



Charlottesville Downtown Mall **TREE MANAGEMENT PLAN**

RECOMMENDATIONS + APPENDICES

2024

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Executive Summary

Charlottesville's Downtown Mall is facing a significant challenge: The decline of its iconic large willow oaks.

The trees of the Downtown Mall have long stood as a treasured asset, contributing to the Mall's unique character, experience and economic success. As they age and show signs of decline, this plan provides a comprehensive and strategic approach at this critical point to address their current health and plan for the future.

To be implemented over time, the Tree Management Plan provides various short and long term improvements. These improvements aim to preserve the existing trees, restore the tree canopy, improve accessibility, and revitalize the Mall's social and commercial vitality. This comprehensive approach ensures long-term sustainability, making the Mall a thriving destination for future generations

Key Objectives:

1. Preserving Existing Trees: Mature oaks and other trees, essential for providing shade, structure and the Mall's character, are preserved to extend their lifespan. Renovating the tree grate substructure girdling the trees as well as additional tree care will best maintain the Mall's current character.

2. Canopy Restoration: The Mall's trees, many planted in the 1970s, are suffering from soil compaction, canopy competition, girdling by metal grates and declining health. Maintaining its long term success, a 25-year, four-phase grove by grove tree replacement plan is proposed to ensure the longevity and vitality of the Mall's trees while restoring components of its original design.

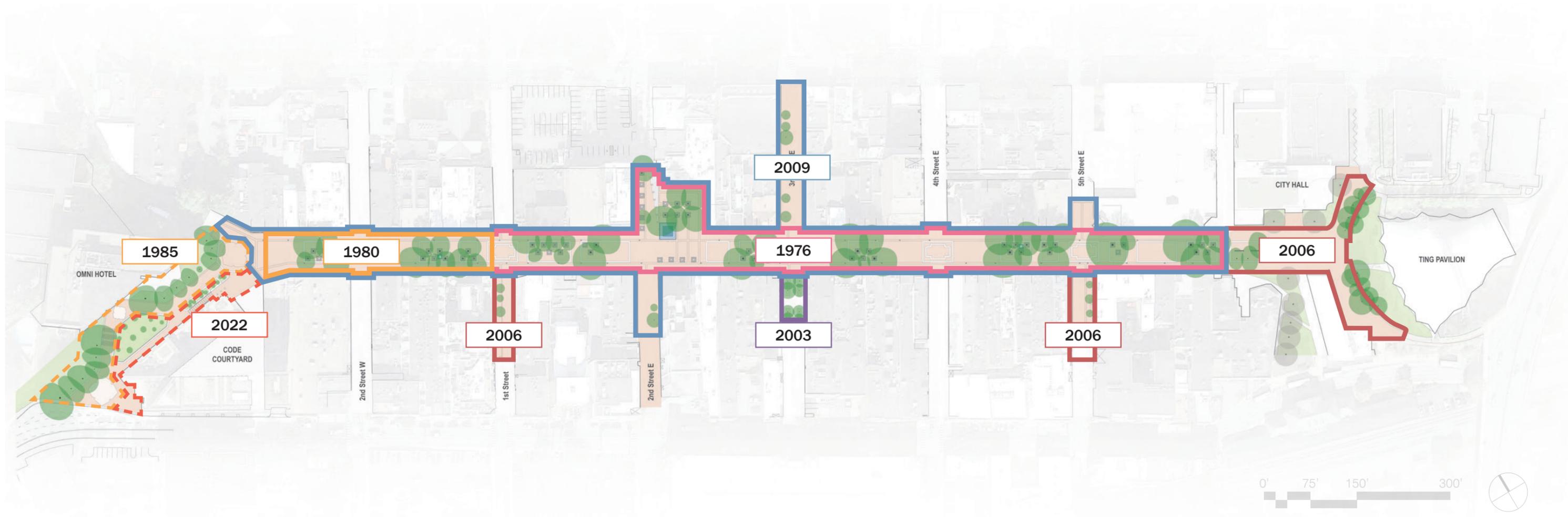
This will be carried out gradually to minimize disruption and maintain the Mall's character throughout the transition period. By carefully managing the introduction of new trees, the Plan aims to preserve the aesthetic continuity of the Downtown Mall while laying the groundwork for a vibrant and sustainable future landscape.

3. Design Intent Restoration

While not in the original design, the cafe areas are vital to the Mall's commercial success. Minor adjustments to fencing and furnishings restore visibility of both the tree groves and overflowing water elements, reclaiming the sensory and engaging experience central to the Mall's historic design.

Project Scope & Development History

The project scope encompasses the original design of the Main Street pedestrian mall, built over two phases in 1976 and 1980 along with expansions to the side streets, the Omni Hotel, The CODE Building, and the Ting Pavilion.



Existing Tree Inventory

Tree #	Common name	Scientific name
1 a	Shumard oak	<i>Quercus shumardii</i>
1 b	Shumard oak	<i>Quercus shumardii</i>
1 c	Shumard oak	<i>Quercus shumardii</i>
1 d	Shumard oak	<i>Quercus shumardii</i>
2 a	Shumard oak	<i>Quercus shumardii</i>
2 b	Shumard oak	<i>Quercus shumardii</i>
2 c	Shumard oak	<i>Quercus shumardii</i>
3	Willow oak	<i>Quercus phellos</i>
4	Willow oak	<i>Quercus phellos</i>
5	Willow oak	<i>Quercus phellos</i>
6	No tree	
10	Willow oak	<i>Quercus phellos</i>
11	Willow oak	<i>Quercus phellos</i>
12	Willow oak	<i>Quercus phellos</i>
13	Willow oak	<i>Quercus phellos</i>
14	Willow oak	<i>Quercus phellos</i>
15	Willow oak	<i>Quercus phellos</i>
16	No tree	
17	Willow oak	<i>Quercus phellos</i>
18	Willow oak	<i>Quercus phellos</i>
19	Willow oak/REMOVED	<i>Quercus phellos</i>
20	Willow oak	<i>Quercus phellos</i>
21	Willow oak	<i>Quercus phellos</i>
22	Willow oak	<i>Quercus phellos</i>
23	Willow oak	<i>Quercus phellos</i>
24	Willow oak	<i>Quercus phellos</i>
25	Willow oak	<i>Quercus phellos</i>
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28	Willow oak	<i>Quercus phellos</i>
29	Willow oak	<i>Quercus phellos</i>
30	Willow oak	<i>Quercus phellos</i>
31	Willow oak	<i>Quercus phellos</i>
32	Willow oak	<i>Quercus phellos</i>
33	Willow oak	<i>Quercus phellos</i>
34	Willow oak	<i>Quercus phellos</i>
35	Willow oak	<i>Quercus phellos</i>
36	No tree	
37	No tree	
38	No tree	
39	No tree	
40	Willow oak	<i>Quercus phellos</i>
41	Willow oak	<i>Quercus phellos</i>
42	Willow oak	<i>Quercus phellos</i>
43	Willow oak	<i>Quercus phellos</i>
44	Willow oak	<i>Quercus phellos</i>
45	No tree	
46 a	No tree	
46	Freeman maple	<i>Acer x freemanii</i>
47	No tree	
48	No tree	
49	No tree	
50	Red maple	<i>Acer rubrum</i>
51	Willow oak	<i>Quercus phellos</i>
52	Willow oak	<i>Quercus phellos</i>
53	No tree	
54	Willow oak	<i>Quercus phellos</i>
55	Willow oak	<i>Quercus phellos</i>
56	Willow oak	<i>Quercus phellos</i>
57	No tree	
58	Willow oak	<i>Quercus phellos</i>
59	Willow oak	<i>Quercus phellos</i>
60	Willow oak	<i>Quercus phellos</i>

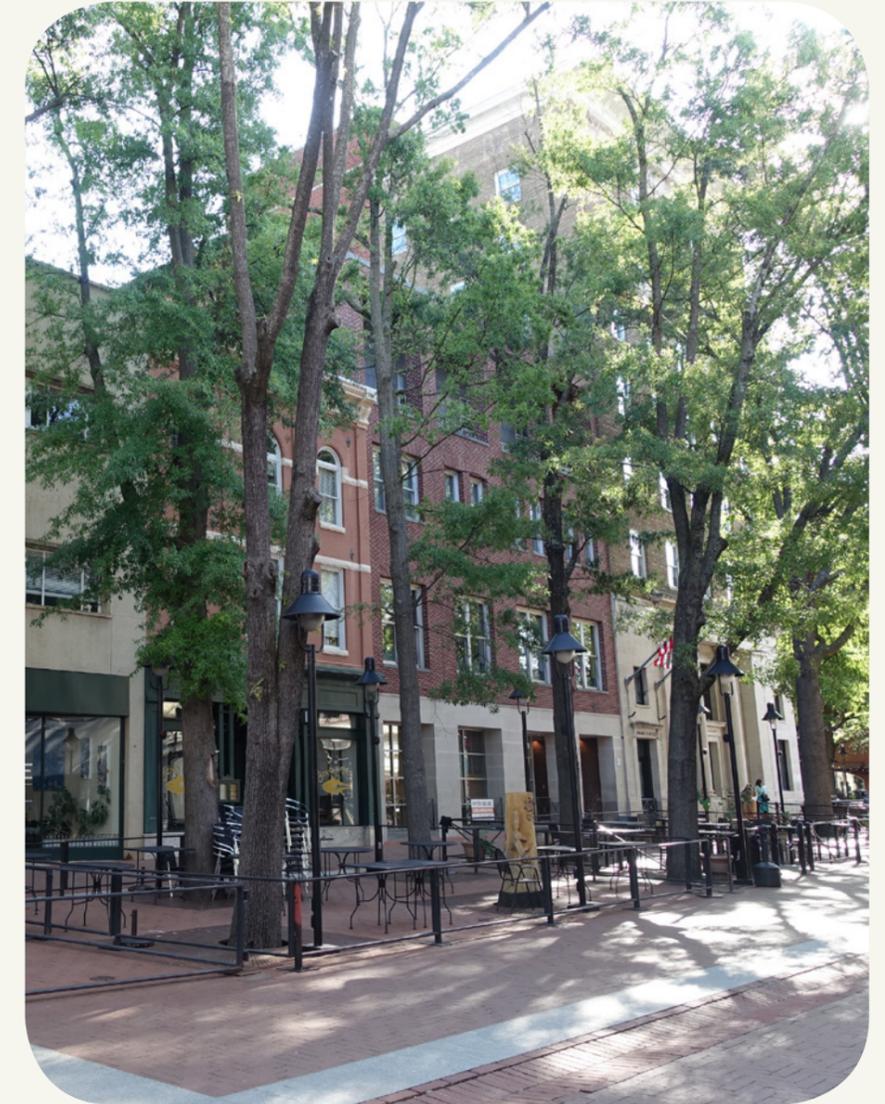
Tree #	Common name	Scientific name
61	Willow oak	<i>Quercus phellos</i>
62	Willow oak	<i>Quercus phellos</i>
63	Willow oak	<i>Quercus phellos</i>
64	Willow oak	<i>Quercus phellos</i>
65	Willow oak	<i>Quercus phellos</i>
66	Willow oak	<i>Quercus phellos</i>
67	Willow oak	<i>Quercus phellos</i>
68	Willow oak	<i>Quercus phellos</i>
69	Willow oak	<i>Quercus phellos</i>
70	Willow oak	<i>Quercus phellos</i>
71	No tree	
72	Willow oak	<i>Quercus phellos</i>
73	Willow oak	<i>Quercus phellos</i>
74	Willow oak	<i>Quercus phellos</i>
75	Willow oak	<i>Quercus phellos</i>
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81	Willow oak	<i>Quercus phellos</i>
82	Willow oak	<i>Quercus phellos</i>
83	Willow oak	<i>Quercus phellos</i>
84	Willow oak	<i>Quercus phellos</i>
85	Willow oak	<i>Quercus phellos</i>
86	Willow oak	<i>Quercus phellos</i>
87	Maidenhair tree	<i>Ginkgo biloba</i>
88	Southern Magnolia	<i>Magnolia grandiflora 'Alta'</i>
89	Maidenhair tree	<i>Ginkgo biloba</i>
90	Maidenhair tree	<i>Ginkgo biloba</i>
91	Freeman maple	<i>Acer x freemanii</i>
92	Freeman maple	<i>Acer x freemanii</i>
93	Maidenhair tree	<i>Ginkgo biloba</i>
94	No tree	
95	Maidenhair tree	<i>Ginkgo biloba</i>
96	Maidenhair tree	<i>Ginkgo biloba</i>
97	Maidenhair tree	<i>Ginkgo biloba</i>
98	Maidenhair tree	<i>Ginkgo biloba</i>
99	Maidenhair tree	<i>Ginkgo biloba</i>
100	Maidenhair tree	<i>Ginkgo biloba</i>
101	Maidenhair tree	<i>Ginkgo biloba</i>
102	Maidenhair tree	<i>Ginkgo biloba</i>
103	Maidenhair tree	<i>Ginkgo biloba</i>
104	Maidenhair tree	<i>Ginkgo biloba</i>
105	Maidenhair tree	<i>Ginkgo biloba</i>
106	Maidenhair tree	<i>Ginkgo biloba</i>
107	Maidenhair tree	<i>Ginkgo biloba</i>
108	Maidenhair tree	<i>Ginkgo biloba</i>
109	Maidenhair tree	<i>Ginkgo biloba</i>
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112	Shumard oak	<i>Quercus shumardii</i>
113	Shumard oak	<i>Quercus shumardii</i>
114	Shumard oak	<i>Quercus shumardii</i>
115	Shumard oak	<i>Quercus shumardii</i>
116	Shumard oak	<i>Quercus shumardii</i>
117	Willow oak	<i>Quercus phellos</i>
118	Willow oak	<i>Quercus phellos</i>
119	Willow oak	<i>Quercus phellos</i>

*See Appendix I for additional tree inventory information

Existing trees were inventoried in October, 2023 with both current and removed trees identified. Prior inventories completed in 1976, 1989, and 2015 by James Urban, FASLA, contributed to the data of the removed trees.

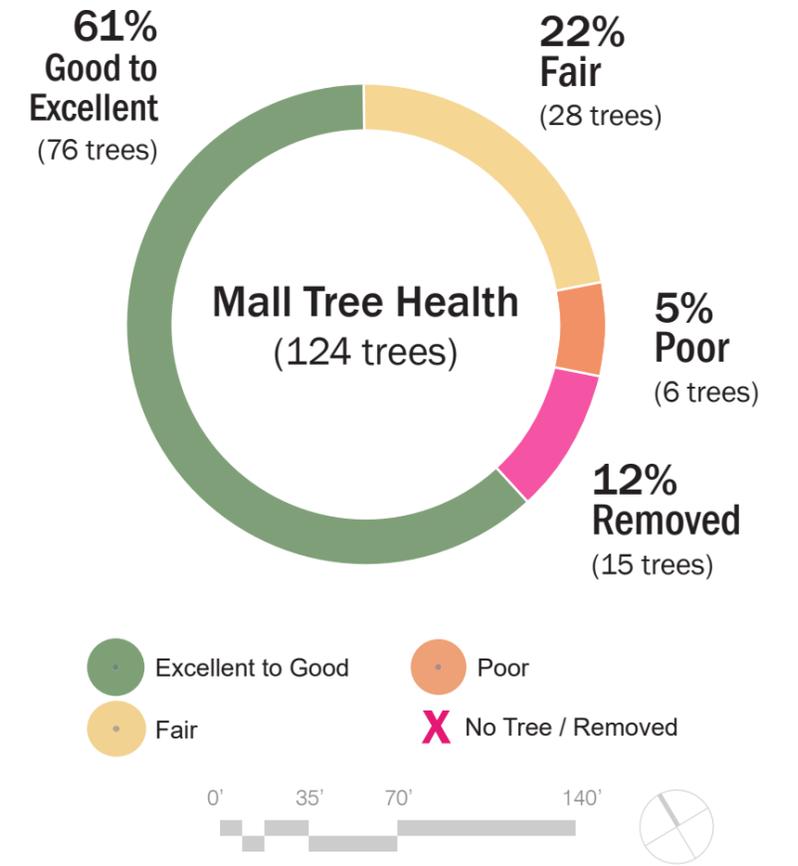
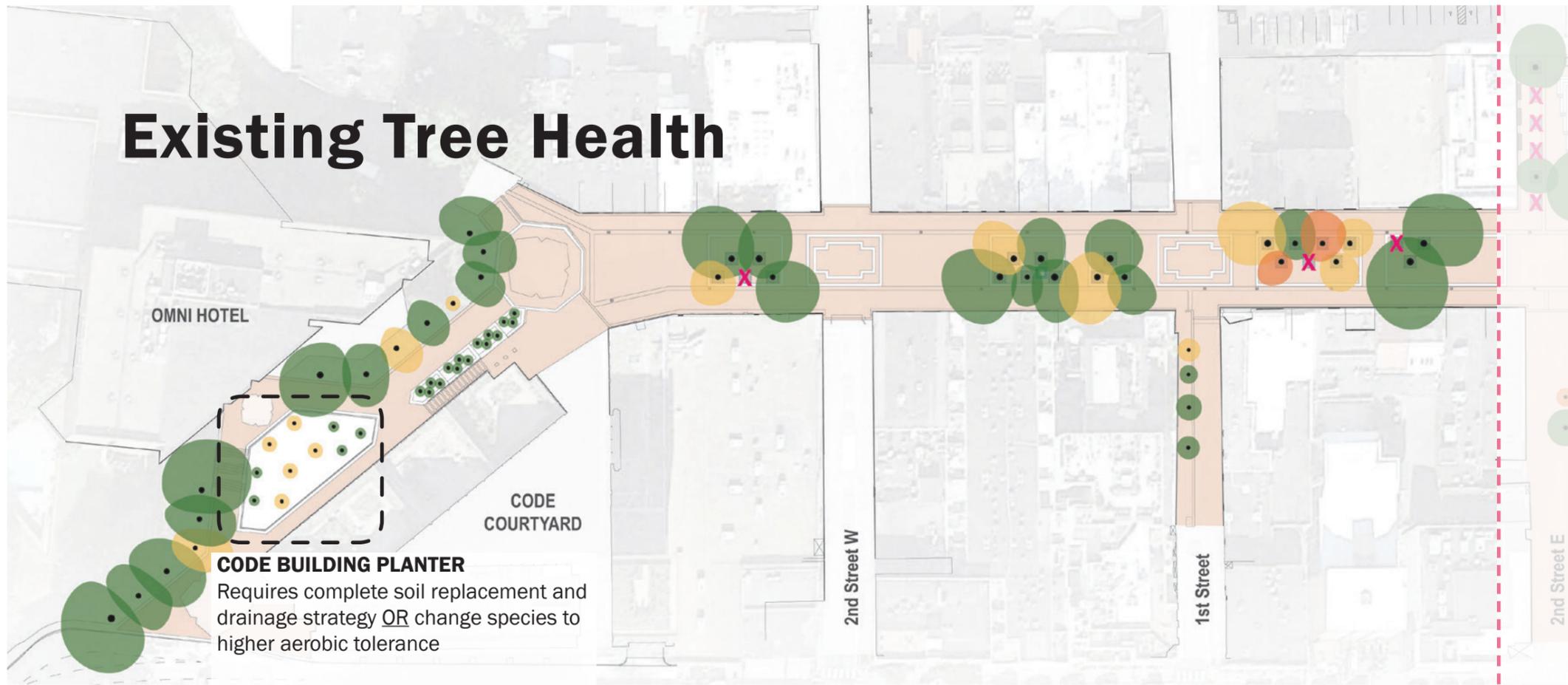


Over 60% of the trees are in good to excellent health. These often are occurring at the perimeter of individual groves with better access to light.

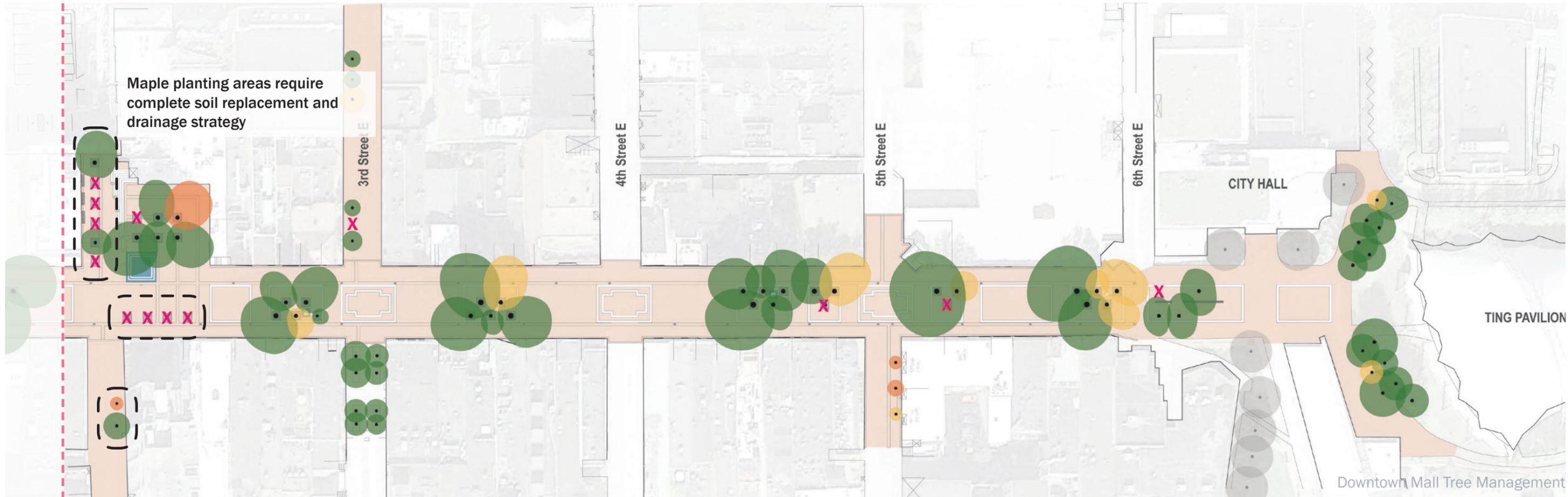


Nearly 40% of existing trees are either removed or in Fair/Poor condition.

Existing Tree Health



■ Background: Tree Health
 ■ Short Term Recommendations



■ Long Term Recommendations
 ■ Cost Estimate

Current & Projected Lifespan without intervention



Willow oak #16



Willow oak #53

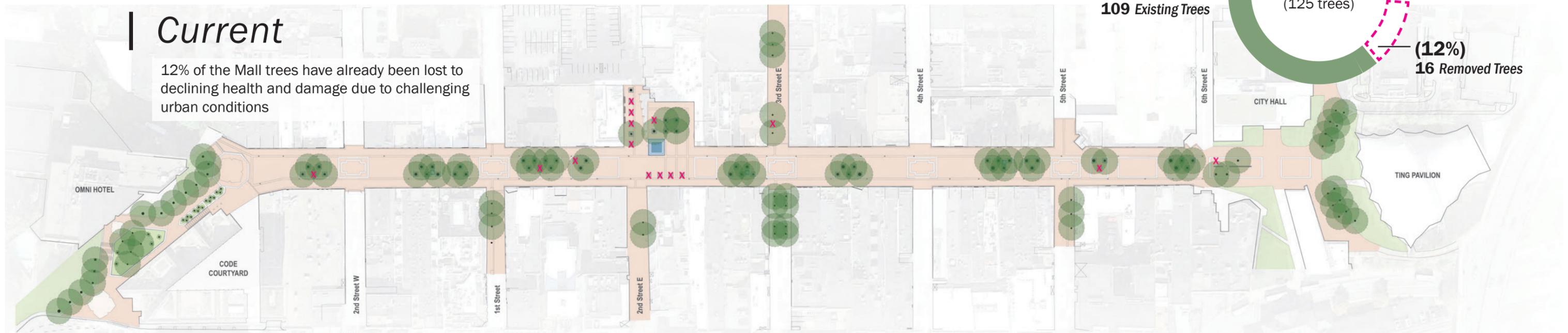


Willow oak #57

The original trees planted in 1976 as part of the Downtown Pedestrian Mall have reached their zenith and are beginning to decline. Sixteen of the planted trees (12%) of the Mall have been removed in the past decade and their loss is notable on the vitality of certain areas. It is particularly notable in groves where the majority of the grove has been removed such as at Central Place and outside of the Market Street garage.

Comparing the current health of Mall trees and their existing conditions, if nothing is done to improve the health of these trees, further loss of up to 44% of the trees in the next 15 years is anticipated.

This conveys the urgency needed to address the health of the current trees and a viable long term replacement plan.





■ **Background:**
Projected Lifespan

■ **Short Term**
Recommendations



■ **Long Term**
Recommendations

■ **Cost Estimate**

Short Term Recommendations: Protect Existing Trees

The mature trees of the Downtown Mall are essential to its success. Protecting these trees and ensuring they live as long as possible before needing replacement is a key aspect of the maintenance goals.

A. *Tree Grates: Expand and/or Replace*

- *Metal grate modifications and brick grate replacements*

B. *Tree and Soil Improvements*

- *Unique conditions*
(*Canopy thinning, Soil protection/renovation, Grate removal, Tree planting, etc.*)
- *Side streets*

C. *Tree and Fountain Visibility*

- *Visibility to trees with revised fencing zones*
- *Fountain accessibility & visibility*

D. *Tree Maintenance*

- *Tree Care Manual recommendation*

E. *Building Height*

- *Building height recommendations for tree health*



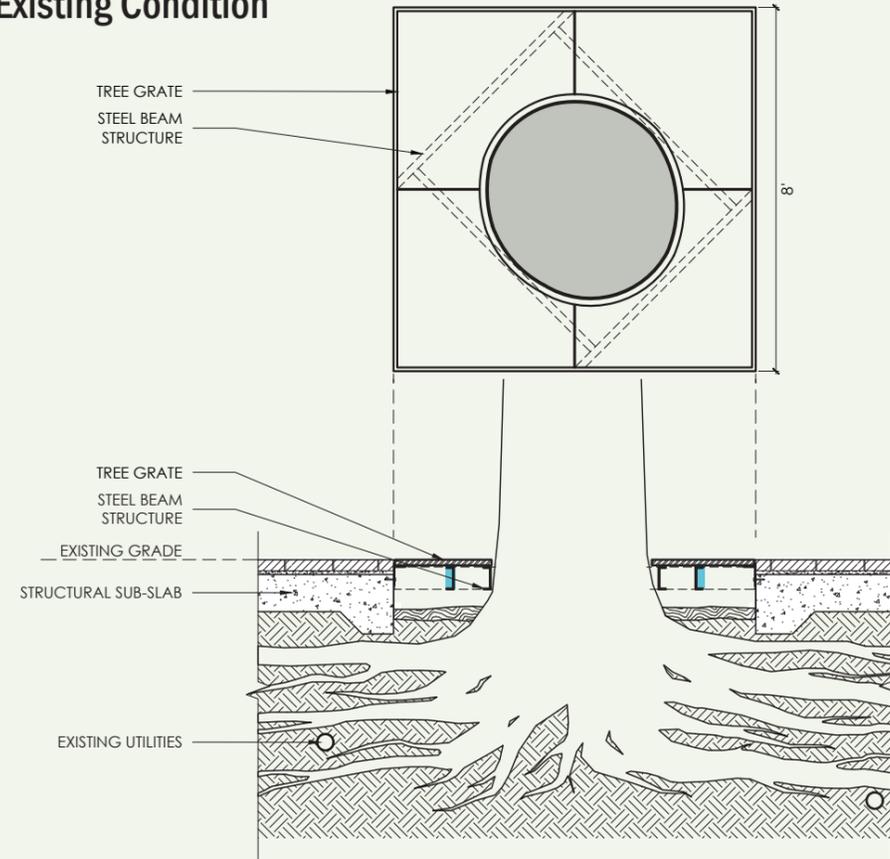
Tree Grates | Modification of Metal Grates

Designing a Flexible and Long Term Solution

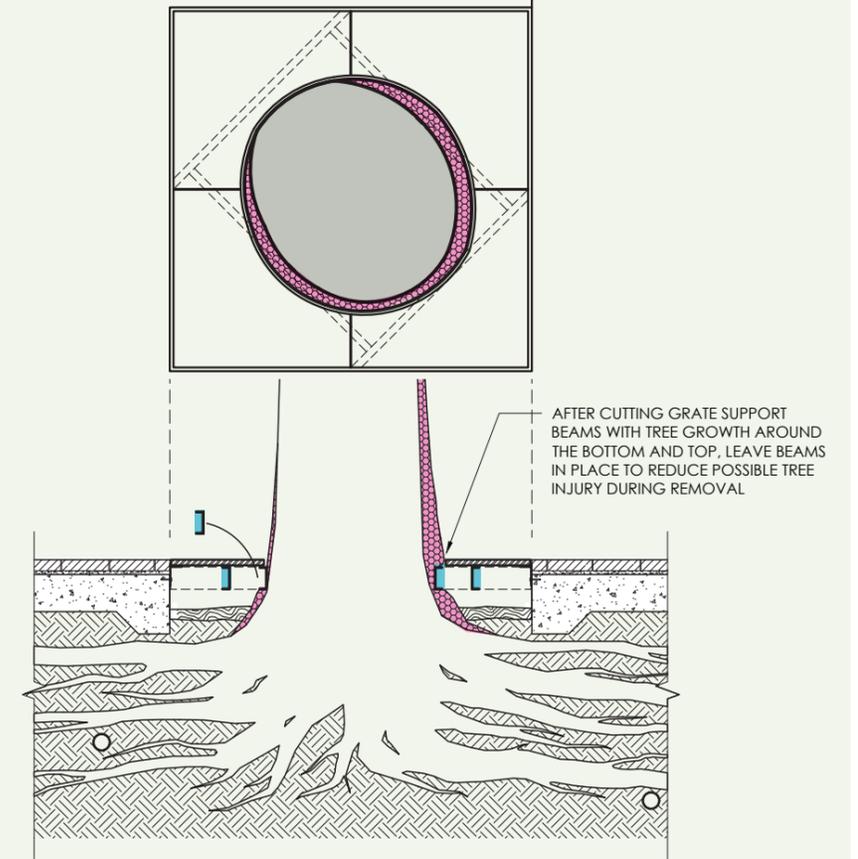
Tree grates are essential for preserving the original Halprin design and ensuring the long term health of the trees. The recommendation is to design a grate that accommodates tree growth from installation to maturity, initially being flexible and then transitioning to a rigid foam substructure post 30 years of growth.



Existing Condition



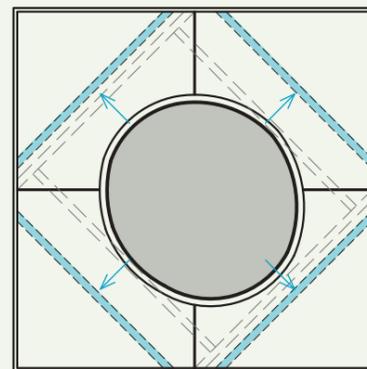
- Trunk flare without girdling by grate beam supports



- Tree trunk growing over grate beam support

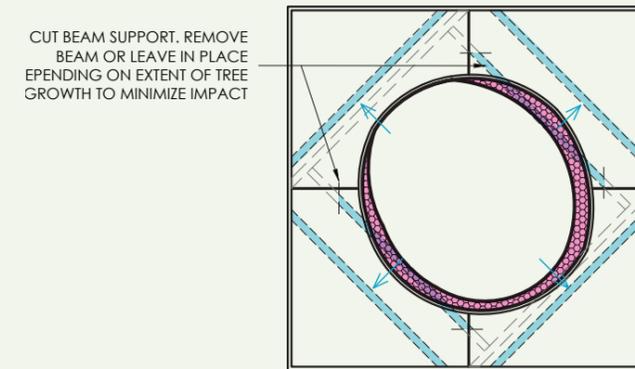
Proposed Modification

1. REPLACE & EXPAND



- Modify grate beams to reduce future conflict

2. MODIFY & EXPAND

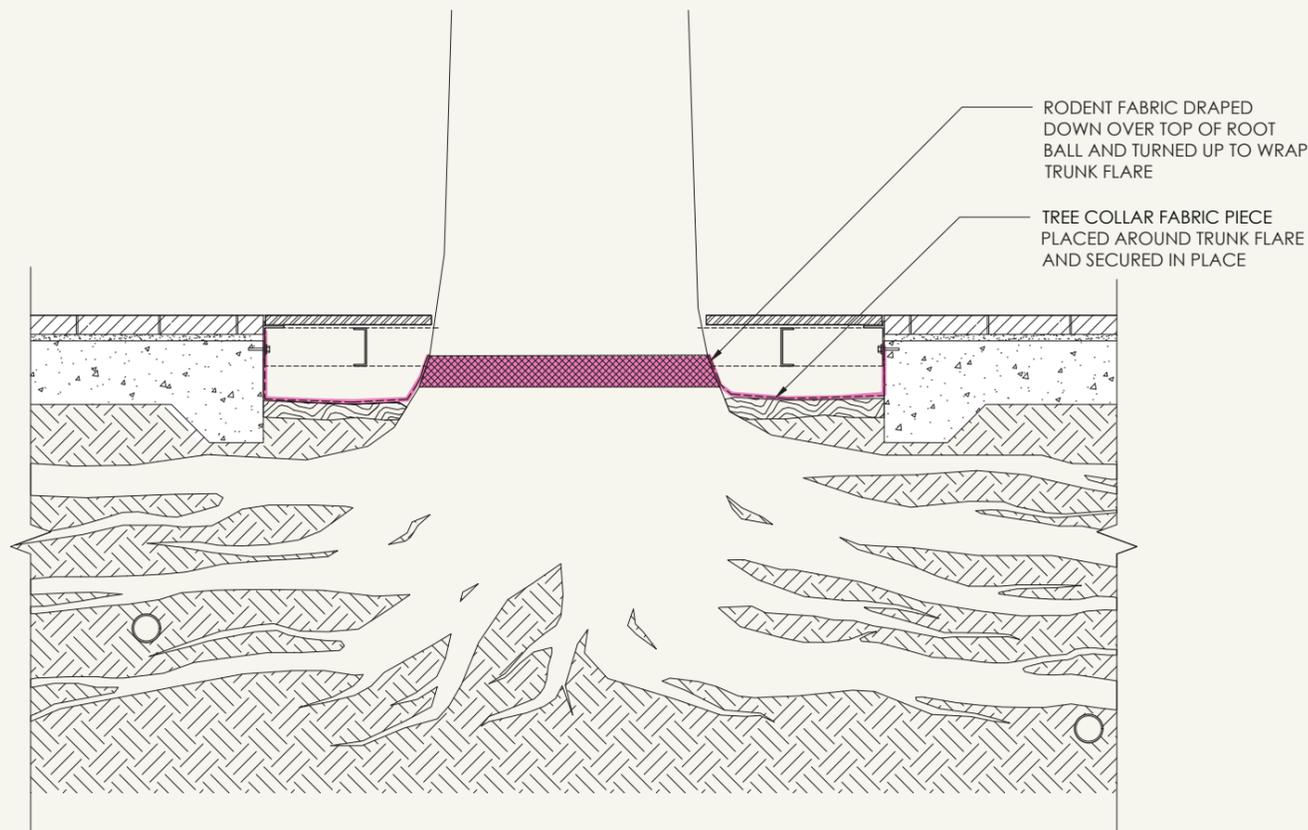


- Modify grate beams as needed to reduce future conflict

Tree Grates | Modification: Rodent Barrier & Light Relocation

Rodent Barrier

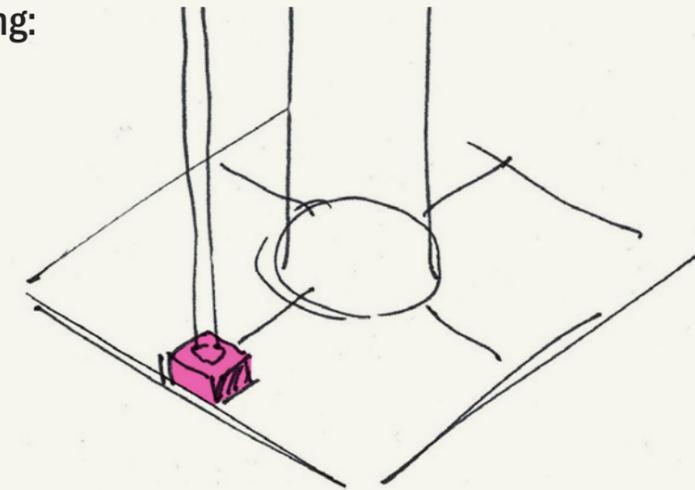
It is recommended to install rat barriers to prevent rats and other rodents from using tree wells as pathways beneath the concrete slab.



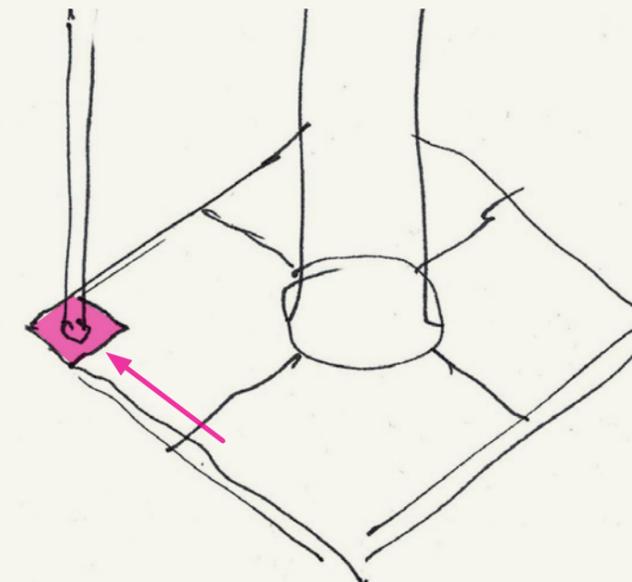
Modify light fixture and driver relocation

The 2010 grate modification repositioned the light fixtures with their bases above grade, creating a trip hazard. It is recommended to move the light fixtures to the corners to increase the distance from the tree and lower the footings so they are flush with the grade.

Existing:



Propose:



Tree Grates | Brick Grate Replacement

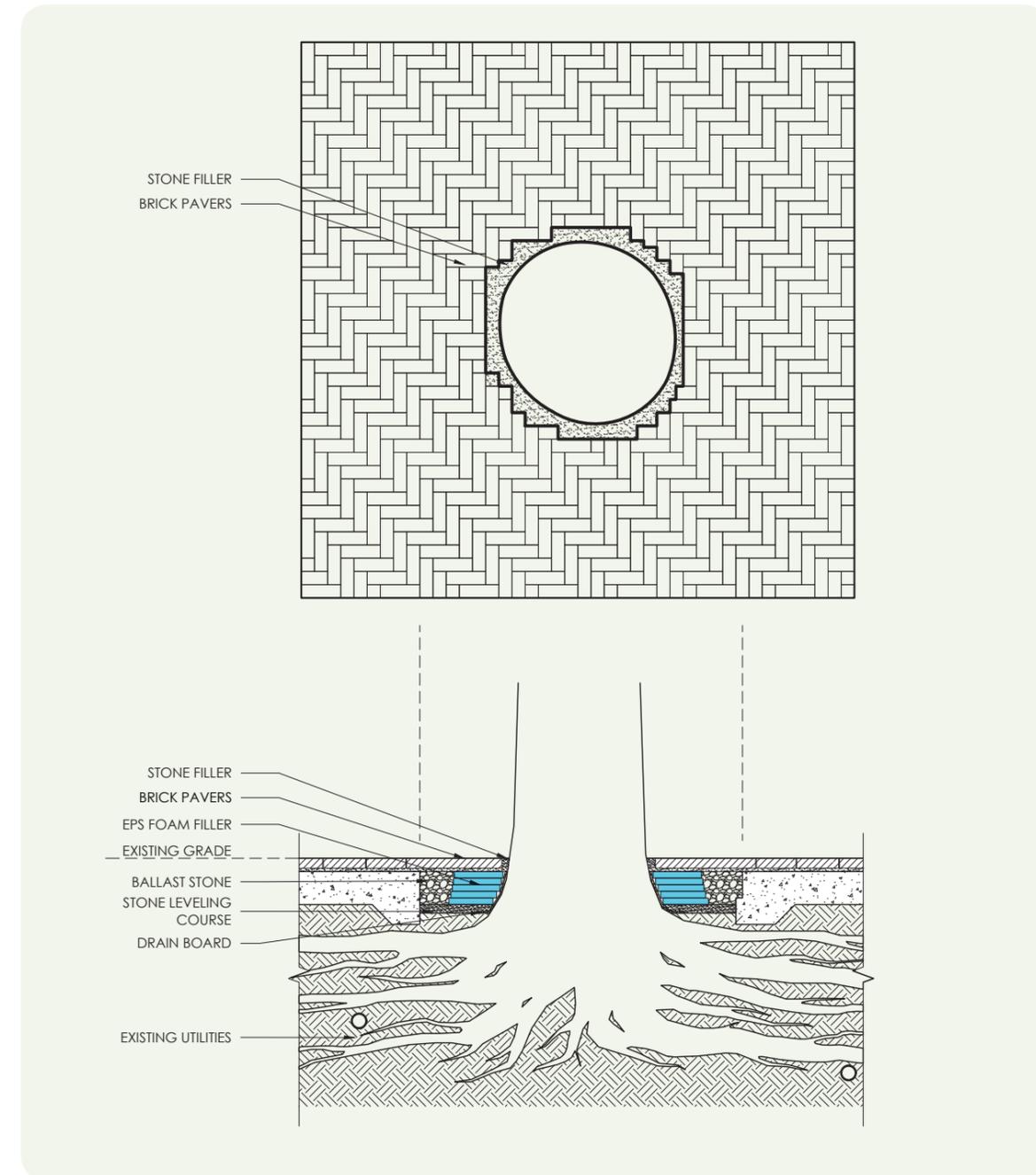
Replace metal grates with pavement and foam support structure

To restore the pavement to its original design intent and prevent girdling from steel grates, a foam support structure is recommended. This structure will be flexible and easily adjustable as the tree trunks expand. For new tree plantings, it is proposed to transition to the foam support structure after 20-30 years of growth or once tree has grown beyond the internal frame sub-structure.

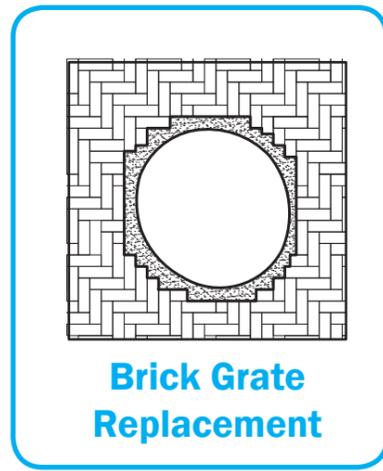
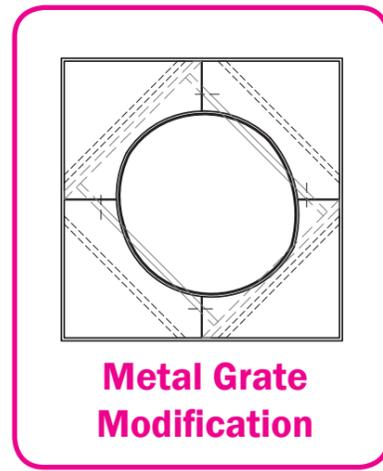
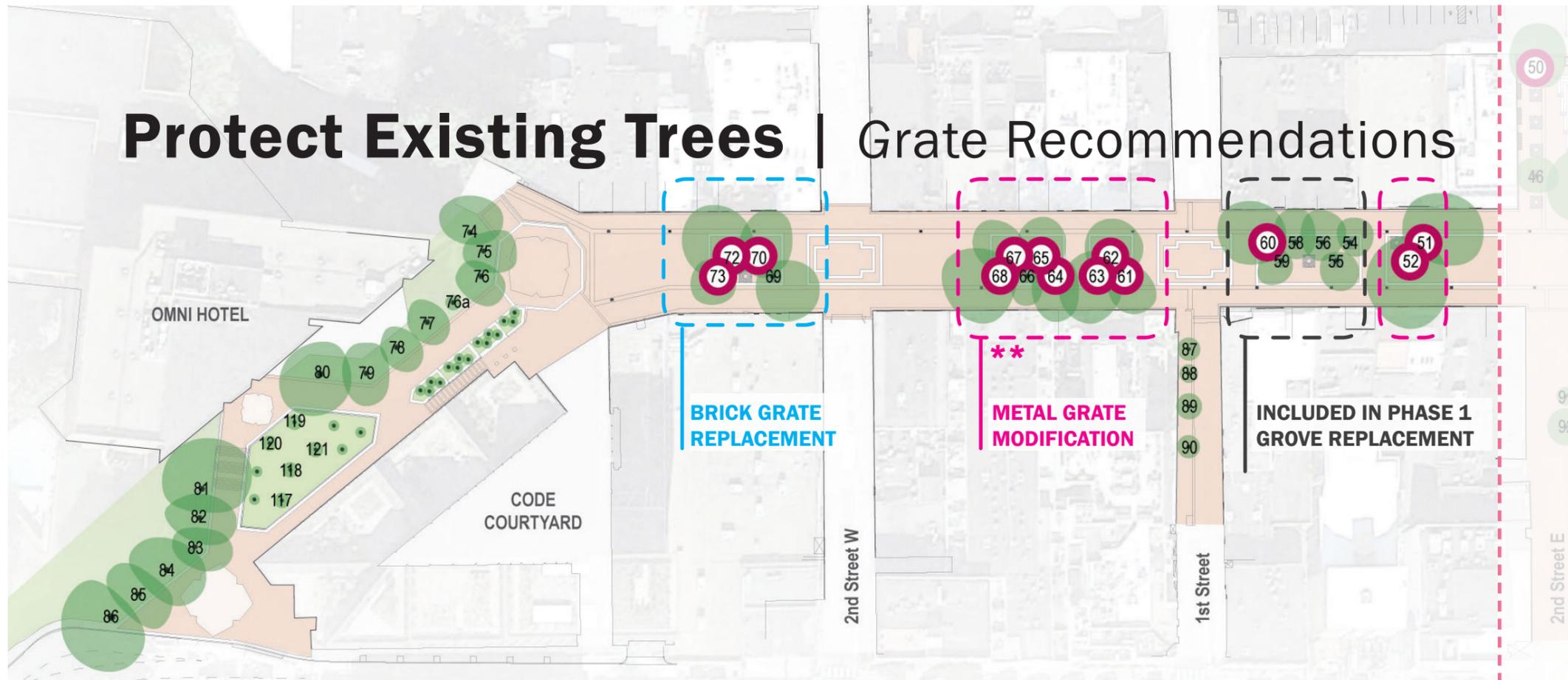


2009

Proposed Brick Grate Replacement Detail



Protect Existing Trees | Grate Recommendations

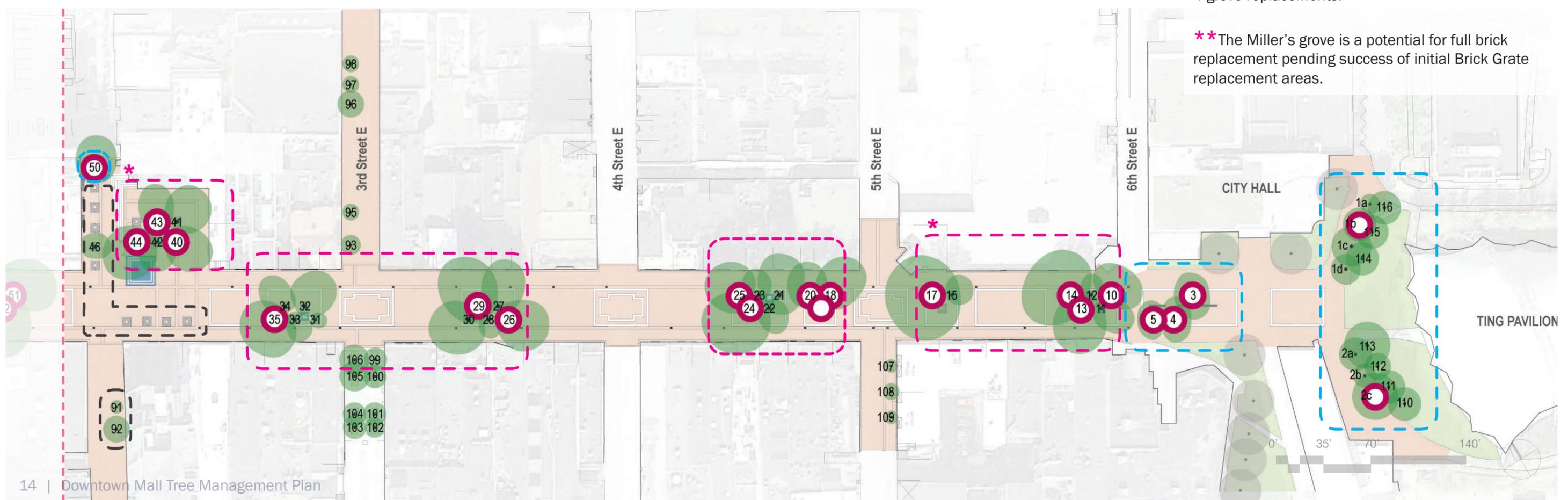


Trees with Root Flare Impacts

In general, full brick replacement is proposed where all of the trees require grate manipulation. Isolated grate modification was limited in groves with only a portion of trees impacted to conserve costs.

* Prioritize metal grate modifications for healthy Phase 3 & 4 grove replacements.

** The Miller's grove is a potential for full brick replacement pending success of initial Brick Grate replacement areas.



B

Tree & Soil Improvements | *Unique Conditions*

Opportunities to extend the lifespan of existing trees include soil remediation for increased water and nutrient holding, canopy thinning to reduce crown competition, providing additional uncompacted soil volume to new trees and redirecting roots away from paving areas to remove accessibility hazards.

OAKS AT OMNI HOTEL

- Poor soil conditions
- Canopy crowding

7 TREE GROVE

- High canopy competition
- Reduce to 5 tree grove during replacement

OAKS AT TING PAVILION

- Severely compacted soils
- Low nutrient holding capacity
- Canopy competition



CODE BUILDING PLANTER

- Poor soils / Saturated soils
- Poor drainage

CENTRAL PLACE TREES

- Limited soil volume
- Saturated soils (minor)

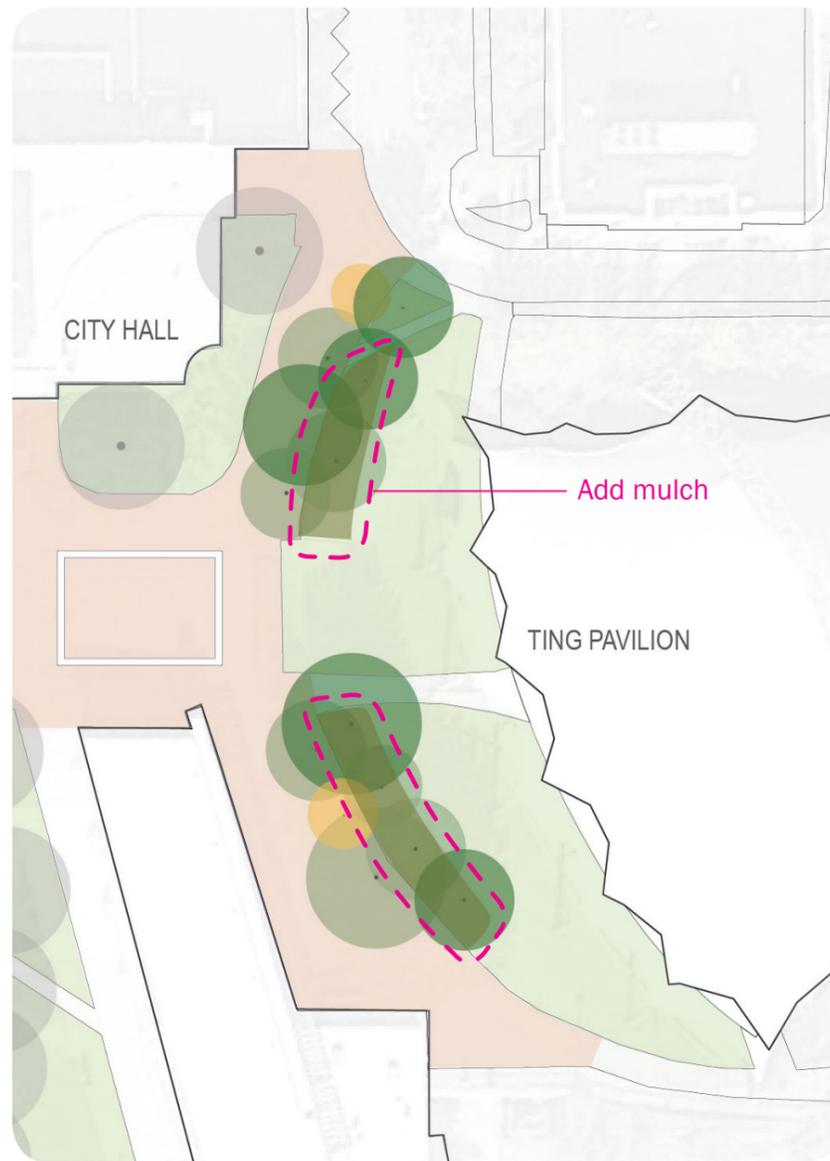
OAKS AT FREEDOM OF SPEECH WALL

- Pavement grate structure failing
- Surface roots buckling pavement

Tree & Soil Improvements | Ting Pavilion

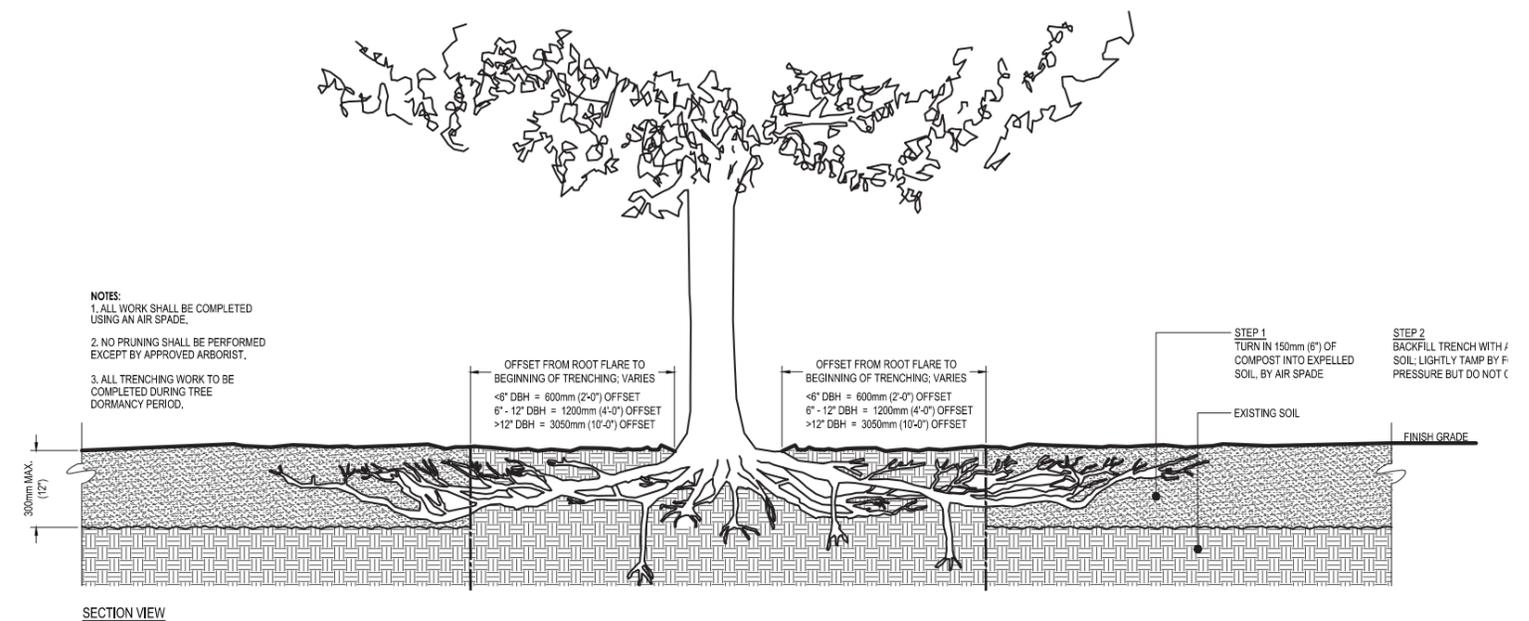
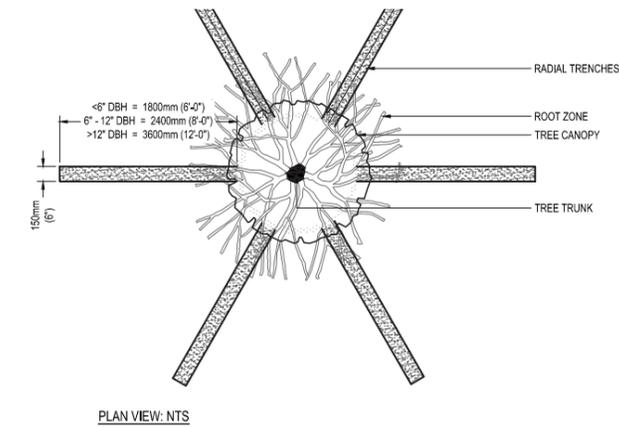
Short Term Recommendation: Mulching

To retain soil moisture and nutrients while limiting compaction, add 3" of double shredded mulch annually each spring.



Long Term Recommendation: Radial Trenching

To improve soil compaction, nutrients, and drainage, perform radial trenching. Radial trenching involves the excavation of narrow trenches, arrayed around the tree trunk at equal intervals to open compacted soil, thereby improving soil aeration and drainage. The trench shall be filled with a mixture of compost and expelled soil - allowing a deeper exchange of oxygen and water around tree roots.

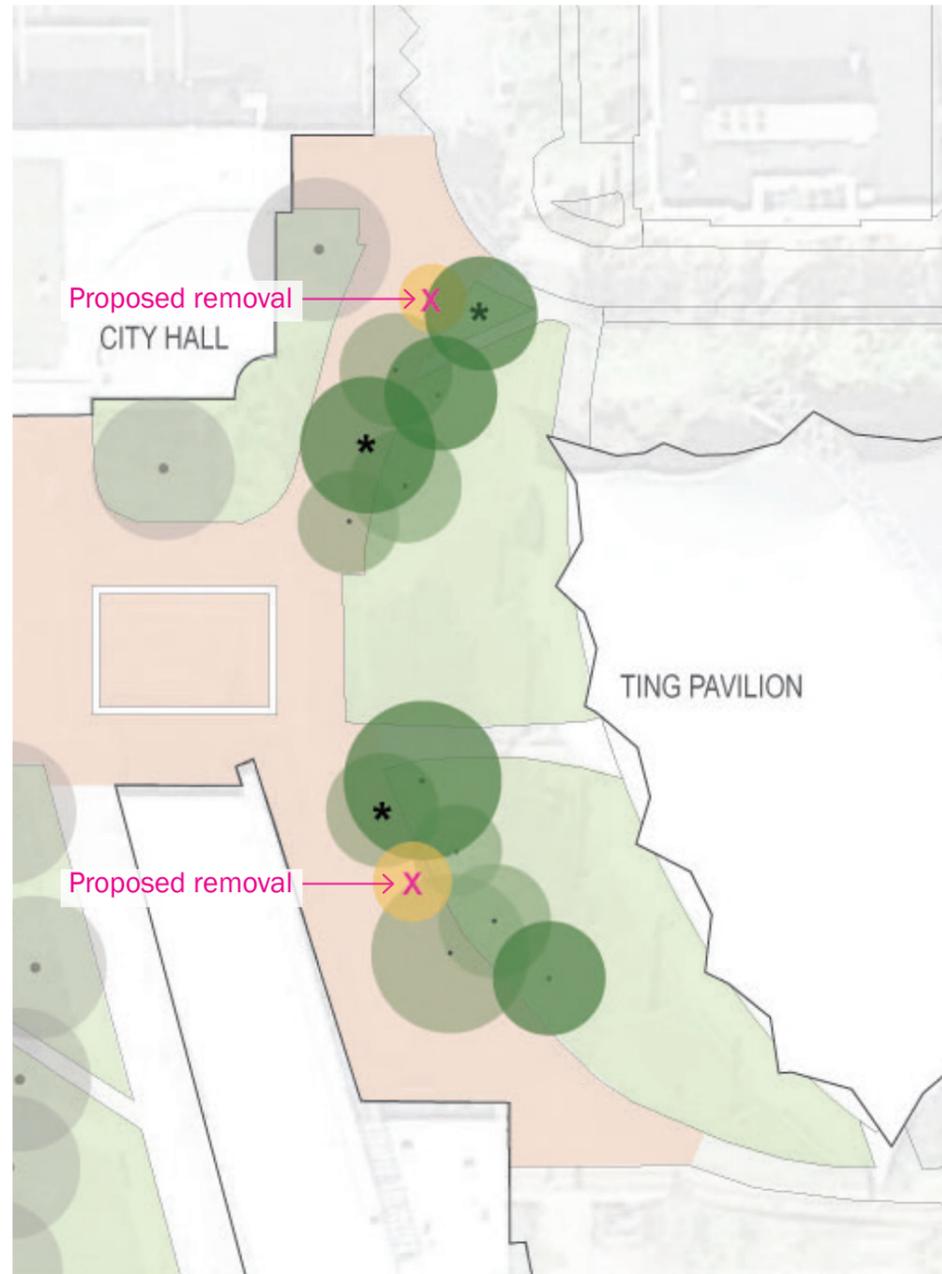


Tree & Soil Improvements | Ting Pavilion

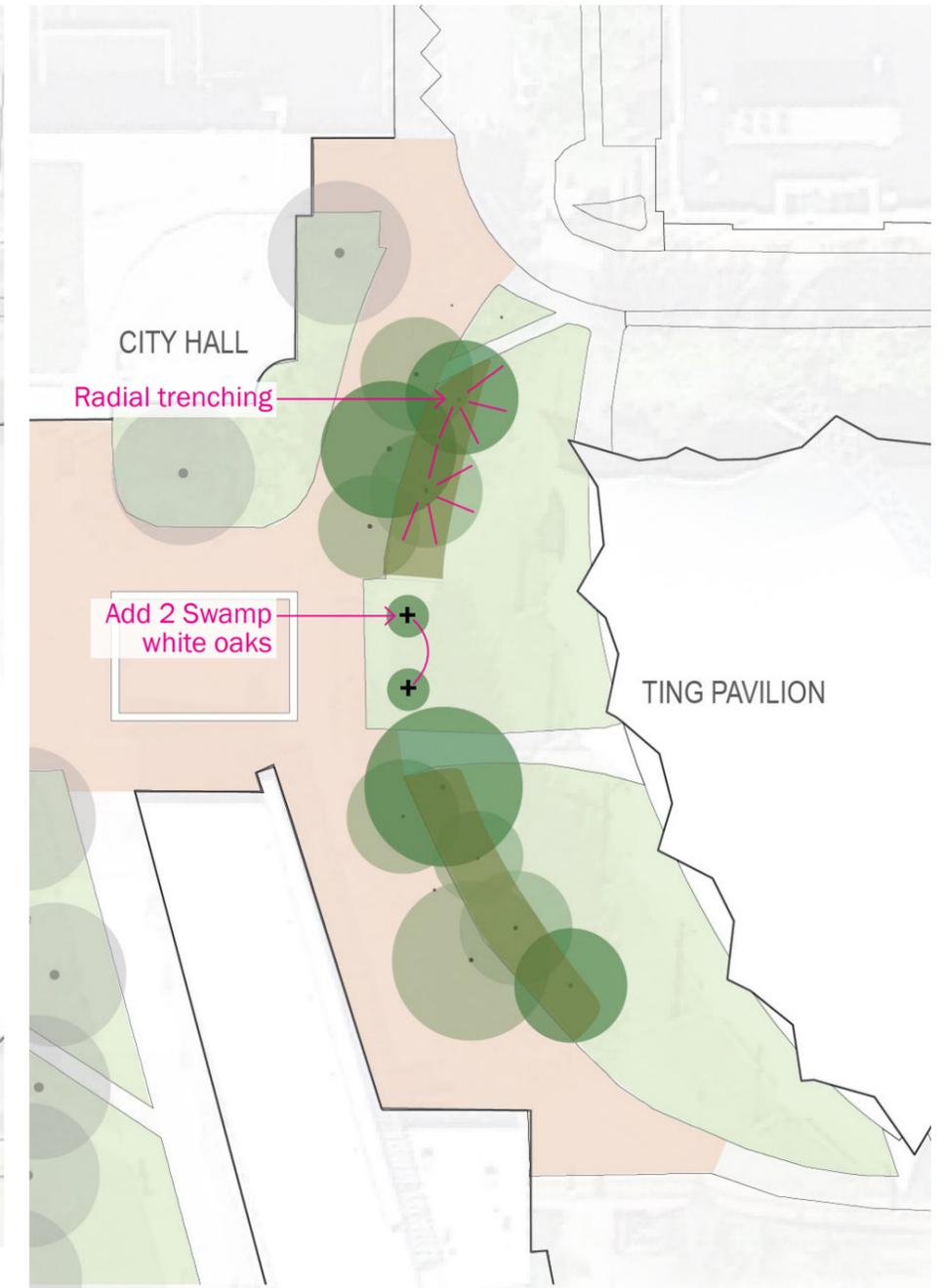
Long Term Recommendations

- The Ting Pavilion Shumard Oaks are predominantly healthy but face heavy competition from the grove
- Thinning the groves, by removing select trees, will reduce competition and allow the existing healthy trees to grow a longer healthier life
- Radial trenching to address compaction and moisture retention (see previous page)
- New tree planting in central lawn to shade popular lawn seating areas during Summer months

Existing



Proposed



*Monitor trees as they develop, consider removal

Tree & Soil Improvements | Side Streets

Designed outside of the Halprin plan and primarily pedestrian, the side streets have a wide range of conditions that are more reactive to existing constraints (utilities, service access, emergency vehicular access and increased slopes) than tree health, comfort and function. Minimally, there are opportunities within the side streets to expand tree openings in paving and decompact soils for improved growth rates. With a redesigned and longer vision, these side streets can become more intentionally welcoming destinations.

1st Street

- Redesign opportunity
- No proposed changes

2nd Street E

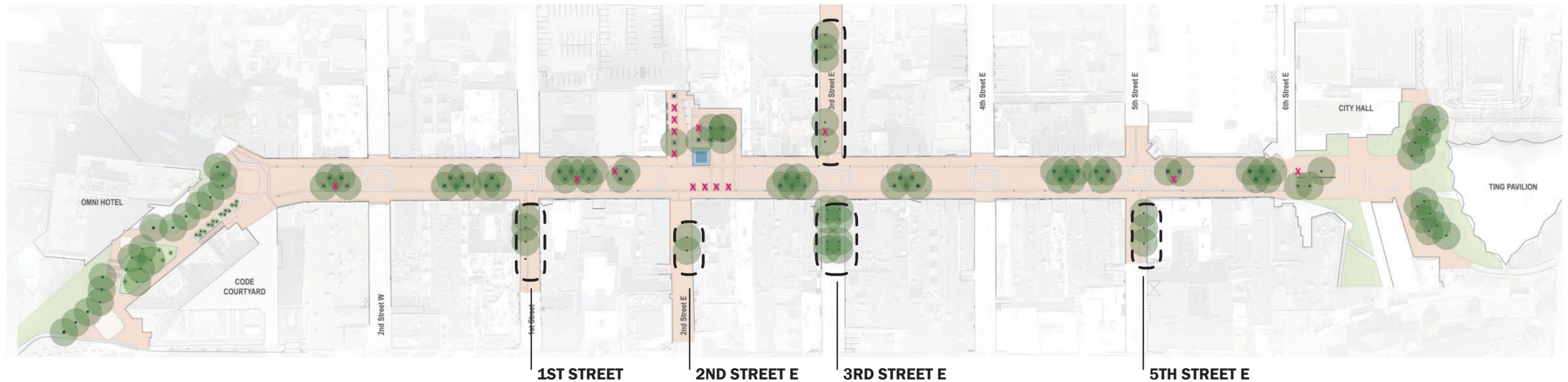
- Add structural slab
- Tree replacement

3rd Street E

- North: ginkgos to have metal grate removed/modified
- South: ginkgos to have soil remediation

5th Street E

- Tree replacement to avoid access conflicts
- Redesign opportunity



Trunk/Ground Plan Interface Obscured

Tree & Fountain Visibility | Tree Visibility

The success of the trees has created shaded and inviting outdoor seating along the Mall, which has led to an expansion of cafe seating. As the space has become more popular, fencing, furnishings, and potted plants have been added. However, these additions have obscured the visual connection between the tree trunks and the pavement, reducing pedestrian interaction with nature.

Additionally, the original Halprin fountains have either been surrounded by cafe seating or fenced off for safety, which has diminished the interactivity they were originally designed to offer.

To improve the experience, reallocating cafe seating, reducing visual clutter, and restoring access to the fountains is recommended. These changes would enhance visibility of the tree trunks and provide pedestrians with direct access to the fountains, enriching their experience of the Mall.



Potted Trees

- Tall vegetation (small trees) enclose and obscure base of trees
- Extensive use of pots obscures base of trees



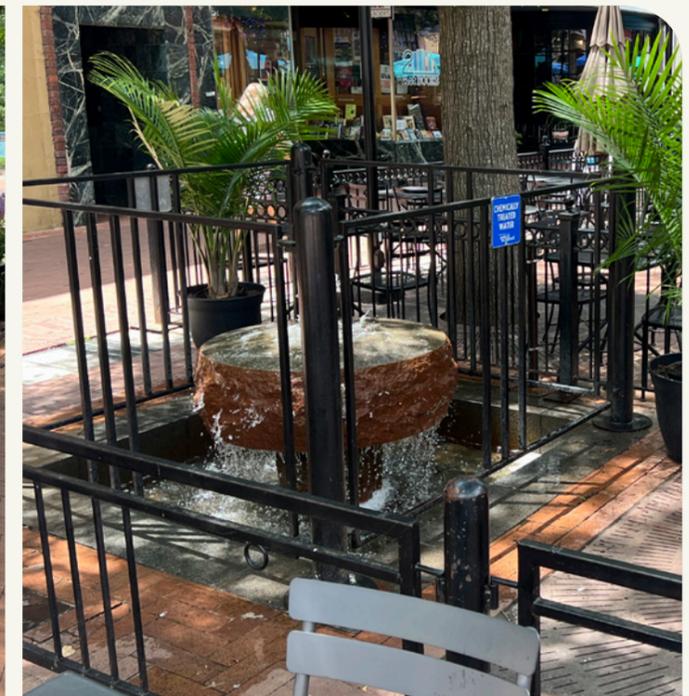
Fencing/Counters/Furnishings

- Solid fencing and counters obscures base of trees
- Tall cafe furnishings such as metal racks obscure base of trees



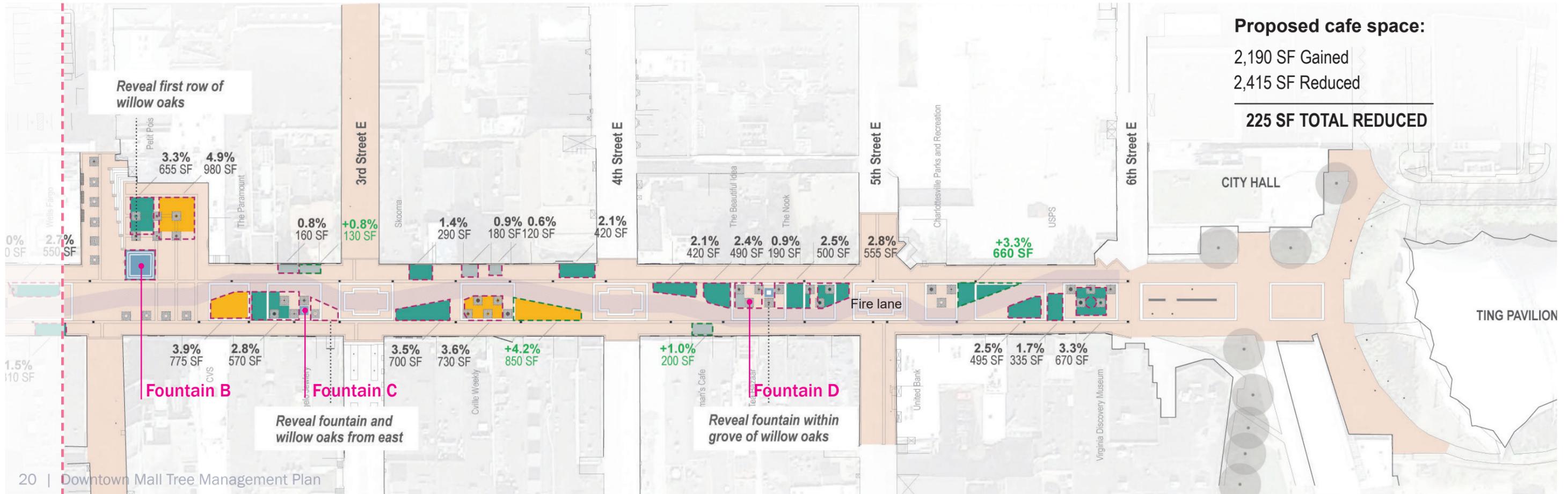
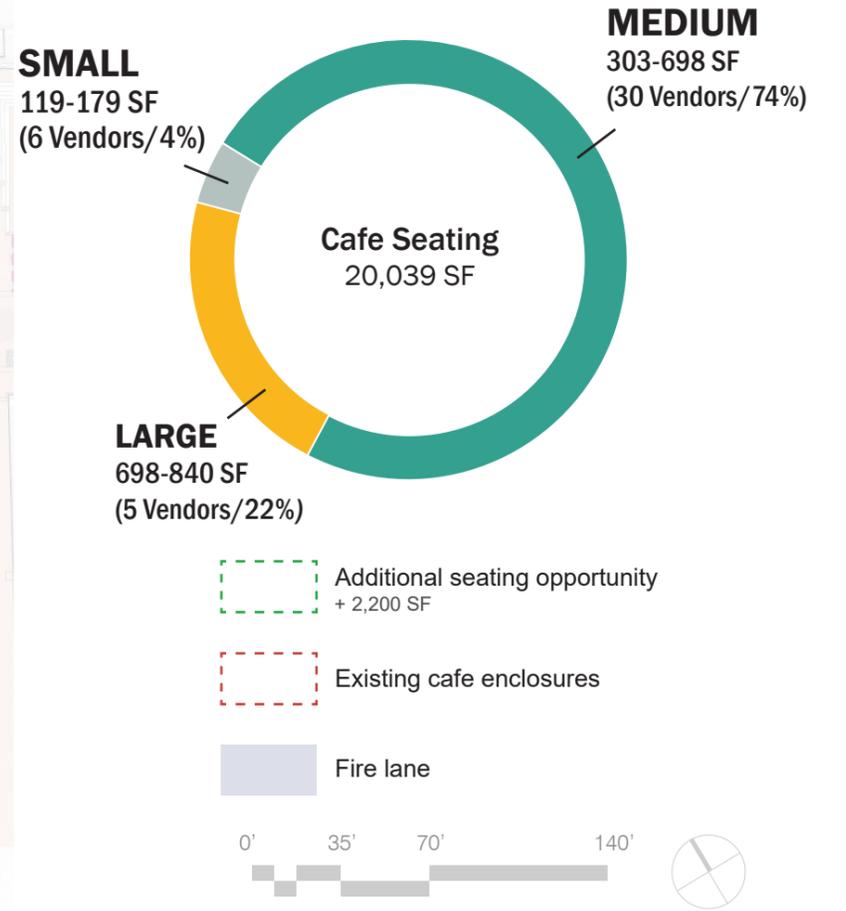
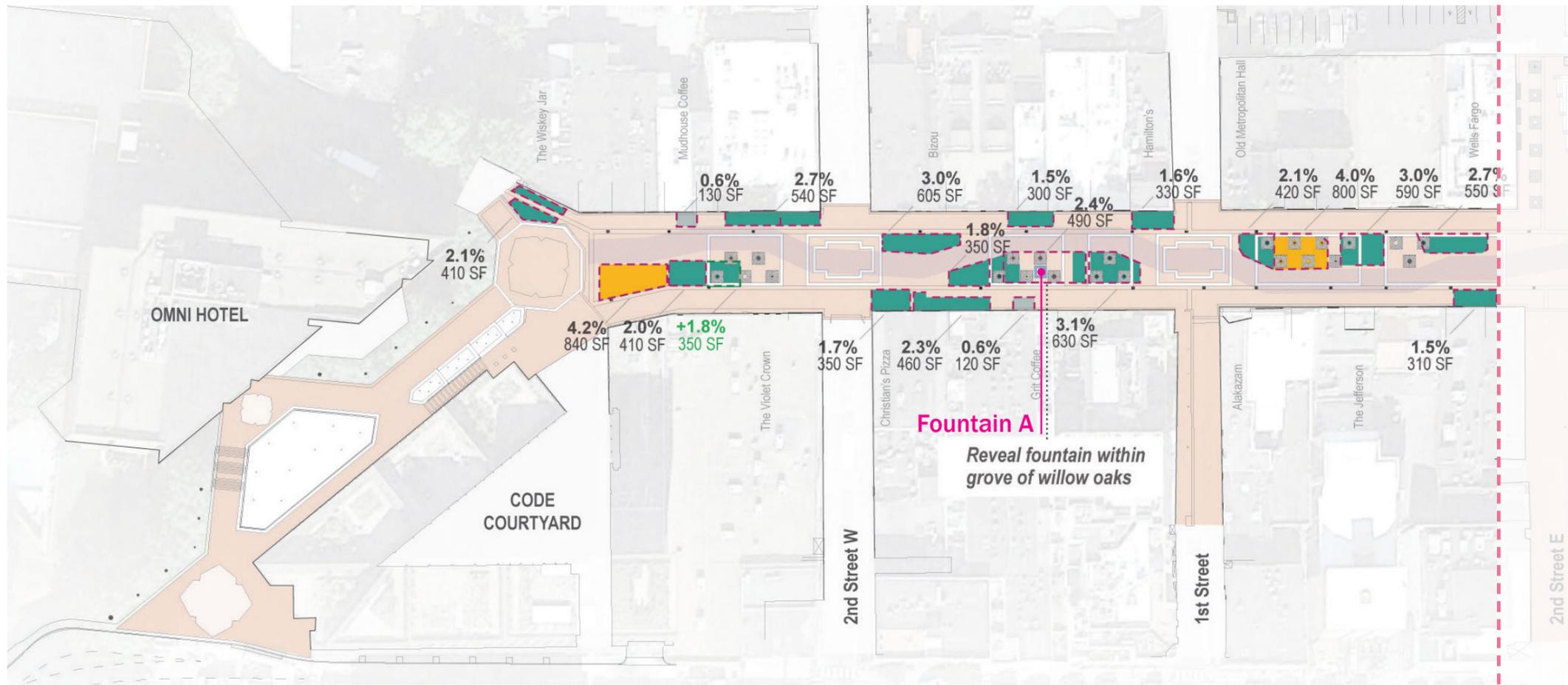
Cafe Fencing

- Cafe fencing blocks the access to public fountain and obscures its visibility



Fencing by Fountain

- Fountain fencing blocks the access

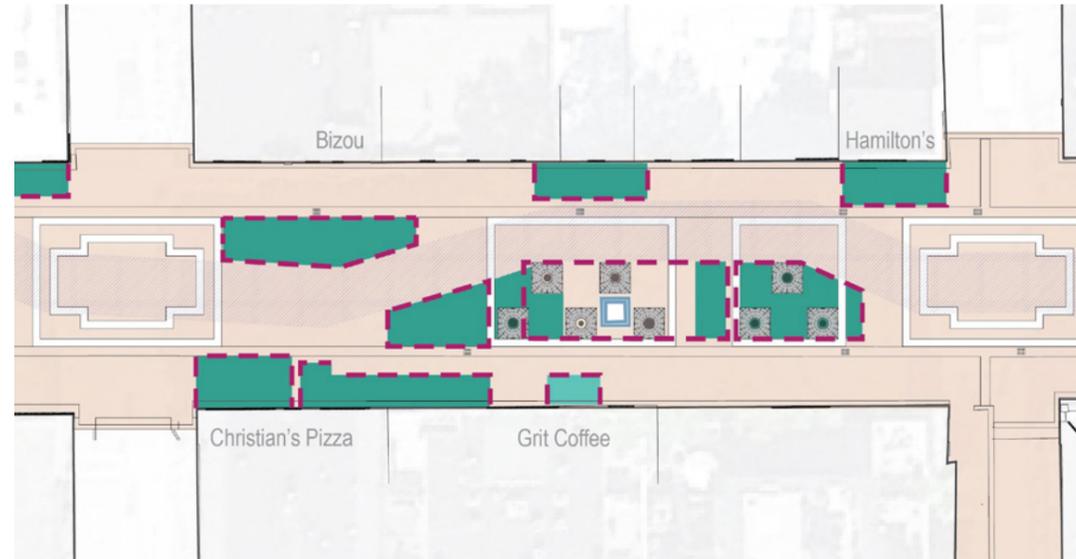


Proposed cafe space:
2,190 SF Gained
2,415 SF Reduced
225 SF TOTAL REDUCED

Tree & Fountain Visibility | *Proposed Cafe Space*

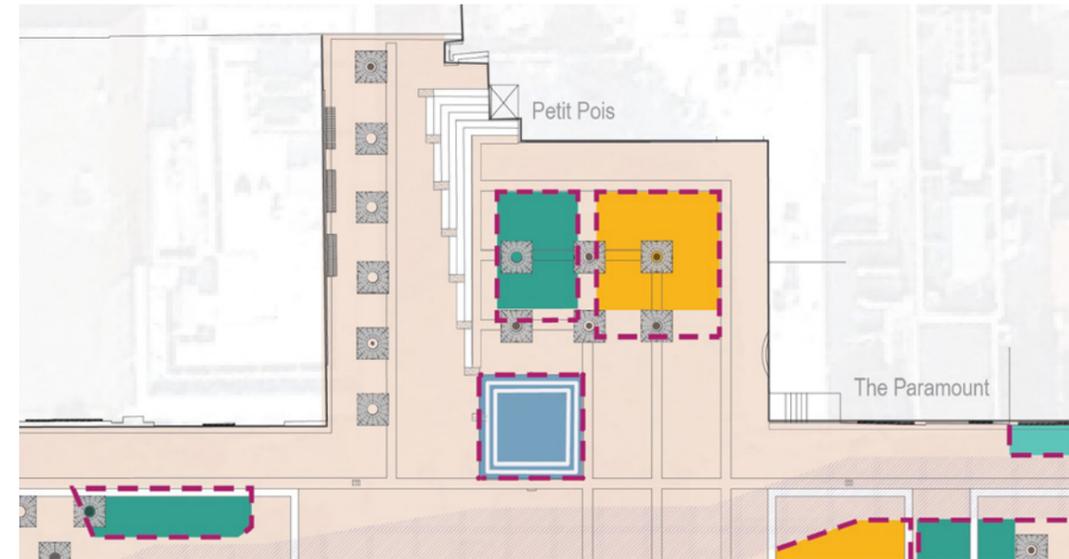
Fountain A

- Reveal fountain and trunks within grove of willow oaks
- Net change: -595 SF



Fountain B

- Reveal first row of willow oaks to increase public area
- Net change: -273 SF



Fountain C

- Reveal fountain and willow oaks from east
- Net change: -927 SF



Fountain D

- Reveal fountain and trunks within grove of willow oaks
- Net change: -690 SF

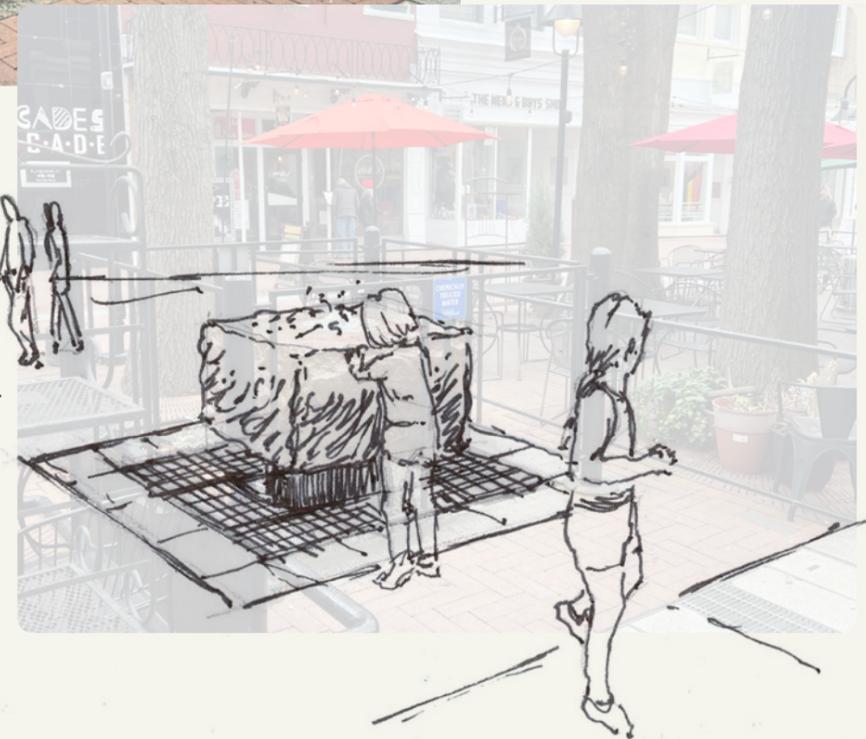


- Existing cafe enclosures
- Additional seating opportunity
- Opportunity to reveal trees & fountains

Tree & Fountain Visibility | Fountain Access

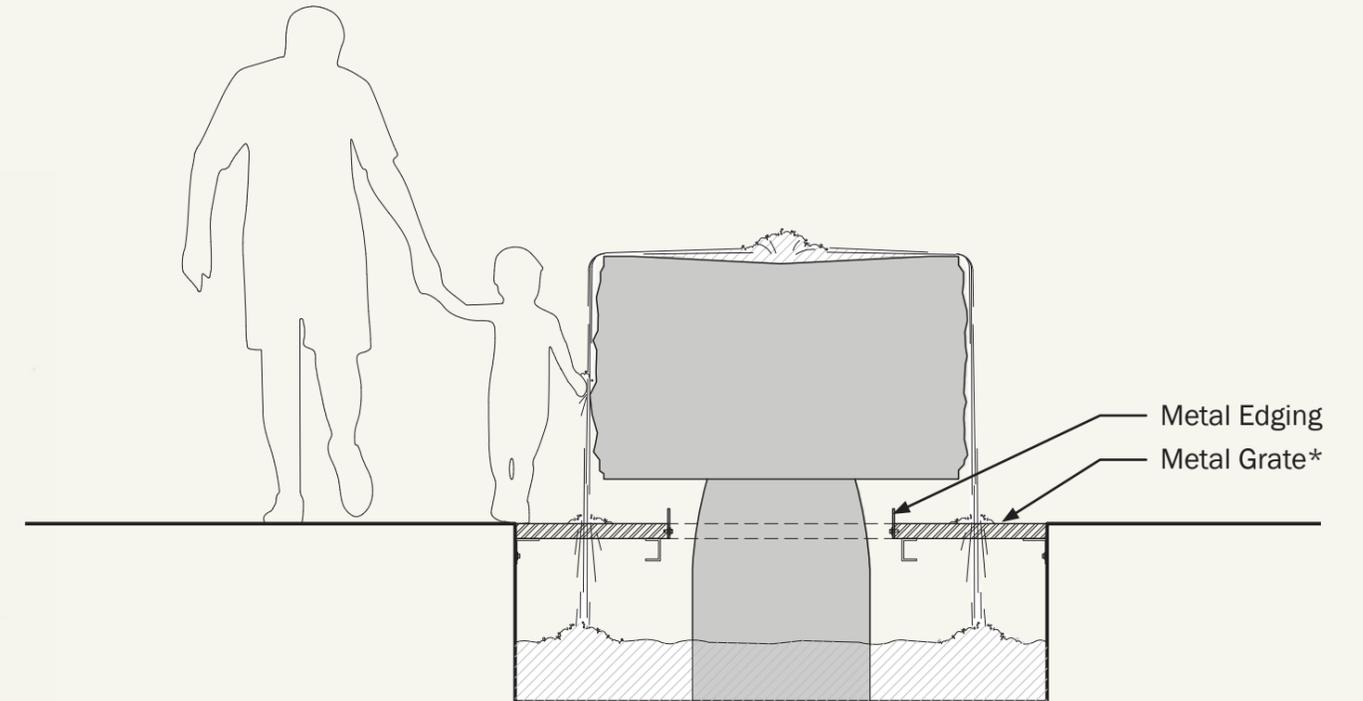
Due to trip hazard concerns, the large cascading fountain at Central Place and the three smaller spring fountains along the Mall have been fenced off, limiting pedestrian interaction and summer water play.

To address this, installing a metal grate surface that allows water to flow through while eliminating the trip hazard is recommended. This would make the fountains accessible again, turning them into lively centers of activity and play instead of unused, fenced-off spaces.



Recommended Accessible Metal Grate Detail

- Remove fencing
- Add metal grate for access

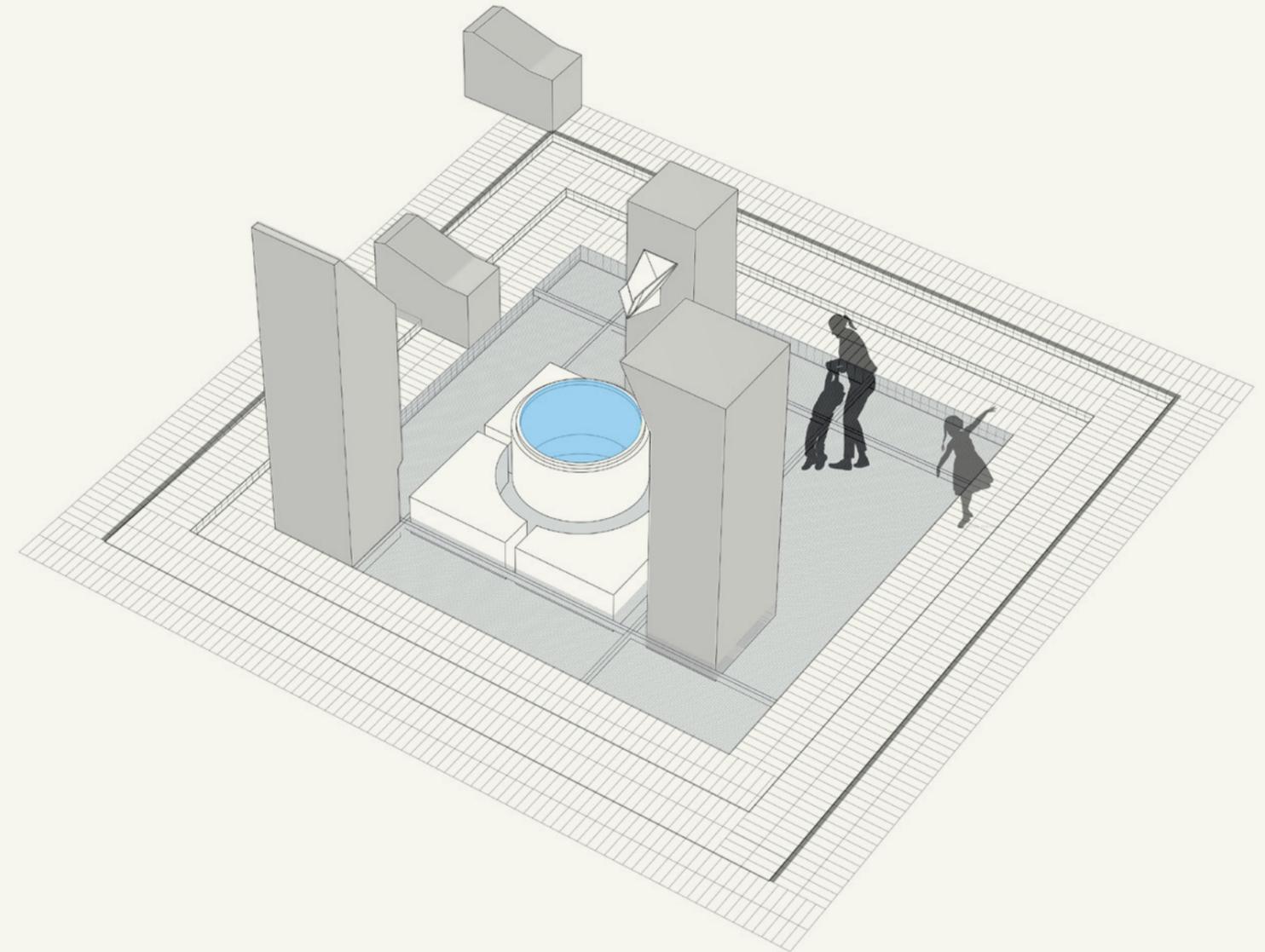


* Final grate elevation to be studied for visibility and compliance with initial design intent



Recommended Accessible Metal Grate Concept

- Add level and accessible stainless grate over basin
- Remove bollards and add safety nosing at stairs
- Add nearby seating for visitors/families



D

Tree Maintenance | Tree Care Manual

An ISA-certified Arborist has provided maintenance recommendations for over 140 assessed trees along the Mall. The report includes details on tree species, current health, and proposed pruning actions. In addition to specific pruning recommendations, general tree care guidelines are provided, categorized by tree age—from newly planted trees to mature specimens.

Takeaways

- Every tree needs specific and individualized care
- Minimize pruning as much as possible

The most important pruning objective are to reduce risk of failure and to set the stage for long-term maintenance by maintaining and developing strong structure

Four essential age classes of trees on the Downtown Mall
Pruning should be by life stage

STAGE: Young-to medium-aged trees

- 1) 6 yrs old, beside the Omni and Code Building
- 2) 20-25 yrs old, along side streets and near the pavilion
 - Structural pruning to reduce potential for limb failure
 - Encourage strong center leader
 - Defect corrections
 - Create good limb spacing

STAGE: Mature - to over mature trees

- 3) 40-45 yrs old, Willows in front of the Omni
- 4) 55-60 yrs old, primary trees along the mall
 - Most have good structure and very little pruning is required
 - Maintaining tree vigor and safety are the two most important goals for these trees

 CHARLOTTEVILLE DOWNTOWN MALL TREE CARE RECOMMENDATIONS - June 2024		
Tree #	Common name	Pruning recommendations
1a	Shumard oak	Consider removal for poor form
1b	Shumard oak	No pruning required
1c	Shumard oak	Crown clean to remove minor deadwood (d/w)
1d	Shumard oak	Crown clean to remove minor deadwood (d/w)
2a	Shumard oak	No pruning required
2b	Shumard oak	Consider removal for poor form
2c	Shumard oak	Crown clean for structure. Remove crossing limbs
3	Willow oak	Structural pruning for crossing limbs
4	Willow oak	Structural pruning for crossing limbs
5	Willow oak	Structural pruning for crossing limbs
10	Willow oak	No pruning required
11	Willow oak	Bark inclusion. Consider cable. No pruning.
12	Willow oak	Consider removal for poor form
13	Willow oak	No pruning required
14	Willow oak	Elevate off of roof. Overextended limbs
15	Willow oak	No pruning required
17	Willow oak	Elevate off of roof. Overextended limbs
18	Willow oak	No pruning required
20	Willow oak	Elevate off of roof. Overextended limbs
21	Willow oak	No pruning required
22	Willow oak	No pruning required
23	Willow oak	Consider removal for poor form
24	Willow oak	Bark inclusion. Consider cable. No pruning.
25	Willow oak	No pruning required
26	Willow oak	No pruning required
27	Willow oak	Overextended limbs

105	Ginkgo	No pruning required
106	Ginkgo	No pruning required
107	Ginkgo	Consider removal for poor form
108	Ginkgo	Consider removal for poor form
109	Ginkgo	Consider removal for poor form
110	Shumard oak	No pruning required
111	Shumard oak	No pruning required
112	Shumard oak	Crown cleaning to remove major d/w
113	Shumard oak	Structural pruning
114	Shumard oak	No pruning required
115	Shumard oak	No pruning required
116	Shumard oak	No pruning required
117	Willow oak	No pruning required
118	Willow oak	No pruning required
119	Willow oak	No pruning required
120	American hornbeam	Structural pruning
121	American hornbeam	Structural pruning
122	Sweetbay magnolia	No pruning required
123	Sweetbay magnolia	No pruning required
124	Serviceberry	Structural pruning
125	Serviceberry	Structural pruning
126	Serviceberry	Structural pruning
127	Serviceberry	Structural pruning
128	Serviceberry	Structural pruning
129	Serviceberry	Structural pruning
130	Serviceberry	Structural pruning
131	Serviceberry	Structural pruning
132	Serviceberry	Structural pruning
133	Serviceberry	Structural pruning
134	Serviceberry	Structural pruning
135	Serviceberry	Structural pruning
136	Serviceberry	Structural pruning
137	Serviceberry	Structural pruning

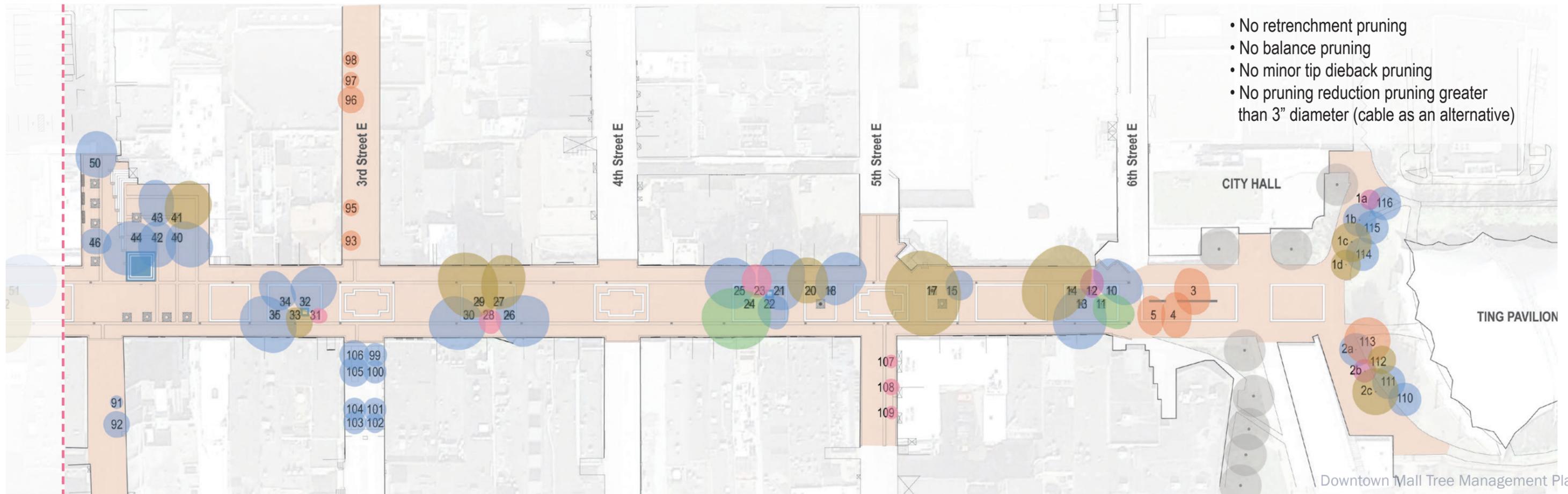
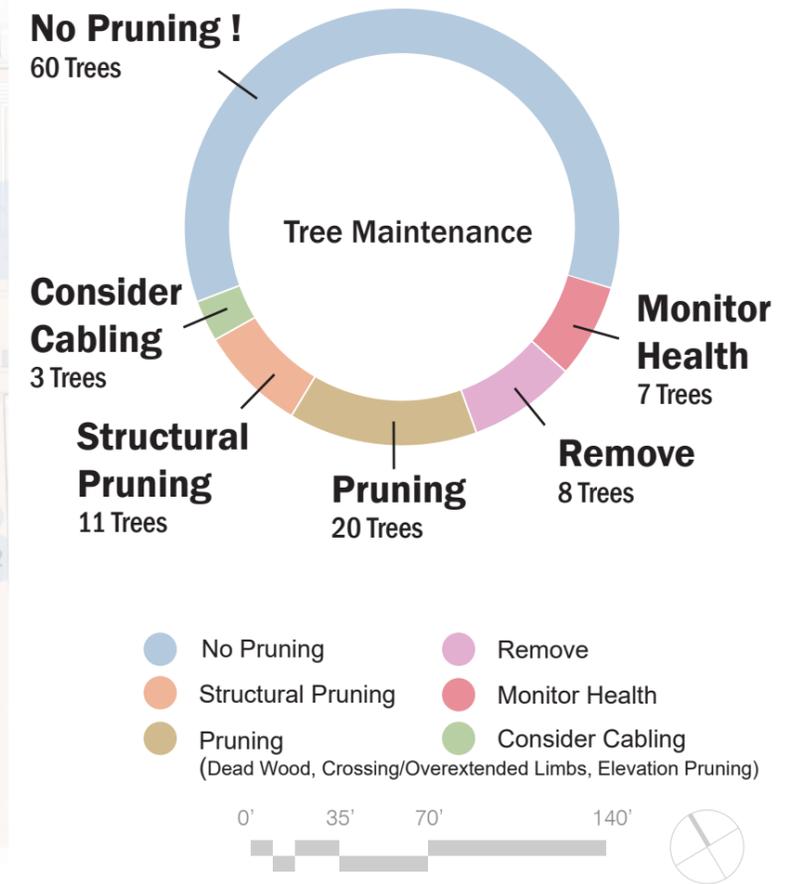
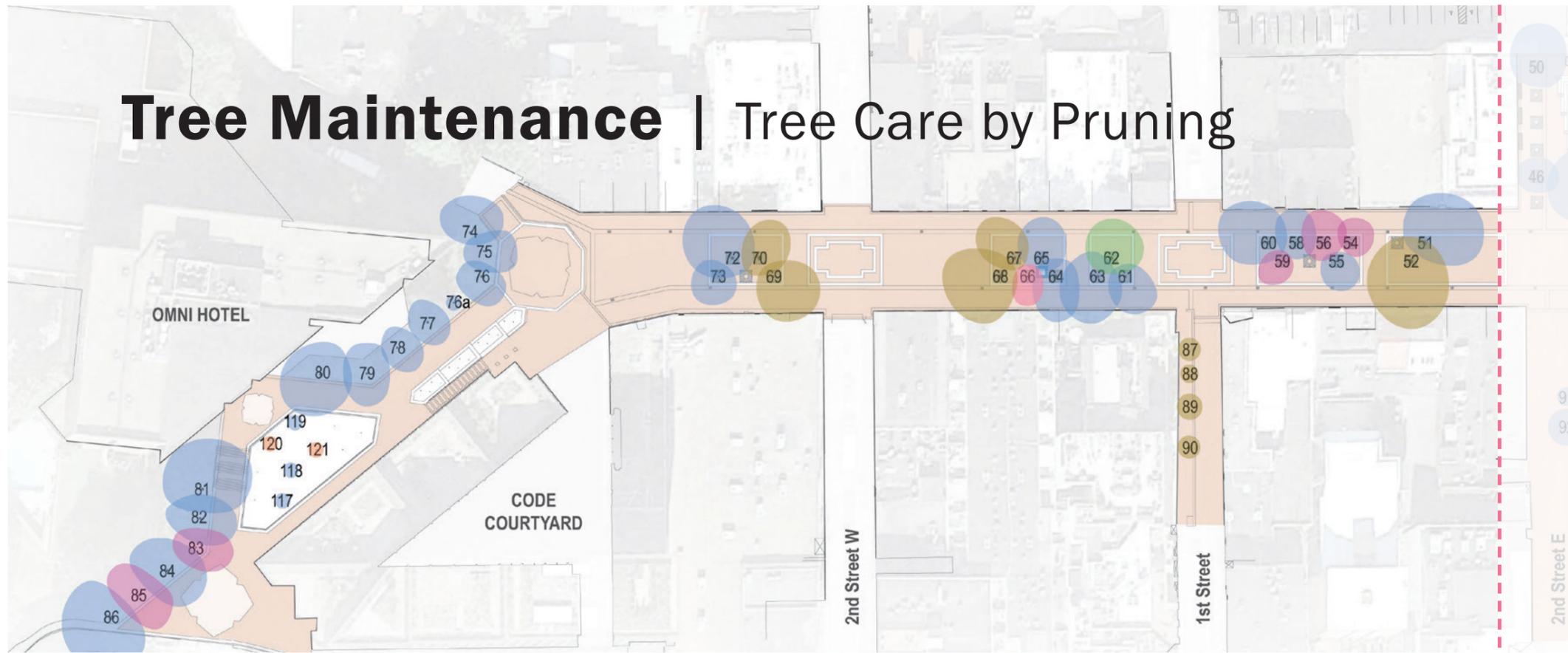
72	Willow oak	No pruning required
73	Willow oak	No pruning required
74	Willow oak	No pruning required
75	Willow oak	No pruning required
76	Willow oak	No pruning required
76a	Willow oak	No pruning required
77	Willow oak	No pruning required
78	Willow oak	No pruning required
79	Willow oak	No pruning required
80	Willow oak	No pruning required
81	Willow oak	No pruning required
82	Willow oak	No pruning required
83	Willow oak	Consider removal for poor form
84	Willow oak	No pruning required
85	Willow oak	Consider removal for poor form
86	Willow oak	No pruning required
87	Ginkgo	Elevation pruning over walkway
88	Southern magnolia	Elevation pruning over walkway
89	Ginkgo	Elevation pruning over walkway
90	Ginkgo	Elevation pruning over walkway
91	Norway maple	No pruning required
92	Norway maple	No pruning required
93	Ginkgo	Structural pruning
95	Ginkgo	Structural pruning
96	Ginkgo	Structural pruning
97	Ginkgo	Structural pruning
98	Ginkgo	Structural pruning
99	Ginkgo	No pruning required
100	Ginkgo	No pruning required
101	Ginkgo	No pruning required
102	Ginkgo	No pruning required
103	Ginkgo	No pruning required
104	Ginkgo	No pruning required

28	Willow oak	Consider removal for poor form
29	Willow oak	Overextended limbs
30	Willow oak	No pruning required
31	Willow oak	Consider removal for poor form
32	Willow oak	No pruning required
33	Willow oak	Prune one lower limb back to branch collar
34	Willow oak	No pruning required
35	Willow oak	No pruning required
40	Willow oak	No pruning required
41	Willow oak	Retrenchment pruning has created hazard
42	Willow oak	No pruning required
43	Willow oak	No pruning required
44	Willow oak	No pruning required
46	Norway maple	No pruning required
50	Red maple	No pruning required
51	Willow oak	No pruning required
52	Willow oak	Crown cleaning to remove major d/w
54	Willow oak	Consider removal for poor condition and hazard
55	Willow oak	No pruning required
56	Willow oak	Consider removal for poor form
58	Willow oak	No pruning required
59	Willow oak	Consider removal for poor condition and hazard
60	Willow oak	No pruning required
61	Willow oak	No pruning required
62	Willow oak	Add cable. No pruning.
63	Willow oak	No pruning required
64	Willow oak	No pruning required
65	Willow oak	No pruning required
66	Willow oak	Consider removal for poor form
67	Willow oak	Remove major d/w. Subordinate co-dom
68	Willow oak	Overextended limbs
69	Willow oak	Elevation pruning off of roof
70	Willow oak	Major d/w, but not hazard now

138	Serviceberry	Structural pruning
139	Serviceberry	Structural pruning
140	Serviceberry	Structural pruning
141	Serviceberry	Structural pruning

* For further details, see separate report

Tree Maintenance | Tree Care by Pruning



- No retrenchment pruning
- No balance pruning
- No minor tip dieback pruning
- No pruning reduction pruning greater than 3" diameter (cable as an alternative)

Background

Short Term Recommendations

Long Term Recommendations

Cost Estimate

Building Height | Zoning & Light Preservation

Zoning changes allow for increased height and density along the downtown mall. Increased building heights could have unintended consequences for existing and proposed trees. With building height increases, new trees will be challenged or not grow in full shade. Willow oaks, the primary tree along the Mall, do not tolerate shady conditions. New trees will be slow to develop and mature trees will have accelerated decline growing in shaded conditions.

Zoning: Building Height

Zoning changes adopted in 2023* allow for increased building height along the downtown mall (Downtown Mixed Use district). Increased building heights could have unintended consequences for existing and proposed trees.

District: DX (Downtown Mixed Use)

Building height (max stories/feet)

- Base: 10 / 142'
- With bonus: 13 / 184'

Transition Type D:

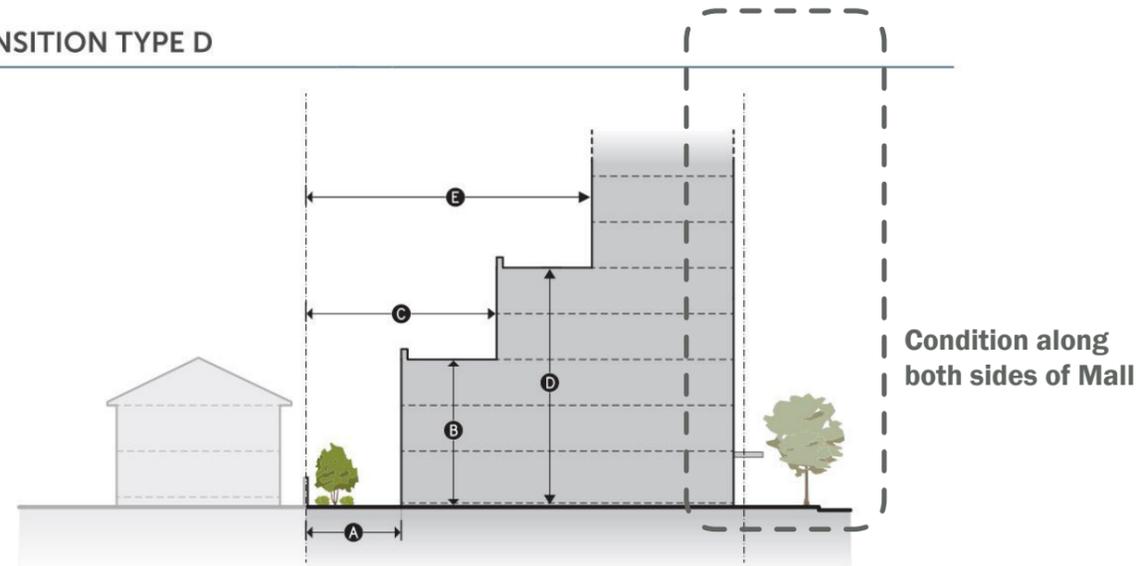
Abutting district: R-A, R-B, & R-C

- Setback: 20'
- Step-back 1: 44'H x 40'W
- Step-back 2: 72'H x 60'W

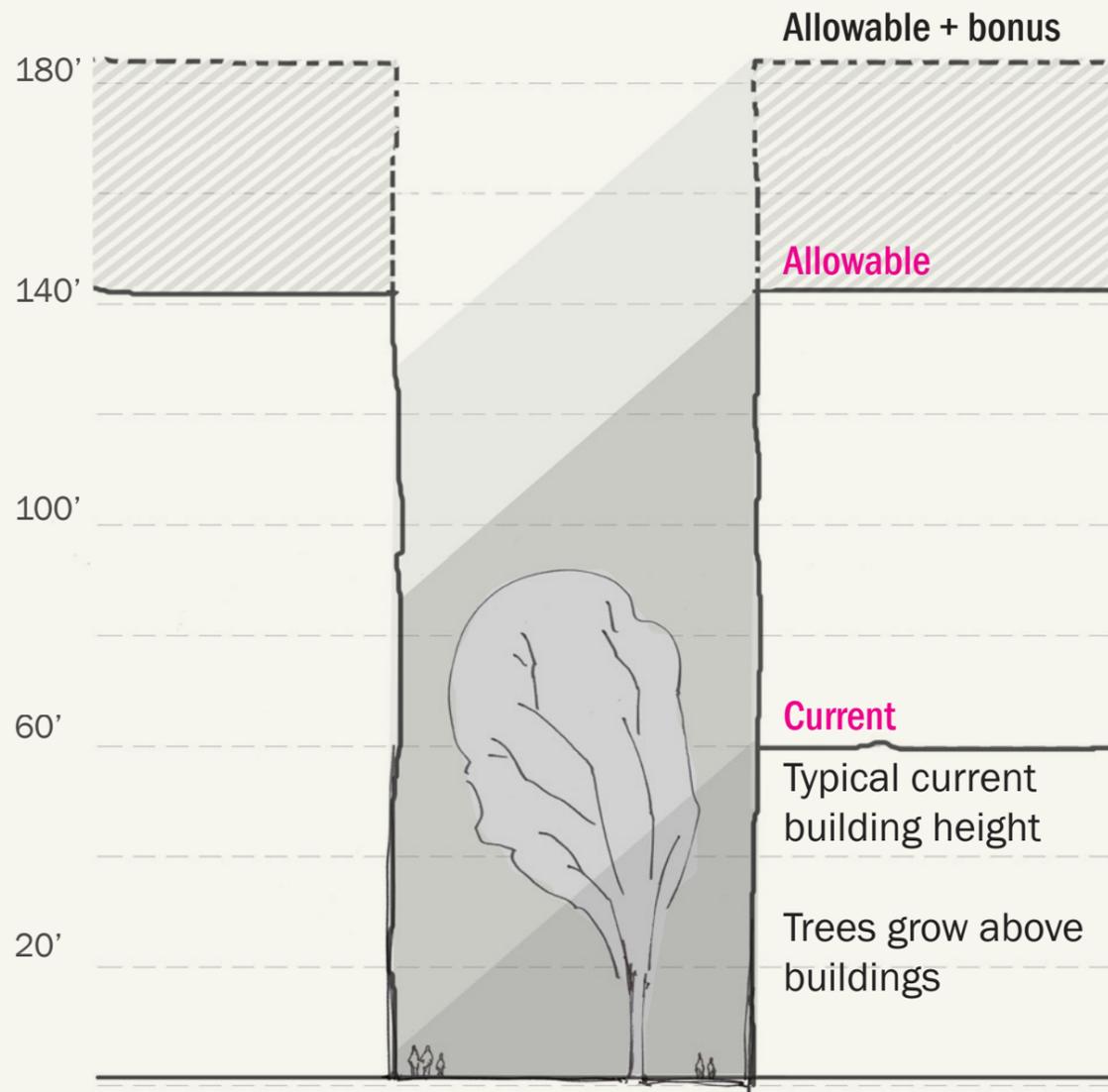
*Charlottesville Development Code (Adopted 12/18/2023)

- Allowable building height fro Downtown Mixed Use (DX) see section 2.5.6
- Building transitions and step-backs see Section 2.10.7 & Div. 4.7

TRANSITION TYPE D

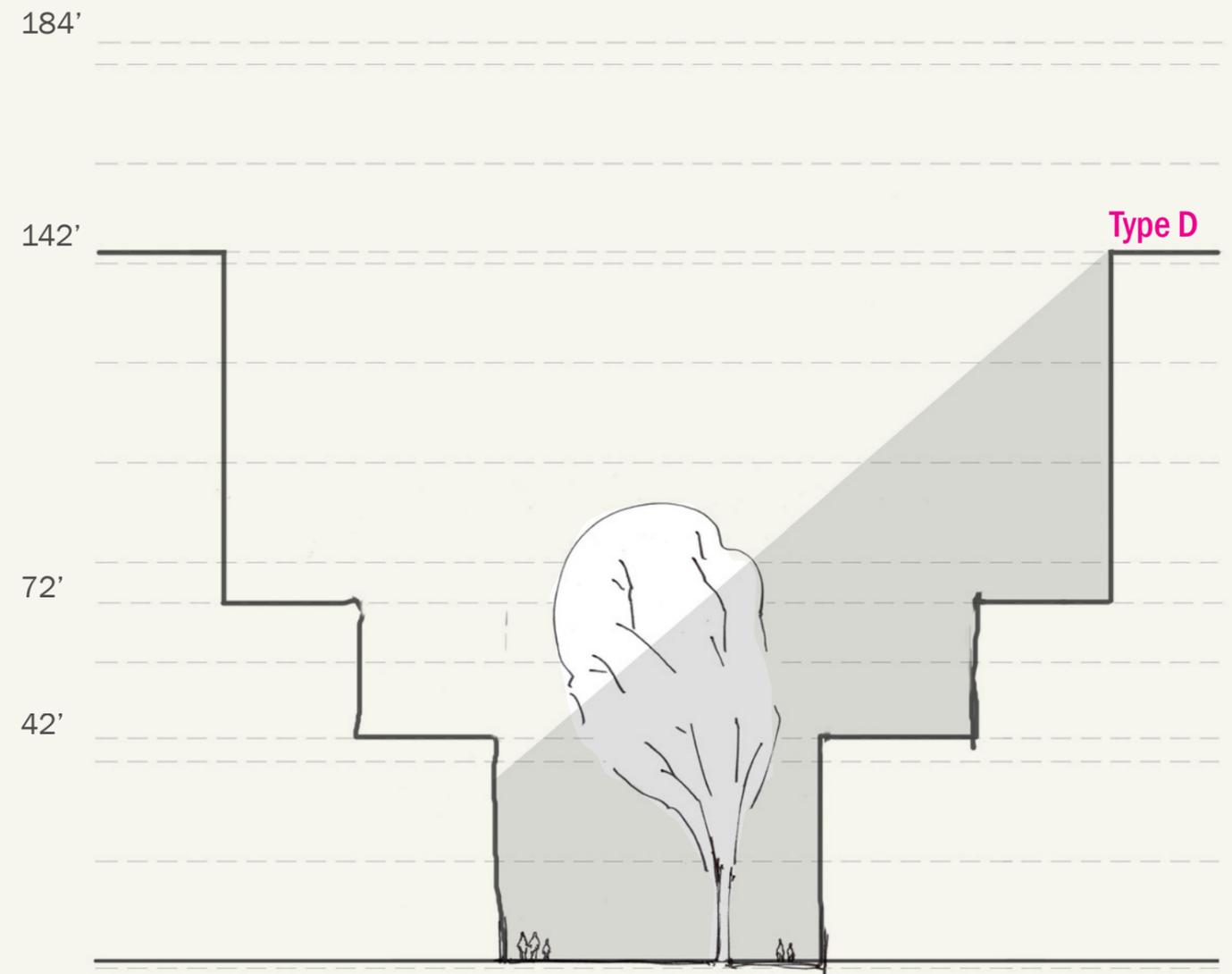


Building Step-Back Precedent: CODE Building



Allowable Condition

Increased building heights directly adjacent to the Downtown Mall will drastically impact the available light for trees to develop. Current buildings, particularly those on the south side, have heights that have largely allowed canopies to have light access. Future zoning heights would create a condition that directly limits light access and plant health.



Recommended code modification

Transition type D for the Downtown Mall corridor creates required step backs that would allow light into the corridor for healthy tree development (and pedestrians).

Long Term Recommendations: Next Generation

The current Willow oaks have thrived for 48 years, despite the challenges of the urban environment. In light of the Mall's historical context and original design intent, the following section outlines an approach for implementing the next generation of trees, creating a resilient and cohesive canopy for the future.

A. Tree Replacement

- *Grove replacement approach*
- *Tree Planter and slab replacement*
- *Tree size at install*

B. Utilities & Critical Root Zones

- *Lateral replacements to avoid critical root zones*
- *Utility relocation options*

C. Tree Selection

- *Size, form, urban resilience, climate, leaf litter, fruit and color*

D. Phasing

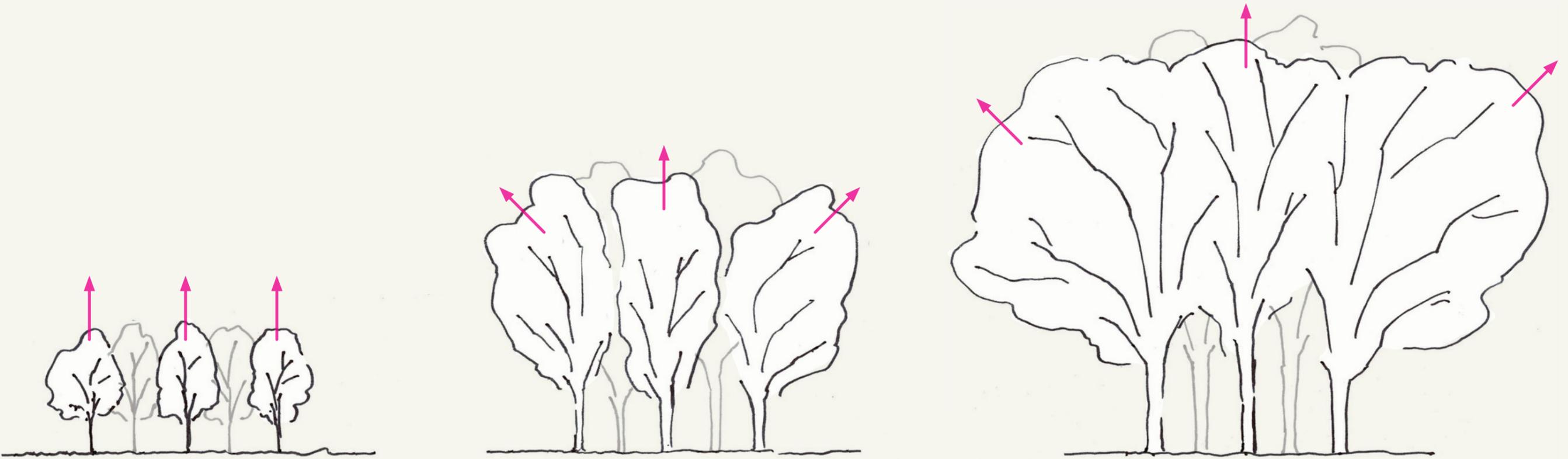
- *Four phased approach*

E. Celebrate Replacements

- *Art installations after tree replacement*
- *Upcycle & recycle*

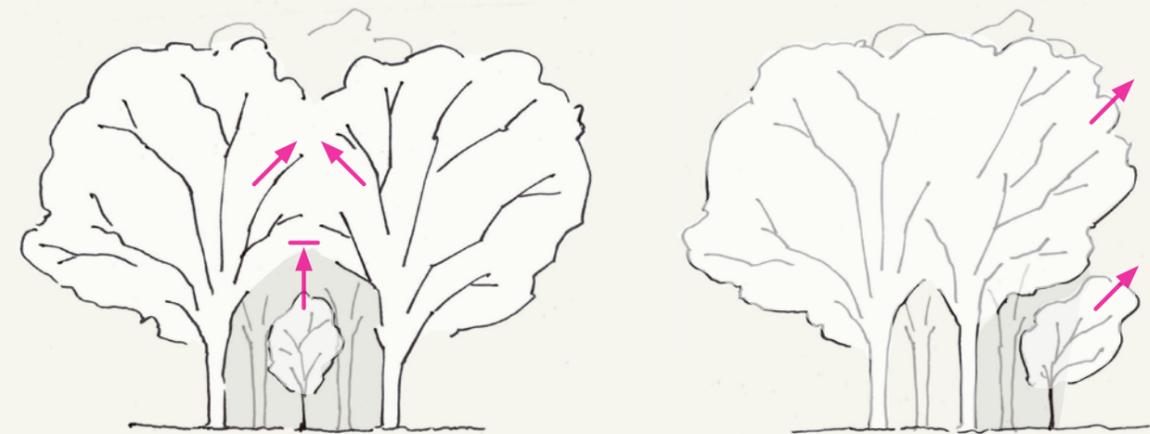


Tree Replacement | Grow Together



Uniform Grove Replacement

When trees are planted at the same time, they grow together as a cohesive form. The outer trees expand outward, while the inner trees focus growth upward, creating a balanced, uniform canopy structure. Each grove should be planted with a single species to promote uniform growth.



Replacing individual trees within established groves can create challenges for the new trees, as they must grow in the shade of the surrounding mature trees. This leads to competition for light, with both the mature and new trees vying to fill the gaps left by the removed trees, often hindering the growth of the replacements.

Tree Replacement | Option 1

Option 1: Planter Replacement

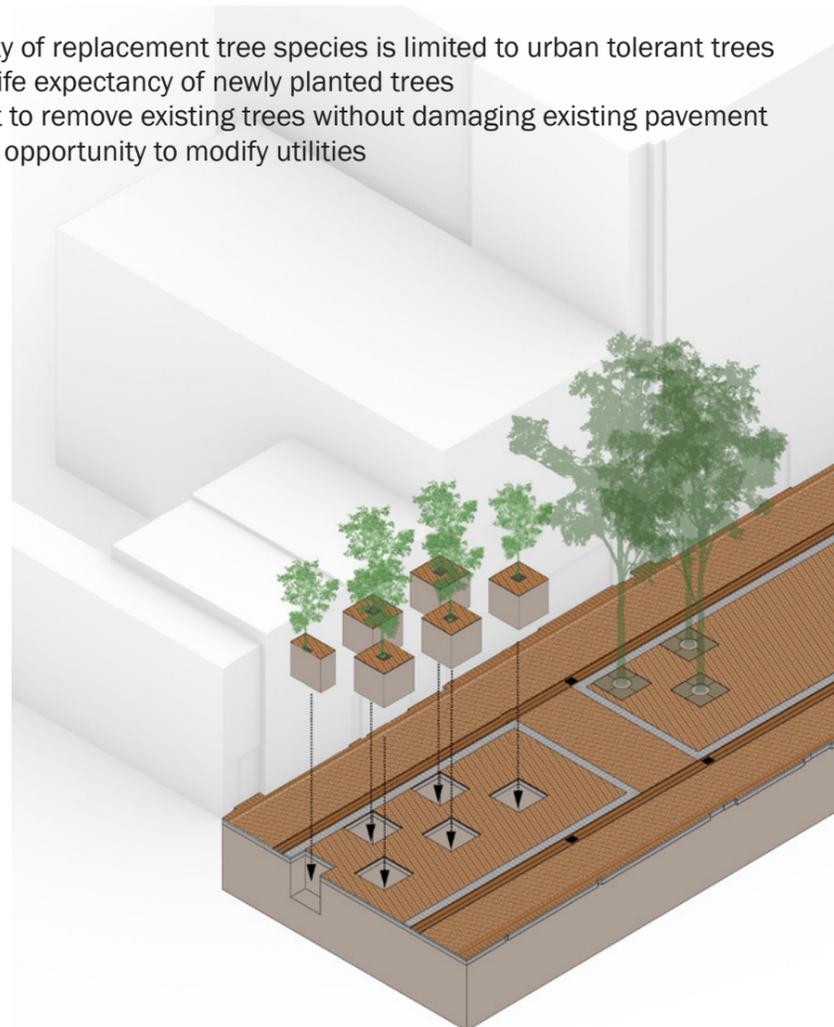
Planter replacement is a minimal tree replacement approach that offers low impact and low cost. This involves removing the tree, metal grate, and the soil directly beneath the grate. A new tree, soil, and paver grate are then installed. This approach does not include soil remediation, drainage, or utility improvements.

Pros

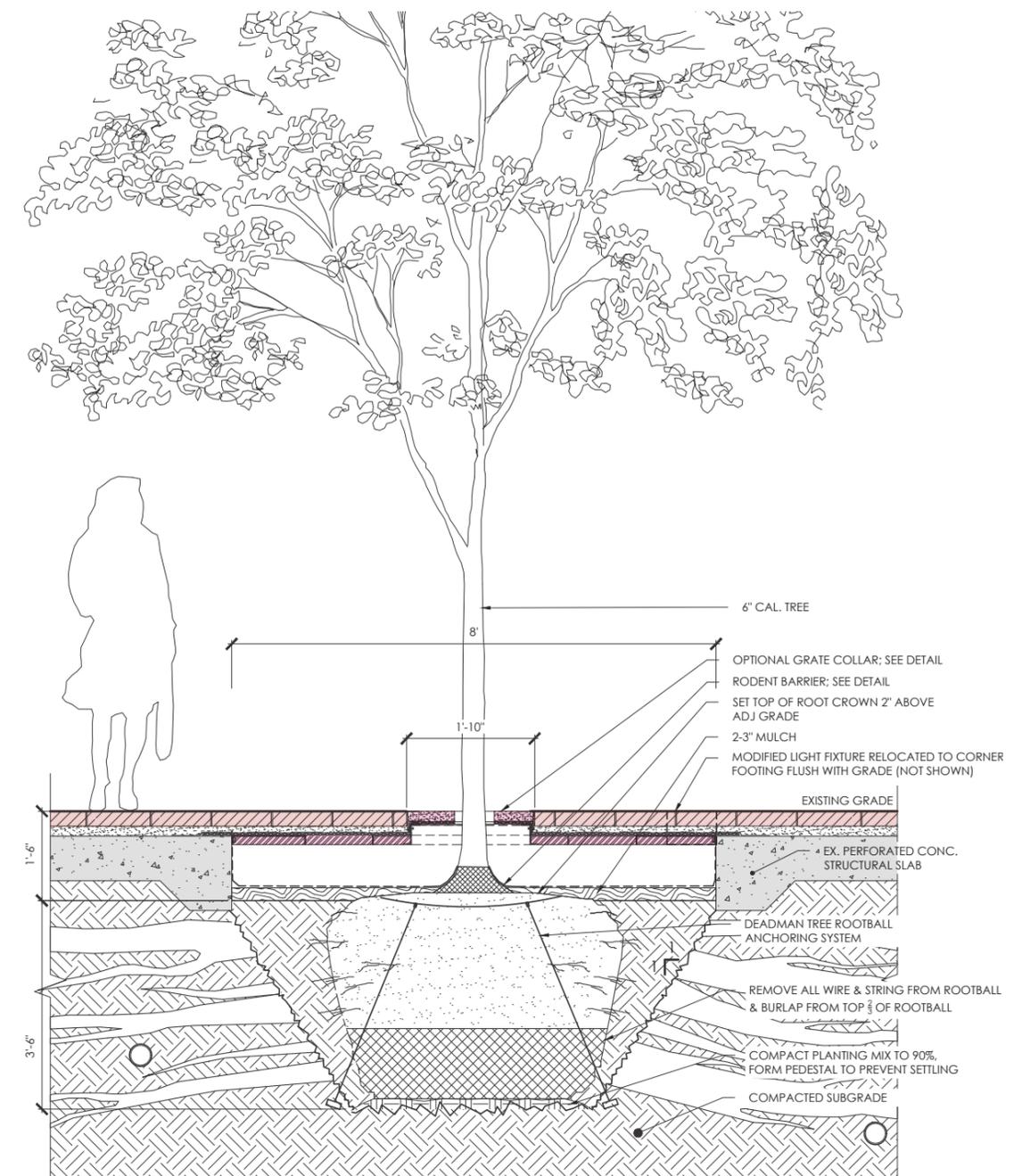
- Cost effective replacement strategy
- Minimal disturbance of existing soils. Existing roots will decompose and provide pore space

Cons

- Diversity of replacement tree species is limited to urban tolerant trees
- Limits life expectancy of newly planted trees
- Difficult to remove existing trees without damaging existing pavement
- Missed opportunity to modify utilities



Option 1 Tree Planting Detail



Once tree extends beyond internal frame sub-structure it is recommended to switch to foam support structure (See page 12)

Tree Replacement | Option 2

Option 2: Soil & Slab Replacement (Preferred)

Soil and slab replacement involves a more comprehensive approach to enhance planting conditions and address potential utility conflicts. This method includes suspending the subslab for soils, improving soil quality with drainage and compost, and updating utility connections to prevent future issues.

Pros

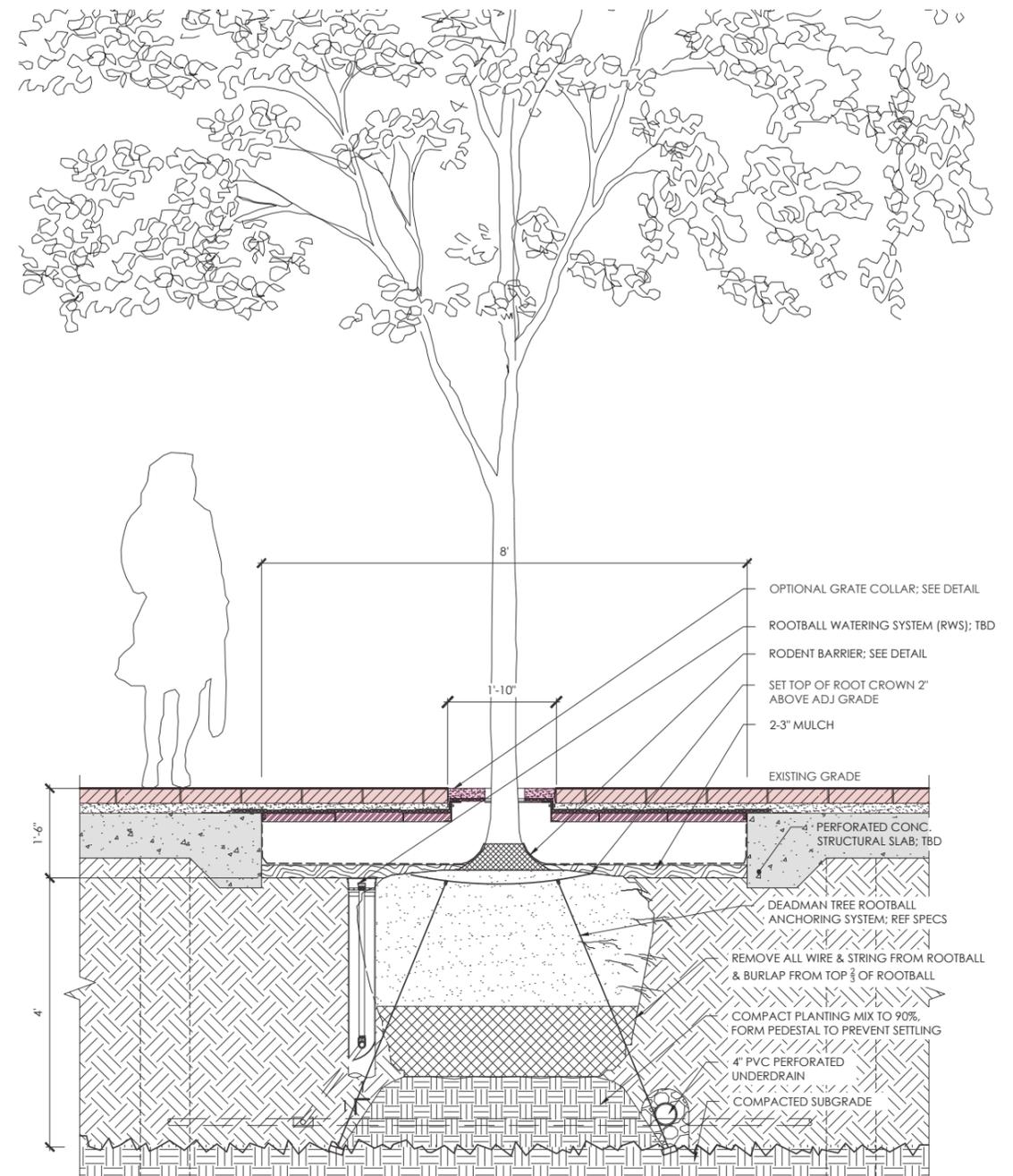
- Extends life expectancy of newly planted trees
- Structural slab provides uncompacted soil volume for tree roots
- Opportunity for utility changes/upgrades during replacement

Cons

- More expensive
- Longer construction time



Option 2 Tree Planting Detail

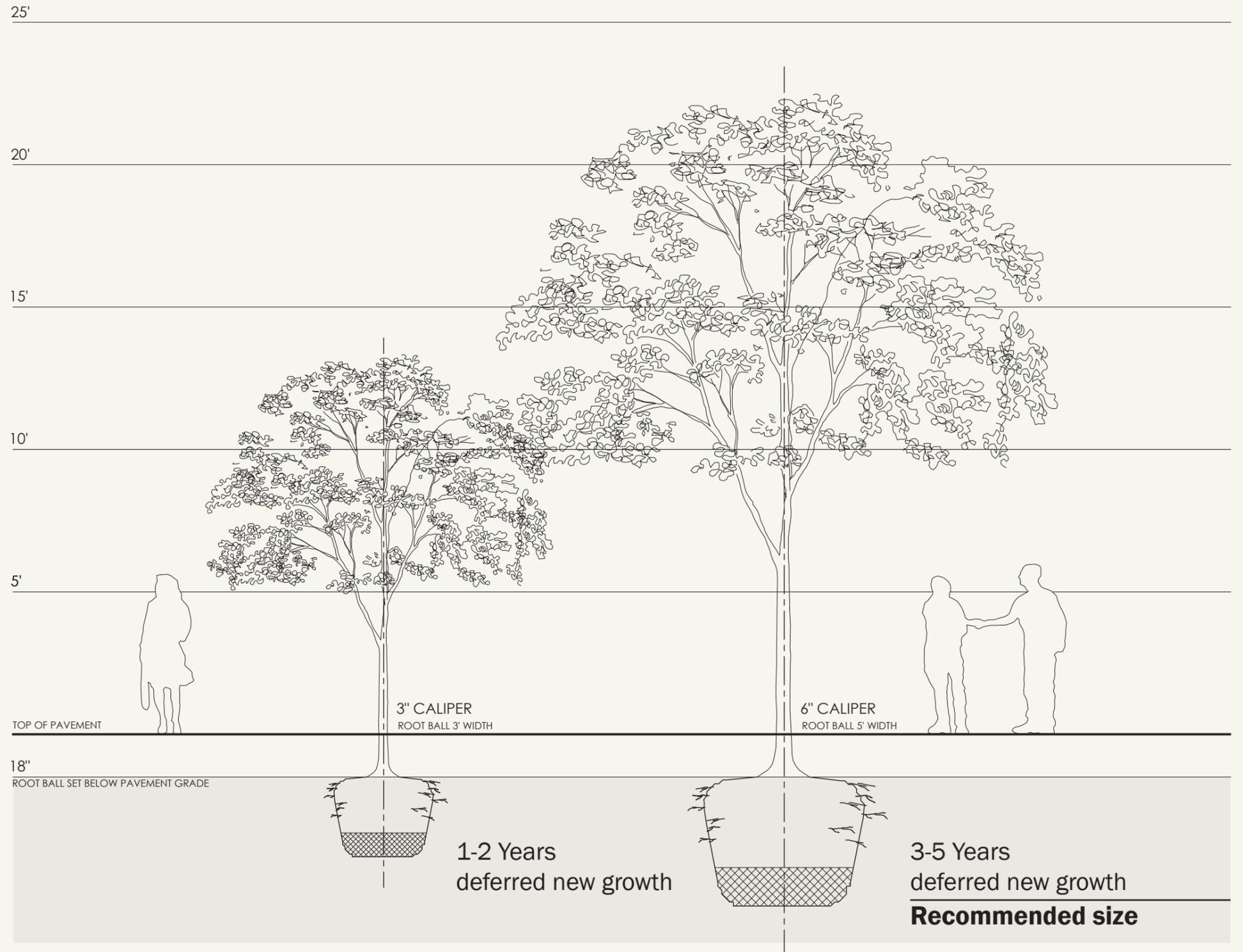


Once tree extends beyond internal frame sub-structure it is recommended to switch to foam support structure (See page 12)

Tree Replacement | *Tree Size at Install*

The size of tree replacements is crucial for public perception, tree health, and safety. Newly planted trees should have a substantial presence and provide some immediate shade. Additionally, the canopy must be elevated enough to allow maintenance and emergency vehicles to pass along fire lanes.

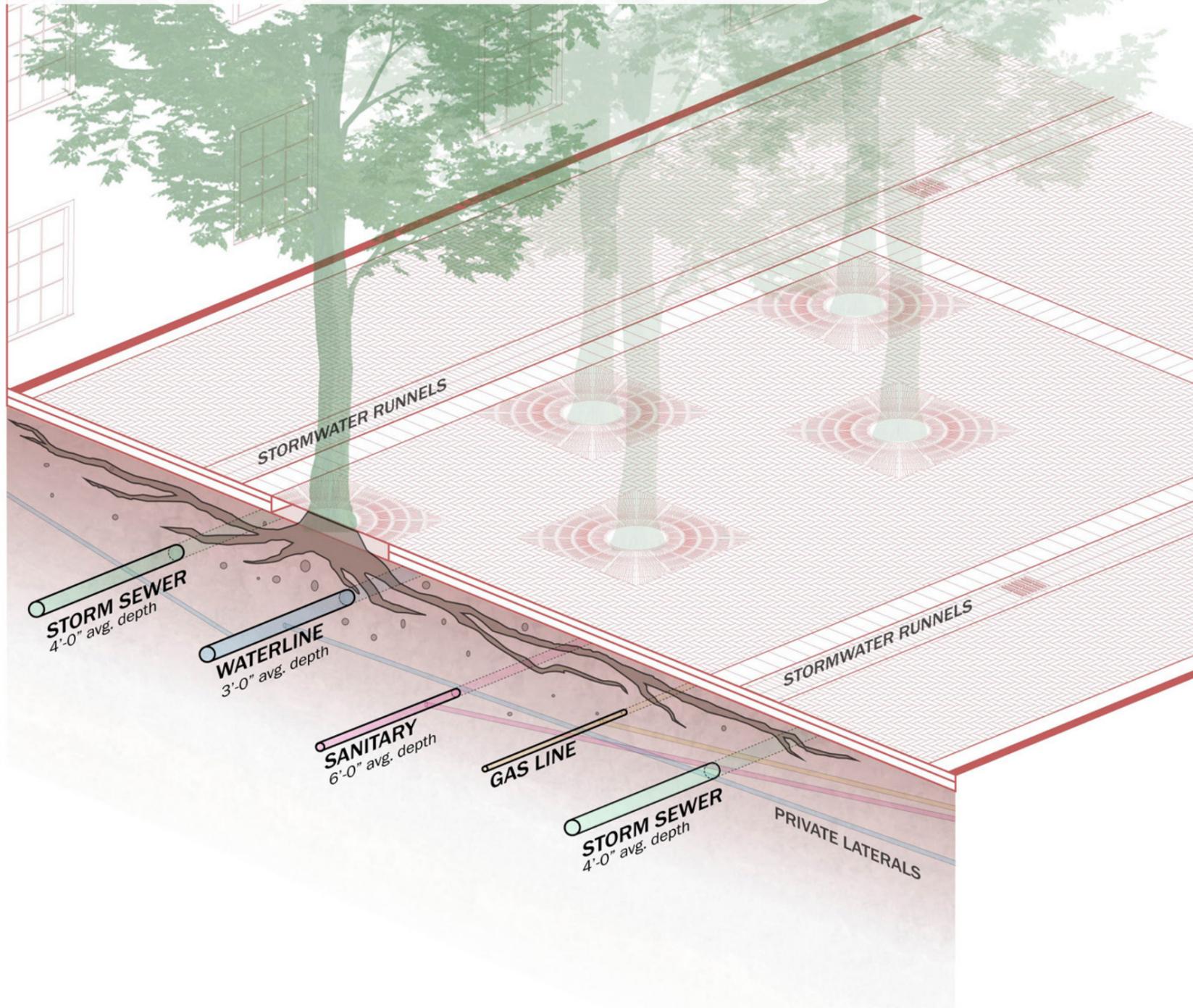
It is recommended to pre-purchase trees from nursery 2-3 years in advance. The nursery should be instructed to limb up to 10' clear for fire truck access.



B

Utilities & Critical Root Zones | Overview

The City provides public utilities—including storm sewer, water, sanitary, and gas—up to property lines, where private laterals connect to main public lines. These utilities run the length of the Mall, servicing businesses while crossing under trees and their critical root zones (CRZ). The CRZ, which contains the majority of a tree's roots essential for its health and survival, must be protected to minimize impact. Replacing these laterals poses a risk to both existing trees and future tree plantings.



Utility Summary

Public

- Main utility lines currently present no immediate concern
- No known waterlines or fountain leaking found
- Laterals have high likelihood to impact critical roots zones in near term due to utility upsizing

Private

- Laterals have high likelihood to impact critical roots zones in near term due to utility up-sizing

Pressure (Water & Gas)

- Water laterals have a high likelihood of replacement and up-sizing as businesses change use

Gravity (Sanitary & Stormwater)

- Terracotta sanitary laterals may need replacement
- Gravity lines are more difficult to modify than pressure fed lines

Utility Recommendations

At Existing Groves

- Lateral replacement tie in distance 25' minimum from existing trees
- Designated no-tie in zones around existing tree groves

At Grove Replacements

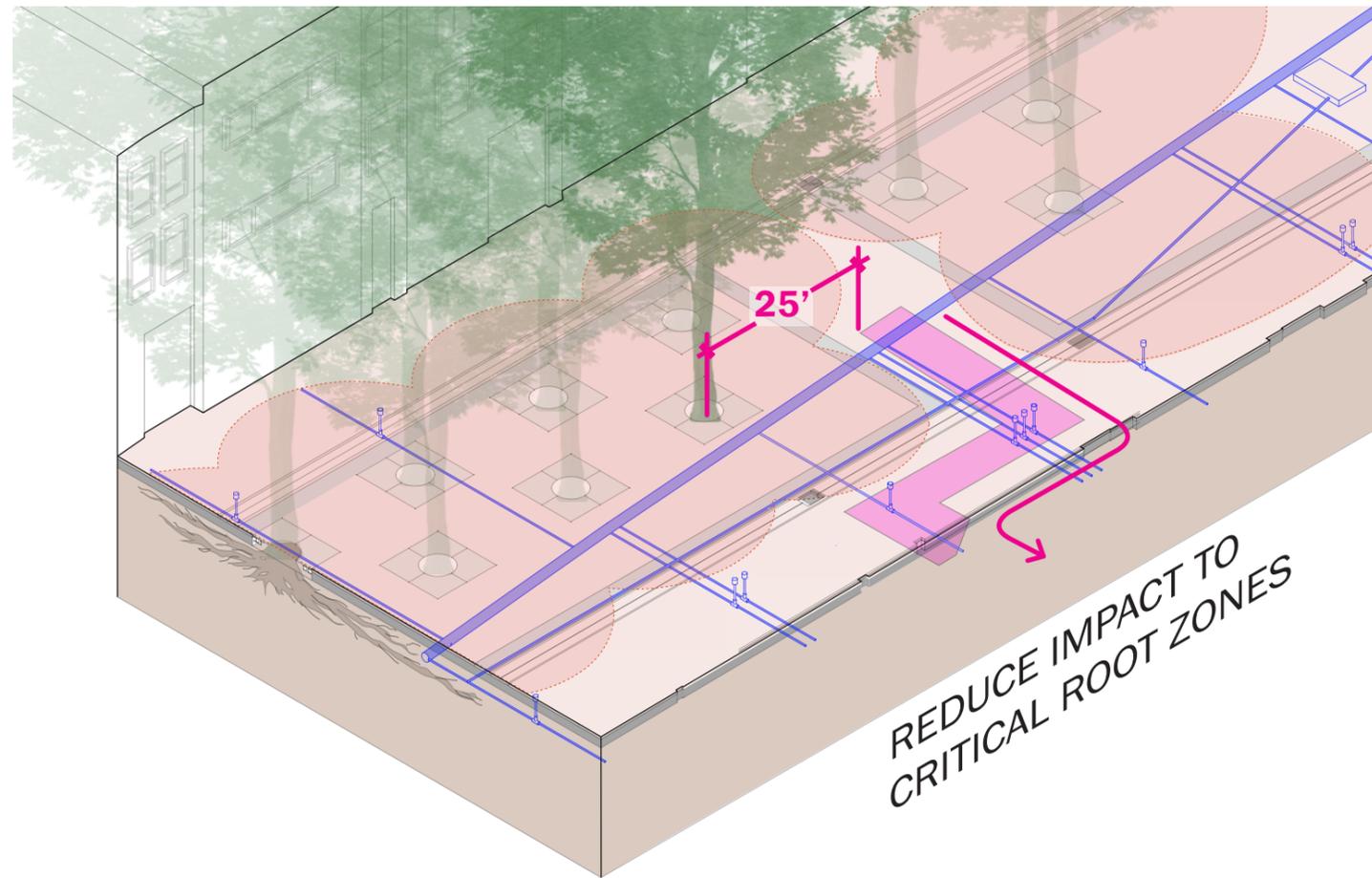
- Shift water & gas connections to perimeter for future up-sizing and easier lateral access for business owners

Alternate

- When viable, buildings could have water access from Water or Market streets

Utilities & Critical Root Zones | *Lateral Replacement Recommendations*

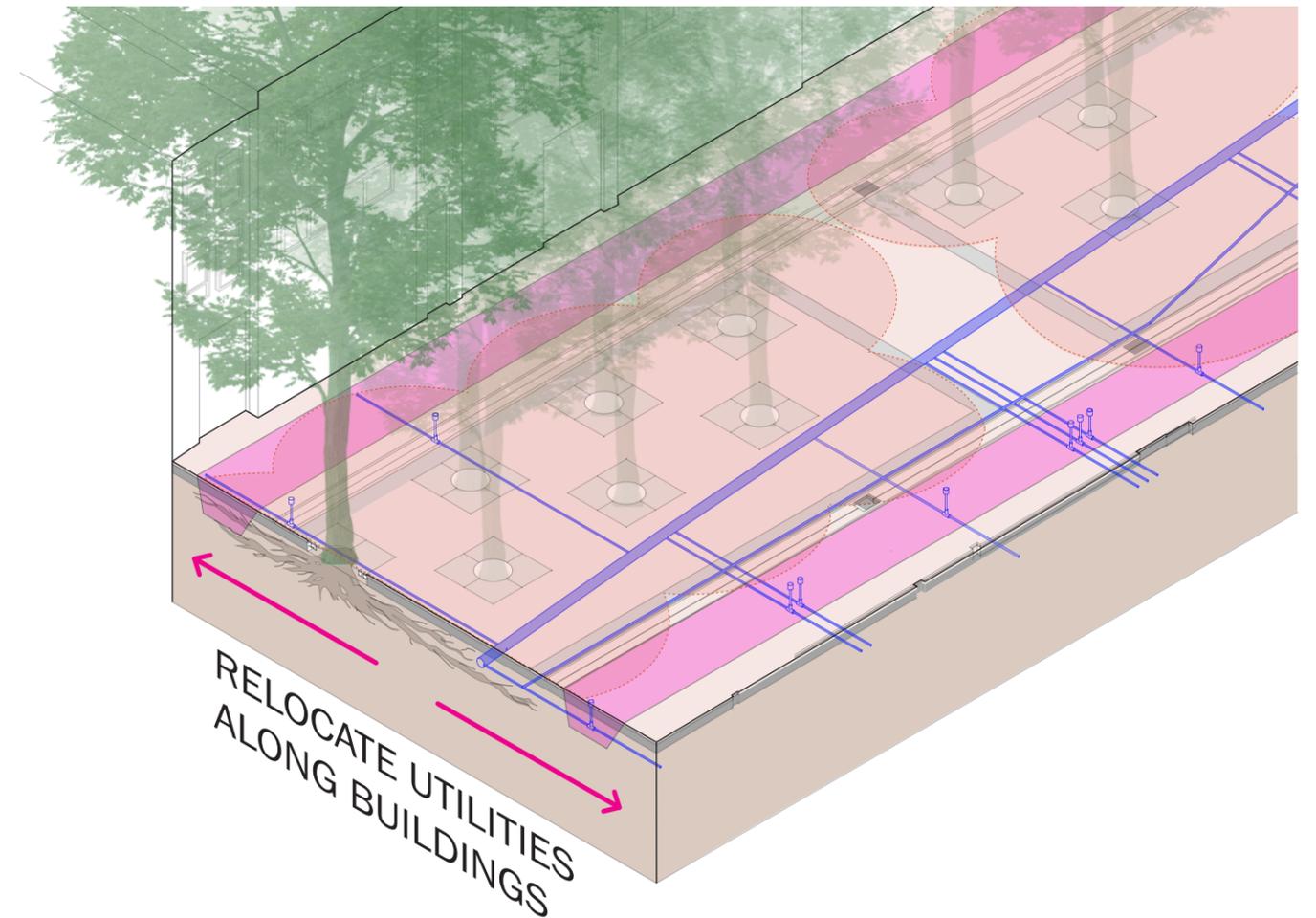
At Existing Groves



Lateral Replacement

Shifting lateral replacements at least 25 feet away from trees on the perimeter of groves would greatly reduce the impact on critical root zones.

At Grove Replacements



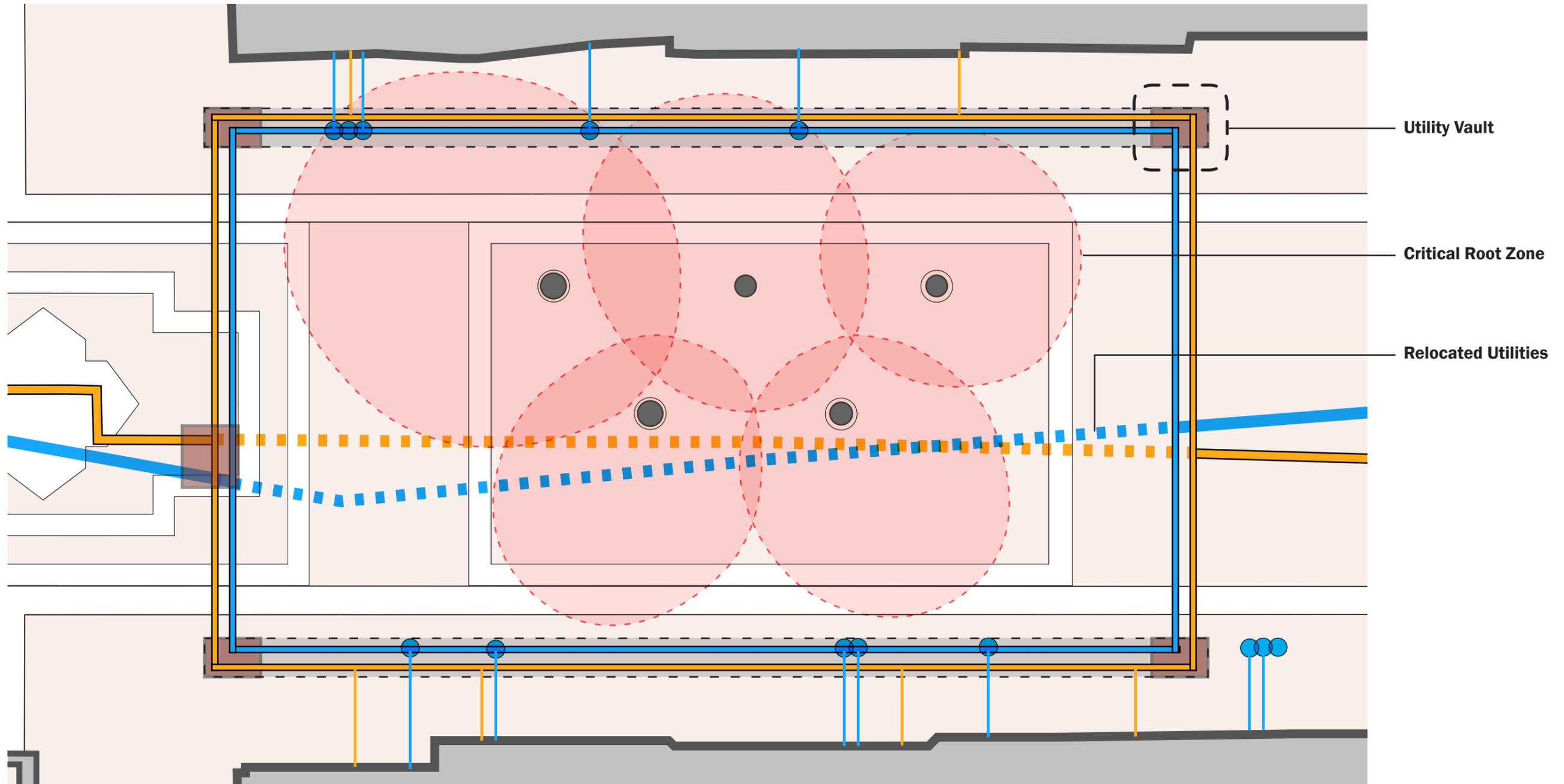
Utility Trench Along Buildings

Replacing the current pavement subslab with a structurally suspended slab and moving utilities to the perimeter of the mall will help minimize future conflicts with Critical Root Zones, thereby supporting the long term health of the trees.

Utilities & Critical Root Zones | *Utility Relocation Diagram*

Relocate Utilities Along Buildings

Relocating utility lines along buildings will help reduce future impacts to critical root zones, ensuring better tree health and longevity. This approach also provides easier access to utility laterals for business owners, minimizing disruption and facilitating maintenance.



Background

Short Term Recommendations

Long Term Recommendations

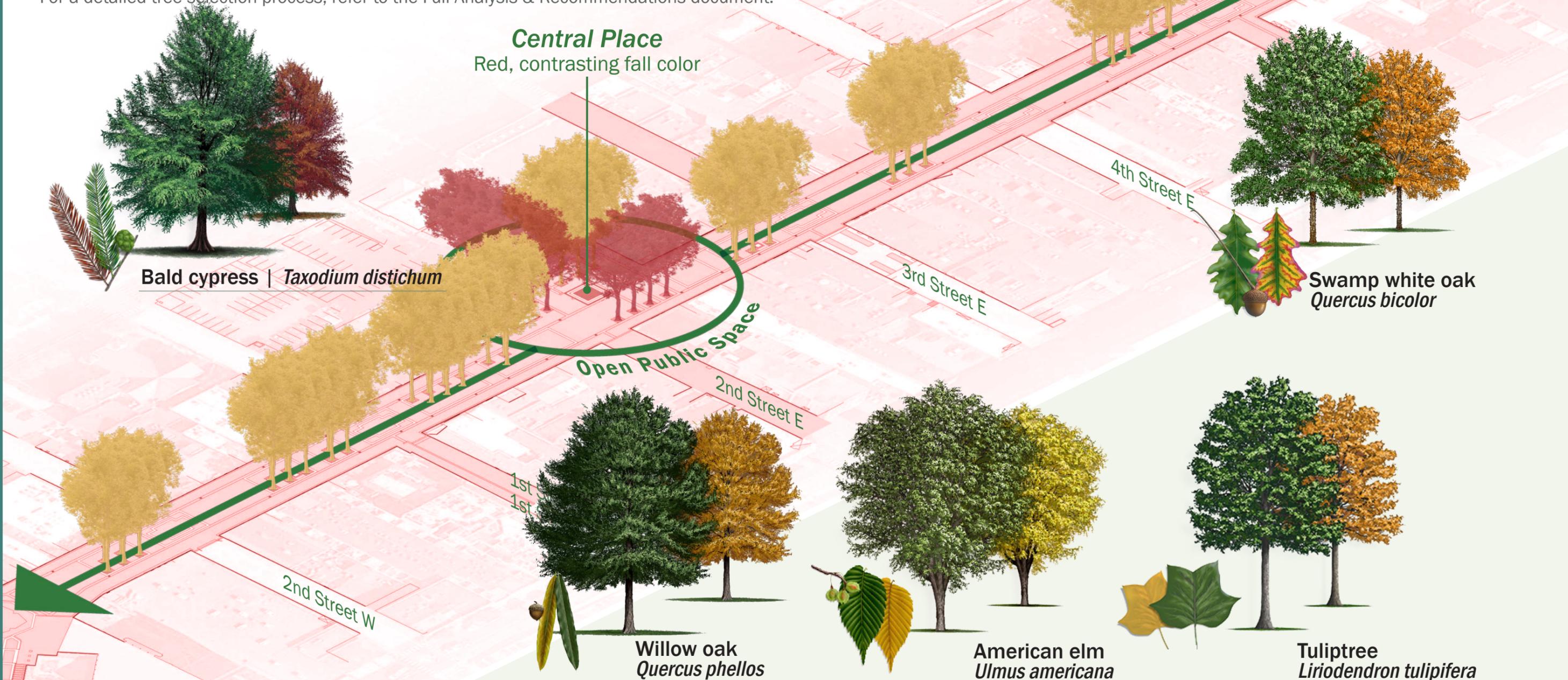
Cost Estimate

C Tree Selection | Recommended Tree Selection & Design Intent

Yellow and red fall colors

The original Halprin design for Central Place highlighted the distinctive red fall color of Maple trees, creating a unique contrast with the yellow fall color of the Willow oaks that line the rest of the Mall. To maintain this color scheme and enhance diversity, a variety of tree species are now recommended, chosen for consistent growth habit in the urban environment. Tulip poplars are only recommended in a full soil replacement scheme as they do not tolerate compacted urban conditions.

*For a detailed tree selection process, refer to the Full Analysis & Recommendations document.



Tree Selection | Recommended Tree Selection

DOWNTOWN MALL

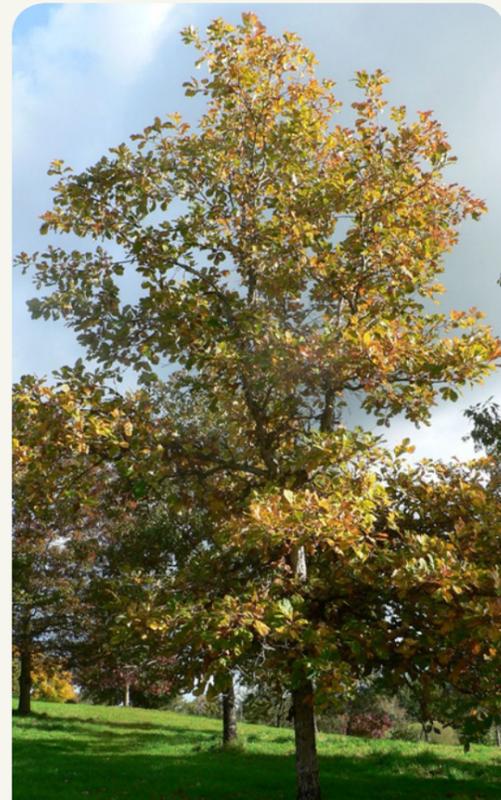
WILLOW OAK

Quercus phellos



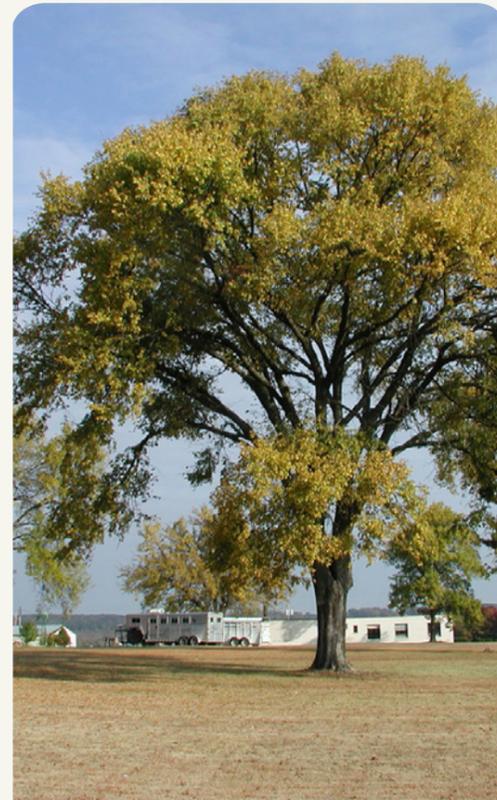
SWAMP WHITE OAK

Quercus bicolor



JEFFERSON ELM

Ulmus americana 'Jefferson'



TULIP POPLAR

Liriodendron tulipifera



CENTRAL PLACE

BALD CYPRESS

Taxodium distichum
'Autumn Gold'



Background

Short Term Recommendations

Long Term Recommendations

Cost Estimate

D

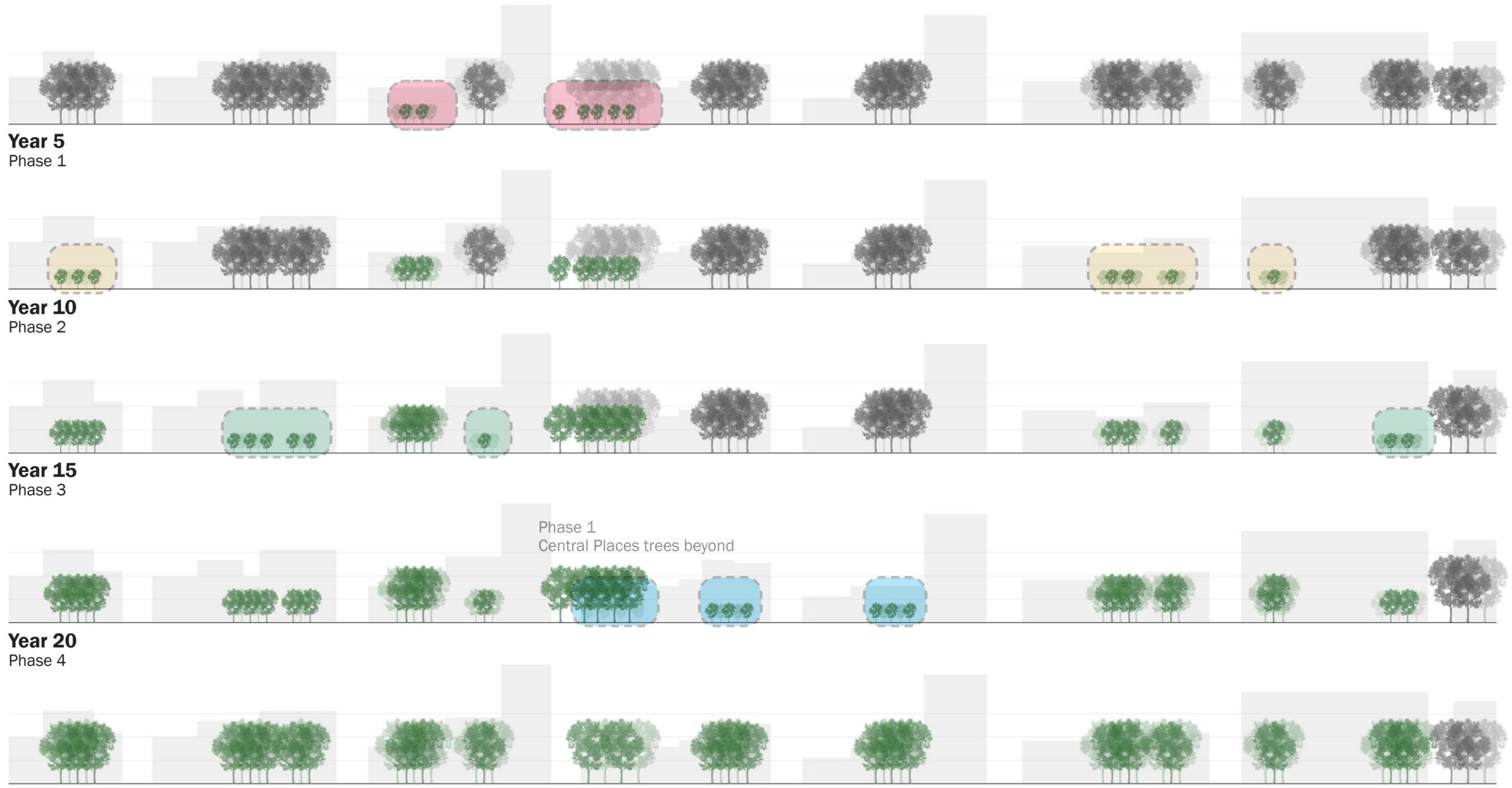
Phasing | Strategy

Spatial Strategy

The spatial strategy for tree replacement begins with Phase 1, focused near the geographic center of the Mall, where the highest concentration of missing and unhealthy trees is located. Phases 2 through 4 will distribute the replacements along the length of the Mall, ensuring that the healthiest groves are preserved for the later stages. Staggering the grove replacements allows the newly planted trees time to grow and establish themselves before further replacements are made, without creating any continuous stretch of the Mall without shade.



Phasing | *Four Phased Approach*



■ Background

■ Short Term Recommendations

■ Long Term Recommendations

■ Cost Estimate

Year 5
Phase 1

Year 10
Phase 2

Year 15
Phase 3

Year 20
Phase 4

Year 50

Phase 1
Central Places trees beyond

Celebrate Replacements | *Tree Replacement Art Installations*

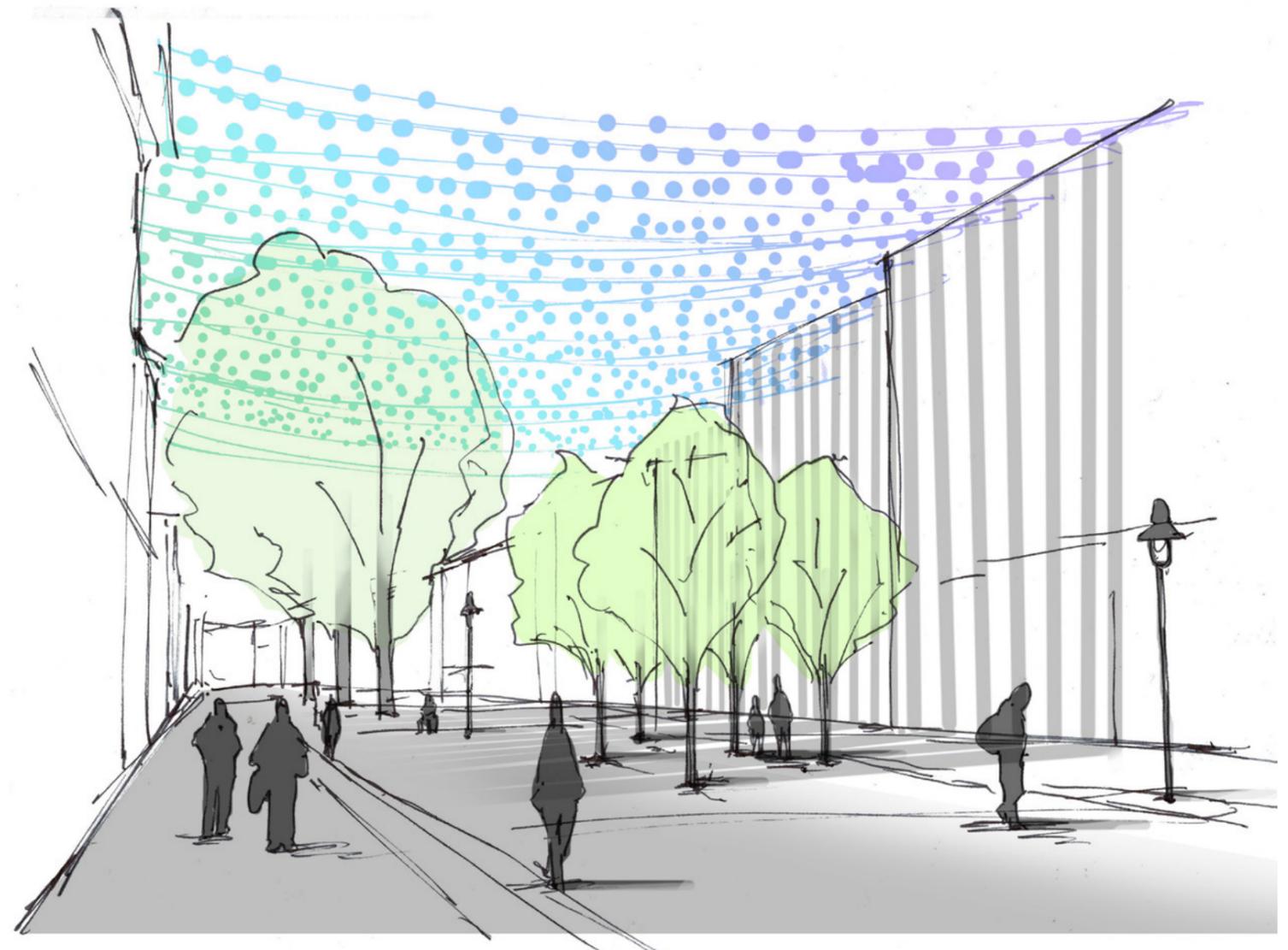
Temporary Art Installations

Removing the existing trees will alter the light and shade in the phased areas until the new trees mature. To enhance this transition, temporary art installations could celebrate the new tree plantings and draw pedestrians to the affected businesses.



Example

Janet Echelman ,Current (2023)

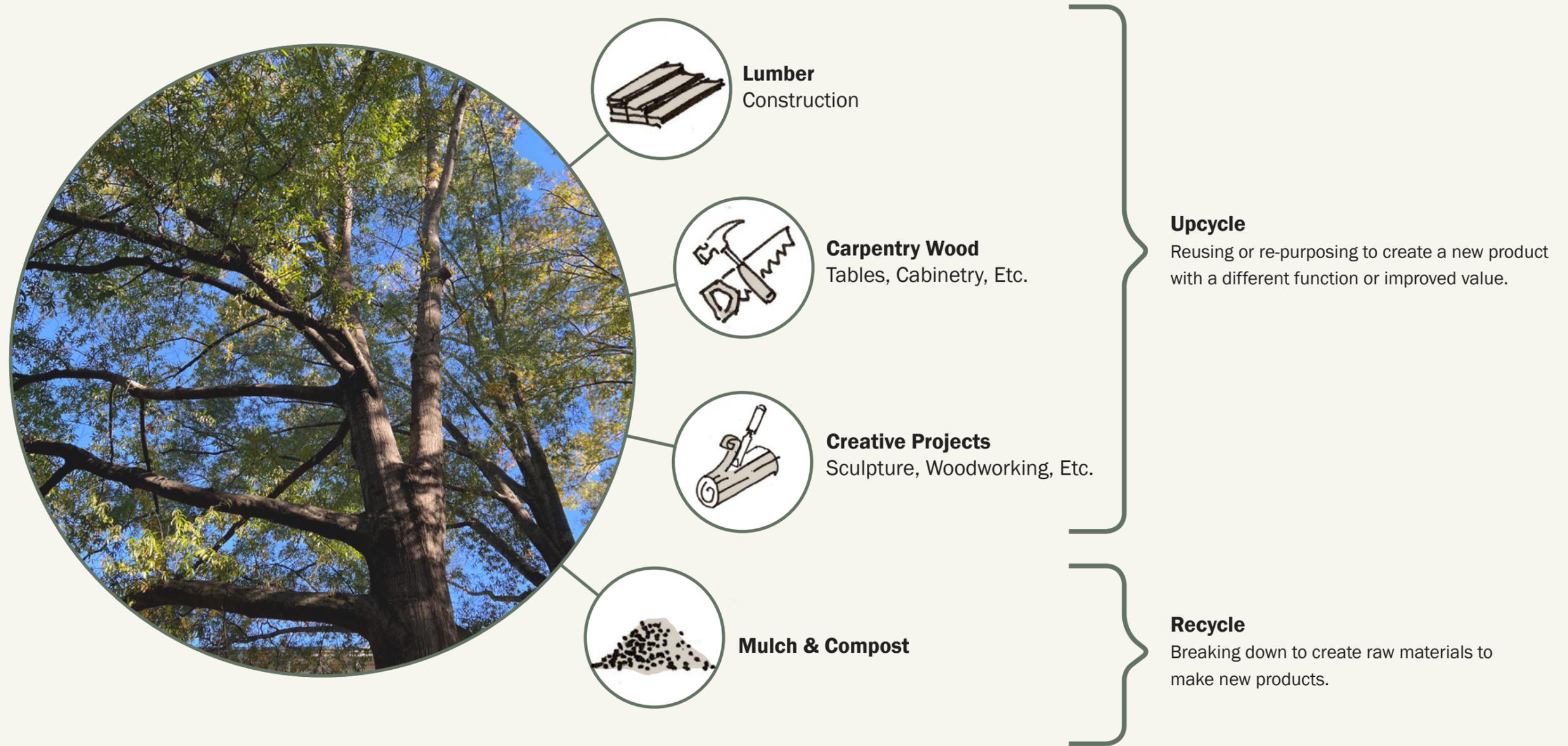


Concept Sketch

Art installations could provide temporary shade and be visually bold attractions

Celebrate Replacements | *Upcycle & Recycle*

There is an opportunity to upcycle and recycle the wood from tree removals, turning wood waste into a valuable resource for the community. Existing Mall tree sculptures can be reused along other city trails. Environmentally responsible practices can help prevent carbon emissions from decomposition, with the wood being upcycled for lumber, craft wood, creative projects, or recycled into mulch and compost.



Project Cost Estimate

The project costs are outlined by phase and include general requirements, overhead and profit, design contingency, and escalation. For detailed cost breakdowns, refer to the included appendix document by Downey & Scott, LLC, which includes a complete cost estimate report.

A. Phase 1 Cost Estimate

- Grove replacement alternatives
- Metal grate modification & brick grate Replacement
- Fountain access improvements
- Side street & unique conditions
- Phase 1 tree replacements
- Phase 1 summary

B. Cost Estimates Summary

- Tree replacement costs for phases 2-4
- Total project cost for phases 1-4



Phase 1 Cost Estimate | Grove Replacement Cost Alternatives

A1

Planter Replacement

(200 cu ft/tree)

8'x8' soil box + trees replaced

Benefits

- Minimal disturbance of existing soils, paving

Constraints

- Limited lifespan / less soil (~50-60 years)
- Slower growth rate
- Future utility conflicts



Average 5 Tree Grove Cost:
\$ 332K (within 5 years)

A2

Soil & Slab Replacement

(800 cu ft/tree)

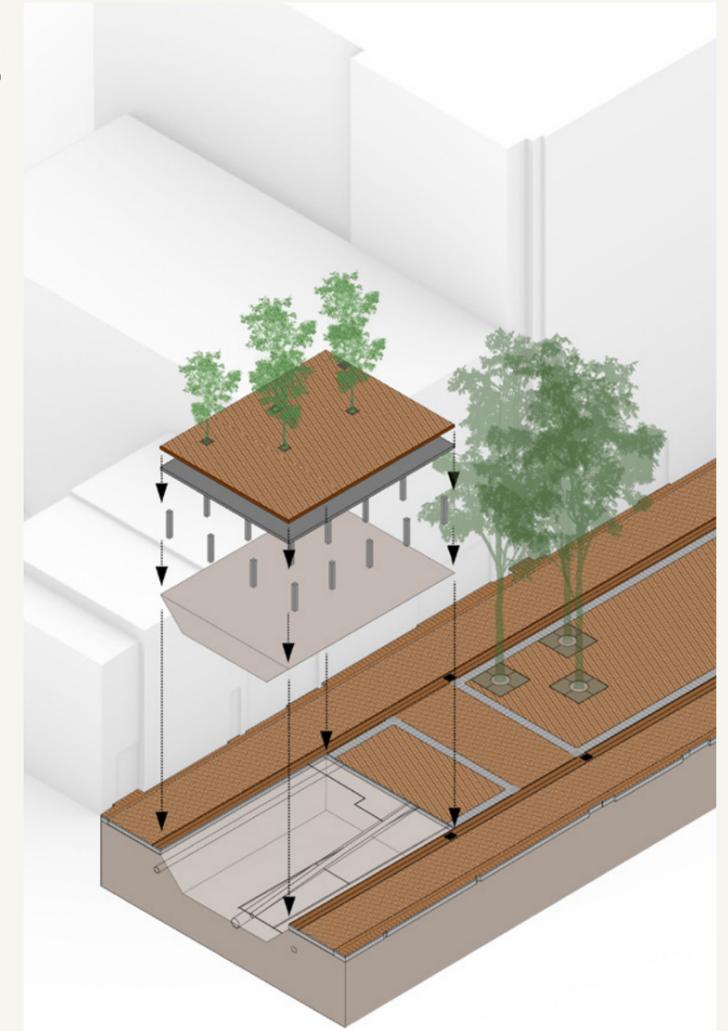
Grove soil, concrete slab + trees replaced

Benefits

- Longer tree lifespan / greater soil volume (80+ years)
- Utility improvements

Constraints

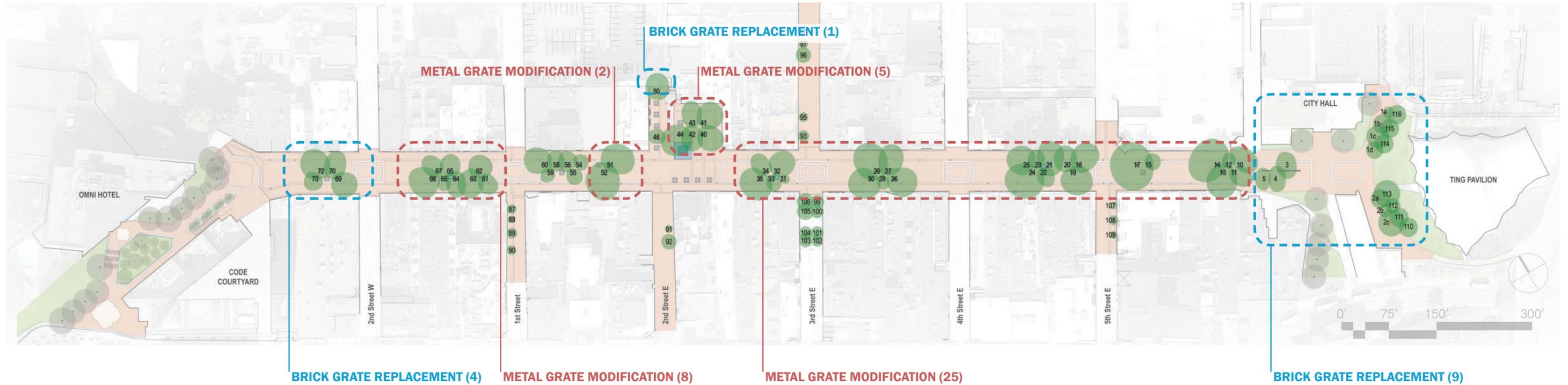
- Longer construction window



Average 5 Tree Grove Cost:
\$ 781K (within 5 years)

*Total cost are SD estimates based on current understanding of scope

Cost Estimate | Phase 1: Metal Grate Modification & Brick Grate Replacement



Metal Grate Modification (x40)

SUBTOTAL: \$238,986

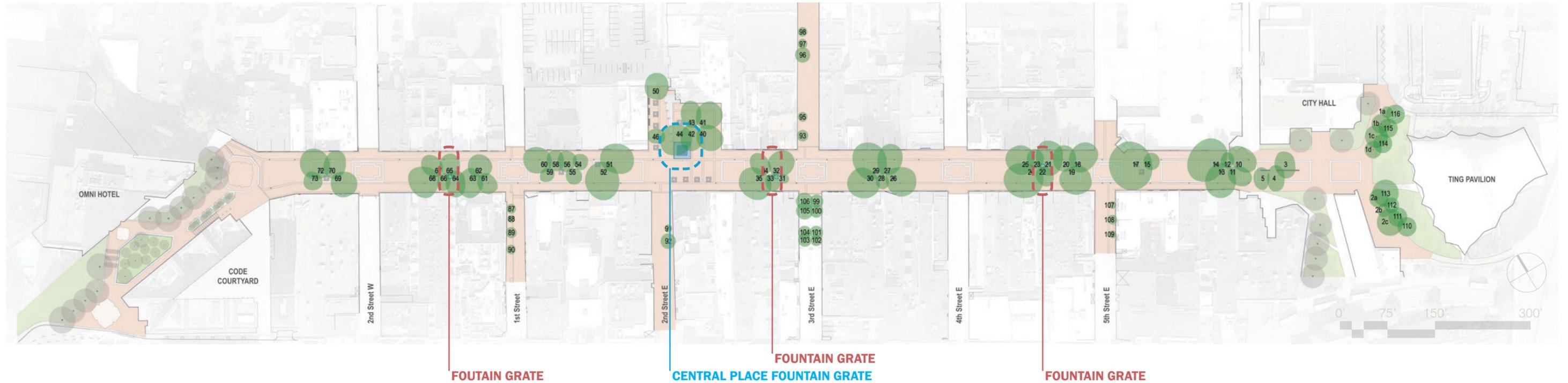
Brick Grate Replacement (x14)

SUBTOTAL: \$103,012

TOTAL: \$341,998

*Total cost are SD estimates based on current understanding of scope

Cost Estimate | Phase 1: Fountain Access Improvements



Fountain Grate (x3)

TOTAL: \$ 98,642

Central Place Fountain Grate

TOTAL: \$ 151,104

TOTAL: \$249,746

*Total cost are SD estimates based on current understanding of scope

Background

Short Term Recommendations

Long Term Recommendations

Cost Estimate

Cost Estimate | Phase 1: 3rd & 5th Street



3rd St: Grate Removal & Tree Replacement

TOTAL: \$33,239

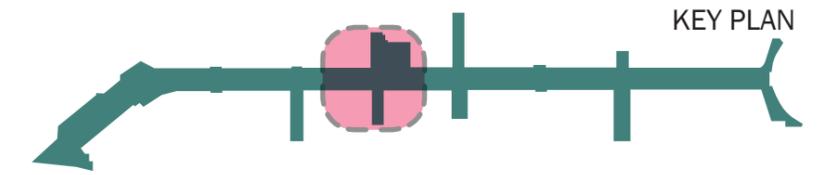
5th St: Grate Removal & Tree Replacement

TOTAL: \$31,557

TOTAL: \$64,796

*Total cost are SD estimates based on current understanding of scope

Cost Estimate | Phase 1: Tree Replacement



A1 Planter Replacement

TOTAL: \$1,265,607

A2 Slab & Soil Replacement

TOTAL: \$1,771,536

*Total cost are SD estimates based on current understanding of scope

Background

Short Term Recommendations

Long Term Recommendations

Cost Estimate

Cost Estimate | Cost Phase 1 Summary

A. Replace Central Place & Nearby Trees (within 5 years, 2030)

- **A1:** Planter Replacement _____ \$1,265,600
- **A2:** Soil & Slab Replacement _____ \$1,771,500

B. Grates & Paving Repair at Base of Trees

- Metal Grate Modification _____ \$ 239,000
- Brick Grate Replacement _____ \$ 103,000

C. Unique Condition Improvements

- 3rd Street Improvements _____ \$ 33,000
- 5th Street Improvement _____ \$ 32,000
- Hidden Grate Removal _____ \$ 14,000

D. Fountain Improvements

- Fountain Grate (x3) _____ \$ 99,000
- Central Place Fountain Grate _____ \$ 151,000

E. Tree Maintenance

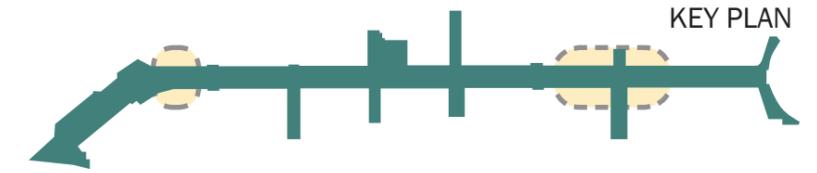
- Recommended Existing Tree Care _____ \$ 241,000

F. Art Installation _____ \$ 25,000

*Opinion of Probable Construction Costs excludes
~10% design fees and soft costs

Phase 1 TOTAL:	Opt 1	\$ 2.02M
	Opt 2	\$ 2.68M

Cost Estimate | Phase 2: Tree Replacement



Option 1 Phase 2: Planter Replacement

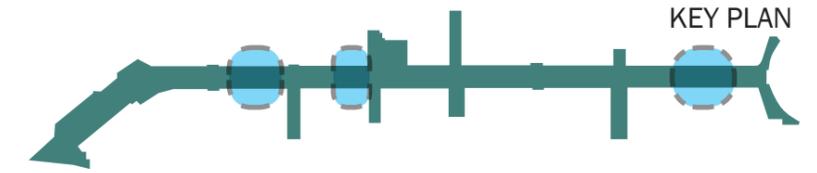
TOTAL: \$1,256,996

Option 2 Phase 2: Slab & Soil Replacement

TOTAL: \$2,384,834

*Total cost are SD estimates based on current understanding of scope

Cost Estimate | Phase 3: Tree Replacement



Option 1
Phase 3: Planter Replacement

TOTAL: \$1,401,819

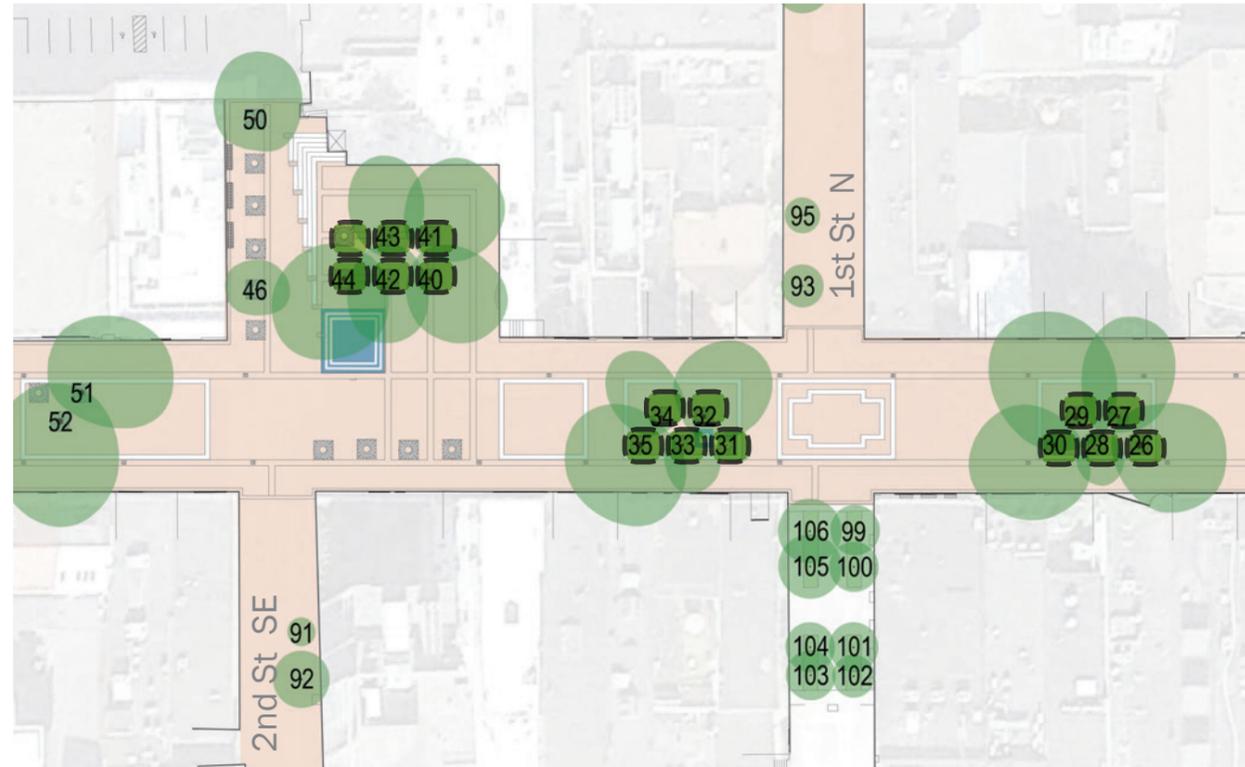
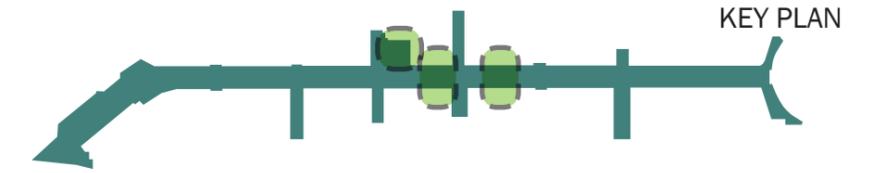


Option 2
Phase 3: Slab & Soil Replacement

TOTAL: \$2,532,047

*Total cost are SD estimates based on current understanding of scope

Cost Estimate | Phase 4: Tree Replacement



Option 1
Phase 4: Planter Replacement

TOTAL: \$1,496,858



Option 2
Phase 4: Slab & Soil Replacement

TOTAL: \$2,778,712

*Total cost are SD estimates based on current understanding of scope

Cost Estimate | Phase 2-4 Summary

Phase 2

- **Option 1:** Planter Replacement _____ \$ 1.26M
- **Option 2:** Soil & Slab Replacement _____ \$ 2.38M

Phase 3

- **Option 1:** Planter Replacement _____ \$ 1.40M
- **Option 2:** Soil & Slab Replacement _____ \$ 2.53M

Phase 4

- **Option 1:** Planter Replacement _____ \$ 1.50M
- **Option 2:** Soil & Slab Replacement _____ \$ 2.78M

Phases 2 - 4 TOTAL: **Opt 1** **\$ 4.16M**
 Opt 2 **\$ 7.69M**

Cost Estimate Summary



Option 1: Planter Replacement

PHASE 1	TOTAL: \$2,176,780
PHASE 2	TOTAL: \$1,256,996
PHASE 3	TOTAL: \$1,401,819
PHASE 4	TOTAL: \$1,496,858

PROJECT TOTAL: \$6,332,453

Option 2: Slab & Soil Replacement

PHASE 1	TOTAL: \$2,682,709
PHASE 2	TOTAL: \$2,384,834
PHASE 3	TOTAL: \$2,532,047
PHASE 4	TOTAL: \$2,778,712

PROJECT TOTAL: \$10,378,302



BOHEMIA

2nd STREET SW
CBD&THG
McGuffey

Charlottesville

DOWNTOWN
CHARLOTTESVILLE

DOWNTOWN
CHARLOTTESVILLE

VIRGINIA
FILM FESTIVAL

2nd STREET S.W.
otto
barre|c|
IRON

CAUTION
VEHICLE
CROSSING

COMING SOON

COMING SOON

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Appendix I

- Cost Estimate.....See separate document



APPENDIX A

COLLABORATORS, PROCESS, & SCHEDULE

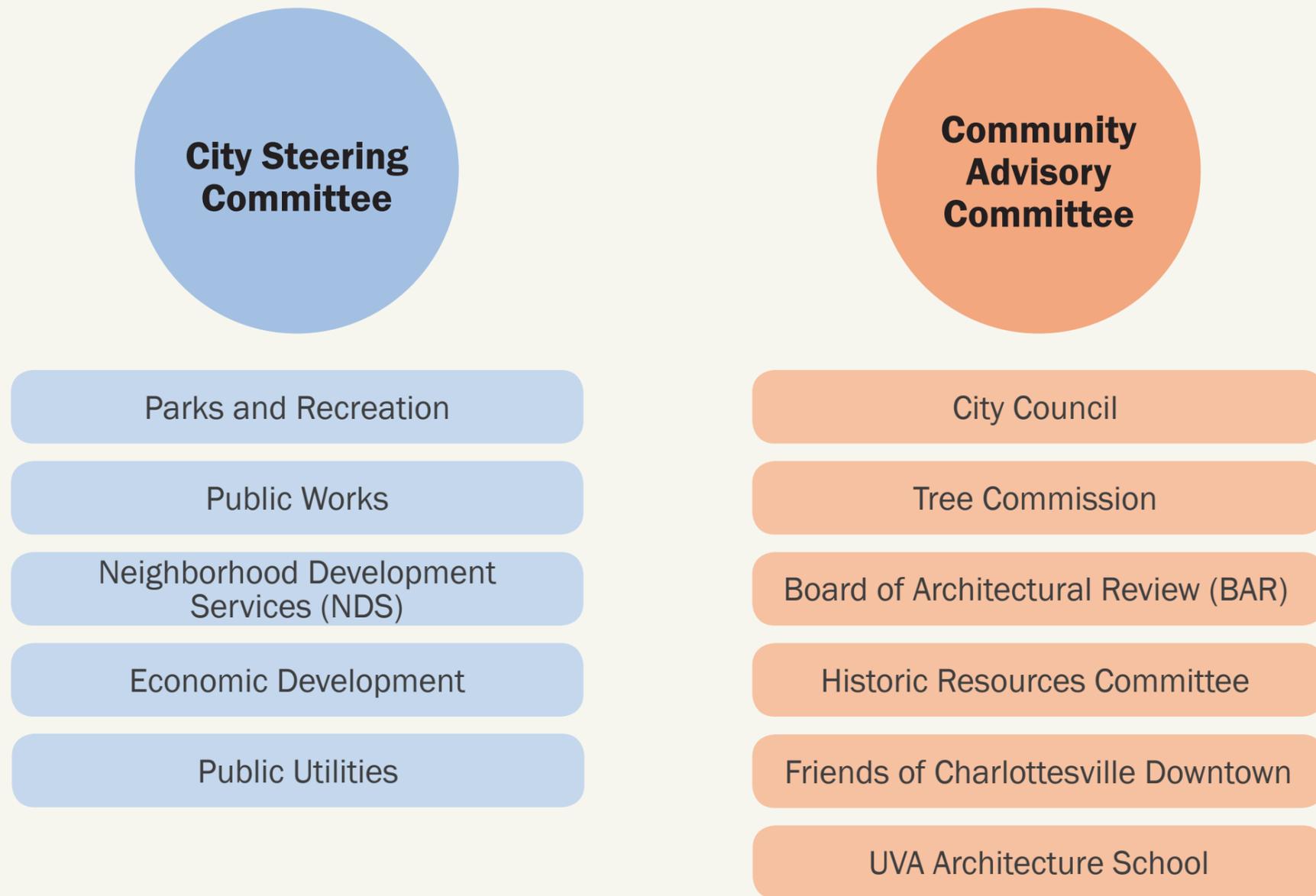
Collaborators | Summary

The development of the Tree Management Plan was a collaborative effort, incorporating feedback from various community members and committees over the course of the project.

Wolf Josey Landscape Architects(WJLA) worked closely with City of Charlottesville leadership to form two key groups: the City Steering Committee and the Community Advisory Committee. WJLA collaborated throughout the planning process with these Committees.

The City Steering Committee was made up of City employees whose work directly affects the Mall.

The Community Advisory Committee included representatives from volunteer organizations, committees, business owners, and the University of Virginia’s School of Architecture, all of whom contributed their perspectives on the Plan.



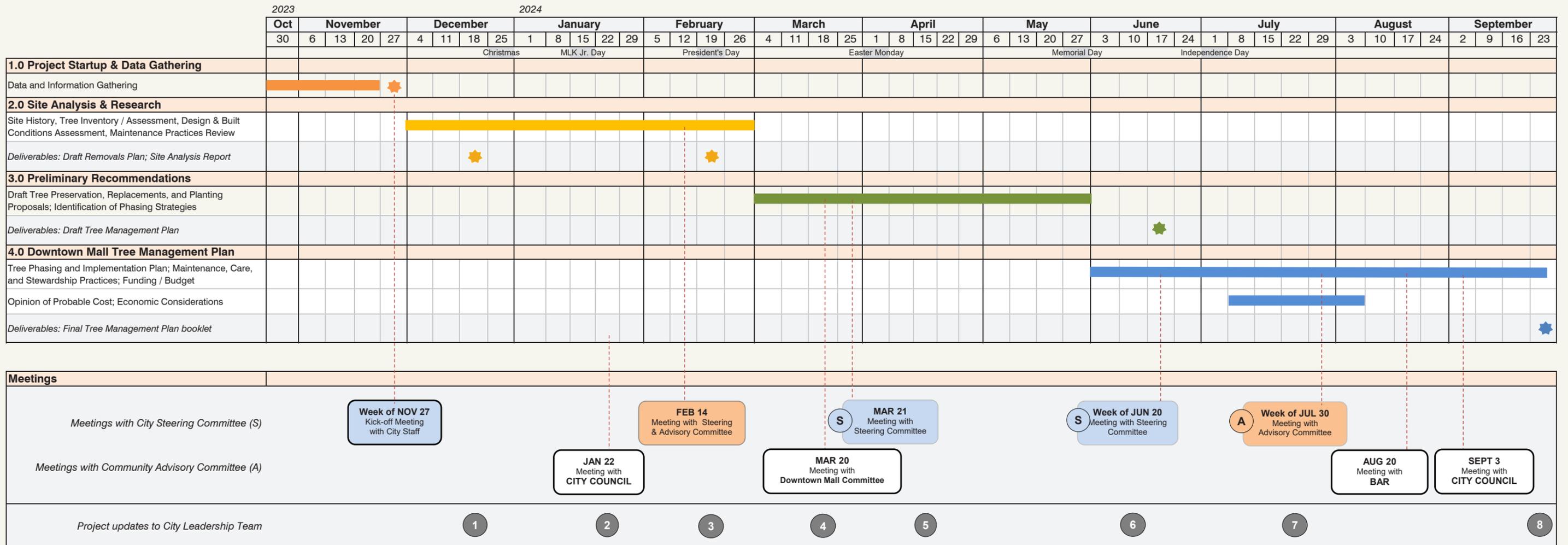
Process | Summary



Schedule

The development of the Tree Management Plan was a collaborative effort, incorporating feedback from various community members and committees over the course of the project.

Downtown Mall Tree Management Plan
 City of Charlottesville
 Version 6.0
 8/16/2024



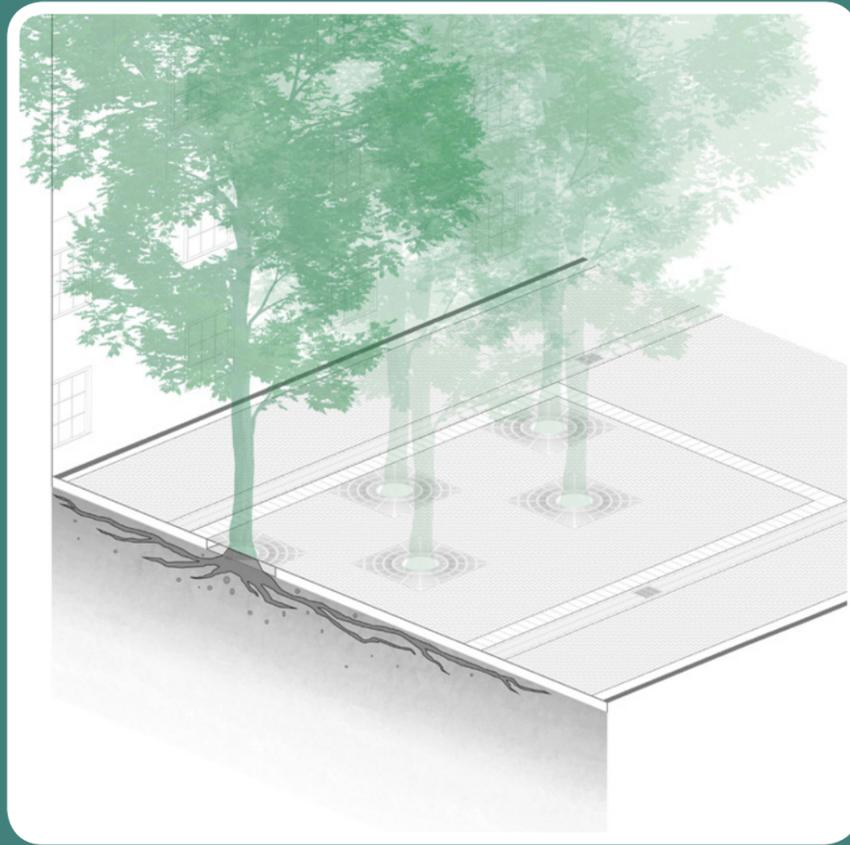
PHASES

- PHASE 1
- PHASE 2
- PHASE 3
- PHASE 4

COMMITTEES

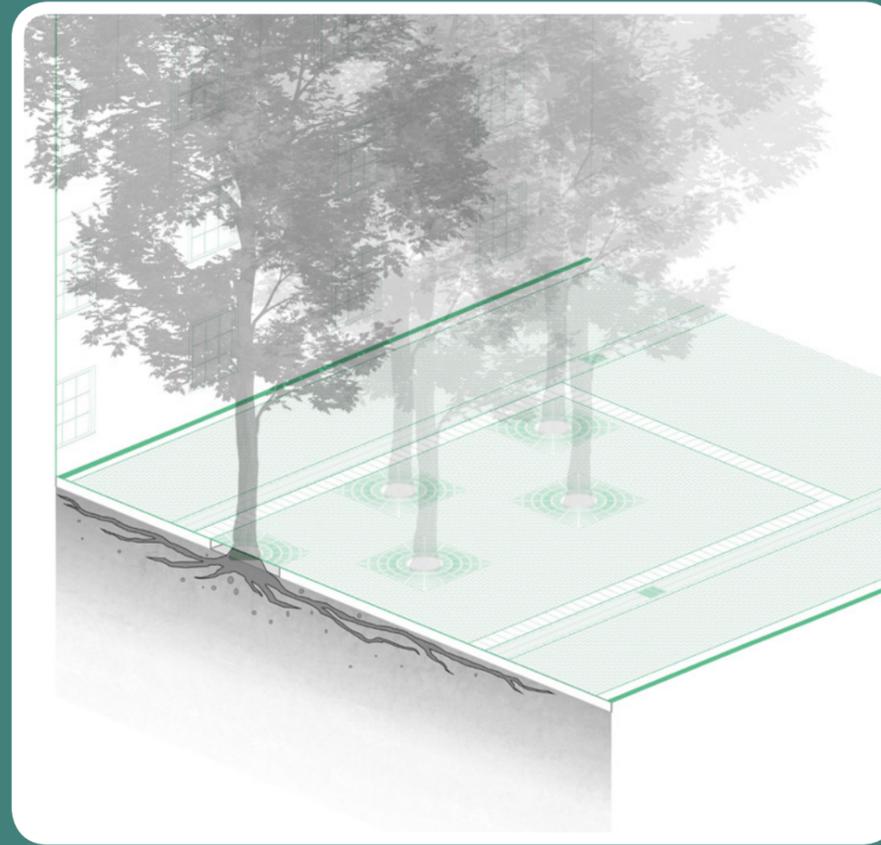
- S CITY STEERING COMMITTEE
- A COMMUNITY ADVISORY COMMITTEE

Tree assessment is divided into three sections:



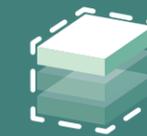
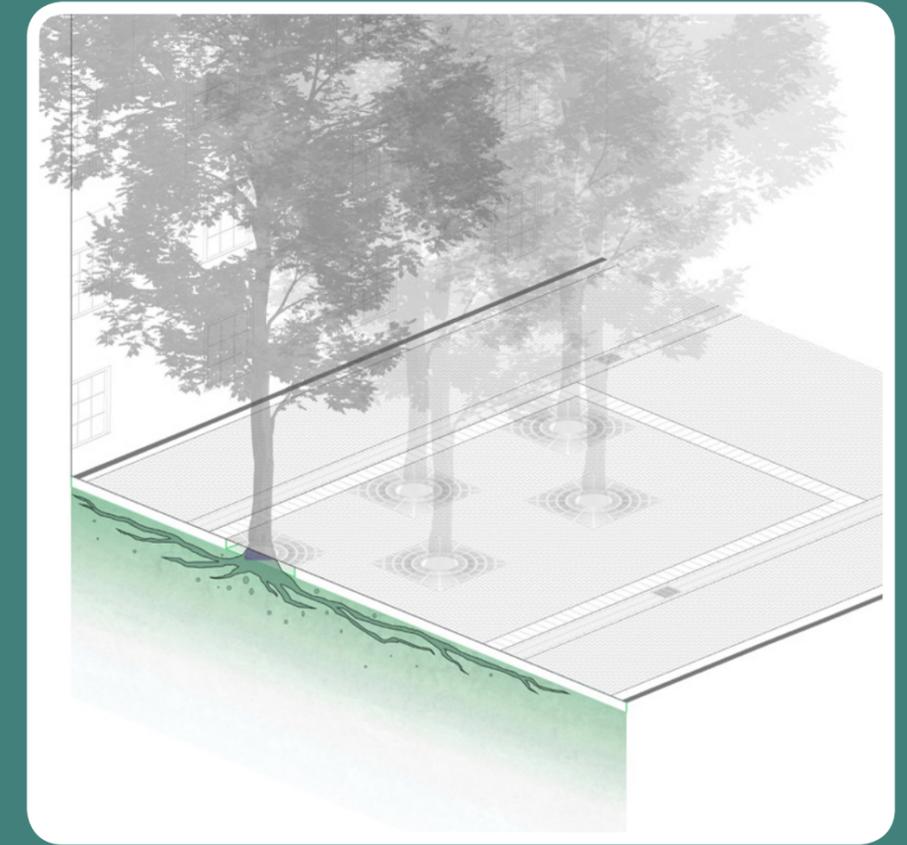
ABOVE GROUND

Observable tree health from trunk, branching, to leaves



AT GRADE

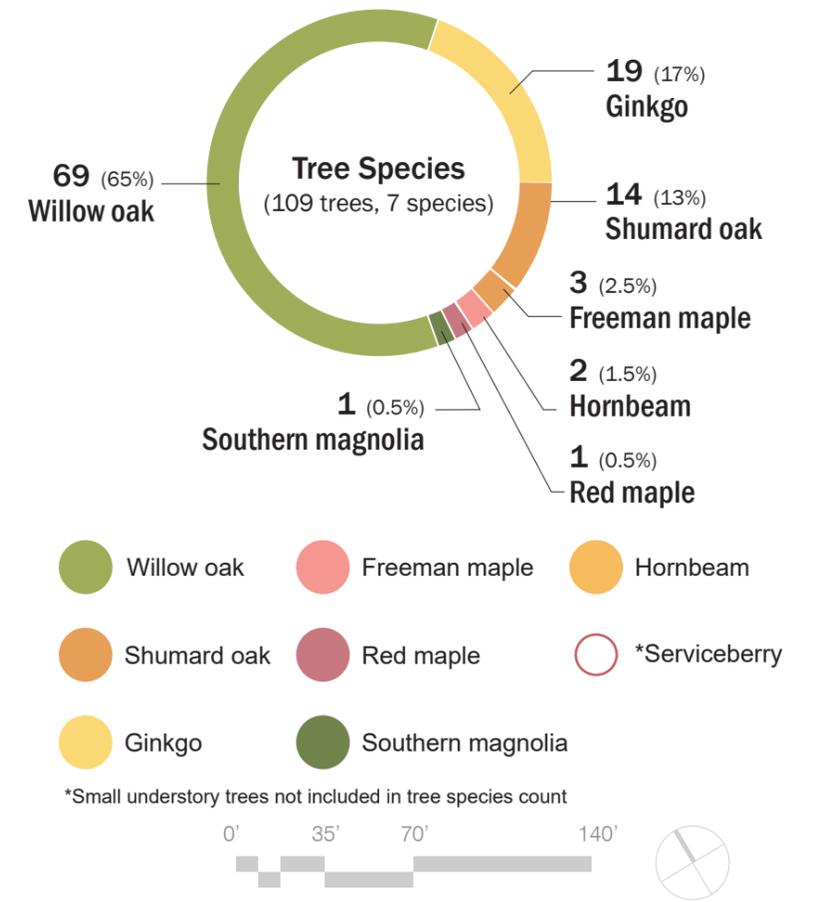
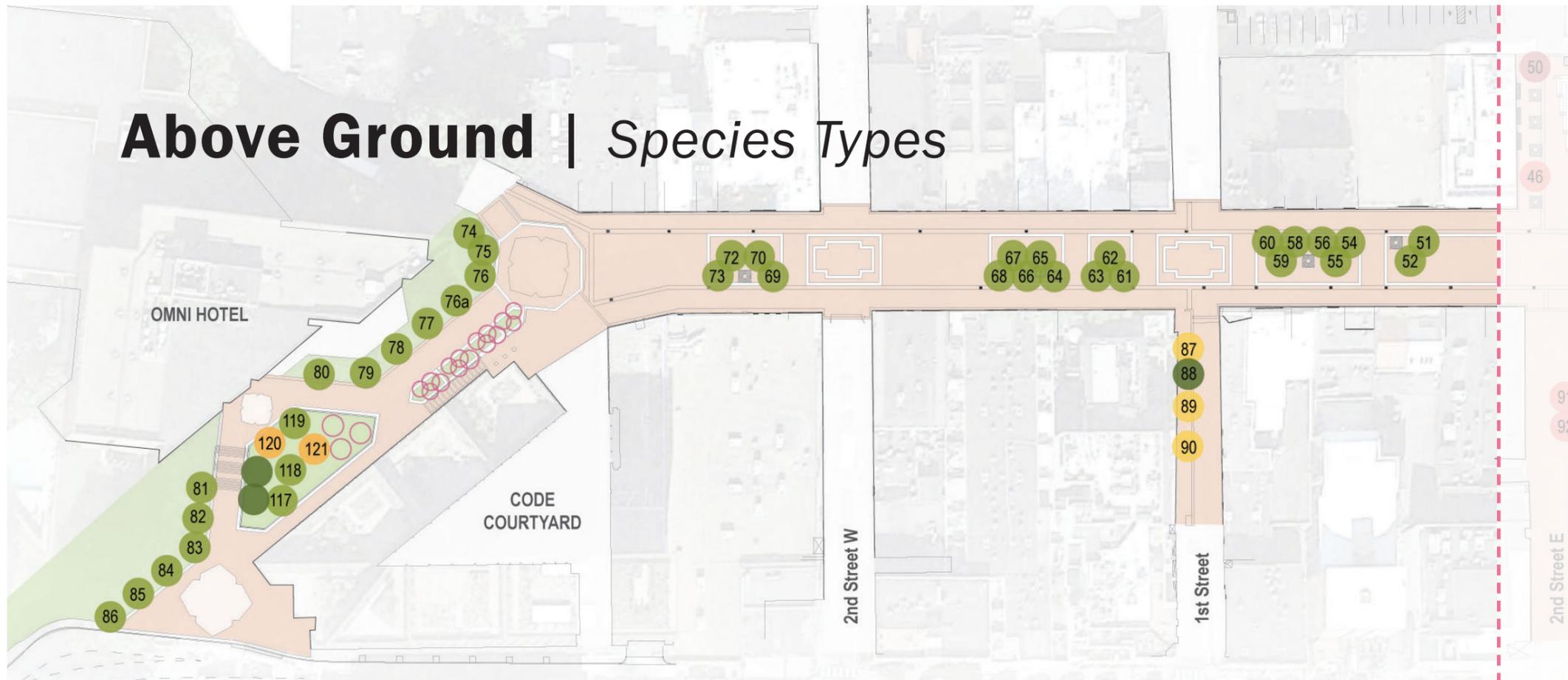
Notable conditions of trunk and root flare at and below tree grate



BELOW GROUND

Soil conditions and utility impacts on critical root zone

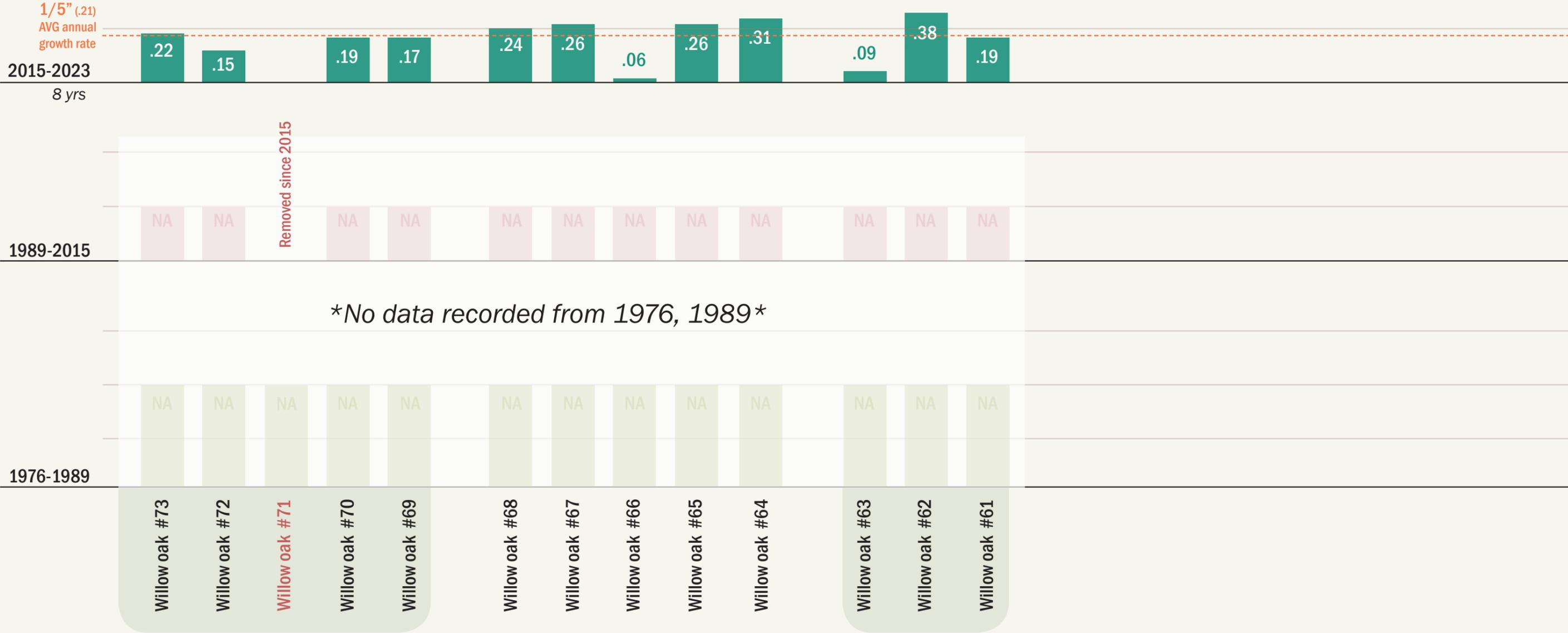
Above Ground | Species Types



Above Ground | Willow Oak Vigor: West of 3rd Street

18 years of tree data (started in 2015)

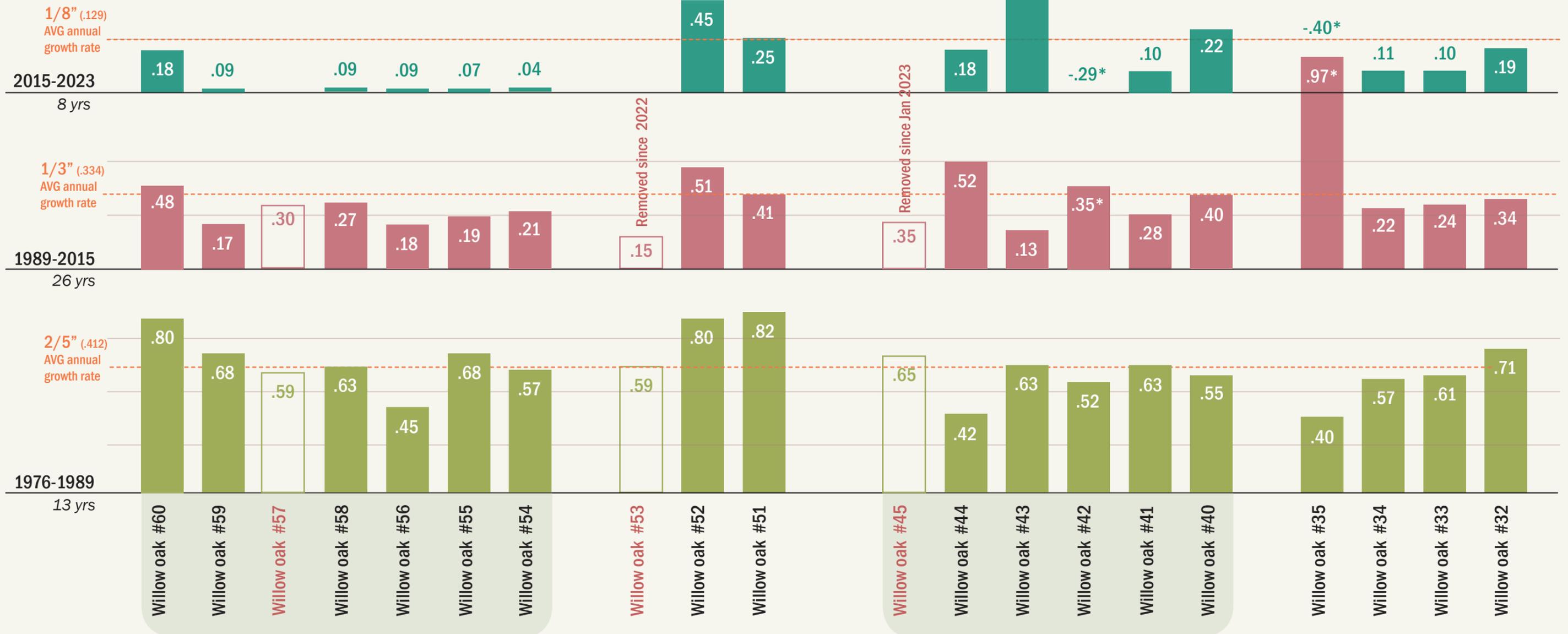
- DBH measurements taken in 2015, 2023



Above Ground | Willow Oak Vigor: West of 3rd Street

47 years of tree data (started in 1976)

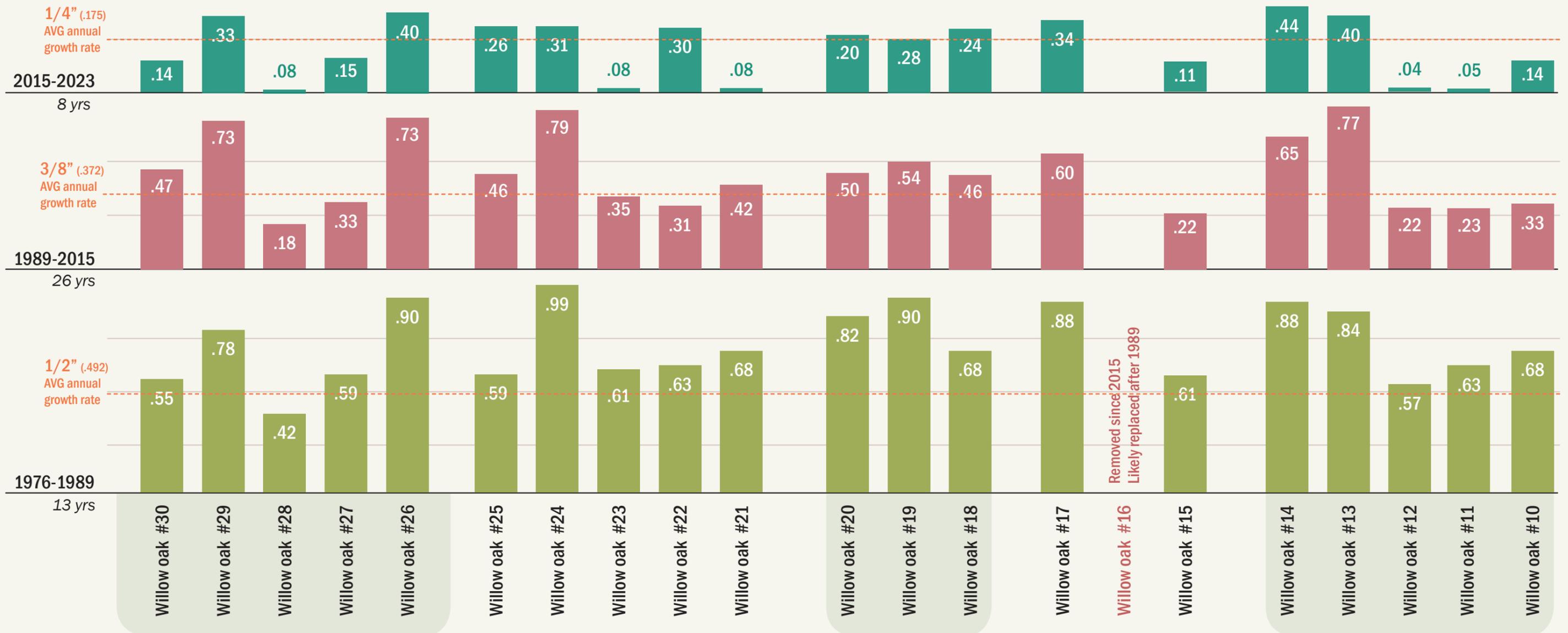
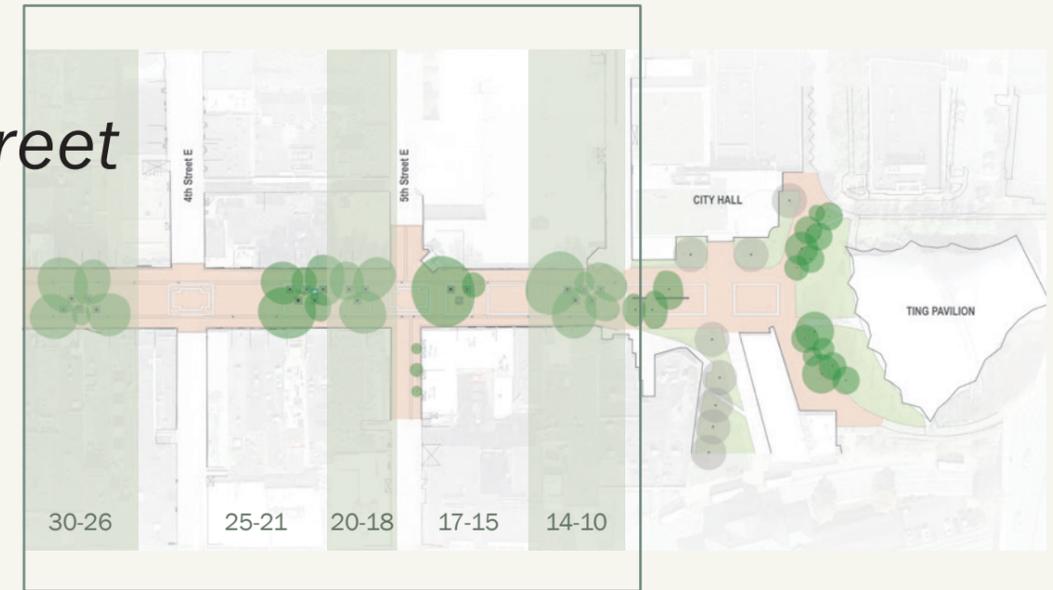
- DBH measurements taken in 1976, 1989, 2015, 2023
- Data reveals reduced growth rate of internal grove trees
- Three tree groves show improved growth
- Growth rates decline over time



Above Ground | Willow Oak Vigor: East of 3rd Street

47 years of tree data (started in 1976)

- DBH measurements taken in 1976, 1989, 2015, 2023
- Data reveals reduced growth rate of internal grove trees
- Three tree groves show improved growth
- Growth rates decline over time



Above Ground | Tree Assessment Documentation

Assessment conducted 10/18/23, 10/23/23, 11/3/23

Tree #	Common name	Scientific name	Year Planted	DBH (in.)	DBH (in.) 2015	DBH growth 2015-2023	DBH (in.) 1989	DBH growth 1989-2015	DBH (in.) 1976	DBH growth 1976-1989	DBH growth 1976-2023	Growth Rate (in./yr) 2015-2023	Growth Rate (in./yr) 1989-2015	Growth Rate (in./yr) 1976-1989	AVG Growth Rate (in./yr)	DBF (in.) - at grates	Crown (ft.)	Tree Height (ft.)	% Live Canopy	Structure	Canopy Quadrants	Grate to Ground (in.)	Grate to Ground (in.) 2015	Grate to Ground diff. 2023 - 2015	Roots / Flare Impacts (Y/N)	Deadwood	Deadwood Quadrant	Building Interference (Y/N)	Pruning Req'd (Y/N)	Tree Damage (Y/N)	Decay (Y/N)	Threat / Risk (Y/N)	Projected Lifespan	Overall Condition 2015	Overall Condition	Notes		
																																					Notes	
50	Red maple	<i>Acer rubrum</i>	1976	23.4	19.7	3.7	8.7	11	NA	NA	NA	0.46	0.42	NA	NA	26	42		1	1	2	4	16	12	Y			N	N	N	N	N	4	1	minor deadwood, phototropic lean			
51	Willow oak	<i>Quercus phellos</i>	1976	28.2	26.2	2	15.5	10.7	4.8	10.7	23.4	0.25	0.41	0.82	0.50	39.6	60		1	1	2	11	15	4	Y			N	Y	N	N	N	1	1	minor deadwood, root flare growing into grate			
52	Willow oak	<i>Quercus phellos</i>	1976	32	28.4	3.6	15.2	13.2	4.8	10.4	27.2	0.45	0.51	0.80	0.58	37	60	77.8	1	1	2	7.5	10	2.5	Y	>4"	NE	N	Y	N	N	N	1	1	minor deadwood, root flare growing into grate			
53	No tree				16.3		12.5	3.8	4.8	7.7			0.15	0.59																			4		tree removed since 2015			
54	Willow oak	<i>Quercus phellos</i>	1976	18	17.7	0.3	12.2	5.5	4.8	7.4	13.2	0.04	0.21	0.57	0.28	22.5	24		2	1	1	12.5	17	4.5	N			N	N	N	N	N	3	2	small canopy, good adventitious sprouting			
55	Willow oak	<i>Quercus phellos</i>	1976	19.2	18.6	0.6	13.7	4.9	4.8	8.9	14.4	0.07	0.19	0.68	0.31	23.8	27	61.3	1	1	1	15	16	1	N	2"-4"		N	Y	N	N	N	3	2	minor deadwood			
56	Willow oak	<i>Quercus phellos</i>	1976	16	15.3	0.7	10.7	4.6	4.8	5.9	11.2	0.09	0.18	0.45	0.24	19.8	33		3	1	2	15	20	5	N	2"-4"	NE	N	Y	N	N	N	3	3				
57	No tree				20		12.2	7.8	4.8	7.4			0.30	0.57																			3		tree removed since Jan 2023 (heater damage)			
58	Willow oak	<i>Quercus phellos</i>	1976	20.6	19.9	0.7	13	6.9	4.8	8.2	15.8	0.09	0.27	0.63	0.34	25.7	30		1	1	2	14.5	20	5.5	N	>4"	N	N	Y	Y	N	N	1	1	heater damage			
59	Willow oak	<i>Quercus phellos</i>	1976	18.9	18.2	0.7	13.7	4.5	4.8	8.9	14.1	0.09	0.17	0.68	0.30	21.9	24		4	3	1	15	19	4	N			N	N	N	N	Y		4	3	co-dominant leader, included bark		
60	Willow oak	<i>Quercus phellos</i>	1976	29	27.6	1.4	15.2	12.4	4.8	10.4	24.2	0.18	0.48	0.80	0.51	43.4	51		2	1	3	9	13	4	Y	>4"	NW	N	Y	N	N	N	3	2	root flare growing into grate			
61	Willow oak	<i>Quercus phellos</i>	1980	23.5	22	1.5	NA	NA	4.8	NA	NA	0.19	NA	NA	NA	35.4	31	68.6	1	1	1	7.5	9	1.5	Y			N	N	Y	N	N	3	1	minor deadwood, heater damage			
62	Willow oak	<i>Quercus phellos</i>	1980	27.5	24.5	3	NA	NA	4.8	NA	NA	0.38	NA	NA	NA	38.8	36		1	2	2	3	11	8	Y	2"-4"	SW	N	N	Y	N	N	2	1	heater damage, burl (leaf hopper), co-dominant leader, torsion on central leader			
63	Willow oak	<i>Quercus phellos</i>	1980	25.1	24.4	0.7	NA	NA	4.8	NA	NA	0.09	NA	NA	NA	33.9	45		1	1	1	5	12	7	Y	2"-4"	SW	N	Y	N	N	N	2	2	root-flare growing into grate			
64	Willow oak	<i>Quercus phellos</i>	1980	32.5	30	2.5	NA	NA	4.8	NA	NA	0.31	NA	NA	NA	48.5	42		1	1	4	6.5	10	3.5	Y			Y	Y	N	N	N	2	1	minor branch tip dieback			
65	Willow oak	<i>Quercus phellos</i>	1980	28.8	26.7	2.1	NA	NA	4.8	NA	NA	0.26	NA	NA	NA	43.6	36		1	1	4	0	10	10	Y	2"	NW	Y	Y	N	N	N	1	1	lichen present, pruning clearance from bldg likely			
66	Willow oak	<i>Quercus phellos</i>	1980	16.6	16.1	0.5	NA	NA	4.8	NA	NA	0.06	NA	NA	NA	22.4	24		1	1	4	9	12	3	N	2"-4"	N	N	Y	N	N	N	1	1	minor deadwood, good adventitious sprouting			
67	Willow oak	<i>Quercus phellos</i>	1980	26	23.9	2.1	NA	NA	4.8	NA	NA	0.26	NA	NA	NA	30	36		2	3	2	5	11	6	Y			N	Y	N	N	Y		1	2	poor overall structure, topped, top dieback, moss on north side of trunk		
68	Willow oak	<i>Quercus phellos</i>	1980	28.4	26.5	1.9	NA	NA	4.8	NA	NA	0.24	NA	NA	NA	47.3	54		1	1	1	4	8	4	Y			Y	Y	N	N	N	1	1	minor branch tip dieback, clearance from bldg likely			
69	Willow oak	<i>Quercus phellos</i>	1980	20.6	19.3	1.3	NA	NA	4.8	NA	NA	0.16	NA	NA	NA	26	45		1	1	2	8	9	1	N			N	Y	N	N	N	3	1	minor deadwood at top, clearance from bldg needed			
70	Willow oak	<i>Quercus phellos</i>	1980	30	28.5	1.5	NA	NA	4.8	NA	NA	0.19	NA	NA	NA	38	45	84.7	1	2	2	5.5	10	4.5	Y			N	N	N	N	N	3	1	co-dominant leader with thru-bolt, lichen on NW side			
71	No tree				15.1				4.8																								4		tree removed since 2015			
72	Willow oak	<i>Quercus phellos</i>	1980	25.4	24.2	1.2	NA	NA	4.8	NA	NA	0.15	NA	NA	NA	39	54		1	1	2	8.5	9	0.5	Y	2"		N	NA	NA	N	N	3	1	minor deadwood at top, good adventitious sprouting, fast inner-bark expansion			
73	Willow oak	<i>Quercus phellos</i>	1980	19.4	17.7	1.7	NA	NA	4.8	NA	NA	0.21	NA	NA	NA	28.6	30	72.2	2	2	2	10.5	12	1.5	Y	2"-4"	S	N	Y	Y	N	Y	3	2	major deadwood, crack forming in bark, thin canopy, phototropic lean w/ banana crack			
74	Willow oak	<i>Quercus phellos</i>	1985	19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	39			1	1	4	NA	NA	NA	NA			Y	NA	NA	NA	NA	NA	NA	1	1	minor root restriction from sidewalk / hollies; canopy close to building	
75	Willow oak	<i>Quercus phellos</i>	1985	17.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	39			1	1	2	NA	NA	NA	NA			NA	NA	NA	NA	NA	NA	NA	NA	1	1	phototropic lean
76	Willow oak	<i>Quercus phellos</i>	1985	18.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	36			1	1	3	NA	NA	NA	NA	Y		NA	NA	NA	NA	NA	NA	NA	NA	1	1	restricted root on sidewalk side
76 a	Willow oak	<i>Quercus phellos</i>	1985	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6			1	1	4	NA	NA	NA	NA			NA	NA	NA	NA	NA	NA	NA	2	2	J'-rooted; bad nursery stock	
77	Willow oak	<i>Quercus phellos</i>	1985	18.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	30			1	1	4	NA	NA	NA	NA			NA	NA	NA	NA	NA	NA	NA	NA	1	1	pruning wounds at top of tree
78	Willow oak	<i>Quercus phellos</i>	1985	18.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	27			2	2	2	NA	NA	NA	NA			NA	NA	NA	NA	NA	NA	NA	NA	2	2	excessive pruning; girdling root at trunk flare
79	Willow oak	<i>Quercus phellos</i>	1985	20.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	42			1	1	4	NA	NA	NA	Y			NA	NA	NA	NA	NA	NA	NA	NA	1	1	damage at trunk flare - cut root from possible utility work (probable root impacts that will affect tree health)
80	Willow oak	<i>Quercus phellos</i>	1985	29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	54	92.4		1	1	4	NA	NA	NA	NA	Y		Y	NA	NA	NA	NA	NA	NA	NA	1	1	canopy close to building; adjacent to utility work (probable root impacts that will affect tree health)
81	Willow oak	<i>Quercus phellos</i>	1985	22.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	63			1	1	4	NA	NA	NA	NA	Y		Y	NA	NA	NA	NA	NA	NA	NA	1	1	minor deadwood; restrictive rooting
82	Willow oak	<i>Quercus phellos</i>	1985	19.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	48			1	1	4	NA	NA	NA	Y			NA	NA	NA	NA	NA	NA	NA	NA	1	1	root girdling trunk flare (possibly from tree #82)
83	Willow oak	<i>Quercus phellos</i>	1985	14.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	42			2	1	3	NA	NA	NA	NA	Y		NA	NA	NA	NA	NA	NA	NA	NA	2	2	erosion around trunk flare; stressed; in path of telephone vault (possible utility impacts)
84	Willow oak	<i>Quercus phellos</i>	1985	21.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	54			2	1	3	NA	NA	NA	NA	Y		NA	NA	NA	NA	NA	NA	NA	NA	1	1	some deadwood; restrictive rooting
85	Willow oak	<i>Quercus phellos</i>	1985	19.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	48			1	1	4	NA	NA	NA	NA			NA	NA	NA	NA	NA	NA	NA	NA	1	1	endothia canker on surface roots
86	Willow oak	<i>Quercus phellos</i>	1985	33.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	63	79.3		1	2	4	NA	NA	NA	NA	Y		NA	NA	NA	NA	NA	NA	NA	NA	1	1	included bark (possible co-dominant leader)
87	Maidenhair tree	<i>Ginkgo biloba</i>	2006	4.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15			1	3	4	NA	NA	NA	NA			NA	NA	NA	NA	NA	NA	NA	NA	2	2	topped, female
88	Southern Magnolia	<i>Magnolia grandiflora 'Alta'</i>	2006	4	NA	NA	NA	NA	NA																													

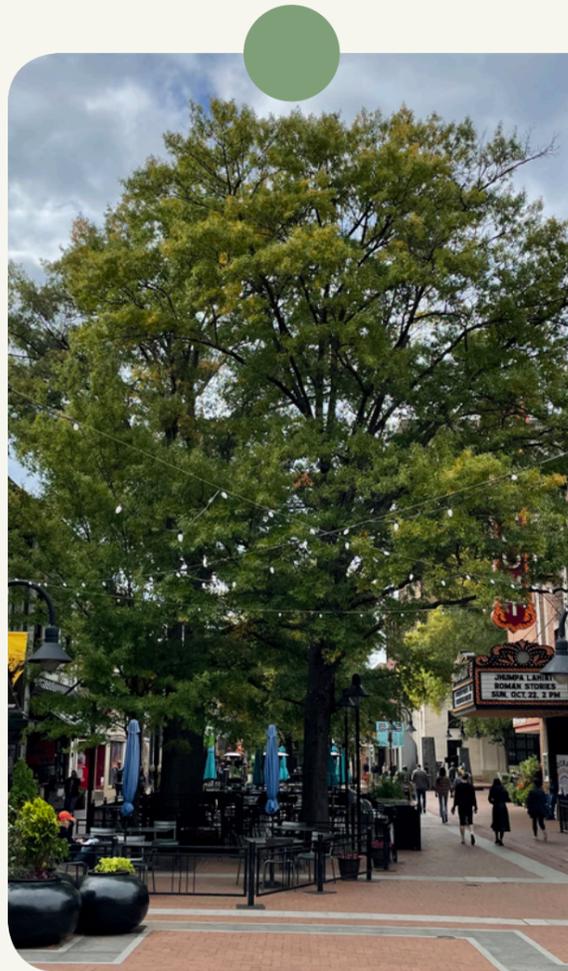
Above Ground | Tree Assessment Documentation

Assessment conducted 10/18/23, 10/23/23, 11/3/23

Tree #	Common name	Scientific name	Year Planted	DBH (in.)	DBH (in.) 2015	DBH growth 2015-2023	DBH (in.) 1989	DBH growth 1989-2015	DBH (in.) 1976	DBH growth 1976-1989	DBH growth 1976-2023	Growth Rate (in./yr) 2015-2023	Growth Rate (in./yr) 1989-2015	Growth Rate (in./yr) 1976-1989	AVG Growth Rate (in./yr)	DBF (in.) - at grates	Crown (ft.)	Tree Height (ft.)	% Live Canopy	Structure	Canopy Quadrants	Grate to Ground (in.)	Grate to Ground (in.) 2015	Grate to Ground diff. 2023 - 2015	Roots / Flare Impacts (Y/N)	Deadwood	Deadwood Quadrant	Building Interference (Y/N)	Pruning Req'd (Y/N)	Tree Damage (Y/N)	Decay (Y/N)	Threat / Risk (Y/N)	Projected Lifespan	Overall Condition 2015	Overall Condition	Notes	
																																					Overall Condition
105	Maidenhair tree	<i>Ginkgo biloba</i>	2003	10.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	27		1	1	4	NA	NA	NA	NA			NA	NA	NA	NA	NA	NA	NA	1		
106	Maidenhair tree	<i>Ginkgo biloba</i>	2003	10.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	27		1	1	4	NA	NA	NA	NA			NA	NA	NA	NA	NA	NA	NA	NA	1	
107	Maidenhair tree	<i>Ginkgo biloba</i>	2006	6.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	12		2	3	2	NA	NA	NA	NA			NA	NA	Y	Y	Y		NA	3	deadwood, severe trunk wound, decay at bottom	
108	Maidenhair tree	<i>Ginkgo biloba</i>	2006	6.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15		1	2	2	NA	NA	NA	NA			NA	NA	NA	Y	Y		NA	3	heaving paving	
109	Maidenhair tree	<i>Ginkgo biloba</i>	2006	7.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	12		1	3	2	NA	NA	NA	NA			NA	NA	NA	NA	NA		NA	2	trunk wound	
110	Shumard oak	<i>Quercus shumardii</i>	2007	13.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	30		1	1	4	NA	NA	NA	N			N	N	N	N	N		NA	1	minor deadwood, very compacted soil	
111	Shumard oak	<i>Quercus shumardii</i>	2007	12.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	30		1	1	4	NA	NA	NA	Y			N	N	N	N	N		NA	1	surface root mower damage, possible girdle, 14" tip growth rate, very compacted soil	
112	Shumard oak	<i>Quercus shumardii</i>	2007	10.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24		1	1	4	NA	NA	NA	Y	<2"		N	N	N	N	N		NA	1	minor deadwood, surface root mower damage, very compacted soil	
113	Shumard oak	<i>Quercus shumardii</i>	2007	15.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	42		1	1	4	NA	NA	NA	Y			N	N	N	N	N		NA	1	slight lean northwest, very compacted soil	
114	Shumard oak	<i>Quercus shumardii</i>	2006	12.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	30		1	1	4	NA	NA	NA	Y			N	N	N	N	N		NA	1	minor deadwood, some surface roots, possible bacterial leaf scorch, very compacted soil	
115	Shumard oak	<i>Quercus shumardii</i>	2006	11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	30		1	1	4	NA	NA	NA	Y			N	N	N	N	N		NA	1	minor deadwood, some surface roots, possible bacterial leaf scorch, very compacted soil	
116	Shumard oak	<i>Quercus shumardii</i>	2006	11.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	30		1	1	4	NA	NA	NA	Y	<2"		N	N	N	N	N		NA	1	minor deadwood at top, only lawn-side tree with all mulch at base	
117	Willow oak	<i>Quercus phellos</i>	2022	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9		1	2	4	NA	NA	NA	Y			NA	NA	NA	NA	NA		NA	2	obscure scale; poor annual growth; bark wounding/damage, canker	
118	Willow oak	<i>Quercus phellos</i>	2022	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9		1	2	4	NA	NA	NA	Y			NA	NA	NA	NA	NA		NA	2	undersized rootball (only 48")	
119	Willow oak	<i>Quercus phellos</i>	2022	6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	11		1	1	4	NA	NA	NA	Y			NA	NA	NA	NA	NA		NA	2	bark wounding/damage, canker; branch damage	
120	American hornbeam	<i>Carpinus caroliniana</i>	2022	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4		1	1	4	NA	NA	NA	N			NA	NA	NA	NA	NA		NA	2	2" linear bark wound near trunk flare	
121	American hornbeam	<i>Carpinus caroliniana</i>	2022	2.25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4		1	1	4	NA	NA	NA	N			NA	NA	NA	NA	NA		NA	2	girdled root; poor nursery stock	
122	Sweetbay magnolia	<i>Magnolia virginiana</i>	2022		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3	7	1	1	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA		NA	1	multi-stem	
123	Sweetbay magnolia	<i>Magnolia virginiana</i>	2022		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3	7	1	1	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA		NA	1	multi-stem	
124	Serviceberry	<i>Amelanchier spp.</i>	2022		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9	7	1	1	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA		NA	1	multi-stem	
125	Serviceberry	<i>Amelanchier spp.</i>	2022		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9	7	1	1	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA		NA	1	multi-stem	
126	Serviceberry	<i>Amelanchier spp.</i>	2022		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9	7	1	1	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA		NA	1	multi-stem	
127	Serviceberry	<i>Amelanchier spp.</i>	2022		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	7	1	1	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA		NA	1	multi-stem	
128	Serviceberry	<i>Amelanchier spp.</i>	2022		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	7	1	1	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA		NA	1	multi-stem	
129	Serviceberry	<i>Amelanchier spp.</i>	2022		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	7	1	1	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA		NA	1	multi-stem	
130	Serviceberry	<i>Amelanchier spp.</i>	2022		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	7	1	1	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA		NA	1	multi-stem	
131	Serviceberry	<i>Amelanchier spp.</i>	2022		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	7	1	1	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA		NA	1	multi-stem	
132	Serviceberry	<i>Amelanchier spp.</i>	2022		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	7	1	1	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA		NA	1	multi-stem	
133	Serviceberry	<i>Amelanchier spp.</i>	2022		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	7	1	1	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA		NA	1	multi-stem	
134	Serviceberry	<i>Amelanchier spp.</i>	2022		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	7	1	1	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA		NA	1	multi-stem	
135	Serviceberry	<i>Amelanchier spp.</i>	2022		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	7	1	1	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA		NA	1	multi-stem	
136	Serviceberry	<i>Amelanchier spp.</i>	2022		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	7	1	1	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA		NA	1	multi-stem	
137	Serviceberry	<i>Amelanchier spp.</i>	2022		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	7	1	1	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA		NA	1	multi-stem	
138	Serviceberry	<i>Amelanchier spp.</i>	2022		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	7	1	1	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA		NA	1	multi-stem	
139	Serviceberry	<i>Amelanchier spp.</i>	2022		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	7	1	1	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA		NA	1	multi-stem	
140	Serviceberry	<i>Amelanchier spp.</i>	2022		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	7	1	1	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA		NA	1	multi-stem	
141	Serviceberry	<i>Amelanchier spp.</i>	2022		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	7	1	1	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA		NA	1	multi-stem	



Above Ground | Health



Excellent to Good



Fair



Poor

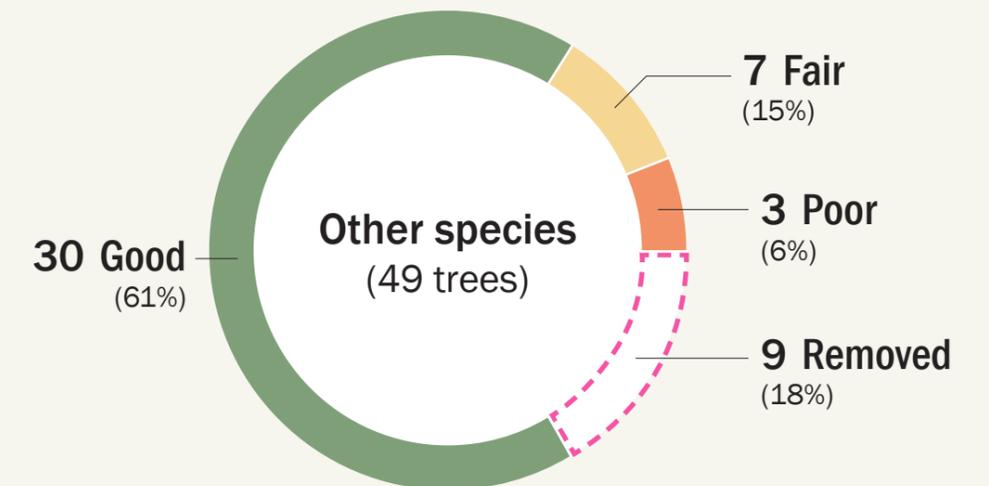
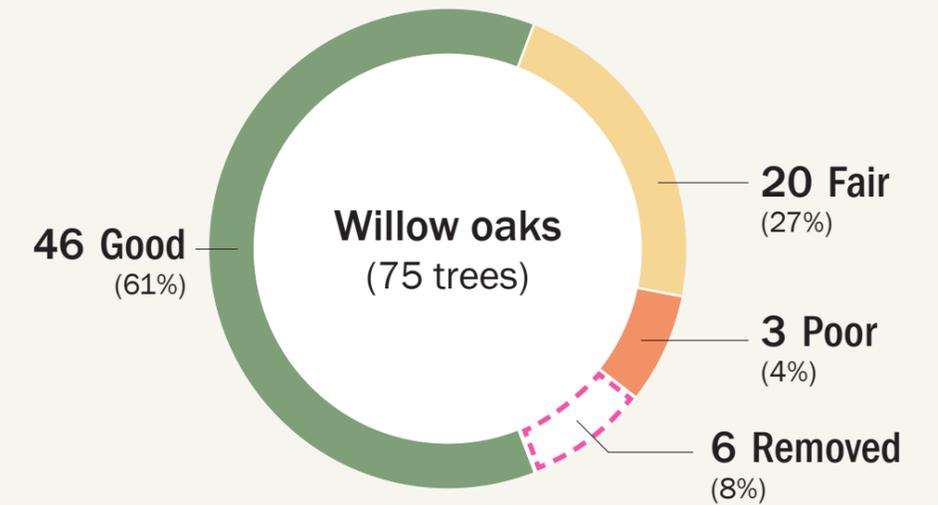
Typical Conditions

- 100% live canopy
- Strong to average annual growth
- Overall healthy condition

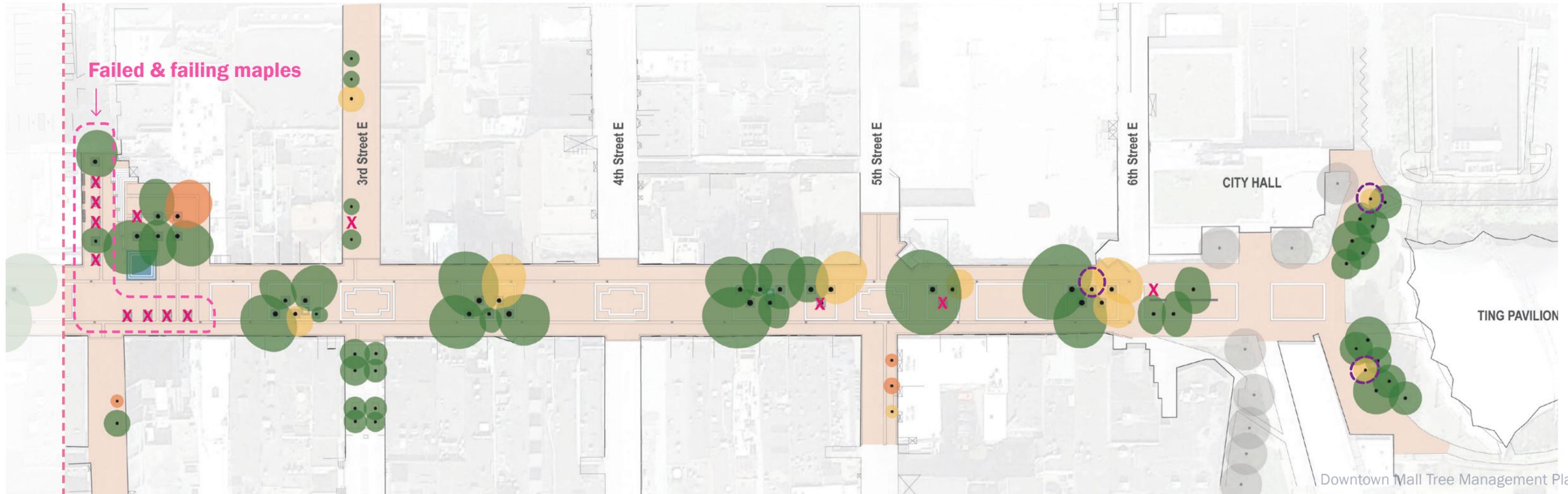
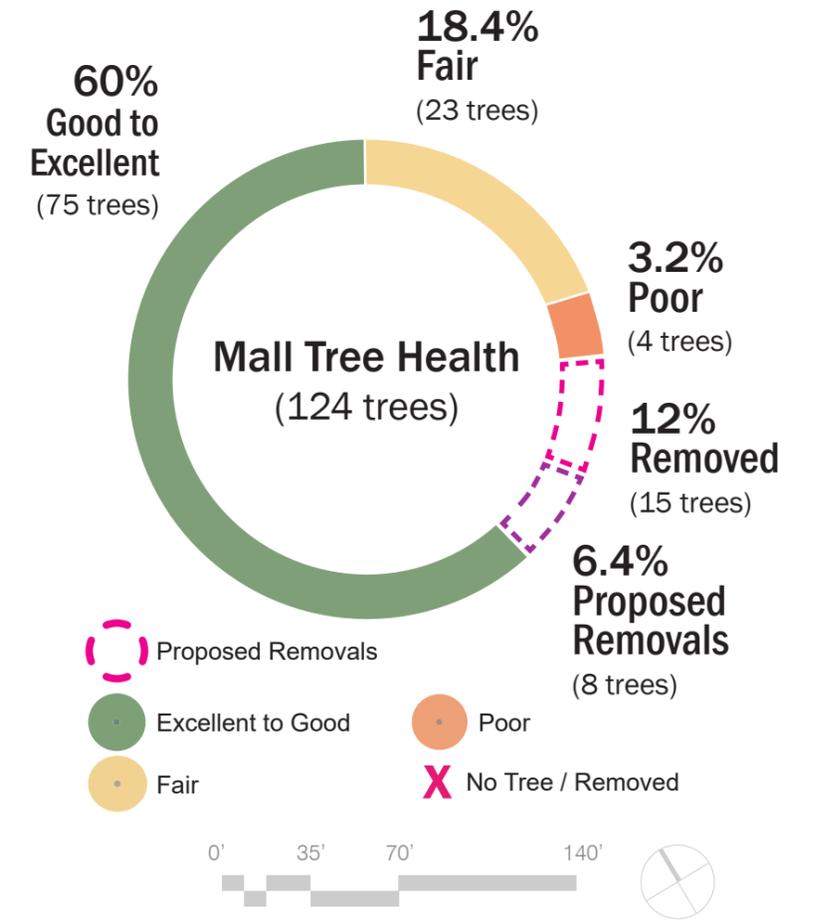
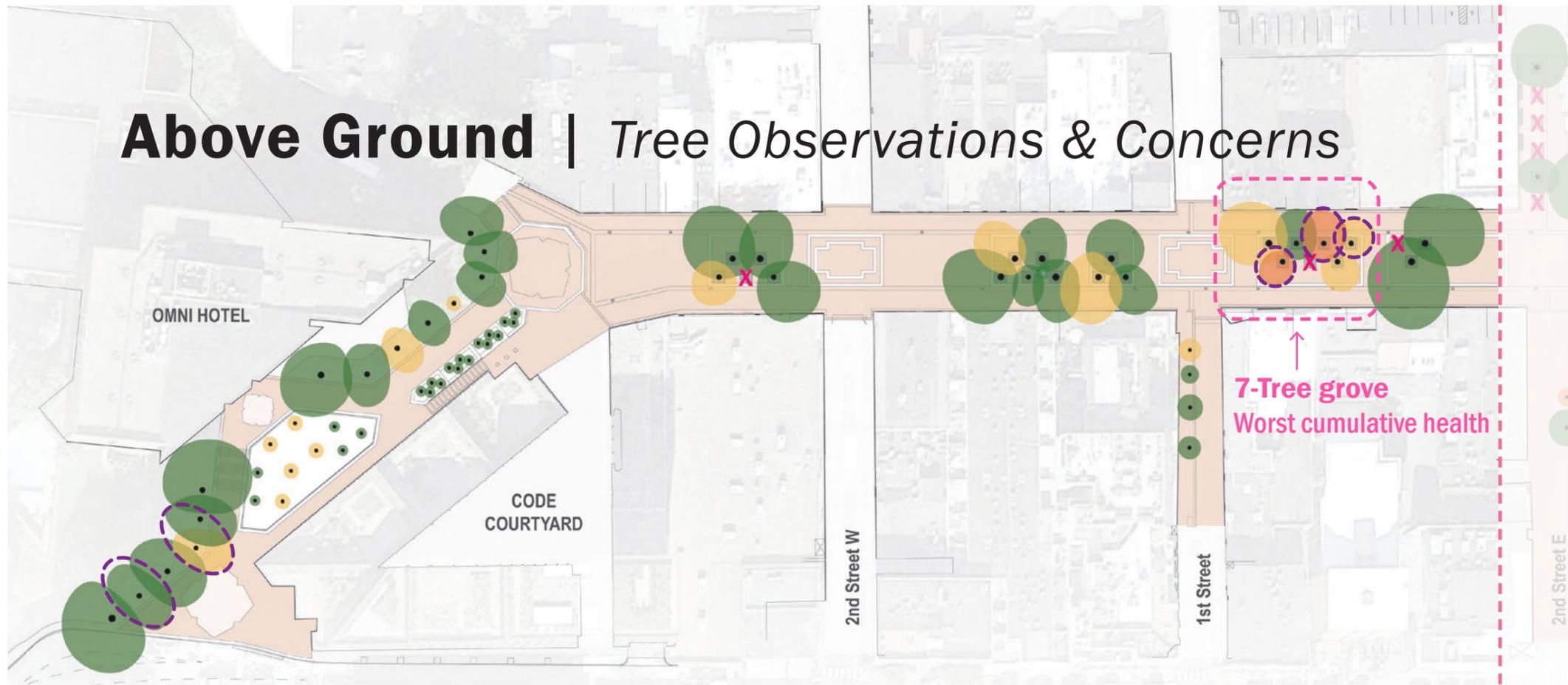
- 75% - 100% live canopy
- Average annual growth
- Some branch dieback and girdled roots

- 50% - 75% live canopy
- Low annual growth
- Structural defects
- Heavy branch dieback or missing central leader

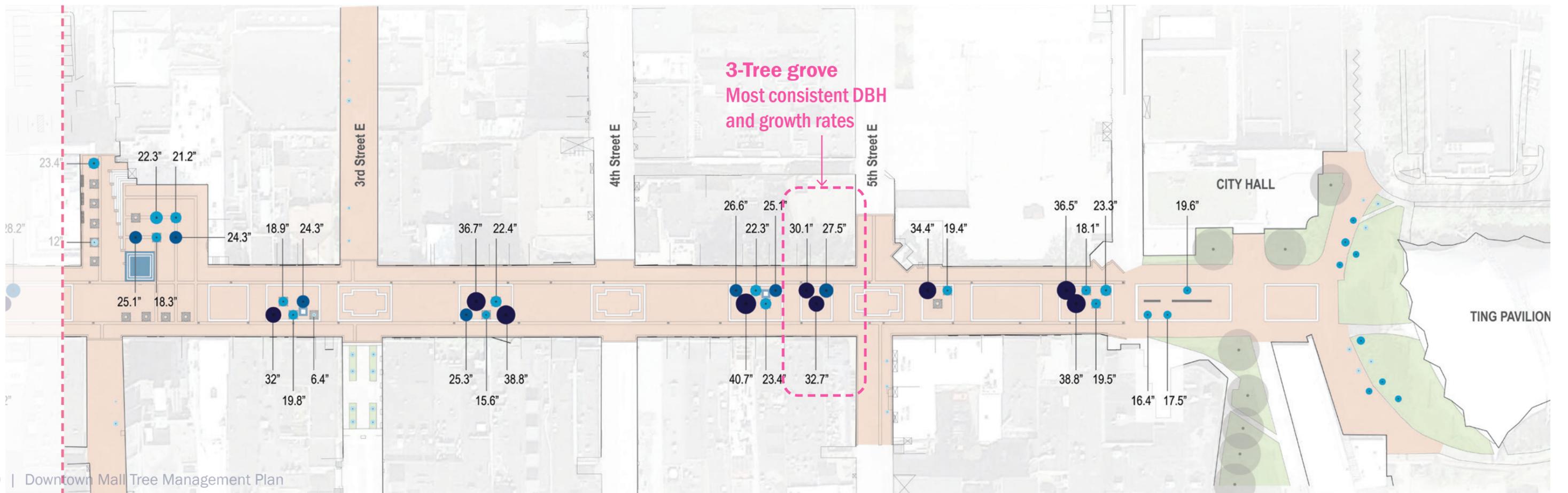
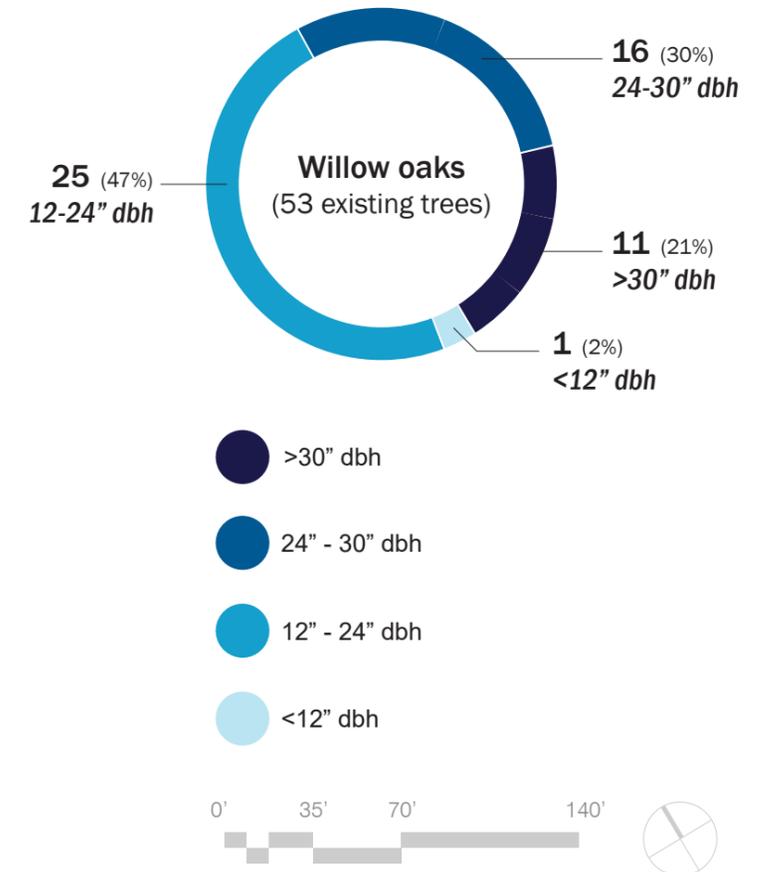
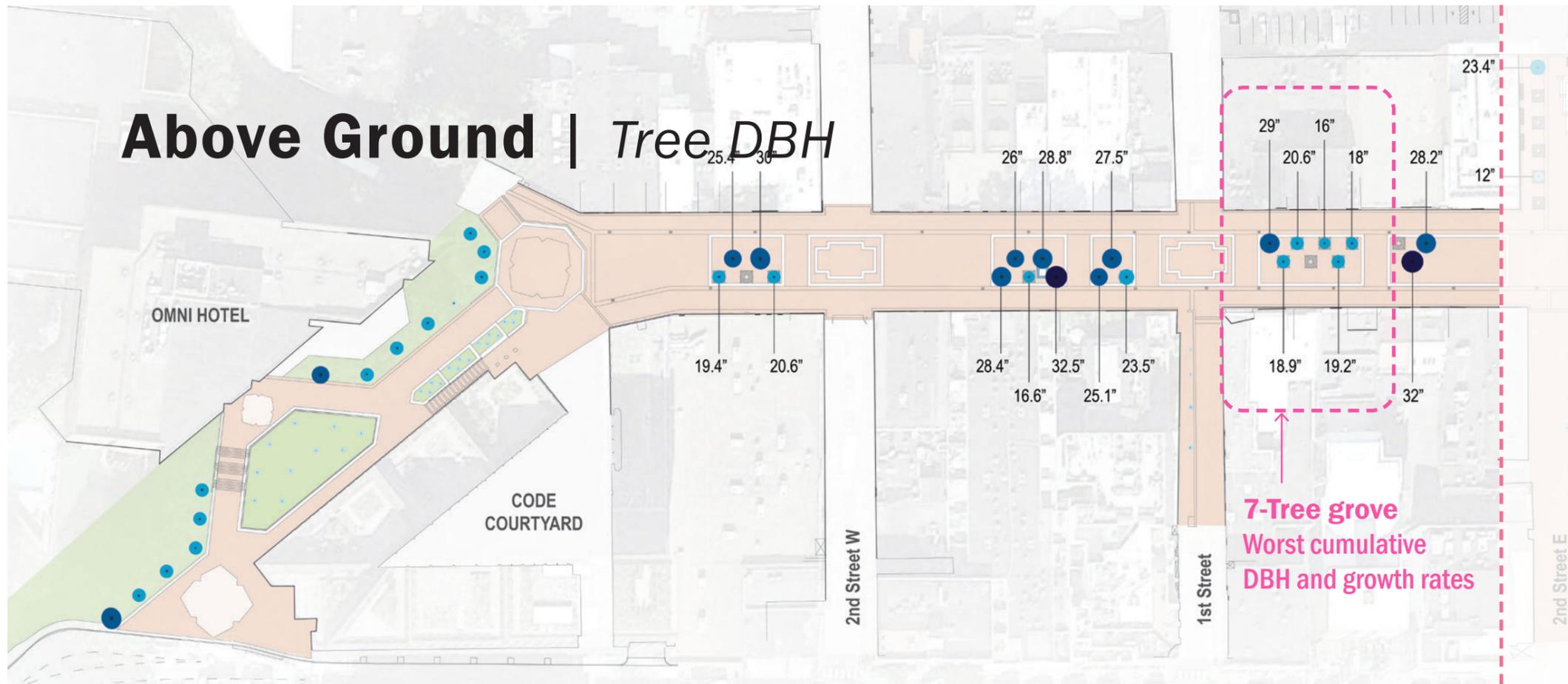
The majority of trees along the Mall have been assessed as being in excellent to good health; however, the increasing proportion of trees in poor and fair condition is concerning from a long-term perspective.



Above Ground | Tree Observations & Concerns



Above Ground | Tree DBH



Above Ground | Heater Wounds & Light Fixtures

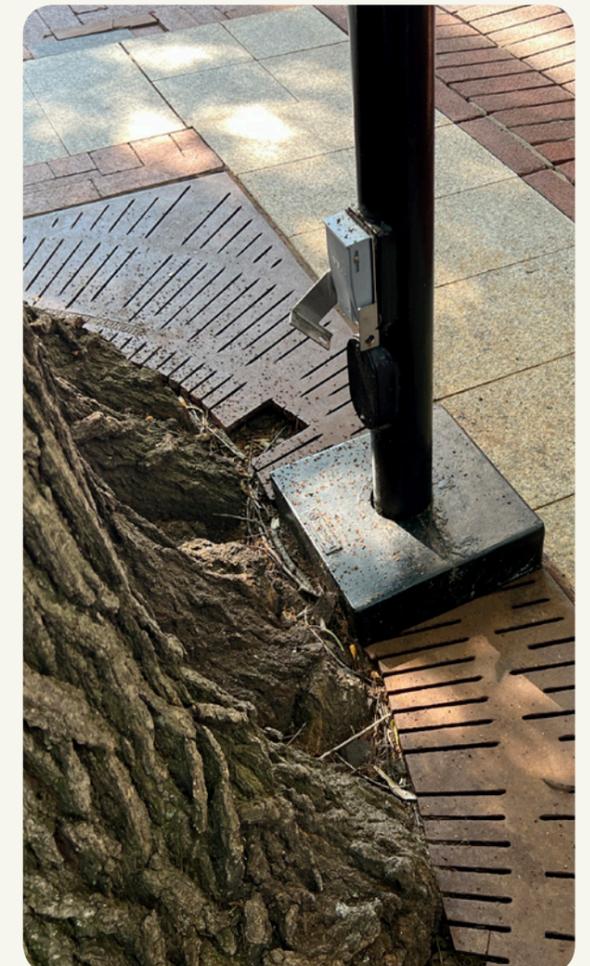
- 9 of 55 original willow oaks were impacted by improper heater use too close to the trees (preventable, human-caused damage)
- 2 of these 9 trees required removal in 2022
- 5 of the 6 cafe enclosures that use heaters near trees have caused the damage
- Light fixtures pose long term health issues to trees and tripping hazard



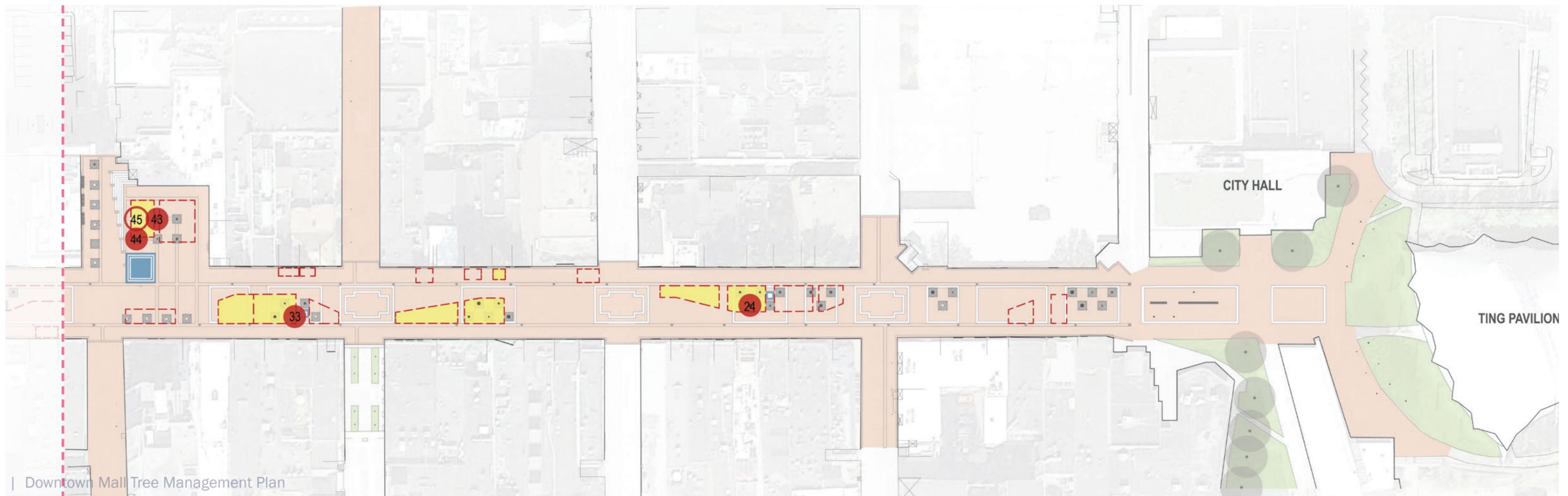
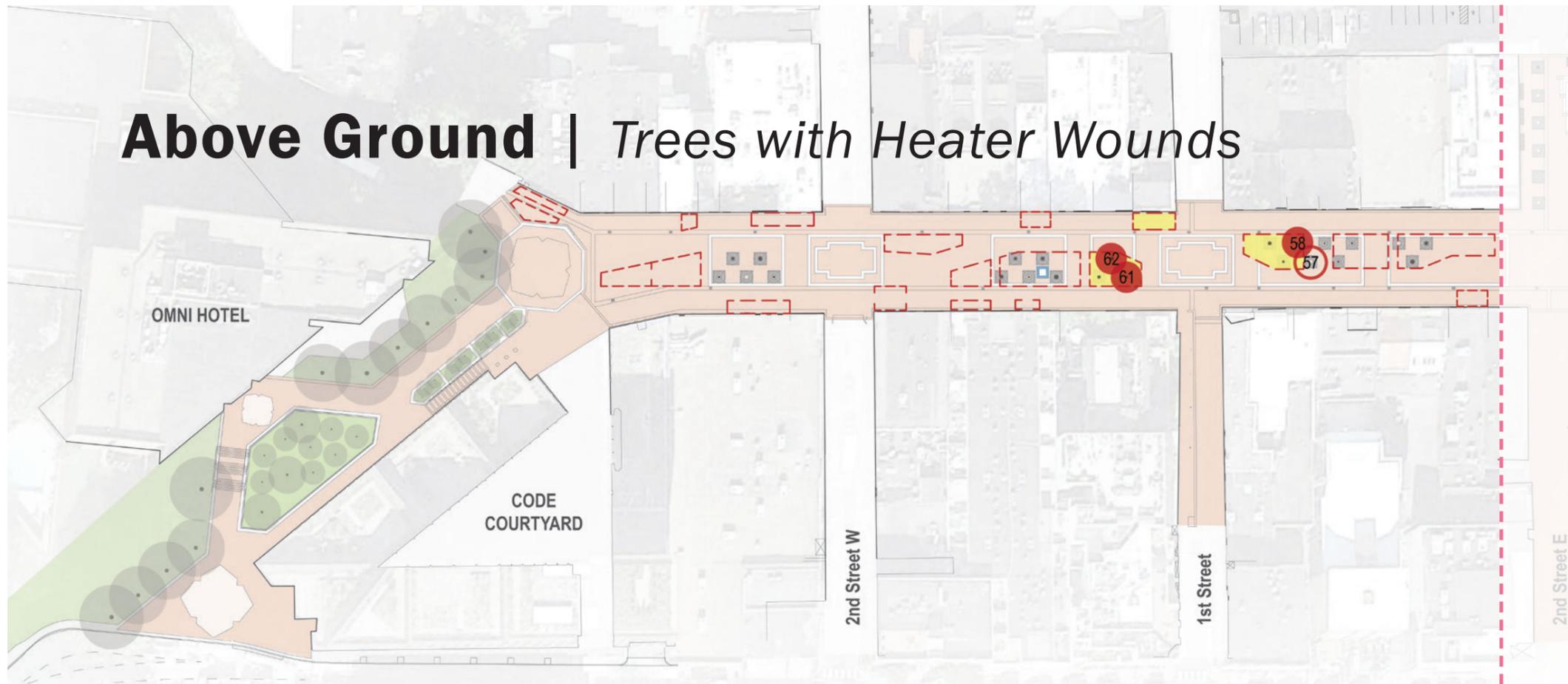
Since the initial assessment, NDS submitted new heater requirements to all downtown businesses

- Minimum 10' clearance from trees
- All heater locations to be approved with NDS
- Penalties include loss of heater usage and possible revocation of cafe space

High risk willow oak #19 removed (1/8/24)



Above Ground | *Trees with Heater Wounds*



At Grade | Grate Impacts Overview



Halprin Design: Hidden Paver Grate

- Benefits:
 - Continuous paving to trunk creates uniform ground plane and contiguous appearance.

Preferred approach



2009 Design Modification: Surface Grate

- Benefits:
 - Girdling by surface grate is more visually apparent.
 - Removes brick masonry modification



At Grade | Grate Impacts



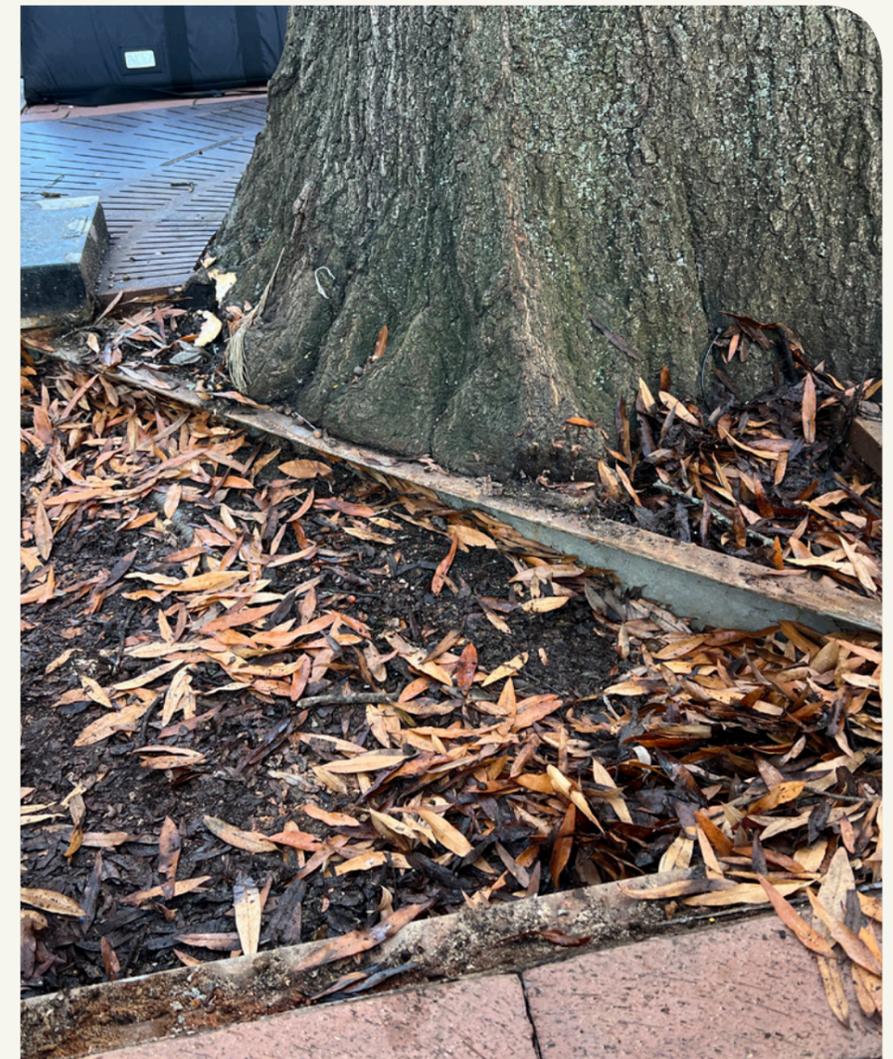
Tree #13

- Tree girdled by grate support beam
- Some trees may be structurally dependent on support beams



Tree #14

- Visible damage to trunk from grate maintenance
- Root flare girdled by both surface grate and structural grate support
- Grate not designed for expansion with broken "teeth" / trip hazard



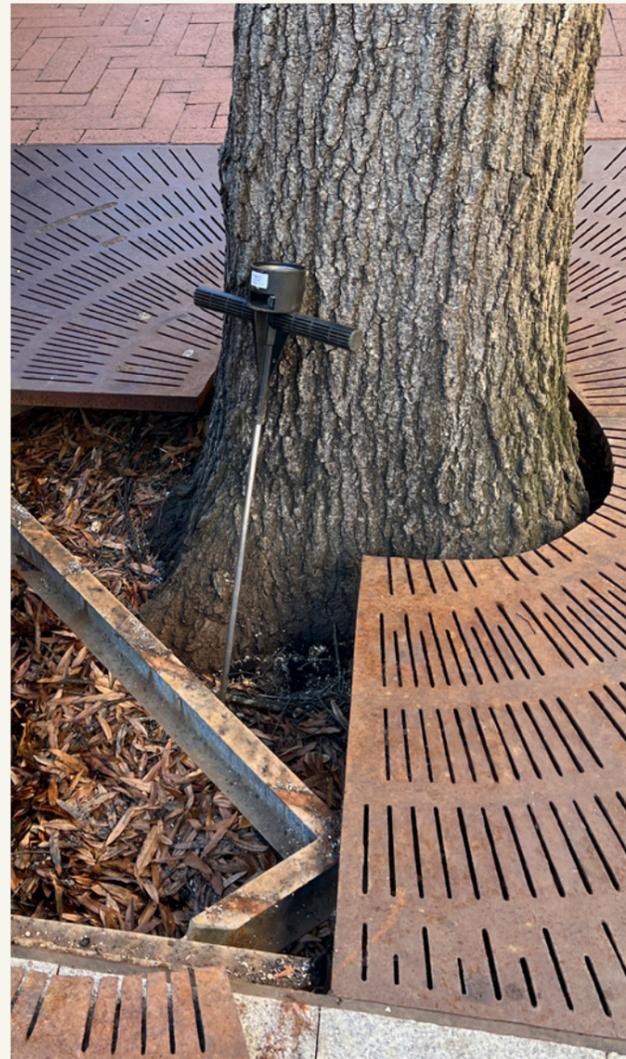
Tree #66

- Tree girdled by grate support beam
- Future light fixture conflict visible at left of image

At Grade | Soil Depth from Pavement Impacts Root Flare



Soil 21" from top of pavement



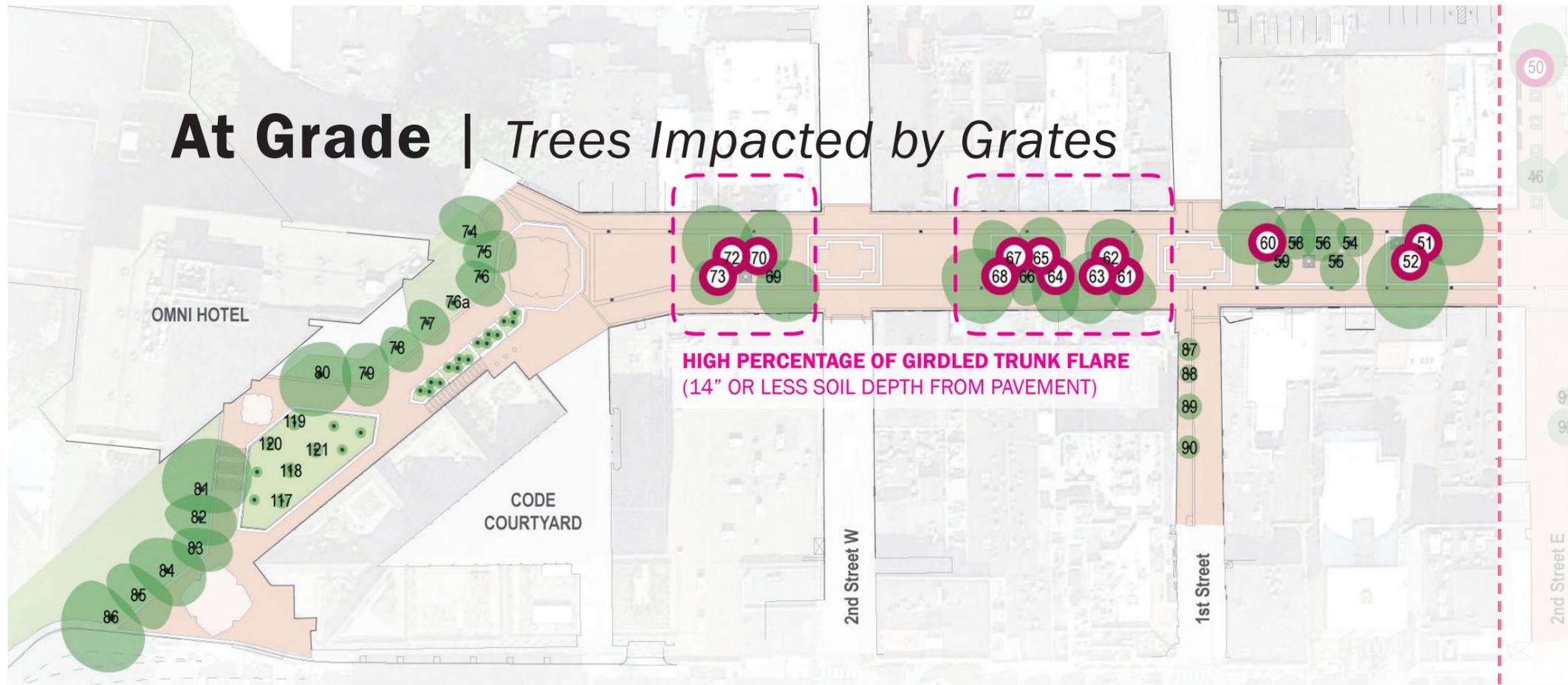
Soil 12" from top of paving



- 18-24" soil depth allows room for root flare below grate and support beam

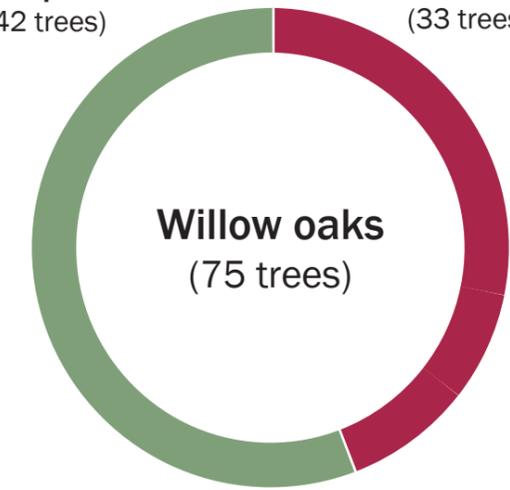
- Shallow soil depth increases trunk flare conflict with grate support beam

At Grade | Trees Impacted by Grates

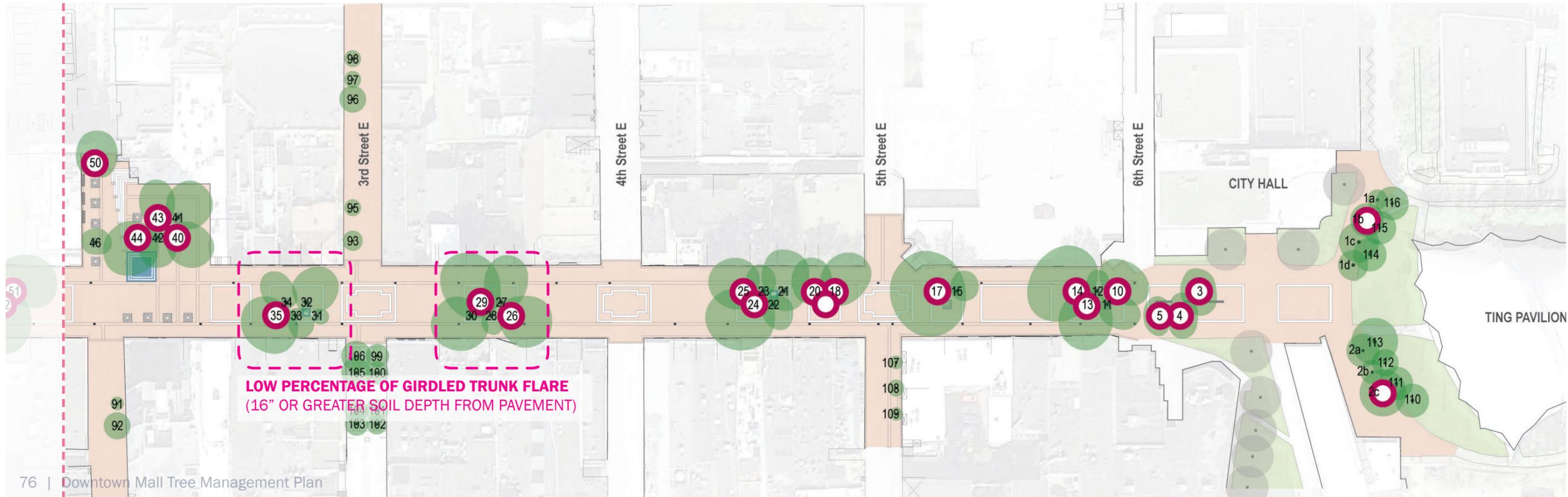


56%
No impact
(42 trees)

44%
Grate Damage
(33 trees)



- Existing Trees
- Trees with Root / Flare Impacts



Below Ground | Soil Assessment

Assessment Process & Description

- Tree grates were removed to access soil
- 15 samples, one from each grove/area, were tested
- Physical texture, soil moisture, soil properties, and nutrient testing were performed
- Compaction testing was performed at each sample point

Overview

Soil pH: Healthy soil pH overall, slightly higher levels were noted on plan for further observation.

Organic Matter: No observed organic matter concerns.

Cation-Exchange Capacity (CEC): Healthy CEC levels overall, except as noted on plan.

Soil Moisture: Healthy moisture levels overall, except areas of excessive moisture noted on plan.

Soil Compaction: Minimal compaction overall, except as noted on plan.

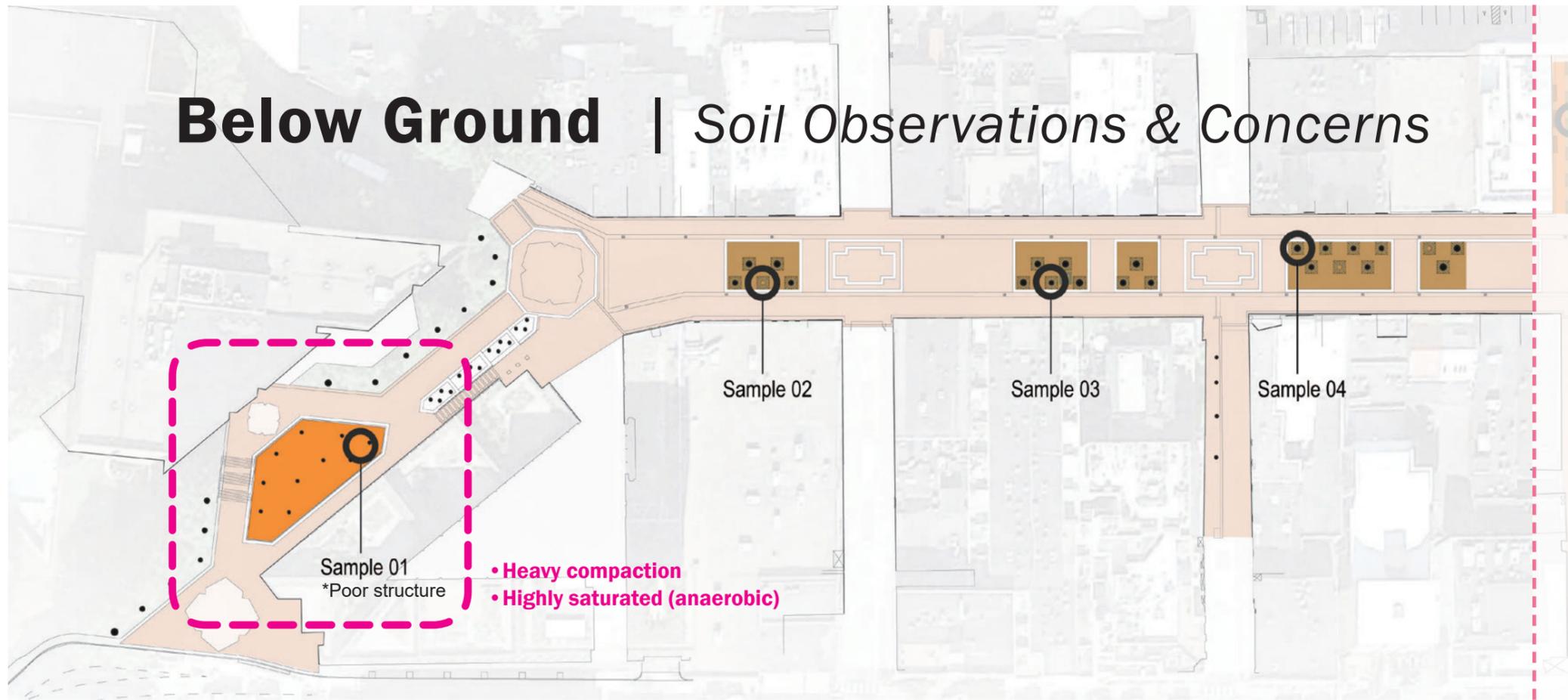
Soil Texture: Primarily clay loam and sandy clay loam throughout, which is common to the area.

Soil Testing Results

N	P	K	Ca	Mg	S	Sulfur R	Na	Sod	Zinc	Zinc	Mn	Mai	Fe	Iror	Cu
29	329	475	2047	317	257	very high	76		10.1		19.1		125.3		2.69
6	20	317	4103	158	72.4	high	285		106		3.1		48.7		2.22
2.5	29	238	1834	66	14.4		50		43.5		3.2		51.7		1.67
5.5	18	278	3582	80	40.4		52		359		3.1		42.8		2.06
7.7	32	204	3437	55	58.3		28		76.2		4.2		41		2.72
20	12	434	2597	75	50.1		269		2.21		1.9		7.4		0.7
2.3	23	122	3089	144	33.7		27		250		4.5		35.1		3.51
7.5	77	121	1945	79	8.8		261		41.7		8.8		111.5		2.75
3.8	22	168	3766	81	60.2		22		154		3.2		34.9		3.37
5.1	157	172	1049	134	10.4		147		5.26		18.9		32.6		0.86
1.8	19	158	2960	73	56		30		77.8		6.6		25		2.89
2.1	10	135	1878	70	12.8		27		119		12.9		35.9		2
2.4	35	164	4144	100	102	high	541		64.2		9.4		37.6		2.07
4.3	22	292	3769	142	61.7		248		196		8.5		35.4		3.11
1	19	186	953	91	27.9		34		4.19		12		35.3		1.74



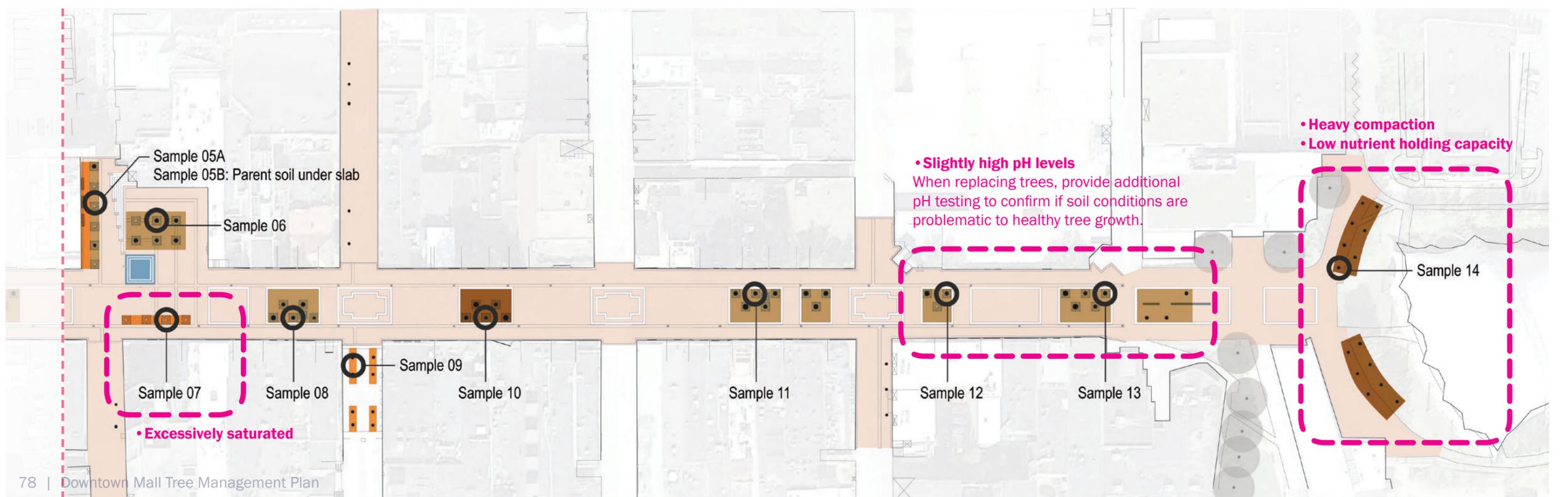
Below Ground | Soil Observations & Concerns



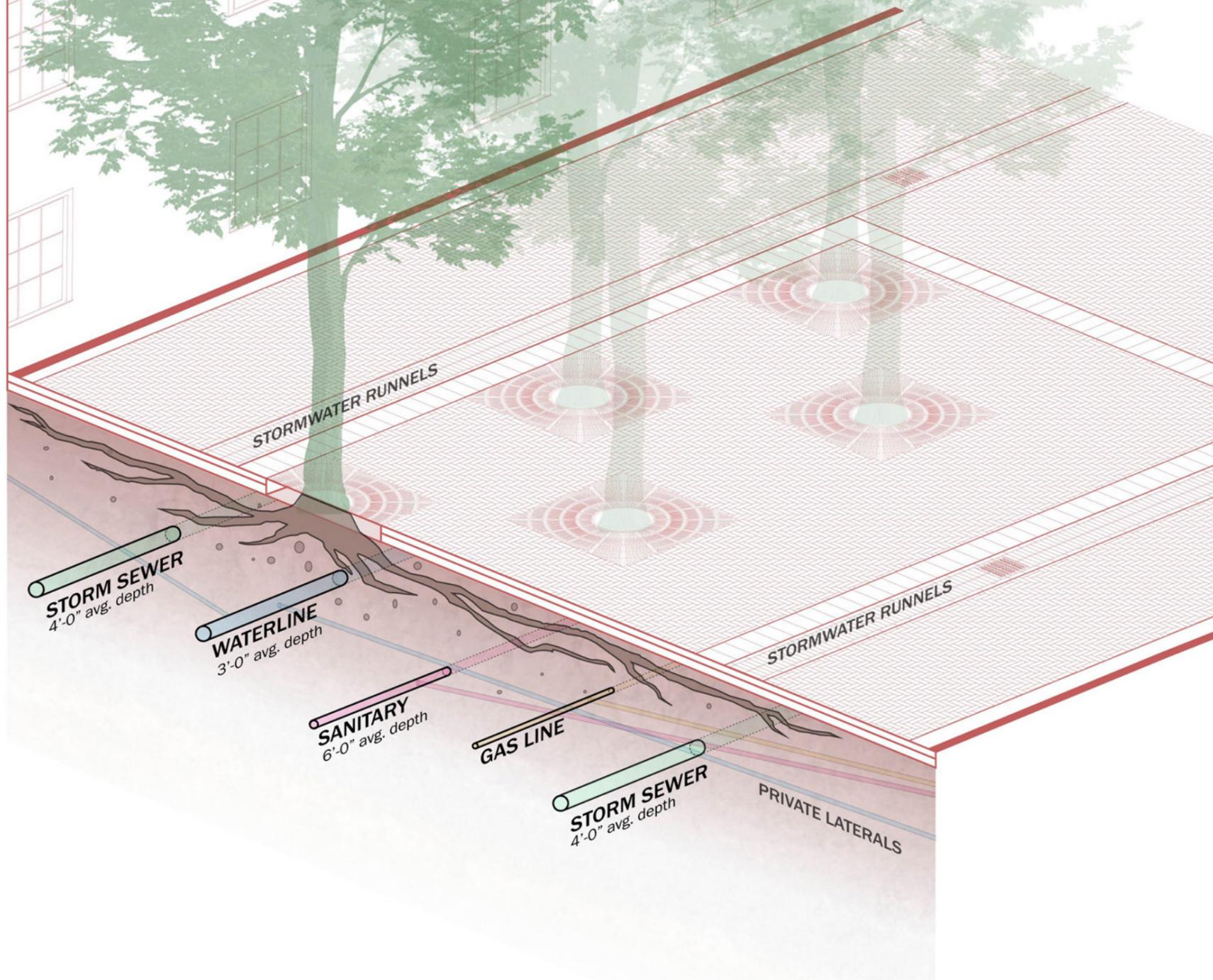
○ Clay ● Clay Loam ● Sandy Clay Loam

Most common soil types on the Mall

0' 35' 70' 140'



Below Ground | Utilities Observations



Utility Public/Private

Main Lines (Public)

Main lines are the City's primary distribution system and include pressure (gas & water) and gravity (storm & sanitary) lines that service the public. Along the Downtown Mall, main lines primarily run parallel with the street.

- No immediate concern
 - Main lines are low with no apparent negative impacts on utility lines or tree roots
- Long-term relocation recommended to avoid future conflicts
- No known waterlines or fountain leaking

Laterals (Private/Public)

Laterals are lines that run from private buildings to public systems

- Private laterals have high likelihood to impact roots in near term
- Laterals are public up to the meter
 - Water meters are outside the building
 - Gas meters are inside the building

Utility Type

Pressure Lines

- Pressure lines include water and gas
- Water laterals have a high likelihood of replacement and up-sizing as businesses change use

Gravity Lines

- Gravity lines include sanitary and stormwater
- Terracotta sanitary laterals may need replacement
- Gravity lines are more difficult to modify than pressure fed lines

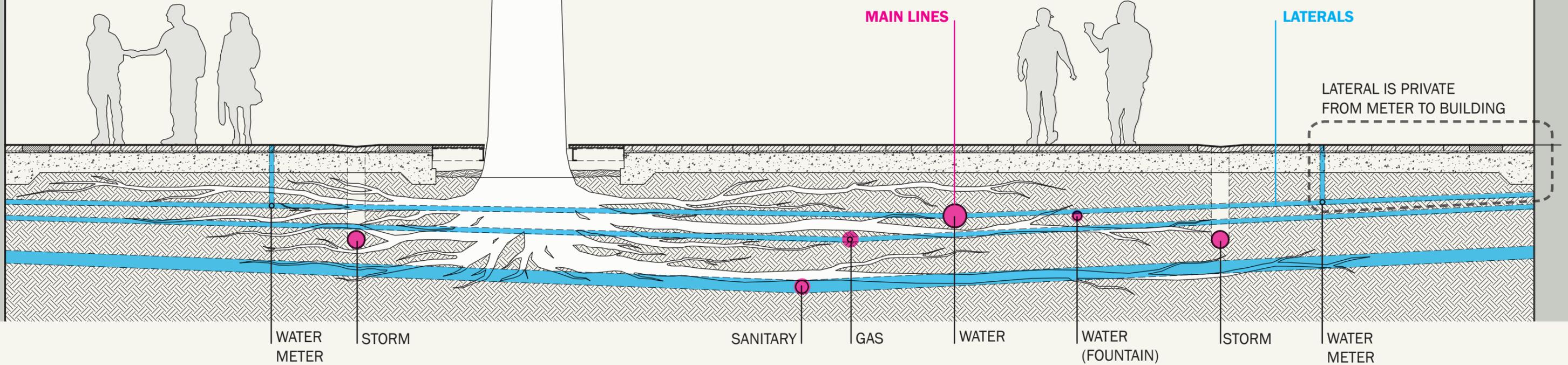
Below Ground | Utility Impacts on Critical Root Zone

Utility Impacts

As businesses along the Mall undergo changes in ownership, size, or use, there will be a need to upgrade or relocate utilities. Upsizing utility laterals is particularly concerning, as it could have a significant impact on the critical root zones (CRZs) of existing trees.

BUILDING

BUILDING



*Sanitary sewer laterals are unknown. Laterals are shown for illustrative purposes only.

Tree Assessment | Summary

Above Grade

1. Tree Health

- Overall tree health is good
- Poor long term health outcome if no intervention is taken

2. Heaters & Light Fixtures

- Steps have been taken to address future heater damage
- Light fixtures in current locations pose a long term issue

At Grade

3. Tree Grates

- Current grate design is problematic and negatively impacting many trees

Below Grade

4. Soils

- Soils are healthy with a few very poor exceptions

5. Utilities

- Future utility work may be major threat to tree health



Tree Assessment | Tracking Willow Oak Growth & In-Field Data Collection

The Mall Tree Management Plan builds on a rich history of monitoring and assessing the Willow Oaks along the Mall. The work of James Urban and Kieth Pitchford has been instrumental in developing a comprehensive understanding of the trees' health.

In addition to the Level 1 Tree Assessments, Level 3 Tree Assessments were conducted on several trees of particular concern, with a summary of the findings provided below.



DBH measurements recorded:

- 1976 James Urban, FASLA
- 1989 James Urban, FASLA



Charlottesville Main Street Tree Assessment and Management Recommendations (2015)

- James Urban, FASLA & Keith Pitchford, ISA



Tree Management Plan In-Field Data Collection (2024)

- Wolf Josey Landscape Architects & Keith Pitchford, ISA

Level 3 Tree Assessment

A Level 3 TRA evaluates the risk of failure in three tree parts – crown and branches, trunk, and roots and root collar. For each tree part an evaluation of risk is made as it relates to the potential for failure, impact, and damage to targets below. A risk rating is assigned to each tree part based on the standard ISA worksheet and based on my visual assessments.

Site Evaluation

- The buildings create a wind tunnel affect.
- Crown density is typically sparse.
- The majority of the tree canopies are restricted to the upper 50% of the tree.
- Relative crown sizes are medium.

Overall: Assessed trees had an overall LOW risk of failure

	Willow oak #24	Willow oak #35	Willow oak #68
Crown and Branches	MODERATE	LOW	LOW
Trunk	LOW	LOW	LOW
Root and Root Collar	LOW	LOW	LOW

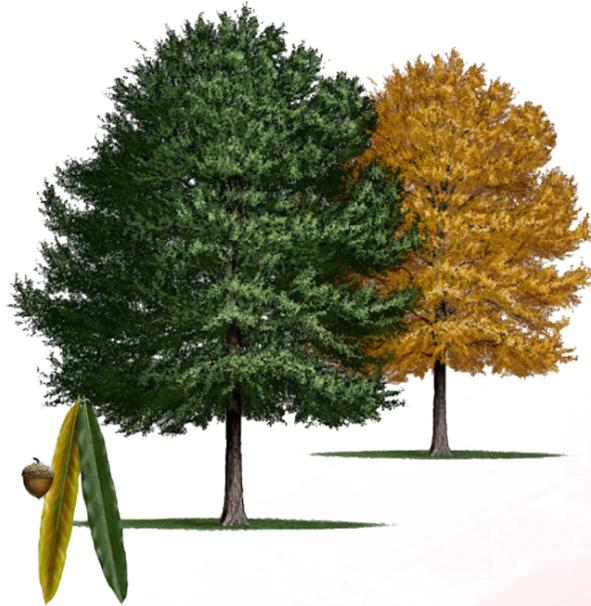


APPENDIX C

ANALYSIS: TREE SELECTION

Tree Selection | Existing Tree Species

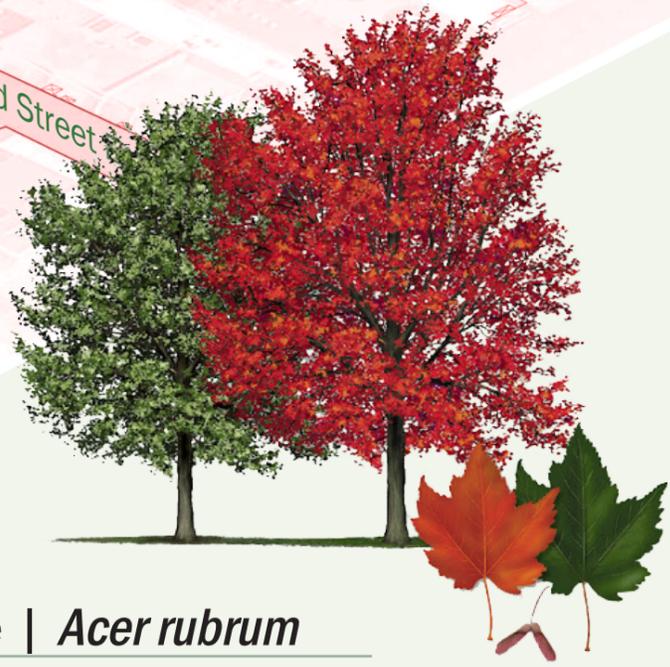
Yellow and red fall colors



Willow oak | *Quercus phellos*

Central Place
Red, contrasting fall color

Open Public Space



Red maple | *Acer rubrum*

Habit

Size:	70' h x 30' w
Shape:	Oval, Upright
Crown:	Medium texture
Growth Rate:	Fast
Fall color:	● Red

Weaknesses

- Only moderately drought tolerance
- Poor salt / urban tolerant
- Girdling and surface roots

Tree Selection | *Criteria for Tree Selection*



Tree selection criteria were based on several factors, listed below, with a particular focus on the historical design intent and the long-term health and survivability of the trees in urban conditions.

HEALTH

- Drought Tolerance*
- Diseases & Pests
- Urban / Disturbance Tolerance
- Structural Vulnerability
- Climate Change Resilience

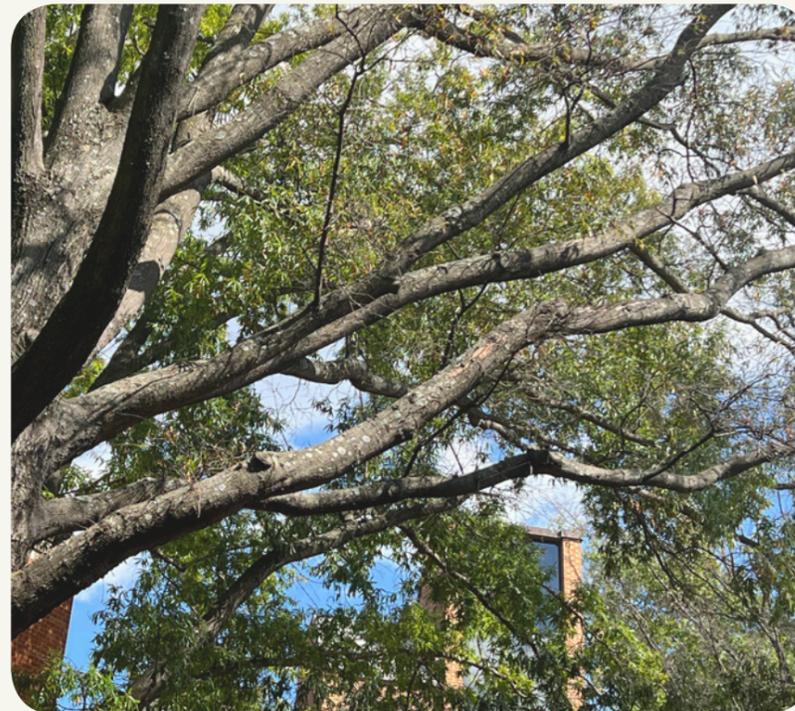
PHYSICAL ATTRIBUTES

- Form & Habit*
- Average lifespan*
- Fruit size / drop hazard*
- Growth Rate
- Leaf Size
- Fall Color

LOCALITY

- Regionally Native
- Pollinator & Habitat

* critical trait multiplier applied



Tree Selection | Selection Matrix

LATIN NAME	COMMON NAME	Form / Habit (x1.5)	Average lifespan (x1.5)	Fruit size/Drop(x1.25)	Drought Tolerance (x1.25)	Urban Tolerance	Disturbance Tolerance	Structural Vulnerability	Leaf Size	Diseases / Pests	Growth Rate	Climate Change Resilience	Pollinator Habitat	Fall Color	Regionally Native	OVERALL	
MALL TREES																	
Liriodendron tulipifera	Tulip poplar **	4.5	4.5	3.8	2.5	2	1	3	2	3	4	4	2	4	Y	Yellow	40
Quercus bicolor	Swamp white oak	4.5	6	2.5	3.8	4	3	4	2	3	3	2	4	3	Y	Yellow/Orange	45
Quercus phellos	Willow oak	4.5	3	5	3.8	4	3	3	4	4	4	4	4	2	Y	Yellow	48
Ulmus americana 'Jefferson'	Jefferson elm	6	4.5	3.8	3.8	4	2	2	3	4	4	4	3	4	Y	Yellow	48
CENTRAL PLACE TREES																	
Taxodium distichum	Baldcypress	3	4.5	3	3.8	3	3	4	4	4	3	4	2	3	Y	Orange/Brown	44



REJECTED SPECIES

Quercus stellata	Post oak	3	6	2	5	2	4	3	2.5	3	2	4	4	2	Y	Orange	43
Quercus palustris	Pin oak	4.5	3	5	2.5	2	1	4	3	3	3	2	4	3	Y	Yellow/Orange	40
Ulmus davidiana var. japonica 'Morton'	Morton Accolade elm	6	4.5	3.8	3.8	2	2	2	3	3	4	4	3	4	N	Yellow	45
Nyssa sylvatica	Black gum	4.5	4.5	3	3.8	2	4	3	3	3	3	4	1	3	Y	Orange/Red	42
Quercus alba	White oak	4.5	6	2	2.5	3	2	4	4	3	1	4	1	4	Y	Red	41
Quercus lyrata	Overcup oak	4.5	6	1	2.5	3	4	4	3	3	2	2	4	2	N	Red	41
Quercus nuttallii	Nuttall oak	3	3	3	3.8	4	3	3	3	3	3	3	4	3	N	Orange/Red	42
Quercus shumardii	Shumard oak	4.5	3	2	5	3	4	3	2	3	3	2	4	3	N	Red	42
Liquidambar styraciflua 'Hapdell'	Sweetgum	3.5	4.5	3	3.8	2	4	3	3	3	3	4	2	3	Y	Orange/Red	42
Metasequoia glyptostroboides '1042'	Palatial Dawn Redwood	4.5	6	3	3.8	4	3	4	4	4	3	4	1	3	N	Orange/Brown	47
Taxodium acendens	Pondcypress	3	4.5	3	3.8	3	3	4	4	4	3	4	1	3	N	Orange/Brown	43

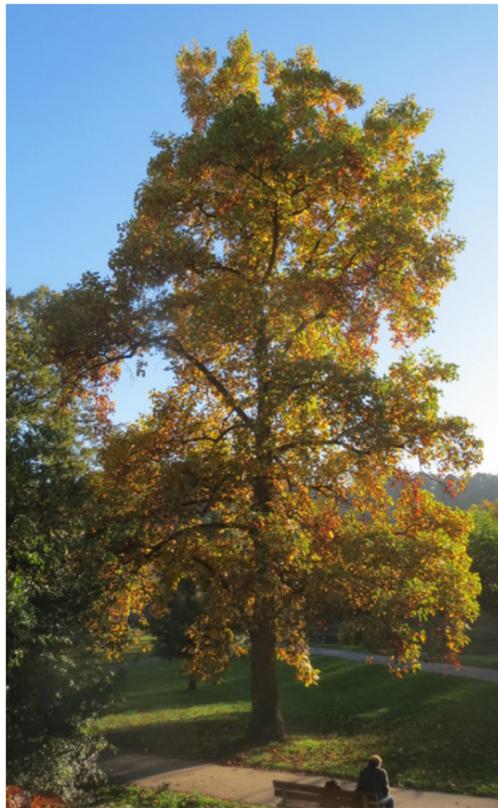
- Platanus x acerifolia London Plane
- Tilia americana American Linden
- Gymnocladus dioicus Kentucky coffeetree
- Quercus falcata Southern red oak

*This matrix represents the selection criteria, which is ranked by importance related to the context of Downtown Mall

**Tulip poplar may not be a candidate for individual replacement because of low urban & disturbance tolerance.

Tree Selection | Mall Trees

TULIP POPLAR *Liriodendron tulipifera*



Fall color: Yellow
 Size: 80' H x 40' W
 Shape: Oval, Columnar
 Growth Rate: Fast

Strengths

- Straight column-like leader

Weaknesses

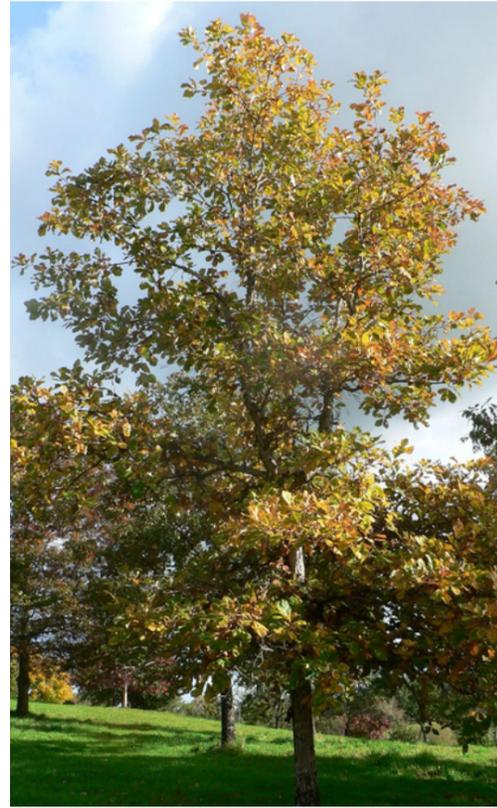
- Sensitive to root impacts
- Quick growth and large size can lead to limb failure with age; required pruning attention with age

Pest/Diseases:

- Minimal threats



SWAMP WHITE OAK *Quercus bicolor*



Fall color: Yellow
 Size: 60' H x 60' W
 Shape: Oval
 Growth Rate: Medium

Strengths

- Tolerant of heavy compaction and drought
- Strong structure with pruning
- Habitat tree for caterpillars/birds

Weaknesses

- Lower branches droop with age and will require pruning
- Medium acorn size (0.5-1")

Pest/Diseases:

- Susceptible to various minor pests like borers and caterpillars.
- Gypsy moth



JEFFERSON ELM *Ulmus americana 'Jefferson'*



Fall color: Copper - Yellow
 Size: 80' H x 60' W
 Shape: Vase-like
 Growth Rate: Fast

Strengths

- Tolerant to heavy compaction, drought
- Habitat tree for caterpillars/birds

Weaknesses

- Needs structural pruning to develop strong structure

Pest/Diseases:

- Asian Longhorned Beetle a concern if it spreads to Virginia
- Very good resistance to Dutch Elm Disease



WILLOW OAK
Quercus phellos



Fall color: Yellow
 Size: 60' H x 40' W
 Shape: Oval, low branching
 Growth Rate: Fast

Strengths

- Tolerant of heavy compaction, drought
- Habitat tree for caterpillars/birds

Weaknesses

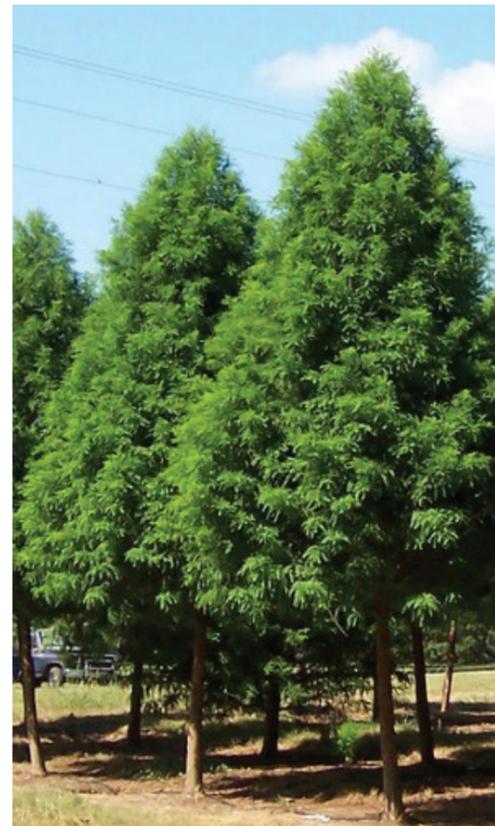
- Short lived (80 - 100 years)
- Large size and dense branching can lead to major limb failure with age; possibility for structural hazard

Pest/Diseases:

- Risk of bacterial leaf scorch, oak wilt
- Minimal lethal threats



BALD CYPRESS
Taxodium distichum 'Autumn Gold'



Fall color: Orange - Brown
 Size: 70' H x 30' W
 Shape: Oval, pyramidal
 Growth Rate: Moderate

Strengths

- Long-lived (~300 yrs)
- Branches are highly resistant to breakage
- Adaptable to extreme soil conditions

Weaknesses

- Deeper taproot can make transplanting difficult

Pest/Diseases:

- Susceptible to various minor pests like beetles, fungus, mites and blight.





APPENDIX D
ANALYSIS: UNIQUE CONDITIONS & Side Streets

Unique Conditions & Side Streets | Location Summary

The unique conditions and side streets, primarily designed after the Halprin plan, present a diverse range of challenges that will require tailored design solutions specific to each condition.

Unique Conditions

Oaks at Omni Hotel

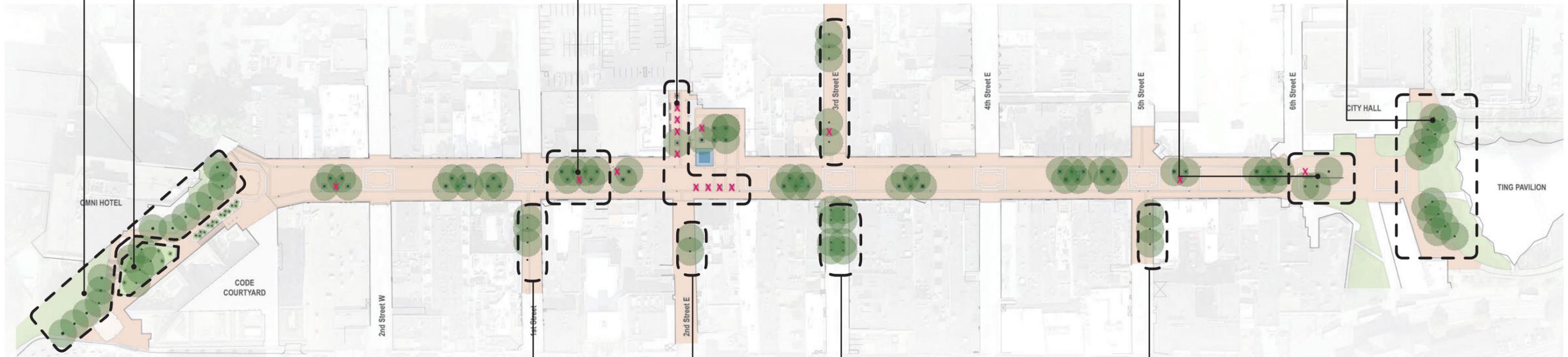
Code Building planter

7 Tree grove

Central Place trees

Oaks at Ting Pavilion

Oaks at Freedom of Speech Wall



1st Street

2nd Street E

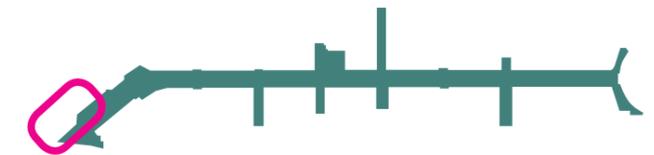
3rd Street E

5th Street E

Side Streets

Unique Conditions | Oaks at Omni Hotel

KEY PLAN: Omni Hotel



OAKS AT OMNI HOTEL

As a primary entrance corridor, planting with seasonally vibrant low shrubs and perennials would be a notable improvement. Amending the soils with compost and low pressure compressed air to decompact the surface will aide both the existing trees and future planting viability.

Due to canopy competition, select trees are recommended for removal to aide the remaining trees with better light and nutrient access for longer lifespans.



CANOPY CROWDING

- Selectively prune and thin trees to reduce crown competition and building conflicts
- Trees are generally healthy

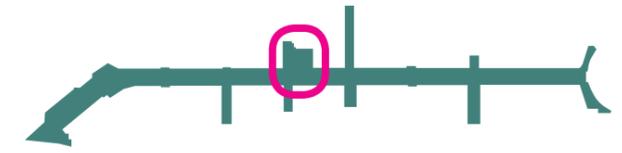


POOR SOIL CONDITIONS

- Apply mulch or chips to exposed soils reducing compaction / improve nutrient holding

Unique Conditions | Central Place Trees

KEY PLAN: Central Place



CENTRAL PLACE TREES

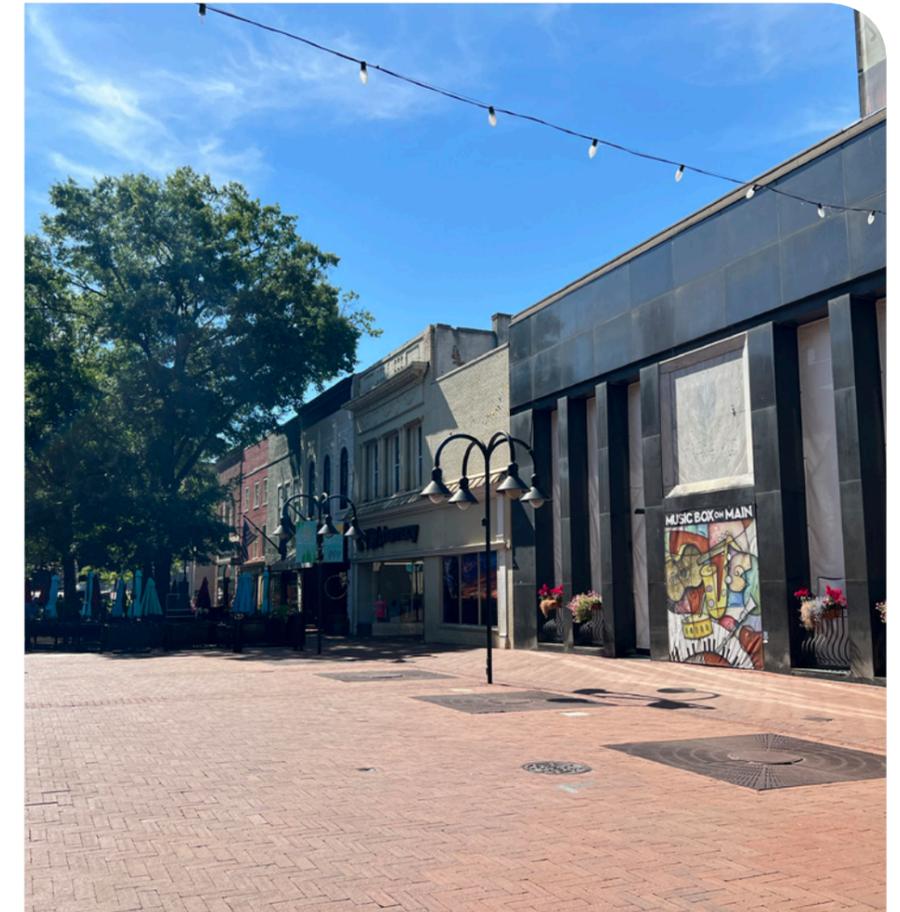
Soil testing in the lower beds near the incomplete Landmark Hotel revealed slightly saturated soil conditions that may be the result of being a natural low spot along the mall, a lack of drainage infrastructure or lack of trees (or a combination of all three). Heavy compaction of adjacent subgrade soils outside of the open planter grate zone was also observed.

Improving upon both of these conditions for future trees, increasing available uncompacted soil volume for future root growth and planter drainage are key improvements. Maples are not recommended for a replacement species due to their inability to tolerate urban conditions.



LIMITED SOIL VOLUME

- Minimal soil volume between building foundation soils and step footers
- Planted maples have limited urban adaptability and lead to high mortality



SATURATED SOILS

- No drainage infrastructure and location has led to higher saturated soil levels

Unique Conditions | CODE Building Planter

KEY PLAN: CODE Planter



CODE BUILDING PLANTER

Soil testing in this bed revealed saturated soil conditions and excessive nutrients resulting from manure based compost in the recently installed soil mix.

The drainage is due to both no internal planter drainage outlet as well as a soil mix that utilized screened clay as a base component. When clay soils maintain their naturally forming peds (clumps), it allows for air and water to migrate within the soil between those peds. When screened or over-manipulated, the pore space is removed, causing the fine clay particles to restrict air and water movement.

Short Term: Modify Planting

- Adjust trees, shrubs and groundcovers with wetland and shade tolerant species
ex. Sweetgum, bald cypress, winterberry holly

Long Term: Replace Soils, Improve Drainage

- Replace poor draining, screen soils with unscreened planting soils and provide internal planter drainage



POOR SOIL QUALITY

- Screened clay soil limits air and gas exchange
- Manure based fertilizers lead to high weed presence



SATURATED SOILS

- Lacking pore space, the soils are unable to drain, leading to high plant mortality
- No drainage infrastructure

Unique Conditions

Freedom of Speech Wall Oaks

KEY PLAN: Freedom of Speech Wall



OVERALL CONDITIONS

- Trees are generally healthy



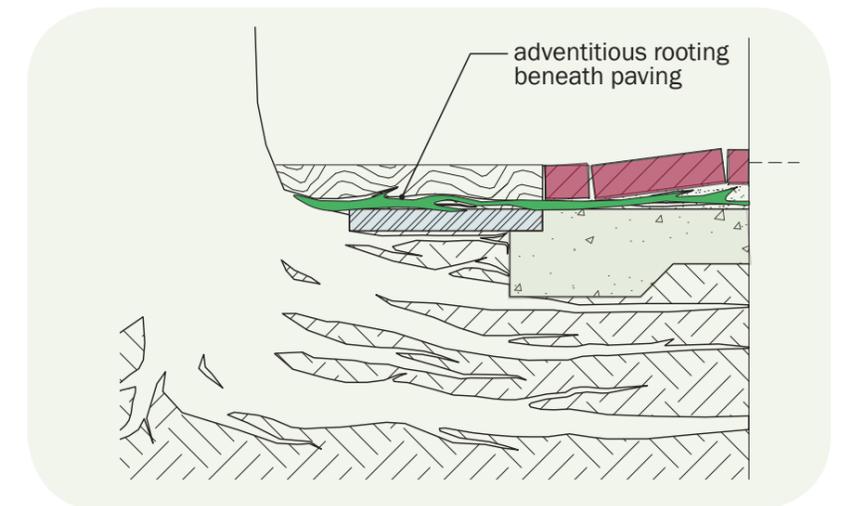
GRATE CONFLICTS

- Surface roots between slab and pavers leading to trip hazards
- Hidden steel paver grate girdling trees

FREEDOM OF SPEECH WALL OAKS

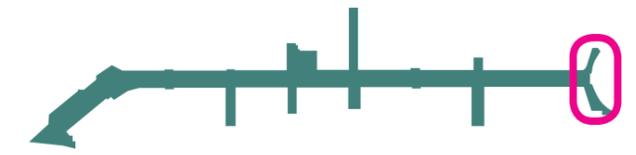
Surface and feeder roots were observed moving into the sand setting bed between the adjacent pavers and concrete subslab. One tree in this grove has been removed and is not recommended for replacement due to existing canopy competition that would compete with the existing trees.

A hidden paver grate system, consistent with nearby installations, is assumed and suggested for removal. Pruning of surface roots and the installation of a root barrier at the end of the planter will prevent future root/paver conflicts.



Unique Conditions | Oaks at Ting Pavilion

KEY PLAN: Ting Pavilion



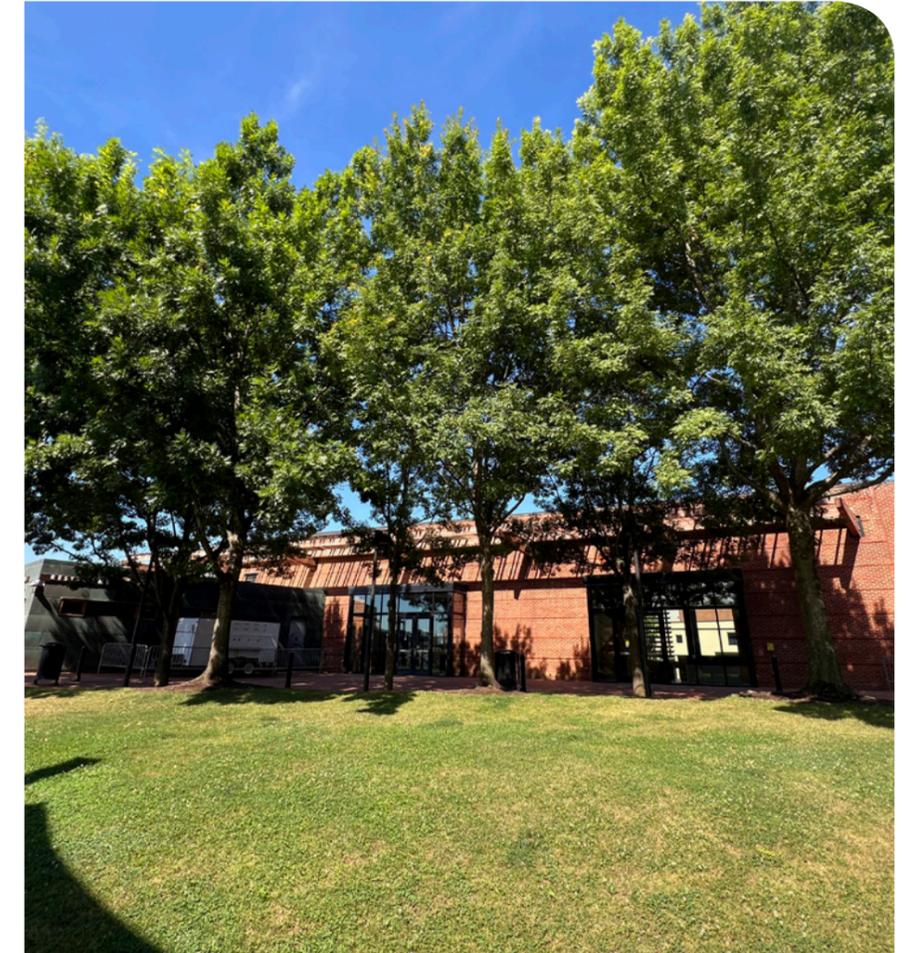
COMPACTED/POOR SOILS

- Heavy surface compaction from events limits water infiltration into soils
- Existing soils have poor nutrient holding capacity leading to greater water stress during droughts. Mulch root zones within lawn areas to better maintain soil moisture.



GRATE CONFLICTS

- Steel substructure frame supporting pavers and grates are girdling trunks limiting water and nutrient exchange

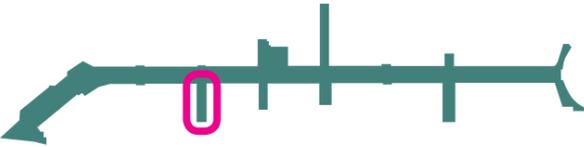


CANOPY CROWDING

- Selectively prune & remove designated trees to reduce crown competition

Side Streets | 1st Street South

KEY PLAN: 1st Street South



TREE PLANTERS

This section of 1st Street, the pedestrian portion limited to the south side of the Mall, has limited access to available soil volume for the narrow strip of planted trees. The mix of trees planted, namely the ginkgos, are well suited to these conditions for the time being. They will become more stunted over time as they reach the extents of available soil volume. The lush shrub planting in addition to the trees is successful at creating vegetated views to and from the Mall.

While there are opportunities to rethink the circulation and better utilize the space, without a comprehensive redesign effort and investment, this area will continue to operate primarily as a semi-vegetated pass through.



OPEN PLANTERS

- Narrow open planters between 1st St and a lower access path offer lush vegetated views while partially screening views of nearby parking lots

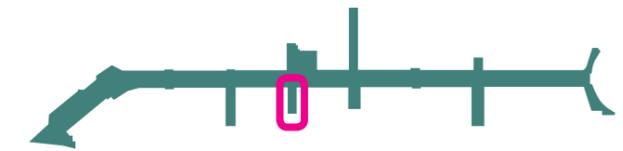


LIMITED SOIL VOLUMES

- Currently healthy, as the ginkgos grow within their contained planters, their health and growth will likely be stunted by limited soil volume

Side Streets | 2nd Street Southeast

KEY PLAN: 2nd Street Southeast



TREE CONDITIONS

The replacement maple cultivars from 2009 have largely failed with ten out of the twelve planted dead or near dead. Outside of the ~5' tree grate zone, the soils are heavily compacted creating a limited available soil volume. While some urban trees are adapted to difficult soils, maples regularly fail in compacted soils.

Increasing the available uncompacted soil volume through suspended paving systems is the main priority in this area. Selecting replacement trees outside of the proposed Mall tree species provides an opportunity for greater resiliency and species diversity.

While the slope of these side streets, available storefronts and emergency access limits opportunities for dedicated planted and pedestrian spaces, this is a critical entrance corridor onto the Mall and high priority for improvements.



Proposed uncompacted soil zone beneath paving

LIMITED SOIL VOLUME

- The maples along 2nd St SE are in poor health and decline due to limited uncompacted soil volume



GRATE CONFLICTS

- Tree grates and their substructure frame have created trunk girdling conditions and bark wounding

Side Streets | 3rd Street Southeast

KEY PLAN: 3rd Street Southeast



SOIL CONDITIONS

Despite limited uncompacted soil volume, ginkgos are adept at succeeding in compacted urban conditions and these are in good condition. The exposed soil they are in has surface compaction and is partially planted in groundcovers.

To improve the trees and viability of planting soil to sustain groundcovers, it is proposed to decompact the surface soils 5' from the trunks and blend in compost with compressed air.

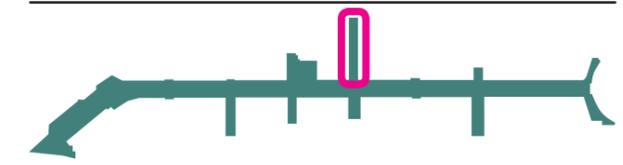


COMPACTED SOILS AND UNSUCCESSFUL GROUND COVER

- The Ginkgos along 3rd Street E (South) are currently in good health
- The trees would benefit from soil remediation and mulch

Side Streets | 3rd Street Northeast

KEY PLAN: 3rd Street Northeast



CONFINED PLANTING

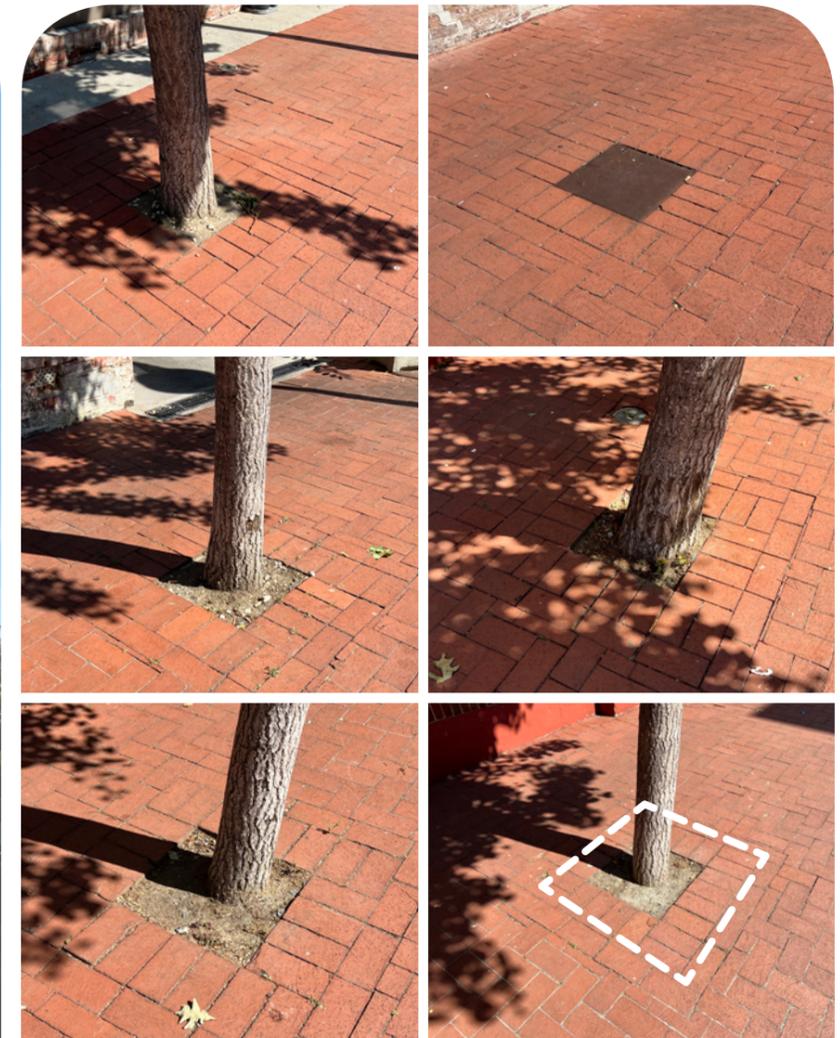
Despite limited uncompacted soil volume, ginkgos are adept at succeeding in compacted urban conditions and, apart from one removal, these are in good condition. Consistent with the other 2009 tree installations, a hidden paver grate system is assumed and beginning to girdle the remaining trees.

To improve the planting soils surrounding the trees, prevent trunk girdling by narrow paver openings, and increase vegetated views off the Mall, it is proposed to remove the paver grates and study opportunities that would increase low shrub and/or perennial plantings within these areas. Include rat barrier wire mesh 6" below the surface of new planting soil and mulch.



CONFINED LOCATION

- The Ginkgos along 3rd Street E (North) are planted very close to the buildings, resulting in an asymmetrical canopy.



SOIL COMPACTION

- Growth appears to be stunted due to limited access to soil and soil compaction

Side Streets | 5th Street Southeast

KEY PLAN: 5th Street Southeast



LIMITED CONDITION

The ginkgos have reached the limits of their planted condition within a likely paver grate system leading to further health decline without making improvements at the base of the trees.

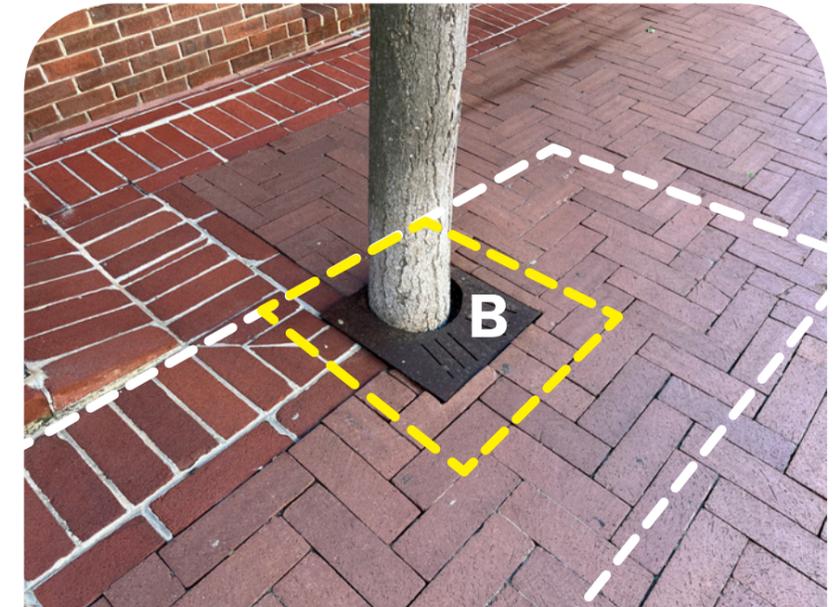
The grate can be partially removed from each of the trees to prevent trunk girdling or, could be studied as an opportunity to be converted to an open planter condition or part of a more comprehensive side street redesign. If proceeding with expanded planters, incorporate a rat barrier wire mesh 6" below the surface of new planting soil and mulch.

At minimum, the metal collars girdling the trees are recommended for more immediate removal.



LIMITED SOIL VOLUME

- The close proximity of tree plantings to structures, such as stairs and ramps, restricts the trees' access to soil



GRATE CONFLICTS

- Trees along 5th St SE have trunk damage due to grate conflicts. At minimum, provide expansion of hidden grate opening (yellow).



APPENDIX E

ANALYSIS: HISTORICAL CONTEXT

Historical Context

The Downtown Mall is a nationally significant designed landscape by Lawrence Halprin (b.1916–d.2009).

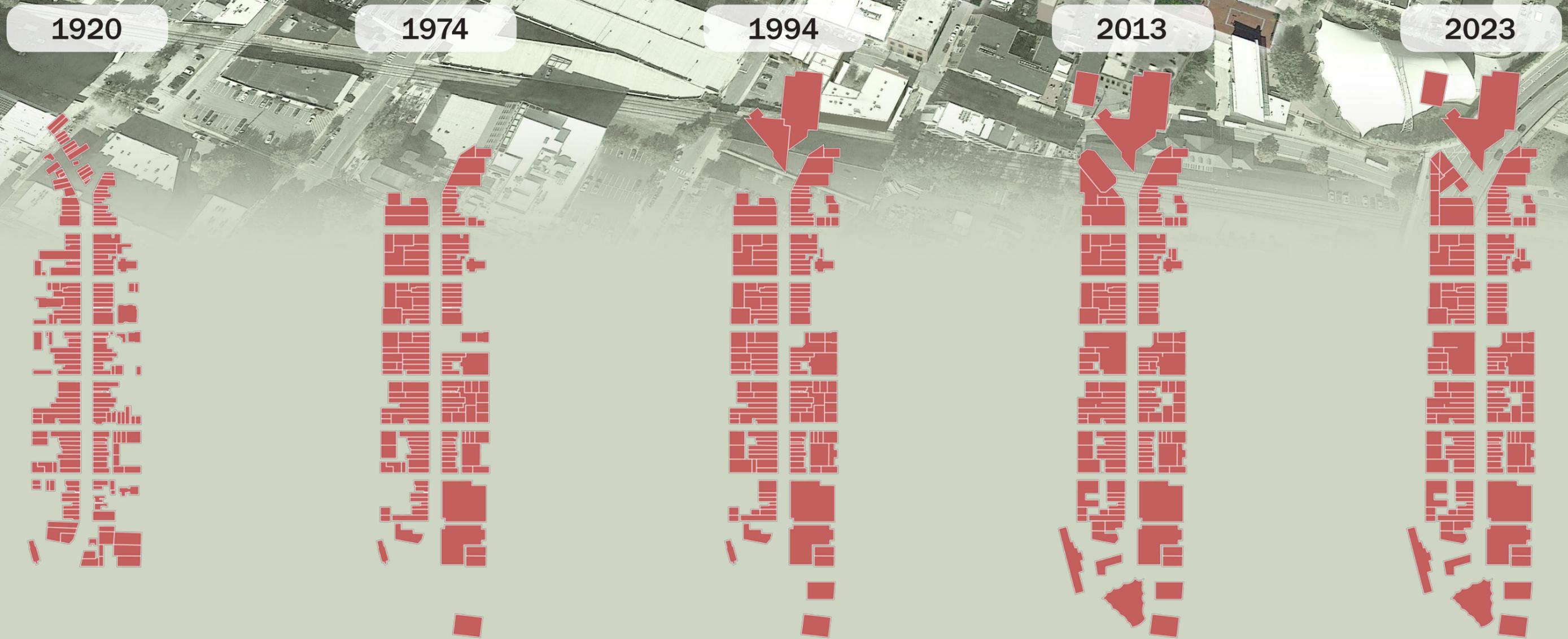
The Mall is a prime example of the renowned landscape architect's modernist-era designs that reshaped the urban public realm during the 1960s and 70s. The Mall represents the only remaining work by Lawrence Halprin in the state of Virginia, and his only pedestrian mall. In fact, the Charlottesville Mall remains one of few surviving pedestrian malls built during the years of urban renewal, a period when pedestrianization emerged as a theme among planners and policy makers to restore vitality and social life to downtown centers.

As the Downtown Mall approaches 50-years old, it is on the precipice of eligibility for nomination to the National Register of Historic Places, as well as the Historic American Landscapes Survey (HALS). The Mall is without doubt an important local, state, and national cultural landscape. We recognize the willow oak groves are a contributing feature to the Mall's integrity and significance, and the need for a thoughtful, practical and sensitive Tree Management Plan cannot be understated.

Project Scope & Limits of Work



History of Building Development

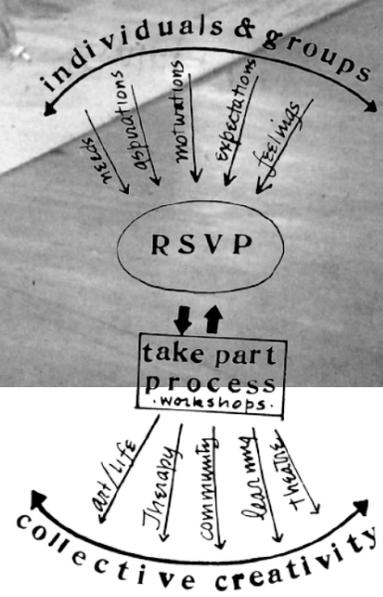
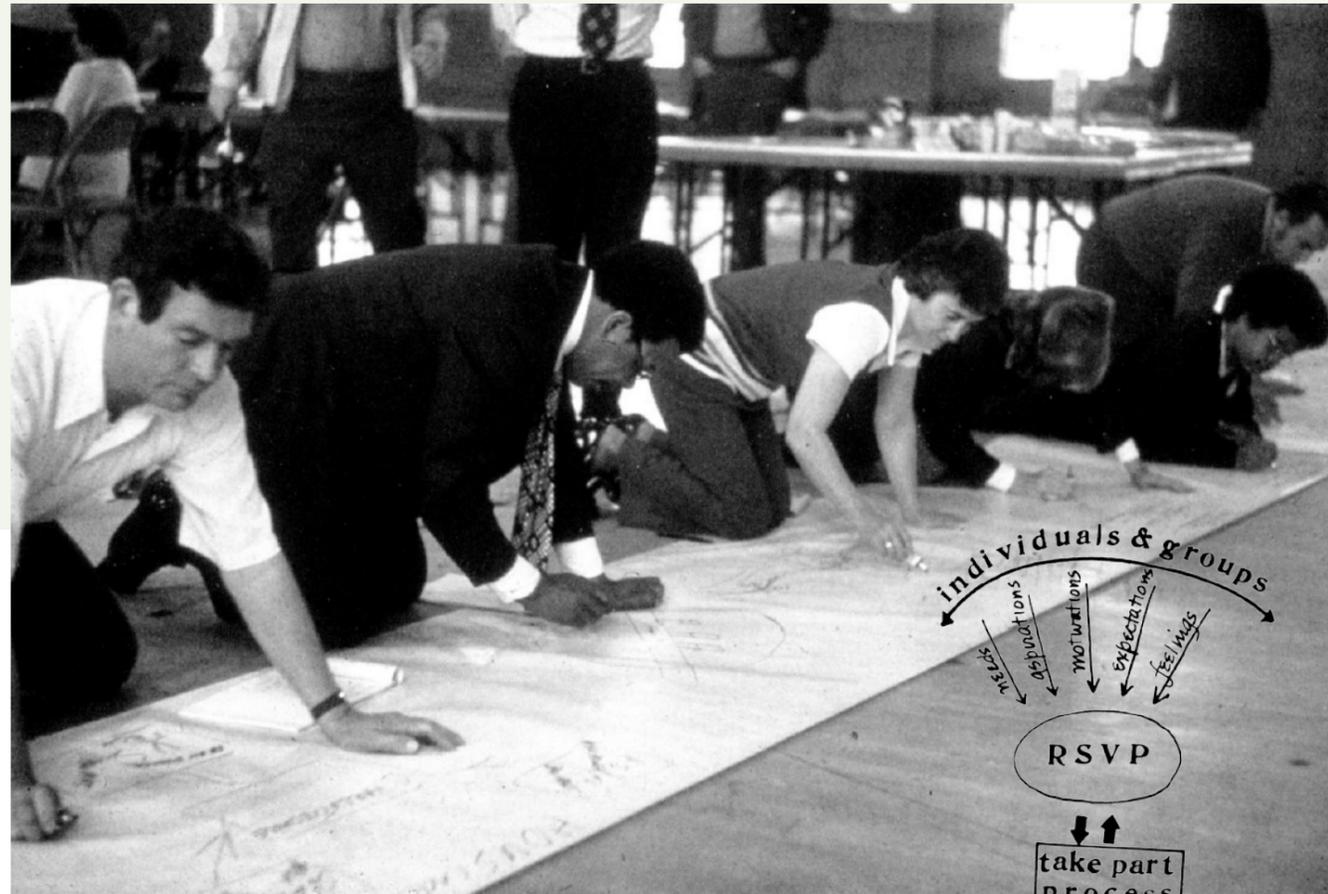


1 Lawrence Halprin and Participatory design

The original design process by Lawrence Halprin and Associates included participatory design workshops to gather feedback from the community.

TAKE PART WORKSHOPS - RSVP CYCLES

Goal was fostering a mutual foundation through shared experience, by way of building an awareness for one's environmental and social context



Participants

- | | |
|------------------------|---------------------|
| Gene Arrington | Thomas Mitchell |
| Charles Barbour | Robert Ponton |
| Raymond Bell | Harry Porter |
| Drewary Brown | Jill Rinehart |
| Leroy Bruton | Dan Rooker |
| Virginia Carrington | Ginny Schatz |
| Alvin Clements | Richard E. Shutz |
| Francis Fife | Cammora Snowden |
| Carroll A. Gardner Jr. | Darden Towe |
| George Gilliam | Myron E. Tremain |
| J.T. Grave | Mitchell Van Yahres |
| Cole Hendrix | H.H. Walker |
| Norma Hill | Bernard Whitsett |
| Martha Hogshire | Harmon Williams |
| Kitty Landes | Mary Williams |
| Bill Leggett | Ed Wilson |

1

Decline of Main Street and the impacts of Urban Renewal

1930s - 1940s Decline from Great Depression

1949 Launch of the Federal Urban Renewal Program

1950s - 1960s U.S. 250 Bypass and Interstate 64 make suburbs more convenient

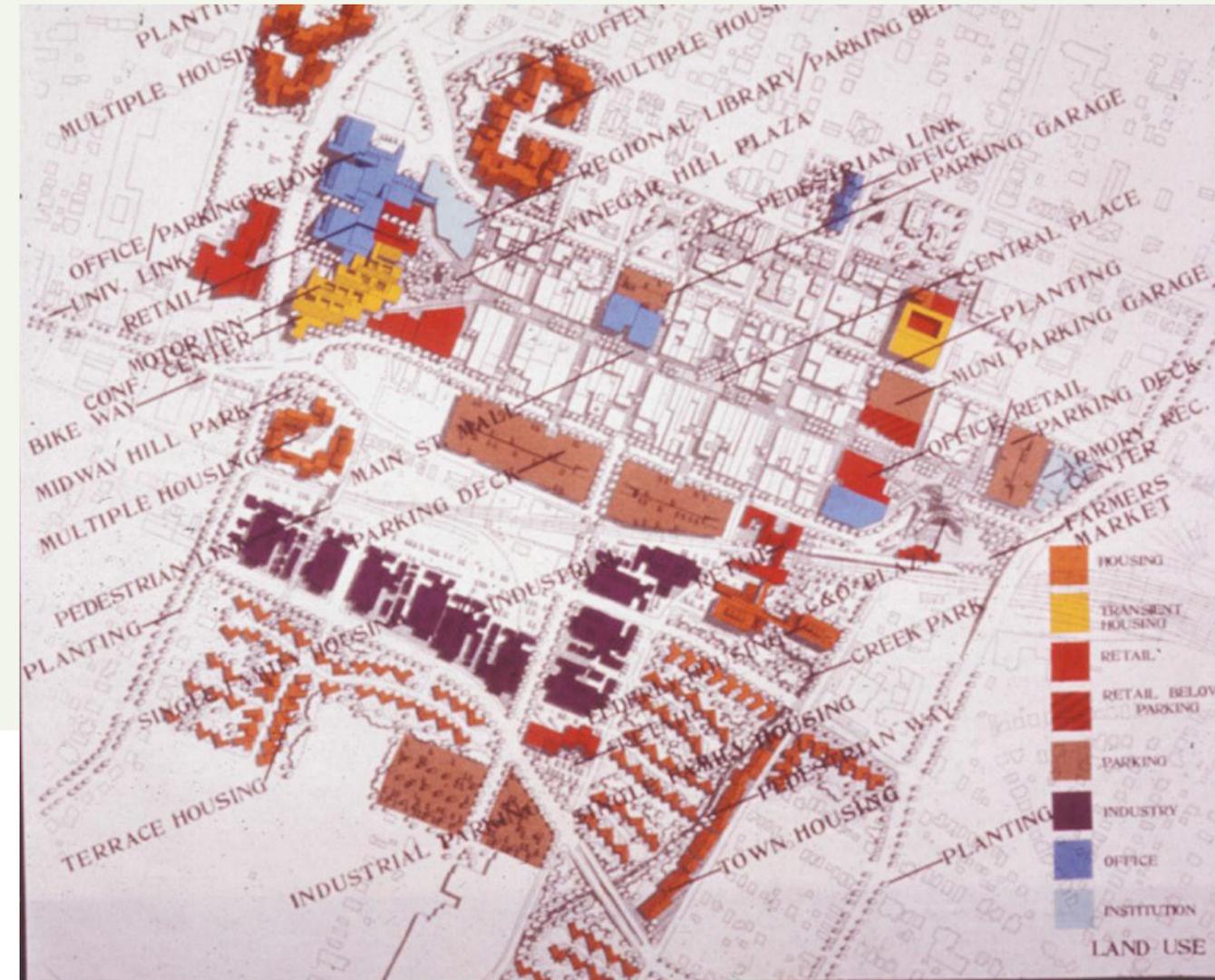
1956 Charlottesville Housing and Redevelopment Authority hires *Harland Bartholomew and Associates* to develop a report on housing, land-use, and zoning (the *CBD Plan*)

> Leads to clearing of downtown areas, including Vinegar Hill, and the idea of a pedestrian mall in the heart of downtown

1971 City planner Thomas Conger and City Council align on critique of *HB&A's* unsound *CBD Plan*

> Joe Bosserman, dean of UVA's Architecture School, recommends engaging *Lawrence Halprin & Associates (LH&A)*

1972 Not without opposition, City Council commissions *LH&A* to create a new Mall / CBD plan for the city



Lawrence Halprin & Associates, 1973 Central Business District (CBD) Plan

2

Lawrence Halprin (b.1916-d.2009)
and the work of a master



Halprin pioneered participatory design and mastered the ability to integrate the needs and experiences of people with artful, environmentally sensitive, and ecologically associative design. He built consensus in urban public environments in the 1960s and 70s when communities struggled for civil rights.

2 Lawrence Halprin and the significance of the Mall



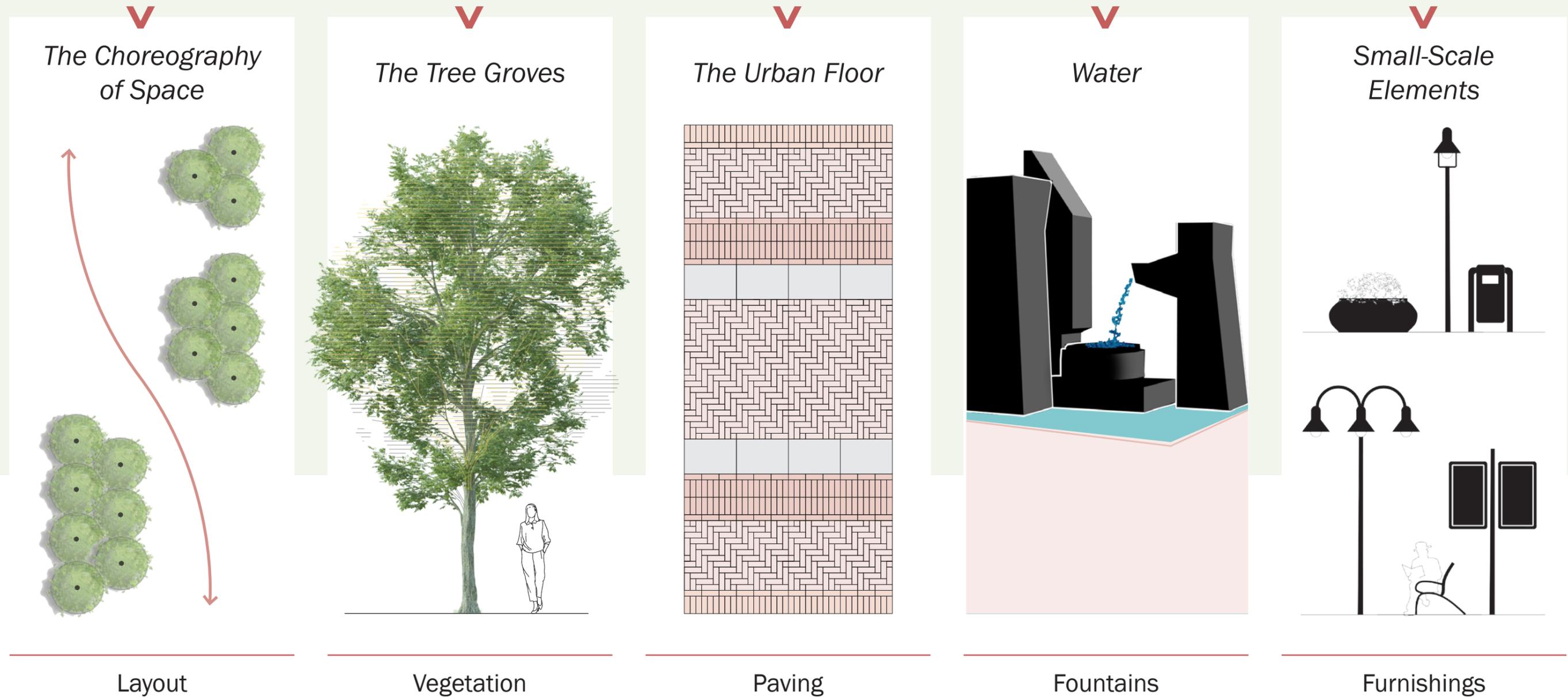
▼
The Downtown Mall is a nationally significant designed landscape by renowned landscape architect Lawrence Halprin.

▼
The Downtown Mall represents Halprin's only remaining work in Virginia and his only existing pedestrian mall.

▼
The Downtown Mall is recognized on the National Register of Historic Places for its association with an event significant to the broad patterns of our history, and as a representative example of design innovation and high artistic value.

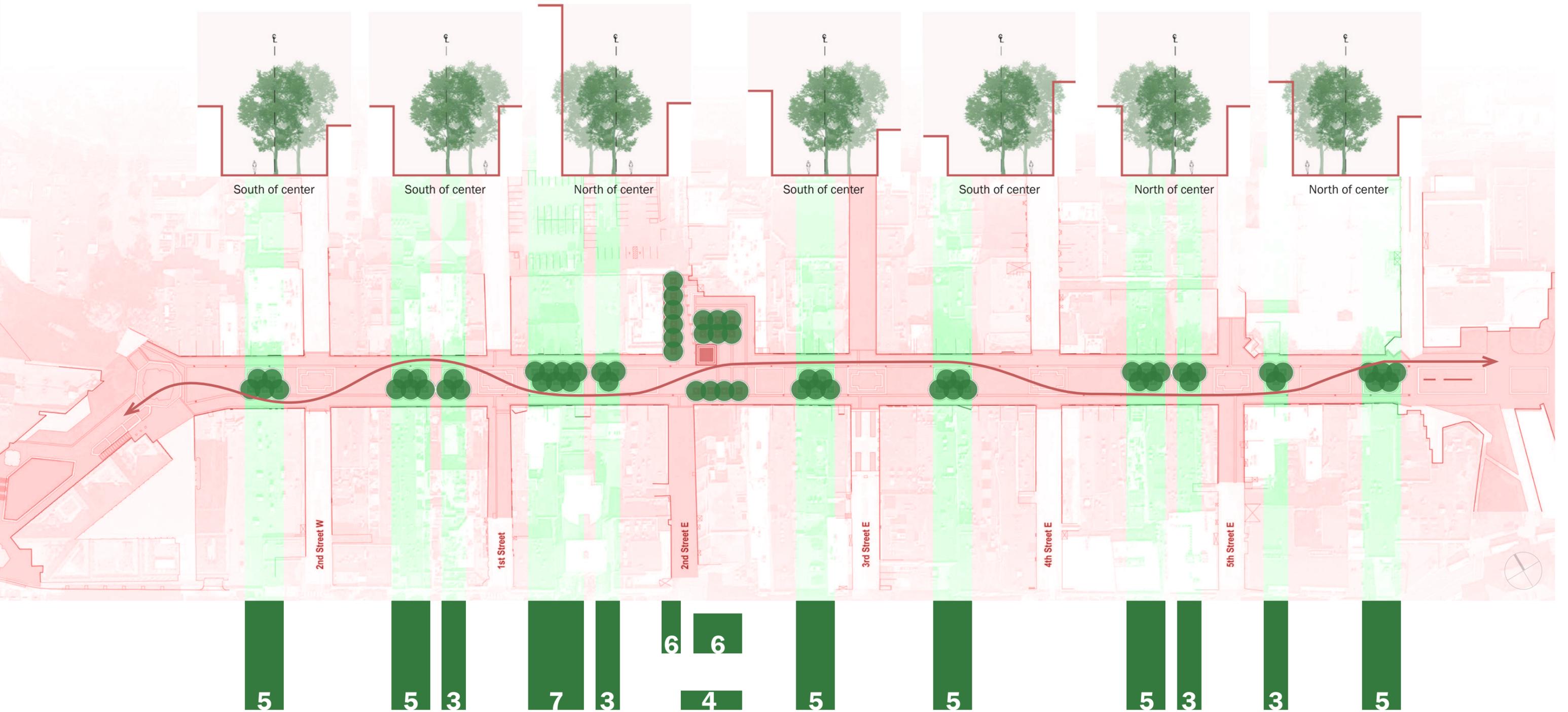
3 The character-defining features of the Design of the Mall

The character of the Mall is defined by five key features.

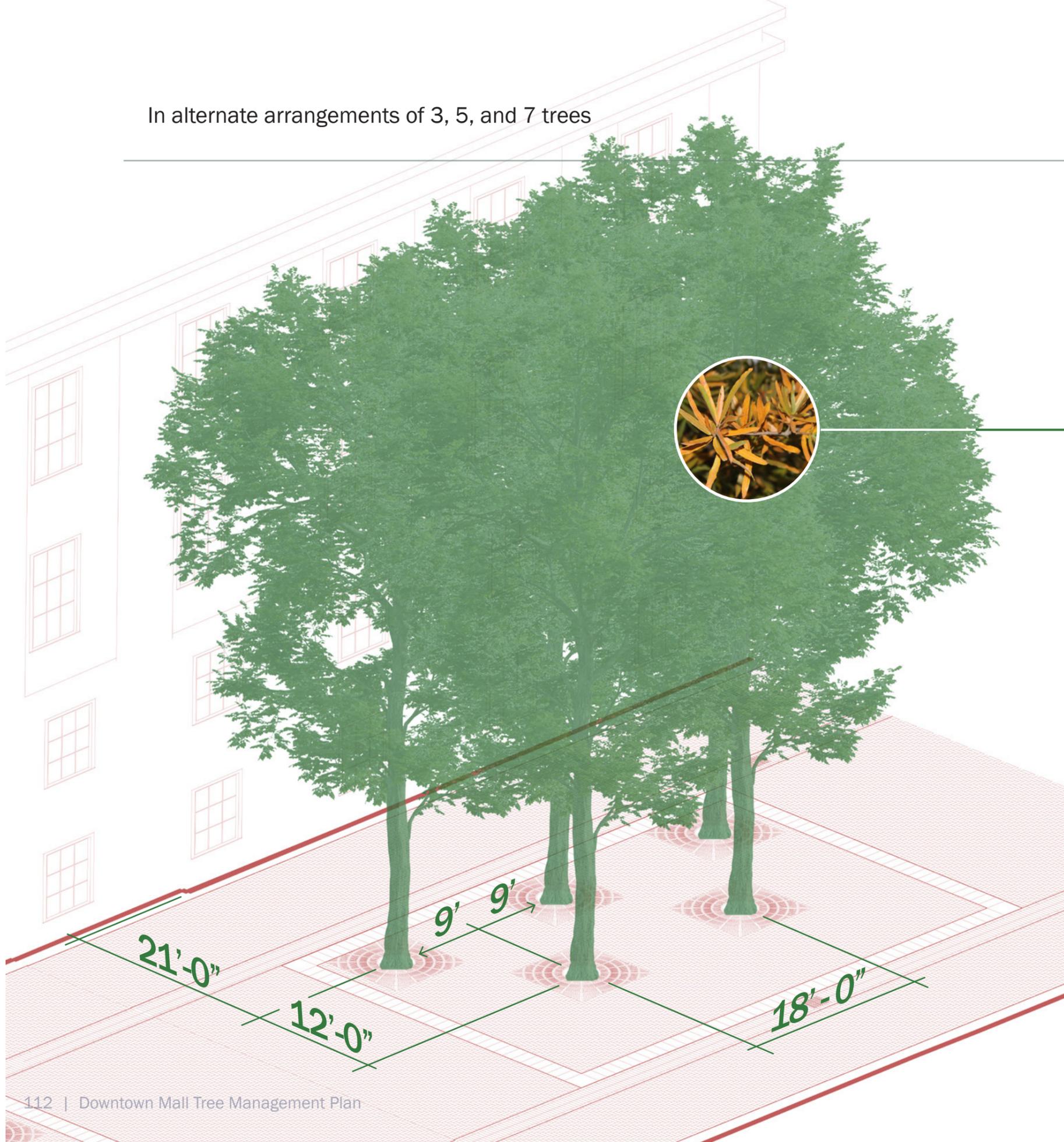


The Choreography of Space

Inspired by dance choreography, Halprin and Associates positioned tree groves to promote dynamic movement and enhance pedestrian engagement.



In alternate arrangements of 3, 5, and 7 trees



Willow oak | *Quercus phellos*



Habit

Size:	75' h x 50' w
Shape:	Oval, (Pyramidal in youth)
Crown:	Dense
Growth Rate:	Fast
Fall color:	● Yellow - Copper

Strengths

- High drought tolerance
- No serious pests or diseases
- Generally urban tolerant
- No serious surface roots

Weaknesses

- Dense canopy / branching

The Urban Floor

A simple palette of clay brick pavers and granite borders, arranged in various patterns, defines the urban floor. The different patterns are clear visual signals to indicate runnels, building thresholds, and the tree groves.

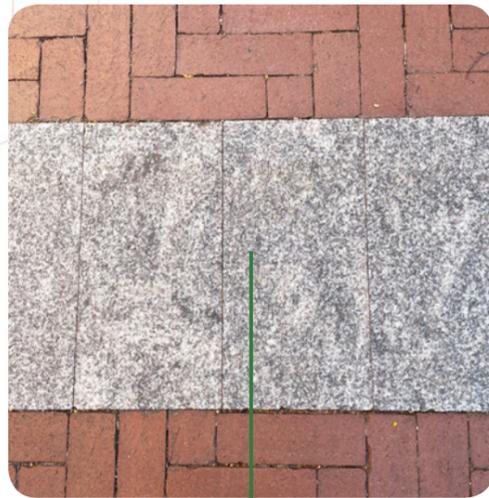
Runnels



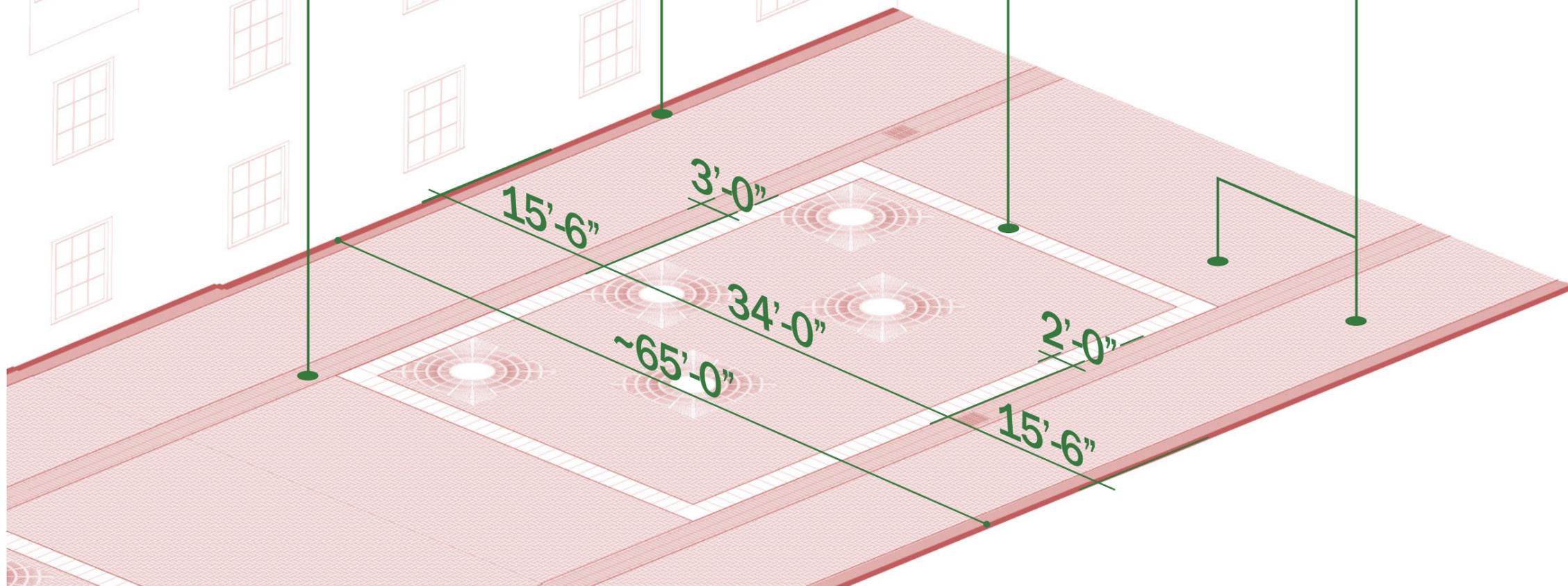
Building Thresholds



Granite Borders



4"x12" Brick Herringbone



16"x16" Tree Opening*



*Original Halprin design

8' x 8' Tree Grate



*Current design

Water

Large cascading Central Place Fountain then and now



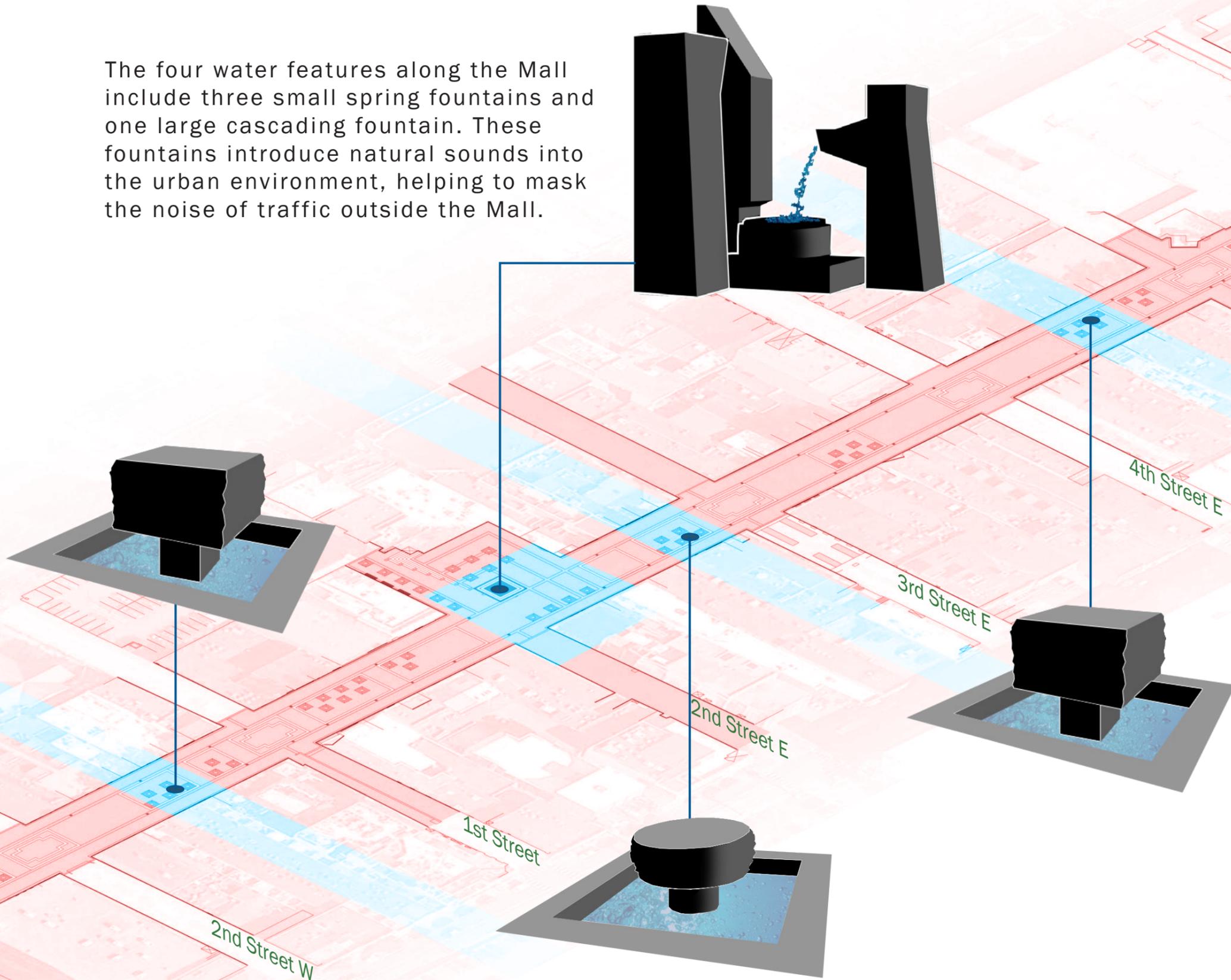
Clear access and legibility of the fountain plaza landscape



Private amenities restrict circulation and contribute to visual incongruity

Water

The four water features along the Mall include three small spring fountains and one large cascading fountain. These fountains introduce natural sounds into the urban environment, helping to mask the noise of traffic outside the Mall.



Historic: Public access to fountains



Current: Fountains gated or blocked off

Small Scale Elements

Furnishing then and now

Originally, public seating was scattered throughout the tree groves. Over time, however, much of this seating has been replaced with private seating areas. While private seating now dominates, particularly around the tree groves, the presence of business patrons remains crucial to the Mall's success.



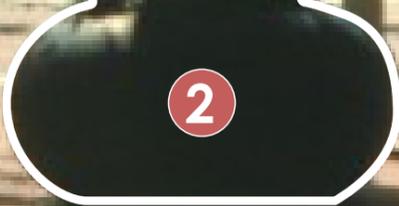
Groupings of single chairs emphasize the public nature of trees and various seating preferences of users



Cafe zones generate economic revenue but declare the trees as private

Small Scale Elements

Custom designs by Halprin and Associates



1 Pedestrian Lights

4-headed pendulous;
enameled steel

*37 locations between
tree groves*

2 Planter Pots

Oblate spheroid shape;
three sizes; cast iron

71 existing planters

3 Bollards

38”h x 12”dia; cast iron

*26 bollards of 46 original
remain at intersections*

4 Chairs

Painted steel frame;
wood slats

*31 non-original exist;
150 planned for in 1974*

5 Tree Lights

Post top; enameled steel

55 locations within groves

Charlottesville Downtown Mall
TREE MANAGEMENT PLAN
RECOMMENDATIONS + APPENDICES 2024

