

ROSEVILLE
REQUEST FOR COUNCIL ACTION

Date: June 20, 2023
Item No.: 10.d

Department Approval



City Manager Approval



Item Description: Authorize Professional Services Agreement with Davey Resource Group, Inc for Tree Inventory

BACKGROUND

In March 2022, the City entered into an agreement with Tree Trust to implement the Accelerated Emerald Ash Borer Program, an aggressive program that calls for the City to proactively address the threat posed by Emerald Ash Borer (EAB) by 2025. Specifically, the plan calls for a combination of ash tree removal, replacement planting of diverse species, and ongoing treatment of select ash trees. As was discussed at the May 15, 2023 City Council Meeting, the program is coming along well and is slightly ahead of schedule.

Prior to the discovery of EAB in Roseville, more than 21% of Roseville's public trees were ash. The EAB infestation has, and will continue to, greatly transform Roseville's urban forest. As we near the half-way point of the program, staff have begun to turn their attention to developing a post-EAB forestry approach.

The first step in that process is updating the City's tree inventory. A public tree inventory is a hand count of all of the City's public trees including their species, size and condition. Additionally, a survey can identify prospective future planting locations on public property. This information can be used to identify possible weak spots in the city's urban tree canopy, including preparedness for future pests such as the Asian Longhorned Beetle, and for the development of a plan to address these deficiencies. Additionally, survey data can be overlaid with demographic data to identify and redress possible equity impacts. If desired, this data can be utilized to develop a ten or twenty year forestry plan.

The City's last public tree inventory occurred in 2011. This was an important step for the City, and one that led to our current Street Tree Master Plan and the development of the City's approach to EAB mitigation. However, as we have worked through the Accelerated EAB program, we have found some of the data to be incorrect or outdated. Best-practices for urban forest management recommend updating a community's tree inventory every ten years to ensure the data is accurate and contains up-to-date condition ratings.

In 2022, the City was awarded a \$125,000 Minnesota Department of Natural Resources (MN DNR) Preparing for Emerald Ash Borer Grant for ash tree removal (\$75,000) and an update to the City's public tree inventory (\$50,000). In March of 2023, a Request for Proposal was issued to solicit proposals for a vendor to conduct a tree inventory for the City. Two proposals were received. The lowest cost and highest scoring proposal was submitted by Davey Resource Group for \$58,940. Review of the proposal and a clarifying interview has shown that the proposal meets the City's

31 requirements and a draft agreement has been reached (attachment A).

32 Work on the survey would be planned to commence soon after authorization and would likely take ten

33 to twelve weeks to complete.

34 As the EAB program concludes over the next couple of years, the data will be updated in real-time to

35 ensure an up-to-date data set at the conclusion of the Accelerated EAB Program.

36 **POLICY OBJECTIVE**

37 To strategically manage Roseville’s urban forest and utilize grant funding to maximize the impact or

38 City dollars.

39 **BUDGET IMPLICATIONS**

40 The total cost of the tree survey is up to \$58,940. \$50,000 would be paid for using an MN DNR

41 Preparing for Emerald Ash Borer Grant, the remaining \$8,940 would be paid for using funds budgeted

42 for forestry in the 2023 Park Improvement Program.

43 **RACIAL EQUITY IMPACT SUMMARY**

44 Research shows that nationwide many neighborhoods of color have significantly less tree cover than

45 more white neighborhoods. Met Council data shows that these trends occur on a regional level as

46 well.

47 An updated public tree inventory would provide the City with a greater opportunity to understand if

48 this problem exists within Roseville by overlaying the up-to-date tree data with demographic tools

49 that the City now has such as MySidewalk and GIS, and to develop a long-term strategy to address

50 any forestry disparities that are identified.

51 Roseville’s ongoing commitment to its public urban forest, including the Accelerated Emerald Ash

52 Borer program, reflects the city’s commitment to ensuring that all residents, regardless of race or

53 economic means, experience the benefits of a robust urban forest including climate resilience, health

54 benefits, emotional benefits and more.

55 **STAFF RECOMMENDATION**

56 Authorize the Mayor and City Manager to execute agreement with Davey Resource Group to conduct

57 a tree survey as outlined above (attachment A).

58 **REQUESTED COUNCIL ACTION**

59 Authorize the Mayor and City Manager to execute agreement with Davey Resource Group to conduct

60 a tree survey as outlined above (attachment A).

61

Prepared by: Matthew Johnson, Parks and Recreation Director
Jim Taylor, Parks Superintendent

Attachments: A: Professional Services Agreement Between the City of Roseville and Davey Resource Group, Inc
(Including Proposal)

CITY OF ROSEVILLE PROFESSIONAL SERVICES AGREEMENT

This Professional Services Agreement (“Agreement”) is made on the 20 day of June, 2023, between the City of Roseville, a Minnesota municipal corporation (the “City”), and Davey Resource Group, Inc., a Delaware corporation (the “Contractor”, each a “Party” and together the “Parties”).

1. Scope of Work. The Contractor agrees to provide the professional services described in **Exhibit A** (“Work”) which is attached to this Agreement and incorporated by this reference. All Work provided by Contractor under this Agreement shall be provided in a manner consistent with the level of care and skill ordinarily exercised by professional consultants currently providing similar services.

2. Term and Termination. The term of this Agreement will commence upon execution. Unless extended by written agreement of the Parties, this Agreement will terminate no later than December 31, 2023, or upon completion of the Work, whichever occurs first. This Agreement may be terminated earlier by either Party with or without cause, by delivering, a written notice at least thirty (30) days prior to the date of such termination to the other Party. The date of termination shall be stated in the notice. Upon termination the Contractor shall be paid for services rendered and eligible reimbursable expenses incurred by the Contractor through and until the date of termination. If the City terminates this Agreement for cause, the notice shall so-state, and no further payment shall be due to the Contractor following the delivery of the termination notice.

3. Compensation for Work. The City agrees to compensate Contractor the in accordance with **Exhibit B** attached hereto for the Work. Any changes in the Work which may result in an increase to the compensation due the Contractor shall require prior written approval of the City.

4. Method of Payment. Following the conclusion of each calendar month, Contractor must submit an itemized invoice detailing the number of units completed and actual expenses incurred for Work performed under this Agreement during the previous month. Invoices submitted shall be paid in the same manner as other claims made to the City. Invoices shall contain the following:

- a. For compensation based on the number of units completed. For reimbursable expenses an itemized listing including, as applicable, receipts for such expenses.
- b. Upon request of the City, Contractor must also provide the City’s project number, a progress summary showing the original (or amended) amount of the Agreement, the current billing, past payments, the unexpended balance due under the Agreement.
- c. A statement dated and signed by the Contractor: “I declare under penalty of perjury that this account, claim, or demand is just and correct and that no part of it has been paid.”

5. Representatives and Notices: The below-named individuals will act as the representatives of the Parties with respect to the work to be performed under this Agreement. Any termination

notice issued under this Agreement shall be either hand delivered or sent by U.S. Mail to the below-named individuals:

To City:

City of Roseville
2660 Civic Center Drive
Roseville, MN 55113
Attn: [NAME, TITLE]

To Contractor:

Attn: _____

6. Assignment or Subcontracting. The Contractor shall not assign or enter into subcontracts for services provided under this Agreement without the written consent of the City. If subcontracts are approved and entered into, the Contractor shall promptly pay any subcontractor involved in the performance of this Agreement as required by, and the Contractor shall otherwise comply with, the State Prompt Payment Act.

7. Independent Contractor. All Work provided pursuant to this Agreement shall be provided by Contractor as an independent contractor and not as an employee of the City for any purpose. Any and all officers, employees, subcontractors, and agents of Contractor, or any other person engaged by Contractor in the performance of the Work pursuant to this Agreement, shall not be considered employees of the City. Contractor, its employees, subcontractors, or agents shall not be entitled to any of the rights, privileges, or benefits of the City's employees, except as otherwise stated herein.

8. Annual Review. Following the anniversary date of each year of this Agreement, the City shall have the right to conduct a review of the performance of the Work performed by the Contractor under this Agreement. The Contractor agrees to cooperate in such review and to provide such information as the City may reasonably request. Following each performance review the Parties shall, if requested by the City, meet and discuss the performance of the Contractor relative to the remaining Work to be performed by the Contractor under this Agreement.

9. Compliance with Laws and Regulations. The Contractor shall comply with all federal, state and local laws, statutes, ordinances, rules and regulations in the performance of the Work.

10. Non-Discrimination. During the performance of this Agreement, the Contractor shall not discriminate against any person, contractor, vendor, employee or applicant for employment because of race, color, creed, religion, national origin, sex, marital status, status with regard to public assistance, disability, sexual orientation or age. The Contractor shall post in places available to employees and applicants for employment, notices setting forth the provisions of this non-discrimination clause and stating that all qualified applicants will receive consideration for employment. The Contractor shall incorporate the foregoing requirements in all of its subcontracts for Work done under this Agreement and will require all of its subcontractors performing such Work to incorporate such requirements in all subcontracts for the performance of the Work. The Contractor further agrees to comply with all aspects of the Minnesota Human Rights Act, Minnesota Statutes 363.01, et. seq., Title VI of the Civil Rights Act of 1964, and the Americans with Disabilities Act.

11. Data Practices Act Compliance. Contractor acknowledges that all data provided, produced, or obtained under this Agreement shall be protected, maintained, and administered in accordance with the Minnesota Government Data Practices Act, Minnesota Statutes Chapter 13 (the “Act”), and that with regard to such data Contractor must comply with the Act as if it were a government entity. Contractor will immediately report to the City any requests from third Parties for information relating to this Agreement.

12. Audit Disclosure. Under Minn. Stat. § 16C.05, subd. 5, Contractor’s books, records, documents, and accounting procedures and practices relevant to this Agreement, including books and records of any approved subcontractors, are subject to examination by the City and/or the State Auditor or Legislative Auditor, as appropriate, for a minimum of six years after the termination of this Agreement.

13. Indemnification. For claims occurring for a period of one year following the completion of Work, the Contractor agrees to defend, indemnify and hold the City, and its mayor, councilmembers, officers, agents, employees, and representatives harmless from and against all liability, claims, damages, costs, judgments, losses and expenses, including but not limited to reasonable attorney’s fees, to the extent caused by any negligent or wrongful act or omission of the Contractor, its officers, agents, employees, contractors and/or subcontractors, during the performance or failure to perform the Work. Nothing herein shall be construed as a limitation on or waiver of any immunities or limitations on liability available to the City under Minnesota Statutes, Chapter 466, or other law. Notwithstanding anything to the contrary in this Agreement, Contractor’s indemnity, defense, and hold harmless obligations will not extend to any claim or liability that be caused by the negligence or willful misconduct of the indemnified party or other third party not controlled by Contractor.

14. Insurance. Prior to starting the Work and during the full term of this Agreement, the Contractor shall procure and maintain insurance, at Contractor's expense, as follows:

- a. Workers Compensation insurance in accordance with Minnesota law;
- b. Professional Liability Insurance covering any damages caused by an error, omission or any negligent act;
- c. [automobile insurance for owned, hired and non-owned vehicles];
- d. Coverage shall be sufficiently broad to cover to all duties and obligations undertaken by Contractor in this Agreement including duties related to indemnification;
- e. Insurance must be on an “occurrence” basis, and, other than Workers Compensation, the limits of such policies must be \$1,000,000 per occurrence and \$1,500,000 aggregate.

- f. Policies must be held by insurance companies licensed to do business in the state in Minnesota and having a current A.M. Best rating of no less than A-, unless otherwise agreed to by the City in writing.
- g. Contractor must provide a copy of: (i) a certification of insurance satisfactory to the City, and (ii) if requested, the Contractor's endorsements, as applicable, which evidences the compliance with this Paragraph, must be filed with the City prior to the start of Contractor's Work. Such documents evidencing insurance shall be in a form acceptable to the City and shall provide satisfactory evidence that the Contractor has complied with all insurance requirements.

15. Ownership of Documents. All plans, diagrams, analysis, reports and information generated in connection with the performance of this Agreement (the "Information") shall become the property of the City, but the Contractor may retain copies of such documents as records of the services provided. The City may use the Information for any reasons it deems appropriate without being liable to the Contractor for such use. The Contractor shall not use or disclose the Information for purposes other than performing the Work contemplated by this Agreement without the prior consent of the City.

16. Conflicts. No salaried officer or employee of the City and no member of the City Council of the City shall have a financial interest, direct or indirect, in this Agreement. The violation of this provision shall render this Agreement void.

17. Waiver. Any waiver by either Party of a breach of any provisions of this Agreement shall not affect, in any respect, the validity of the remainder of this Agreement or either Parties' ability to enforce a subsequent breach.

18. Governing Law. This Agreement shall be controlled by the laws of the State of Minnesota. Any disputes, controversies, or claims arising under this Agreement shall be heard in the state or federal courts of Minnesota and the Parties waive any objections to jurisdiction.

19. Counterparts. This Agreement may be executed in multiple counterparts, each of which shall be considered an original.

20. Severability. The provisions of this Agreement are severable. If any portion hereof is, for any reason, held by a court of competent jurisdiction to be contrary to law, such decision shall not affect the remaining provisions of this Agreement.

21. Entire Agreement. Unless stated otherwise in this, the entire agreement of the Parties is contained in this Agreement. This Agreement supersedes all prior oral agreements and negotiations between the Parties relating to the subject matter hereof as well as any previous agreements presently in effect between the Parties relating to the subject matter hereof. Any alterations, amendments, deletions, or waivers of the provisions of this Agreement shall be valid only when expressed in writing and duly signed by the Parties, unless otherwise provided herein.

22. Force Majeure. Notwithstanding anything to the contrary in this Agreement, Contractor shall not be liable or responsible to the City, nor be deemed to have defaulted under or breached this Agreement, for any failure or delay in fulfilling or performing any term of this Agreement, if Contractor's failure or delay is caused by or results from any of the following events: acts of God, flood, fire, earthquake, hurricane, epidemic, explosion, war, invasion, hostilities, terrorist threats or acts, riot, government order or law, embargoes, blockades, or other similar events beyond the reasonable control of Contractor.

IN WITNESS WHEREOF, the undersigned Parties have entered into this Agreement as of the date set forth above.

CITY OF ROSEVILLE

DAVEY RESOURCE GROUP,
INC.

By: _____
Mayor

By: _____
Its: _____

By: _____
City Manager

By: _____
Its: _____

EXHIBIT A

WORK

The Contractor shall perform work as outlined in Exhibit C, City of Roseville-Street, Park and Public Property Tree Assessment Services Proposal.

EXHIBIT B
COMPENSATION

** Must include list of reimbursable expenses or statement that no expenses are eligible for reimbursement.

- The City of Roseville will compensate Contractor a per unit cost of \$3.90 per tree and \$3.90 per site.
- The total cost may not exceed the proposal fee of \$58,940 without prior written authorization from the City.
- This agreement does not include any reimbursable expenses.

EXHIBIT C

PROPOSAL

City of Roseville-Street, Park, and Public Property Street Tree Assessment Services Proposal:
April 7, 2023



City of Roseville-Street, Park, and Public Property Tree Assessment Services

Prepared For:

City of Roseville

2660 Civic Center Drive
Roseville MN 55113

Prepared By:

Gail Nozal

Area Manager
Davey Resource Group, Inc.
1196 7th Street East
Saint Paul, MN 55106
Cell: 651-442-7153
E-mail: gail.nozal@davey.com

April 7, 2023

Street, Park, and Public Property Tree Assessment Services



Introduction

Trees are part of everyday life in the City of Roseville. The City's urban forest creates a sense of place and supplies real benefits to those who live in Roseville. Trees along streets, in parks, around playgrounds, and in backyards provide shade and beauty and enhance the quality of life in Roseville 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 29 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 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 and present our qualifications for providing tree inventory 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 Roseville's project on time and budget while exceeding the city's expectations.

We understand that the information in a tree inventory database and helps 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
- Follow public record or Roseville's statutes and laws

Natural Resource Management

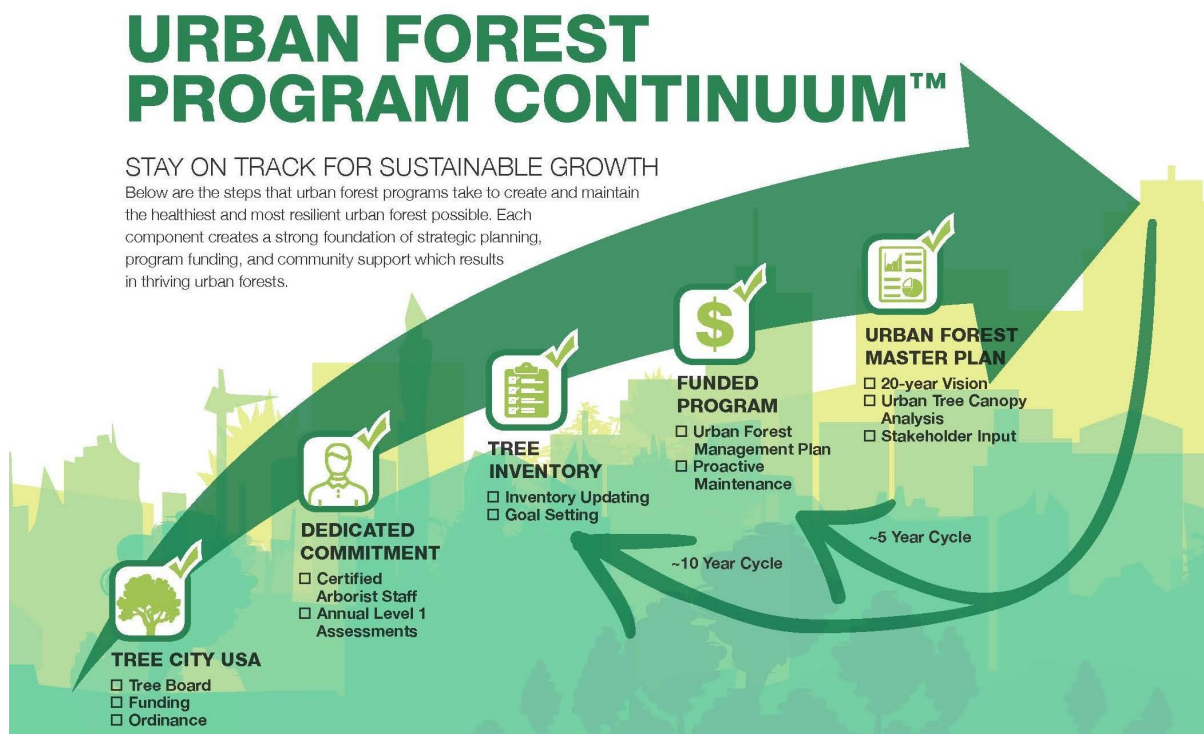
DRG's Environmental Consulting team is your committed partner for natural resource planning and management. With 22 local offices and a national footprint, we offer a wide and growing variety of consulting services (in addition to urban forestry) including wetlands and stream studies, environmental design 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 the City of Roseville 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 City of Roseville 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 Roseville 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 the City of Roseville 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 Roseville's comprehensive tree care program. The results of this project will help Roseville 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, planting sites, and stumps found along public rights-of-way (ROW) and in public parks and properties. The inventory consists of DRG's urban foresters locating approximately 15,096 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.

Project Approach

The following sections describe DRG's overall approach, or methodology, for accomplishing the City's scope of work. This section includes a plan of work for the tree inventory. To illustrate the strength and experience of the DRG team, a few representative staff resumes, project examples, and references are 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 (hard hats where required), high-visibility safety vests, safety glasses, and over-the-ankle boots. All employees adhere to company COVID policies as well as local and state guidelines.



Davey has provided Proven Solutions for a Growing World since 1880 and has been employee owned for 43 years.

Tree Inventory Work Plan

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 the City of Roseville via telephone, e-mail, and, as needed, in-person meetings. DRG answers any questions Roseville 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, Roseville'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, planting sites, and stumps along maintained street ROWs and in public parks and properties, evaluate those trees and record the data specified by the City. The collected data, once finalized, are Roseville'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, parks, and properties inventoried and shares that information with the City. DRG also informs the City of Roseville 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 Roseville's inventory, DRG will collect the following data fields specified in the City's Request for Proposal (RFP) as defined in Appendix C of this proposal:

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

The data fields listed above give Roseville ample information to manage their trees, planting sites, and stumps proactively. However, if Roseville 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, planting sites, and stumps, DRG can inventory other infrastructure that the City might be managing, such as 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 Roseville 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 the City'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. Visual inspection does not include aerial or subterranean inspection, testing, or analysis unless stated in the scope of work. DRG is not responsible for the discovery or identification of non-visually observable, latent, dormant, or hidden conditions

or hazards. If desired, DRG can provide additional levels of assessment or analysis for an additional fee that might help identify or further explore specific defects or tree conditions of interest.

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.

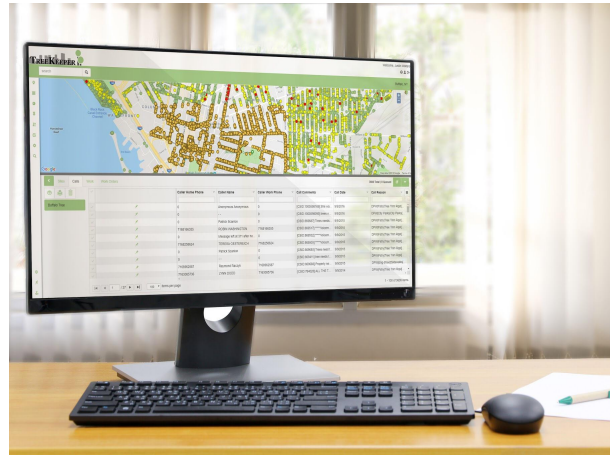
Planting Sites

When examining the state of Roseville's urban forest, it is essential to assess more than just the trees themselves. Species diversity is integral to the sustainability of an urban forest. Understanding your current stocking level and potential ability is crucial to short- and long-term planning. When assessing planting sites, we follow the mantra "Right Tree in the Right Place for the Right Reason". DRG will determine planting sites based on factors such as growing space, overhead utilities, and proximity to signs, lights, intersections, etc. Due to the nature of inventorying available planting sites, DRG recognizes the importance of understanding your goals and objectives for this tree inventory project. Based on your priorities, we recommend considering the following options:

1. **100% Inventory.** DRG will inventory all available planting sites during the tree inventory.
2. **Partial Planting Site Inventory.** DRG will prioritize and limit collection of the planting sites to keep the total number to approximately 25% of the total sites inventoried.
3. **Five-Year Planting Strategy.** Based on the current annual planting levels, DRG will locate five years of potential planting sites. For example, if the City plants 100 trees annually, then DRG will locate approximately 500 available sites. These sites can be a combination of small, medium, or large based on planting goals.
4. **Priority Areas (i.e., Environmental Justice Areas).** DRG will inventory available planting sites in predetermined areas during the tree inventory to facilitate improving canopy cover and diversity goals.

Tree Inventory Data Delivery

Data delivery is available 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.



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.

Project Schedule (weeks)									
Task	1	2	3	4	5	6	7	8	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 14,000 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

Quality Control and Assurance

WE TAKE YOUR DATA SERIOUSLY

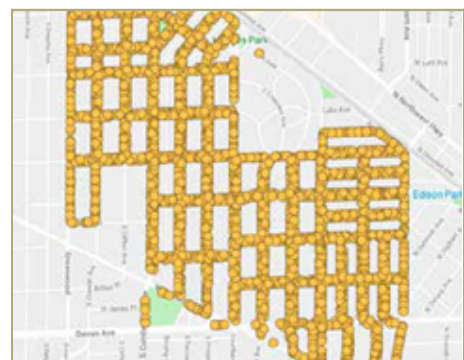
From the project's start to its finish, DRG focuses on the experience the City has working with DRG and the quality of the project's deliverables. To ensure a good working relationship throughout the project, DRG collaborates with the City early on to schedule fieldwork and meetings at mutually agreeable times and determine protocols for addressing questions and concerns that arise during data collection. DRG's staff also stay in contact with the City'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	Overall Non-Critical Error Score	Target Non-Critical Score	Percent Audited
100%	98%	98.7%	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 business development staff review the project's scope 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, Gail Nozal and GIS and IT specialists. Gail Nozal reviews the scope of work again to ensure that the data fields and input codes match Roseville's specifications. Once Gail Nozal approves the data specification, then DRG's GIS and IT staff program the field computers for data collection. Before the kick-off meeting, Gail Nozal 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 Roseville 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 the City to do so as well. DRG regularly updates Roseville 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 Roseville'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 databases.
4. Coordinate and host a kick-off meeting before the start of fieldwork.

5. By accepting this proposal, the City of Roseville accepts DRG's Terms and Conditions and Limited Warranty (listed after the Authorization to Proceed page below) 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 15,096 existing trees, planting sites, and stumps for a cost of: **\$ 3.90 lump sum/per tree**
- ❑ Additional inventory data collection above 15,096 trees/sites at a unit rate of: **\$3.90/site**

Authorization to Proceed

The above prices and terms and conditions and warranty are hereby accepted. I am authorized to bind the City and authorize Davey Resource Group, Inc. to perform the specified work. I am familiar with and agree to the terms and conditions appended to this proposal. I understand that once accepted this proposal constitutes a binding contract. This proposal is based on an estimated number of trees/sites to be inventoried. Davey Resource Group, Inc. reserves the right to renegotiate the price based on the timing of the award, scheduling of fieldwork, the final methodology chosen by the client, and availability, completeness, and quality of maps and GIS information.

City of Roseville-Street, Park, and Public Property Tree Assessment Services

Project Total

\$58,940.00

By signing this form, I do hereby acknowledge acceptance of the scope of work and associated fee, as well as the terms and conditions and limited warranty contained herein. Furthermore, my signature authorizes the work to be performed.

City of Roseville

Client Representative:

Authorizing Signature:

Title:

Date:

Davey Resource Group, Inc.

DRG Project Representative:

Title:

Date:

TERMS AND CONDITIONS

- All pricing is valid for 30 days from the date of this proposal, after which time we reserve the right to amend fees as needed.
- 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

Davey Resource Group, Inc. ("DRG") provides this limited warranty ("Limited Warranty") in connection with the provision of services by DRG (collectively the "Services") under the agreement between the parties, including any bids, orders, contracts, or understandings between the parties (collectively the "Agreement").

Notwithstanding anything to the contrary in the Agreement, this Limited Warranty will apply to all Services rendered by DRG and supersedes all other warranties in the Agreement and all other terms and conditions in the Agreement that conflict with the provisions of this Limited Warranty. Any terms or conditions contained in any other agreement, instrument, or document between the parties, or any document or communication from you, that in any way modifies the provisions in this Limited Warranty, will not modify this Limited Warranty nor be binding on the parties unless such terms and conditions are approved in a writing signed by both parties that specifically references this Limited Warranty.

Subject to the terms and conditions set forth in this Limited Warranty, for a period of ninety (90) days from the date Services are performed (the "Warranty Period"), DRG warrants to Customer that the Services will be performed in a timely, professional and workmanlike manner by qualified personnel.

To the extent the Services involve the evaluation or documentation ("Observational Data") of trees, tree inventories, natural areas, wetlands and other water features, animal or plant species, or other subjects (collectively, "Subjects"), the Observational Data will pertain only to the specific point in time it is collected (the "Time of Collection"). DRG will not be responsible nor in any way liable for (a) any conditions not discoverable using the agreed upon means and methods used to perform the Services, (b) updating any Observational Data, (c) any changes in the Subjects after the Time of Collection (including, but not limited to, decay or damage by the elements, persons or implements; insect infestation; deterioration; or acts of God or nature [collectively, "Changes"]), (d) performing services that are in addition to or different from the originally agreed upon Services in response to Changes, or (e) any actions or inactions of you or any third party in connection with or in response to the Observational Data. If a visual inspection is utilized, visual inspection does not include aerial or subterranean inspection, testing, or analysis unless stated in the scope of work. When performing tree inventories or assessments, DRG 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 Subjects 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.

To the extent you request DRG's guidance on your permitting and license requirements, DRG's guidance represents its recommendations based on its understanding of and experience in the industry and does not guarantee your compliance with any particular federal, state or local law, code or regulation.

DRG may review information provided by or on behalf of you, including, without limitation, paper and digital GIS databases, maps, and other information publicly available or other third-party records or conducted interviews (collectively, "Source Information"). DRG assumes the genuineness of all Source Information. DRG disclaims any liability for errors, omissions, or inaccuracies resulting from or contained in any Source Information.

If it is determined that DRG has breached this Limited Warranty, DRG will, in its reasonable discretion, either: (i) re-perform the defective part of the Services or (ii) credit or refund the fees paid for the defective part of the Services. **This remedy will be your sole and exclusive remedy and DRG's entire liability for any breach of this Limited Warranty.** You will be deemed to have accepted all of the Services if written notice of an alleged breach of this Limited Warranty is not delivered to DRG prior to the expiration of the Warranty Period.

To the greatest extent permitted by law, except for this Limited Warranty, DRG makes no warranty whatsoever, including, without limitation, any warranty of merchantability or fitness for a particular purpose, whether express or implied, by law, course of dealing, course of performance, usage of trade or otherwise.

Appendix A: Experienced Staff

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

Based in Minneapolis/St. Paul, Minnesota, **Gail Nozal** is one of the Area Managers for DRG. Gail has over 27 years of industry experience, and has been with Davey for over 15 years—beginning with S&S Tree, a Davey Company, and joining DRG in 2019. She has worked in municipal, non-profit, and commercial sectors.

With her wealth of industry knowledge, Gail brings specific expertise in contract forestry projects, oak wilt management, general management and operations, and public education. As area manager with DRG, Gail is primarily responsible for business development, operational management, and staff supervision of a Minnesota-based team focused on Urban Forestry and Ecological Consulting. Gail's experience includes completing urban forest inventories, management plans, contract forestry, plant health care diagnosis, oak wilt management, tree preservation, operations and ordinance review. Additionally, she is skilled in using various technologies to improve efficiency for urban forestry projects, and participates in public education opportunities. She also completes tree risk assessments and i-Tree tree inventories.

Gail has a master's degree in forestry with emphasis in education and a bachelor's degree in urban forestry, both from the University of Minnesota. She is a Board Certified Master Arborist and Municipal Specialist (#MN-0276BM) through the International Society of Arboriculture (ISA) and has an ISA Tree Risk Assessment Qualification. She is also a Certified Minnesota Pesticide Applicator (#MN20163825). Gail is a Minnesota Tree Inspector, Minnesota Certified Landscape Specialist, and Minnesota Pest Detector.

Jack Spadafore is an environmental technician with DRG. He specializes in stormwater mitigation and forestry inventory and has over six years of industry experience with forest inventory, tree pruning, aerial lift operation, and plant healthcare coordination. He is particularly skilled in tree pruning, and planting and chemical treatment for diseases and invasive insects.

Jack has experience working with private landowners and cities on tree inventories, such as a park tree inventory for the City of Inner Grove Heights, Minnesota. He also assisted with the Superior National Forest project, which included spraying invasive and noxious weeds.

Jack has a bachelor of science degree in forest management from the University of Wisconsin-Stevens Point. He is a Certified Arborist and Municipal Specialist (#MN-4765A) through the International Society of Arboriculture (ISA) and a Certified Minnesota Pesticide Applicator (#20177428) through the Minnesota Department of Agriculture.

Kyle Schansberg joined DRG in 2022 as an inventory arborist in the Minnesota-St. Paul office. Bringing over four years of passion and relevant experience, Kyle conducts urban tree inventories, performs tree climbing, operates aerial-lift bucket trucks, operates small equipment, completes tree planting and maintenance, and implements integrated pest management techniques to combat common diseases and increase the health of trees.

Kyle previously worked for The Davey Tree Expert Company's Residential/Commercial (R/C) office out of South St. Paul as a climbing arborist and plant health care technician for about three years, gaining valuable experience in tree and shrub assessments, pruning, removal, and disease and pest mitigation.

Prior to joining Davey, Kyle worked for the cities of Minnetonka and Apple Valley as a certified tree inspector, where he developed a passion for combating diseases and pests to preserve urban forests and create a diverse landscape for future generations.

Kyle has a bachelor of science degree in forest science with a certificate in environmental studies for University of Wisconsin-Madison. He is a Certified Arborist (#MN-4758A) through the International Society of Arboriculture (ISA), a Certified Pesticide Applicator in Minnesota (#20204207) and Wisconsin (#507559), and has a Class A Commercial Driver's License. Kyle is also a member of the International Society of Arboriculture and Forest Stewards Guild professional organizations.

Holly Knox, GISP, M.S., is a senior geospatial analyst with DRG, applying GIS technology to environmental analysis. Holly currently plays a key role in coordinating municipal inventory projects. She is responsible for coordinating the setup, testing, and programming of custom input forms for our field inventory projects utilizing our mobile mapping 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. Holly is also the lead for the creation of field maps and final cartographic products for our Environmental Consulting services.

Holly joined DRG in 2008. Since 2009, Holly 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. Holly also has experience and knowledge with AutoCAD®, as well as the utilization and support of mobile mapping hardware and global positioning systems (GPS).

In addition to her role with DRG, Holly is a volunteer at the Portage County Park District, providing GIS support.

Holly 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.

Appendix B: Related Projects and References

City of Buffalo, MN Tree Inventory and Management Plan

BUFFALO, MN

Davey Resource Group, Inc. (DRG) was contracted by the City of Buffalo, MN to conduct a tree inventory and management plan as part of the city's comprehensive tree care program. The results of this project will help Buffalo 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:

Tree Inventory. The project is a GIS-based inventory of maintained trees found along public rights-of-way (ROW) and in public parks and properties. The inventory consists of DRG's urban foresters locating approximately 4,892 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.

Tree Management Software. 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.

Tree Management Plan. DRG uses Buffalo's inventory data and industry standards and best management practices to develop a tree inventory management plan with a section focused on Emerald Ash Borer upon completion of the inventory.

The City of Buffalo has a long-standing relationship with DRG and the Davey Tree Expert Company. The city will continue to use the data from the inventory and management plan to perform pruning, removals, and planting according to the plan's schedule.



Project Completion: 2022

Project Owner: City of Buffalo, MN

Reference: Adam Farrell, Parks Supervisor | adam.farrell@ci.buffalo.mn.us

City of Aitkin, MN Tree Inventory and Management Plan

AITKIN, MN

Davey Resource Group, Inc. (DRG) was contracted by the City of Aitkin, MN to conduct a tree inventory and management plan as part of Aitkin's comprehensive tree care program. The results of this project will help Aitkin 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:

Tree Inventory. The project is a GIS-based inventory of maintained trees, found along public rights-of-way and in public parks and properties. The inventory consists of DRG's urban foresters locating each tree and recording the specified information about each tree in the inventory database. DRG bases our tree inventory on the ANSI A300 Part 9 standards.

Tree Management Plan. DRG uses Aitkin's inventory data and industry standards and best management practices to develop a management plan upon completion of the inventory.

Additionally, the biggest challenge for this project was the lack of clear aerial imagery for the Rover software. The DRG arborist exceeded client expectations by cross-referencing Google Maps with the aerial imagery to make sure the data was as accurate as possible.



Photo credit: News Age—Aitkin

Project Completion: 2022

Project Owner: City of Aitkin, MN

Reference: Mike Skrbich, City Administrator
| cityadmin@ci.aitkin.mn.us

Inventory Update and Management Plan

SUPERIOR, WISCONSIN

The City of Superior hired Davey Resource Group (DRG) to complete a tree inventory update and management plan for future program growth. The project is a GIS-based inventory update of maintained trees found along public rights-of-way (ROW) and in public parks and properties. The City of Superior had an existing inventory and is a TreeKeeper® user.

Since the City was already using TreeKeeper®, it presented some challenges when trying to combine with their existing data fields with new data. The TreeKeeper® team at DRG successfully solved these hiccups to deliver a full update of inventory data in TreeKeeper® format, consisting of 26,488 trees and recorded specific information about each site in the inventory database. The updated data points included information on tree species, address, condition, DBH, hardscape damage, overhead utilities, primary defects, maintenance suggestions, and risk assessments of each site.

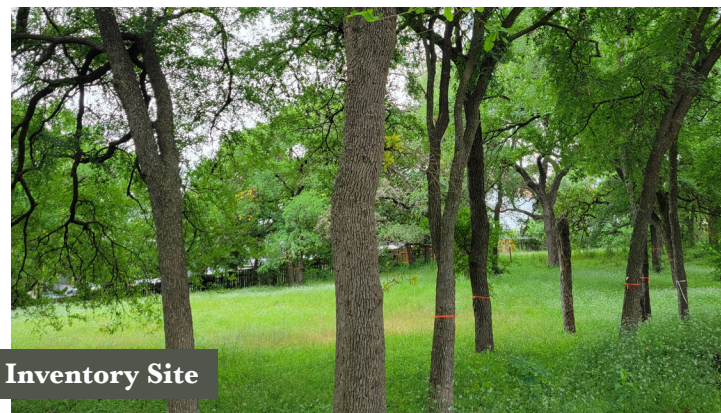
Snow, ice, and cold presented a challenge for this inventory in early 2022. DRG staff worked hard to complete the project within the timeline, however due to this weather and DRG's dedication to safety, the project schedule exceeded the planned timeline.



Inventory Site



Inventory Site



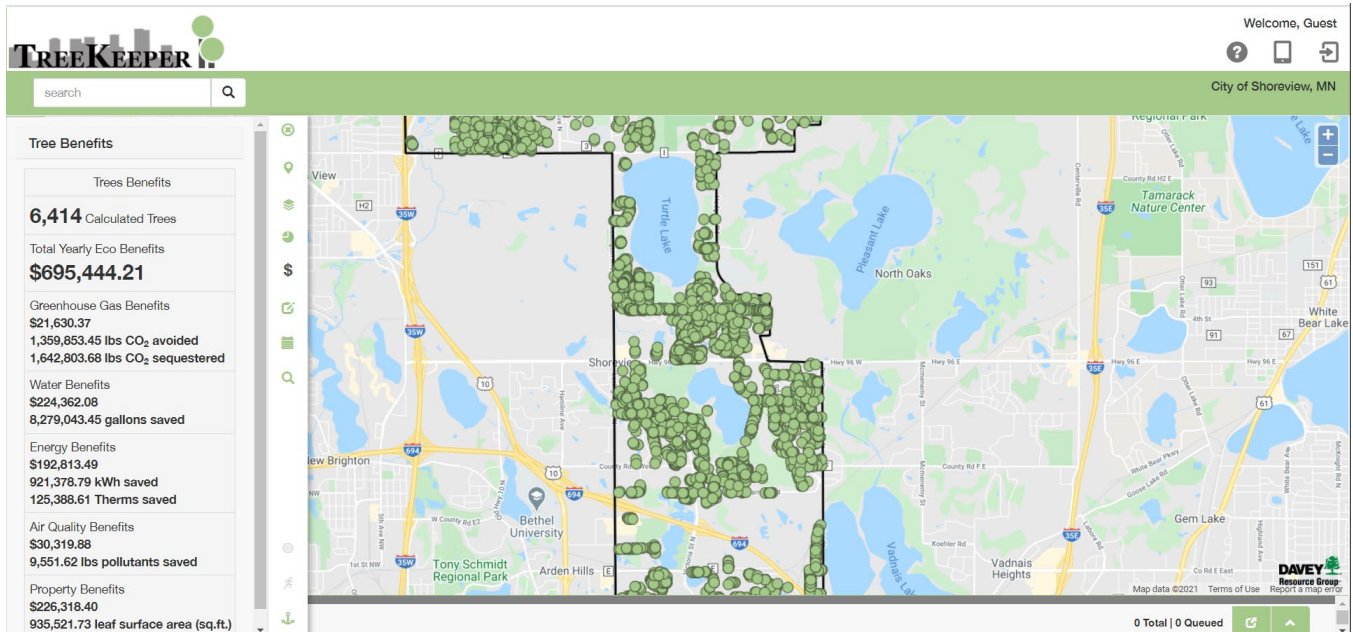
Inventory Site

Project Completion: 2022

Project Owner: City of Superior, WI

**Reference: Linda Cadotte, Director
of Parks, Recreation, and Forestry
Department**

cadottel@ci.superior.wi.us



Street and Park Tree Inventory

Shoreview, MN

The City of Shoreview contracted DRG to complete an inventory of street and park trees in 2019. We completed the inventory in December of 2019, and established the inventory data in the city's TreeKeeper database. The client utilizes the inventory data for daily management of their urban forest.

The need for this inventory was the culmination of multiple separate efforts. First, in 2011, the City discovered Emerald Ash Borer (EAB) in one of their parks and started to inventory their park trees on a rolling basis with summer interns. Second, in 2019, the city decided that they needed a complete inventory of their boulevard and park trees.

The city desired to combine these inventories, but they did not have a software that could successfully combine the inventory data as well as general maintenance logs for city-owned trees, such as EAB-related work such as tree removals and ash injections. We proposed using Davey's TreeKeeper Inventory software to store and access the inventory data and to help them manage the trees. The city's Parks and Natural Resources departments hope to both use it to manage their tree resource.

Following the inventory, we also supplied the client with a summary report that they could share with the city council that quantified economic and environmental benefits of the trees in their city.



Project Details:

Project Completion: 2020

Project Owner: Shoreview, Minnesota

Reference: Ellen Brenna, Natural Resources Coordinator
651-490-4665, ebrenna@shoreviewmn.gov

Appendix C: Inventory Data Fields

1. **Address/Location**—DRG identifies the location of each tree, planting site, 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.
 - e. *Park Name*. The name of the park.
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. **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.
5. **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*. Roseville may opt to prune or manage the trees for health or aesthetic appearance.
 - e. *Palm Prune*. Removal of fronds, fruit, or loose petioles when palm parts create a dangerous condition.
 - f. *Stump Removal*. A stump is present and recommended to be removed.
 - g. *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.
6. **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).
7. **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.

1. *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.
2. *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.
3. *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; Roseville must determine the level of acceptable risk.

8. **Risk Assessment Complete**—Staff record if they are not able to complete the assessment due to obstructions, safety concerns, or other unforeseen site conditions.
9. **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.
10. **Date of Inventory**—The date the DRG urban forester collected the data.
11. **Multi-Stem Tree**—DRG notes if a tree has multiple stems on trunks splitting less than 1 foot above ground level.
12. **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.