

# Request for Proposal

## Public Tree Inventory Update and Management Plan

for the City of Muncie, IN

January 15, 2020

The City of Muncie, in receiving a 2020 Community and Urban Forestry Grant from the Indiana Department of Natural Resources, is accepting proposals for street and park tree inventory update, tree management plan, and tree inventory software. Street trees and stumps in parks and along street city owned right-of-ways is the area of interest. The objective is to identify trees that have senesced or need removed, opinion of when mitigation could occur, recommend replacement trees, and estimate a budget for work identified in the inventory. The number of trees and stumps is estimated to be at 14,000 - 15,000. A determination of new street tree planting sites will be included but only for select areas of interest using iTree Landscape analysis as guidance followed by the direction of Muncie.

Preferences will be given to contractors located within 100 mile radius of Muncie, Indiana. The contractor shall have previous experience performing similar inventories and shall include with its bid five (5) references from municipal inventory projects of similar size. At least three (3) references shall be within the State of Indiana and have occurred within the last 3 years. It is understood that the City of Muncie reserves the right to reject any and all proposals, to waive informalities, and to award the agreement to the best interest of the City. Project completion is expected by December 31, 2021.

### Tree Inventory

Inventory data for each site shall include the following:

1. **Address/Location**—identifies the location of each tree, planting site, and stump by the following attributes.
  - *Address.* House address.
  - *On Street.* The street the tree is physically found.
  - *Side.* The side of the house on which the tree stands in relation to the physical address.
  - X and Y coordinates in the desired format.
  - *Park Name.* The name of the park.
2. **Species**— tree name by genus and species using both botanical and common names, and by cultivars where appropriate.

3. **Tree Size**—measurement of diameter to the nearest inch in 1-inch size classes at 4½ feet above the ground, or diameter at breast height (DBH).
4. **Multi-Stem Tree**—notation if a tree has multiple stems on trunks splitting less than 1 foot above ground level.
5. **Condition**—consideration of signs of stress, poor structure, mechanical damage, soil and root problems, disease, and pests in the assessment of tree condition.
  - *Good*. A good tree shows no significant problems.
  - *Fair*. A fair tree has minor problems that may be corrected with time or corrective action.
  - *Poor*. A poor tree has significant problems that are irrecoverable.
  - *Dead*. A dead tree shows no sign of life.
6. **Primary Maintenance**—assignment of one of the following maintenance needs:
  - a. *Remove*. Trees recommended for removal have defects that cannot be practically or cost-effectively treated. Most trees in this category have a sizable percentage of dead crown.
  - b. *Prune*. Removal of one or more limbs to reduce risk, provide clearance, and restore the tree.
  - c. *Train*. Pruning of young or medium-aged trees to improve tree and branch architecture.
  - d. *Discretionary*. Muncie may opt to prune or manage the trees for health or aesthetic appearance.
  - e. *Stump Removal*. A stump is present and recommended to be removed.
  - f. *Plant*. During the inventory, vacant planting sites are identified as Vacant Site Small, Vacant Site Medium, and Vacant Site Large (implying mature tree size), depending on the growing space available and the presence of overhead wires. Lacking local code definitions, planting sites are determined based on standard specifications included in accepted technical journals and by the arboriculture industry.
7. **Defect**—identifies the conditions which indicate the presence of structural defects recording only the most significant condition and limit conditions to the following:
  - a. Dead and dying branches.
  - b. Broken and/or hanging branches.
  - c. Branch attachment (adventitious, codominant, multiple, overextended).
  - d. Trunk condition (canker, bulges, ridges).
  - e. Cracks.
  - f. Decay or cavity (large trunk wound).
  - g. Tree architecture (lean, bows, taper, live crown ratio).
  - h. Root problem (dead, decayed, missing, abnormal, girdling, lack of flare).

8. **Risk Rating**—evaluation of risk and assignment of a risk rating based on an assessment of the failure mode (i.e., branch, whole tree, codominant stem) with the most significant risk. The specified period for the risk assessment is one year. The risk part of this inventory and evaluation is to maintain compliance with the most recent standards and practices in the arboricultural industry. It is important to note that our inspections are “rapid assessments” and are meant to show a need for further study, and thus are not legally binding in any litigation.

To arrive at a risk rating use the following criteria and matrices, based on the *International Society of Arboriculture Best Management Practices - Tree Risk Assessment*, Second Edition (E. Thomas Smiley, Nelda Matheny, and Sharon Lilly 2017).

- a. *Likelihood of Failure*. Identifies the most probable failure and rates the likelihood that structural defect(s) will result in failure based on observed current conditions.
- b. *Likelihood of Impacting a Target*. The rate of occupancy of targets within the target zone and any factors that could affect the failed tree as it falls towards the target.
- c. *Consequences of Failure*. The consequences of tree failure are based on the level of target and potential harm that may occur. Consequences can vary depending on the size of the defect, a distance of fall for the tree or limb, and any other factors that may protect a target from harm. Target values are subjective, but try to assess them from Muncie's perspective.

As shown in the matrix below, the likelihood of failure and the likelihood of target determine the likelihood of tree failure impacting a target.

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

Estimate the risk rating by combining the likelihood of tree failure impacting a target and the consequences of failure in the matrix below. Risk ratings are Low, Moderate, High, and Extreme. A Low Risk tree poses a low overall level of risk. A Moderate Risk tree may pose some threat, particularly during storm events or unusual weather. A High Risk tree presents a high likelihood of tree or tree part failure, even during normal weather conditions. An Extreme Risk tree always poses a significant risk and probability of failure.

Likelihood of Failure	Consequences			
	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

Even though trees may pose multiple risks at once, assign one risk rating to each tree during the inventory process. The risk rating serves only as a prioritization mechanism and is not a guarantee; Muncie must determine the level of acceptable risk.

9. **Risk Assessment Complete**—record if arborists are not able to complete the assessment due to obstructions, safety concerns, or other unforeseen site conditions.
10. **Overhead Utilities**—for each tree or site, record if overhead utilities are:
  - a. Present and not conflicting.
  - b. Present and conflicting.
  - c. Not present.
11. **Date of Inventory**—the date the data was collected.

The inventory data must be delivered in an i-Tree ECO project file and in formats Excel spreadsheet and ESRI shapefiles. A project narrative and presentation slides shall also accompany inventory data deliverables. The contractor shall present the inventory and plan results at a council or park board meeting, pending COVID-19 restrictions at that time.

*Inventory Quality Control*

The contractor is fully responsible for a high quality inventory and must ensure that there is a quality control and assurance program in place. It is expected that the contractor demonstrates routinely what the Critical Error Score and Non-Critical Error Score are with a goal of scoring greater than 98% on critical errors and 95% on non-critical errors. Each scoring report shall also include the percent audited.

The site manager shall be an ISA Certified Arborist and have the Tree Risk Assessment Qualification (TRAQ) through the ISA. The site manager shall be present in Muncie through the duration of fieldwork.

**Management Plan**

The consultant shall provide a written, 5-year Public Tree Management Plan. The consultant shall analyze the collected inventory data to summarize and determine overall health, size, and

characteristics of the City's public tree population. The plan shall include a prioritized maintenance schedule and detailed budget recommendations. The consultant shall also review the City's current tree ordinance and give suggestions of change based on inventory findings and plan recommendations.

### **Tree Management Software Program**

The proposals shall include the installation of tree management software and any applicable licenses fees that includes a mobile application solution. The tree management software program shall be web-based and provide:

- inventory data management
- create work orders
- work history tracking and analysis
- maintenance and planting cost analysis
- integrated mapping component and visual representation of the inventory data
- ability to upload and store digital photos and electronic reports
- upload and track call in history from residents
- run i-Tree analysis
- create custom user created reports
- have unlimited concurrent access
- have a guest read only access version

The tree management software must also include a mobile solution for use on Android, iOS, and Windows operating systems. The mobile application must have full ability for in-field edits and utilize built in location service from smartphones and tablets. The mobile solution must be a native application.