SUNY Canton

Study of French Hall Sidewalks, Stairs, and Plazas, and Campus Trees Along Cornell Drive

SUCF Project Number: 231029001

Spring 2019

The LA GROUP
Landscape Architecture & Engineering P.C.
People. Purpose. Place.

Table of Contents

Overview

Introduction

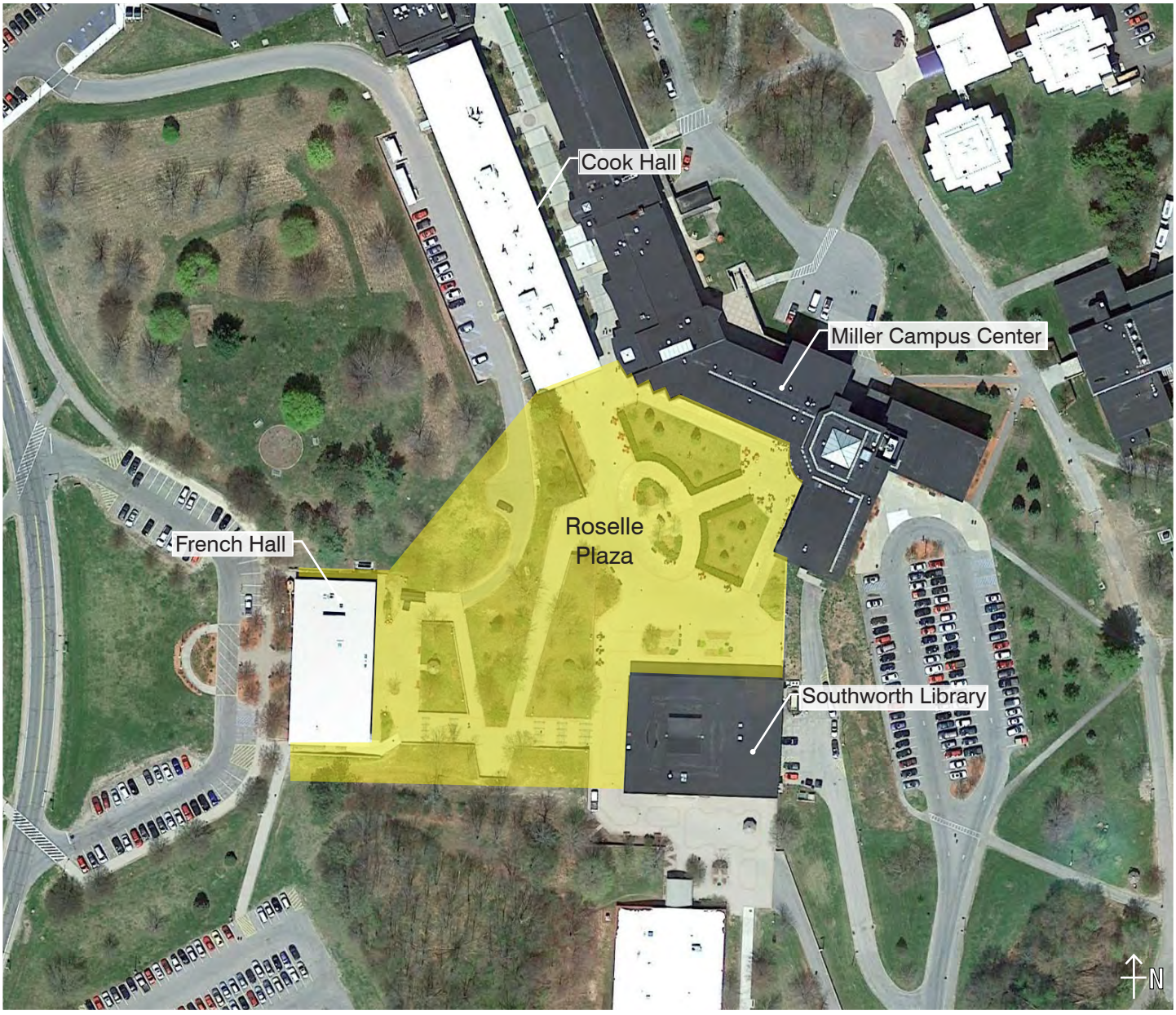
The State University of New York Technology at Canton campus was relocated to its current location in the 1960's. SUNY Canton is located adjacent to the Grasse River and within walking distance to downtown Canton. The campus is on a sloped site with academic buildings at the highest point, followed by residences halls that sit above the Grasse River to the east. Upon arriving to the campus, visitors drive up the tree lined Cornell Drive and into the core of the campus. The campus landscape consists of a large centrally located plaza, manicured lawns, scattered woodlands and colorful accent planting around buildings and select pedestrian areas, all of which add value to the campus aesthetic. Along the left fork of Cornell Drive is French Hall, home of Admissions. A major pedestrian route leads visitors by French Hall down a slope to Roselle Plaza, the main gathering space on campus.

Cornell Drive

A study evaluating the condition of the Norway Maple trees along Cornell Drive was completed by the SUNY College of Environmental Science and Forestry (SUNY ESF) Department of Landscape Architecture in 1985. The study determined that 45% of the trees suffered damage due to frost cracking. While some trees were able to heal themselves, 30% were found to have wounds that did not heal and have caused internal decay. It was also noted that the life span of the trees would be 50 to 70 years instead of the normal life span of 100 years. Over the last few years, SUNY Canton has lost about 5 trees a year, confirming the accuracy of this study and demonstrating that the campus is in jeopardy of losing this impressive arrival experience.

Roselle Plaza

The same 1985 study conducted by SUNY ESF, also looked at the hardscape in the Plaza space between French Hall, Miller Campus Center, Southworth Library and Cook Hall. For the purpose of this project, this space is referred to as Roselle Plaza. The study noted concerns about failing walking surfaces, as well as maintaining the planting on and around the plaza. The plaza was renovated in 1997, but now, 21 years later, is deteriorating and requiring updating. Since the 1997 project, additional concerns have been identified including accessibility from the French Hall Parking Lot to Roselle Plaza, the condition and amount of retaining walls along the route, and reducing overall maintenance.



Purpose & Goals

Cornell Drive

The purpose of this project is to study, inventory, assess, and create a sustainable plan to replace and/or supplement the existing trees along Cornell Drive.

Roselle Plaza

The purpose was to assess the existing conditions of the hardscape and landscape within the plaza. This will inform the development of concept plans for the redesign of the plaza including exploring accessible routes from the parking lots west and south of French Hall to Roselle Plaza. The concept plans will include recommendations that can be extended to other projects on campus as recommended by the Facilities Master Plan.

Inventory & Analysis

Cornell Drive Summary

In September 2018, the Bartlett Inventory Solutions (BIS) Team from Bartlett Tree Experts conducted an inventory of selected trees along Cornell Drive on the SUNY Canton campus. We identified 212 trees which included 23 species. The attributes that we collected include tree latitude and longitude, size, age and condition class, and a visual assessment of tree structure, health, and vigor.

We conducted the attribute collection using a sub-meter accuracy Global Positioning Satellite Receiver (GPSr) device with an error-in-location potential of not greater than three meters. Our pruning recommendations for the subject trees over the next 3-year period are outlined below. All tree work activities will comply with current American National Standards Institute (ANSI) Z133.1 requirements for safety.

Tree Risk Assessments and Mitigation

Perform the recommended tree risk mitigation activities for the 2 trees (1%) which we found defects or concerns that prompted the need to use the International Society of Arboriculture's (ISA) risk matrices in the field. Risk mitigation activities will comply with current ANSI A300 standard practices. Please see the Tree Risk Assessments, Limitations & Glossary section for more information.

Soil Sampling

Taking soil samples throughout planting beds and actively managed areas. Soil analysis provides information on the presence of soil nutrients, pH, organic matter, and cation exchange capacity.

Bulk Density Sampling

Taking bulk density samples throughout planting beds and actively managed areas to determine the amount of soil compaction.

Soil Rx®

Apply Bartlett's Soil Rx® program to 37 trees (17%) to correct nutrient deficiencies and optimize soil conditions for the designated trees.

Root Invigoration™

Perform Bartlett's patented Root Invigoration™ on 3 trees (1%) to improve aeration and promote more efficient root growth, especially for high-value trees in disturbed areas.

Mulching

Wherever possible, apply 2-4 inches of mulch within the root zone to help moderate soil temperatures, reduce soil moisture loss, reduce soil compaction, provide nutrients, improve
soil structure, and keep mowers and string trimmers away from tree trunks. The best mulch
materials are wood chips, bark nuggets, composted leaves, or pine needles. To avoid potential disease problems, mulch should not be placed directly against the trunk.

Root Collar Excavations

Perform root collar excavations to 19 trees (9%) to lower risk of damaging conditions such as girdling roots, basal cankers, masking of root decay and lower-stem decay, and predisposing trees to various insect and disease pests.

Plant Health Care (PHC)

Implement Bartlett's PHC program to monitor pests and diseases on the subject trees. Treatments are therapeutic and preventive, and treatment timing is based on pest life cycle.

Pruning

Prune 63 trees (30%) for safety, health, structure, and appearance. Pruning will comply with current ANSI A300 standard practices for pruning.

Structural Support

There are structural support system recommendations for 10 trees (5%) to reduce risk of branch or whole tree failure. All structural support systems will comply with current ANSI A300 standard practices for supplemental support systems.

Lightning Protection

At the time of inventory, no trees were recommended for lightning protection systems. However, as trees continue to grow and site changes occur, we recommend continual consultation with your local Bartlett Arborist Representative to determine if lightning protection systems are warranted in the future.

Removals

Remove 38 trees (18%) due to condition or because of their location in relation to other trees to try and prevent competition or damage to infrastructure. Trees are listed on a scale of 1-5 for the order that they should be removed due to their condition or severity of defects.

Tree Risk *Advanced Assessments (Level 3)*

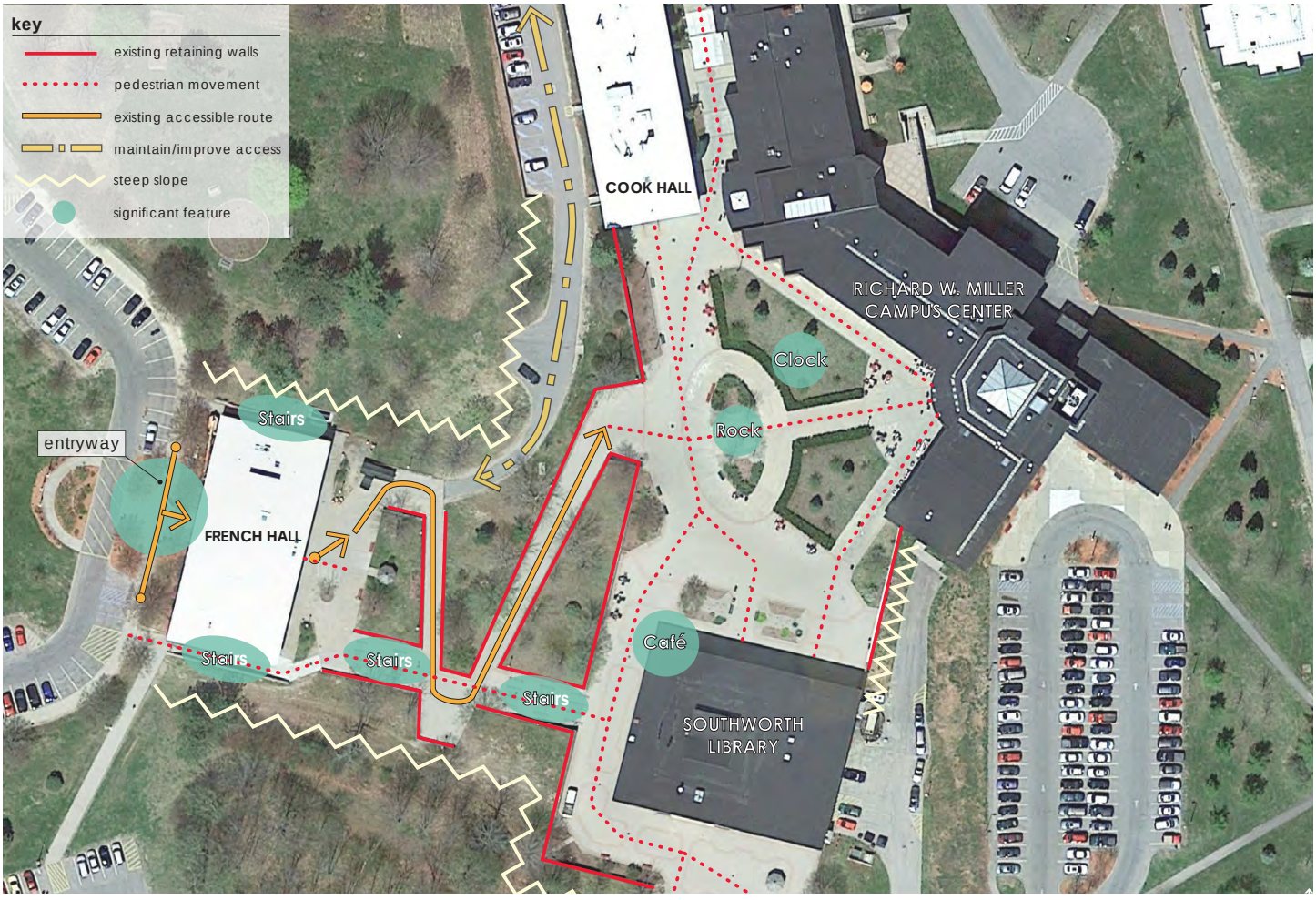
At the time of inventory, no trees were recommended for *advanced assessments* to evaluate the impact of wood decay in stems or buttress roots. However, as trees continue to grow and site changes occur, we recommend continual consultation with your local Bartlett Arborist Representative to determine if *advanced assessments* are warranted in the future.

*See Appendix for the entire BIS SUNY Canton Tree Inventory and Management Plan Report

Roselle Plaza

This significant space is roughly 2.3 acres in size and is defined by two distinct areas. The first space is located between French Hall and the Southworth Library. This area is characterized by the significant grade change, mature tree plantings and large stair and walk system. From the front of French Hall to the back, there is a ten foot grade change. Concrete stairs with failing metal railings are provided on both sides of French Hall allowing access to the lower level. However, the current configuration doesn't provide an exterior accessible route to the lower level. The lower level of French Hall serves as the starting point for perspective student tours and for many of them this is their first view into the campus. Unfortunately, the view from this location is limited due to the site walls and mature tree plantings. From the lower level of French Hall there is another large, thirteen foot, grade change to the Southworth Library. A walk system lined with large retaining walls zig zags through the landscape and provides pedestrian access from French Hall to the lower plaza, while granite stairs lined with retaining walls allow direct access from French Hall to the library.

The second area is a large open plaza space that sits at the crossroads of the academic buildings on campus. The majority of the space is comprised of paved (pavers and concrete) surfaces with multiple plant beds and seating opportunities scattered around the plaza. It is also home to the SUNY Canton clock and the Knowledge Rock, which was placed in the plaza during the 1997 renovation and holds significance to the campus. Pedestrian circulation patterns are influenced by the arrangement and location of building entries. The wide walks and expansive hardscape areas allow for adequate pedestrian movements. The plaza supports both civic and social opportunities including those activities generated from the Miller Campus Center and the library café.



Pedestrian Pavements and Curbs

The walks within Roselle Plaza primarily consist of pavers. The pavers are in relatively good condition given that they are over 20 years old. However, some areas need repair due to cracking, oxidation marks from use of steel snow plows, differential settlement from freeze thaw, and from maintenance vehicles. In many locations where pavers abut the concrete, the pavers have settled causing a tripping hazard. The joints between the pavers are generally tight although a fair amount of weeds are growing between them.

Areas of particular concern are:

- Walk from French Hall down to the lower area.
- South West Entrance to Cook Hall.
- Adjacent to storm drains.
- At pavers and concrete joints.
- Adjacent to railings at monumental stairs (from French Hall to Library).

Aesthetically, the pavers have faded a considerable amount, to the point that the color is similar to the surrounding concrete. This condition has created a monotone and dull setting. Furthermore, when broken pavers are replaced with new ones, they do not match creating an undesirable appearance.

Standard concrete walks are also provided at select areas including:

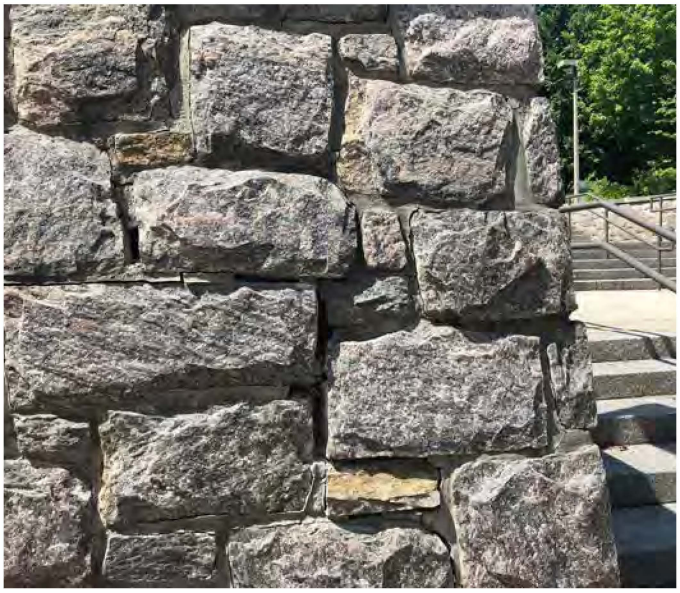
- Plaza area east of French Hall: concrete is in poor condition with numerous cracks.
- The oval area around the Knowledge Rock: in poor condition with areas cracking, spalling, and numerous rust / oxidation marks from plowing.
- The walkways leading to Miller Campus Center are in fair condition with some minor cracking. Areas have been repaired over the years and therefore the color of the concrete is different and patchy.

The existing curbs along walkways and plant beds are mostly in good condition. Some curbs are in fair condition, deteriorating at the corners, and have some rust / oxidation markings and chipping from the use of steel plows.

- The curbs adjacent to the plant beds are in good condition but contain some minor oxidation marks and chips in the curbing from plowing.
- The curbs along walks leading to the Miller Campus Center and the surrounding grass areas are in good to fair condition. There are heavy oxidation markings along the sides of the curbs and minor to moderate chipping from being struck by snow plowing blades. The corners of the curbs are deteriorating and in poor condition.

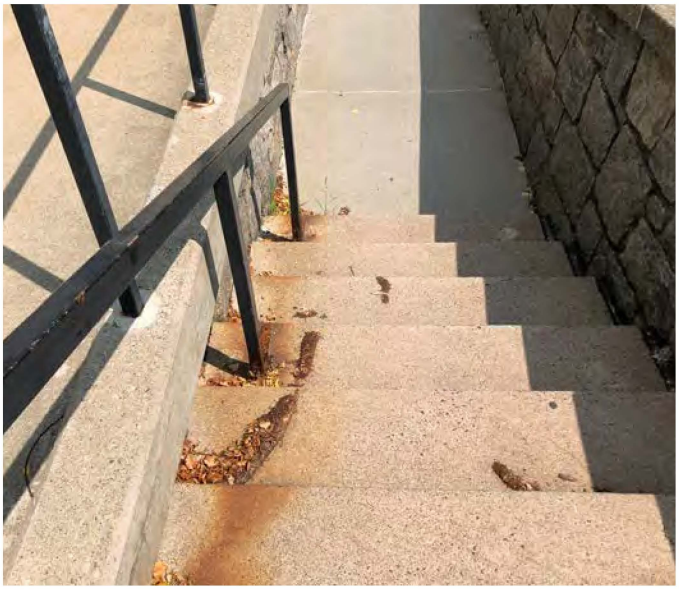
Accessibility

The only accessible access to Roselle Plaza from the French Hall parking lot is through an elevator within French Hall. From the elevator a person with physical disabilities exits the lower level and traverses down the existing walk system. This walk is over 400' feet long and ranges from 12' to 25' feet in width. The majority of the walk is compliant with the American Disabilities Act (ADA), however according to the site survey, at the lower section of the walk the grades exceed the 2% maximum cross pitch and 5% maximum longitudinal slope allowed by ADA. The latter requires handrails per ADA.



Retaining Walls

Existing retaining walls east of French Hall are in poor condition. The areas in poor condition showed clear signs of deterioration including loose or dislodged stones, large cracks and bowing. The walls block views from French Hall to the Miller Campus Center but are currently needed due to the steep grade change.



Stairs

Stairs along both the north and south ends of French Hall are in poor condition. The stairs along the north end could be removed as they are not utilized as frequently as the south stairs. Stairs on the south end are severely damaged and a safety concern. This is primarily due to years of over salting as well as the corroding handrails. Rust is causing the concrete beneath the handrails to deteriorate. The barrier rails at the south end door above the stairs do no provide fall protection as required by the current building codes. The granite stairs and existing handrails from French Hall down to the library are in good condition. Only a few pavers where the railings are attached, are in poor condition and popping out of the ground due to freeze and thaw.

Landscaping

The overall landscaping within Roselle Plaza is successful and well maintained with only a few noticeably struggling plants, primarily the Azaleas. There are a variety of successful perennials, deciduous shrubs, and evergreens in the planting beds that include Daylily's, Black Eyed Susans, Hostas, Iris, as well as Hydrangea, Spirea, Nine Bark, and Arborvitaes. Annual planting within the plant beds are in good condition and create seasonal interest.

The landscaping at the front of French Hall is sparse considering the significant role this building plays in student recruitment for the college. The landscaping at the back of the building is limited to mature trees within lawn areas. This is in part due to the fact that the retaining walls create access issues for maintenance staff and they are already challenged to mow the lawn in these sloped areas.

The existing plant beds are in good condition. Some small trees and shrubs are dead, but otherwise, all of the beds are well maintained. While the majority of plant beds are contained by curbing or an edge, in a few locations mulch spills out onto the surrounding pavers due to lack of curbing/edge.

Lighting

Lighting is in good condition. All lights are pole mounted; light posts along the retaining walls differ from the light posts in the plaza area which are newer. Although the lights are in fair condition, they are inconsistent, dated, and subsequently, not energy efficient and past their useful and serviceable life.

Signage

The site lacks wayfinding and signage which is essential to a campus landscape. The introduction of wayfinding and signage near French Hall would aid in a sense of arrival to campus as well as a positive user experience for prospective students and families.

The site also lacks signage identifying the accessible route from the basement of French Hall to Roselle Plaza and the surrounding academic buildings.

Seating

Tables (11) and benches (15) are in good condition and are all matching colors (green and red) and material (metal). Some furniture has white paint markings and signs of weathering. There is an adequate amount of seating for the size of the plaza. However, most of the seating is located in open areas with no shade.

Trash Receptacles

Trash receptacles (4) are in good condition and are scattered throughout the site. They are the same material and colors as the benches and tables. The site lacks recycle bins alongside the trash cans.

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Design Concepts

Cornell Drive

The arrival experience to SUNY Canton is one that many campuses strive for. Lined with large trees, Cornell Drive meanders uphill and into the campus providing a formal, institutional setting. This type of landscape is known as an "Allée".[1] An allée is a straight path or road with a line of trees or large shrubs running along each side, which is used to emphasize the "coming to," or arrival at a landscape or architectural feature. This design approach has effectively worked for over roughly 50 years. Unfortunately, the campus is in jeopardy of losing this great landscape due to the rapid decline in tree health. The Bartlett Tree Analysis and Report presents a detailed look at the condition of each tree and provides recommendations on how to increase the health, vigor and longevity of the trees. However, it did not evaluate the overall landscape design or long-term success of the allée. The LA Group studied this aspect of the corridor and used the Bartlett Tree Analysis and Report as a guide to help develop a concept to improve and recreate a new allée of trees along Cornell Drive.

Alternative concepts were considered and reviewed with the stakeholders. They included maintaining / re-establishing the existing tree line and creating a new naturalized edge. Below is a summary of those alternatives.

(1) Maintain / Re-Establish Existing Tree Line

The goal of this concept is to maintain the existing tree line to the greatest extent possible. This approach would consist of removing existing trees that are dying or deemed a safety hazard, replacing removed trees with new shade trees with similar characteristics, and improving tree health, vigor, and life span of the existing trees through implementation of the tree improvements identified in the Tree Inventory and Management Plan.

This may include:

- Soil Care and Fertilization
- Tree Pruning
- Lightening Protection Systems
- Plant Health Care
- Structural Support Systems
- Tree Removal

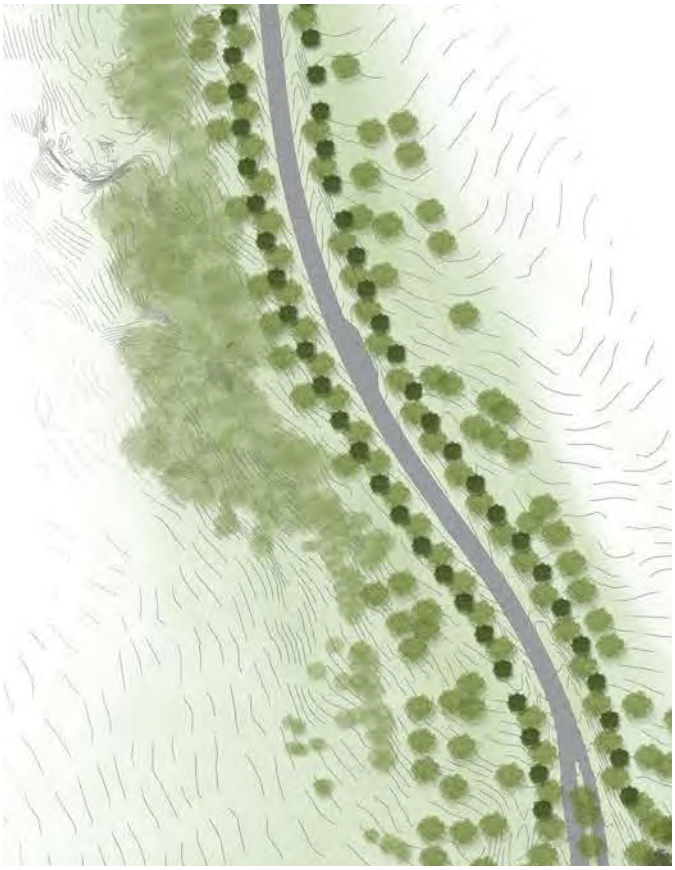
The concern of the stakeholders with this concept is that it would result in inconsistent tree heights and uniformity, thus creating a less effective and less desirable allée. It was also determined that investing significant resources into aging trees near their life expectancy was not advantageous.

(2) Create a Natural Edge

With this concept the tree lined street concept is abandoned, and a more naturalized woodland edge is established. This approach consists of removing existing trees that are dying or deemed a safety hazard, planting new native woodland trees and shrubs adjacent to the existing tree line and allow for a natural woodland to grow in and establish, and improving tree health, vigor, and life span of the existing trees through implementation of the tree improvements identified in the Tree Inventory and Management Plan. This may include:

- Soil Care and Fertilization
- Tree Pruning
- Lightening Protection Systems
- Plant Health Care
- Structural Support Systems
- Tree Removal

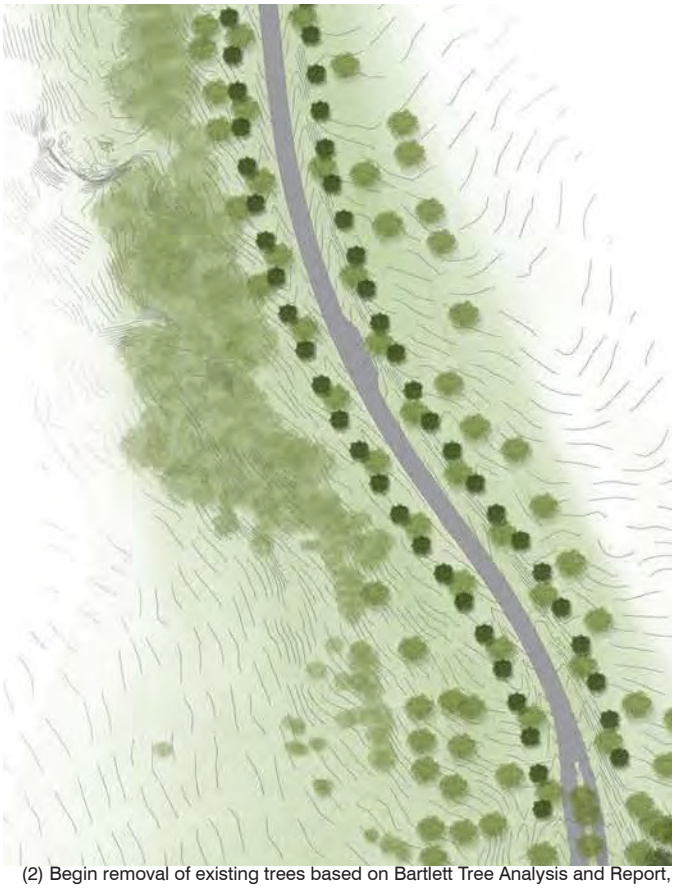
Ultimately the remaining Norway Maples would be removed. This concept wasn't advisable due to the time frame required to establish a natural wood line. More importantly it was deemed by the stakeholders, to be too dramatic of a change.



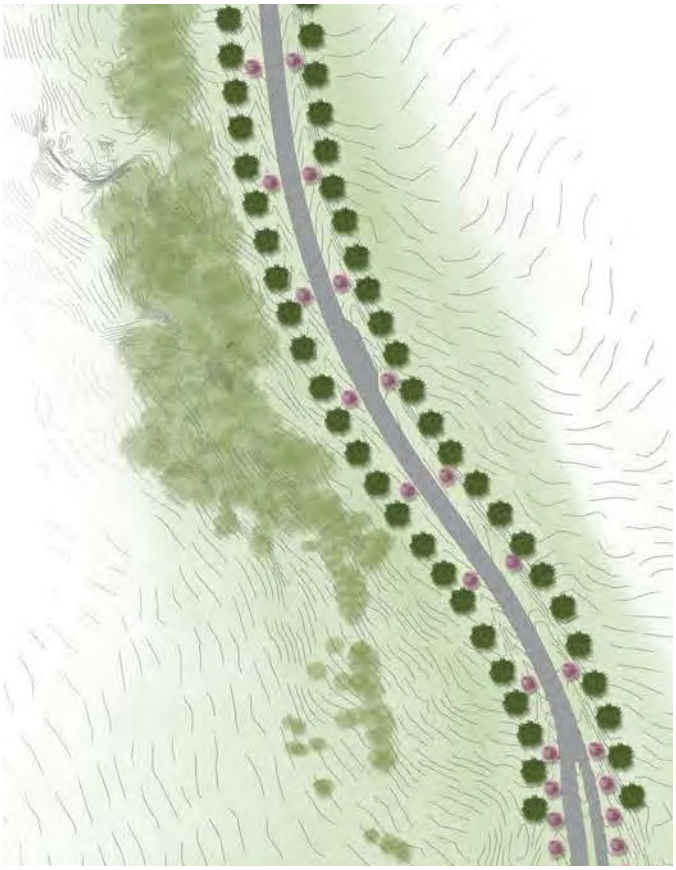
(1) New deciduous trees planted behind and in between existing trees.

The selected concept is to initially plant new deciduous shade trees slightly behind and in between the existing trees identified to remain. Rather than eliminating the existing trees and creating a wide-open landscape, The LA Group recommends leaving the existing trees in place while the new trees grow and become more substantial. Existing trees should only be removed if they become safety concerns or if they severely impeded the growth of the new trees. This will allow the campus to maintain the existing aesthetic for a longer duration as well as give the new trees time to grow, creating the desired look for when the existing trees are removed.

Additionally, new flowering trees will be introduced to the driver side of the shade trees. These trees will be strategically placed along Cornell Drive and will reinforce the allée concept while providing supplemental color and seasonal interest. Flowering trees require a substantial amount of sun, and the existing Norway Maples cast large shadows, therefore, the flowering trees should be installed after a majority of the existing Norway Maples have been removed, and the new deciduous trees have had time to grow.

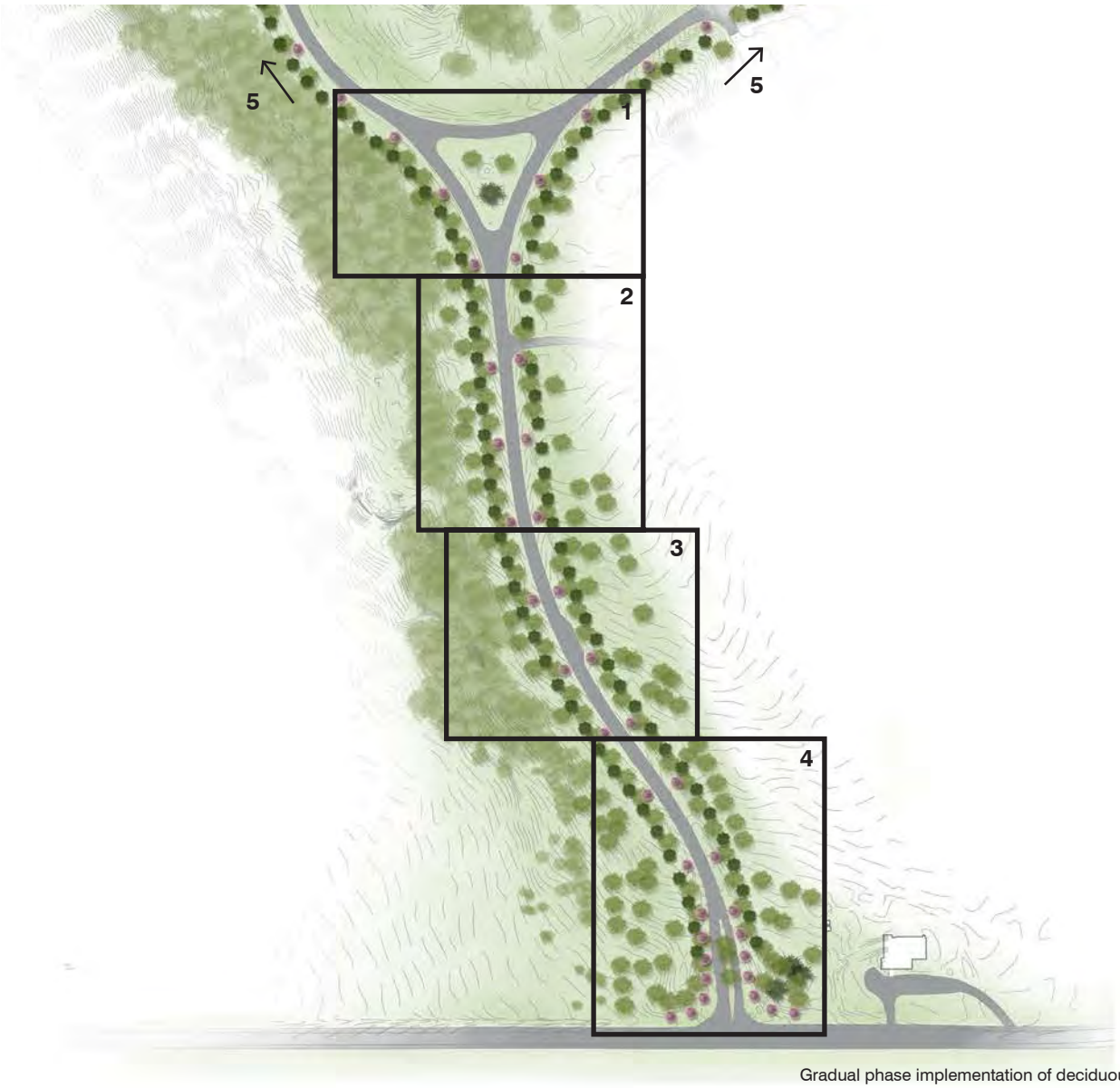


(2) Begin removal of existing trees based on Bartlett Tree Analysis and Report, to allow for new deciduous trees to grow.



(3) Proposed final condition; with all existing trees removed, and flowering trees planted in front of grown deciduous trees.

It is recommended that site be divided into multiple sections to allow for a gradual (phased) implementation. The size and number of phases will primarily be based on the amount of money that is available at any one time. However, to provide a consistent and uniform appearance it is recommended that the number of phases and associated time frames be limited to the greatest extent possible. It is recommended that the implementation of this plan start at the "Y" intersection at the top of Cornell Drive and then sequentially continue down to the campus entry. The following image illustrates one example how this project can be phased. This approach will result in successional growth from top to bottom and create the desired effect (areas 1-4). Once the main entry drive is complete, improvements along the loop road should begin (area 5).



Gradual phase implementation of deciduous and flowering trees.

Phase 5 of Cornell Drive gradual tree implementation.

Tree selection is critical for any design and this project is no exception. In many cases an allée of trees is comprised of one type of tree, however, we do not recommend pursuing this monoculture planting approach due to the risk of a disease or insect attack. If a disease or insect were to attack a monoculture planting there is a greater potential of destroying a high percentage, if not all, of the trees. Therefore, it is recommended to install multiple tree types. To create an effective uniform allée of trees it is important that the selected trees have similar characteristics. Overall tree size, form, growth rate, leaf or flower color should all be considered. Tree selection should also take local environmental conditions under consideration including USDA Plant Hardiness, prevailing winds, solar orientation, and soil.

The following is a list of recommended trees to consider, however, further soil studies should be performed prior to planting to ensure that the selected trees are compatible with the site specific environmental criteria described above.

Shade Trees:

- Red Maple
- Sugar Maple
- Red Oak
- Honey Locust
- River Birch
- White Oak

Flowering Trees:

- Serviceberry
- Crabapples
- Hawthorn
- Canadian

Existing view of French Hall from walkway.

Gathering area precedent image from Kent State University.[2]

Amphitheater precedent image from Sternwheeler Park, La Center, WA.[3]

Design Concepts

Roselle Plaza

With the information gathered during the Inventory and Analysis phase, numerous concepts were developed with the following goals and objectives in mind:

Goals

- The primary goal of this project is to redesign the space between French Hall and Roselle Plaza, with the secondary goal being the redesign of Roselle Plaza. The following image illustrates the delineation of the two areas.

Objectives

- **Improve the arrival experience to French Hall and improve the physical and visual connection between French Hall and Roselle Plaza.**
    - French Hall is a significant building to the Campus as prospective students and parents typically visit this building first to meet and begin campus tours. Studies have shown that what prospective students see and experience when they first arrive on a campus affects their decisions. Therefore, improving the arrival experience at French Hall as well as the connectivity to the campus is a high priority.

- **Assembly Space**
    - The design for Roselle Plaza should include a variety of open space opportunities and experiences for campus users, including assembly areas for larger events. The space should allow for day to day student interaction as well as space for larger student socials, guest speakers, or other planned events. Assembly space could include an amphitheater, open lawns or large paved areas that can accommodate tents and temporary seating.

Existing retaining walls.

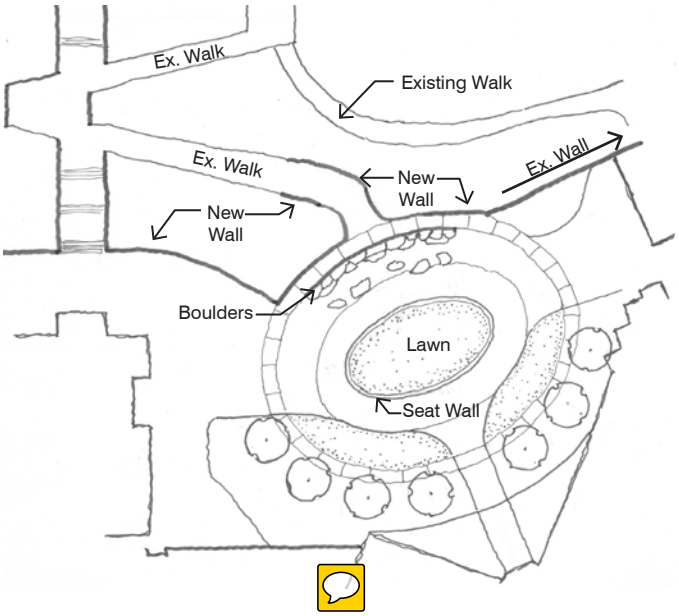
Existing pedestrian walk defined by the retaining walls.

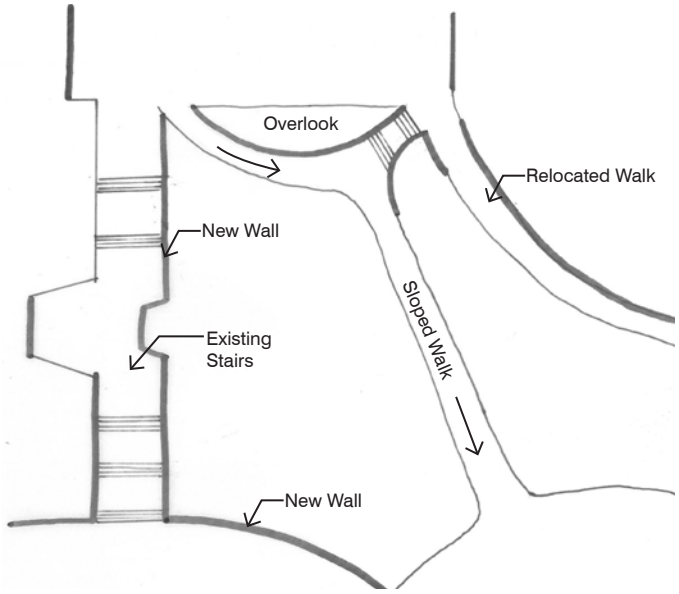
- **Amount of Retaining Walls**
  - The existing retaining walls are showing signs of deterioration and making repairs to the walls is costly and time consuming. In the current design the walls are the most dominate and influential feature of the landscape. They cut through grade creating pedestrian walks, however, they also create physical and visual barriers throughout and beyond the space. It was decided that due to the above concerns, that the new design should eliminate the walls to the greatest extent possible.

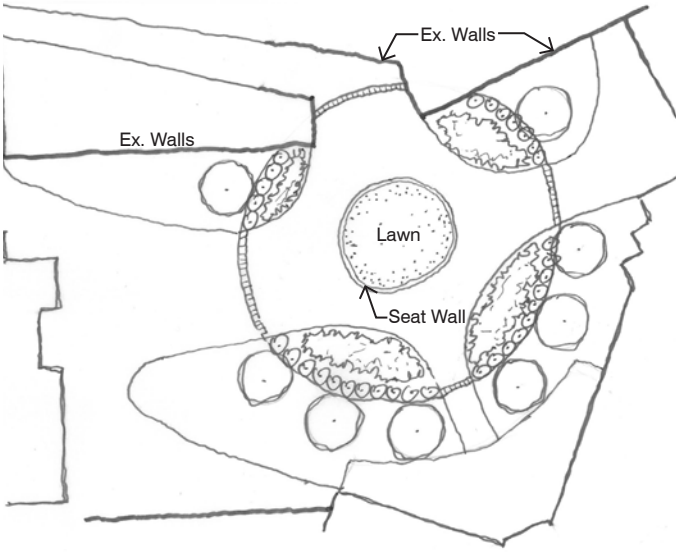
- **Pedestrian Circulation**
  - Roselle Plaza is the main pedestrian hub and cross roads of multiple circulation patterns. The established patterns should be maintained to the greatest extent possible. The walks connecting French Hall to Roselle plaza should also respect traffic flows to both the north and south sides of the plaza.

- **Overall Maintenance**
  - With limited resources available landscape maintenance including snow removal, mowing, and general landscape maintenance should be considered for each design.

- **Maintain Emergency Vehicle Access**
  - All designs should ensure that emergency vehicle access is provided through Roselle Plaza.



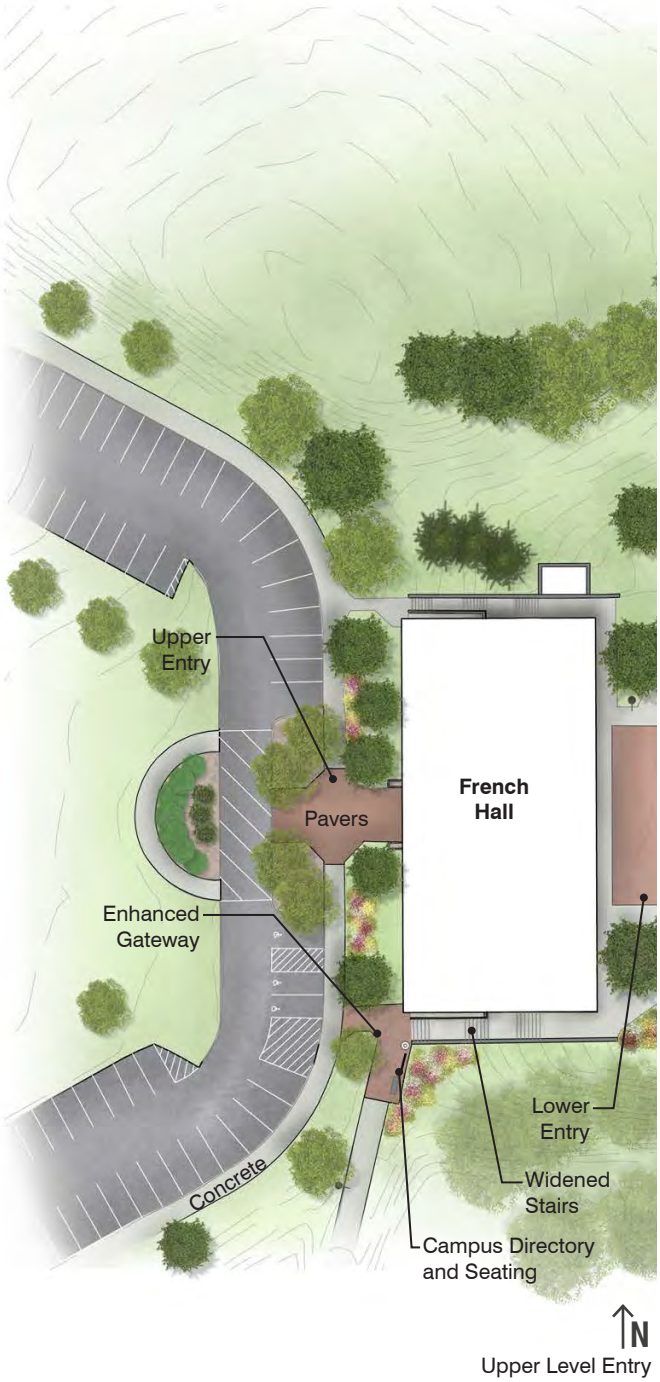




Concepts

Design concepts were developed utilizing the information obtained from the Inventory and Analysis while also keeping the established goals and objectives in mind. Alternative concepts were considered. They included looking at defining the upper and lower level entries at French Hall, the possibility of regrading the existing walkway to establish better sight lines or creating a new walkway, enhancing the existing plaza space, as well as creating a new plaza space with gathering areas. The concepts were reviewed with the stakeholders and it was determined that the following designs be enhanced. It should also be noted that the concepts have been designed so that the French Hall area and Roselle Plaza designs are interchangeable between the (3) three concepts. Each concept is further described and illustrated per the following format:

- General Concept Description.
- French Hall Improvements.
    - Upper Level Entry.
    - Lower Level.
    - Improvements between French Hall and Roselle Plaza.
- Roselle Plaza Improvements.



Upper Level Entry

Concept A | Renovation

General Concept Description

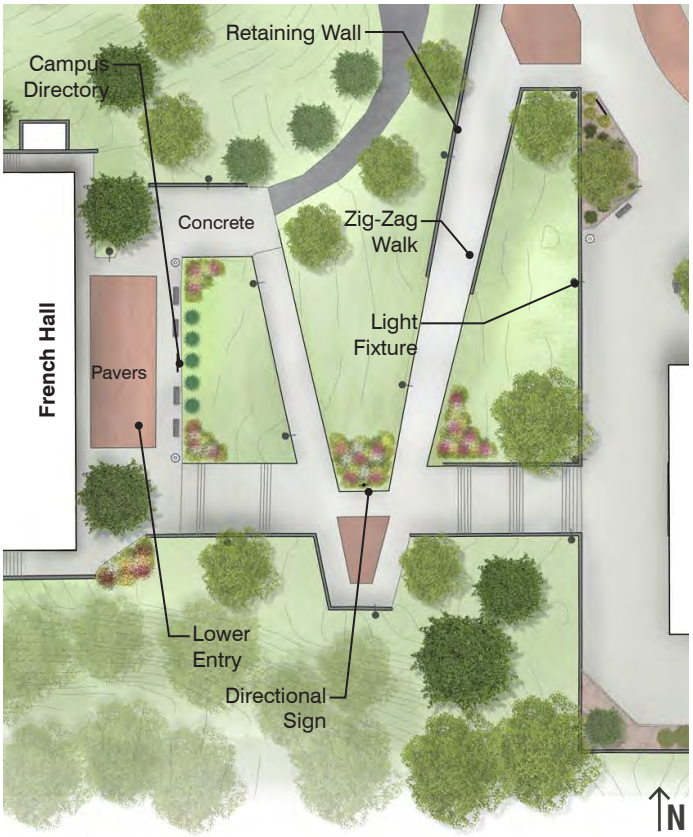
This concept is a complete renovation of both the French Hall and Roselle Plaza areas. The approach is to simply maintain the original design intent but, give the space a fresh appearance by replacing and providing new amenities. Other significant aspects of this design include improving the arrival experience to French Hall as well as removing many of the existing walls and trees between French Hall and Roselle Plaza.

French Hall Improvements

Upper Level Entry

The arrival experience to French Hall should begin at the entry road off Cornell Drive and continue all the way to the back of French Hall. To enhance the arrival experience, this concept proposes a new building identification sign at the entry drive. The sign along with some landscaping will provide the announcement that is currently lacking. Additional site improvements are located at the entry of French Hall as well. The existing symmetrical design complements French Hall well, and will remain. However, the suggested pavements, site amenities, furnishings and landscaping improvements will further enhance the overall aesthetics of the entry.

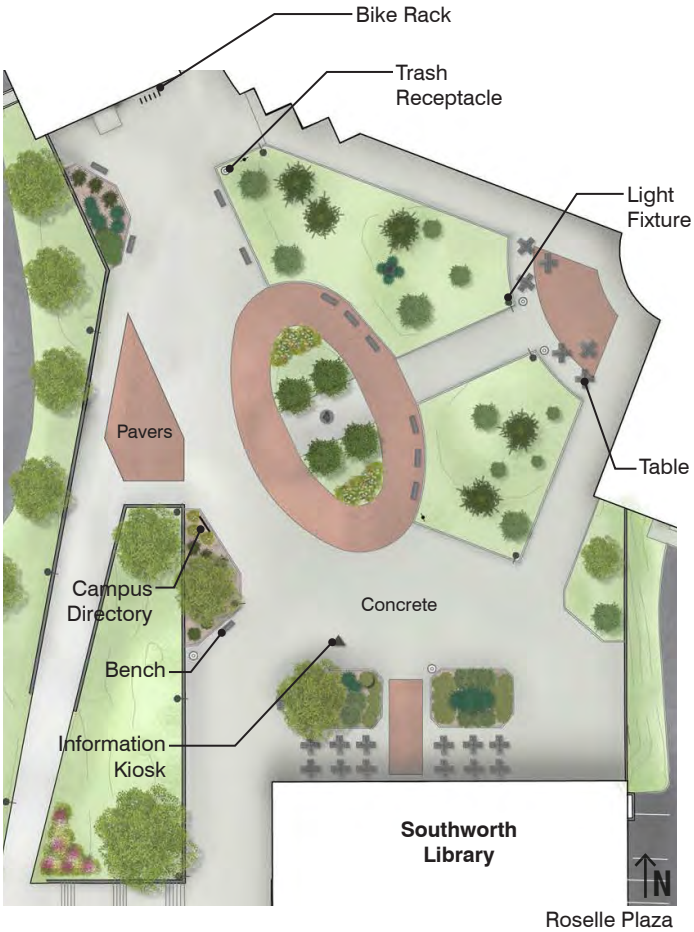
The deteriorating stairs to the south side of French Hall should be replaced. This stair case is one of the primary pedestrian access points into the campus. Therefore, it is recommended that the new stairs be wider to better accommodate the pedestrian flows. At the top of the stairs, additional site amenities will call attention to this gateway into the campus. The improvements are to include a campus directory sign, a bench, trash receptacle and landscaping. The landscape not only provides an aesthetic quality, but it will also serve as a barrier to help prevent students from walking down the hillside. An accessible route from the south side of French Hall down to the lower level behind French Hall was considered, but unfortunately, the grade change was to significant and deemed impracticable.



Lower Level Entry

Lower Level Entry

Enhancements include replacing the existing pavement will be reconstructed with a mix of pavers and concrete walks, removing the existing gazebo, and provide new site amenities and furnishings. To open views to the campus the walls within the plaza area and adjacent to the zig-zag walk will be removed. With the walls removed the existing lawn and walk areas will need to be regraded and reconstructed. This earthwork will result in the need to relocate existing utilities in the impacted area. This activity will also result in the removal of the trees, which only further open views into the campus. The existing walls adjacent to the existing stair system will remain and be repaired as needed. Note that this master plan does not include a structural assessment of the wall and it is recommended that this be performed prior to moving forward with this concept. The existing stairs shall remain, but it is recommended that general repairs be provided. The existing pavers around the stairs should be replaced and match with proposed pavements in other areas.



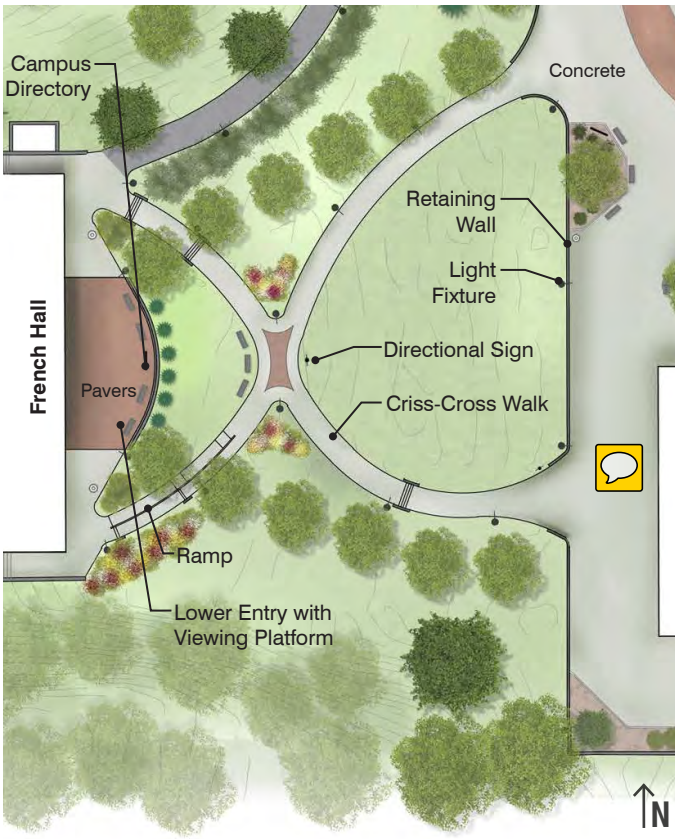
Roselle Plaza

Roselle Plaza Improvements

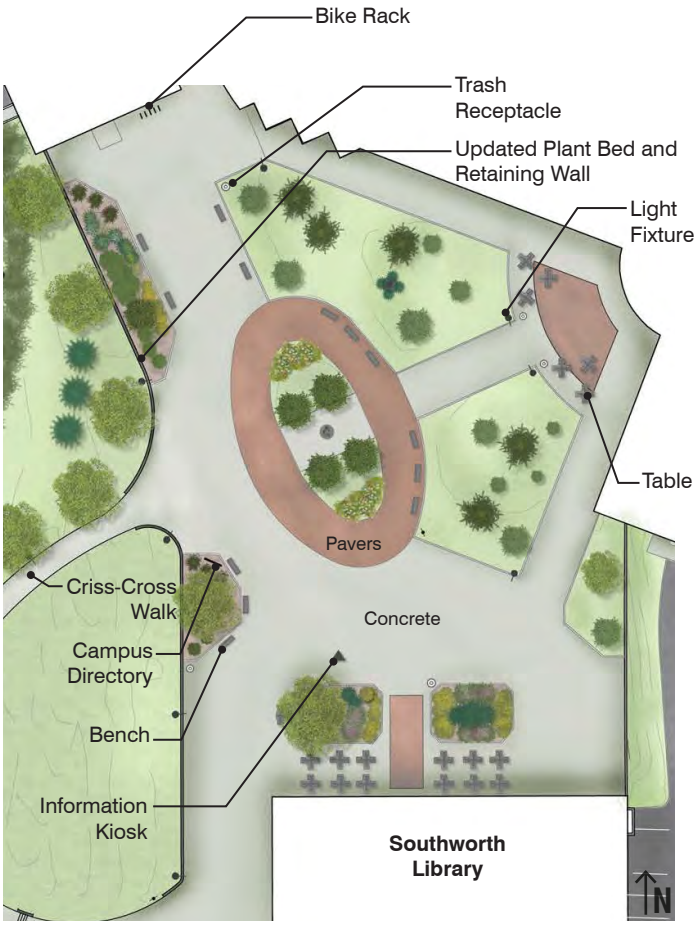
One of the most impactful improvements for Roselle Plaza renovation is the reconstruction of the paved areas. Replacing the faded pavers and deteriorating concrete walks with new vibrant, decorative pavement will drastically enhance the site aesthetics. Another big design change is reducing the size of the large walls that define the western edge of the plaza. Lowering these walls to a seat level elevation will eliminate the physical barrier and strengthen the visual relationship between French Hall and Roselle Plaza. The large wall extending out from Cook Hall will need to remain in place. However, the western portion of the wall will be reconfigured to open views as pedestrians walk down from French Hall. Existing grades in the plaza itself will be maintained, allowing for existing stormwater structures to remain and be replaced as needed. New site amenities shall be provided throughout Roselle Plaza including:

- Benches
- Tables
- Trash Receptacles
- Bike Racks
- Lighting
- General Landscaping
- Wayfinding Signage

Overall Concept A



Lower Level Entry



Roselle Plaza

The improvements to Roselle Plaza are the same as described in Concept A.

Concept B | Connection & Renovation

General Concept Description

The intent of this design is to install a completely new landscape and connection between French Hall and Roselle Plaza while only renovating Roselle Plaza.

French Hall Improvements

Upper Level Entry

Improvements are the same as described in Concept A.

Lower Level Entry

The concept includes a new plaza and viewing platform outside of French Hall. The viewing platform will serve as a meeting location and start for campus tours and provide the first view and impression of the campus. It can also provide an opportunity to display the “rock of knowledge”, public art, interpretive signage, or another relevant focal point. This space will also be accompanied with new site furnishings, lighting, and signage. Pavements will consist of a mix of concrete and pavers, which will be equipped with radiant heat for snow melt. Flanking either side of the viewing platform is a pedestrian route that traverses downhill toward Roselle Plaza. The walks intersect and create a crisscross pattern until they reach the lower level, and lead pedestrians to either the center of Roselle Plaza or to the west side of Southworth Library. The crisscross configuration provides the length needed to traverse the grade without needing a massive number of stairs or walls. Some stairs and ramps will be needed with this design. However, there are significantly less compared to the existing condition which reduces maintenance and increases safety. The new walls are limited to the stair and ramp areas along the crisscross walk. Trees will be planted within lawn areas and will be located to accentuate the design and frame views. To reduce maintenance issues, ground cover plantings will be placed on slopes 3:1 and greater. This earthwork will result in the need to relocate existing utilities in the impacted area. To enhance the landscape, accent plantings will be added to points of interest including at walk intersection. The intersection plantings provide aesthetic value while discouraging pedestrians from cutting through what would otherwise be lawn areas.

Roselle Plaza Improvements

These improvements are the same as described in Concept A.

Overall Concept B

Concept C | Connection & New Plaza

General Concept Description

This concept combines the French Hall connection design with a new design of Roselle Plaza, thus completing a comprehensive reconstruction of the entire project area.

French Hall Improvements

Upper Entry Level & Lower Level

These improvements are the same as described in Concept B.

Roselle Plaza

Roselle Plaza Improvements

The most significant improvement to the plaza is the introduction of the new central green that is surrounded by a seat wall. Located at the crossing of multiple pedestrian routes, the green will be the focal point of the plaza where students can meet and socialize. Although centrally located the design still maintains most of the existing pedestrian circulation patters and allows passage for emergency vehicles. This versatile space can also serve as a stage for guest speakers, bands or for other scheduled events. For larger events portable seating and or tents can be installed within the vast pavement areas. Another benefit to the green is that it softens the space by breaking up and reducing the amount of hardscape materials. Due to the vast changes to pavement and greenspace in this concept, new stormwater infrastructure will be required within Roselle Plaza.

The design also acknowledges and compliments the success of the café within Southworth Library and extends the outdoor café with additional seating and tables. Trees located within this area define the space while creating a little intimacy and shade to some of the tables. Additional landscape areas located around the perimeter of the plaza and in front of Miller Campus Center will be bordered with a granite curb. The curb will provide a solid edge for snow removal and a clean delineation line between the green and hardscape. The curb should be set with a low-profile so that the granite doesn't compete with other vertical elements or give a road like appearance. A mix of lawn, planting beds and specimen trees are strategically located within these areas. In the winter months these areas will also serve as snow storage areas. Therefore, plant selection and placement will need to be carefully evaluated.

An amphitheater built into the hill up to French Hall is feature that offers multiple opportunities. It can be used day to day by the general public, as an outdoor classroom or other small organized events. A detailed description of the proposed site amenities is included under the Site Amenities section of the report.

Overall Concept C

Site Amenities

The campus environment can be improved greatly with the addition of site amenities that enhance the sense of place and appearance. In order to create a harmonious landscape, it is important to develop and institute a consistent landscape vocabulary. The various amenities should be of similar style, form, color and material. A complementary family of site amenities should be used to establish a unified and attractive campus standard. Products shall be built from durable materials able to withstand the local environmental conditions including but not limited to freeze / thaw cycles, use of salts (snow melt) and frequent snow plowing. All the design concepts should follow the following site amenities recommendations and design principals.

Pavements

The existing pavement (including pavers) within Roselle Plaza held up remarkably well over the years and therefore it is recommended to continue with the use of pavers and concrete. Concrete paving shall be used with accent paver panels to provide texture and interest at special locations such as building entries, assembly areas, seating areas, crossroads of walk, etc. Paver style and color should complement the existing stone veneer used on existing and proposed site walls. Patterns shall be simple and reinforce building architecture and pedestrian circulation patterns. Stakeholders also suggested during design meetings that this study explore ways to re-purpose the stone veneer from the existing stone walls. One opportunity to investigate is to reuse them as pavers in select areas to highlight a specific area. It is recommended that the paver joints be filled with polymeric sand. This material discourages weed growth and ant invasions, and thus reduces the amount of maintenance required. Another major improvement and maintenance time saver is the introduction of heated pavement. Radiant pavement should be considered for all the pavements within the French Hall area. Note that this improvement is dependent on the feasibility of adding the associated mechanical equipment in French Hall.

Trash and Recycling Receptacles

The successful appearance of a campus includes control of litter. Appropriate trash receptacles should be placed in unobtrusive locations yet in areas they are needed including walk intersections, building entries and the perimeter of open spaces and as otherwise desired due to the nature of the space. Convenient locations improve the likelihood of them being used. Their aesthetics and materials should blend well with other site furnishings.

Precedent image of light posts with banners from Harvard Divinity School and Siena College.[4]

Precedent image of lighting under wall coping.[5]

Precedent image of wayfinding signage in Saratoga Springs, New York.

Lighting

Site lighting helps provide safe navigation through campus and when designed correctly can also contribute to the overall campus aesthetic and experience. Pedestrian light poles are located adjacent to walks and throughout larger plaza spaces and are spaced uniformly to achieve consistent light levels throughout the space. The poles shall be placed so that they do not conflict or compete with other landscape elements including tree canopies, landscaping, signage or utilities. Pedestrian light poles should be in the 12' to 16' range and, to further enhance the collegiate setting, the poles should have the capability of adding banners or flags. Light fixtures should be down lit style to discourage night sky light pollution and use LED bulbs.

Accent lighting should also be considered to highlight specific site features. This could include lighting under the exterior edge of the wall coping around the central green, directional lighting at the French Hall overlook area and lights highlighting the "Rock of Knowledge" or other public art or feature.

Please note that the lights indicated on the plan are for illustrative purposes only and further light level studies are required.

Wayfinding and Signage

Students, and especially visitors should be able to easily find their way to their intended destination. Are Integral parts of a comfortable campus landscape are signage components and their design requires a cohesive approach. It is recommended that a campus wide wayfinding and signage study be performed prior to implementation of any signs suggested in this study. This study provides recommendations for various signs including campus directory signs and general directional signs to help users navigate to their destination. Campus directory signs should be located at campus gateways as well as at other points of interest. These signs should include, but not be limited to a map of the entire campus with locations of buildings, parking lots, athletic venues, pedestrian corridors, accessible routes and bike racks. Directional signage should be located as needed to direct the flow of traffic across the site.

Precedent image of seat wall bench from the University at Albany.

Precedent image of a wood bench with metal accents.

Walls

In general, walls are typically minimized due to their cost, related maintenance issues and the boundaries they create. Site walls should be designed to replicate the existing wall designs and using the stone veneer from the exiting walls should be considered. For increased comfort seat walls should consider fastening benches to the coping similar to the bench shown on the image below. Another design consideration is to provide skate deterrent's mounted to the coping or benches.

Benches

Benches should be provided at planned resting and gathering locations. Seating can create a comfortable setting conducive to conversation as well as security. The seating locations should strive to balance the number of benches located in shade versus sun. Recommended locations include along walks and along the perimeter of open spaces and as otherwise desired due to the nature of the space. They may be grouped at larger plazas, building entrances and features where larger groups may gather. It is recommended that the benches be anchored in place and that dark color finishes be considered because lighter colors tend to show wear and stains sooner. Materials should be metal with wood accents. The metal provides a modern feel and the wood will help soften the appearance of the space.

Precedent image of a ground cover with bulb plantings.[6]

Existing successful plant materials.

Landscaping

Planting Guidelines:

- In general, planting designs should be organized with a simple scheme and maintenance in mind.
- Plants should be consolidated to larger planting beds for ease of maintenance and mowing of surrounding lawn areas.
- Lower plantings should be placed adjacent to walks and at intersection to maintain visibility and security.
- Use annual and perennial plantings to provide additional seasonal interest.
- Ground Cover plantings are recommended within plant beds and steep, hard to maintain areas. They not only provide additional aesthetic value, but they also help reduce maintenance and lower costs. Using ground covers will reduce the amount of mulch replacement required, can control erosion, and reduce the number weeds that establish. Ground covers can also be complimented with bulb plantings below the ground cover. Some ground covers allow bulbs to grow through the ground cover creating additional seasonal interest and effect.
- Plant Material Selection:
    - Use materials that have been successfully used on campus.
    - Place emphasis on native plant materials.
    - Materials shall have early spring and or fall interest to coincide with the times that the greatest number of staff and students are on campus.
    - Select plants that perform well with limited pruning.
    - Accent and specimen plantings should be considered at key focal points.
    - Appropriate plantings can also be utilized to screen/filter undesirable views and as wind breaks.

Conceptual Estimates

The following estimates have been prepared for the purpose of establishing a probable cost of construction at a conceptual level. This pricing exercise is based on current industry prices using applicable historical data. The estimate does not include soft costs, construction allowances, escalation, market conditions or other factors beyond our control, however, it does include construction contingencies.

It should also be noted that estimates do not include costs associated with the mechanical equipment enhancements required to supply the required hot water to the radiant pavement system because further studies are needed in order to determine the specific improvements.

Cornell Drive Concept

This estimate includes the removal of the existing trees, stump grinding, minimal grading and reestablishment of lawn areas. It also includes the proposed deciduous and flowering trees with associated soil amendments and support tree staking. The estimated conceptual cost for the implementation of the Cornell Drive Concept is $1,000,000. The estimate costs for the previously identified areas 1 through 4 are $170,00 per area and zone 5 approximately $320,000. The following estimates should be used if the campus determines that they would like to proceed with the individual tree recommendations provided by Bartlett Tree Experts.

- Tree Pruning: $350 per tree
- Tree Cabling: $200 per tree
- Tree Fertilization: $160 per tree
- Root Collar: $200 per tree

Roselle Plaza Concept

Each estimate evaluated site preparation, hardscape materials, site amenities, landscaping and utilities items.

- Site preparations items generally include site clearing, removals, erosion control and rough grading.
- Hardscape materials include various pavements, curbs, stairs, ramps and retaining walls.
- Site Amenities include various signs, site furnishings and light poles.
- Landscaping items included topsoil and seeding, as well as tree, shrub, and perennial plantings.
- Utilities items estimated include stormwater improvements, electrical wiring, and relocation of water and fiber optic lines.

The following illustrates the estimate cost analysis between the three concepts:

Item	Concept A	Concept B	Concept C
Site Preparations and Grading:	$520,000	$585,000	$658,000
Hardscape Materials:	$1,300,000	$1,280,000	$1,250,000
Site Amenities:	$70,000	$100,000	$120,000
Landscaping:	$40,000	$60,000	$90,000
Utilities:	$177,000	$181,000	$225,000
Temporary Facilities and Staging:	$40,000	$60,000	$80,000
Contingency 35%:	$751,450	$793,100	$848,050
TOTAL	**$2,898,450**	**$3,059,100**	**$3,271,050**

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Cover: “SUNY Canton.” 44° 36’01.75”N and 75° 11’02.13”W. Google Earth. May 5, 2015. Nov.,2018.

*All images unless otherwise specified are property of The LA Group, P.C.

Appendix

The following document is the SUNY Canton BIS Tree Inventory and Management Plan in its entirety.

SUNY Canton
Tree Inventory and Management Plan | 2018

Submitted by:
Bartlett Tree Experts

Kevin Weber, Bartlett Inventory Solutions Technical Advisor
Registered Consulting Arborist #636, ISA Board Certified Master Arborist #PD-2030B,
ISA Tree Risk Assessment Qualified, Certified Treecare Safety Professional #732

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TABLE OF CONTENTS

MAKING THE MOST OF YOUR INVENTORY MANAGEMENT PLAN

Those who operate a large business or institution understand how inventory impacts operations and budgeting. One must know what's there, how much or how many, and where it all is. But the task doesn't end there. To obtain the greatest benefit from inventory, owners or their designees must manage it. Are a company's tools, for example, old and defective, in need of repair, in short supply, or useless and taking up space that could be better occupied? A good management plan will address these issues and keep the inventory current, in good condition, and functioning for the benefit and safety of those involved.

Managing trees on a large property can seem like an overwhelming task, but the same principles of inventory management apply. This inventory and management plan should provide managers the data they need to develop realistic budgets for their tree maintenance needs, and it will help make the SUNY Canton campus a safer and more beautiful environment.

The following tips will assist you in making the most of this document:

Who's Who

Those who conducted the inventory and prepared this document are members of the Bartlett Inventory Solutions team. They are also employees of Bartlett Tree Experts. The Bartlett Inventory Solutions team is overseen by four technical advisors out of the Bartlett Tree Research Laboratories in Charlotte, North Carolina. The advisors are primarily charged with client support, coordination, quality control, and documentation of inventories and the related data. Extensively trained Regional Inventory Arborists from local Bartlett Tree Experts offices are the primary data collectors and authors of the management plans. Readers may interpret the terms "Bartlett Tree Experts," "Bartlett," "the Inventory Team," "the team," "we," and "our" as the Bartlett company and those who conducted the inventory and prepared this management plan. In addition to the primary author(s) listed on the cover page, Team Member(s) involved in this project included:

Technical Advisor
Kevin Weber, Bartlett Inventory Solutions Technical Advisor
Registered Consulting Arborist #636, ISA Board Certified Master Arborist #PD-2030B,
ISA Tree Risk Assessment Qualified, Certified Treecare Safety Professional #732

Data Collection
Julian Monaco, Regional Inventory Arborist
ISA Certified Arborist #NY-5604A

Subject Trees

In this document, the term "subject trees" refers (depending on context) to some or all of the 212 trees included in the inventory.

Definitions & Bolded Terms

Some definitions or specifications are detailed within a given section to explain how readers should interpret certain terms or classifications. We have also appended a Glossary for other terms that appear throughout the document. The first reference to each of these terms appears in **bold** for the reader's convenience.

How This Document is Organized

An outline appears below that introduces the order in which the sections of the management plan will appear. The management plan layout is as follows:

- **Table of Contents**
  - Road map for the management plan
- **Making the Most of Your Inventory Management Plan**
  - Explanations for how to efficiently and effectively understand and navigate this management plan document
- **Executive Summary**
  - Synopsis of the major findings and recommendations
- **Introduction**
  - Brief explanation of the inventory and what was included
- **Goals & Objectives**
  - Explanation of the specific goals and objectives for this inventory
- **Data Collection & Tree Inspection Methodology**
  - Lists, explanations, and definitions of all data collected during the inventory
- **Stand Dynamics Results**
  - Summary information for the entire tree population inventoried including risk ratings assigned during the inventory with corresponding table and map displays with figures if applicable
- **Recommendations**
  - Summary of all recommendations made during the inventory including associated table and map displays, explanations and examples, and figures if applicable
- **Defects or Observations**
  - List of all trees observed to have defects in the field in a table view with associated descriptive figures and maps if applicable

- **Entire Inventory**
    - List of all trees collected in a table display
- **Additional Resources**
    - Listing of all appended items for this management plan

EXECUTIVE SUMMARY

In September 2018, the Bartlett Inventory Solutions (BIS) Team from Bartlett Tree Experts conducted an inventory of selected trees along Cornell Drive on the SUNY Canton campus. We identified 212 trees which included 23 species. The attributes that we collected include tree latitude and longitude, size, age and condition class, and a visual assessment of tree structure, health, and **vigor**.

We conducted the attribute collection using a sub-meter accuracy Global Positioning Satellite Receiver (GPSr) device with an error-in-location potential of not greater than three meters. Our pruning recommendations for the subject trees over the next 3-year period are outlined below. All tree work activities will comply with current American National Standards Institute (ANSI) Z133.1 requirements for safety.

Tree Risk Assessments and Mitigation
Perform the recommended tree risk mitigation activities for the 2 trees (1%) which we found defects or concerns that prompted the need to use the International Society of Arboriculture's (ISA) risk matrices in the field. Risk mitigation activities will comply with current ANSI A300 standard practices. Please see the Tree Risk Assessments, Limitations & Glossary section for more information.

Soil Sampling
Taking soil samples throughout planting beds and actively managed areas. Soil analysis provides information on the presence of soil nutrients, pH, organic matter, and cation exchange capacity.

Bulk Density Sampling
Taking bulk density samples throughout planting beds and actively managed areas to determine the amount of soil compaction.

Soil Rx®
Apply Bartlett's Soil Rx® program to 37 trees (17%) to correct nutrient deficiencies and optimize soil conditions for the designated trees.

Root Invigoration™
Perform Bartlett's patented Root Invigoration™ on 3 trees (1%) to improve aeration and promote more efficient root growth, especially for high-value trees in disturbed areas.

Mulching
Wherever possible, apply 2-4 inches of mulch within the root zone to help moderate soil temperatures, reduce soil moisture loss, reduce soil compaction, provide nutrients, improve soil structure, and keep mowers and string trimmers away from tree trunks. The best mulch materials are wood chips, bark nuggets, composted leaves, or pine needles. To avoid potential disease problems, mulch should not be placed directly against the trunk.

Root Collar Excavations
Perform **root collar** excavations to 19 trees (9%) to lower risk of damaging conditions such as **girdling roots**, basal cankers, masking of root decay and lower-stem decay, and predisposing trees to various insect and disease pests.

Plant Health Care (PHC)
Implement Bartlett's PHC program to monitor pests and diseases on the subject trees. Treatments are therapeutic and preventive, and treatment timing is based on pest life cycle.

Pruning
Prune 63 trees (30%) for safety, health, structure, and appearance. Pruning will comply with current ANSI A300 standard practices for pruning.

Structural Support
There are structural support system recommendations for 10 trees (5%) to reduce risk of branch or whole tree failure. All structural support systems will comply with current ANSI A300 standard practices for supplemental support systems.

Lightning Protection
At the time of inventory, no trees were recommended for lightning protection systems. However, as trees continue to grow and site changes occur, we recommend continual consultation with your local Bartlett Arborist Representative to determine if lightning protection systems are warranted in the future.

Removals
Remove 38 trees (18%) due to condition or because of their location in relation to other trees to try and prevent competition or damage to infrastructure. Trees are listed on a scale of 1-5 for the order that they should be removed due to their condition or severity of defects.

Tree Risk *Advanced Assessments (Level 3)*
At the time of inventory, no trees were recommended for *advanced assessments* to evaluate the impact of wood decay in **stems** or **buttress roots**. However, as trees continue to grow and site changes occur, we recommend continual consultation with your local Bartlett Arborist Representative to determine if *advanced assessments* are warranted in the future.

INTRODUCTION

In September 2018, the LA Group located in Saratoga Springs, NY retained Bartlett Tree Experts to perform an inventory of trees along Cornell Drive on the SUNY Canton campus. Team members Julian Monaco and Kevin Weber visited the site on September 4-5 to conduct the inventory.

The inventory included:

- identifying trees and assigning a Tree ID number (Tree ID numbers ranging from 1 to 212);
- identifying the trees' condition, health, and vigor;
- recommending risk evaluations and removals of appropriate trees;
- recommending tree care, soil care and fertilization, structural support, and pest management treatments to promote tree safety, health, appearance, and longevity; and
- mapping the trees using GPSr hardware and Geographic Information System (GIS) software, and Bartlett Tree Experts' ArborScope™ web-based management system

The methods and procedures we used to make the above determinations and recommendations are detailed in the following sections.

GOALS & OBJECTIVES

An effective management plan communicates clear goals and the specific objectives designed to carry out those goals. We intend "goal" to mean the overall aim or result we expect to achieve for the client in producing the inventory and management plan. The objectives are the specific actions taken or recommended to support goal completion. The table below describes each goal and its corresponding objective(s).

GOALS & OBJECTIVES

GOAL	OBJECTIVES TO ACCOMPLISH GOAL
Establish the tree inventory (per numbers agreed) on the SUNY Canton campus.	• Using Trimble® Geo GPSr hardware and ArborScope™ Inventory Management Tools, collect data such as tree name, location, size, age class, and condition class. • Assign a Tree ID number to each tree inventoried.
Provide mechanism for managing inventory, recommendations, and related budget planning.	• Provide map or maps of the inventoried trees to assist the client in managing property areas. • Submit a comprehensive management plan that documents and organizes findings and provides other resources to assist the client in efficient use of the information.
Maximize client understanding and implementation of management plan.	• Include in management plan specific explanations and visuals related to plan recommendations. • Provide appended resources that address health, procedures, and standards related to tree care. • Make periodic contact with client to follow up and answer any questions about the management plan's contents.
Maximize immediate and long-term tree health and aesthetics.	Implement recommended plant-health-care program that uses • integrated pest management • soil care and fertilization • maintenance pruning
Manage immediate and long-term risk associated with trees in high-use areas.	Implement recommended risk-management measures that include • risk-reduction pruning • required removals • tree structure evaluations

DATA COLLECTION & TREE INSPECTION METHODOLOGY

In conducting the inventory, we used specialized equipment and software and followed specific procedures to determine tree characteristics, risk evaluations, and recommendations. The following explanation will assist the reader in interpreting the findings of this management plan.

Data Collection Equipment & Attribute Data

The Inventory Team used Trimble® Geo GPSr hardware units, TerraSync® and GPS Pathfinder® Office GIS software, and Bartlett Tree Experts' ArborScope™ web-based management system to inventory the trees. The attribute data we collected on site are listed below.

- botanical name and regional common name according to local ISA Chapter Tree Species List
- tree location based on GPS coordinate system
- tree ID number
- diameter at breast height (**DBH**)
- canopy radius
- age class
- height class
- condition class
- root zone infringement, based on **dripline** and estimated **grayscape** (e.g., sidewalks) impact on root zone
- infrastructure interaction (between trees and grayscape that may cause an undesirable condition
- documented *basic assessment (Level 2)* of tree risk where defects or concerns were observed that prompted the need to use the ISA risk matrices in the field resulting in an *overall risk rating*
- priority of tree and shrub work (based on 3-year management plan)
- pruning
- need for and inspection of existing structural support systems
- need for and inspection of existing lightning protection systems
- need for *advanced assessments (Level 3)*
- succession plan tree removals (based on a scale of 1-5)
- soil care and fertilization recommendations
- plant health care recommendations
- noted defects/observations
- observed pests/diseases

Specifications/Definitions

Age Class

New Planting	Tree not yet established
Young	Established tree but not in the landscape for many years
Semi-mature	Established tree but has not yet reached full growth potential
Mature	Tree within its full growth potential
Over-mature	Tree that is declining or beginning to decline due to its age

Height Class

Small	Less than 15 feet
Medium	15 to 40 feet
Large	Greater than 40 feet

Condition Class

Dead

Poor Most of the canopy displays dieback and undesirable leaf color, inappropriate leaf size or inadequate new growth. Tree or parts of tree are in the process of failure.

Fair Parts of canopy display undesirable leaf color, inappropriate leaf size, and inadequate new growth. Parts of the tree are likely to fail.

Good Tree health and condition are acceptable.

Tree and Shrub Care Priority

Priority class recommendations are based on a 3-year management plan that takes into consideration tree species, condition, location, age, and proximity to infrastructure. We intend that this rating system assist decision makers in prioritizing tree pruning, cabling and bracing, and tree lightning protection recommendations. *Trees with a priority of 1 and an Overall Risk Rating of Extreme or High (see definitions in the next section) should be addressed immediately.* Prioritization does not take into account any budgetary or financial considerations.

Recommendations for Priorities 1, 2, and 3 are all based on observations by the inventory arborist. The following additional information clarifies each priority class:

Priority 1 To be addressed in years 1 or 2 of the management cycle. Priority 1 may include trees with large dead wood, structural defects, located in exposed sites, high aesthetic value, and/or parts that are currently negatively interacting with infrastructure, such as branches that touch buildings, interfere with signage or lighting, or obstruct pathways.

Priority 2 To be addressed in years 2 or 3 of the management cycle. Priority 2 may include trees with small dead wood, developing structural defects, located in semi-exposed sites, moderate esthetic value, and/or parts that are anticipated to negatively interact with infrastructure, such as branches that touch buildings, interfere with signage or lighting, or obstruct pathways.

Priority 3 To be addressed in year 3 of the management cycle. Priority 3 may include trees with small dead wood, developing structural defects, located in lesser used sites, and/or parts that are anticipated to negatively interact with infrastructure, such as branches that rub on buildings, interfere with signage or lighting, or obstruct pathways.

Pruning

Each of the following is a selective pruning technique to achieve the pruning goal described:

Clean	Remove one or more of dead, diseased, and/or broken branches
Raise	Provide vertical clearance
Thin	Reduce height or spread, sometimes for a particular branch (overextended or co-dominant)
Reduce	Reduce height or spread
Structural	Select live branches and stems to influence orientation, spacing, growth rate, strength of attachment, and ultimate size of branches and stems; possibly to reduce defects or space main branches on mature trees.
Vista	A combination of thinning and reduction pruning to enhance the view from a vantage point to an area of interest while minimizing negative impacts on tree structure and health.

Tree Risk Assessments, Limitations & Glossary

In accordance with industry standards, tree risk ratings are derived from a combination of three factors: the *likelihood of failure*, the *likelihood of the failed tree part impacting a target*, and the *consequences* of the target being struck. The guidelines used to classify each of these factors are presented in the *ISA's BMP for Tree Risk Assessment* and guidelines developed by the Bartlett Tree Research Laboratories. *These factors are then used to categorize tree risk as Extreme, High, Moderate or Low*. The factors used to define your risk ratings are identified in this report. An explanation of terms used in this report appears in the glossary located in the appendix. The information provided in this report is based on the conditions identified at the time of inspection. Tree conditions do change over time so reassessment is recommended annually and after major storm events.

Limitations of Tree Risk Assessments

It is important for the tree owner or manager to know and understand that all trees pose some degree of risk from failure or other conditions. The information and recommendations within this report have been derived from the level of tree risk assessment identified in this report, using the information and practices outlined in the *International Society of Arboriculture's Best Management Practices for Tree Risk Assessment*, as well as the information available at the time of the inspection. However, the overall risk rating, the mitigation recommendations, or any other conclusions do not preclude the possibility of failure from undetected conditions, weather events, or other acts of man or nature. Trees can unpredictably fail even if no defects or other conditions are present. It is the responsibility of the tree owner or manager to schedule repeat or *advanced assessments*, determine actions, and implement follow up recommendations, monitoring and/or mitigation.

Bartlett Tree Experts can make no warranty or guarantee whatsoever regarding the safety of any tree, trees, or parts of trees, regardless of the level of tree risk assessment provided, the risk rating, or the residual risk rating after mitigation. The information in this report

should not be considered as making safety, legal, architectural, engineering, landscape architectural, land surveying advice or other professional advice. This information is solely for the use of the tree owner and manager to assist in the decision making process regarding the management of their tree or trees. Tree risk assessments are simply tools which should be used in conjunction with the owner or tree manager's knowledge, other information and observations related to the specific tree or trees discussed, and sound decision making.

Glossary

Tree risk assessment has a unique set of terms with specific meanings. Definitions of all specific terms may be found in the International Society of Arboriculture's *Best Management Practice for Tree Risk Assessment*. Definitions of some of these terms used in this report are as follows:

The *likelihood of failure* may be categorized as imminent meaning that failure has started or could occur at any time; probable meaning that failure may be expected under normal weather conditions within the next 3 years; possible meaning that failure could occur, but is unlikely under normal weather conditions during that time frame; and improbable meaning that failure is not likely under normal weather conditions, and may not occur in severe weather conditions during that time frame.

The likelihood of the failed tree part impacting a target may be categorized as high meaning that a failed tree or tree part will most likely impact a target; medium meaning the failed tree or tree part could impact the target, but is not expected to do so; low meaning that the failed tree or tree part is not likely to impact a target; and very low meaning that the chance of a failed tree or tree part impacting the target is remote.

The *likelihood of failure and impact* is defined by the Likelihood Matrix below.

LIKELIHOOD OF FAILURE AND IMPACT

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

The *consequences* of a known target being struck may be categorized as severe meaning that impact could involve serious personal injury or death, damage to high value property, or disruption to important activities; significant meaning that the impact may involve personal injury, property damage of moderate to high value, or considerable disruption; minor meaning that impact could cause low to moderate property damage, small disruptions to traffic or a communication utility, or minor injury; and negligible meaning that impact may involve low value property damage, disruption that can be replaced or repaired, and do not involve personal injury.

Targets are people, property, or activities that could be injured, damaged or disrupted by a tree failure.

Levels of assessment 1) *Limited visual assessments* are conducted to identify obvious defects. 2) *Basic assessments* are visual inspections done by walking around the tree looking at the site, buttress roots, trunk and branches. It may include the use of simple tools to gain information about the tree or defects. 3) *Advanced assessments* are performed to provide detailed information about specific tree parts, defects, targets of site conditions. Drilling to detect decay is an advanced assessment technique.

Tree Risk Ratings are terms used to communicate the level of risk rating. They are defined in defined in the Risk Matrix below as a combination of Likelihood and Consequences:

ISA RISK MATRIX

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

Overall tree risk rating is the highest individual risk identified for the tree. The *residual risk* is the level of risk the tree should pose after the recommended mitigation.

Bartlett Tree Experts can inventory trees that have ropes courses, zip lines, swings, tree houses, or any other life support system attached for several different attributes; however, Bartlett Tree Experts is unable to provide tree risk assessment information on such trees, nor is Bartlett Tree Experts able to determine whether the correct hardware has been used, the systems are attached to the trees correctly, or whether the trees can withstand the additional forces that are placed on the tree or trees from such systems or structures. Bartlett Tree Experts does not recommend that any hardware or structures, other than those recommended by and installed by qualified arborists to aid the tree in structural support or protections from lightning, be installed in or attached to any tree(s). Bartlett Tree Experts recommends removing, or discontinuing the use of, any such system or recreational

structure until the Client hires or consults with an engineer/specialist that deals specifically with ropes courses, zip lines, swings, tree houses, or any other life support systems and how they attach to and impact trees to determine if the trees can handle the forces being placed on them.

STAND DYNAMICS RESULTS

STAND DYNAMICS RESULTS

In reviewing the results and recommendations, the reader will find useful the specifications and definitions detailed in the preceding methodology above. We used the following categories to organize the stand dynamics results, which are displayed in tables:

- **Tree Risk Assessment Report and Mitigation**
- **Subject Trees Summarized According to:**
    - Tree Species Identified
    - Condition Class
    - Age Class
    - Tree Size per DBH
    - Estimated Tree Asset Value

Where appropriate, we have included explanations, photos, drawings, or other information to illuminate the table contents.

Tree Risk Assessment Report and Mitigation

As part of the inventory process, the Inventory Team conducts a *basic assessment (Level 2)* from the ground. While every tree poses a risk, typically *Low*, the trees in the following table were assigned *likelihood of failure, likelihood of the failed tree part impacting a target, and consequences* ratings in the field. The Inventory Team found conditions with these trees that posed a hazardous situation, prompting the arborists to go through the steps outlined in the Tree Risk Assessments, Limitations, and Glossary section of this plan. *Overall risk ratings* were then assigned to these trees.

The Tree Risk Table below summarizes the inventoried trees that were observed posing a hazardous situation during the course of the inventory. The table is organized first by *Overall Risk Rating* (highest to lowest), then by Tree Care Priority (ascending order), and finally by Tree ID (ascending order).

TREE RISK ASSESSMENT REPORT AND MITIGATION (2 Trees)

Tree ID	Common Name	DBH	Condition	Overall Risk Rating	Primary Target	Tree Care Priority	Pruning	Defect(s) or Observation(s)
157	Maple-Norway	27	Poor	Moderate	Street	1	Remove	• Decay-Stem • Crack-branch
32	Maple-Norway	20	Poor	Low	Street	2	Remove	• Uneven crown • Wound-stem

INVENTORIED TREES ASSIGNED RISK RATINGS AT THE TIME OF DATA COLLECTION

Overall Risk Rating: Low Moderate

Stand Dynamics

Tree Species Identified

Our inventory revealed 23 species of trees, as detailed in the following table:

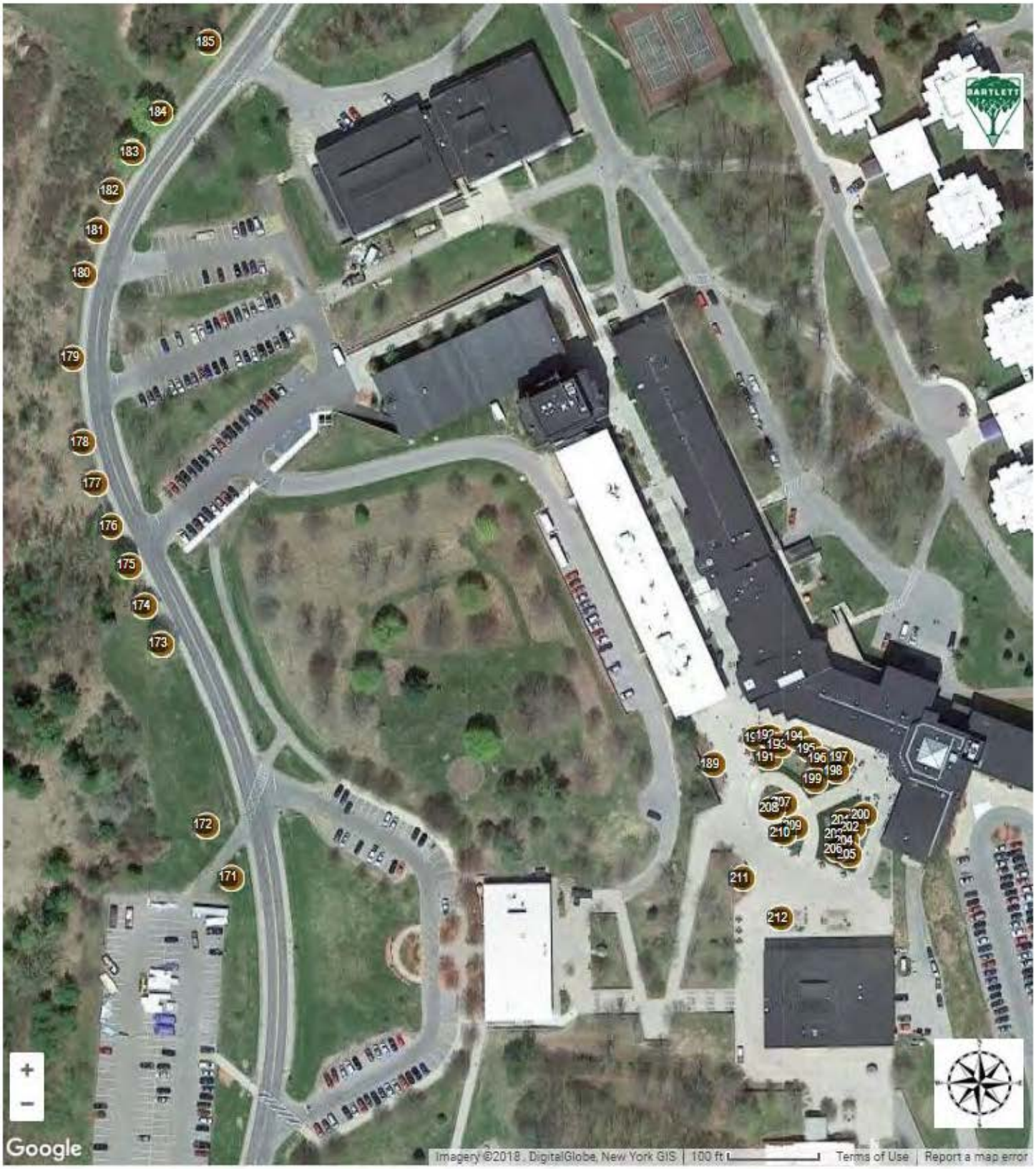
TREE SPECIES IDENTIFIED

Genus	Species	Common Name	Count	% Distribution Total
Acer	*platanoides*	Maple-Norway	110	52%
	rubrum	Maple-Red	6	3%
	saccharum	Maple-Sugar	12	6%
***Acer* Total**			**128**	**60%**
Amelanchier	*arborea*	Serviceberry-Downy	1	< 1%
Catalpa	*speciosa*	Catalpa-Northern	1	< 1%
Crataegus	sp.	Hawthorn	2	1%
Fraxinus	*americana*	Ash-White	13	6%
	pennsylvanica	Ash-Green	22	10%
***Fraxinus* Total**			**35**	**17%**
Gleditsia	*triacanthos* var. inermis	Honeylocust-Thornless Common	2	1%
Gymnocladus	*dioicus*	Coffeetree-Kentucky	1	< 1%
Liriodendron	*tulipifera*	Tuliptree	1	< 1%
Magnolia	sp.	Magnolia	1	< 1%
Malus	*domestica*	Apple-Common	2	1%
	sp.	Crabapple	11	5%
***Malus* Total**			**13**	**6%**
Picea	*pungens*	Spruce-Colorado Blue	9	4%
Pinus	*nigra*	Pine-Austrian	2	1%
	strobus	Pine-Eastern White	1	< 1%
***Pinus* Total**			**3**	**1%**
Pyrus	*communis*	Pear-Common	1	< 1%
Quercus	*macrocarpa*	Oak-Bur	1	< 1%
	rubra	Oak-Northern Red	8	4%
***Quercus* Total**			**9**	**4%**
Syringa	*reticulata*	Lilac-Japanese Tree	1	< 1%
Tilia	*americana*	Linden-American	2	1%
	cordata	Linden-Littleleaf	2	1%
***Tilia* Total**			**4**	**2%**
Grand Total			**212**	**100%**

2018 TREE INVENTORY (SOUTH)

2018 TREE INVENTORY (CENTRAL)

2018 TREE INVENTORY (NORTH)

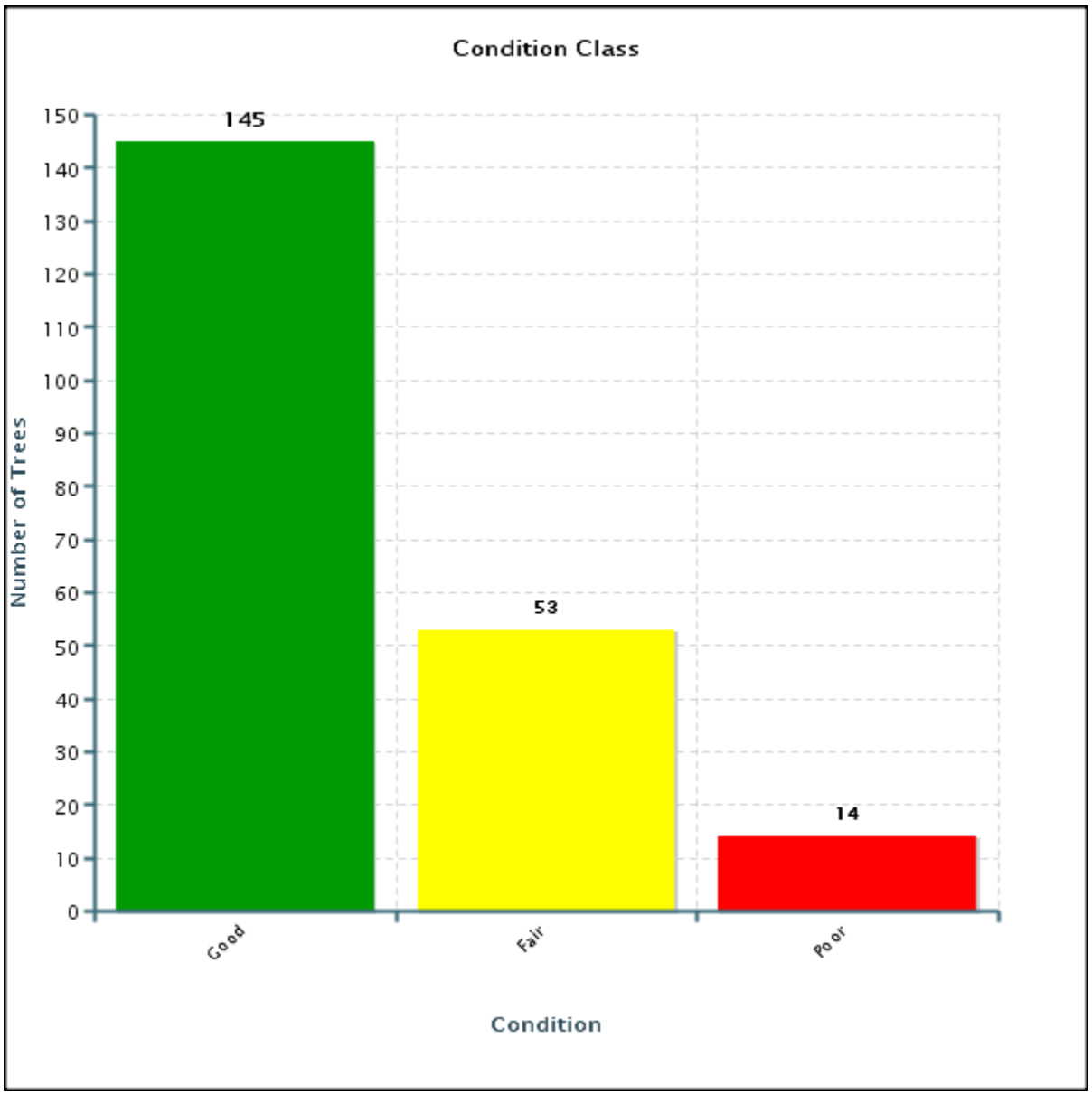


Condition Class

The breakdown of tree condition follows:

CONDITION CLASS BREAKDOWN

Condition Class	Quantity	% of Total
Good	145	68%
Fair	53	25%
Poor	14	7%



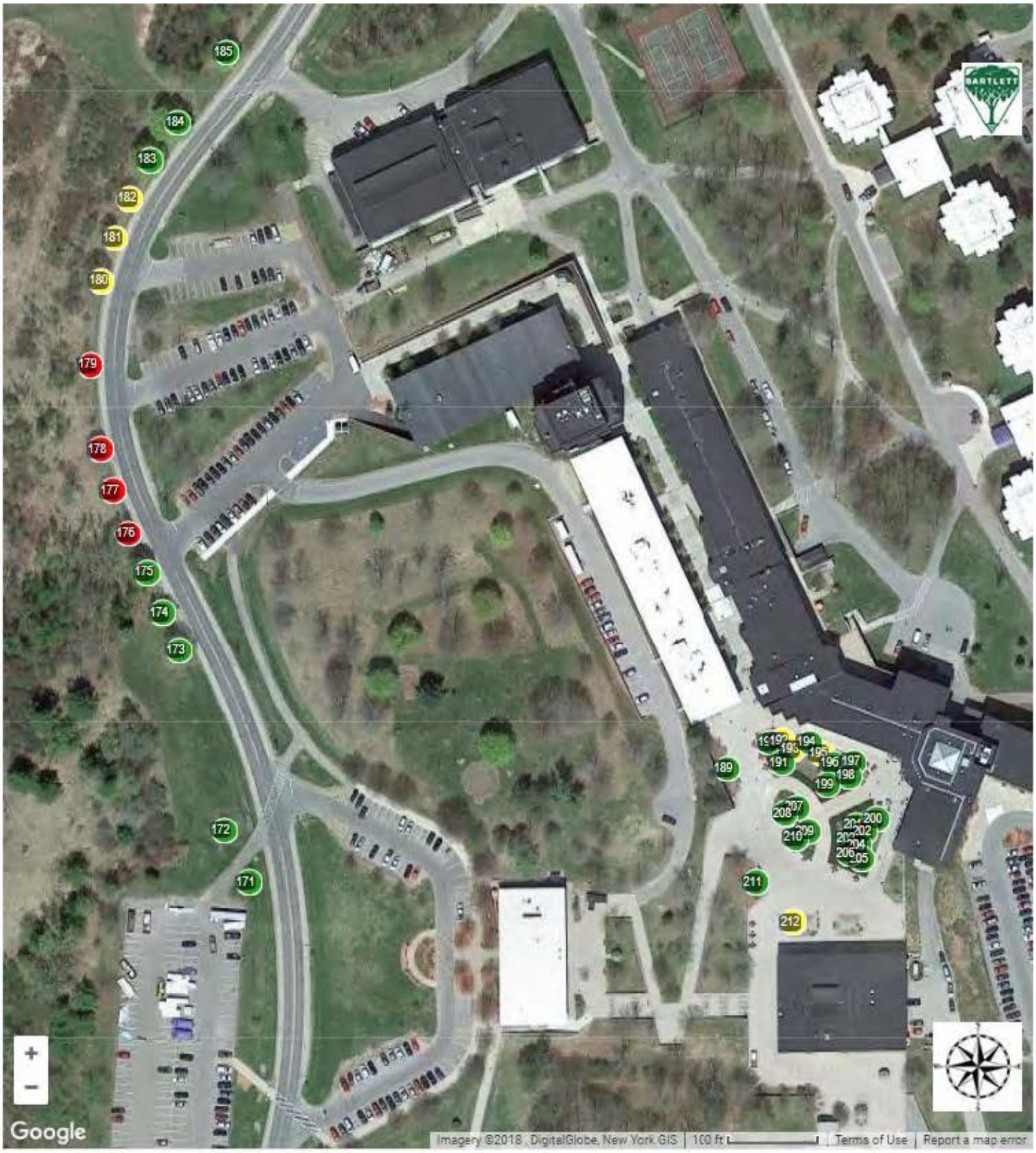
INVENTORIED TREES BY CONDITION CLASS (SOUTH)

Condition: Good Fair Poor

INVENTORIED TREES BY CONDITION CLASS (CENTRAL)

Condition: Good Fair Poor

INVENTORIED TREES BY CONDITION CLASS (NORTH)



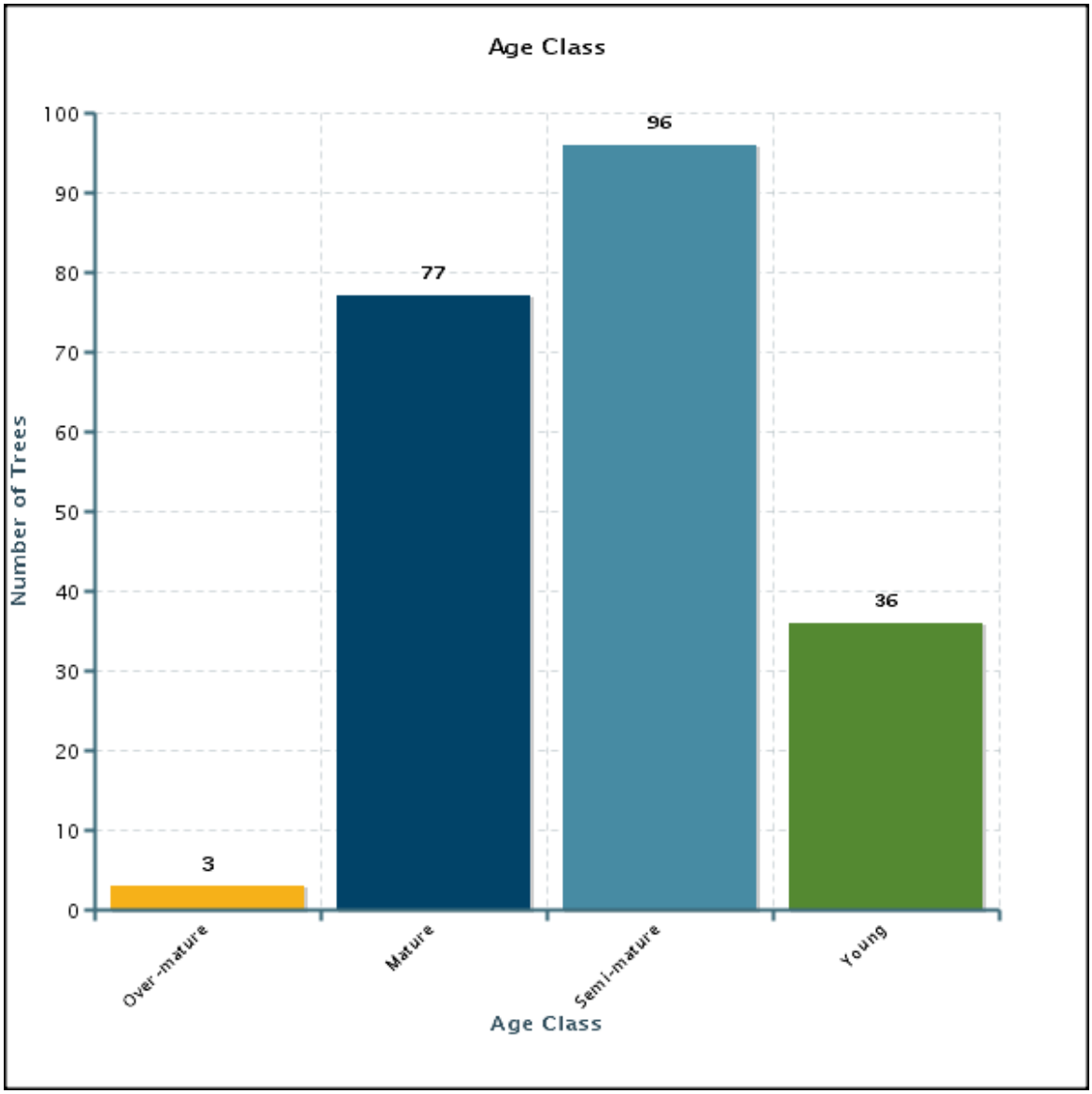
Condition: Good Fair Poor

Age Class

The breakdown of tree age class follows:

AGE CLASS BREAKDOWN

Age Class	Quantity	% of Total
Over-mature	3	1%
Mature	77	36%
Semi-mature	96	45%
Young	36	17%



INVENTORIED TREES BY AGE CLASSS (SOUTH)

Age: Young Semi-Mature Mature Over-Mature

INVENTORIED TREES BY AGE CLASS (CENTRAL)

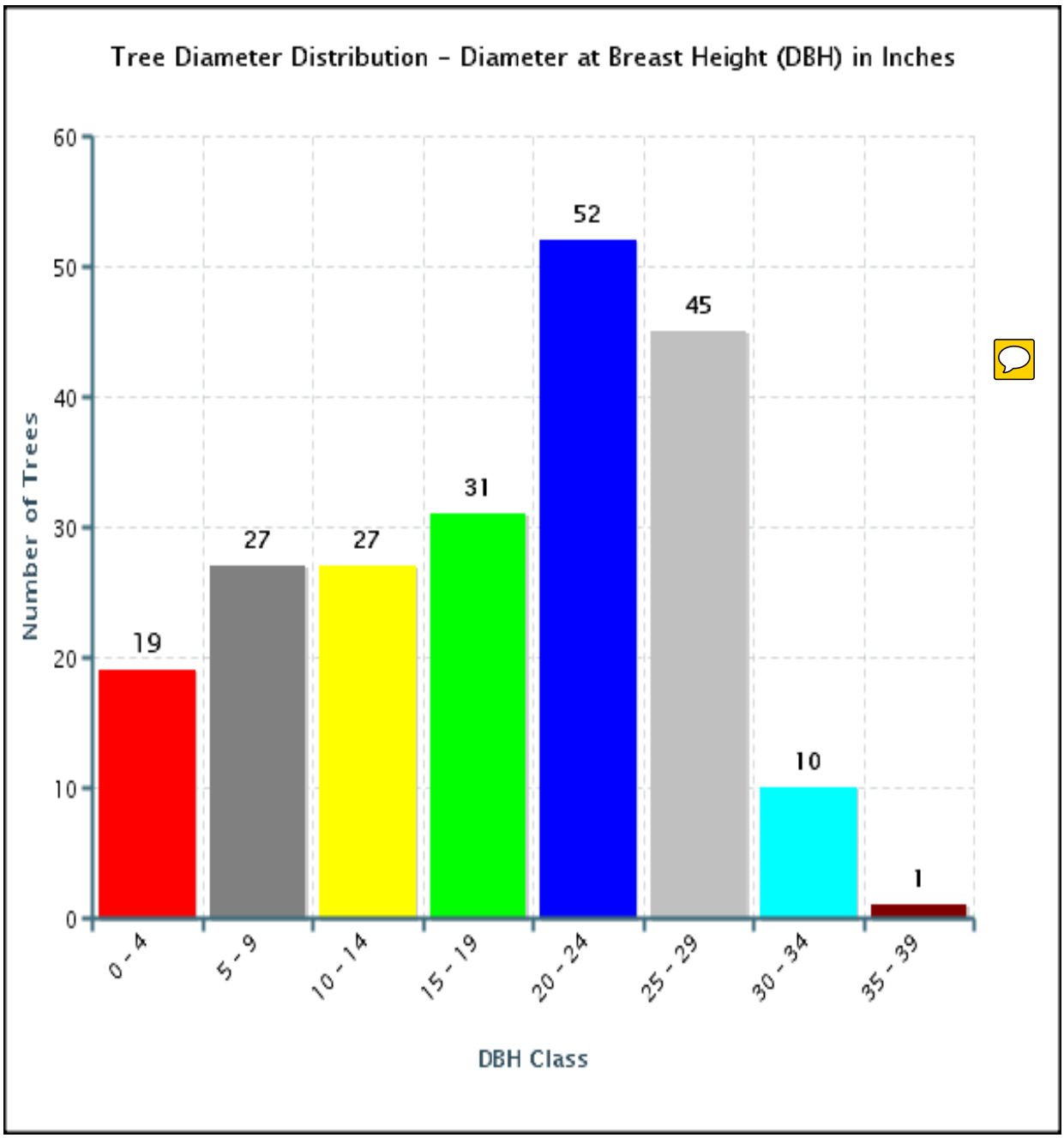
Age: Young | Semi-Mature | Mature | Over-Mature

INVENTORIED TREES BY AGE CLASS (NORTH)

Age: Young Semi-Mature Mature Over-Mature

Tree Size (DBH)

The following chart illustrates numbers of trees according to size per DBH:



Estimated Tree Asset Value

As part of the Bartlett inventory process, we have included an Estimated Tree Asset Value for each tree and a cumulative total for all trees inventoried. We use an average per square inch nursery price, size (DBH), species factor, condition factor, and location factor to estimate the tree asset value. This is not intended to replace a tree appraisal.

The following data fields are used in this formula:

Data Field	Description
Average Per Square Inch Nursery Price	Based on the average nursery prices for two common tree species and one exotic tree species within a region, then taking the average of those three as the average per square inch price for the region
Size	Based on tree DBH (4.5 feet above grade)
Species Factor	Relative species desirability based on 100% for the tree in that geographical location. In most cases, species desirability ratings, published by the International Society of Arboriculture, are used for adjustment.
Condition Factor	Rating of the tree's structure and health based on 100%
Location Factor	Average rating for the site and the tree's contribution and placement, based on 100%

Estimated Tree Asset Value = (Average Per Square Inch Nursery Price*Size)*Species Factor*Condition Factor*Location Factor

The estimated cumulative total value for all trees inventoried is **$1,602,744.20**. The following table lists the ten trees with the highest Tree Asset Values:

TOP TEN TREES - HIGHEST ESTIMATED TREE ASSET VALUE

Tree ID	Common Name	Genus	Species	DBH	Tree Asset Value
129	Maple-Norway	*Acer*	*platanoides*	34	$24,200.43
55	Oak-Northern Red	*Quercus*	*rubra*	26	$20,801.87
101	Ash-White	*Fraxinus*	*americana*	34	$20,743.23
164	Maple-Norway	*Acer*	*platanoides*	37	$19,962.31
159	Ash-White	*Fraxinus*	*americana*	33	$19,641.20
94	Ash-Green	*Fraxinus*	*pennsylvanica*	33	$19,641.20
95	Maple-Norway	*Acer*	*platanoides*	29	$18,115.48
96	Oak-Northern Red	*Quercus*	*rubra*	24	$17,724.67
128	Oak-Northern Red	*Quercus*	*rubra*	24	$17,724.67
144	Maple-Sugar	*Acer*	*saccharum*	25	$17,309.25

TOP TEN TREES - HIGHEST TREE ASSET VALUE

Condition: Good Fair

RECOMMENDATIONS

RECOMMENDATIONS

In reviewing the results and recommendations, the reader will find useful the specifications and definitions detailed in the preceding methodology. We used the following categories to organize the results and recommendations, which are displayed in tables:

Recommendations

- Soil Care and Fertilization
- Plant Health Care
- Tree Pruning
- Structural Support Systems
- Lightning Protection Systems
- Tree Removal
- Tree Risk *Advanced Assessments (Level 3)*

Soil Care and Fertilization

Healthy soil is critical to the health and longevity of trees. Soil provides trees with the essential nutrients required for their growth. Many secondary problems such as reduced vigor, inadequate growth, branch dieback, and pest or disease concerns are related to the primary stress of poor soil conditions. Undisturbed, native forest soils generally contain adequate levels of organic matter, soil microbes, and nutrients. Urban, suburban, and landscape soils (as opposed to forest soils) usually lack these qualities, and are often compacted. In many cases, trees in a landscaped environment suffer from inadequate soil fertility, soil compaction, root zone competition with turf grasses, and inadequate total soil volume. Soil care recommendations are intended to correct these concerns and improve or maintain overall plant health.

Bartlett Tree Experts recommends several procedures and treatments that address soil quality. Taking soil samples is perhaps the most important. Proper tree care cannot be initiated unless it is known what type of soil environment the trees are growing in. Soil testing results can help to create a path forward for improved tree health. We address some of these below.

Soil Sampling

Collecting soil samples and having them tested helps determine nutrients that may be lacking, unfavorable soil pH values, and adequacy of soil organic matter. Laboratory tests and analyses can determine the need for soil amendments.

Bulk Density

Compacted soils are regrettably common in the urban setting. A bulk density test, which requires an undisturbed core sample, measures the level of soil compaction. Arborists can use the results to diagnose problems or to determine what size holes to dig for planting. If soil density exceeds a measured threshold for a given soil type and tree species, we recommend Bartlett's Root Invigoration™ program.

Soil Rx®

Bartlett's Soil Rx® program, which is a prescription fertilization program, aims to correct nutrient deficiencies and optimize soil conditions for designated trees.

Root Invigoration™

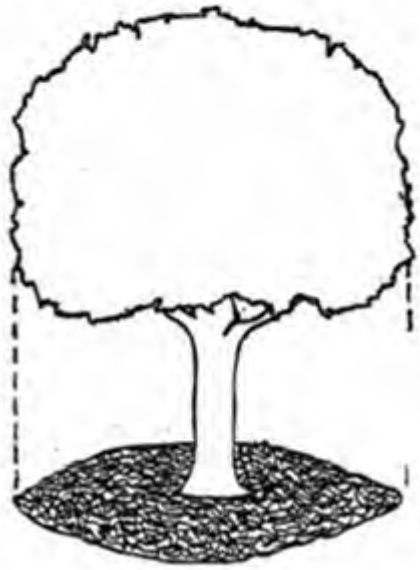
The aim of Bartlett's patented Root Invigoration™ Program is to improve soil conditions by addressing soil compaction and promoting efficient root growth, especially for high-value trees in disturbed areas. The process includes taking soil samples to determine what nutrients are deficient, performing a root collar excavation, "air-tilling" a portion of the root zone to find fine roots, incorporating organic matter, fertilizing (based on soil sample), and applying mulch. The area of the root system treated can vary by tree. For the Root Invigoration™ Program to be successful, proper watering techniques must be employed after

Mulch Application

Proper mulching (top left and bottom left) provides many benefits to trees and shrubs. It moderates soil temperatures, reduces soil moisture loss, reduces soil compaction, provides nutrients, and improves soil structure. This practice results in more root growth and healthier plants. The image on the top right illustrates root growth density under grass versus mulch. Mulch is frequently applied incorrectly (bottom right), so we recommend that readers inspect the technical report on mulch application guidelines that appears in the Appendix.

Example of how mulch should be installed, 2-4 inches thick and not against the trunk.

Example of root density under grass versus mulch.



Example of how mulch should be applied from the trunk to the dripline.

Example of improper mulch application, known as "volcano mulch".

The following inventoried trees are recommended for soil management because of possible nutrient deficiencies, soil compaction, or inadequate soil conditions:

INVENTORIED TREES RECOMMENDED FOR SOIL MANAGEMENT (40 Trees)

Tree ID	Common Name	DBH	Soils Management Type
10	Maple-Norway	25	Soil Rx ®
16	Maple-Norway	28	Soil Rx ®
19	Maple-Norway	26	Soil Rx ®
20	Maple-Norway	25	Soil Rx ®

Tree ID	Common Name	DBH	Soils Management Type
22	Maple-Norway	22	Soil Rx ®
23	Maple-Norway	27	Soil Rx ®
24	Maple-Norway	25	Soil Rx ®
25	Maple-Norway	4	Root Invigoration ™
26	Maple-Norway	27	Soil Rx ®
28	Maple-Norway	26	Soil Rx ®
29	Maple-Sugar	6	Root Invigoration ™
35	Maple-Norway	21	Soil Rx ®
37	Maple-Norway	25	Soil Rx ®
46	Maple-Norway	27	Soil Rx ®
55	Oak-Northern Red	26	Soil Rx ®
60	Maple-Red	27	Soil Rx ®
61	Honeylocust-Thornless Common	27	Soil Rx ®
65	Maple-Norway	27	Soil Rx ®
72	Maple-Norway	25	Soil Rx ®
85	Maple-Red	12	Root Invigoration ™
94	Ash-Green	33	Soil Rx ®
95	Maple-Norway	29	Soil Rx ®
101	Ash-White	34	Soil Rx ®
106	Ash-Green	26	Soil Rx ®
116	Maple-Norway	27	Soil Rx ®
119	Maple-Norway	28	Soil Rx ®
120	Maple-Norway	26	Soil Rx ®
127	Maple-Norway	25	Soil Rx ®
129	Maple-Norway	34	Soil Rx ®
134	Maple-Norway	28	Soil Rx ®
142	Maple-Norway	25	Soil Rx ®
144	Maple-Sugar	25	Soil Rx ®
145	Maple-Norway	27	Soil Rx ®
149	Maple-Norway	25	Soil Rx ®
154	Maple-Norway	25	Soil Rx ®
156	Maple-Norway	26	Soil Rx ®
159	Ash-White	33	Soil Rx ®
161	Maple-Norway	25	Soil Rx ®
183	Maple-Norway	25	Soil Rx ®
184	Maple-Norway	28	Soil Rx ®

INVENTORIED TREES RECOMMENDED FOR SOIL MANAGEMENT

Root Collar Excavation

Excavating the root collar is necessary for trees whose buttress roots are covered by excess soil or mulch. Buried root collars can contribute to tree health problems, including girdling roots, basal cankers, and masking root and lower stem decay.

The top image shows a buried root collar and the bottom image shows an exposed root collar.

Example of a buried root collar.

Example of an exposed root collar.

Girdling Roots

Girdling roots (top left and right) restrict water and nutrient movement throughout the tree. If left untreated they can cause the tree to decline, fail (bottom), and eventually die in severe cases. Girdling roots should be removed as soon as possible, unless removal will significantly impact the condition of the tree. In some cases, the presence of significant or severe girdling roots may cause the tree to be recommended for removal.

Examples of girdling roots.

Example of tree failure from girdling roots.

The following trees are recommended for a root collar excavation:

INVENTORIED TREES RECOMMENDED FOR A ROOT COLLAR EXCAVATION (19 Trees)

Tree ID	Common Name	DBH	Girdling Roots
1	Spruce-Colorado Blue	7	...
2	Spruce-Colorado Blue	5	...
12	Maple-Norway	23	Girdling roots present
16	Maple-Norway	28	Girdling roots present
17	Maple-Norway	3	...
29	Maple-Sugar	6	...
31	Maple-Sugar	4	...
78	Maple-Norway	19	Girdling roots present
81	Maple-Red	13,10,9	Girdling roots present
85	Maple-Red	12	...
108	Maple-Norway	21	Girdling roots present
111	Maple-Norway	23	Girdling roots present
114	Maple-Sugar	4	...
115	Maple-Norway	21	Girdling roots present
117	Maple-Norway	24	Girdling roots present
122	Maple-Norway	6	...
131	Maple-Norway	24	Girdling roots present
145	Maple-Norway	27	Girdling roots present
187	Maple-Norway	2	...

INVENTORIED TREES RECOMMENDED FOR A ROOT COLLAR EXCAVATION

Condition: Good Fair

Plant Health Care

The Inventory Team also recommends Plant Health Care (PHC) programs for trees in the formal landscape. In addition, an Integrated Pest Management (IPM) program monitors for potentially damaging insects, diseases and cultural problems that are often seasonal and may not have been evident during our inventory visit. These pests and diseases include, but are not limited to, the following:

- Anthracnose - on a variety of species
- Aphids - on a variety of species
- Bacterial Leaf Scorch - on trees within red oak group
- Bagworms - on a variety of tree species
- Boring Insects - on a variety of tree species
- Caterpillar Defoliators - on a variety of tree species, especially oak
- Gall Insects - on a variety of species
- Lacebugs - on a variety of species
- Scab and Rust Fungi - on crabapple and apple species.
- Suspected Phytophthora Root Rot and Canker - on a variety of tree species, especially beech species
- Scale Insects - on a variety of tree species, especially oak
- Spider Mites - on a variety of tree species
- Tar Spot – on Norway maple

Tree #142 with tar spot present.

We identified pests or diseases and/or provided plant health care recommendations on the following inventoried trees at the time of the inventory:

INVENTORIED TREES IDENTIFIED FOR PLANT HEALTH CARE (18 Trees)

Tree ID	Common Name	DBH	Pest(s) or Disease(s)
5	Spruce-Colorado Blue	11	• Borers
7	Apple-Common	8,6	• Rust
11	Maple-Norway	19	• Tar spot
12	Maple-Norway	23	• Tar spot
17	Maple-Norway	3	• Tar spot
18*	Maple-Norway	33	• Tar spot
20	Maple-Norway	25	• Tar spot
21	Maple-Norway	5	• Tar spot
38*	Maple-Norway	23	• Tar spot
43	Maple-Norway	20	• Tar spot
45	Maple-Norway	17	• Tar spot
70	Ash-Green	24	• Borers
73	Ash-Green	8	• Borers
84	Ash-Green	14	• Borers
103	Oak-Bur	19	• Sapsucker
105	Ash-White	25	• Borers
142	Maple-Norway	25	• Tar spot
146	Ash-White	16	• Borers

* Trees that are recommended for removal in the Tree Removal Section

INVENTORIED TREES IDENTIFIED FOR PLANT HEALTH CARE

Tree Pruning

A commonly offered service among tree companies, pruning trees is one of the most poorly executed practices by tree workers who lack training in the basics of tree biology. "Lion's tailing," topping, and flush cuts are a few examples, and these can lead to hazardous conditions over time.

Because this practice is so misunderstood, and because specific standards exist to perform pruning correctly, the Inventory Team decided to include some explanation in the main body of this management plan.

Tree owners and tree-care practitioners should always keep in mind that any pruning cut is a wound. Informed tree-care professionals have learned to manage that wounding to preserve the health, safety, and integrity of the tree.

Improper Pruning Practices

A few of the most common pruning abuses are

- Lion's Tailing - pruning that removes interior branches along the stem and scaffold branches. This encourages poor branch taper, poor wind load distribution, and risk of branch failure. It also deprives the tree of foliage it needs to produce **photosynthates**. See next page, top left
- Topping - pruning cuts that reduce a tree's size by using heading cuts that shorten branches to a predetermined size. Topping substantially reduces the functional benefits a tree is capable of providing and predisposes trees to structural defects that can contribute to failures in the future. It also reduces the value of the trees substantially and deprives the tree of adequate foliage. See next page, top right.
- Flush Cuts - pruning cut through the **branch collar**, flush against the trunk or parent stem, causing unnecessary injury. See next page, bottom.
- Using Climbing Spikes Inappropriately - Using climbing spikes on a healthy tree, for example, wounds healthy stem tissues and can lead to infection by fungal pathogens.

Example of Lion's tailing.

Examples of topping.

Examples of flush cuts.

Correct Pruning Practices

We have included below some key pruning categories and diagrams to illuminate the goal of each.

Cleaning
Selective pruning to remove one or more of the following parts: dead, diseased, and/or broken branches.

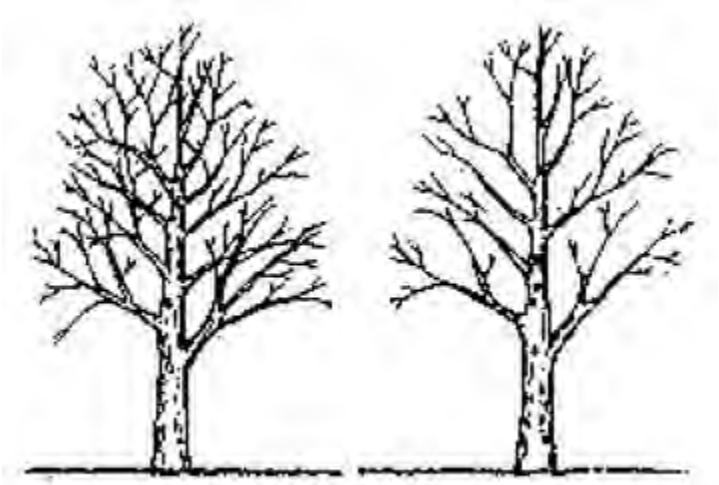


Illustration of crown cleaning.

Raising
Selectively pruning to provide vertical clearance.

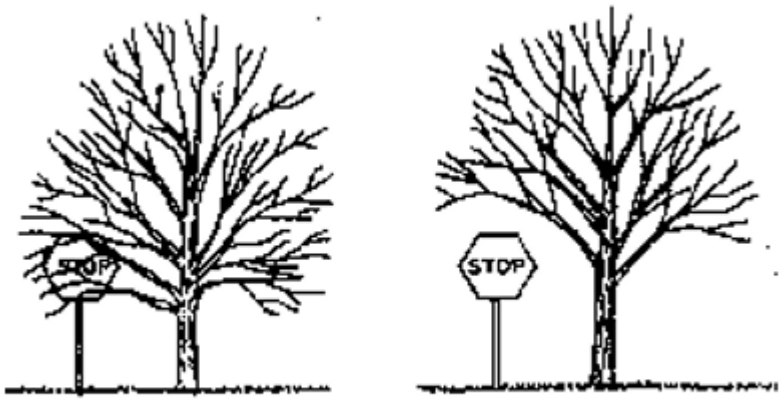


Illustration of crown raising.

Thinning
Selective pruning to reduce density of live branches.

Illustration of thinning.

Reducing (Reduction Pruning)
Selective pruning to reduce height or spread.

Illustration of reduction pruning.

Structural
Selective pruning of live branches and stems to influence orientation, spacing, growth rate, strength of attachment, and ultimate size of branches and stems.

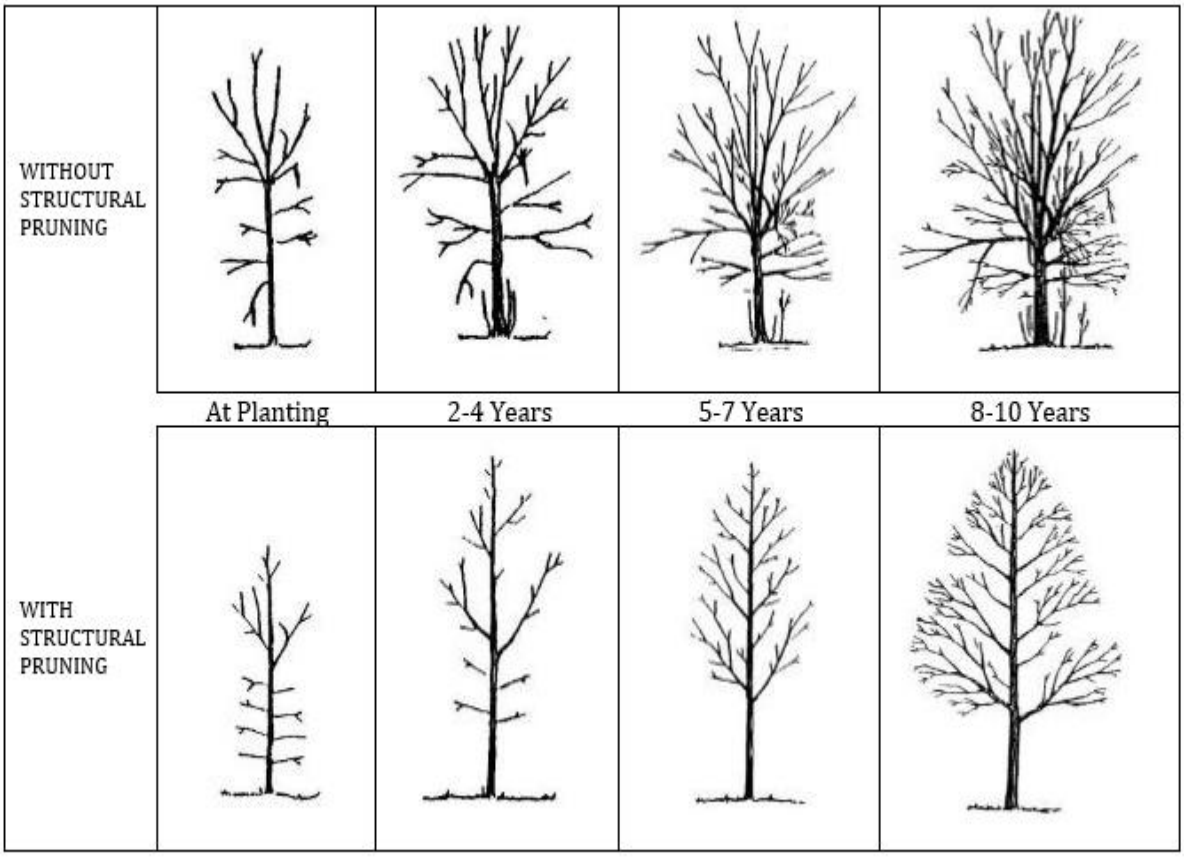


Illustration of structural pruning.

Vista Pruning
Vista pruning is a combination of thinning and reduction pruning to enhance the view from a vantage point to an area of interest while minimizing negative impacts on tree structure and health.

We recommended pruning on the following trees:

INVENTORIED TREES RECOMMENDED FOR PRUNING (63 Trees)

Tree ID	Common Name	DBH	Tree Care Priority	Pruning Recommended
28	Maple-Norway	26	1	• Clean
60	Maple-Red	27	1	• Clean • Thin
72	Maple-Norway	25	1	• Clean
101	Ash-White	34	1	• Clean
105	Ash-White	25	1	• Clean
116	Maple-Norway	27	1	• Clean
119	Maple-Norway	28	1	• Clean • Thin
128	Oak-Northern Red	24	1	• Clean
141	Maple-Norway	24	1	• Clean • Thin
6	Oak-Northern Red	15	2	• Structural
7	Apple-Common	8,6	2	• Structural
10	Maple-Norway	25	2	• Clean
16	Maple-Norway	28	2	• Clean
20	Maple-Norway	25	2	• Clean
22	Maple-Norway	22	2	• Clean
26	Maple-Norway	27	2	• Clean
34	Maple-Norway	22	2	• Clean
58	Ash-Green	24	2	• Clean
61	Honeylocust-Thornless Common	27	2	• Clean • Thin
63	Maple-Norway	24	2	• Clean
71	Maple-Red	17	2	• Thin • Structural
74	Maple-Norway	19	2	• Clean • Thin
75	Maple-Norway	21	2	• Clean • Thin
79	Maple-Norway	19	2	• Clean • Thin • Structural
85	Maple-Red	12	2	• Thin
87	Maple-Red	10	2	• Structural
88	Ash-Green	5	2	• Clean
99	Pine-Eastern White	24	2	• Clean
103	Oak-Bur	19	2	• Clean

Tree ID	Common Name	DBH	Tree Care Priority	Pruning Recommended
117	Maple-Norway	24	2	• Clean
127	Maple-Norway	25	2	• Clean
132	Maple-Sugar	20	2	• Clean • Thin • Structural
134	Maple-Norway	28	2	• Clean • Thin
135	Linden-American	18	2	• Thin
143	Maple-Norway	16	2	• Thin • Structural
145	Maple-Norway	27	2	• Clean • Thin
150	Maple-Norway	20	2	• Structural
151	Honeylocust-Thornless Common	18	2	• Clean
154	Maple-Norway	25	2	• Clean • Thin
155	Maple-Sugar	23	2	• Clean
156	Maple-Norway	26	2	• Clean
160	Maple-Norway	21	2	• Structural
161	Maple-Norway	25	2	• Structural
165	Oak-Northern Red	16	2	• Structural
172	Maple-Sugar	15	2	• Structural
173	Maple-Norway	22	2	• Structural
184	Maple-Norway	28	2	• Clean
17	Maple-Norway	3	3	• Structural
24	Maple-Norway	25	3	• Clean
25	Maple-Norway	4	3	• Structural
29	Maple-Sugar	6	3	• Structural
30	Maple-Sugar	5	3	• Structural
31	Maple-Sugar	4	3	• Structural
44	Maple-Sugar	6	3	• Structural
55	Oak-Northern Red	26	3	• Thin
102	Ash-White	13	3	• Structural
104	Oak-Northern Red	13	3	• Structural
107	Ash-Green	7	3	• Structural
114	Maple-Sugar	4	3	• Structural
122	Maple-Norway	6	3	• Structural
125	Maple-Norway	3	3	• Structural
133	Maple-Sugar	5	3	• Structural
169	Maple-Norway	24	3	• Clean • Thin

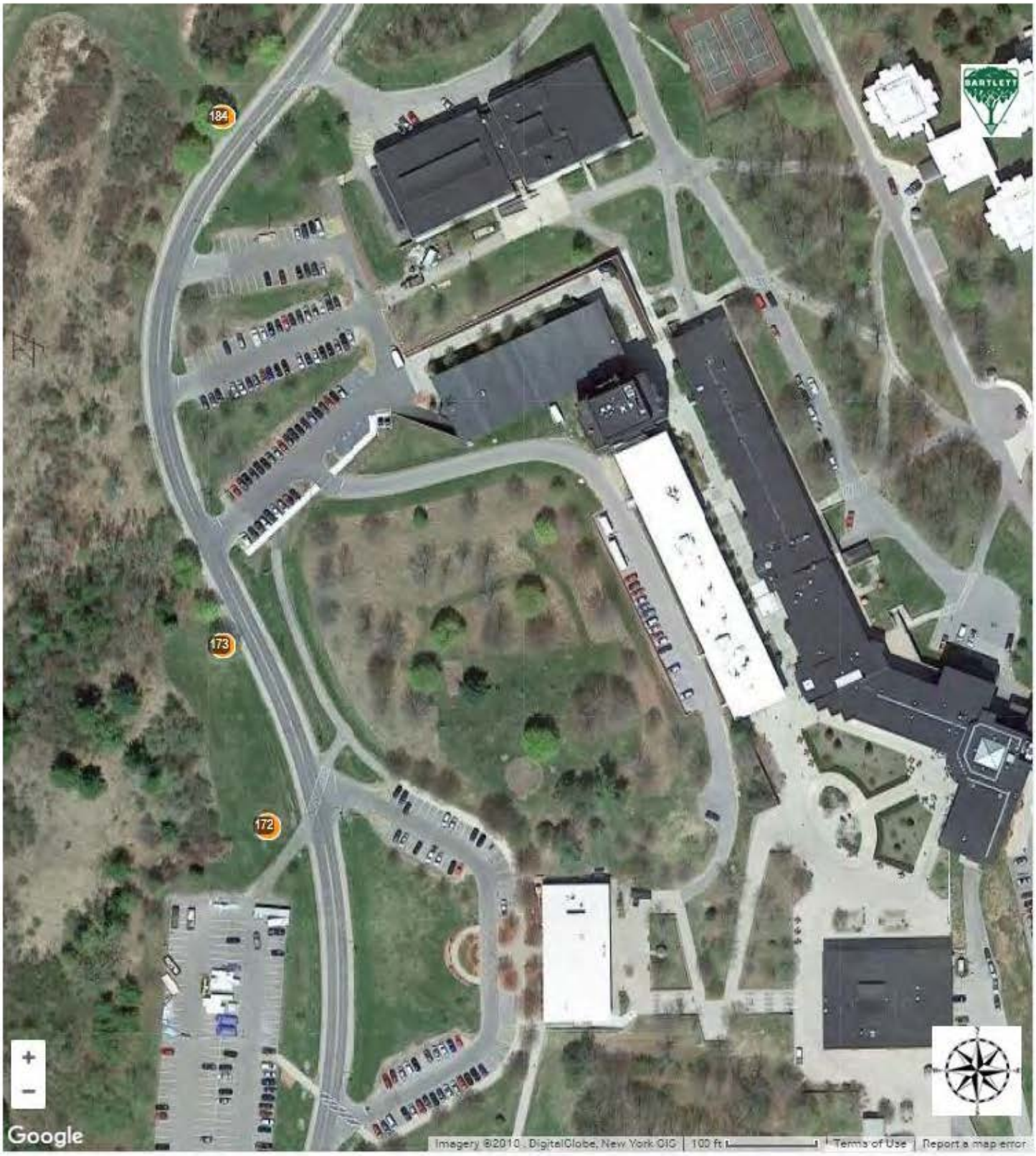
INVENTORIED TREES RECOMMENDED FOR PRUNING (SOUTH)

Tree Care Priority: 1 2 3

INVENTORIED TREES RECOMMENDED FOR PRUNING (CENTRAL)

Tree Care Priority: 1 2 3

INVENTORIED TREES RECOMMENDED FOR PRUNING (NORTH)



Tree Care Priority: 1 2 3

Structural Support Systems

Structural support systems can reduce risk of tree or tree part(s) failure by limiting movement of stems or branches in certain situations. Examples include co-dominant stems or overextended branches with heavy foliage loads.

Cabling

Cabling is the process of connecting two or more upright stems or leaders to one another to add stability and reduce the likelihood of failure. In some instances, a lateral branch may be secured to the central leader using a cabling system to support the weight of the branch.

Bracing

Bracing is the process of securing the union of two codominant leaders or stems using high strength steel rods to alleviate stresses at the union and reduce the likelihood of failure. Bracing may also be used to reinforce trees that have a partial failure and are likely to benefit from bracing.

Guying

Guying is the process of anchoring a tree's stem to the ground or another immovable object to reduce the likelihood of root failure. Guying can be temporary or permanent and is most often used for establishing a tree in the landscape.

Propping

Propping is the process of using rigid structures that are built on or into the ground to help support the trunk or branch(s) that are oriented near the ground in a horizontal position to reduce the likelihood of failure from the weight or defect of the tree part being supported.

Tree #128 recommended for cabling due to co-dominant leaders.

The following table lists all inventoried trees with structural support system recommendations:

INVENTORIED TREES WITH STRUCTURAL SUPPORT SYSTEM RECOMMENDATIONS (10 Trees)

Tree ID	Common Name	DBH	Tree Care Priority	Cable
28	Maple-Norway	26	1	New 2
46	Maple-Norway	27	1	New 1
72	Maple-Norway	25	1	New 3
101	Ash-White	34	1	New 1
119	Maple-Norway	28	1	New 3
128	Oak-Northern Red	24	1	New 2
141	Maple-Norway	24	1	New 2
59	Oak-Northern Red	21	2	New 1
134	Maple-Norway	28	2	New 2
135	Linden-American	18	2	New 2

INVENTORIED TREES WITH STRUCTURAL SUPPORT SYSTEM RECOMMENDATIONS

Structural Support: Cable

Lightning Protection Systems

Lightning strikes kill many people each year and can cause significant damage to objects on the property. Lightning protection systems are designed to provide a preferred path for lightning to the ground in a manner that minimizes tree damage; adjacent tree damage; and also to buildings, property, animals, and people near the tree. Tree species that are naturally more susceptible to lightning strikes, valuable to the landscape, and trees that are within 10 feet of, taller than, or have limbs that are extending over a structure are recommended for lightning protection systems due to the possibility of damage, "sideflashes", and step voltage.

At the time of inventory, no trees were recommended for lightning protection systems. However, as trees continue to grow and site changes occur, we recommend continual consultation with your local Bartlett Arborist Representative to determine if lightning protection systems are warranted in the future.

Tree Removal

In some cases, the inspector may determine need for removal while assessing the tree. The trees were based on a scale of five for the succession plan. Trees listed as priority one should be the first to be removed from the landscape due to their condition or structural defects. Trees listed as priority five should be removed in later years as their condition declines or other defects arise. Trees may be recommended for removal during the inventory for several reasons:

- The tree is dead;
- The tree is in poor condition and thought to be beyond rehabilitation;
- The tree is over-mature and will continue to decline in condition;
- The tree has significant structural weaknesses that cannot be addressed;
- The tree is already or will interfere with infrastructure (overhead lines for example);
- The location value for the tree is poor or unacceptable (for example, large maturing tree growing directly under overhead lines); and/or,
- The tree species has been declared an invasive for the given area or region.

Tree #66 recommended for removal because it is in poor condition and has a crack.

The tree(s) listed in the table below are recommended for removal:

INVENTORIED TREES RECOMMENDED FOR REMOVAL (38 Trees)

Tree ID	Common Name	DBH	Overall Risk Rating	Condition	Priority	Defect(s) or Observation(s)
157	Maple-Norway	27	Moderate	Poor	1	• Decay-Stem • Crack-branch
32	Maple-Norway	20	Low	Poor	2	• Uneven crown • Wound-stem
33	Maple-Norway	20	...	Poor	1	• Dieback (moderate) • Decay-Stem
47	Maple-Sugar	14	...	Poor	1	• Dieback (severe)
66	Maple-Norway	31	...	Poor	1	• Crack-stem
67	Ash-White	21	...	Poor	1	• Dieback (severe)
76	Maple-Norway	15	...	Poor	1	• Uneven crown • Dieback (moderate)
158	Maple-Sugar	17	...	Poor	1	• Dieback
163	Maple-Norway	26	...	Fair	1	• Decay-Stem • Dead branches >2
13	Maple-Norway	25	...	Fair	2	• Seam • Girdling roots present • Uneven crown
14	Maple-Norway	29	...	Fair	2	• Dieback (moderate) • Dead branches >2
18	Maple-Norway	33	...	Fair	2	• Decay-Stem • Uneven crown • Decay-Stem
77	Maple-Norway	24	...	Fair	2	• Decay-Stem
89	Maple-Norway	16	...	Poor	2	• Dieback (severe)
112	Maple-Norway	29	...	Fair	2	• Dieback • Seam • Cavity-Suspected
118	Maple-Norway	28	...	Fair	2	• Co-dominant leaders • Cavity-Suspected • Seam
124	Maple-Norway	27	...	Fair	2	• Cavity-Suspected • Dieback • Co-dominant leaders
164	Maple-Norway	37	...	Fair	2	• Cavity-stem • Poor branch structure
177	Maple-Norway	14	...	Poor	2	...
179	Maple-Norway	13	...	Poor	2	...
9	Maple-Norway	27	...	Fair	3	• Crack-stem • Decay-Stem

Tree ID	Common Name	DBH	Overall Risk Rating	Condition	Priority	Defect(s) or Observation(s)
15	Maple-Norway	31	...	Fair	3	• Storm damage • Cavity-Suspected • Seam
64	Maple-Norway	21	...	Fair	3	...
123	Coffeetree-Kentucky	14	...	Fair	3	• Wound-root flare • Dieback
152	Maple-Norway	32	...	Fair	3	• Wound-stem • Cavity-Suspected • Decay-Branch • Poor branch structure
166	Maple-Norway	24	...	Poor	3	• Cavity-stem
27	Maple-Norway	28	...	Fair	4	• Seam • Wound-stem
38	Maple-Norway	23	...	Fair	4	• Dieback (moderate) • Construction damage • Wound-root flare
93	Maple-Norway	30	...	Fair	4	• Storm damage • Wound-stem
110	Maple-Norway	30	...	Fair	4	• Rib • Dieback • Included bark
139	Maple-Norway	27	...	Fair	4	• Wound-branch • Uneven crown
168	Maple-Norway	24	...	Fair	4	• Wound-stem • Decay-Stem • Dieback
40	Maple-Norway	13	...	Fair	5	• Cavity-Suspected • Rib
48	Maple-Norway	20	...	Fair	5	• Rib
80	Maple-Norway	17	...	Fair	5	• Cavity-stem
136	Maple-Norway	27	...	Fair	5	• Storm damage • Wound-stem
137	Maple-Norway	23	...	Fair	5	• Wound-stem • Uneven crown
167	Maple-Norway	22	...	Fair	5	• Decay-Stem • Wound-stem • Cavity-Suspected

INVENTORIED TREES RECOMMENDED FOR REMOVAL

Tree Risk *Advanced Assessments (Level 3)*

As part of the inventory process, the Inventory Team conducts a *basic assessment (Level 2)* from the ground. During this assessment the inspector can determine whether some aspect of tree structure or health indicates that a more comprehensive tree structure evaluation *(Level 3) advanced assessment* is needed to more thoroughly evaluate tree condition and risk of failure.

In such cases, we may recommend *(Level 3) advanced assessments* of the roots, stem, or crown. These assessments may include climbing inspections, examination of the root system using a compressed-air tool (that avoids damage to roots and underground utilities), or one or more of the following: resistance drilling; using the resistograph (a precision drilling instrument that provides graphical output); or sonic tomography that produces a visual representation of internal conditions based on how sound moved through the tree. The goal is to use the appropriate method to evaluate impact of wood decay in stems and buttress roots that show potential for failure and to determine presence and condition of the root system.

Once we complete such *(Level 3) advanced assessments*, we can then recommend appropriate measures, such as remediation, maintenance, or removal.

At the time of inventory, no trees were recommended for *advanced assessments*. However, as trees continue to grow and site changes occur, we recommend continual consultation with your local Bartlett Arborist Representative to determine if *advanced assessments* are warranted in the future.

DEFECTS OR OBSERVATIONS

DEFECTS OR OBSERVATIONS

The following table lists inventoried trees for which we noted defects, observations, or other structural issues. The image below provides an example of a seam.

Tree #118 exhibiting a seam.

INVENTORIED TREES WITH DEFECTS, OBSERVATIONS, OR OTHER STRUCTURAL ISSUES (131 Trees)

Tree ID	Common Name	DBH	Defect(s) or Observation(s)
3	Ash-Green	15	• Wound-root flare
4	Spruce-Colorado Blue	18	• Corrected lean
5	Spruce-Colorado Blue	11	• Wound-stem • Wound-root flare
7	Apple-Common	8,6	• Wound-stem
8	Pine-Austrian	10	• Co-dominant leaders
9	Maple-Norway	27	• Crack-stem • Decay-Stem
10	Maple-Norway	25	• Seam • Wound-stem
11	Maple-Norway	19	• Decay-Stem • Storm damage
12	Maple-Norway	23	• Seam • Girdling roots present
13	Maple-Norway	25	• Seam • Girdling roots present • Uneven crown
14	Maple-Norway	29	• Dieback (moderate) • Dead branches >2
15	Maple-Norway	31	• Storm damage • Cavity-Suspected • Seam
16	Maple-Norway	28	• Cavity-stem • Storm damage • Girdling roots present
17	Maple-Norway	3	• Wound-stem
18	Maple-Norway	33	• Decay-Stem • Uneven crown • Decay-Stem
19	Maple-Norway	26	• Wound-stem
20	Maple-Norway	25	• Seam
21	Maple-Norway	5	• Wound-stem
22	Maple-Norway	22	• Seam • Dead branches >2
23	Maple-Norway	27	• Wound-branch
25	Maple-Norway	4	• Wound-stem • Included bark
26	Maple-Norway	27	• Seam
27	Maple-Norway	28	• Seam • Wound-stem
28	Maple-Norway	26	• Seam
30	Maple-Sugar	5	• Wound-stem

Tree ID	Common Name	DBH	Defect(s) or Observation(s)
32	Maple-Norway	20	• Uneven crown • Wound-stem
33	Maple-Norway	20	• Dieback (moderate) • Decay-Stem
36	Maple-Norway	2	• Wound-stem
37	Maple-Norway	25	• Rib • Construction damage
38	Maple-Norway	23	• Dieback (moderate) • Construction damage • Wound-root flare
39	Maple-Norway	19	• Seam
40	Maple-Norway	13	• Cavity-Suspected • Rib
41	Maple-Norway	21	• Included bark
43	Maple-Norway	20	• Wound-stem
45	Maple-Norway	17	• Wound-stem
46	Maple-Norway	27	• Co-dominant leaders
47	Maple-Sugar	14	• Dieback (severe)
48	Maple-Norway	20	• Rib
49	Ash-White	20	• Wound-root flare
51	Ash-White	21	• Decay-Root flare
54	Maple-Red	26	• Included bark
55	Oak-Northern Red	26	• Included bark
56	Ash-Green	21	• Co-dominant leaders
57	Ash-Green	13	• Wound-root flare
59	Oak-Northern Red	21	• Co-dominant leaders
60	Maple-Red	27	• Co-dominant leaders
61	Honeylocust-Thornless Common	27	• Dead branches >2
62	Maple-Norway	19	• Decay-Stem
63	Maple-Norway	24	• Dead branches >2
65	Maple-Norway	27	• Rib • Seam
66	Maple-Norway	31	• Crack-stem
67	Ash-White	21	• Dieback (severe)
70	Ash-Green	24	• Co-dominant leaders
71	Maple-Red	17	• Co-dominant leaders
72	Maple-Norway	25	• Included bark • Rib
74	Maple-Norway	19	• Co-dominant leaders
75	Maple-Norway	21	• Included bark • Seam
76	Maple-Norway	15	• Uneven crown • Dieback (moderate)
77	Maple-Norway	24	• Decay-Stem

Tree ID	Common Name	DBH	Defect(s) or Observation(s)
78	Maple-Norway	19	• Girdling roots present • Cavity-stem
79	Maple-Norway	19	• Included bark
80	Maple-Norway	17	• Cavity-stem
81	Maple-Red	13,10,9	• Included bark • Girdling roots present • Co-dominant stems
82	Ash-Green	8	• Wound-root flare
85	Maple-Red	12	• Included bark
88	Ash-Green	5	• Dieback
89	Maple-Norway	16	• Dieback (severe)
90	Maple-Norway	17	• Wound-branch
91	Lilac-Japanese Tree	5,4,4,4	• Included bark
92	Maple-Norway	21	• Seam
93	Maple-Norway	30	• Storm damage • Wound-stem
95	Maple-Norway	29	• Included bark
97	Apple-Common	21	• Cavity-stem
99	Pine-Eastern White	24	• Storm damage
101	Ash-White	34	• Cavity-stem • Co-dominant leaders
105	Ash-White	25	• Dieback
108	Maple-Norway	21	• Seam • Girdling roots present • Storm damage
110	Maple-Norway	30	• Rib • Dieback • Included bark
111	Maple-Norway	23	• Wound-stem • Girdling roots present
112	Maple-Norway	29	• Dieback • Seam • Cavity-Suspected
113	Maple-Norway	18	• Wound-stem • Seam
114	Maple-Sugar	4	• Buried root collar • Wound-stem
115	Maple-Norway	21	• Wound-root flare • Seam • Girdling roots present
116	Maple-Norway	27	• Cavity-Suspected • Cavity-branch
117	Maple-Norway	24	• Girdling roots present • Hanger

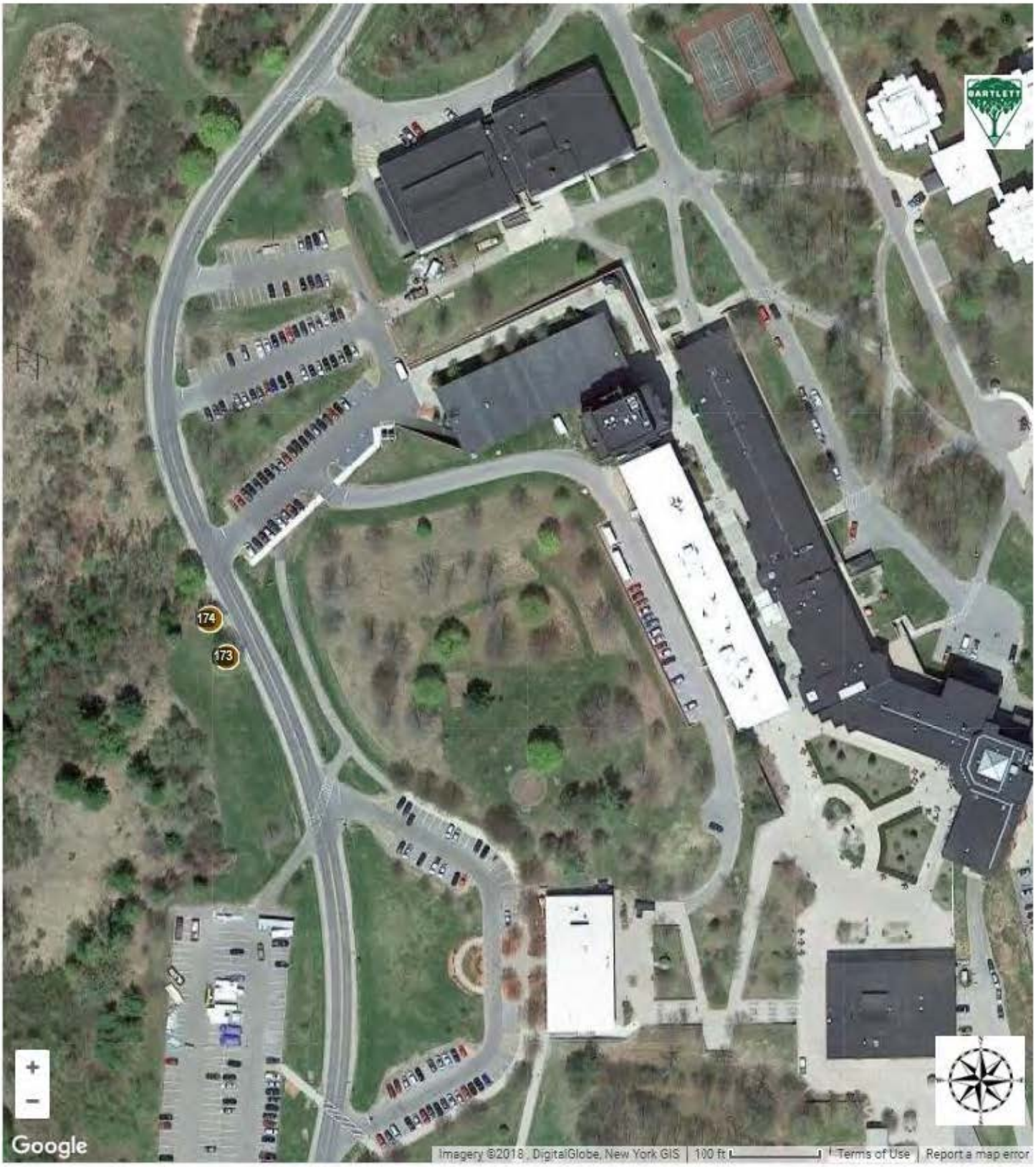
Tree ID	Common Name	DBH	Defect(s) or Observation(s)
118	Maple-Norway	28	• Co-dominant leaders • Cavity-Suspected • Seam
119	Maple-Norway	28	• Co-dominant leaders
121	Maple-Norway	22	• Wound-stem
122	Maple-Norway	6	• Wound-stem
123	Coffeetree-Kentucky	14	• Wound-root flare • Dieback
124	Maple-Norway	27	• Cavity-Suspected • Dieback • Co-dominant leaders
125	Maple-Norway	3	• Wound-root flare
126	Ash-Green	7	• Dieback
128	Oak-Northern Red	24	• Co-dominant stems • Seam
129	Maple-Norway	34	• Dead branches >2 • Hanger
130	Ash-White	13	• Co-dominant leaders
131	Maple-Norway	24	• Rib • Girdling roots present
132	Maple-Sugar	20	• Co-dominant leaders • Included bark
134	Maple-Norway	28	• Girdling roots present
135	Linden-American	18	• Co-dominant leaders
136	Maple-Norway	27	• Storm damage • Wound-stem
137	Maple-Norway	23	• Wound-stem • Uneven crown
138	Maple-Norway	10	• Wound-stem
139	Maple-Norway	27	• Wound-branch • Uneven crown
140	Ash-White	11	• Co-dominant leaders
141	Maple-Norway	24	• Co-dominant leaders • Wound-branch
142	Maple-Norway	25	• Decay-Stem
143	Maple-Norway	16	• Co-dominant leaders • Included bark
144	Maple-Sugar	25	• Included bark
145	Maple-Norway	27	• Included bark • Girdling roots present
146	Ash-White	16	• Co-dominant leaders
147	Maple-Norway	24	• Storm damage • Dieback • Cavity-Suspected
148	Ash-White	11	• Co-dominant leaders

Tree ID	Common Name	DBH	Defect(s) or Observation(s)
149	Maple-Norway	25	• Wound-branch • Seam • Poor branch structure
150	Maple-Norway	20	• Poor branch structure
152	Maple-Norway	32	• Wound-stem • Cavity-Suspected • Decay-Branch • Poor branch structure
155	Maple-Sugar	23	• Hanger
157	Maple-Norway	27	• Decay-Stem • Crack-branch
158	Maple-Sugar	17	• Dieback
159	Ash-White	33	• Co-dominant leaders
160	Maple-Norway	21	• Poor branch structure
161	Maple-Norway	25	• Wound-branch • Poor branch structure
163	Maple-Norway	26	• Decay-Stem • Dead branches >2
164	Maple-Norway	37	• Cavity-stem • Poor branch structure
165	Oak-Northern Red	16	• Co-dominant leaders
166	Maple-Norway	24	• Cavity-stem
167	Maple-Norway	22	• Decay-Stem • Wound-stem • Cavity-Suspected
168	Maple-Norway	24	• Wound-stem • Decay-Stem • Dieback
170	Maple-Norway	27	• Decay-Branch • Dead branches >2
173	Maple-Norway	22	• Poor branch structure
174	Maple-Norway	16,9,8	• Poor branch structure • Decay-Stem

INVENTORIED TREES WITH DEFECTS, OBSERVATIONS, OR OTHER STRUCTURAL ISSUES (SOUTH)

INVENTORIED TREES WITH DEFECTS, OBSERVATIONS, OR OTHER STRUCTURAL ISSUES (CENTRAL)

INVENTORIED TREES WITH DEFECTS, OBSERVATIONS, OR OTHER STRUCTURAL ISSUES (NORTH)



ENTIRE INVENTORY

ENTIRE INVENTORY (212 Trees)

Tree ID	Common Name	Genus	Species	DBH	Age Class	Condition Class	Tree Care Priority	Tree Asset Value
1	Spruce-Colorado Blue	*Picea*	*pungens*	7	Young	Good	...	$904.70
2	Spruce-Colorado Blue	*Picea*	*pungens*	5	Young	Good	...	$461.58
3	Ash-Green	*Fraxinus*	*pennsylvanica*	15	Semi-mature	Good	...	$4,154.22
4	Spruce-Colorado Blue	*Picea*	*pungens*	18	Mature	Good	...	$5,982.08
5	Spruce-Colorado Blue	*Picea*	*pungens*	11	Semi-mature	Fair	...	$1,595.75
6	Oak-Northern Red	*Quercus*	*rubra*	15	Semi-mature	Good	2	$6,923.70
7	Apple-Common	*Malus*	*domestica*	8,6	Mature	Fair	2	$1,538.60
8	Pine-Austrian	*Pinus*	*nigra*	10	Semi-mature	Fair	...	$1,099.00
9	Maple-Norway	*Acer*	*platanoides*	27	Mature	Fair	3	$11,216.39
10	Maple-Norway	*Acer*	*platanoides*	25	Mature	Good	2	$13,462.75
11	Maple-Norway	*Acer*	*platanoides*	19	Mature	Fair	...	$5,554.35
12	Maple-Norway	*Acer*	*platanoides*	23	Mature	Good	...	$11,394.87
13	Maple-Norway	*Acer*	*platanoides*	25	Mature	Fair	2	$9,616.25
14	Maple-Norway	*Acer*	*platanoides*	29	Mature	Fair	2	$12,939.63
15	Maple-Norway	*Acer*	*platanoides*	31	Mature	Fair	3	$14,491.55
16	Maple-Norway	*Acer*	*platanoides*	28	Mature	Good	2	$16,887.67
17	Maple-Norway	*Acer*	*platanoides*	3	Young	Good	3	$193.86
18	Maple-Norway	*Acer*	*platanoides*	33	Mature	Fair	2	$16,367.67
19	Maple-Norway	*Acer*	*platanoides*	26	Mature	Good	...	$14,561.31
20	Maple-Norway	*Acer*	*platanoides*	25	Mature	Good	2	$13,462.75
21	Maple-Norway	*Acer*	*platanoides*	5	Young	Good	...	$538.51
22	Maple-Norway	*Acer*	*platanoides*	22	Mature	Good	2	$10,425.55
23	Maple-Norway	*Acer*	*platanoides*	27	Mature	Good	...	$15,702.95
24	Maple-Norway	*Acer*	*platanoides*	25	Mature	Fair	3	$9,616.25
25	Maple-Norway	*Acer*	*platanoides*	4	Young	Good	3	$344.65
26	Maple-Norway	*Acer*	*platanoides*	27	Mature	Good	2	$15,702.95
27	Maple-Norway	*Acer*	*platanoides*	28	Mature	Fair	4	$12,062.62
28	Maple-Norway	*Acer*	*platanoides*	26	Mature	Good	1	$14,561.31
29	Maple-Sugar	*Acer*	*saccharum*	6	Young	Good	3	$997.01

Tree ID	Common Name	Genus	Species	DBH	Age Class	Condition Class	Tree Care Priority	Tree Asset Value
30	Maple-Sugar	*Acer*	*saccharum*	5	Young	Good	3	$692.37
31	Maple-Sugar	*Acer*	*saccharum*	4	Young	Good	3	$443.12
32	Maple-Norway	*Acer*	*platanoides*	20	Semi-mature	Poor	2	$3,692.64
33	Maple-Norway	*Acer*	*platanoides*	20	Semi-mature	Poor	1	$3,692.64
34	Maple-Norway	*Acer*	*platanoides*	22	Semi-mature	Good	2	$10,425.55
35	Maple-Norway	*Acer*	*platanoides*	21	Semi-mature	Fair	...	$6,785.23
36	Maple-Norway	*Acer*	*platanoides*	2	Young	Good	...	$86.16
37	Maple-Norway	*Acer*	*platanoides*	25	Mature	Good	...	$13,462.75
38	Maple-Norway	*Acer*	*platanoides*	23	Mature	Fair	4	$8,139.19
39	Maple-Norway	*Acer*	*platanoides*	19	Semi-mature	Fair	...	$5,554.35
40	Maple-Norway	*Acer*	*platanoides*	13	Semi-mature	Fair	5	$2,600.23
41	Maple-Norway	*Acer*	*platanoides*	21	Semi-mature	Good	...	$9,499.32
42	Maple-Norway	*Acer*	*platanoides*	16	Semi-mature	Good	...	$5,514.34
43	Maple-Norway	*Acer*	*platanoides*	20	Semi-mature	Good	...	$8,616.16
44	Maple-Sugar	*Acer*	*saccharum*	6	Young	Good	3	$997.01
45	Maple-Norway	*Acer*	*platanoides*	17	Semi-mature	Good	...	$6,225.18
46	Maple-Norway	*Acer*	*platanoides*	27	Mature	Good	1	$15,702.95
47	Maple-Sugar	*Acer*	*saccharum*	14	Semi-mature	Poor	1	$2,326.36
48	Maple-Norway	*Acer*	*platanoides*	20	Semi-mature	Fair	5	$6,154.40
49	Ash-White	*Fraxinus*	*americana*	20	Mature	Good	...	$7,385.28
50	Ash-White	*Fraxinus*	*americana*	24	Mature	Good	...	$10,634.80
51	Ash-White	*Fraxinus*	*americana*	21	Mature	Good	...	$8,142.27
52	Linden-American	*Tilia*	*americana*	21	Mature	Good	...	$8,142.27
53	Ash-Green	*Fraxinus*	*pennsylvanica*	13	Mature	Good	...	$3,120.28
54	Maple-Red	*Acer*	*rubrum*	26	Mature	Fair	...	$10,400.94
55	Oak-Northern Red	*Quercus*	*rubra*	26	Mature	Good	3	$20,801.87
56	Ash-Green	*Fraxinus*	*pennsylvanica*	21	Semi-mature	Good	...	$8,142.27
57	Ash-Green	*Fraxinus*	*pennsylvanica*	13	Semi-mature	Good	...	$3,120.28
58	Ash-Green	*Fraxinus*	*pennsylvanica*	24	Semi-mature	Good	2	$10,634.80
59	Oak-Northern Red	*Quercus*	*rubra*	21	Semi-mature	Good	2	$13,570.45
60	Maple-Red	*Acer*	*rubrum*	27	Mature	Good	1	$15,702.95

Tree ID	Common Name	Genus	Species	DBH	Age Class	Condition Class	Tree Care Priority	Tree Asset Value
61	Honeylocust-Thornless Common	*Gleditsia*	*triacanthos* var. inermis	27	Mature	Good	2	$15,702.95
62	Maple-Norway	*Acer*	*platanoides*	19	Mature	Fair	...	$5,554.35
63	Maple-Norway	*Acer*	*platanoides*	24	Mature	Good	2	$12,407.27
64	Maple-Norway	*Acer*	*platanoides*	21	Semi-mature	Fair	3	$6,785.23
65	Maple-Norway	*Acer*	*platanoides*	27	Mature	Good	...	$15,702.95
66	Maple-Norway	*Acer*	*platanoides*	31	Mature	Poor	1	$8,694.93
67	Ash-White	*Fraxinus*	*americana*	21	Semi-mature	Poor	1	$3,489.54
68	Ash-Green	*Fraxinus*	*pennsylvanica*	24	Mature	Good	...	$10,634.80
69	Ash-Green	*Fraxinus*	*pennsylvanica*	14	Semi-mature	Good	...	$3,618.79
70	Ash-Green	*Fraxinus*	*pennsylvanica*	24	Mature	Good	...	$10,634.80
71	Maple-Red	*Acer*	*rubrum*	17	Semi-mature	Good	2	$6,225.18
72	Maple-Norway	*Acer*	*platanoides*	25	Semi-mature	Good	1	$13,462.75
73	Ash-Green	*Fraxinus*	*pennsylvanica*	8	Young	Good	...	$1,181.64
74	Maple-Norway	*Acer*	*platanoides*	19	Semi-mature	Good	2	$7,776.08
75	Maple-Norway	*Acer*	*platanoides*	21	Semi-mature	Good	2	$9,499.32
76	Maple-Norway	*Acer*	*platanoides*	15	Semi-mature	Poor	1	$2,077.11
77	Maple-Norway	*Acer*	*platanoides*	24	Mature	Fair	2	$8,862.34
78	Maple-Norway	*Acer*	*platanoides*	19	Semi-mature	Fair	...	$5,554.35
79	Maple-Norway	*Acer*	*platanoides*	19	Semi-mature	Good	2	$7,776.08
80	Maple-Norway	*Acer*	*platanoides*	17	Semi-mature	Fair	5	$4,446.55
81	Maple-Red	*Acer*	*rubrum*	13,10,9	Semi-mature	Good	...	$7,539.14
82	Ash-Green	*Fraxinus*	*pennsylvanica*	8	Semi-mature	Fair	...	$844.03
83	Ash-Green	*Fraxinus*	*pennsylvanica*	20	Semi-mature	Good	...	$7,385.28
84	Ash-Green	*Fraxinus*	*pennsylvanica*	14	Semi-mature	Good	...	$3,618.79
85	Maple-Red	*Acer*	*rubrum*	12	Semi-mature	Good	2	$3,101.82
86	Serviceberry-Downy	*Amelanchier*	*arborea*	6	Young	Good	...	$1,107.79
87	Maple-Red	*Acer*	*rubrum*	10	Semi-mature	Good	2	$2,154.04
88	Ash-Green	*Fraxinus*	*pennsylvanica*	5	Young	Fair	2	$329.70
89	Maple-Norway	*Acer*	*platanoides*	16	Semi-mature	Poor	2	$2,363.29
90	Maple-Norway	*Acer*	*platanoides*	17	Semi-mature	Good	...	$6,225.18
91	Lilac-Japanese Tree	*Syringa*	*reticulata*	5,4,4,4	Semi-mature	Good	...	$1,797.08

Tree ID	Common Name	Genus	Species	DBH	Age Class	Condition Class	Tree Care Priority	Tree Asset Value
92	Maple-Norway	*Acer*	*platanoides*	21	Semi-mature	Good	...	$9,499.32
93	Maple-Norway	*Acer*	*platanoides*	30	Mature	Fair	4	$13,847.40
94	Ash-Green	*Fraxinus*	*pennsylvanica*	33	Mature	Good	...	$19,641.20
95	Maple-Norway	*Acer*	*platanoides*	29	Mature	Good	...	$18,115.48
96	Oak-Northern Red	*Quercus*	*rubra*	24	Mature	Good	...	$17,724.67
97	Apple-Common	*Malus*	*domestica*	21	Over-mature	Fair	...	$6,785.23
98	Hawthorn	*Crataegus*	sp.	12,11,10,10,10,10	Over-mature	Good	...	$14,324.37
99	Pine-Eastern White	*Pinus*	*strobus*	24	Mature	Good	2	$15,952.21
100	Hawthorn	*Crataegus*	sp.	24	Over-mature	Good	...	$12,407.27
101	Ash-White	*Fraxinus*	*americana*	34	Mature	Good	1	$20,743.23
102	Ash-White	*Fraxinus*	*americana*	13	Semi-mature	Good	3	$3,120.28
103	Oak-Bur	*Quercus*	*macrocarpa*	19	Semi-mature	Good	2	$9,997.82
104	Oak-Northern Red	*Quercus*	*rubra*	13	Semi-mature	Good	3	$5,200.47
105	Ash-White	*Fraxinus*	*americana*	25	Mature	Fair	1	$8,242.50
106	Ash-Green	*Fraxinus*	*pennsylvanica*	26	Mature	Good	...	$12,481.12
107	Ash-Green	*Fraxinus*	*pennsylvanica*	7	Young	Good	3	$904.70
108	Maple-Norway	*Acer*	*platanoides*	21	Semi-mature	Good	...	$9,499.32
109	Pine-Austrian	*Pinus*	*nigra*	14	Semi-mature	Fair	...	$2,154.04
110	Maple-Norway	*Acer*	*platanoides*	30	Mature	Fair	4	$13,847.40
111	Maple-Norway	*Acer*	*platanoides*	23	Semi-mature	Good	...	$11,394.87
112	Maple-Norway	*Acer*	*platanoides*	29	Mature	Fair	2	$12,939.63
113	Maple-Norway	*Acer*	*platanoides*	18	Semi-mature	Good	...	$6,979.09
114	Maple-Sugar	*Acer*	*saccharum*	4	Young	Good	3	$443.12
115	Maple-Norway	*Acer*	*platanoides*	21	Semi-mature	Good	...	$9,499.32
116	Maple-Norway	*Acer*	*platanoides*	27	Mature	Good	1	$15,702.95
117	Maple-Norway	*Acer*	*platanoides*	24	Mature	Good	2	$12,407.27
118	Maple-Norway	*Acer*	*platanoides*	28	Mature	Fair	2	$12,062.62
119	Maple-Norway	*Acer*	*platanoides*	28	Mature	Good	1	$16,887.67
120	Maple-Norway	*Acer*	*platanoides*	26	Mature	Good	...	$14,561.31
121	Maple-Norway	*Acer*	*platanoides*	22	Semi-mature	Good	...	$10,425.55
122	Maple-Norway	*Acer*	*platanoides*	6	Young	Good	3	$775.45
123	Coffeetree-Kentucky	*Gymnocladus*	*dioicus*	14	Semi-mature	Fair	3	$3,446.46

Tree ID	Common Name	Genus	Species	DBH	Age Class	Condition Class	Tree Care Priority	Tree Asset Value
124	Maple-Norway	*Acer*	*platanoides*	27	Mature	Fair	2	$11,216.39
125	Maple-Norway	*Acer*	*platanoides*	3	Young	Good	3	$193.86
126	Ash-Green	*Fraxinus*	*pennsylvanica*	7	Young	Fair	...	$646.21
127	Maple-Norway	*Acer*	*platanoides*	25	Mature	Good	2	$13,462.75
128	Oak-Northern Red	*Quercus*	*rubra*	24	Mature	Good	1	$17,724.67
129	Maple-Norway	*Acer*	*platanoides*	34	Mature	Good	...	$24,200.43
130	Ash-White	*Fraxinus*	*americana*	13	Semi-mature	Good	...	$3,120.28
131	Maple-Norway	*Acer*	*platanoides*	24	Mature	Good	...	$12,407.27
132	Maple-Sugar	*Acer*	*saccharum*	20	Semi-mature	Good	2	$11,077.92
133	Maple-Sugar	*Acer*	*saccharum*	5	Young	Good	3	$692.37
134	Maple-Norway	*Acer*	*platanoides*	28	Mature	Good	2	$16,887.67
135	Linden-American	*Tilia*	*americana*	18	Semi-mature	Good	2	$5,982.08
136	Maple-Norway	*Acer*	*platanoides*	27	Mature	Fair	5	$11,216.39
137	Maple-Norway	*Acer*	*platanoides*	23	Semi-mature	Fair	5	$8,139.19
138	Maple-Norway	*Acer*	*platanoides*	10	Semi-mature	Good	...	$2,154.04
139	Maple-Norway	*Acer*	*platanoides*	27	Mature	Fair	4	$11,216.39
140	Ash-White	*Fraxinus*	*americana*	11	Semi-mature	Good	...	$2,234.05
141	Maple-Norway	*Acer*	*platanoides*	24	Semi-mature	Good	1	$12,407.27
142	Maple-Norway	*Acer*	*platanoides*	25	Mature	Good	...	$13,462.75
143	Maple-Norway	*Acer*	*platanoides*	16	Semi-mature	Good	2	$5,514.34
144	Maple-Sugar	*Acer*	*saccharum*	25	Mature	Good	...	$17,309.25
145	Maple-Norway	*Acer*	*platanoides*	27	Mature	Good	2	$15,702.95
146	Ash-White	*Fraxinus*	*americana*	16	Semi-mature	Fair	...	$3,376.13
147	Maple-Norway	*Acer*	*platanoides*	24	Mature	Fair	...	$8,862.34
148	Ash-White	*Fraxinus*	*americana*	11	Semi-mature	Good	...	$2,234.05
149	Maple-Norway	*Acer*	*platanoides*	25	Mature	Good	...	$13,462.75
150	Maple-Norway	*Acer*	*platanoides*	20	Semi-mature	Fair	2	$6,154.40
151	Honeylocust-Thornless Common	*Gleditsia*	*triacanthos* var. inermis	18	Semi-mature	Good	2	$6,979.09
152	Maple-Norway	*Acer*	*platanoides*	32	Mature	Fair	3	$15,436.18
153	Ash-White	*Fraxinus*	*americana*	8	Semi-mature	Good	...	$1,181.64
154	Maple-Norway	*Acer*	*platanoides*	25	Mature	Good	2	$13,462.75

Tree ID	Common Name	Genus	Species	DBH	Age Class	Condition Class	Tree Care Priority	Tree Asset Value
155	Maple-Sugar	*Acer*	*saccharum*	23	Semi-mature	Good	2	$14,650.55
156	Maple-Norway	*Acer*	*platanoides*	26	Mature	Good	2	$14,561.31
157	Maple-Norway	*Acer*	*platanoides*	27	Mature	Poor	1	$6,729.84
158	Maple-Sugar	*Acer*	*saccharum*	17	Semi-mature	Poor	1	$3,430.20
159	Ash-White	*Fraxinus*	*americana*	33	Mature	Good	...	$19,641.20
160	Maple-Norway	*Acer*	*platanoides*	21	Semi-mature	Good	2	$9,499.32
161	Maple-Norway	*Acer*	*platanoides*	25	Mature	Good	2	$13,462.75
162	Oak-Northern Red	*Quercus*	*rubra*	21	Semi-mature	Good	...	$13,570.45
163	Maple-Norway	*Acer*	*platanoides*	26	Mature	Fair	1	$10,400.94
164	Maple-Norway	*Acer*	*platanoides*	37	Mature	Fair	2	$19,962.31
165	Oak-Northern Red	*Quercus*	*rubra*	16	Semi-mature	Good	2	$7,877.63
166	Maple-Norway	*Acer*	*platanoides*	24	Semi-mature	Poor	3	$5,317.40
167	Maple-Norway	*Acer*	*platanoides*	22	Semi-mature	Fair	5	$7,446.82
168	Maple-Norway	*Acer*	*platanoides*	24	Semi-mature	Fair	4	$8,862.34
169	Maple-Norway	*Acer*	*platanoides*	24	Semi-mature	Good	3	$12,407.27
170	Maple-Norway	*Acer*	*platanoides*	27	Mature	Fair	...	$11,216.39
171	Ash-Green	*Fraxinus*	*pennsylvanica*	12	Semi-mature	Good	...	$2,658.70
172	Maple-Sugar	*Acer*	*saccharum*	15	Semi-mature	Good	2	$6,231.33
173	Maple-Norway	*Acer*	*platanoides*	22	Semi-mature	Good	2	$10,425.55
174	Maple-Norway	*Acer*	*platanoides*	16,9,8	Semi-mature	Good	...	$8,637.70
175	Maple-Norway	*Acer*	*platanoides*	21	Semi-mature	Good	...	$9,499.32
176	Maple-Norway	*Acer*	*platanoides*	16	Semi-mature	Poor	...	$2,363.29
177	Maple-Norway	*Acer*	*platanoides*	14	Semi-mature	Poor	2	$1,809.39
178	Maple-Norway	*Acer*	*platanoides*	16	Semi-mature	Poor	...	$2,363.29
179	Maple-Norway	*Acer*	*platanoides*	13	Semi-mature	Poor	2	$1,560.14
180	Maple-Norway	*Acer*	*platanoides*	23	Semi-mature	Fair	...	$8,139.19
181	Maple-Norway	*Acer*	*platanoides*	14	Semi-mature	Fair	...	$3,015.66
182	Maple-Norway	*Acer*	*platanoides*	16	Semi-mature	Fair	...	$3,938.82
183	Maple-Norway	*Acer*	*platanoides*	25	Mature	Good	...	$13,462.75
184	Maple-Norway	*Acer*	*platanoides*	28	Mature	Good	2	$16,887.67
185	Maple-Norway	*Acer*	*platanoides*	19	Semi-mature	Good	...	$7,776.08
186	Tuliptree	*Liriodendron*	*tulipifera*	11	Semi-mature	Good	...	$2,978.73

Tree ID	Common Name	Genus	Species	DBH	Age Class	Condition Class	Tree Care Priority	Tree Asset Value
187	Maple-Norway	*Acer*	*platanoides*	2	Young	Good	...	$86.16
188	Catalpa-Northern	*Catalpa*	*speciosa*	18	Semi-mature	Good	...	$3,988.05
189	Pear-Common	*Pyrus*	*communis*	3	Young	Good	...	$110.78
190	Crabapple	*Malus*	sp.	4	Semi-mature	Good	...	$443.12
191	Crabapple	*Malus*	sp.	6	Semi-mature	Good	...	$997.01
192	Spruce-Colorado Blue	*Picea*	*pungens*	8	Semi-mature	Fair	...	$844.03
193	Spruce-Colorado Blue	*Picea*	*pungens*	9	Semi-mature	Fair	...	$1,068.23
194	Magnolia	*Magnolia*	sp.	1	Young	Good	...	$21.54
195	Spruce-Colorado Blue	*Picea*	*pungens*	9	Young	Fair	...	$1,068.23
196	Crabapple	*Malus*	sp.	2	Young	Good	...	$110.78
197	Crabapple	*Malus*	sp.	2	Young	Good	...	$110.78
198	Crabapple	*Malus*	sp.	2	Young	Good	...	$110.78
199	Crabapple	*Malus*	sp.	3	Young	Good	...	$249.25
200	Crabapple	*Malus*	sp.	2	Young	Good	...	$110.78
201	Crabapple	*Malus*	sp.	3	Young	Good	...	$249.25
202	Spruce-Colorado Blue	*Picea*	*pungens*	9	Semi-mature	Good	...	$1,495.52
203	Crabapple	*Malus*	sp.	3	Young	Good	...	$249.25
204	Crabapple	*Malus*	sp.	1	Young	Good	...	$27.69
205	Crabapple	*Malus*	sp.	3	Young	Good	...	$249.25
206	Spruce-Colorado Blue	*Picea*	*pungens*	7	Semi-mature	Good	...	$904.70
207	Ash-Green	*Fraxinus*	*pennsylvanica*	6	Young	Good	...	$664.68
208	Ash-Green	*Fraxinus*	*pennsylvanica*	6	Young	Good	...	$664.68
209	Ash-Green	*Fraxinus*	*pennsylvanica*	6	Young	Good	...	$664.68
210	Ash-Green	*Fraxinus*	*pennsylvanica*	6	Young	Good	...	$664.68
211	Linden-Littleleaf	*Tilia*	*cordata*	14	Semi-mature	Good	...	$4,825.05
212	Linden-Littleleaf	*Tilia*	*cordata*	11	Semi-mature	Fair	...	$2,127.66

APPENDIX


BARTLETT
BARTLETT
TREE EXPERTS
SCIENTIFIC TREE CARE SINCE 1907

ADDITIONAL RESOURCES

Bartlett publishes a variety of tree-resource documents, including technical reports, plant health care recommendations, and service brochures. The following technical reports may be pertinent to your inventory. To access these documents and view the complete Bartlett Resource Library online, please follow this URL:

https://www.bartlett.com/resourcelist.cfm

Girdling Roots

Maintenance Pruning Program

Monitor IPM Program

Mulch Application Guidelines

Tree Risk Assessments

Tree Structure Evaluation

GLOSSARY OF TERMS

air pollution removal: removal of pollutants from the air by plants through natural processes

arborist: 1. An individual engaged in the profession of arboriculture who, through experience, education and related training, possesses the competence to provide for, or supervise the management of, trees and other woody ornamentals. [ANSI A300 (Part 1, 2, 4, 5, 6)] 2. An individual engaged in the profession of arboriculture. [ANSI Z133.1-2000 Safety Requirements for Arboricultural Operations]

bracing: The installation of lag-thread screw or threaded-steel rods in limbs, leaders, or trunks to provide supplemental support. [ANSI A300 (Part 3)-2000 Support Systems]

branch: An outgrowing shoot, stem or twig that grows from the main stem or trunk. [ANSI Z60.1â€“2004 Nursery Stock]

buttress roots: Lateral surface roots that aid in stabilizing the tree.

cable: 1) Zinc coated strand per ASTM A-475 for dead-end grip applications. 2) Wire rope or strand for general applications. 3) Synthetic-fiber rope or synthetic-fiber webbing for general applications. [ANSI A300 (Part 3)-2000 Support Systems]

cabling: The installation of a steel wire rope, steel strand, or synthetic-fiber system within a tree between limbs or leaders to limit movement and provide supplemental support. [ANSI A300 (Part 3)-2000 Support Systems]

canopy: collective branches and foliage of a tree or group of trees' crowns

carbon sequestration: removal of carbon from the air by plants through natural processes

carbon storage: storage of carbon removed from the air in plant tissues

cation exchange capacity(CEC): The ability of soil to absorb nutrients.

cavity: An open wound characterized by the presence of decay and resulting in a hollow.

cleaning: Selective pruning to remove one or more of the following parts: dead, diseased, and/ or broken branches (5.6.1). [ANSI A300 (Part 1)-2001 Pruning]

co-dominant branches: Equal in size and importance, usually associated with either the trunks, stems, or scaffold limbs.

conk: fruiting body or nonfruiting body of a fungus. Often associated with decay. critical root zone(CRZ): area of soil around a tree trunk where roots are located that provide

stability and uptake of water and minerals required for tree survival.

crown: 1. The leaves and branches of a tree measured from the lowest branch on the trunk to the top of the tree. [ANSI A300 (Part 1)-2001Pruning] [ANSI A300 (Part 6)-2005 Transplanting] 2. The portion of a tree comprising the branches. [ANSI Z60.1-2004 Nursery Stock]

D.B.H. [diameter at breast height]: Measurement of trunk diameter taken at 4.5 feet (1.4 m) off the ground. [ANSI A300 (Part 6)- 2005 Transplanting]

decay: The degradation of woody tissue caused by microorganisms. [ANSI A300 (Part 1)-2001 Pruning]

Geographic Information System (GIS): is any system for capturing, storing, analyzing and managing data and associated attributes which are spatially referenced to earth.

girdling root: A root that may impede proper development of other roots, trunk flare, and/or trunk. [ANSI A300 (Part 6)-2005 Transplanting]

Global Positioning System (GPS): A constellation of at least 24 Medium Earth Orbit satellites that transmit precise microwave signals, the system enables a GPS receiver to determine its location, speed, direction, and time.

Global Positioning System receiver (GPSr): A receiver that receives its input from GPS satellites to determine location, speed, direction, and time.

heading: cutting a shoot back to a bud o cutting branches back to buds, stubs, or lateral branches not large enough to assume apical dominance. Cutting an older branch or stem back to meet a structural objective

integrated pest management (IPM): A pest control strategy that uses an array of complementary methods: mechanical devices, physical devices, genetic, biological, legal, cultural management, and chemical management. These methods are done in three stages of prevention, Observation, and finally Intervention. It is an ecological approach that has its main goal is to significantly reduce or eliminate the use of pesticides.

lateral branch: A shoot or stem growing from a parent branch or stem. [ANSI A300 (Part 1)- 2001 Pruning]

leader: A dominant or co-dominant, upright stem. [ANSI A300 (Part 1)-2001 Pruning]

lean: Departure from vertical of the stem, beginning at or near the base of the trunk.

limb: A large, prominent branch. [ANSI A300 (Part 1)-2001 Pruning] lion's tailing: The removal of an excessive number of inner, lateral branches from parent branches. Lion's tailing is not an acceptable pruning practice (5.5.7). [ANSI A300 (Part 1)- 2001 Pruning]

macronutrient: Nutrient required in relatively large amounts by plants, such as nitrogen (N), phosphorus (P), potassium (K), and sulfur (S). [ANSI A300 (Part 2)-2004 Fertilization]

micronutrient: Nutrient required in relatively small amounts by plants, such as iron (Fe), manganese (Mn), zinc (Zn), copper (Cu), and boron (B). [ANSI A300 (Part 2)-2004 Fertilization]

noise attenuation: reducing sound levels via materials, structures, plants, etc.

nutrient: Element or compound required for growth, reproduction or development of a plant. [ANSI A300 (Part 2)-2004 Fertilization]

organic matter: material derived from the growth (and death) of living organisms. The organic components of soil.

parent branch or stem: A tree trunk, limb, or prominent branch from which shoots or stems grow. [ANSI A300 (Part 1)-2001 Pruning]

pH: unit of measurement that describes the alkalinity or acidity of a solution. Measured on a scale of 0 to 14. Greater than 7 Is alkaline, less than 7 is acid, and 7 is neutral (pure water).

pruning: The selective removal of plant parts to meet specific goals and objectives. [ANSI A300 (Part 1)-2001 Pruning]

qualified arborist: An individual who, by possession of a recognized degree, certification, or professional standing, or through related training and on-the-job experience, is familiar with the equipment and hazards involved in arboricultural operations and who has demonstrated ability in the performance of the special techniques involved. [ANSI Z133.1-2000 Safety Requirements for Arboricultural Operations]

raising: Selective pruning to provide vertical clearance (5.6.3). [ANSI A300 (Part 1)-2001 Pruning]

reduction: Selective pruning to decrease height and/or spread (5.6.4). [ANSI A300 (Part 1)-2001 Pruning]

risk assessment: process of evaluating what unexpected things could happen, how likely it is, and what the likely outcomes are. In tree management, the systematic process to determine the level of risk posed by a tree, tree part, or group of trees.

root collar: 1. The transition zone between the trunk and the root system. [ANSI A300 (Part 6)-2005 Transplanting] 2. See COLLAR. [ANSI Z60.1-2004 Nursery Stock]

root flare or trunk flare: The area at the base of the plant's stem or trunk where the stem

or trunk broadens to form roots; the area of transition between the root system and the stem or trunk. [ANSI Z60.1-2004 Nursery Stock] [ANSI A300 (Part 6)-2005 Transplanting]

root zone: The volume of soil containing the roots of a plant. [ANSI A300 (Part 5)-2005

secondary nutrient: Nutrient required in moderate amounts by plants, such as calcium (Ca) and magnesium (Mg). [ANSI A300 (Part 2)-2004 Fertilization]

seam: Vertical line that appears where two edges of wound wood or callus ridge meet.

soil amendment: Any material added to soil to alter its composition and structure, such as sand, fertilizer, or organic matter. [ANSI A300 (Part6)-2005 Transplanting]

soil pH: A measure of the acidity or alkalinity of the soil.

stormwater runoff: water (generally from rain or snow melt) that flows over the ground after storm events.

structural support system: hardware installed in tree, may be; cables, braces, or guys, to provide supplemental support.

sweep: Departure from vertical of the stem, beginning above the base of the trunk.

thinning: Selective pruning to reduce density of live branches (5.6.2). [ANSI A300 (Part 1)-2001 Pruning]

tree risk assessment: Closer inspection of visibly damaged, dead, defected, diseased, leaning or dying tree to determine management needs.

topping: The reduction of a tree's size using heading cuts that shorten limbs or branches back to a predetermined crown limit. Topping is not acceptable pruning practice. (5.5.7). [ANSI A300 (Part 1)-2001 Pruning]

tree inventory: A comprehensive list of individual trees providing descriptive information on all or a portion of the project area. [ANSI A300 (Part 5)-2005 Management during site planning, site development, and construction]

tree protection zone: A space above and belowground within which trees are to be retained and protected. [ANSI A300 (Part 5)-2005 Management during site planning, site development, and construction]

trunk: That portion of a stem or stems of a tree before branching occurs. [ANSA Z60.1-2004 Nursery Stock]

vigor : Overall health. Capacity to grow and resist stress. [ISA Municipal Specialist Certification Study Guide 2008]

wound: An opening that is created when the bark of a living branch or stem is penetrated, cut, or removed. [ANSI A300 (Part 1)-2001 Pruning]