a report relating to the removal of larger trees within the park system that may be perceived as significant to the public and/or the use of the park. The report recommended a policy that outlined the procedures to be followed whenever large trees were to be removed due to either being a public safety hazard or due to park development. A link to the 2009 report is included in the legislative history section of this report; and in summary, the P&R tree removal procedure for hazardous trees now includes the following key elements:

1. Tree Risk Assessment Forms will be completed by the Department's certified International Society of Arboriculture Forester and staff.
2. Trees larger than 20-inch Diameter at Breast Height (DBH) but smaller than 30-inch DBH must have the approval of the Park Development Superintendent and the Park Services Manager to be removed.

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3. Trees larger than 30-inch DBH must have the approval of the P&R Director who will notify Council that the tree or trees will be removed.
4. Any size tree that presents an immediate danger to the public shall be removed immediately.

The Silver Maple tree that the Parks and Recreation Forestry staff is proposing to remove is located in Stephens Lake Park directly southeast of Riechmann Pavilion. The tree has a Diameter at Breast Height of 46 inches and has shown considerable decline over the past five years. The visible signs of decay and cavity in the branch system and over mature age of the tree create a high potential for falling scaffolding branches and dead limbs from the crown and canopy. The mature Silver Maple has had previous branch failures and continuous decline of the tree is due to age and drought conditions in the summer of 2012. This species of tree is notorious for failure in its current state of decline and mitigation is not feasible at this time. Forestry staff has determined that the potential for failure is the key factor for the determination of removal due to the location of the tree near park patrons utilizing Riechmann Pavilion.

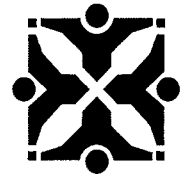
The second tree recommended for removal is a Honeylocust tree located on the north side of Stephens Lake Park along the hard surface trail. The Honeylocust tree has grown to a mature height of 65 feet with a 49-inch Diameter at Breast Height. The tree has approximately 30% living crown and has shown visible signs of rot, decay and cavity in the branches and root crown. The visual signs of rot at the branch attachments is a clear sign of branch failure. Forestry staff has observed falling limbs and deadwood in the tree over the last 2 years and blame the decline over the past year due to the severe drought of 2012. Staff is requesting permission to remove the failing tree due to the risk of failure and public safety due to the proximity to the Stephens Lake Park fitness trail.

The final tree recommended for removal by Forestry staff is a mature Honeylocust tree located in the northwest corner of Stephens Lake Park. The tree has a 32-inch diameter at breast height and a total height of 40 feet. The Honeylocust currently has signs of complete decline in the upper 40% of the tree and has undergone multiple pruning cycles in which significant amounts of deadwood were removed. The continued dieback in the canopy continues to pose a hazard to East Walnut Street and park patrons utilizing the hard surface trail and amphitheater. The tree has shown previous signs of branch and major stem failure and will continue to drop large, dead limbs if it is not removed. The removal of the tree is necessary due to the weakened state of the tree and safety issues for park patrons.

All three trees have reached a mature growing age and the majority of the dieback and canopy loss is due to reaching the mature growing age in conjunction with excessive heat and drought conditions from 2010 to 2012. The severe drought of 2012 severely affected the overall health of each of these trees and is the main contributing factor for the tree loss. The Silver Maple tree located near Riechmann Pavilion and Honeylocust tree located on the north side of the park will be replaced with new trees similar in species in the same approximate locations. The Honeylocust tree adjacent to the amphitheater and hard surface trail will not be replaced because the Forestry staff has already planted a new tree adjacent to the mature Honeylocust in anticipation for the removal of the tree. A number of existing trees are also present in this location of the park. As reported to Council in 2012, there are several trees located between Walnut Street and the Stephens Lake Park trail that will

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eventually be lost to age, storms, disease, or other acts of nature, so additional trees have been planted as a replacement and investment toward the future. An early example of this investment is the 82 trees that were planted as part of a TRIM Grant in 2004. Over 90 additional trees have been planted as a result of the community donating memorial and heritage trees to the park. Approximately 150 more trees have been planted as part of shoreline stabilization, tree collections (Maple, Nut, Oak, conifers) and other landscaping projects.

Fiscal Impact

Short-Term Impact: No fiscal impact

Long-Term Impact: No fiscal impact

Vision, Strategic & Comprehensive Plan Impact

Vision Impact: Not Applicable

Strategic Plan Impact: Not Applicable

Comprehensive Plan Impact: Not Applicable

Suggested Council Action

Unless Council directs otherwise, park staff will proceed with the tree removal as outlined in this report.

Legislative History

2009 report regarding the removal of hazardous trees in the park system:

<http://www.gocolumbiamo.com/Council/Bills/2009/mar16bills/ReportG.pdf>


Department Approved


City Manager Approved



SUPPORTING DOCUMENTS INCLUDED WITH THIS AGENDA ITEM ARE AS FOLLOWS:

Images, Basic Tree Risk Assessment Forms



Basic Tree Risk Assessment Form

Client City of Columbia Parks and Recreation Date 8/28/15 Time _____
 Address/Tree location Stephens Lake Park: south side of Riechmann Pavilion Tree no. _____ Sheet _____ of _____
 Tree species Silver Maple (Acer saccharinum) dbh 46" Height 61' Crown spread dia. 75'
 Assessor(s) Steve Fritz, Eric Schmittlel Time frame _____ Tools used _____

Target Assessment

Target number	Target description	Target zone			Occupancy rate 1 - rare 2 - occasional 3 - frequent 4 - constant	Practical to move target?	Restriction practical?
		Target within drip line	Target within 1 x Ht.	Target within 1.5 x Ht.			
1	Park users traveling near tree. Tree is located near a frequently used shelter.				2	no	no
2							
3							
4							

Site Factors

History of failures Tree has lost several large limbs already Topography Flat ☒ Slope ☐ _____ % Aspect S
 Site changes None ☐ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe _____
 Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☐ Pavement over roots ☐ _____ % Describe _____
 Prevailing wind direction W Common weather Strong winds ☒ Ice ☐ Snow ☐ Heavy rain ☐ Describe Open hilltop

Tree Health and Species Profile

Vigor Low ☒ Normal ☐ High ☐ Foliage None (seasonal) ☐ None (dead) ☐ Normal 70 % Chlorotic _____ % Necrotic 30 %
 Pests _____ Abiotic _____
 Species failure profile Branches ☒ Trunk ☐ Roots ☐ Describe Tree has major dieback in canopy and has begun shedding large limbs

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 planned change in load factors no

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☐ LCR _____ %
 Dead twigs/branches ☒ 30 % overall Max. dia. 20"
 Broken/Hangers Number _____ Max. dia. 10"
 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 _____
 Main concern(s) Tree has major dieback in canopy and has begun shedding large limbs

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 _____
 Main concern(s) potential for dead/dying codominant stems to split out
 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 _____
 Main concern(s) _____
 Load on defect N/A ☐ Minor ☒ Moderate ☐ Significant ☐
 Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization																							
Condition number	Tree part	Conditions of concern	Part size	Fall distance	Target number	Target protection	Likelihood												Consequences				Risk rating of part (from Matrix 2)
							Failure				Impact				Failure & Impact (from Matrix 1)				Negligible	Minor	Significant	Severe	
							Improbable	Possible	Probable	Imminent	Very low	Low	Medium	High	Unlikely	Somewhat	Likely	Very likely					
1	Canopy	significant amounts of dead/dying branches	6'	50'	1	N	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	MOD		
2							<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
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Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impacting Target			
	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 Over-mature silver maple with significant amounts of large diameter dead and dying wood in the main stems and canopy. Tree has been pruned in the past to remove hazards, and continues in a cycle of decline.

Mitigation options Tree should be removed and new plantings installed in its place.

Residual risk _____

Residual risk _____

Residual risk _____

Residual risk _____

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

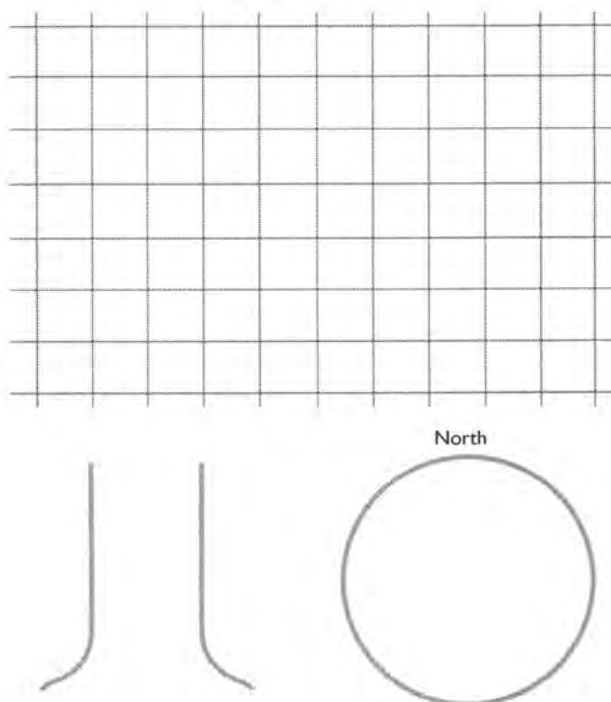
Work priority 1 ☐ 2 ☐ 3 ☐ 4 ☐

Overall residual risk 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 _____



Existing Conditions – Silver Maple Tree
Stephens Lake Park – Adjacent to Riechmann Pavilion



Significant amount dead/dying limbs



Significant bark loss/decay on main trunks

ISA Basic Tree Risk Assessment Form

Client City of Columbia Date 6/22/15 Time _____
 Address/Tree location Stephens Lake Park Tree no. _____ Sheet _____ of _____
 Tree species Honeylocust dbh 49" Height 65' Crown spread dia. 68'
 Assessor(s) Eric Schmittel MW-4775A Time frame _____ Tools used _____

Target Assessment

Target number	Target description	Target zone			Occupancy rate 1 - rare 2 - occasional 3 - frequent 4 - constant	Practical to move target?	Restriction practical?
		Target within drip line	Target within 1 x Ht.	Target within 1.5 x Ht.			
1	Hardsurface Trail	✓			3	n	n
2							
3							
4							

Site Factors

History of failures Previous tree failure from drought and construction damage. Topography Flat ☐ Slope ☒ 10 % Aspect SE
 Site changes None ☐ Grade change ☒ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☒ Describe Soil was compacted and raised for trail.
 Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☒ Pavement over roots ☒ 15 % Describe Trail around 2/3 of tree.
 Prevailing wind direction west Common weather Strong winds ☐ Ice ☒ Snow ☒ Heavy rain ☐ Describe _____

Tree Health and Species Profile

Vigor Low ☒ Normal ☐ High ☐ Foliage None (seasonal) ☐ None (dead) ☐ Normal 30 % Chlorotic 10 % Necrotic _____ %
 Pests Borers, Carpenter ants Abiotic Soil work around tree for trail.
 Species failure profile Branches ☒ Trunk ☐ Roots ☐ Describe Several large branches have broken out of this tree in the past

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 ☒ Wintercreeper, vines _____
 Recent or planned change in load factors _____

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☒ LCR 30 %
 Dead twigs/branches ☒ 70 % overall Max. dia. 24"
 Broken/Hangers Number 6 Max. dia. 12"
 Over-extended branches ☒
 Pruning history
 Crown cleaned ☒ Thinned ☒ Raised ☐
 Reduced ☒ Topped ☐ Lion-tailed ☐
 Flush cuts ☐ Other _____
 Cracks ☒ Lightning damage ☐
 Codominant ☒ 3 large codominant stems Included bark ☒
 Weak attachments ☒ Rot at attachments Cavity/Nest hole 50 % circ.
 Previous branch failures ☒ Similar branches present ☒
 Dead/Missing bark ☒ Cankers/Galls/Burls ☐ Sapwood damage/decay ☐
 Conks ☐ Heartwood decay ☒ Large open wounds _____
 Response growth _____
 Main concern(s) Seventy percent of the crown is completely dead. The primary branches of the remaining live canopy have large wounds from previous limb drop leaving them susceptible to failure.
 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 _____
 Main concern(s) _____
 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 35'
 Root plate lifting ☐ Soil weakness ☐
 Response growth _____
 Main concern(s) _____
 Load on defect N/A ☐ Minor ☒ Moderate ☐ Significant ☐
 Likelihood of failure Improbable ☒ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization																							
Condition number	Tree part	Conditions of concern	Part size	Fall distance	Target number	Target protection	Likelihood												Consequences				Risk rating of part (from Matrix 2)
							Failure				Impact				Failure & Impact (from Matrix 1)								
							Improbable	Possible	Probable	Imminent	Very low	Low	Medium	High	Unlikely	Somewhat	Likely	Very likely	Negligible	Minor	Significant	Severe	
1	Branches	-Size of parts -Advanced stage of decay	18"	20'	1		<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	High		
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Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impacting Target			
	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 The majority of this tree's canopy is dead and the branches are rapidly decaying. Failure of these branches is imminent. Several of the larger live branches have advanced heartwood decay from previous failures. This tree not only looks bad but is also a large threat to park users.

Mitigation options No options due to condition and age

Residual risk

Residual risk

Residual risk

Residual risk

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

Work priority 1 ☐ 2 ☐ 3 ☐ 4 ☒

Overall residual risk 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

Existing Conditions – Honeylocust Tree
Stephens Lake Park – Adjacent to fitness trail and lake trail



Only 30% of tree canopy is still alive / large amounts of deadwood



Large wound with decay at base of tree / entry point for disease and fungus



Basic Tree Risk Assessment Form

Client City of Columbia Parks and Recreation Date 7/8/15 Time _____
 Address/Tree location Stephens Lake Park Tree no. _____ Sheet _____ of _____
 Tree species Honeylocust Gleditsia tricanthos dbh 32 Height 40 Crown spread dia. 40
 Assessor(s) David Dittmer ISA # MW4935a Time frame _____ Tools used Diameter tape, sounding hammer

Target Assessment

Target number	Target description	Target zone			Occupancy rate 1 - rare 2 - occasional 3 - frequent 4 - constant	Practical to move target?	Restriction practical?
		Target within drip line	Target within 1 x Ht.	Target within 1.5 x Ht.			
1	East Walnut Ave		✓		3	n	n
2	Stephens Lake Fitness Trail	✓			3	n	n
3	Private parking lot on north side of E. Walnut			✓	3	n	n
4							

Site Factors

History of failures Main stem of tree has been removed, tree routinely sheds dead limbs Topography Flat ☐ Slope ☒ 0-5 % Aspect S
 Site changes None ☐ Grade change ☒ Site clearing ☒ Changed soil hydrology ☐ Root cuts ☒ Describe park construction and sidewalk installation
 Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☒ Pavement over roots ☒ 20 % 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 70 % Chlorotic _____ % Necrotic 30 %
 Pests none seen Abiotic long term effects of drought from 2012 and site construction
 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 planned change in load factors _____

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☒ LCR _____ %
 Dead twigs/branches ☒ 40 % overall Max. dia. 12"
 Broken/Hangers Number _____ Max. dia. _____
 Over-extended branches ☐
 Pruning history
 Crown cleaned ☒ Thinned ☐ Raised ☐
 Reduced ☒ Topped ☐ Lion-tailed ☐
 Flush cuts ☐ Other _____
 Cracks ☐ _____ Lightning damage ☐
 Codominant ☒ other stem previously removed _____ 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 _____
 Main concern(s) Tree has been in a long term cycle of decline. Yearly dieback has been routinely pruned and removed. Over 65% of original canopy has been removed or is currently dead and threatening a roadway and fitness trail
 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 _____
 Main concern(s) none
 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 _____
 Main concern(s) none
 Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☐
 Likelihood of failure Improbable ☐ Possible ☐ Probable ☐ Imminent ☐

Risk Categorization																							
Condition number	Tree part	Conditions of concern	Part size	Fall distance	Target number	Target protection	Likelihood												Consequences				Risk rating of part (from Matrix 2)
							Failure				Impact				Failure & Impact (from Matrix 1)								
							Improbable	Possible	Probable	Imminent	Very low	Low	Medium	High	Unlikely	Somewhat	Likely	Very likely	Negligible	Minor	Significant	Severe	
1	limbs	-size of limbs -history of failure -decay/deadwood in canopy	12"	25"	1,2,3		<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	high
2							<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
3							<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
4							<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

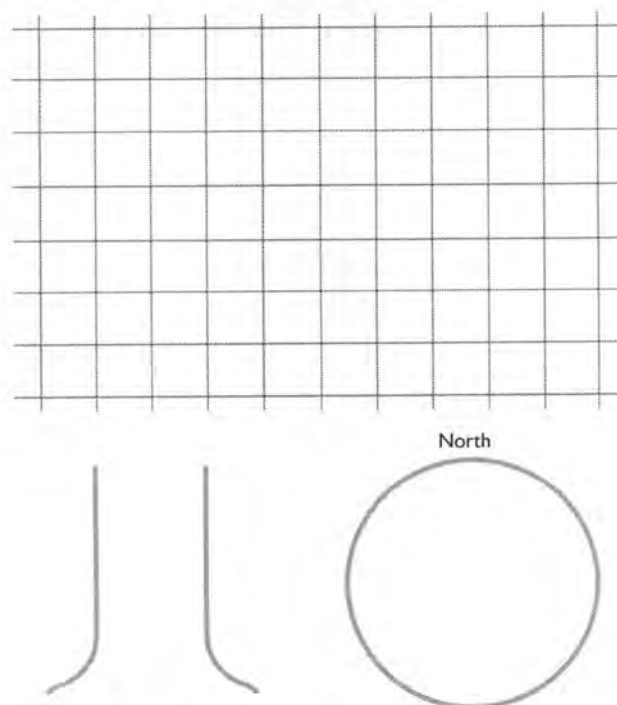
Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impacting Target			
	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 _____



Mitigation options Tree has undergone multiple pruning cycles where significant amounts of dead wood were removed. Tree has continued to decline, and only a small percentage of the original canopy is still living. I believe it is time to remove the entire tree, as the dieback in the canopy continues to pose a hazard to the roadway and fitness trail below. Residual risk _____
 Residual risk _____
 Residual risk _____
 Residual risk _____

Overall tree risk rating Low ☐ Moderate ☐ High ☒ Extreme ☐ Work priority 1 ☒ 2 ☐ 3 ☐ 4 ☐
 Overall residual risk 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 _____

Existing Conditions – Honeylocust
Stephens Lake Park – Adjacent to Fitness Trail and Amphitheater



Significant limb loss over past three years/Removal of large amount of canopy



Dead limbs hanging over East Walnut Street and fitness trail