

A Demand-Driven, Multi-Objective Approach to Allocate Urban Ecosystem Services from 10,000 Trees

Supplement 2 — Optimization plan presented to and implemented by the City of Durham

**Recommendations for
Maximizing the Benefits of
Tree Planting in Durham, NC**

February 7th, 2018

These recommendations were prepared by Arik Tashie, a grantee of the Oak Ridge Institute for Science and Education, and Laura Jackson, PhD. The opinions expressed herein do not reflect the view of the Environmental Protection Agency or the United States Government.

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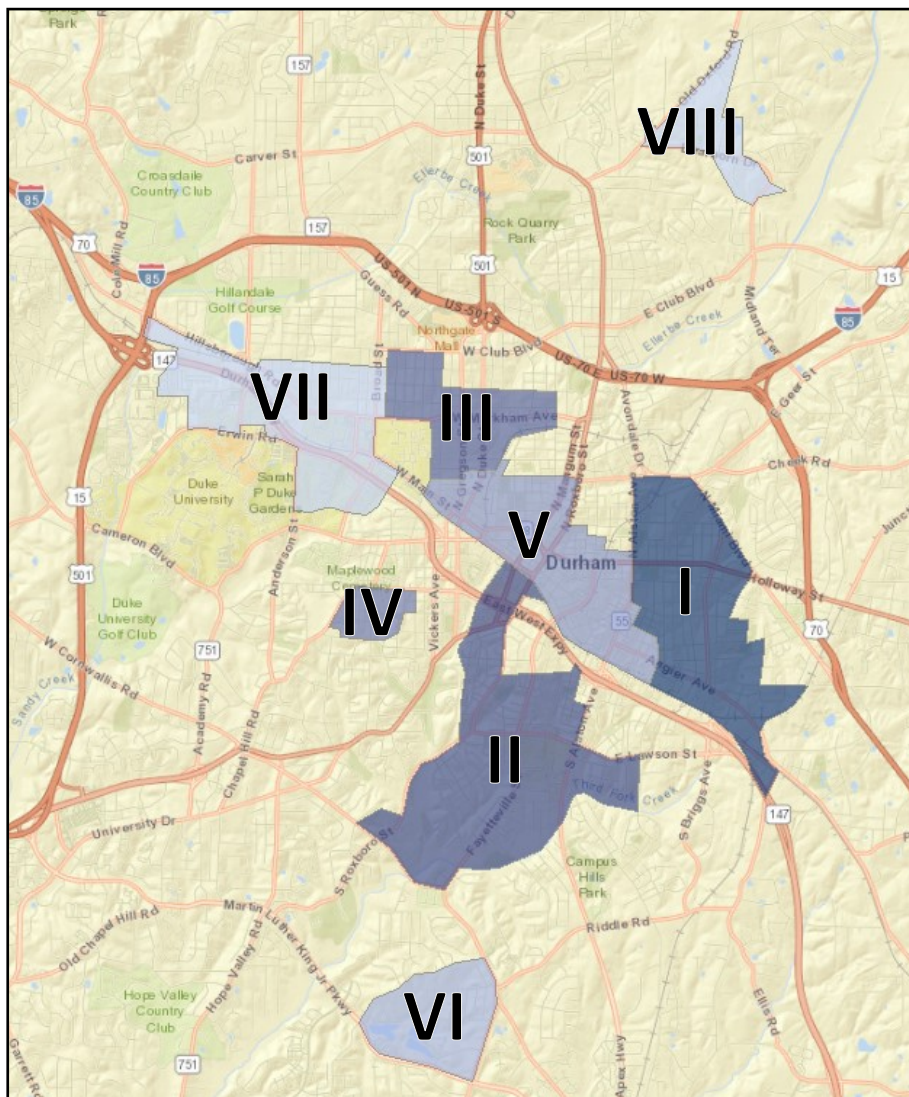
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Maximizing the Benefits of Tree Planting

Part One: Prioritizing Neighborhoods

Eight neighborhood groups in Durham, NC, were identified as high-priority targets for tree planting (below figure). These neighborhoods were selected and ranked according to the estimated benefits potentially generated by the planting of new trees along street rights-of-way.

Potential benefits were estimated according to three socioeconomic goals: improving walkability along sidewalks and neighborhood streets, reducing air pollution from car traffic, and targeting benefits to disadvantaged or vulnerable populations. Calculations were performed using data available from the US Census Bureau, the City and County of Durham geospatial data portal, and high-resolution (1-meter) landcover and landcover-derived products developed for the city of Durham by EnviroAtlas, a research group with the Environmental Protection Agency.



Priority Neighborhoods

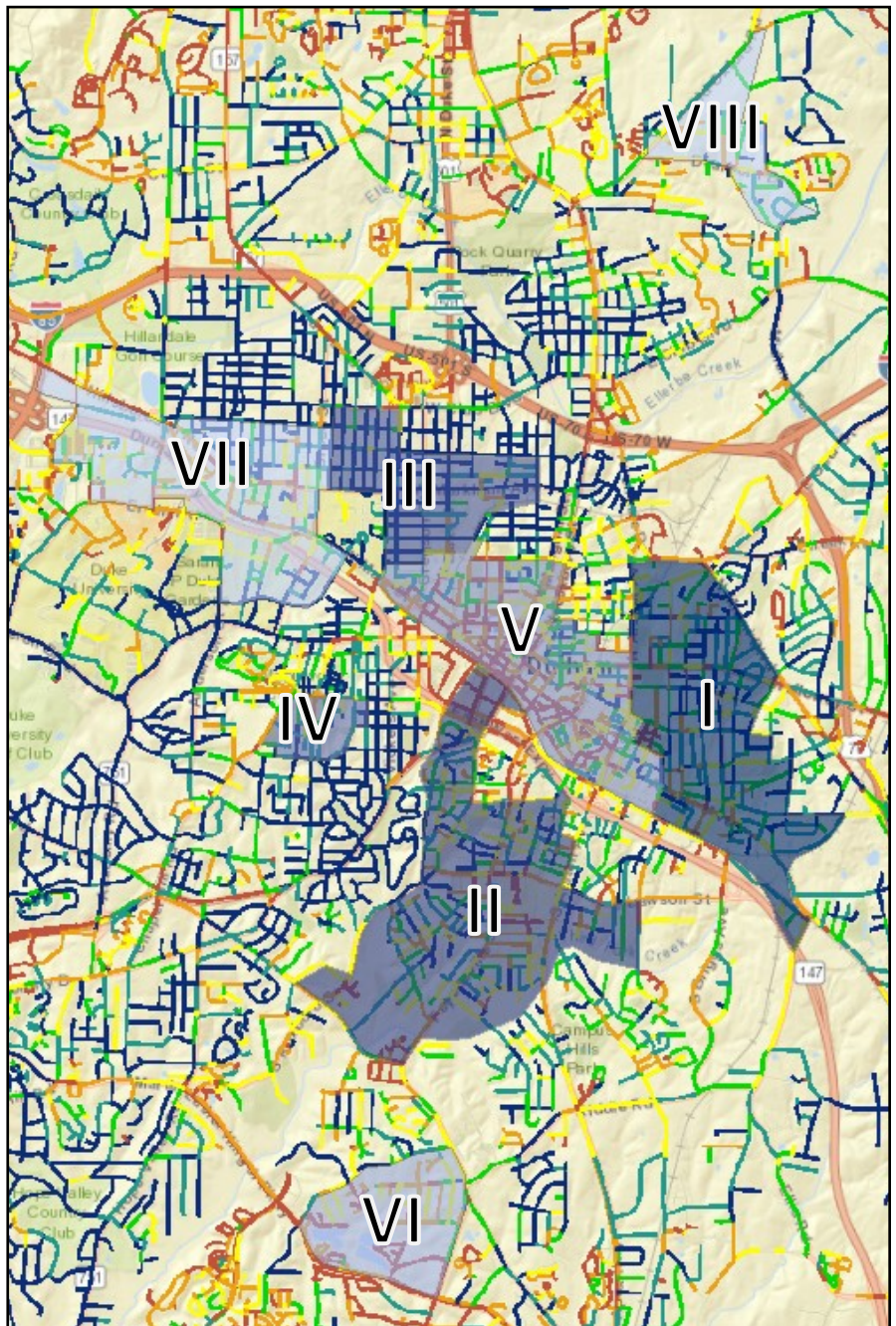
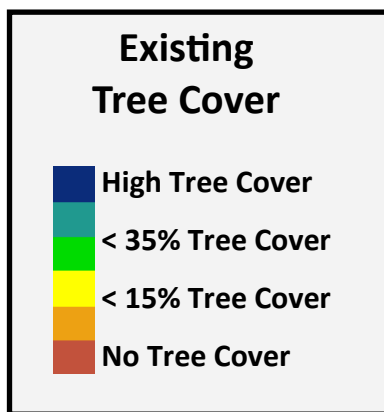
- I Old East
Durham
- II Southside / Col-
lege View
- III Walltown
- IV Lyon Park
- V Downtown
- VI Stratford Lakes
- VII Old West
Durham
- VIII Weaver

Maximizing the Benefits of Tree Planting

Part Two: Targeting Specific Roadways

Specific roadways within these neighborhoods were highlighted for planting according to a two-part process. First, walkable roads with inadequate tree cover were identified using EnviroAtlas data* which estimates the percent tree cover within 7.5 meters of each street edge (figure below - Estimated Percent Tree Cover Along Walkable Roads). We include in our review all streets for which there is less than 35% tree cover, though relatively bare street lengths (highlighted red or orange) should be prioritized over streets for which some tree cover does already exist (highlighted green and yellow).

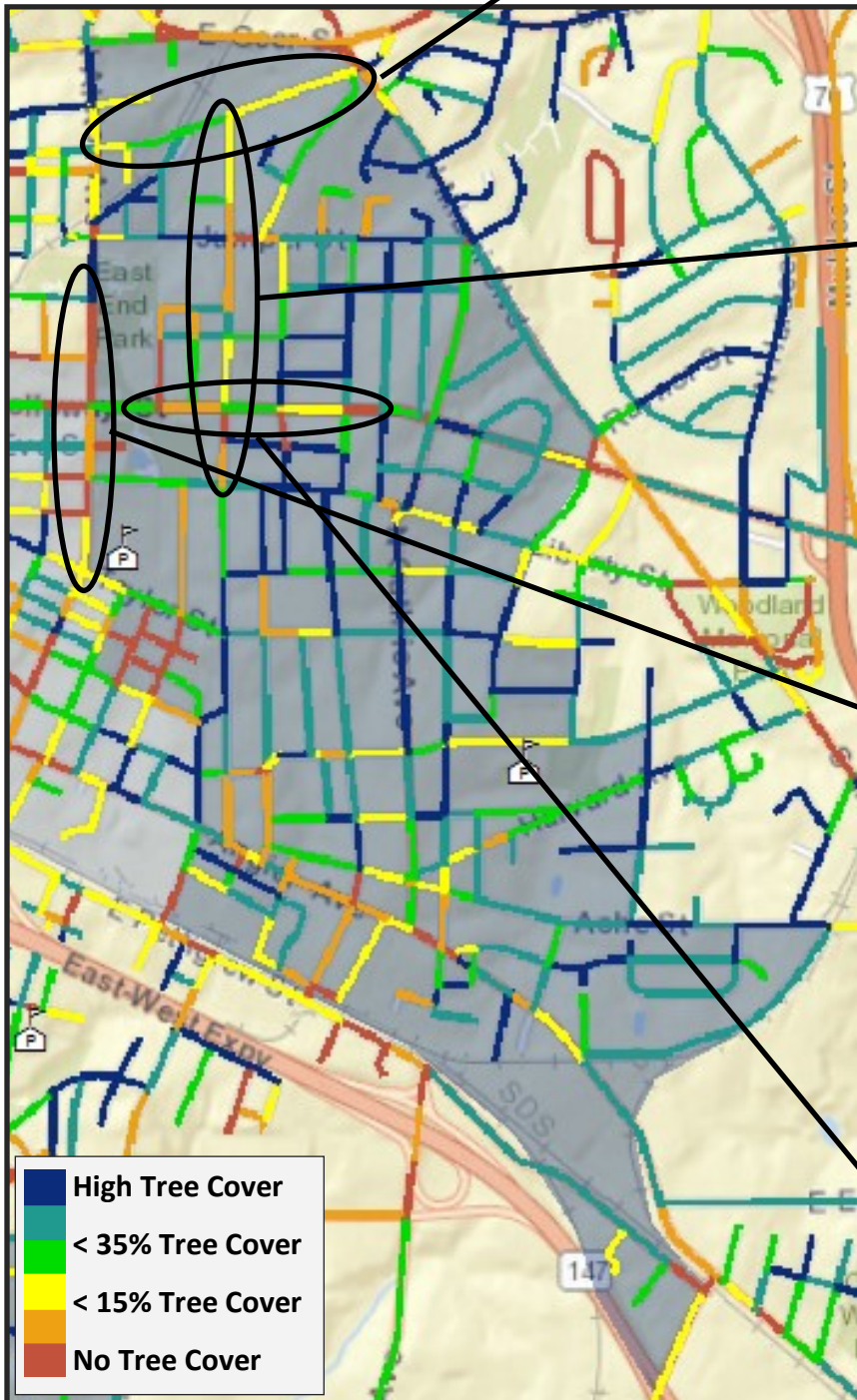
We verified these results using Google Street View imagery. Roadways where existing infrastructure makes tree planting obviously impractical were eliminated, as were roadways where recent tree-planting efforts were apparent. Lengths of roadway amenable to tree planting in target neighborhoods are detailed in the following pages, alongside a representative image of the roadway taken from Google Street View.



*EnviroAtlas data can be viewed or downloaded via the interactive map: <https://enviroatlas.epa.gov/enviroatlas/interactivemap/#>

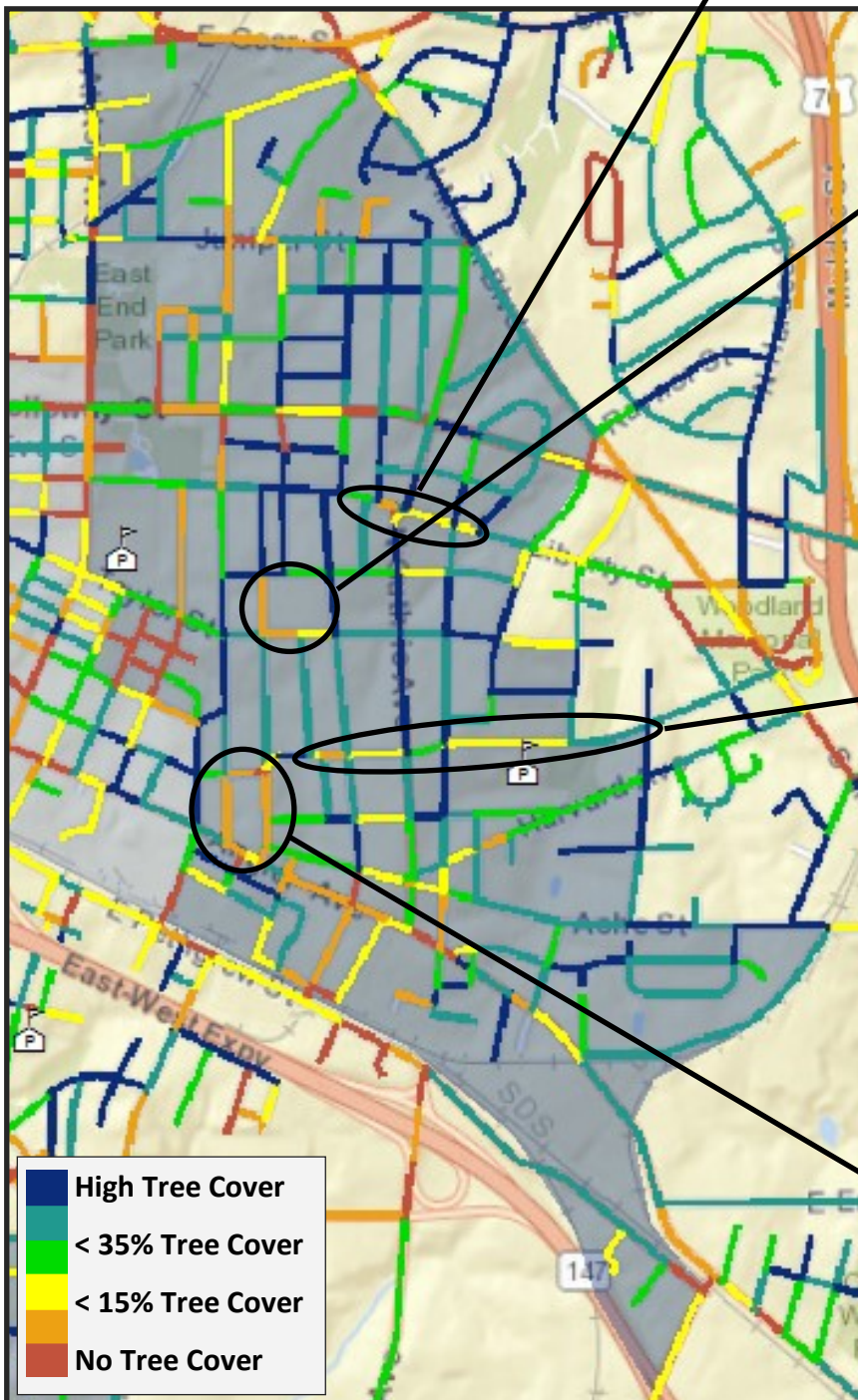
I. Old East Durham

1. Drew St (S Alston Ave to N Miami Blvd)
2. N Hyde Park Ave (Drew St to Liberty St)
3. S Alston Ave (Mallard Ave to Taylor St)
4. Holloway St (Calvin St to Park Ave)



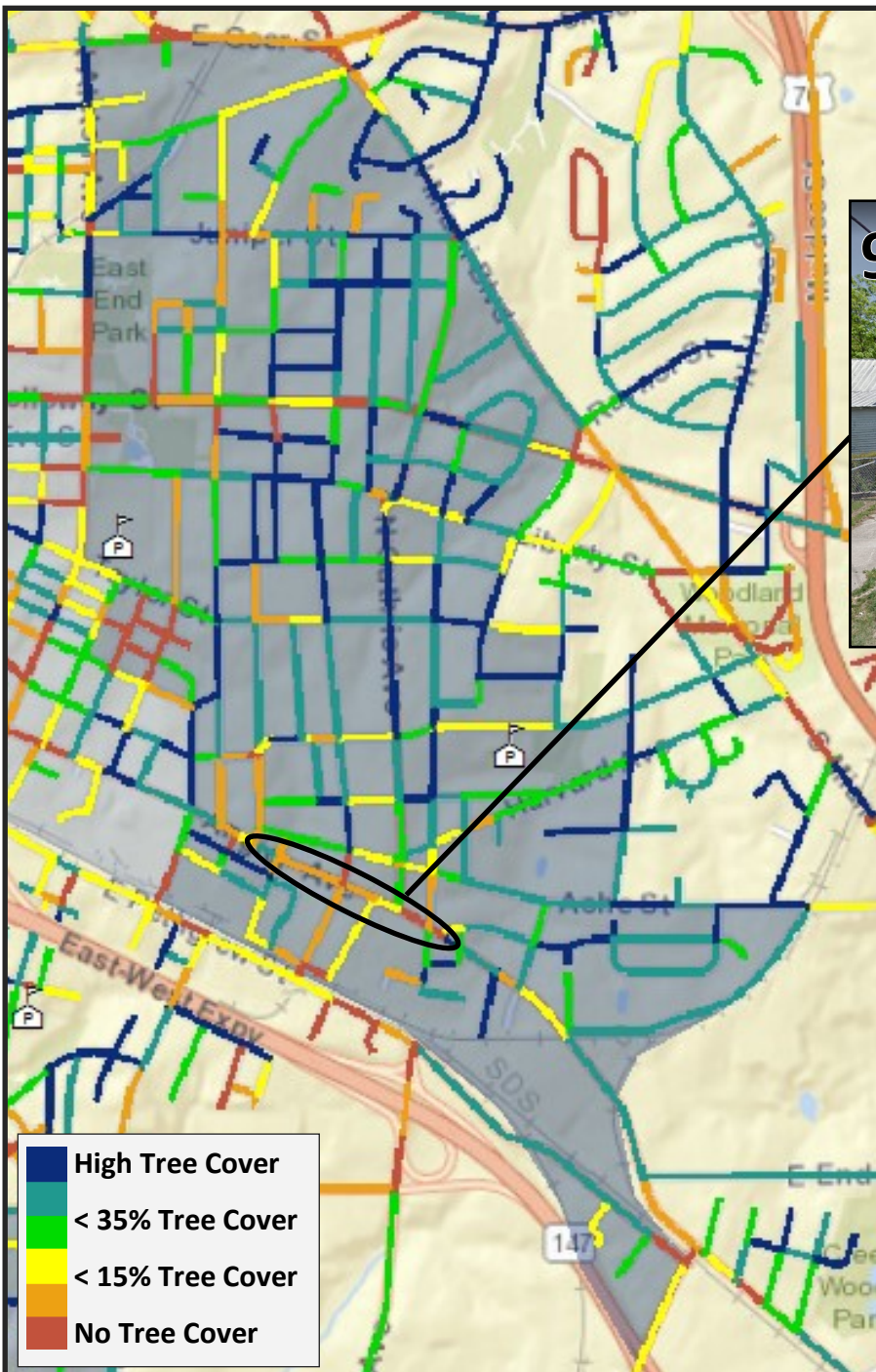
I. Old East Durham (cont)

5. Liberty St (N DriverSt to Brye St)
6. Corner of Taylor St and N Maple St
7. E Main St (Roberson St to S Benjamine St)
8. Block at Angier and S Hyde Park Ave



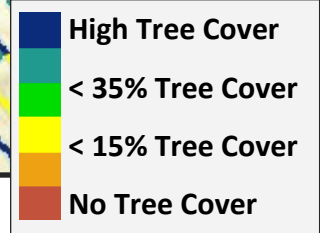
I. Old East Durham (cont)

9. Angier Ave (S Maple St to Owen St)



II. Southside and College View

1. Blackwell St
2. S Roxboro St (Hwy 147 to Chestnut St)
3. W Enterprise St (ATC to S Roxboro St)
4. E Umstead St



5



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High Tree Cover
< 35% Tree Cover
< 15% Tree Cover
No Tree Cover



II. Southside and College View (cont)

9. Formosa Ave

10. S Alston Ave (Cox Ave to Burlington Ave)

11. Block at Truman St and Lakeland St

12. Lincoln St



13



14



15



16



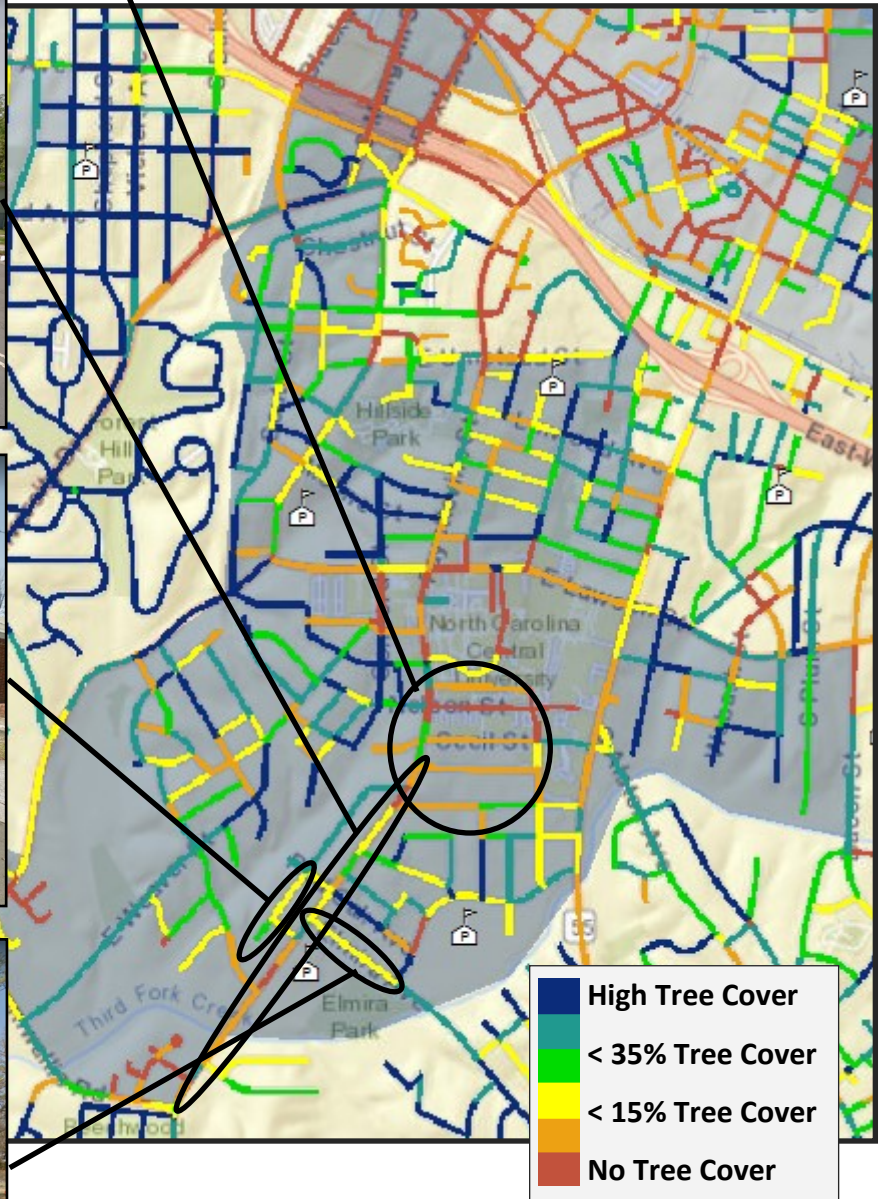
II. Southside and College View (cont)

13. George St, Nelson St, Cecil St, Martha St, & Burlington Ave

14. Fayetteville St (Martha St to E Cornwallis Rd)

15. Atlantic St (Utah Ave to Red Oak Ave)

16. Elmira Ave (Fayetteville St to Dakota St)





II. Southside and College View (cont)

17. Hwy 147

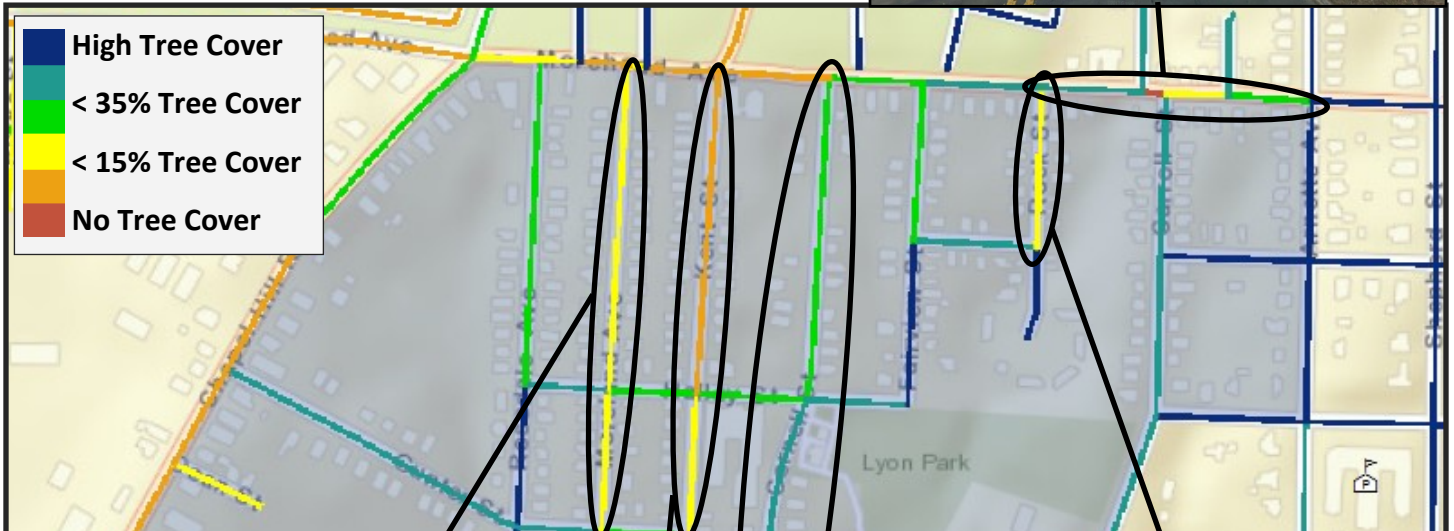
18. Charles St

19. S Roxboro St (W Cornwallis Rd to Summit St)



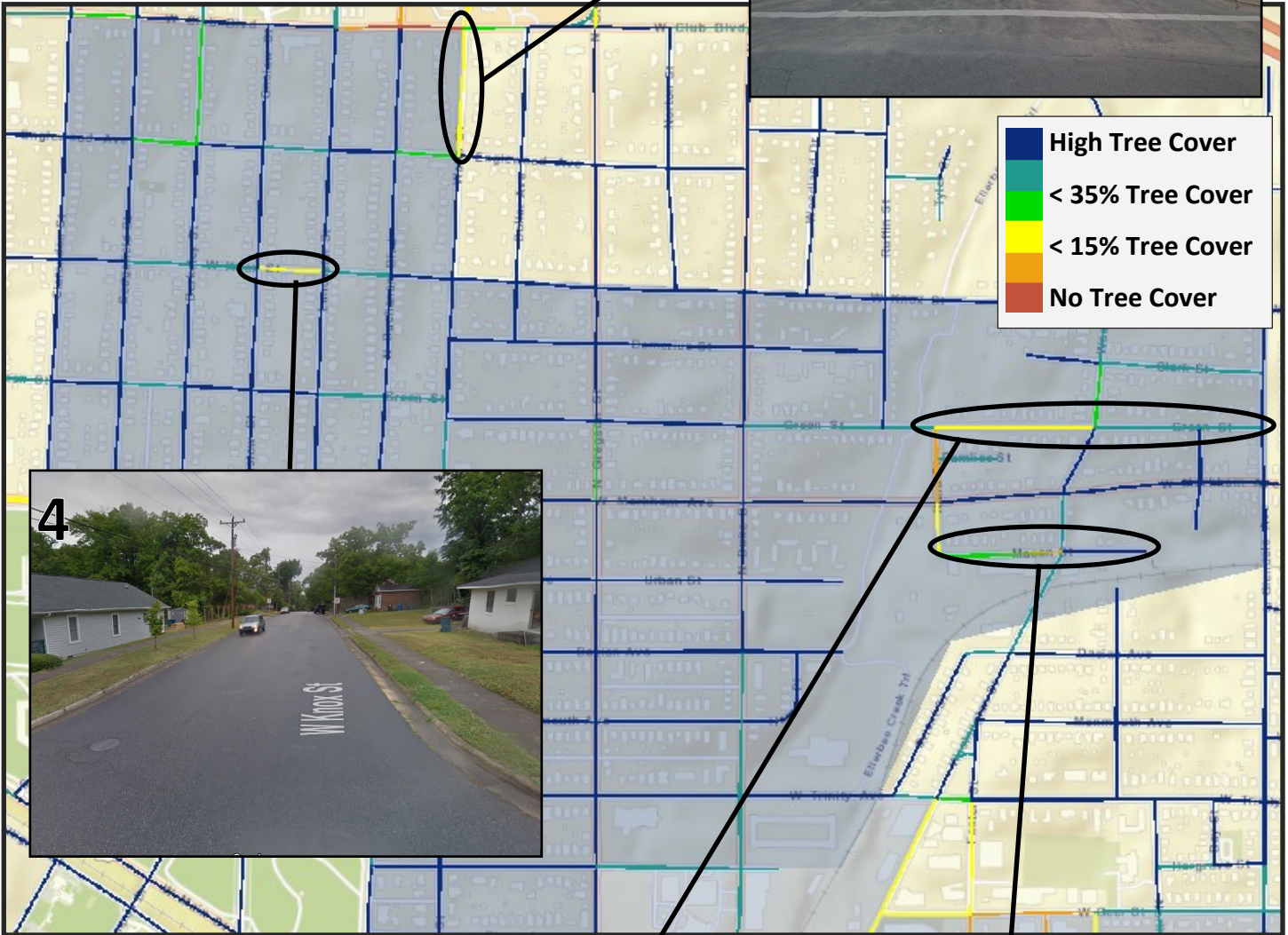
III. Lyon Park

1. Morehead Ave (Rock St to Arnette Ave)
2. Rock St
3. Cornell St
4. Kent St (Morehead Ave to Gunter St)
5. Morehead Ave



IV. Walltown

1. Watts St (W Club Blvd to Englewood Ave)
2. Macon St
3. Green St (Ruffin St to Glendale Ave)
4. W Knox St (Onslow St to Lancaster St)



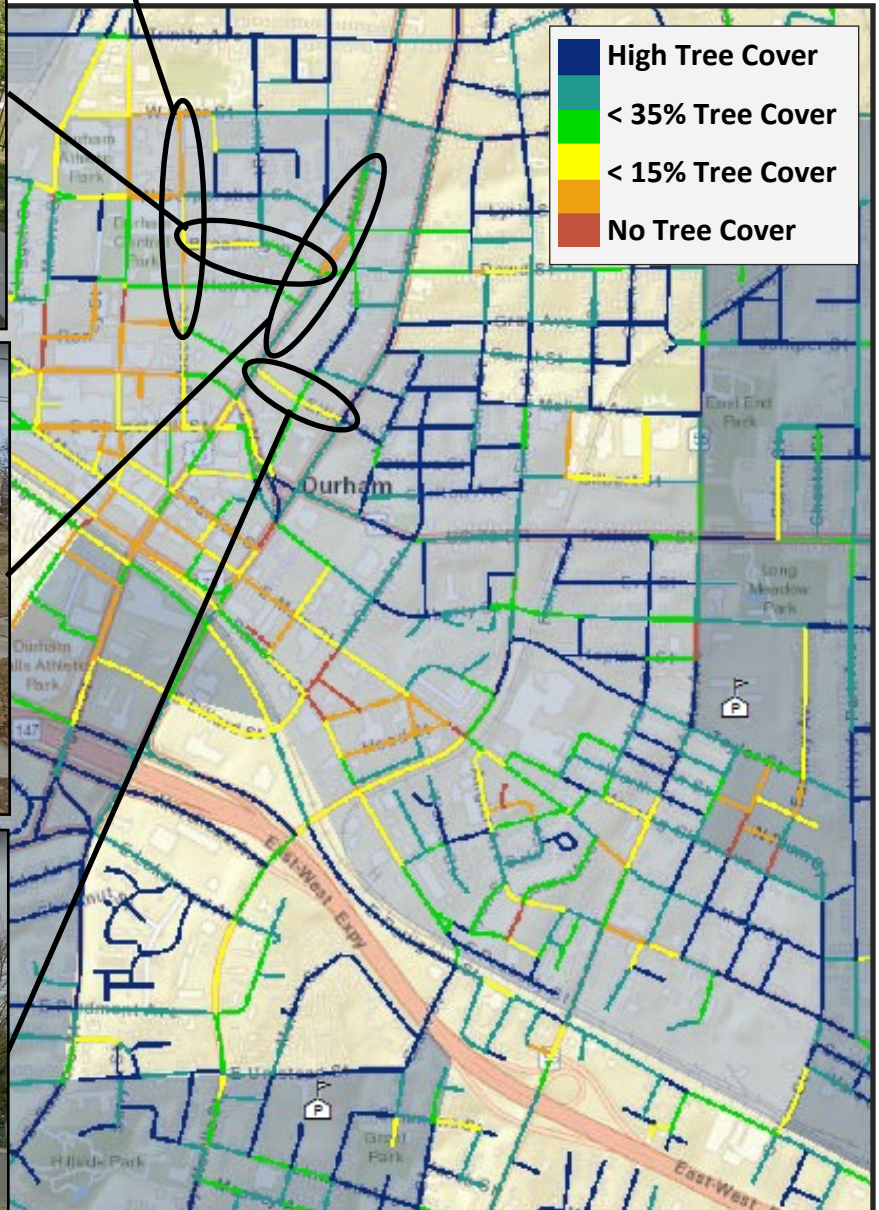
V. Downtown

1. W Geer St (Foster St to North St)
2. Madison St
3. Corner of W Morgan St and Morris St
4. W Corporation St (Washington St to Madison St)



V. Downtown (cont)

5. Rigsbee Ave
6. Broadway St
7. N Mangum St (Geer St to W Seminary Ave)
8. E Seminary Ave

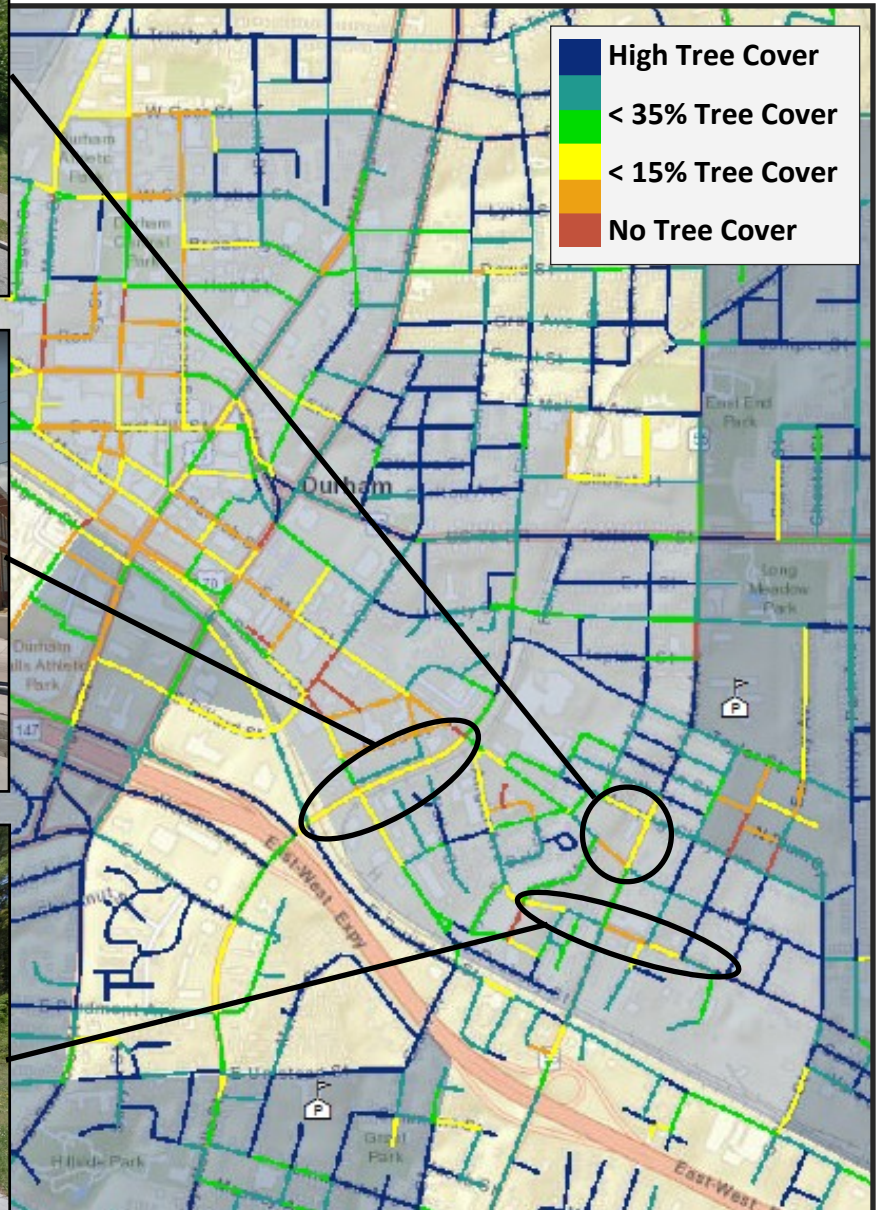


V. Downtown (cont)

9. Fayetteville St (E Main St to E Pettigrew St)

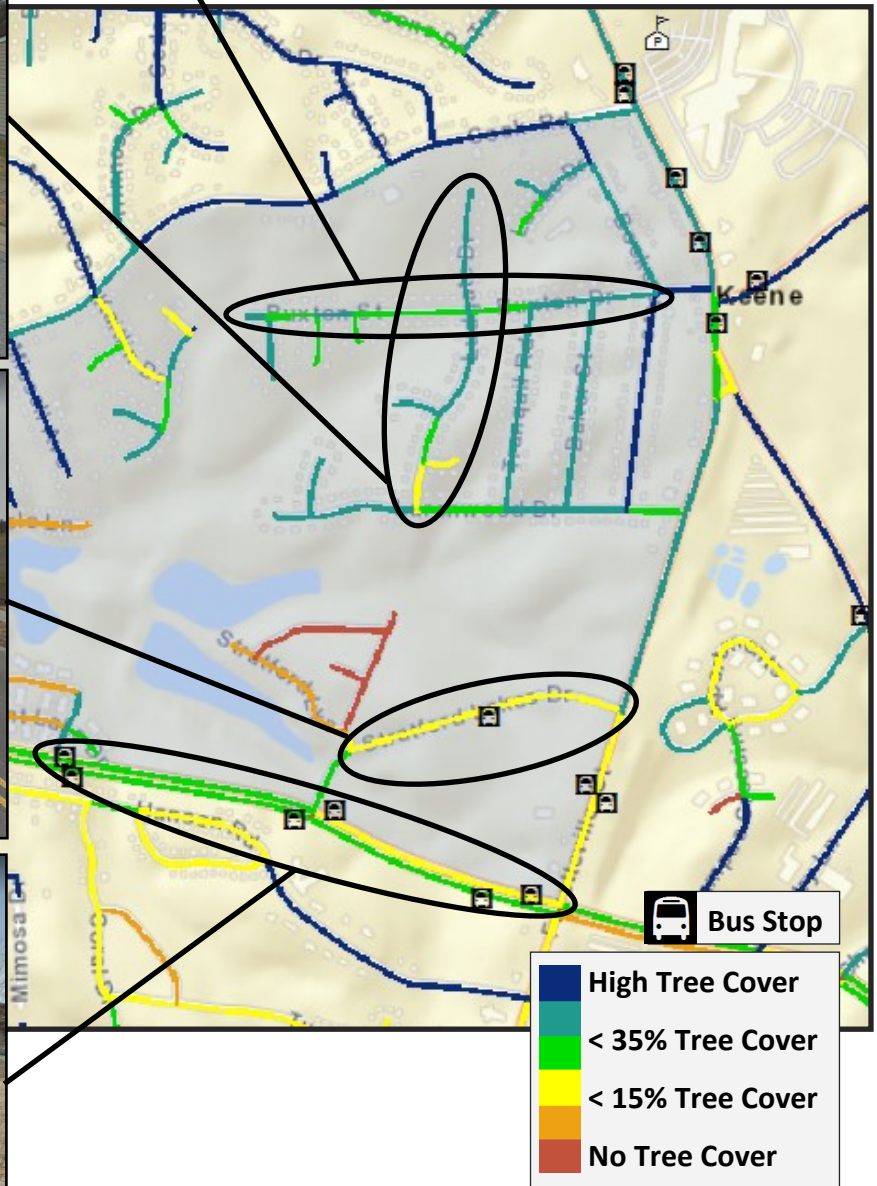
10. Corner of S Alston and Morning Glory Ave

11. Angier Ave (Lyon St to S Goley St)



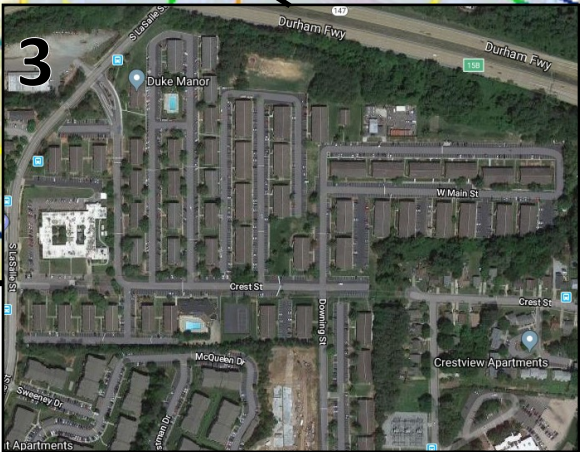
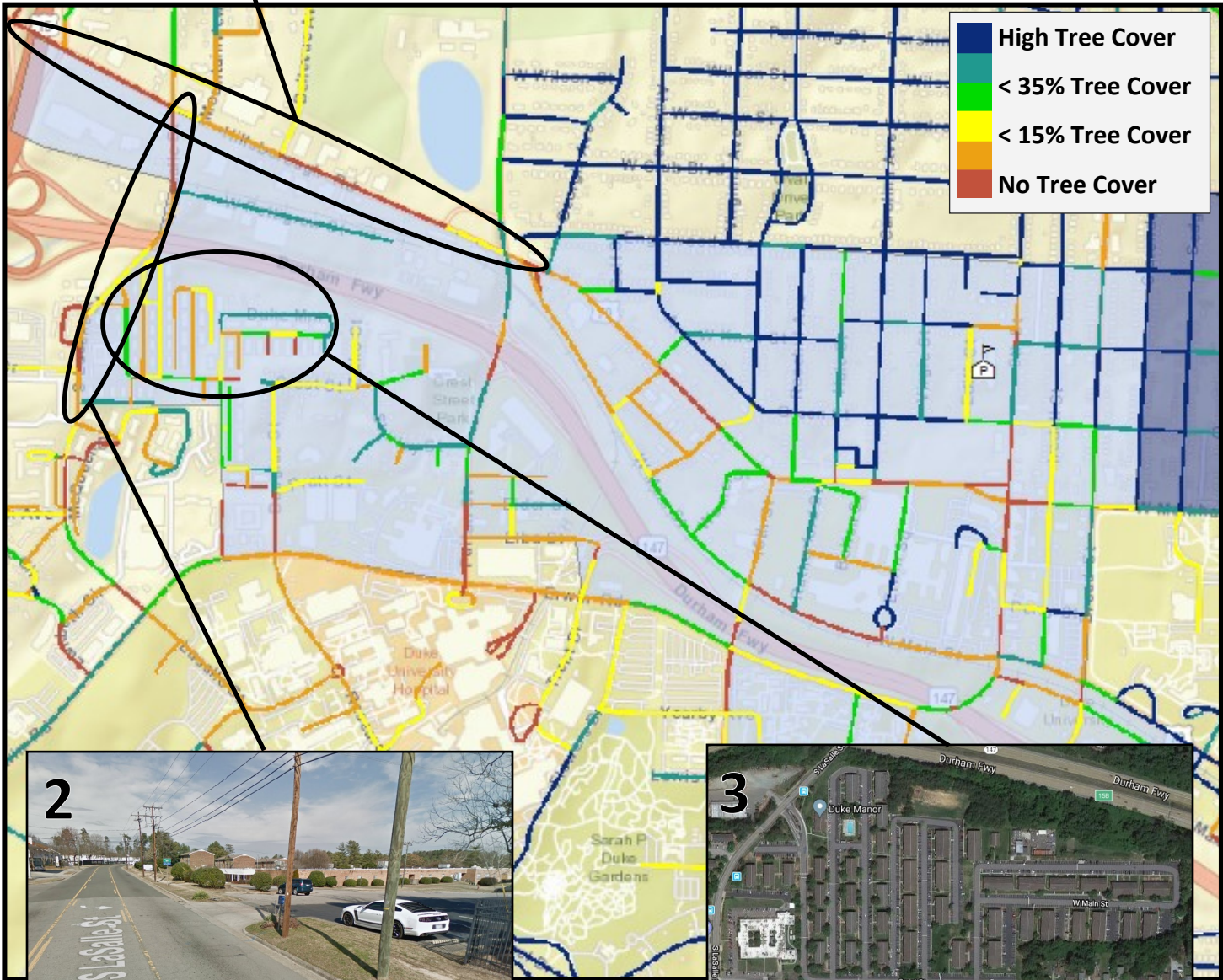
VI. Stratford Lakes

1. Buxton St
2. Ludgate Dr
3. Stratford Lakes Dr
4. MLK Jr Pkwy (Lake Cook Dr to Fayetteville Rd)



VII. Old West Durham

- 1. Hillsborough Rd (501 to Hillandale Rd)
- 2. LaSalle St (Hillsborough Rd to Sweeny Dr)
- 3. Duke Manor (apartments)



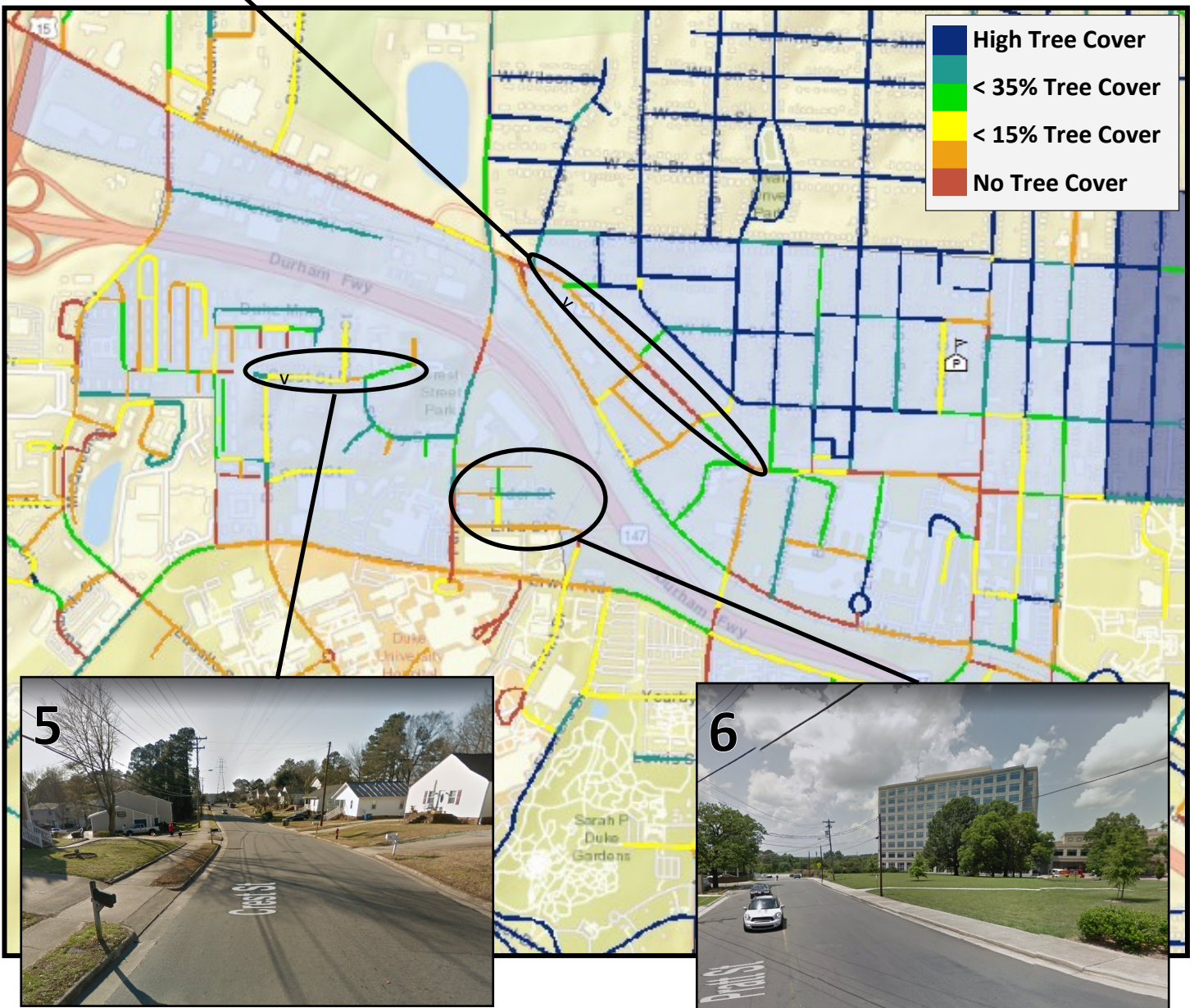
VII. Old West Durham (cont)



4. Hillsborough Rd (Hillandale Rd to 15th St)

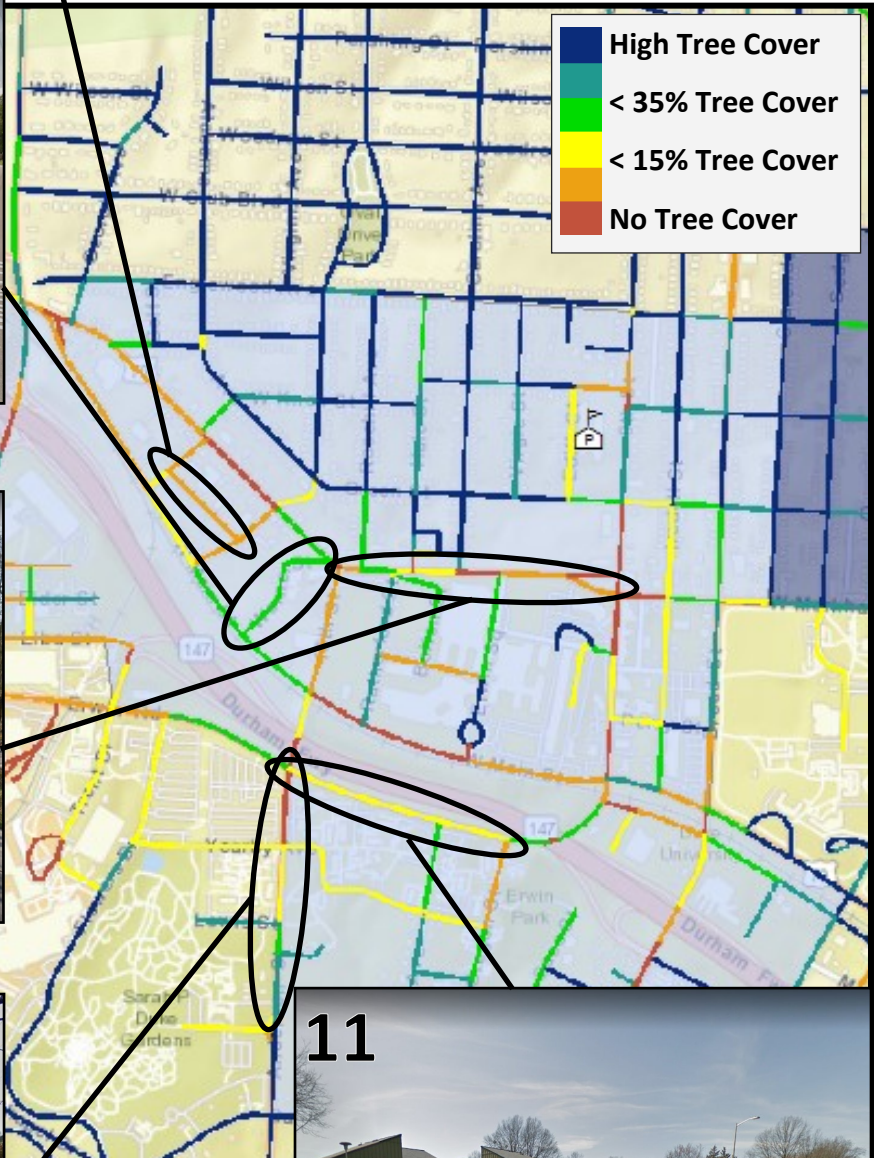
5. Crest St

6. Pratt, Elder, Elba, and Elf St



VII. Old West Durham (cont)

7. Edmund St
8. Warner St
9. Hillsborough Rd (15th St to 9th St)
10. Anderson St (Erwin Rd to Duke Gardens)
11. Erwin Rd (Anderson St to Oregon St)



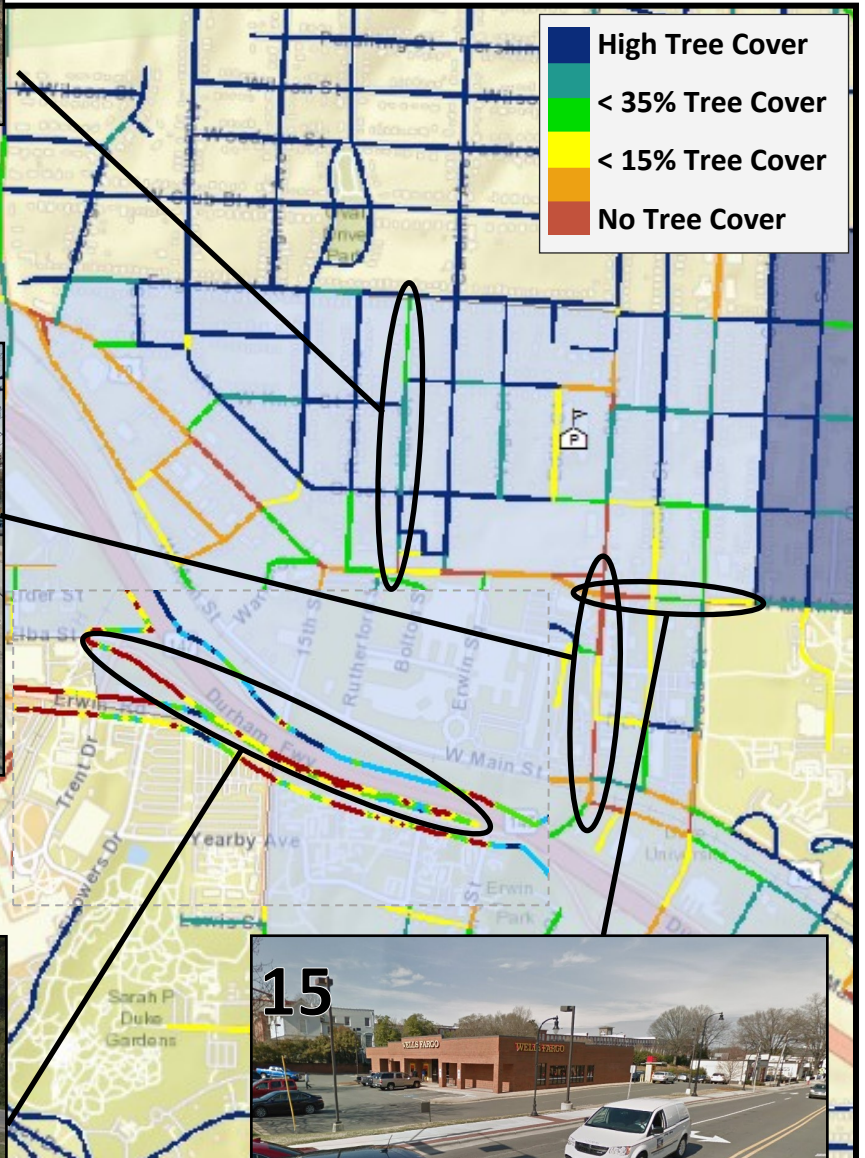
VII. Old West Durham (cont)

12. Hale St

13. 9th St (W Pettigrew St to Hillsborough Rd)

14. Hwy 147

15. W Markham (9th St to Broad St)



VIII. Weaver

1. Hamlin Rd (Old Oxford Rd to Paul Rd)
2. Wiggins St
3. Allgood St, Craven St, Denver Ave, Usher St, and Martin St,
4. Dearborn Dr (Old Oxford Rd to Apollo St)

