**Special Meeting**
**6:00 p.m., Monday, Sept. 28, 2020**
**Virtual - Zoom**
**Meeting ID: 821 5802 3428**
**Password: 791102**

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# SPECIAL MEETING AGENDA

1. **Roll Call**

2. **Approval of Agenda**

3. **Water main replacement at Floral and Nine Mile Road**

4. **Consideration to authorize administration to submit a grant application to the Michigan Department of Natural Resources for the 2021 Urban and Community Forestry Program**

5. **Other Business**

6. **Public Comment**

7. **Council Comment**

8. **Adjournment**

*The City will follow its normal procedures for accommodation of persons with disabilities. Those individuals needing accommodations for effective participation in this meeting should contact the City Clerk (248) 474-5500, ext. 2218 at least two working days in advance of the meeting. An attempt will be made to make reasonable accommodations.*

| **Farmington City Council**<br>**Staff Report** | **Council Meeting**<br>**Date: Sept. 28, 2020** | **Item Number 4** |
|---|---|---|

**Submitted by:** David Murphy and Christopher Weber

**Agenda Topic:** Michigan Department of Natural Resources 2021 Urban and Community Forestry Program Grant Application

**Proposed Motion**:
Authorize Administration to submit a grant application to the Michigan Department of Natural Resources for the 2021 Urban and Community Forestry Program.

**Background:**

The 2021-2026 Capital Improvement Program includes a tree inventory study under Sidewalks and Streetscapes for the year ended June 30, 2022 in the amount of $10,000.

A tree inventory is important because it:

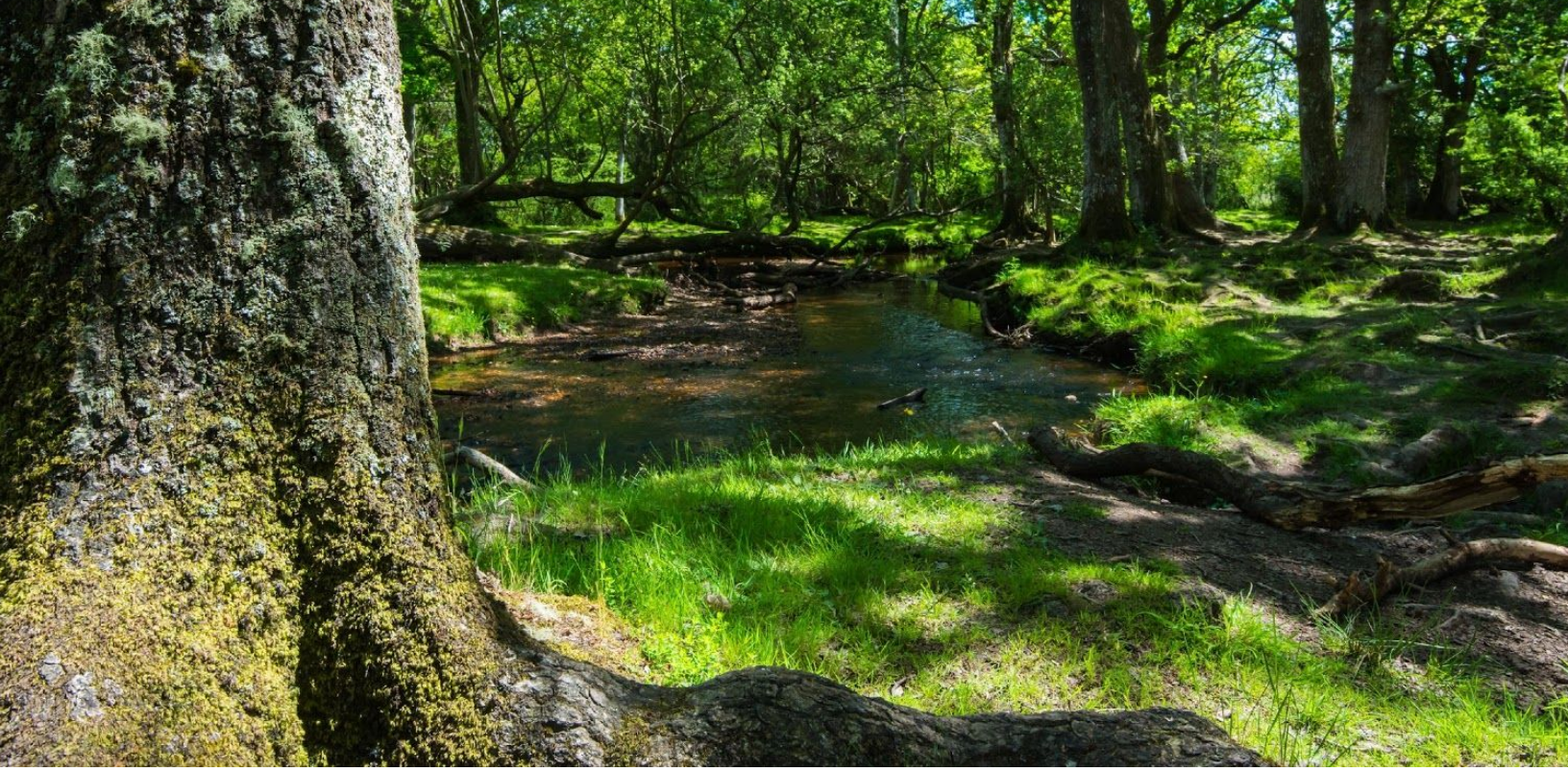
- Identifies sick trees that might cause damage to people and property
- Determines the type and location of trees to plant to ensure proper health and diversity
- Improves the efficiency and effectiveness of maintenance plans
- Shows the benefits of our urban forest
- Improves the City's ability to receive future tree grants

The total cost of the project is anticipated to be approximately $14,500. The grant would provide $7,250. The remaining $7,250 would be drawn from fund balance in the Capital Improvement Millage Fund.

Attached is one proposal obtained from the City to inform our grant submittal. If the grant is received, a total of 3 proposals would be solicited.

**Materials:**

Davey Resource Group Tree Inventory Proposal



# City of Farmington Tree Inventory


***Prepared For:***

**City of Farmington**

David Murphy
23600 Liberty Street
Farmington, MI 48335

***Prepared By:***

**Davey Resource Group, Inc.**

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**September 22, 2020**

# Introduction

Trees are part of everyday life in the City of Farmington. The City's urban forest creates a sense of place and supplies real benefits to those who live in Farmington. Trees along streets, in parks, around playgrounds, and in backyards provide shade and beauty and enhance the quality of life in Farmington by bringing natural elements and wildlife habitats into urban settings. Trees also moderate temperatures, reduce air pollution and energy use, improve water quality, and promote human health and well-being. Davey Resource Group, Inc. "DRG" understands the benefits trees bring to your community. We also realize the challenges that come with managing public trees.

# About Davey Resource Group, Inc.

For over 25 years, DRG has inventoried trees throughout the United States. We know that the data collected during a tree inventory is critical to helping you manage your urban forest proactively and better mitigate tree-related risk. Since you rely on the inventory data and recommendations to make important decisions, DRG uses only qualified, experienced staff who are knowledgeable of both industry standards and the municipal work environment.

Trees bring natural elements and wildlife habitats into urban settings and they also moderate temperatures, reduce air pollution and energy use, and improve water quality.

## Urban Forest Experts

We are pleased to introduce DRG and our team of urban forest experts to the City of Farmington and present our qualifications for providing tree inventory and planning services. DRG's team will provide you with solutions you can count on for building and maintaining tree canopy in a manner that not only enhances community aesthetics and public safety but also improves the community's environmental and social well-being through trees.

Our team consists of International Society of Arboriculture (ISA) Certified Arborists, urban and traditional foresters, urban planners, Geographic Information Systems (GIS) and Information Technology (IT) specialists, and ecological scientists. We have experience working with a wide variety of clients, including municipalities, parks, commercial complexes, and utilities, and have the knowledge, certifications, and training required to complete Farmington's project on time and budget while exceeding the City's expectations.

We understand that the information in a tree inventory database and our associated services help you to complete your daily work more efficiently and allows you to:

- Respond to inquiries and requests about trees
- Quickly find trees when you need to schedule work
- Keep maintenance records up to date
- Make data-driven decisions; be accountable for actions and justify decisions
- Showcase the benefits of your urban forest

## Natural Resource Management

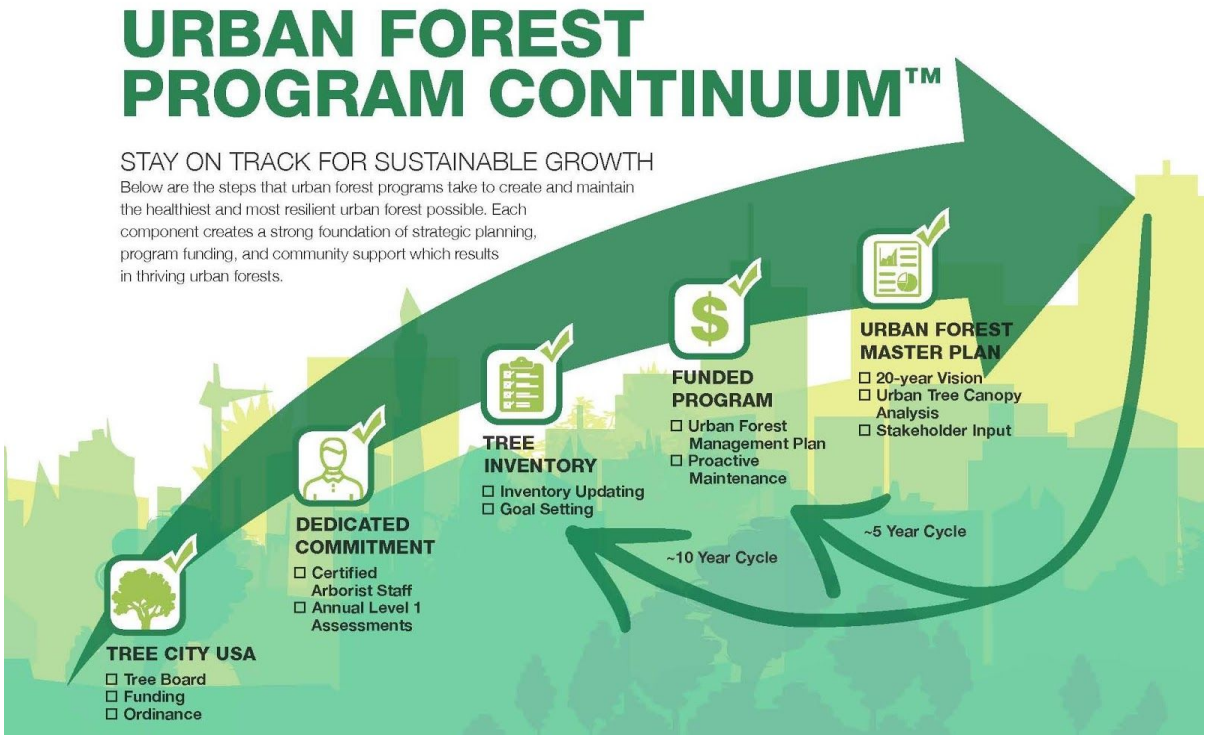
DRG's Environmental Consulting team is your committed partner for natural resource planning and management. With 22 local offices and a national footprint, we offer a wide and growing variety of consulting services (in addition to urban forestry) including wetlands and stream studies, environmental design and ecosystem restoration, stormwater management and compliance, and invasive species management.

We understand the complex ecosystems, resource challenges, and regulatory concerns that impact the success of any environmental project. No matter the location—dense city core or a remote rural site—we leverage our creativity and expertise to deliver reliable, turn-key environmental consulting services. We combine the latest technologies with time-tested techniques to provide high-quality results in a timely and professional manner.

## A Trusted Partner and Supporter of Arboriculture

Davey is a trusted partner of the United States Department of Agriculture (USDA) Forest Service and the Arbor Day Foundation, and a long-time supporter of the ISA and its local chapters. Davey is a founding partner with the USDA Forest Service of the i-Tree software.

Davey staff helped to develop and revise the American National Standards Institute (ANSI) standards for arboriculture, including tree risk assessment, and drafted some of ISA's best management practices. Davey also works with the Tree Care Industry Association (TCIA), as safety is priority one for the Davey Company. Recently, DRG created the Urban Forest Program Continuum to help our clients gauge and grow their tree management programs.




***Davey Resource Group has proven solutions to help Farmington launch its program forward along the Urban Forest Continuum.***

# DRG's Focused Urban Forestry Services

## TREE INVENTORY

Whether inventorying one tree or hundreds of thousands of trees, DRG tailors each inventory to meet your specific program needs and project budget.

## TREEKEEPER® SOFTWARE

Developed, maintained, and supported by DRG's in-house IT professionals, TreeKeeper® is easy-to-use, web-based software used to manage, share, and update inventory data.

## URBAN FOREST PLANNING

Whether Farmington needs help managing the City's trees daily or reaching overarching goals for the urban forest, our team has the experience, tools, and ability to help Farmington achieve both its short- and long-term goals. DRG develops management and master plans as well as storm preparedness, tree protection, woodlot, and invasive species management plans.

## GIS

With GIS specialists in-house, we can map the City's urban tree grow out, analyze the spatial distribution of available planting space, and predict the impact of threats to the tree canopy.

## STAFFING

If Farmington does not have an urban forester or needs help with program management or projects, DRG's experienced ISA Certified Arborists work on-call, perform project work, or work as part-time or full-time contract staff.

## TREE BENEFITS

As a developer of i-Tree, DRG knows how to use i-Tree Tools to highlight the benefits of your trees.

## Scope of Work

This project is an integral part of Farmington's comprehensive tree care program. The results of this project will help Farmington better understand the composition, structure, and maintenance needs of its urban forest, allocate resources, develop risk management strategies, and promote the ecosystem benefits the City's trees provide to the local community.

The proposed project has the following key components:

1. **Tree Inventory.** The project is a GIS-based inventory of maintained trees and stumps found along public rights-of-way (ROW). The inventory consists of DRG's urban foresters locating approximately 4,000 sites and recording the specified information about each site in the inventory database. DRG bases our tree inventory on the *ANSI A300 Part 9* standards.
2. **Tree Inventory Data Delivery.** DRG offers a free, one-time, one-year trial of our TreeKeeper® Software. DRG delivers the City's inventory data in TreeKeeper® and as ESRI® shapefiles and an Excel™ Spreadsheet.
3. **Tree Inventory Summary Report.** DRG uses Farmington's inventory data and industry standards and best management practices to develop a tree inventory summary report upon completion of the inventory.

# Project Approach

The following sections describe DRG's overall approach, or methodology, for accomplishing Farmington's scope of work. We include a plan of work for the tree inventory and explain the technologies used to complete the inventory, an overview of our TreeKeeper® software, and a description of a typical inventory summary report. To illustrate the strength and experience of the DRG team, we provide a few representative staff resumes and project examples and references in Appendices A and B, respectively.

## Dedicated to Safety

Safety is the number one priority of DRG. To ensure the safety of DRG's workers and those traveling nearby, DRG uses the following Personal Protective Equipment (PPE): ball caps, high-visibility safety vests, safety glasses, and over-the-ankle boots.

Davey has provided Proven Solutions for a Growing World since 1880 and has been employee owned for 38 years.

# Task 1. Tree Inventory

To ensure that the tree inventory meets the City's goals and deadlines, DRG uses the following work plan.

## Step 1. Communication

From project beginning to end, DRG staff keep open lines of communication with Farmington via telephone, e-mail, and, as needed, in-person meetings. DRG answers any questions Farmington has as well as keeps the City apprised of the project's progress.

## Step 2. Contract Phase

Once awarded the project, DRG executes a contract and supplies insurance per project specifications.

## Step 3. Data Mining and Hardware Programming

The next step in the inventory process is to obtain the GIS data and imagery needed to set up the field computers used for data collection. DRG's urban foresters typically work with the City's GIS or planning department to complete this step. If necessary, we can get imagery from other public sources. DRG uses the data fields defined in this proposal and the imagery, maps, and data files obtained from the City and various sources to program the data collection software and field computers. At this time, we may contact you by phone to confirm the data attributes.

## Step 4. Kick-Off Meeting

DRG staff will contact the City after contract execution to schedule a kick-off meeting. During the kick-off meeting, Farmington's staff and the DRG project team discuss inventory safety and communication procedures and confirm project expectations and milestones. If possible, DRG's urban foresters assess a few trees with City staff to ensure consistent assessment results.

## Step 5. Data Collection

DRG typically begins data collection after the kick-off meeting. Our experienced, qualified urban foresters locate trees and stumps along maintained street ROWs, evaluate those trees, and record the data specified by the City. The collected data, once finalized, is Farmington's tree inventory database.

### *Accessing Inventory Data*

DRG supplies access to the tree inventory data during data collection. To access tree records, utilize TreeKeeper® to view and field check data and even to route and plan for tree work.

### *Location Accuracy*

DRG uses field computers and equipment that meet or exceed this project's location accuracy requirements. Having worked on thousands of tree inventory projects, DRG has found that using a combination of GIS and a customized data collection program provides the most exact data and the most efficient means for inventorying trees. DRG uses our in-house designed GIS software tool in conjunction with ruggedized computers with a GPS receiver to collect inventory data. Under favorable conditions, the equipment allows for sub-meter location accuracy of point data.

### *Individual Tree Inspection Process*

During data collection, DRG's urban foresters walk by each tree and inspect the tree from the ground. Based on the conditions at the time of the inspection, DRG's staff identify the tree's species and its location, measure tree diameter, and rate its health. DRG's urban foresters also assess tree risk and suggest the specific maintenance involved in mitigating that risk as well as collecting all other information at this time. When data collection for an individual tree is complete, DRG's urban foresters walk to the next tree and follow the same steps, in the same order, to ensure consistent data collection.

DRG formally routes the collection of inventory data to ensure that staff collect all the sites in the project area in a systematic manner. Throughout the inventory process, DRG maps the streets inventoried and shares that information with the City. DRG also tells Farmington where staff intend to collect data next. DRG's urban foresters collect data Monday through Friday and often on weekends with our clients' permission.

### *Data Fields*

For Farmington's inventory, DRG recommends collecting the following data fields, defined in Appendix A of this proposal:

1. Address (street address and X and Y coordinates)
2. Species
3. Tree size
4. Multi-stem tree
5. Condition
6. Maintenance needs
7. Defects
8. Tree risk assessment and rating
9. Residual risk
10. Further inspection
11. Overhead utilities
12. Date of inventory

The data fields listed above give Farmington ample information to manage their trees and stumps proactively. However, if Farmington has specific needs that the above data fields do not address, such as tree roots lifting sidewalks or clearance concerns, contact DRG to customize the project's scope of work.

### *Upgrading the Inventory*

In addition to collecting trees and stumps, DRG can inventory other infrastructure that Farmington might be managing, such as tree planting locations, shrub rows, woodlots, natural or environmentally sensitive areas, irrigation boxes, benches, signage, and turf. DRG's urban foresters can also take and link pictures to tree records. DRG can upgrade the City's inventory by changing the current scope of work or by further developing the project to have additional phases. If Farmington is interested in learning more about options for upgrading the inventory, contact DRG for information and fees.

### *Tree Risk Assessment*

During the inventory, DRG's urban foresters perform an inspection of each tree that follows the ANSI tree risk assessment (ANSI 2017). For Farmington's inventory, DRG will complete a 360-degree ground-based visual inspection of the crown, trunk, trunk flare, above-ground roots, and site conditions around the tree in relation to targets. The assessment only includes conditions detected from the ground; internal, belowground, and upper crown factors are still mostly undetected. The specified period for the risk assessment is one year. The risk part of this inventory and evaluation is to keep in compliance with the most recent standards and practices in

the arboricultural industry. It is important to note that DRG's inspections are "rapid assessments" and are meant to show a need for further study; the assessments are not legally binding in any litigation.

For the tree risk assessment, DRG's urban foresters assign each tree one qualitative risk rating using the risk categorization matrices found in the ISA's *Best Management Practices - Tree Risk Assessment, Second Edition* (E. Thomas Smiley, Nelda Matheny, and Sharon Lilly 2017). Various and multiple failure scenarios help determine a tree's risk rating. The failure mode (i.e., branch, whole tree, codominant stem) with the most significant risk serves as the overall tree risk rating. DRG's staff will not sound trees during the inventory. See Appendix D for the limitations of the tree risk assessment.

### Step 6. Inventory Close-Out

At the end of the inventory project, DRG supplies a one- to two-page project close-out report which spells out the number and types of sites collected, provides information about the species composition and diameter size class distribution, and shows the amount and type of maintenance recommended during the inventory. We provide the report in PDF format within four weeks of inventory completion.

## Task 2. Tree Inventory Data Delivery

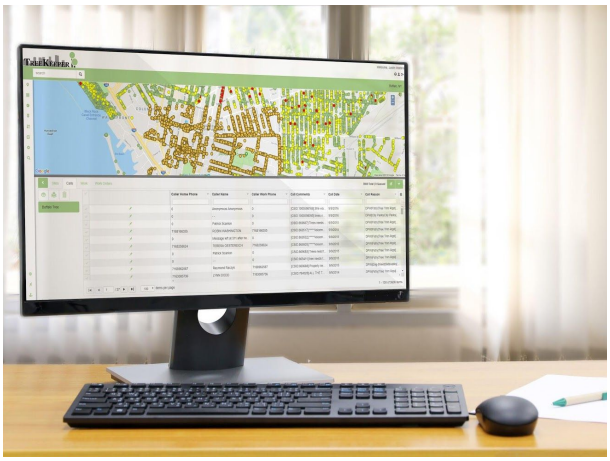
For this project, Farmington is eligible to receive tree inventory data in DRG's TreeKeeper® software. As part of our one-time software trial, DRG provides a one-year subscription to TreeKeeper® software to Farmington free of charge. The City also receives one year of telephone software support, also free of charge for the first one-year period.

- To access TreeKeeper®, use Safari® on an iOS device or via Google Chrome™ on a Windows® or Android device; the secure login information DRG provides to the City.
- Once using TreeKeeper®, Farmington can view and use the inventory data and download the data in a variety of formats, including CSV/Excel™ and ESRI® shapefile formats.

DRG offers custom software training for an added fee; contact DRG to learn more about our training programs, which can earn attendees up to eight ISA continuing education units (CEUs).

### Other Formats

If Farmington needs the inventory data in different formats, such as Google Earth's KML, AutoCAD®, or i-Tree, or for a particular asset management software program like CityWorks, Hansen, or Cartegraph, DRG can supply the inventory data in those formats for an added charge. Please contact DRG for more information about data formatting options and fees.



TreeKeeper® gives Farmington instant access to tree inventory data.

# Davey's TreeKeeper® Software

Developed, maintained, and supported by DRG, TreeKeeper® is our flagship tree management software. Leading the industry for over 20 years, TreeKeeper® is a versatile cloud-based software service designed to manage, update, and share tree inventory data. TreeKeeper® also highlights the environmental benefits of community trees.

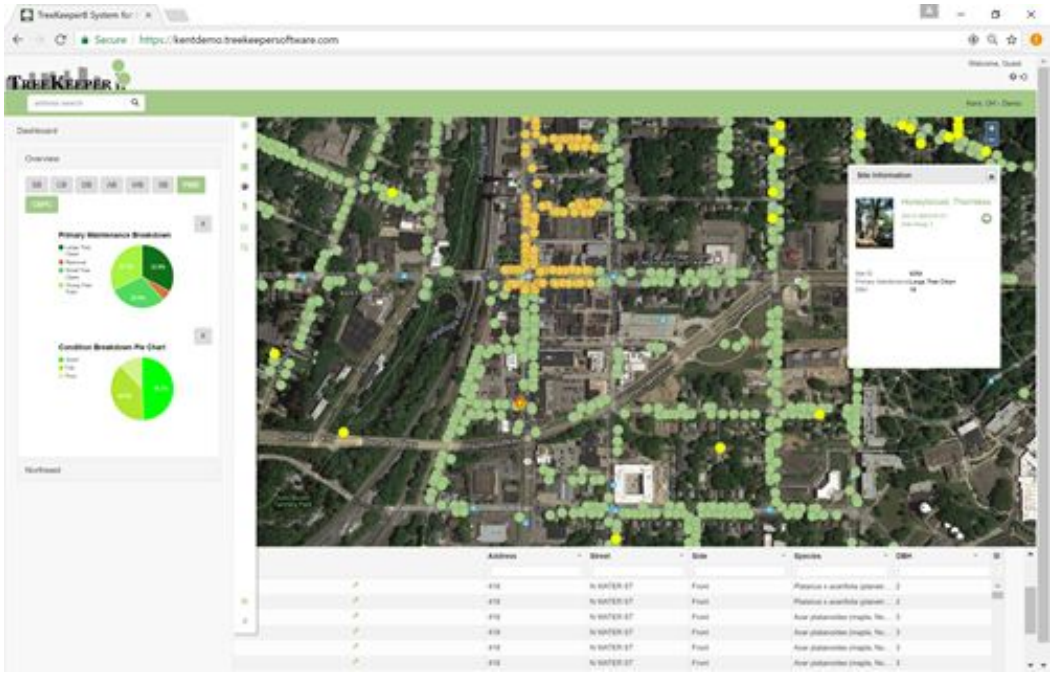
TreeKeeper® is available as a subscription service (SaaS) with one-year, three-year, and five-year subscriptions available to fit Farmington's program's budget. TreeKeeper®'s pricing is "all in and upfront." There are no hidden fees or unexpected and expensive add-ons.

## Easy to Use

TreeKeeper®'s interactive work environment makes managing inventory data easy. The City can see and work with the tree inventory data through an interactive map and table. The map and table can be used independently or at the same time, giving you a totally custom work environment.

Another reason TreeKeeper® is easy to use is that it is accessible by multiple people in separate locations at the same time. Any changes to the data, such as adding new sites, updating the information for an existing site, or running a report, are updated in real-time.

Knowing the benefits your trees provide is also easy. TreeKeeper® automatically calculates the environmental benefits provided by trees. Air quality, carbon sequestration and storage, and stormwater benefits can be estimated for one tree, groups of trees, or for the entire population.



Using inventory data has never been easier. This screenshot of DRG's TreeKeeper® shows the dashboard, query, and the call-out box.

## Key Features

- *Map-Centric:* use the map to find information about individual sites or groups of sites.
- *List View*: sort and analyze data.
- *Query*: look up sites by any data field, such as address, species, or condition.
- *Search*: by one or multiple data fields; no nested searches.
- *Narrow Down:* refine the search results to find the result needed.
- *Switch Layers On-the-Fly:* change the data layer through a drop-down menu.
- *Dashboards*: gauge the inventory data via pre-set and user-designed graphs.
- *Reporting*: create reports at the touch of a button.
- *Work Orders*: assign work to crews, projects, or programs.
- *Work History:* keep track of the edits made to a site.
- *Edit*: update one site at a time or make batch edits to multiple sites.
- *Multi-User Access:* available via a secure internet connection.
- *Permissions*: assign access levels (no read or edit access) to users and viewers.
- *Tree Value*: calculated using a built-in tree value estimator based on i-Tree Tools.
- *Export Data:* to software such as Microsoft® Office and other word processing and spreadsheet programs.

## In the Field

While in the field, you can find and update site information and add new trees or sites to the database using TreeKeeper®. All edits are real-time. TreeKeeper® works with most tablet computers and uses the tablet computer's location services or GPS availability to determine location.

## Data Download Formats

In TreeKeeper®, you can view, edit, and update the inventory data and download the data in a variety of formats, including CSV/Excel™ and ESRI® shapefile formats.

## Information Sharing

If Farmington wants to share the tree inventory data with other organizations or the public, TreeKeeper® provides a public interface for third-party viewing. TreeKeeper®'s public interface does not allow visitors to edit the data or "crowdsource" information, and you can determine what data are shown to visitors to the site.

## We Listen to You

DRG stays on top of the latest technology trends to maintain TreeKeeper®'s place as one of the most advanced software systems for tree inventory management on the market. And, we also listen to you, our clients, to make sure TreeKeeper® responds to the needs of their respective workplaces. Over the past 20 years, many of the upgrades to TreeKeeper®, made by DRG's in-house software developers, came about by suggestion from our clients.

***WANT TO LEARN MORE ABOUT TREEKEEPER®? Click HERE.***

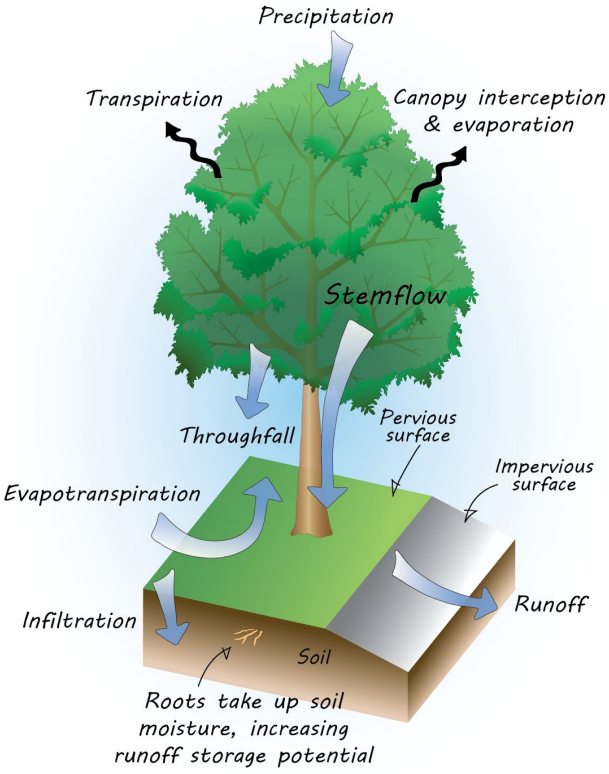
# Task 3. Tree Inventory Summary Report

The Michigan Department of Natural Resources often wants a summary or narrative describing the results of tree inventory projects funded. DRG's inventory summary report is an excellent choice for those communities who are interested in knowing baseline information about their urban forest, communicating the importance of trees to citizens, or helping meet grant reporting requirements. The inventory summary report includes an analysis of the inventory data and presentation of the ecosystem benefits provided by community trees.

The following are typical sections in DRG's inventory summary report:

### *Report Sections*

- *Executive Summary*—describes the assignment and provides an overview of inventory findings.
- *Inventory Analysis*—using charts and tables and insight from DRG's experienced urban foresters, the inventory analysis section describes the composition, function, and structure of the tree population, including its species diversity, diameter size class distribution, general health, and priority maintenance.
- *Benefits of the Urban Forest*—highlights the environmental, ecological, and economic benefits trees provide to the community.



# Project Schedule, Tasks, and Deliverables

The following project schedule lists key tasks along with expected completion dates and deliverables. If the City's project schedule differs from what DRG projected, use the information for planning purposes.

Recognizing that the City is applying for a Michigan Department of Natural Resources Urban and Community Forestry Grant, the anticipated schedule is built based on previous experience with similar grant-funded projects.

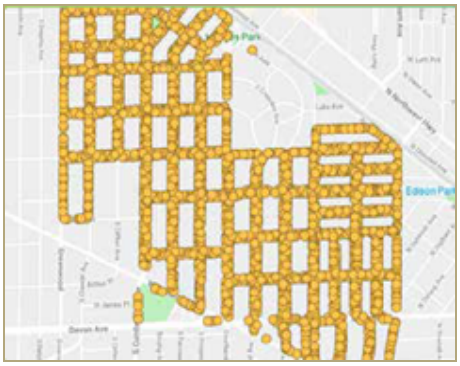
| Project Schedule | | | | | |
|---|---|---|---|---|---|
| **Task** | **Jan** | **Feb** | **Mar** | **April** | **Deliverable** |
| Award | | | | | Insurance, contract |
| Data Mining and Field Computer Set-Up | | | | | Obtain basemaps and GIS data/ program software and hardware |
| Kick-off Meeting | | | | | Meeting summary as needed |
| Inventory Data Collection and QA/QC | | | | | Inventory of 4,000 sites; ongoing field checks; weekly e-mail updates |
| Inventory Data Delivery | | | | | Inventory data in TreeKeeper® and as ESRI® shapefiles and Excel™ |
| Inventory Close-Out Meeting | | | | | If scheduled, usually takes place on the last day of data collection |
| Inventory Reporting | | | | | Close-out reports |
| Inventory Summary Report | | | | | Data analysis and summary |

# Quality Control and Assurance

## WE TAKE YOUR DATA SERIOUSLY

From the project's start to its finish, DRG focuses on the experience the City has working with DRG and the quality of the project's deliverables. To ensure a good working relationship throughout the project, DRG collaborates with Farmington early on to schedule fieldwork and meetings at mutually agreeable times and determine protocols for addressing questions and concerns that arise during data collection. DRG's staff also stay in contact with Farmington's staff during all phases of the project to keep the City informed of the project's status. The following is an example of an inventory progress update, e-mailed on a set schedule such as weekly or bi-weekly, from DRG's urban forester to the client.

### *INVENTORY PROGRESS UPDATE E-MAIL*



Dear Valued Client:

Below is a recap of last week's inventory progress.
So far, we have inventoried 3,161 sites. The map (right) shows our progress in Zone C. We also had a chance to do some in-the-field quality assurance last week (bottom). We audited 1% of the data collected last week and found no critical errors.

We expect to wrap up data collection later this week. We predict that the remaining streets will have the same tree density, although the road running along the train tracks in the northeast may have slightly more trees. In all, we think that the total site count will be close to the pre-project estimate of 3,800 sites. We will keep everyone apprised if this expectation changes.

Katie will be on the ground this week, and Pete may come out to help with collection. If needed, they can be available for an in-person closing meeting. Otherwise, we can include the final site count and notes in a close-out e-mail.

As far as data delivery, we expect it will take a few days for GIS quality control checks after data collection is complete. We will follow up with an e-mail when your final inventory dataset is available in TreeKeeper®. If you have any questions or concerns, please reach out to me.

Thanks, Your DRG Urban Forester

| **Inventory Statistics** | | | | |
|---|---|---|---|---|
| Site Count to Date | | Percent Complete | Estimated Total Site Count | |
| 3,161 | | 83% | 3,800 | |
| **Quality Assurance** | | | | |
| Overall Critical Error Score | Target Critical Score | Target Non-Critical Error Score | Target Non-Critical Score | Percent Audited |
| 100% | 98% | 97.87% | 95% | 1% |

In addition to providing an excellent client experience and thorough communication, DRG takes measures to ensure the delivery of the entire scope of work. DRG's staff review the project's scope together and provide a data specification, based on the project's contract, to DRG's in-house development team. DRG's development team consists of the inventory's project manager, and GIS and IT specialists. DRG's inventory project manager reviews the scope of work again to ensure that the data fields and input codes match Farmington's specifications. Once the project manager approves the data specification, then DRG's GIS and IT staff program the field computers for data collection. Before the kick-off meeting, DRG's project manager checks the field computers to make sure the computers are set up correctly and work properly. At the kick-off meeting, DRG reviews the project's work plan with the City, answers questions, and ensures that Farmington and DRG's urban foresters are on the same page concerning the project's expectations.

Quality control and assurance continues during data collection. DRG's project manager and urban foresters use hot and cold data checks during fieldwork and encourage Farmington to do so as well. DRG regularly updates Farmington on the project's status and makes the City aware of any situations that may need immediate attention. At the end of the project, DRG's IT specialists run computer diagnostics on the inventory data to make sure the data is clean. Finally, DRG answers any questions the City has about the data and our TreeKeeper® software and verifies Farmington's satisfaction with DRG's work.

## Client Responsibilities

1. Provide DRG with imagery, maps, and data files. Our request may include the following: digital orthophotographs, available GIS data layers, other electronic or paper copies of maps for roads, pavement widths, right-of-way widths, boundaries and utilities, and an electronic file or printed list of street names and endpoints.
2. Provide daily contact information and directions during the inventory project.
3. Provide a copy of any existing tree inventory database(s).
4. Coordinate and host a kick-off meeting before the start of fieldwork.
5. Agree to allow DRG to host Farmington's tree inventory data in TreeKeeper® software for one year. Terms and conditions apply.
6. The limitations of the Scope of Work are outlined in Appendix D. By accepting this proposal, Farmington accepts DRG's Limited Warranty and agrees that, upon award, this proposal and its attachments will be made a part of the Agreement.

# Investment

## Tree Inventory

- ❑ Computerized inventory data collection of up to 4,000 existing trees and stumps for a cost of: **$14,500**
- ❑ Additional inventory data collection above 4,000 trees/sites at a unit rate of: **$3.56/site**

## TreeKeeper® Software - Free One-Year Trial

- ❑ One-year subscription **Free ($2,500 value)**

During data collection, tree inventory data will be available for clients to view with compatible computer systems via our TreeKeeper® software. Clients agreeing to receive our promotional offer receive one free year of TreeKeeper® service beginning on the last day of the month of the inventory data release and ending 365 days later. DRG also supplies one year of telephone software support. DRG offers no discounts if Farmington refuses the promotional software service offer.

## (optional) TreeKeeper® Software - Renewal Fees

The inventory data are the property of the City, and there is no obligation to extend the software beyond the one-year complimentary service. Should Farmington wish to continue using TreeKeeper®, the following fees apply. DRG locks in the renewal fee at the prices listed below if the subscription does not lapse.

- ❑ One-year subscription **$2,500/yr.**
- ❑ Three-year subscription **$6,250/3-yr.**
- ❑ Five-year subscription **$10,000/5-yr.**

## (optional) Tree Inventory Summary Report

- ❑ Inventory Summary Report **$1,500**
  A brief analysis of inventory data with i-Tree results. This summary report often helps fulfill reporting requirements for DNR-funded projects.

This proposal is valid for 60 days.

# TERMS AND CONDITIONS

- All pricing is valid for 60 days from the date of this proposal.
- Time and materials (T&M) estimates may fluctuate and will be billed accordingly. Fixed fee contract prices will be billed as shown.
- Invoicing will be submitted monthly for work performed, unless otherwise agreed upon.
- Payment terms are net 30 days.
- If prevailing wage requirements are discovered after the date of this proposal, we reserve the right to negotiate our fees.
- The client is responsible for any permit fees, taxes, and other related expenses, unless noted as being included in our proposal.
- The client shall provide 48 hours' notice of any meetings where the consultant's attendance is required.
- Unless otherwise stated, one round of revisions to deliverables is included in our base fee. Additional edits or revisions will be billed on a time and material (T&M) basis.
- All reports are provided only to the client unless otherwise directed.

# LIMITED WARRANTY

The Davey Tree Expert Company, its divisions, agents, representatives, operations, and subsidiaries (collectively "Davey") provides this Limited Warranty as a condition of providing the services outlined in the agreement between the parties, including any bids, orders, contracts, or understandings between the parties (collectively the "Services").

Davey provides the Services utilizing applicable standard industry practices and based on the facts and conditions known at the point in time the Services are performed. Facts and conditions related to the subject of the Services may change over time. Davey cannot predict or determine developments concerning the subject of the Services and will not be liable for any developments, changes, or conditions that occur, including, but not limited to, decay or damage by the elements, persons or implements, insect infestation, deterioration, conditions not discoverable using the means and methods used to perform the Services, or acts of God or nature or otherwise. If a visual inspection is utilized, visual inspection does not include aerial or subterranean inspection, testing, or analysis. Davey will not be liable for the discovery or identification of non-visually observable, latent, dormant, or hidden conditions or hazards, and does not guarantee that items will be healthy or safe under all circumstances or for a specified period of time, or that remedial treatments will remedy a defect or condition.

Davey may have reviewed publicly available or other third-party records or conducted interviews and has assumed the genuineness of such documents and statements. Davey disclaims any liability for errors, omissions, or inaccuracies resulting from or contained in any information obtained from any third-party or publicly available source.

To the extent permitted by law, Davey does not make and expressly disclaims any warranties or representations of any kind, express or implied, with respect to completeness, accuracy, or current nature of the information contained in the Services or the reports or findings resulting therefrom beyond that expressly contracted for by Davey in the agreements between the parties, including but not limited to, performing diagnosis or identifying hazards or conditions not within the scope of the Services or not readily discoverable using applicable standard industry practices. Davey disclaims any warranty of fitness for any particular purpose. Davey's warranty is limited to one year from the date Services are performed. Davey's liability for any claim, damage, or loss, whether direct,

indirect, special, consequential, or otherwise, caused by or related to the Services shall be limited to the Services expressly contracted to be performed by Davey.

# Appendix A: Experienced Staff

DRG may assign the following team members to Farmington's project. Their experiences and credentials prove that they have the qualifications needed to work for the City.

**Lee S. Mueller, M.S., C.F.,** is a market manager with Davey Resource Group. Mr. Mueller is responsible for expanding environmental consulting services, establishing new regional offices, and strengthening key business partnerships across the Great Lakes. Throughout his career, Mr. Mueller has demonstrated deep experience in all aspects of developing and supporting complex, multi-partner projects in urban forestry and ecosystem restoration—from project visioning and budgeting to implementation strategies and long-term maintenance. Mr. Mueller has also served as a staff or board member on a variety of professional and nonprofit organizations dedicated to forestry, arboriculture, and parks and recreation. Mr. Mueller provides a holistic approach to urban forestry, forest management, ecosystem restoration, parks and recreation planning, staff and volunteer training, nonprofit programs, and community outreach and engagement. Additionally, he excels in creating strategic partnerships; building and evaluating processes and systems; engaging diverse communities; and seeking, writing, and managing private or government grants. Prior to joining Davey Resource Group, he was instrumental in establishing an urban forestry outreach and volunteer program that garnered state and national recognition in Grand Rapids, Michigan, as well as managing large-scale, volunteer-led tree planting and phytoremediation projects in Detroit. Mr. Mueller is an International Society of Arboriculture (ISA) Certified Arborist, has an ISA Tree Risk Assessment Qualification (TRAQ), and is a Certified Forester through the Society of American Foresters, a Michigan Qualified Forester through the Michigan Department of Agriculture and Rural Development, a Michigan Registered Forester, and a Certified Plan Writer through the Michigan Forest Stewardship Program. Mr. Mueller has a master's degree and a bachelor's degree in forestry from Michigan State University.

**Emily Hanson** is the area manager for Michigan's Environmental Consulting team. In this role, Emily provides operational leadership, team oversight, and day-to-day direction for a wide range of ecosystem restoration, ecological consulting, and urban forestry services across the state, including: vegetation surveys, tree inventories, invasive plant control, wetland delineation, contract urban forestry, forest management planning, and native plant seeding and establishment. Emily has more than 10 years of experience in the field of Urban Forestry. Before moving to Michigan, she worked for New York City's Department of Parks & Recreation as a senior forester for street tree planting and manager of the city's tree procurement program. Prior to that she worked as an urban forestry volunteer coordinator for small communities in Illinois, funded by the USDA Forest Service.

Emily has Midwestern roots, growing up in Southern Minnesota and earning her bachelor of science degree in urban and community forestry from the University of Minnesota Twin Cities. She became an ISA Certified Arborist in 2011 and earned her ISA Tree Risk Assessment Qualification in 2017.

**Gerritt Moeke, CCF.,** is an environmental specialist with DRG. Gerritt assists site managers and project managers in the implementation of urban forestry and ecological restoration projects. Currently, he supports a Michigan Department of Transportation project covering the maintenance of newly planted trees along I-75 and the mitigation of invasives and other undesirable species that threaten the health of the planted trees and shrubs. Gerritt is OSHA 10-hour certified in General Industry Safety and was internally trained in construction oversight by Davey Resource Group alongside TGC engineering. Previously, Gerritt worked in traditional forestry assessing and managing private tracts of forest land in Northern Michigan for a small forest products company. His experience covered the cruising of timber to

appraise both the value and the health of forest, planning and implementation of long-term management of northern hardwood forests, the grading and scaling of cut timber, and the sale of veneer quality hardwood logs. Gerritt earned his bachelor of science degree in forestry from Michigan State University with a minor in economics and is currently a Candidate Certified Forester for the Society of American Foresters and an International Society of Arboriculture Certified Arborist (MI-4520A).

**Sean Wylie** is an urban forestry planner for DRG, primarily assisting the Urban Forestry Planning Team with writing and coordinating urban forest master plans. He also assists with DRG's ecological restoration projects and creates GIS data products, as needed. Some of Mr. Wylie's previous experience includes using GIS analysis to remotely delineate wetlands in Minnesota for a National Wetlands Inventory update, and an ecological study of various experimental treatments for removing invasive plant species at a prairie restoration site in the Manistee National Forest. He has also helped maintain Ann Arbor's urban forest inventory by updating GIS records on trees owned by both the city and on trees owned by the University of Michigan, along with working privately as a tree and shrub health care technician. Mr. Wylie received his bachelor of science degree in natural resources management with a GIS Technology Certificate from Grand Valley State University. He is also an International Society of Arboriculture (ISA) certified arborist (MI-4522A), a certified Michigan Pesticide Applicator (C003180368) with reciprocity in Ohio and Indiana, and has the L-180, S-130, and S-190 from the National Wildfire Certification Group.

**Holly Knox, GISP, M.S.,** is a senior geospatial analyst with DRG applying GIS technology to environmental analysis. Ms. Knox currently plays a key role in coordinating municipal inventory projects. She is responsible for coordinating the set-up, testing, and programming custom input forms for our field inventory projects utilizing our mobile mapping software solutions, including DRG's Rover, Esri ArcPad, and ArcGIS for Collector software. Her routine work involves managing and building relationships with our internal urban forestry project managers and our clients, in addition to coordinating the acquisition, manipulation, interpretation, and conversion of geospatial data for all three of our market segments. Ms. Knox is also the lead for the creation of field maps and final cartographic products for our Environmental Consulting services.

Since 2009, Ms. Knox has been involved in all quality assurance and quality control (QA/QC) processes for urban tree canopy (UTC) analysis projects. She generates statistical reports and final cartographic map outputs for land cover assessments and i-Tree analyses. Ms. Knox also has experience and knowledge with AutoCAD®, as well as the utilization and support of mobile mapping hardware and global positioning systems (GPS).

Ms. Knox holds a master of science degree in geographic information systems from American Sentinel University. She also has a bachelor of arts degree in geography from Kent State University with an emphasis on natural resource management and conservation, as well as a minor in anthropology. She is a member of the Ohio Urban Regional System Association (URISA) Ohio Chapter, GIS Users of Northern Ohio (GUONO), and the Gamma Theta Upsilon, a National Geography Honors Organization. Since January 2015, she has served on the Ravenna Ohio Shade Tree Commission. She is a volunteer at the Portage County Park District, providing GIS support. She joined Davey in May of 2008.

# Appendix B: Related Projects and References

DRG lists several projects to demonstrate our ability to complete a similar scope of work to that proposed by Farmington. These experiences show that DRG can:

- Undertake, manage, and complete an inventory project.
- Accurately inventory trees, planting sites, and stumps.
- Provide data in specified formats.
- Assess tree risk following ANSI standards and industry best management practices.
- Provide qualified staff with proven experience inventorying trees and assessing tree condition and risk.
- Analyze inventory data extracting meaningful information that affects tree management, such as species diversity, diameter size class distribution, and tree risk.
- Help communities understand the costs associated with long-term tree maintenance.
- Provide solutions that address the needs of our clients.

Contact DRG for more examples of our work.

**Client: City of Ferndale, Michigan**
**Contact: Erin Quetell, 248-336-4361**

The City of Ferndale contracted DRG to perform an urban tree canopy assessment (UTC), ordinance review, phased inventory, and management plan. The UTC identified the city's total tree canopy, where tree canopy occurs, and opportunities for improvement. Coupled with the city's tree ordinance review, the city has clear direction and strategies to maximize tree canopy across the community. To date, all 4 inventory phases have been completed. A total of 8,014 trees have been collected. As data are collected, the city immediately handles any maintenance concerns identified. These efforts have raised the visibility of the city's forestry program among city leadership. As a result, Ferndale crafted a series of goals and metrics to advance urban forestry in fiscal year 2018. To move these goals forward, Ferndale has contracted DRG to provide on-site forestry support one day a month for several years. DRG has been supporting city efforts through tree inspections, further ordinance review, resident communication, planting program evaluation, and long-range municipal forestry plans.

**Client: City of East Grand Rapids, Michigan**
**Contact: Doug La Fave, 616-940-4817**

DRG conducted a street tree inventory in the City of East Grand Rapids. The GIS-based inventory included an assessment of 7,113 trees and stumps. All trees were evaluated for condition, structural soundness, and assigned a risk level to enable the city to prioritize its maintenance needs. DRG's experienced GIS/IT team ensured the city was able to successfully import all inventory data into the city's existing asset management system. The city immediately used their tree inventory to address all priority maintenance issues identified by DRG. DRG's experienced consulting team also presented inventory findings to the City Council, further establishing the value and importance of monitoring community trees.

Subsequently, the city has engaged DRG in ongoing contract forestry services. DRG's team of professional arborists have provided tree inspections and risk assessments to guide city decisions in the maintenance of specific trees. DRG was also asked to put together a cyclical pruning program and specifications for future tree maintenance contracts. More recently, DRG used inventory data to identify specific tree management concerns, set up a body of work, advertised a contract, managed the bid process, and administered the contract for Fiscal Years 2018, 2019, and 2020 pruning and removal operations. DRG continues to support the city's forestry efforts through tree assessments, contract management, tree pest and disease concerns, and public outreach.

**Client: Village of Milford**
**Contact: Christian Wuerth, 248-684-1515**

The Village of Milford is a small, tight-knit community in southwestern Oakland County. With a public works department pulled in multiple directions, Milford was interested in gaining further insight on its tree population and using data to improve operations. DRG helped the community secure a State of Michigan Urban and Community Forestry Grant and conducted a complete inventory of 3,066 trees along public streets and within the village's Central Park. The GIS-based tree inventory included an assessment of tree size, species, condition, risk level, and maintenance need. The village received the tree inventory data in Davey's Treekeeper® 7 Tree Management Software. Village staff have been using Treekeeper® 7 to prioritize maintenance activities based on tree risk. To support staff efforts, DRG presented to the village council and detailed the inventory process, key findings, and management recommendations. DRG provides on-call consulting to address specific tree issues or questions that may arise within the village as well as revisions to the village ordinances. The partnership has allowed the village to utilize forestry expertise to augment staff capacity and expertise.

**Client: City of Rochester Hills, Michigan**
**Contact: Matt Einheuser, Natural Resources Manager, 248-841-2551**

Rochester Hills' aging tree inventory had not been fully updated since originally collected over 10 years ago. In the intervening years, trees had been removed, planted, and the community has grown. The city hired DRG to perform a full update of the city's existing tree inventory data. The effort was completed in the summer of 2019, resulting in a review and assessment of 21,079 trees across the city. When complete, inventory data were analyzed to produce a Tree Management Plan and provide training and support to city staff on the use of tree inventory management software for the long-term maintenance of community trees.

**Client: City of Hamtramck, Michigan**
**Contact: Kathy Angerer, City Manager, 313-876-7700 x326**

Hamtramck has been exploring opportunities to plant trees and expand community tree canopy. Recognizing that the city had no data on the current state, extent, and condition of its tree assets, the City of Hamtramck applied for and received a Michigan Urban and Community Forestry Grant to complete a tree inventory in 2018. Through a competitive bid process, Hamtramck hired Davey Resource Group, Inc. to perform a tree inventory of all streets, write a tree management plan, and present findings to City Council. DRG completed the inventory of 3,283 trees, stumps, and planting

sites in June 2019. A management plan was delivered that following July, followed by a City Council presentation. Hamtramck is using these data to improve maintenance of public trees and implement a planting program to fill empty planting spaces.

# Appendix C: Inventory Data Fields

1. **Address/Location**—DRG identifies the location of each tree and stump by the following attributes.
    a. *Address.* House address.
    b. *On Street.* The street the tree is physically found.
    c. *Side.* The side of the house on which the tree stands in relation to the physical address.
    d. X and Y coordinates in the desired format.
2. **Species**—DRG names trees by genus and species using both botanical and common names, and by cultivars where appropriate.
3. **Tree Size**—DRG's urban foresters measure the 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**—DRG notes if a tree has multiple stems on trunks splitting less than 1 foot above ground level.
5. **Condition**—Staff consider signs of stress, poor structure, mechanical damage, soil and root problems, disease, and pests in the assessment of tree condition.
    a. *Good.* A good tree shows no significant problems.
    b. *Fair.* A fair tree has minor problems that may be corrected with time or corrective action.
    c. *Poor.* A poor tree has significant problems that are irrecoverable.
    d. *Dead.* A dead tree shows no sign of life.
6. **Primary Maintenance**—DRG assigns 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.* Farmington 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.
7. **Defects**—DRG 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**—DRG evaluates risk and assigns 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.

DRG used 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), to arrive at a risk rating.

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 DRG staff try to assess them from our client'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 |

DRG's urban foresters 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, DRG assigns one risk rating to each tree during the inventory process. The risk rating serves only as a prioritization mechanism and is not a guarantee; Farmington must determine the level of acceptable risk.

9. **Risk Assessment Complete**—Staff record if they are not able to complete the assessment due to obstructions, safety concerns, or other unforeseen site conditions.
10. **Residual Risk**—DRG estimates residual risk as None, Moderate, High, or Extreme for each inventoried tree, assuming that the recommended maintenance was carried out. DRG based residual risk solely on professional judgment, and our assessment of residual risk is not a guarantee or warranty of risk reduction.
11. **Further Inspection**—Trees in this category need added and future inspections due to a variety of issues beyond the scope of a standard tree inventory. Categories for further inspection include:
    a. Annual inspection (e.g., a tree with a defect requiring annual monitoring).
    b. Recent damage inspection (e.g., a healthy tree affected by recent construction or other damage).
    c. Advanced risk assessment (e.g., a tree with a defect needing added or specialized equipment for investigation).
    d. Insect/disease monitoring (e.g., a tree that appears to have an emerging insect or disease problem).
    e. None.
12. **Overhead Utilities**—For each tree or site, DRG records if overhead utilities are:
    a. Present and not conflicting.
    b. Present and conflicting.
    c. Not present.
13. **Date of Inventory**—The date the DRG urban forester collected the data.