



BEAT THE HEAT

APEX, NORTH CAROLINA

Green Cities = Cool Cities



Demographics

Top Five Racial and Ethnic Groups*

- 74.6% White (Non-Hispanic)
- 8.07% Asian (Non-Hispanic)
- 6.91% Black (Non-Hispanic)
- 4.91% White (Hispanic)
- 2.73% Two+ Races (Non-Hispanic)

\$105,404 Median Household Income

*Source: 2018 Data USA, at: <https://datausa.io/profile/geo/apex-nc>



Urban Forest

- 59.3% Current tree canopy
- 76.2% Potential tree canopy
- 16.9% Potential canopy increase
- 12.9% Impervious surfaces
- 5,937 Acres of Potential Planting Area (PPA)



Urban Heat

97.8°F Average surface temperature*

Projected future days above 100°F**

- 9 days Historically (1971 – 2000)
- 49 days Mid-century (2036 – 2065)
- 81 days Late century (2070 – 2099)



*across study area on August 26th, 2016
** Data source: Union of Concerned Scientists, Killer Heat in the United States, at: <https://www.ucsusa.org/resources/killer-heat-united-states-0>

Overview

The Town of Apex has one of the fastest rates of growth in North Carolina and the demand to meet the needs for housing, commercial, business, industrial uses and transportation has put strains on both the town's grey and green infrastructure. With a five-year growth rate of 5.28 percent, Apex's population is projected to almost double by the year 2030, to 89,477 persons (Apex 2018). Growth will continue because of increased density within town boundaries and through annexations. Growth could result in the loss of valuable mature trees and associated shade to cool future neighborhoods.



Street widths can be narrowed to accommodate tree wells and bioswales for managing stormwater, adding shade and improving the aesthetics of downtown shopping districts



Many areas along ROWs are underplanted, despite having adequate room for trees. These spaces are easy ways to increase canopy in neighborhoods, as long as trees do not interfere with above- or below-ground utilities.

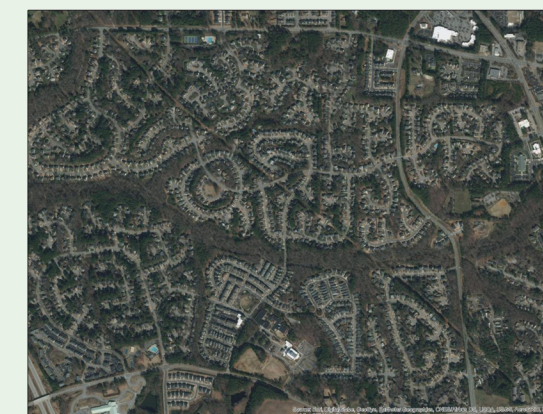
Public rights-of-way (ROWs) are key areas where trees are needed. Residents depend on roads, sidewalks and greenways for transportation to work, whether driving, transit, walking or biking, and to access recreation sites. Street trees can lower temperatures by up to 5°F in mostly unpaved neighborhoods and around 2°F in areas with significant pavement, such as streets (Alonzo 2021). These lower temperatures can extend the life of pavement and ultimately save on costs, but this also means significantly less heat stress for individuals.

The ability to walk or bike without undue heat stress brings up issues of equity, where lower-income households that cannot afford a car are forced to walk in extreme temperatures in urban environments. Strategies for communities that have low canopy along public rights-of-way could be to identify or create new planting spots that don't interfere with above- or below-ground utilities and have adequate soil surface area and volume for trees. Other options include the adoption of a "complete green streets" policy. Complete green streets allow for integration of stormwater management and aesthetic goals. Incorporating vegetation as an integral part of the designs provides for creation and connection of habitats, reduced urban heat island effect, air pollutant removal, and promotion of walking and biking.

In cities such as Apex, with downtowns that have narrow streets without much room to add trees, new bump outs can be created within existing parking spaces using structured cells that allow for trees to be fitted into paved landscapes. While several spaces of parking are lost, retailers should not see a decline in business since people shop longer and pay more in tree-lined districts (Wolf 2008).

Step-Wise Strategy to Identify Communities and Mitigation Opportunities

Aerial image



Heat imagery



Streets that lack shade



1. Use maps to identify hot spot(s).
2. Identify vulnerable or underserved populations of interest.
3. Prioritize areas that meet the first two criteria.
4. Outreach and engage with the community.
5. Identify hot and low canopy streets.
6. Work with the community to plant neighborhood ROWs.
7. Institute policies that incorporate green street design principles.