Tree Replacement Committee Report

For Downtown Fayetteville

July 2017

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SUMMARY OF RECOMMENDATIONS

A future for downtown Fayetteville with fully mature and healthy, tree-lined streets…

Similar to the downtown redevelopment effort of the 1980s, Fayetteville is experiencing another flourish of investment and interest in its downtown. With the redevelopment of the historic Prince Charles hotel, completion of the new ballpark hotel, parking garage and plaza, the face of downtown will be forever changed. This investment will make a significant impact. Money will be spent and new structures and facilities erected. Trees will be planted. But- the long-term value of this investment surge will be dependent on how these investments are managed over time, including the maintenance and care of newly planted trees.

The current state of tree health in downtown is not good. Trees have not received the ongoing care and maintenance they require to thrive. This includes both recently planted trees as well as those that are now mature. There needs to be one person specifically charged with this responsibility. The committee recommends that the City create a position of urban forester and task this individual with overseeing the care of the City's trees as their primary responsibility.

The City should establish a plan to replace diseased and unsightly trees recognizing that the proper establishment, cultural practices, species selection and ongoing maintenance are important factors that impact the economics of downtown. Additionally, measures should be taken to preserve the mature trees along Hay Street as an asset that provide ambiance and shade for the visitors and businesses of that area. The City should use these recommendations to establish a proactive plan to preserve and replace these trees.

New tree plantings should be provided a minimum of 1000 CF of soil area and trees planted in plaza areas or tree pits should have suspended pavement systems (Silva Cells), so that the required soil area can be provided. By so doing, we believe that the City can be ensured that investments made today in new tree plantings will grow and mature as a valuable asset of an economically robust downtown.

Findings:

- Our Hay Street trees are in decline and trees installed downtown within the last ten years are not doing well.
- No one individual has the dedicated task of overseeing tree care.
- New investments in public facilities will soon increase the number of trees downtown.
- Without a coordinated tree care program, these trees will not survive long-term.
- A comprehensive, coordinated tree care and planting program should be implemented.
- The City should establish an Urban Forester position to oversee this program.
- Part of this coordination would include working closely with other departments in the implementation of capital improvement projects that could benefit tree health.

INTRODUCTION

Not so many years ago, Bradford Pear trees were the tree of choice and were almost exclusively utilized throughout the City along streets and under power lines. Several downtown streets were also planted with Bradford Pear trees. Although the tree had merit early on, they have not aged well. The tree's structure is problematic and is known for splitting, particularly in ice storms. Additionally, surface roots cause tripping hazards and heave sidewalks. There is a desire that deteriorated trees be replaced. So, the question has been raised, what do we replace it with?

On February 8th, 2017 the Downtown Alliance DESIGN Work Group formed the Tree Replacement Committee with members consisting of individuals representing downtown property owners, business owners and members with expertise in urban planning and horticulture. PWC and Fayetteville- Cumberland Parks and Recreation provided staff resources to support and advise the committee. Charlie Allen of Green Biz was asked to Chair the effort. Committee meetings were open to anyone interested in participating.

Thank you to the following who were active participants:
Charlie Allen, Licensed Landscape Contractor - Green Biz Nursery and Landscaping
Molly Arnold, Downtown Business Owner - Rude Awakening Coffee House, White Trash & colorful accessories
Steven Banard, Military Relationship Specialist - Kaplan
John Malzone, President - Malzone Marketing
Eloise Sahlstrom, Urban Designer - City of Fayetteville[1][2]

Committee Charge

The DESIGN Work Group charged this committee with developing tree replacement recommendations for downtown. The committee worked with the City to evaluate options and recommend the best plantings for an urban area consisting of:

- Coordinating efforts between City departments including Engineering and Fayetteville-Cumberland Parks & Recreation
- Reviewing the City's current tree replacement plan
- Taking walking tour of downtown to identify areas for tree replacement or plantings
- Researching and identifying best practices in other municipalities
- Prioritization of tree care for long-term health and recommended practices
- Identification of appropriate planting types for downtown urban areas
- Prioritization of replacements

THE VALUE OF TREES

Most people understand that trees are important for the environment, but may not recognize the role trees play in an economically robust downtown

- Research indicates that trees are an important component in attracting shoppers and visitors. Trees make the downtown more welcoming and appealing and create a sense of place. Amenity and comfort ratings are 80% higher for a tree-lined sidewalk compared to a non-shaded street.

- Healthy and well-maintained trees send a positive message about the appeal of our downtown, product value, and the quality of products offered. Quality of product ratings are 30% higher in districts having trees, over those with barren sidewalks.

- Positive interactions with merchants are 15% higher for districts with trees and people infer that they have better experiences in more attractive settings.

- People are more willing to travel more often, for more time, and over greater distance to a retail district having high quality trees. This means that a downtown having a quality urban forest may attract visitors over greater distances, boosting the number of possible customers. Visitors indicate that they will spend more time in those districts with trees, once they arrive.

It pays to invest in trees. Downtowns nationwide have experienced increased economic viability as a result of an aggressive tree planting program.

Officials in the City of Greenville (SC) point to the planting of hundreds of trees in 1978 as the catalyst for their dramatic downtown rejuvenation. They consider the tree-lined Main Street as the trademark of their city and their most valuable downtown asset.

ANALYSIS

Background

Urban trees often suffer due to root damage and soil volume restriction. As a result, urban trees face a premature death. However, in the interim, as urban trees seek to survive, their roots will seek out water and nutrition.

In these constrained environments, the adjacent pavement becomes cracked and heaved, creating tripping hazards and a huge liability for the City. This root vs. pavement conflict is one of the most pervasive problems in urban forestry. Removal and/or replacement of trees and repair of paved surfaces can strain limited municipal funds. In addition, city governments may be found liable in damage suits where injuries occur as a result of pavement hazards.

Often, expenses to repair the infrastructure may be covered from one department (street maintenance) while the trees usually are managed in a different department, e.g., parks. As a result, it is not uncommon for infrastructure repair and renovation projects to result in damage to the trees themselves, especially given that the majority of the fine roots active in water and nutrient absorption are in the top 12" of soil area.

This was true on the recent Winslow Street project. A new concrete sidewalk was installed at the Hay Street intersection with the brick pavers reinstalled over a concrete slab rather than sand (see photo to the right). The existing tree roots in the top 12" of soil area were cut and the existing trees are now confined to a 4x6 foot area. With root damage and inadequate soil area, the trees will die prematurely.

Prior Hay Street redevelopment work of the 1980s included sidewalk pavers laid over a sand base. Overtime the pavers settled resulting in an uneven and hazardous sidewalk. A Capital Improvement Program was funded to phase out the old pavers and add new pavers laid over a concrete base. This has resulted in a cleaner, upscale, and more enduring, level sidewalk. However, when the new pavers are installed, existing tree roots are cut and removed to accommodate the concrete base and pavers. As a result, the majority of roots have been substantially reduced to a six-foot diameter tree ring area.

A long-term approach is needed that is vested in resolving the conflict so that trees and sidewalks can coexist without failure. Cities internationally have had success in doing so. Fayetteville can do so as well.

Walking Tour

The committee conducted a walking tour of Downtown on February 15, 2017 for the purpose of determining which areas were the highest priority for tree replacements and new plantings. The prioritization was based on overall health and visual appearance as described below:

- High - Majority of trees missing and/or in poor health. Majority visually unacceptable.
- Medium - Majority of trees in fair to poor health, missing. Over half visually unacceptable.
- Low - Majority of trees in fair to good health, few missing. Majority still visually acceptable.

During the walking tour, the committee identified several problems with existing trees.

- Limited soil area for root growth
- Over mulching at installation
- Regular maintenance lacking

  Young trees-
  - Pruning needed for structural branching
  - Pruning needed to remove dead limbs
  - Excess mulch needs removal to prevent girdling roots and further tree decline
  - Maintenance recommendations from tree inventory have gone unheeded

  Mature trees- Protection and health of Hay Street oaks
  - Previous pruning limited to lower branch removal for street clearance
  - Pruning needed to remove dead limbs
  - Fertilization
  - Crown reduction to balance root damage
  - See Bartlett Tree recommendations & quote

Prioritization of Replacements

The following findings were made:

High Priority Areas

- Anderson St (removal of Bradford Pears)
- Burgess St (removal of Bradford Pears)
- Maxwell St (removal of stump)

Medium Priority Areas

- Maiden Ln (removal of Maples)
- Maxwell St (new tree plantings)

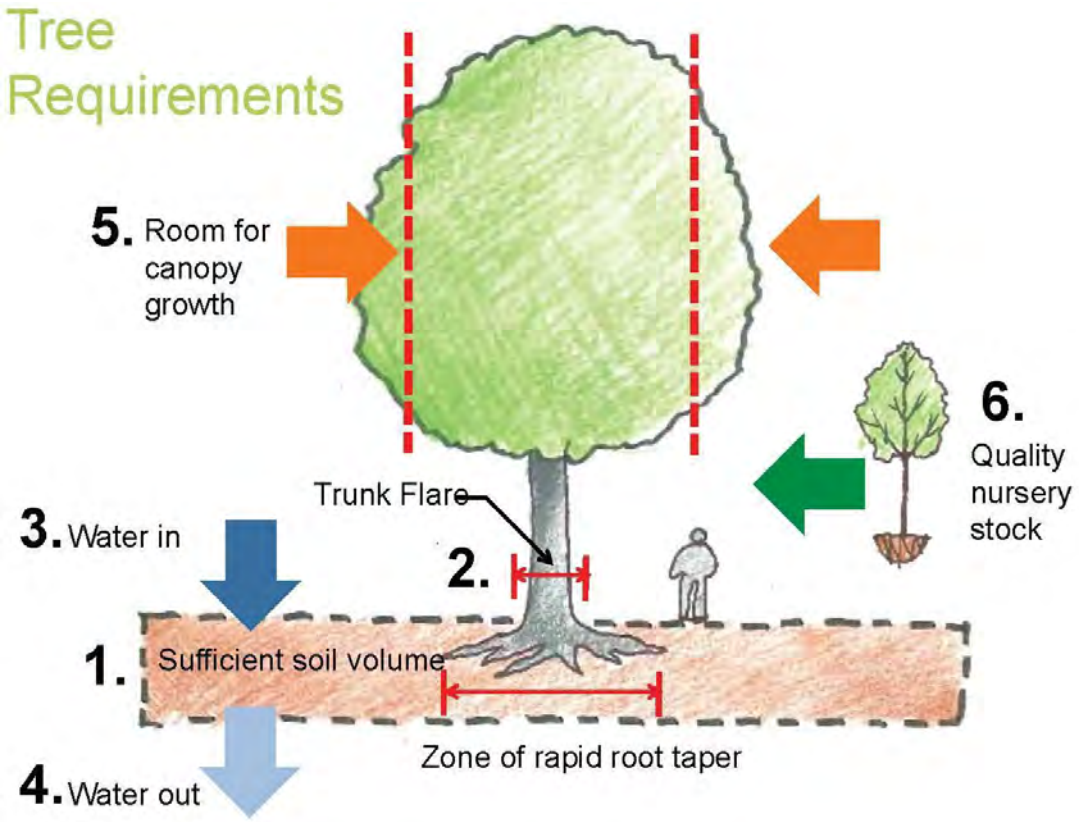
Low Priority Areas

- Ray Ave (Zelkova- maintenance needed in interim)
- Cool Springs St (removal of Bradford Pears)

RECOMMENDATIONS

Tree Requirements

Trees are the only piece of urban infrastructure that appreciate in value, but that value is based on proper care to achieve for good health.



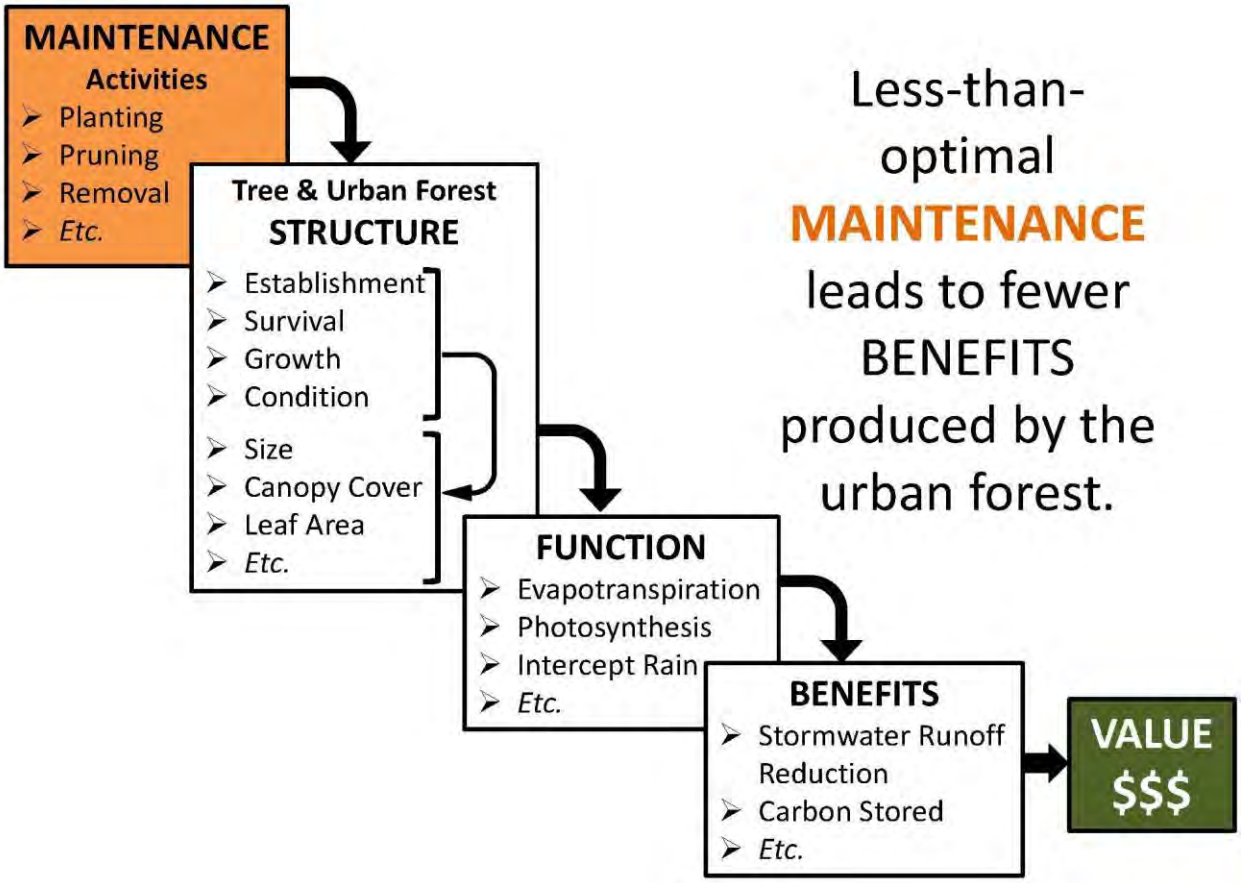
It's the old adage pay now or pay later. For example, costs for structural pruning of a mature tree is 20 time more than what it is for a young tree. Proper care for a young tree is an investment in the reduction of future costs.

As previously mentioned, healthy and well-maintained trees send a positive message, but the reverse is also true. Unhealthy, poorly maintained landscapes and trees send a negative message of neglect, lack of care, and poor value.

Trees should be planned, installed and maintained so that the City gets the highest return available on their investment.

Appropriate tree care requires dedicated manpower and funding. Many cities in North Carolina have an Urban Forestry Division or an Urban Forestry Coordinator within their Parks Department that is charged with tree care. Some of these cities include: Asheville; Charlotte; Durham; Greensboro; Raleigh; Wake Forest; Wilmington; and Winston-Salem.

As a result, these cities are reaping the benefit of their urban forest. The City should create a new position of Urban Forester and task this individual with overseeing the care of the City's trees.

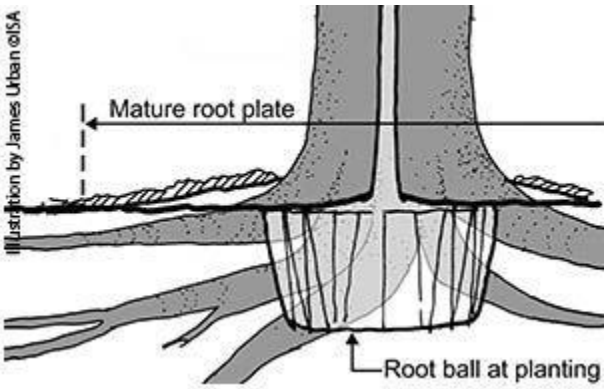


Planting Pits and Root Requirements

As living resources, trees change in character and form, over time. What a tree requires at planting is much different than its requirements a few years, or 10, or 20 years later. Tree roots need space to grow. The best opportunity of dealing with sidewalk lifting problems is at the time of tree planting or concrete installation.

Potential for conflicts between trees and sidewalks/curbs is high when one or more of these factors are present:

- Fast growing trees
- Trees planted in restricted soil volumes
- Shallow top soil (hardpan underneath top-soil)
- Shallow foundations underneath the sidewalk (limited or no base materials)
- Shallow irrigation
- Limited distance between the tree and sidewalk
- Tree species that are large at maturity
- Canopy trees greater than 15 to 20 years old



A tree planting program initiative should include adequate soil area for root growth to provide for tree longevity and reduce potential liability from heaved sidewalks.

The key to growing large trees for 50 years or more in a downtown area is to plant them in large amounts of high quality loam. Planting sites should be large enough to accommodate the tree's roots at maturity.

Constraints on urban sites make it difficult to accommodate the minimum soil area needed for healthy trees unless other options are provided, such as the use of suspended pavement systems (Silva Cells). A tree with an ultimate trunk diameter of 16 inches requires 1000 CF of soil volume for its roots.

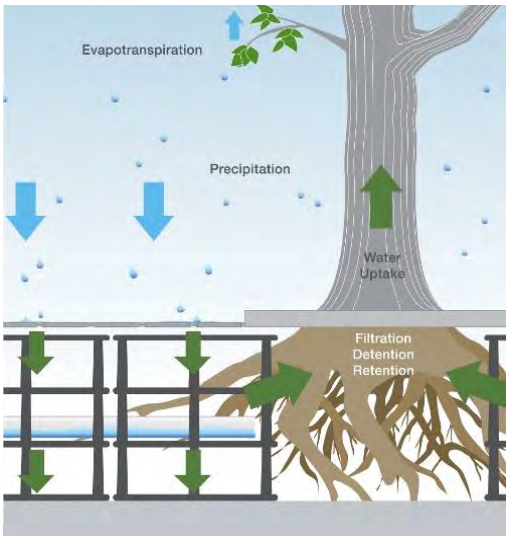
A tree planting program initiative should be coordinated with the repair / replacement of downtown brick pavers in sidewalks. Sidewalk replacement provides the unique opportunity for installation of a suspended pavement system (such as Silva Cell) allowing for an uncompacted volume of soil beneath pavements while meeting structural stability required for pavements.

Currently in Greenville's downtown, the city is using a suspended pavement approach (Silva Cells) for new tree plantings. Similar to other infrastructure costs, this system requires a substantial upfront cost to implement. However, it is an investment in the long-term longevity of the city's downtown tree canopy.

The Silva Cell approach provides the required soil area when there is not open land available. Silva Cells look like steel industrial shelving with each Silva Cell composed of a frame with posts, and a deck. The frames surround an optimum amount of soil volume for tree root growth and stormwater treatment. Each unit is approximately 92% void space that is filled with ideal soil, making it easy to accommodate surrounding utilities and provide an ample amount of stormwater storage.

The weight of the paving and any surface loading is transferred downward by the cells to the firm soil at the bottom of the planting pit. Each Silva Cell contains about 10 cubic feet (0.3 cu. m.) of soil and can store about 2 cubic feet (0.5 cu. m.) of water. Water can enter the system through pervious paving, drains, and catch basins.

Because of this Silva Cells are also considered a means of collecting stormwater. Recently, Fayetteville's Person Street Stormwater Innovative Greenscape Project included four tree installations with Silva Cells. Regardless of the technique utilized, the key is to provide the required soil area for the tree roots.



Further Reading:
http://www.clemson.edu/cafls/vincent/streettree_profiles/greenville_sc.pdf

Recommended Street Tree Species - Downtown

Plants furnished shall meet the variety requirements of the American Standard for Nursery Stock, latest edition published by the American Association of Nurserymen. Any substitutions made shall be made with varieties that have similar growth habits, soil preferences, mature size and pest tolerances. All substitutions are subject to approval by the City's new Urban Forester. Approval for substitutions are to be made on a case-by-case basis.

ANDERSON STREET, BETWEEN MAIDEN LANE AND OLD STREET

Existing Conditions

Street- Two Lanes, Two-Way

On-Street Parking- Yes, east side between planting strip.

Street Lighting- pedestrian scale, both sides, UGE

Street Wall- Adjoins parking lot and green space. Church at corner where there are no trees.

Sidewalk, East Side- 8' wide with older brick pavers plus 10" concrete banding around planting strip. Pavers run parallel to the street.

At downtown park entrance, pavers change pattern and are mortared in. There is a

Sidewalk, West Side- 4'-3" width between curb and concrete banding for tree pit. Brick pavers run perpendicular to the street.

Trees- (14) Bradford Pear

East Side- 6'-4" wide planting strip at each end of street, lined by a 10" concrete band. Three (3) trees in 41' strip by Old Street and two (2) trees in a 55' strip by Maiden Lane. Adequate soil area is not available for the number of trees included in the planting strip.

At Park Plaza, four (4) trees are planted in a square in 5'x5' tree pits with angle iron tree grates.

West Side- (5) 4'x'6' tree pits lined by a 10" concrete band. Angle iron tree grate support is still in place. Last two tree pits closest to Old Street are lacking trees. Trees planted 29' o.c.

Opportunity

When the old pavers are replaced, Silva Cells should be used so that an appropriate volume of rooting soil area is provided. Otherwise trees will be short-lived.

East Side- The concrete band lining the park strip should be removed. Replace with a narrower 6" band where the pit adjoins the pavers.

West Side- The concrete band lining the 4'x6' tree pits should be removed. Replace with a narrower 6" band where the pit adjoins the pavers and leave off the banding on the west side where the pit adjoins a turf area.

Tree Recommendations

East Side Landscape Strips-

(2) AccaladeTM Elm- Ulmus 'Morton'
Height 50-60', spread 25-40'. Habit is vase shaped. Shiny dark green foliage.
Yellow fall color. Resistant to Dutch Elm disease. Full Sun. Deciduous. Rapid growth rate.
OR
(2) Dawn Redwood- Metasequoia glyptostroboides.
Height 50-80', spread 25'. Habit is pyramidal. Small, flat needle like, green foliage. Golden apricot fall color. Sun. Deciduous. Rapid growth rate. A row of these trees is planted around the corner on Person Street in an 8-ft landscape strip immediately adjacent to the ROW.

East Side Park Plaza-
(4) 'Spring Fleecing' Fringetree- Chionanthus virginicus 'Spring Fleecing'
Height 15-20', spread 10-15'. Habit is upright. Narrow green foliage. Fragrant white flowers. Sun to part shade. Deciduous. Moderate growth rate.

West Side-
(2-5) AccaladeTM Elm- Ulmus 'Morton'
Height 50-60', spread 25-40'. Habit is vase shaped. Shiny dark green foliage.
Yellow fall color. Resistant to Dutch Elm disease. Full Sun. Deciduous. Rapid growth rate.
OR
(2-5) Dawn Redwood- Metasequoia glyptostroboides.
Height 50-80', spread 25'. Habit is pyramidal. Small, flat needle like, green foliage. Golden apricot fall color. Sun. Deciduous. Rapid growth rate. A row of these trees is planted around the corner on Person Street in an 8-ft landscape strip immediately adjacent to the ROW.

ANDERSON STREET, BETWEEN OLD STREET AND HAY STREET
<u>Existing Conditions</u>
Street- approx. 36’ wide, One Lane, One-Way
On-Street Parking- Yes, located between tree pits.
Street Lighting- Pedestrian style, both sides, UGE
Street Wall- Yes, lined by two and three-story urban buildings
Sidewalk- Narrow and confined with older pavers, width varies at tree pits from 3’-8” to 6’-2”.
Trees- Bradford Pear trees are doing poorly
(8) 4’x6’ tree pits lined by a 10” concrete band. Angle iron tree grate support present.
Tree pits are located 21” from curb (which includes 10” concrete band and 11” strip of pavers) and spaced approx. 50’ o.c. with 4 trees at each end of the street, framing the on-street parking. Second tree on east side from Old St. is missing. Stump remains. Sidewalk constrained- only 3’-8” to building. 10” concrete banding surrounding 4’x6’ tree pit is heaved up.
Effect- Trees arch over the street. The area available for planting is narrow and confined.

Opportunity

When the old pavers are replaced, Silva Cells should be used so that an appropriate volume of soil area is provided. Otherwise trees will be short-lived. The existing tree pits could be widened out to the curb and the 10” concrete banding could be replaced with 6” concrete banding. This will expand the soil area significantly from 4’x6’ (24 SF of soil area) to 74”x77” (38.5 SF soil area), but it will still be constrained. Additional soil area is needed below the pavement.

Tree Recommendation

(2) Goldspire Ginkgo- Ginkgo biloba ‘Blagon’

Height 14-16’, spread 5-6’. Habit is dense, narrowly pyramidal. Rich green foliage. Golden yellow fall color. Fruit- seedless. Slow growth rate.

OR

(2) Princeton Sentry Ginkgo- Ginkgo biloba ‘Princeton Sentry’

Height 40’, spread 15’. Habit is open, narrowly pyramidal. Bright yellow fall color. Fruit- seedless. Slow growth rate.

OR

(2) AccaladeTM Elm- Ulmus 'Morton'

Height 50-60', spread 25-40'. Habit is vase shaped. Shiny dark green foliage.
Yellow fall color. Resistant to Dutch Elm disease. Full Sun. Deciduous. Rapid growth rate.

BURGESS STREET BETWEEN MAIDEN LANE AND OLD STREET

Existing Conditions

Street- approx. 22’ wide, Two 11-ft Travel Lanes*, Two-Way
Drainage Structures- None.
On-Street Parking- None.
Street Lighting- Three lights, centered in sidewalk, west side only, UGE
Street Wall- Yes, in street center, both sides, less than 30% of street length. Adjoins large parking lots at corners both sides.
Sidewalk, West Side- Concrete, adjacent to curb
Sidewalk, East Side- Concrete, adjacent to curb, except for end of block where bisects a grass strip with a total width of 10’
Irrigation- Possibly.
Trees, West Side- landscape strip between sidewalk and adjacent parking lot (likely beyond ROW). Two oaks doing poorly near Maiden Ln.; Two Bradford Pear with shrubbery near Old St.
Trees, East Side- landscape strip between sidewalk and adjacent parking lot (likely beyond ROW) Two Bradford Pear with shrubbery near Old St.

Opportunity

At the end of the block near Maiden Lane, move the sidewalk to be adjacent to curb, creating a 5' landscape strip that can be planted with shrubbery and trees to screen the parking lot. Relocate lights outside of sidewalk.

Tree Recommendation

Check ROW & ownership.

S. COOL SPRING STREET (COURTHOUSE AREA) BETWEEN E. RUSSELL & PERSON STREET

Existing Conditions

Street- 32', Two 10-ft Travel Lanes* with 12-ft Center Turning Lane, Two-Way
Drainage Structures- Both sides, three places
On-Street Parking- None.
Street Lighting- Three lights, west side only, UGE
Street Wall, East Side- Yes, about 1/3 of the street is fronted with former homes converted to law offices. Remainder of street adjoins smaller parking lots, not interconnected, resulting in many curb cuts.
Street Wall, West Side- None. Adjoins large parking lot, interconnected, only three curb cuts.
Sidewalk, West Side- Concrete, 8' wide at north end transitioning to 5' wide
Sidewalk, East Side- Concrete, 4.5-ft to 5-ft wide
Irrigation- None observed.
Trees, West Side- 8' wide park strip at north end, transitioning to 5' park strip
Existing Spacing- 8 trees at approximately 39-ft. o.c. with street lighting located between
Soil Area- 200-312 SF per tree; The available soil area will not support canopy trees long-term unless more soil area is provided by widening the park strip or providing for the root infrastructure under the pavement through a Silva Cell system.
Trees, East Side- 5-ft. wide park strip
Existing Spacing- 12 trees at approximately 25-ft. o.c.
Soil Area- 125 SF per tree; The available soil area will not support canopy trees long-term unless more soil area is provided by widening the park strip or providing for the root infrastructure under the pavement through a Silva Cell system.

Opportunity

12-ft. center turning lane space does not appear justified and could be utilized for another purpose such expanding travel lanes to 11' and expanding the park strip by 5' on each side, adding 5' bike lanes on each side, or adding on-street parking on the west side where there are fewer curb cuts. Expanding the park strip could be accomplished while leaving the existing drainage structures in place.

Tree Recommendation

The available soil area is limited will not support large canopy trees long term unless more soil area is provided by widening the park strip or providing for the root infrastructure under the pavement. Understory trees should be avoided as their branching patterns can create pedestrian hazards. Drought tolerant trees will be required, especially if irrigation is unavailable.

Avoid street lighting- keep new trees at least 15’ from street lights.

(26) Dawn Redwood- Metasequoia glyptostroboides. Space approximately 30-35’ o.c.
Height 50-80', spread 25'. Habit is pyramidal. Small, flat needle like, green foliage. Golden apricot fall color. Sun. Deciduous. Rapid growth rate. A row of these trees is planted around the corner on Person Street in an 8-ft landscape strip immediately adjacent to the ROW.

OR

(26) Chinese Pistache- Pistachio chinensis. Space approximately 30-35’ o.c.
Height 30-35', spread 25-35'. Habit is oval, rounded. Dark green foliage. Orange to crimson fall color. Drought tolerant. Sun. Deciduous. Moderate to rapid growth rate. A row of these trees is planted around the City Hall Parking Lot.

OR

(26) European Hornbeam- Carpinus betulus 'Fastigiata'. Space approximately 30-35’ o.c.
Height 30-40', spread 20-30'. Habit is upright, vase shape. Yellow to orange fall color. Tolerates heat & drought. Sun/part shade. Deciduous. Slow to moderate growth rate.

OR

(26-28) Persian Ironwood- Parrotia persica 'Vanessa. Space approximately 25-30’ o.c.
Height & spread 15-30'. Habit is upright. reddish purple new growth to dark green foliage. Yellow, orange and red fall color. Drought tolerant. Sun to part shade. Deciduous. Slow to moderate growth rate.

OR

(26) Allee Chinese Lacebark Elm Ulmus parvifolia 'Emer II' (pp 7551) Space approx. 35-40’ o.c.
Height 40-60', spread 45-65. Habit is upright, vase shaped, round head. Long, narrow green foliage. Yellow fall color. Resistant to Dutch Elm Disease. Drought tolerant. Sun. Deciduous. Rapid growth rate.

MAIDEN LANE, BETWEEN BURGESS STREET AND ANDERSON STREET

Existing Conditions

Street- Two Travel Lanes, Two-Way
On-Street Parking- Yes, both sides, parallel
Street Lighting- both sides, UGE
Street Wall- None, Adjacent to large parking lots
Sidewalk- 7’-6” wide, concrete
Irrigation- Existing, may not be operable

Trees, North Side- (13) Maples doing poorly in 8’ wide park strip, spaced 23’ o.c.
Trees, South Side- (12) Maples doing poorly in 8’ wide park strip, spaced 23’ o.c.

Opportunity
Planting strip provides adequate soil area for canopy trees, if spaced 35’ o.c.

Tree Recommendation
North Side (6-7) large canopy trees, spaced at approx. 35’ o.c.
South Side (9) large canopy trees, spaced at approx. 35’ o.c.
(15) Allee Chinese Lacebark Elm- Ulmus parvifolia 'Emer II' (pp 7551)
Height 40-60', spread 45-65. Habit is upright, vase shaped, round head.
Long, narrow green foliage. Yellow fall color. Resistant to Dutch Elm Disease. Drought tolerant. Sun. Deciduous. Rapid growth rate.
OR
(15) Willow Oak- Quercus phellos
Height 40-60', spread 30-40'. Habit is upright, pyramidal. Small, narrow
green foliage. Yellow fall color. Broadens and rounds with age. Sun. Deciduous. Moderate to rapid growth rate.

MAXWELL STREET, BETWEEN OLD STREET AND HAY STREET
Existing Conditions
Street- approx. 21’ wide, One 11’ Travel Lane, One-Way
On-Street Parking- Yes, 10’ parallel, west side
Street Lighting- west side, pedestrian style, UGE
Street Wall, East Side- Yes, 100% of the street is fronted with three-story urban buildings
Street Wall, West Side- Yes, 100% of the street is fronted with two-story urban buildings. There is only about 30’ between the buildings.
Sidewalk- Narrow and confined, about 4-5’ wide, Newer Pavers.
Trees- (2) on West Side only. (1) Bradford Pear doing poorly at Old Street; (1) Recently planted Zelkova at Hay Street. 4’x6’ tree pits lined by a 10” concrete band. Angle iron tree grate support is still present. Tree pit closest to Hay Street- strip of pavers between tree pit and curbing. Tree pit closest to Old Street- Space for trees is narrow and confined.

Opportunity
The Zelkova should be relocated to Ray St. where there is more room for spreading. The existing tree pit near Hay St. could be widened out to extend to the curb and the 10” concrete banding could be replaced with 6” concrete banding. This will expand the soil area significantly from 4’x6’ to 5’x7’, but it will still be constrained. Additional soil area is needed below the pavement through a Silva Cell system. Otherwise, trees will likely be stunted if they survive.

Tree Recommendation

(2) Goldspire Ginkgo- Ginkgo biloba 'Blagon'

Height 14-16', spread 5-6'. Habit is dense, narrowly pyramidal. Rich green foliage. Golden yellow fall color. Fruit- seedless. Slow growth rate. [Not in Taylor's 2016 Availability List]

OR

(2) City Sprite® Zelkova- Zelkova serrata 'JFS-KW1' PP 20996

Height: 24', spread 18'. Habit is compact oval to vase shape. Bright green, fine textured foliage. Yellow fall color. Deciduous. Moderate growth rate. [Not in Taylor's 2016 Availability List]

MAXWELL STREET, BETWEEN HAY STREET & FRANKLIN STREET

Existing Conditions

Street- approx. 30' wide, 18' One Travel Lane, One-Way

On-Street Parking- Yes, 12' angled, east side

Street Lighting- west side, approx. 2' off of curb, UGE

Street Wall, East Side- Yes, 100% of the street is fronted with one and two-story urban buildings

Street Wall, West Side- Yes, about 66% of the street is fronted with one-story urban buildings

Sidewalk- 8' wide, Newer Pavers

Trees- none

Opportunity

Striped pavement (8'x40') & (12.5'x22') on each end of angled parking area could be converted to tree islands.

Tree Recommendation

(2) AccaladeTM Elm- Ulmus 'Morton'

Height 50-60', spread 25-40'. Habit is vase shaped. Shiny dark green foliage.

Yellow fall color. Resistant to Dutch Elm disease. Full Sun. Deciduous. Rapid growth rate.

OR

(2) City Sprite® Zelkova- Zelkova serrata 'JFS-KW1' PP 20996

Height: 24', spread 18'. Habit is compact oval to vase shape. Bright green, fine textured foliage. Yellow fall color. Deciduous. Moderate growth rate.

MAXWELL STREET, BETWEEN FRANKLIN STREET & RUSSELL STREET

Existing Conditions

Street- approx. 28' wide, Two 10' Travel Lanes, Two-Way

On-Street Parking- Yes, 8' parallel, east side

Street Lighting- west side, approx. 2' off of curb, UGE

Street Wall, East Side- Yes, about 66% of the street is fronted with one-story urban buildings

Street Wall, West Side- Yes, about 33% of the street is fronted with one-story urban buildings

Sidewalk- 8' wide, Newer Pavers

Trees- (2) Crepe myrtles in tree grates on West Side, by transportation museum annex,

Opportunity

The on-street parking area ends well in advance of the intersection at Russell. A tapered tree island could be added in this area to narrow the travel lane from 18’ to 10’ in this location. Remove several of the parallel spaces to create tree islands (with a min. surface soil area of 180 SF). Expanding the soil area below the pavement through a Silva Cell system would allow larger trees.

Tree Recommendation

(3) City Sprite® Zelkova- Zelkova serrata ‘JFS-KW1’ PP 20996

Height: 24’, spread 18’. Habit is compact oval to vase shape. Bright green, fine textured foliage. Yellow fall color. Deciduous. Moderate growth rate. [Not in Taylor’s 2016 Availability List]

OR

(3) AccaladeTM Elm- Ulmus 'Morton'

Height 50-60', spread 25-40'. Habit is vase shaped. Shiny dark green foliage.
Yellow fall color. Resistant to Dutch Elm disease. Full Sun. Deciduous. Rapid growth rate.

OR

(3) Dawn Redwood- Metasequoia glyptostroboides.

Height 50-80', spread 25'. Habit is pyramidal. Small, flat needle like, green foliage. Golden apricot fall color. Sun. Deciduous. Rapid growth rate. A row of these trees is planted around the corner on Person Street in an 8-ft landscape strip immediately adjacent to the ROW.

RAY AVENUE, BETWEEN MAIDEN LANE & HAY STREET

Existing Conditions

Street- Three Travel Lanes, Two-Way
On-Street Parking- angled, west side
Street Lighting- UGE
Sidewalk, East Side- off of curb, 5’ wide, new brick pavers.
Sidewalk, West Side- off of curb, 5’ wide, concrete
Trees, East Side- (5) Bradford Pear, by Hay St. Methodist Church, in fair health in 20’ wide planting strip. Spacing- approx. 19’ o.c. No trees in 8’ planting strip close to Maiden Ln.
Trees, West Side- (9) Zelkova ‘Green Vase’, in poor health in 8’ wide planting strip. Spacing- approx. 30’ o.c.

Opportunity

Remove excess mulch and replace unhealthy trees with different tree.

Tree Recommendation

(14) Allee Chinese Lacebark Elm- Ulmus parvifolia 'Emer II' (pp 7551)

Height 40-60', spread 45-65. Habit is upright, vase shaped, round head.
Long, narrow green foliage. Yellow fall color. Resistant to Dutch Elm Disease. Drought tolerant. Sun. Deciduous. Rapid growth rate.

OR

(14) Willow Oak- Quercus phellos

Height 40-60', spread 30-40'. Habit is upright, pyramidal. Small, narrow green foliage. Yellow fall color. Broadens and rounds with age. Sun. Deciduous. Moderate to rapid growth rate.

OR

(14) Japanese Zelkova- Zelkova serrata 'Village Green' ®

Space at 35' o.c.

Height & spread 40-50'. Habit is rounded, ascending branches. Dark green foliage. Wine-red fall color. Sun to shade. Deciduous. Moderate to rapid growth rate. Has better branching habit than 'Green Vase'. Make sure root flare is visible and that mulch does not get piled up against trunk.

RAY AVENUE, BETWEEN HAY STREET & FRANKLIN STREET

Existing Conditions

Street- Two Travel Lanes widen at intersections, Two-Way

On-Street Parking- parallel, both sides

Street Lighting- UGE

Sidewalk, East Side- off of curb, 5' wide, new brick pavers.

Sidewalk, West Side- off of curb, 5' wide, concrete

Trees, East Side- 8' planting strip with (6) Zelkova 'Green Vase', in poor health. Spacing- approx. 50' o.c.

Trees, West Side- (6) Zelkova 'Green Vase', in poor health. Spacing- approx. 45' o.c.

Opportunity

Increase soil area below pavement.** Replant with different tree.

Tree Recommendation

If soil area is increased, plant

Japanese Zelkova- Zelkova serrata 'Village Green' ® Space at 35' o.c.

Height & spread 40-50'. Habit is rounded, ascending branches. Dark green foliage. Wine-red fall color. Sun to shade. Deciduous. Moderate to rapid growth rate. Has better branching habit than 'Green Vase'. Make sure root flare is visible and that mulch does not get piled up against trunk.

RAY AVENUE, BETWEEN FRANKLIN STREET & RUSSELL STREET

Existing Conditions

Street- Four Travel Lanes, Two-Way

On-Street Parking- none

Street Lighting- UGE

Sidewalk- off of curb, 5' wide, new brick pavers.

Trees, East Side- none.

Trees, west side- (5) Zelkova 'Green Vase', in poor health possibly from volcano mulching in 8' planting strip, spaced approx. 24' o.c.

Opportunity

Replant unhealthy zelkova. Increase spacing. Add trees to 8' planting strip on east side

Tree Recommendation

(5) on West Side; (2) on East Side

(7) Allee Chinese Lacebark Elm- Ulmus parvifolia 'Emer II' (pp 7551)

Height 40-60', spread 45-65. Habit is upright, vase shaped, round head.

Long, narrow green foliage. Yellow fall color. Resistant to Dutch Elm Disease. Drought tolerant. Sun. Deciduous. Rapid growth rate.

OR

Willow Oak- Quercus phellos

Height 40-60', spread 30-40'. Habit is upright, pyramidal. Small, narrow green foliage. Yellow fall color. Broadens and rounds with age. Sun. Deciduous. Moderate to rapid growth rate. (5)

OR

Japanese Zelkova- Zelkova serrata 'Village Green' ® Space at 35' o.c.

Height & spread 40-50'. Habit is rounded, ascending branches. Dark green foliage. Wine-red fall color. Sun to shade. Deciduous. Moderate to rapid growth rate. Has better branching habit than 'Green Vase'. Make sure root flare is visible and mulch does not get piled up against trunk.

Protection and Health of Hay Street Trees

The committee also reviewed the health of the Hay Street Willow Oaks from Robeson Street to the Market House. The trees are showing decline, as evidenced by an increasing number of dead limbs and girdling roots. In the past, roots have been removed to allow for the installation of new pavers. Surface roots are confined to a six-foot diameter tree ring area.

Extending the functional lifespan of these large, mature trees is needed so that the economic vitality of Hay Street is not diminished. Routine maintenance can delay these expenses and maximize returns. Increasing the longevity should be a priority. A maintenance quote for the Hay Street Willow Oaks follows.

Client: 6109012

Printed on: 4/13/2017
Created on: 4/12/2017

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Mobile Phone: 910-322-8811
E-Mail Address: charlie@greenbiznursery.com

Bartlett Tree Experts
Robert Day - Representative
5808 Triangle Drive
Raleigh, NC 27617
Fax Number: 919-788-9147
Business: 919-782-7803
E-Mail Address: rday@bartlett.com

Property Address: 201 Hay Street, Fayetteville, NC 28306

The following program is recommended for certain trees and shrubs on your property. In addition to a thorough plant health care program, Bartlett Tree Experts recommends having a qualified arborist inspect your property periodically to assist you in identifying potential risks or hazardous conditions relating to your trees or shrubs. THIS IS NOT AN INVOICE.

Hello again Charlie,
Thanks for the opportunity to partner with you on a strategy to maintain the willow oaks on Hay St. As we discussed on site the willow oak is one of if not the toughest most durable street tree we have to choose from. These trees are under incredible cultural stresses, which have lead to insect infestation and decline. There is also very limited space for the root system which has also caused decline some trees. The following proposal will address these issues. The goal is to improve the health while minimizing the overall growth.
-Treatment to suppress damaging insects. Two different types of scale have been identified on the trees
-Fertilization intended to promote plant health not growth, keeping the nitrogen rate low, focusing on pH, P,K, Mg, etc.
-Structural pruning to maintain the canopy size of each tree to help balance the root shoot ratio. This would entail doing 1-2" cuts on parts of the outside of the crown. Preferably on an annual basis.
-Growth regulator treatment to suppress excess vegetative growth and to help maintain the root/shoot ratio.

The investment for the program for each of the larger trees the first year would be approximately $710 a tree with most of that being the pruning (approx. $500).

The investment for the smaller trees would be approximately $105 per tree with just under half of the cost being pruning.

I would anticipate the cost to drop approximately 1/3 to 1/2 for the following years depending on the results achieved.

One question-For those trees where surface roots have filled up the open space, can we remove the ring of concrete pavers so they do not do more damage to the root system?

Let me now any questions or concerns.

Thanks,
Robert

Pest Management - PM-Scales

Perform a bark treatment to the following plant to help suppress lecanium scale.
- specified willow oak (59) located at the right and left side of Hay St. from Gillespie to Ray

Provide 1 treatment at 1,560.00 per treatment.

Estimated Treatment Date: 4/18/2017.

Amount: $1,560.00

Soil Care and Fertilization - Soil Rx

Apply a prescription soil treatment to supply necessary nutrients according to soil analysis results and recommendations to the following plant and location.

- specified willow oak (59) located at the right and left side of Hay St. from Gillespie to Ray

Provide 1 treatment at 2,250.00 per treatment.

Estimated Treatment Date: 4/18/2017.

Amount: $2,250.00

Pest Management - PM-Scales

Perform a foliage and bark treatment to the following plant to help suppress obscure scale.
- specified willow oak (59) located at the right and left side of Hay St. from Gillespie to Ray

Provide 1 treatment at 3,120.00 per treatment.

Estimated Treatment Date: 7/18/2017.

Amount: $3,120.00

Tree and Shrub Work - Tree Pruning

Prune specified willow oak (59) located at the right and left side of Hay St. from Gillespie to Ray according to the following specifications:

• Clean to remove all dead, diseased and broken branches 2" in diameter and larger throughout crown to improve health and appearance and reduce risk of branch failure.
• Structural prune to maintain overall canopy size and improve root/shoot ratio.
  ¤ Subordinate rapidly growing lateral branches

Remove resulting debris.

Amount: $29,440.00

Pest Management - Growth Regulator

Apply a soil applied systemic treatment (where possible) of a growth regulator to the following plant to suppress growth and alleviate environmental stress.
• specified willow oak (59) located at the right and left side of Hay St. from Gillespie to Ray

Provide 1 treatment at 5,522.00 per treatment.

Estimated Treatment Date: 4/18/2017.

Amount: $5,522.00

Pest Management - PM-Scales

Perform a bark treatment to the following plant to help suppress lecanium scale.
• smaller willow oak (48) located at the right and left side of Hay St. from Ray to Bragg

Provide 1 treatment at 585.00 per treatment.

Estimated Treatment Date: 4/18/2017.

Amount: $585.00

Soil Care and Fertilization - Soil Rx

Apply a prescription soil treatment to supply necessary nutrients according to soil analysis results and recommendations to the following plant and location.

• smaller willow oak (48) located at the right and left side of Hay St. from Ray to Bragg

Provide 1 treatment at 486.00 per treatment.

Estimated Treatment Date: 4/18/2017.

Amount: $486.00

Pest Management - PM-Scales

Perform a foliage and bark treatment to the following plant to help suppress obscure scale.
- smaller willow oak (48) located at the right and left side of Hay St. from Ray to Bragg

Provide 1 treatment at 780.00 per treatment.

Estimated Treatment Date: 7/18/2017.

Amount: $780.00

Tree and Shrub Work - Tree Pruning

Prune smaller willow oak (48) located at the right and left side of Hay St. from Ray to Bragg according to the following specifications:

- Reduce crown height and spread by approximately 1-2 feet to help maintain root/shoot ratio.

Remove resulting debris.

Amount: $2,208.00

Pest Management - Growth Regulator

Apply a soil applied systemic treatment of a growth regulator to the following plant to suppress growth and alleviate environmental stress.
- smaller willow oak (48) located at the right and left side of Hay St. from Ray to Bragg

Provide 1 treatment at 975.00 per treatment.

Estimated Treatment Date: 4/18/2017.

Amount: $975.00

Total Amount: $46,926.00

Please review the information and the terms and conditions attached, which become part of the agreement, and sign and return one copy authorizing the program.

_____	_____
(Customer Signature)	(Date)
	4/13/2017
_____	_____
(Bartlett Representative - Robert Day)	(Date)

Prices are guaranteed if accepted within thirty days.
All accounts are net payable upon receipt of invoice.
Work is done in accordance with ANSI A300 Tree Care Standards.

To access a certificate of liability insurance for Bartlett Tree Experts, please navigate to
http://www.bartlett.com/BartlettCOI.pdf

A Job Site Safety Analysis was completed for your property, please contact your arborist for further details.