Seattle's Canopy Cover Assessment

Second Phase Results

November 2022

Office of Sustainability & Environment

City of Seattle

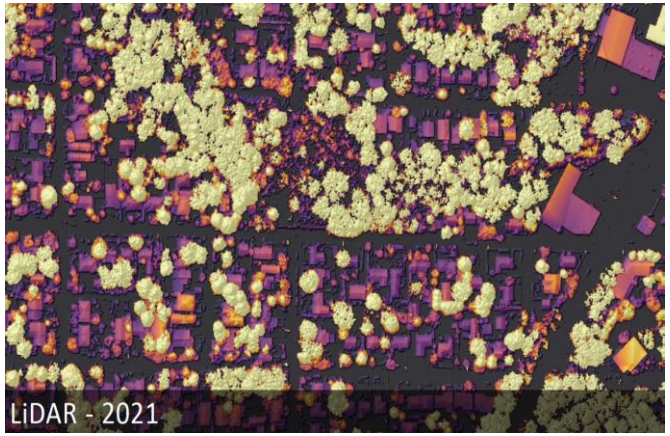
Today’s goals

- Recap information covered to date
- Focus on canopy coverage and change by MU
- Share additional equity neighborhood information

Key Takeaways

- We lost canopy during this time period – 1.7% relative decrease in canopy, 255 acres net loss
- Those net losses are comprised of both gains (new growth, planting) and losses (removals, trees dying)
- Largest net losses seen in Neighborhood Residential, Parks Natural Areas and Multifamily
- Our equity priority neighborhoods continue to see canopy losses despite city investment there
- We need to take better care of the trees we have and accelerate investment in new trees

What is the Tree Canopy Cover Assessment?



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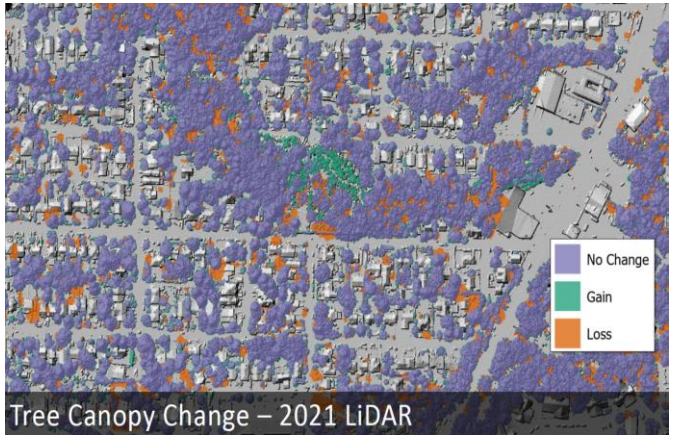


- We combine LiDAR data with aerial imagery to determine the amount of canopy cover and the change in cover since 2016.
- This round of assessment is our first opportunity for trend analysis.
- Preliminary data included canopy citywide and by land use type (management unit*); change in canopy since 2016
- We now have an additional set of data to share.

*The Urban Forest Management Plan defines nine management units that cover all the land in the city. The management units consider trees based on their geographic location within the city.

Second phase data

- Understanding canopy change data
- Deeper dive into changes within Management Units
- Environmental Justice neighborhoods mapping
- Tree counts
- Evergreen/deciduous ratio

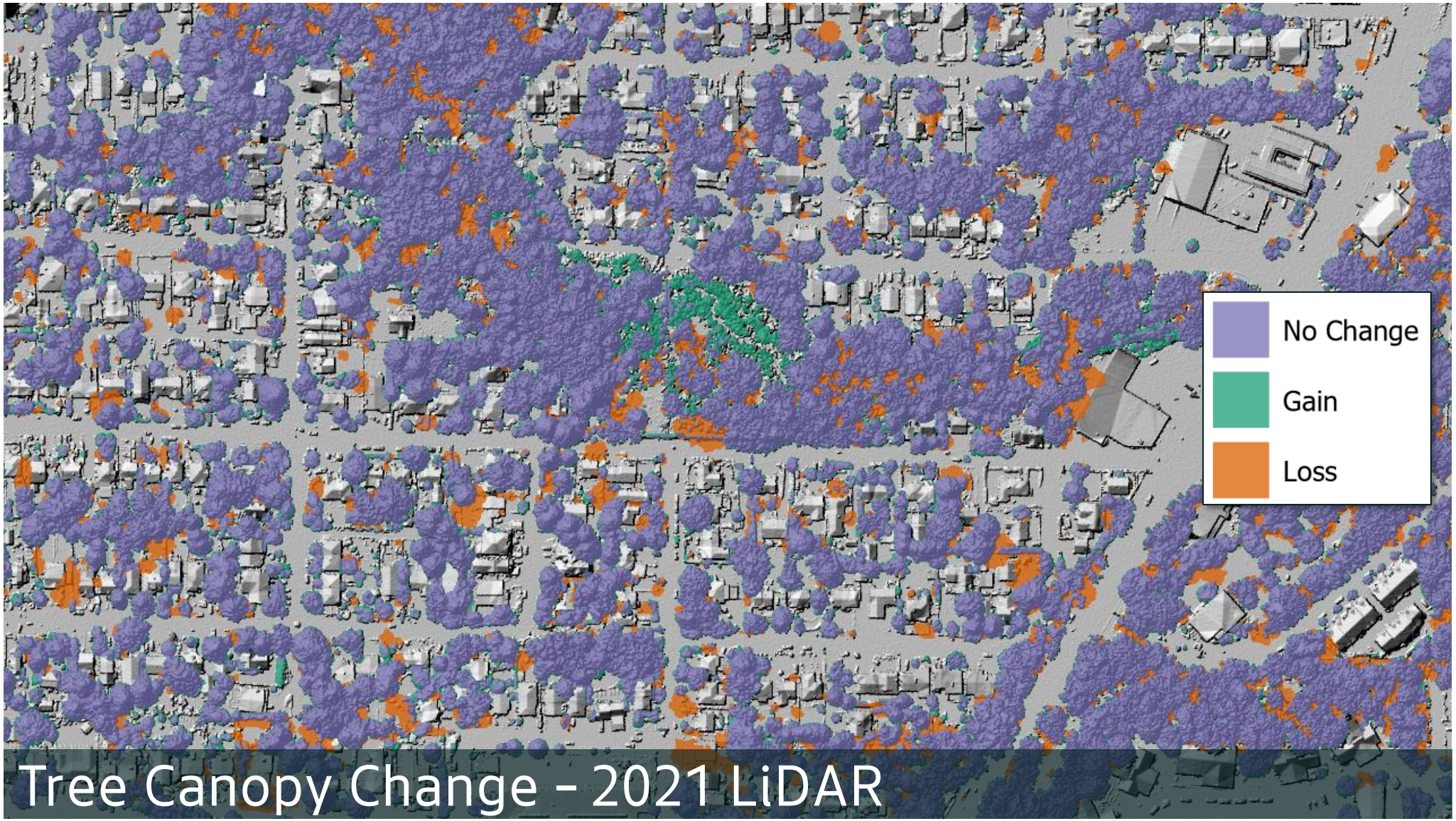
Understanding Canopy Change Data

Net Loss = 255 Acres (about the size of Green Lake)

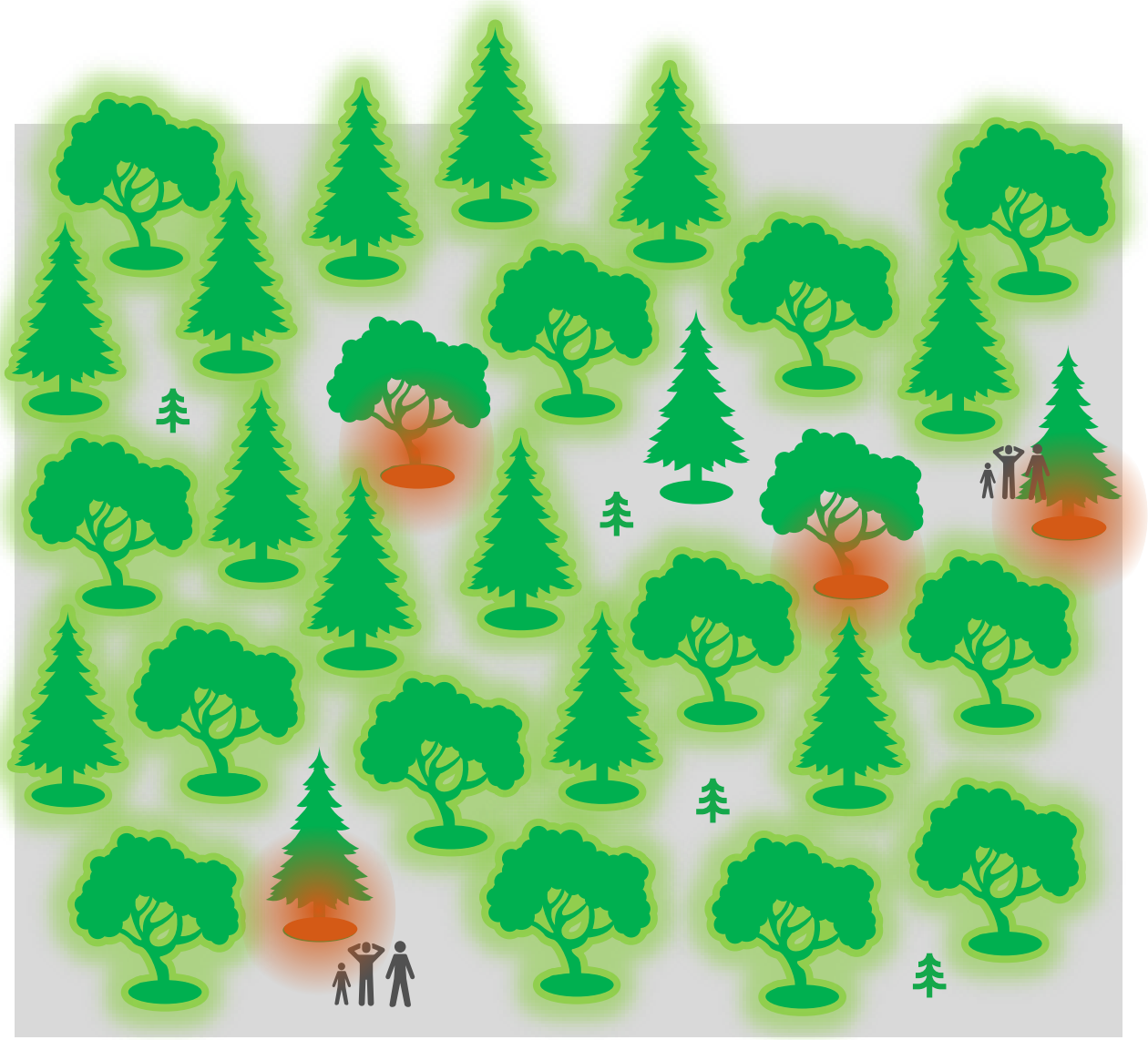
Functionality lost without those trees:

- **Carbon** – hundreds of thousands of lbs CO^2/year not sequestered
- **Stormwater** – millions of gallons of runoff not avoided
- **Heat/cooling** – hundreds of acres shade lost; millions of gallons water not transpired;
- **Air quality** – hundreds of thousands of lbs of pollutants not absorbed

Both losses and gains contribute to net canopy change



Loss + Gain = Net Change



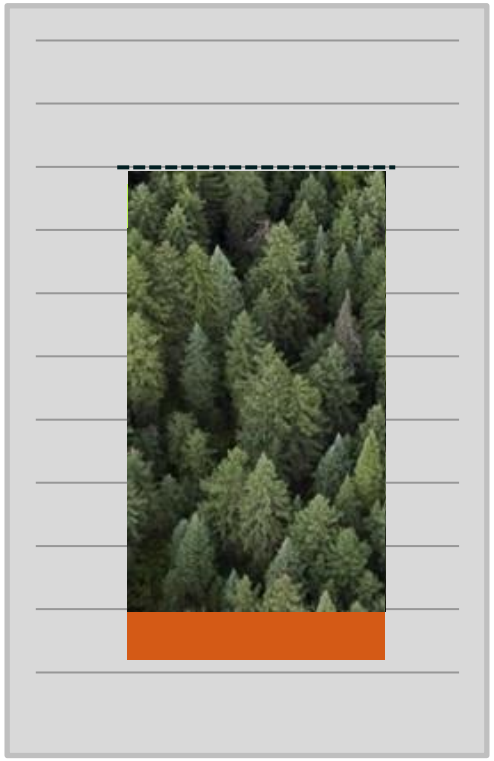
Loss

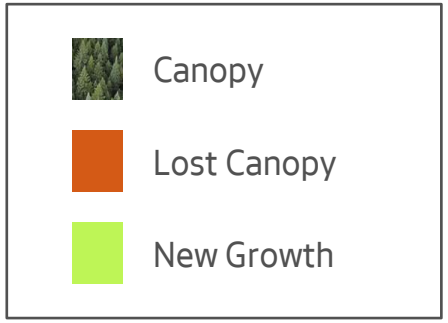
- Happens suddenly, as an event
- Has both immediate and long-lasting environmental and quality of life impacts
- Cannot be reversed

Gains

- Accrue gradually, over long periods of time
- Require continual tree care and maintenance
- Are not always visible or noticed
- Remain vulnerable to climate and other impacts

Losses and gains: Citywide





2016 Canopy **(15,279 acres)**

- 1,790 acres of canopy lost (trees removed or fallen)

+ 1,534 acres of canopy gained (growth of existing trees, newly planted trees)

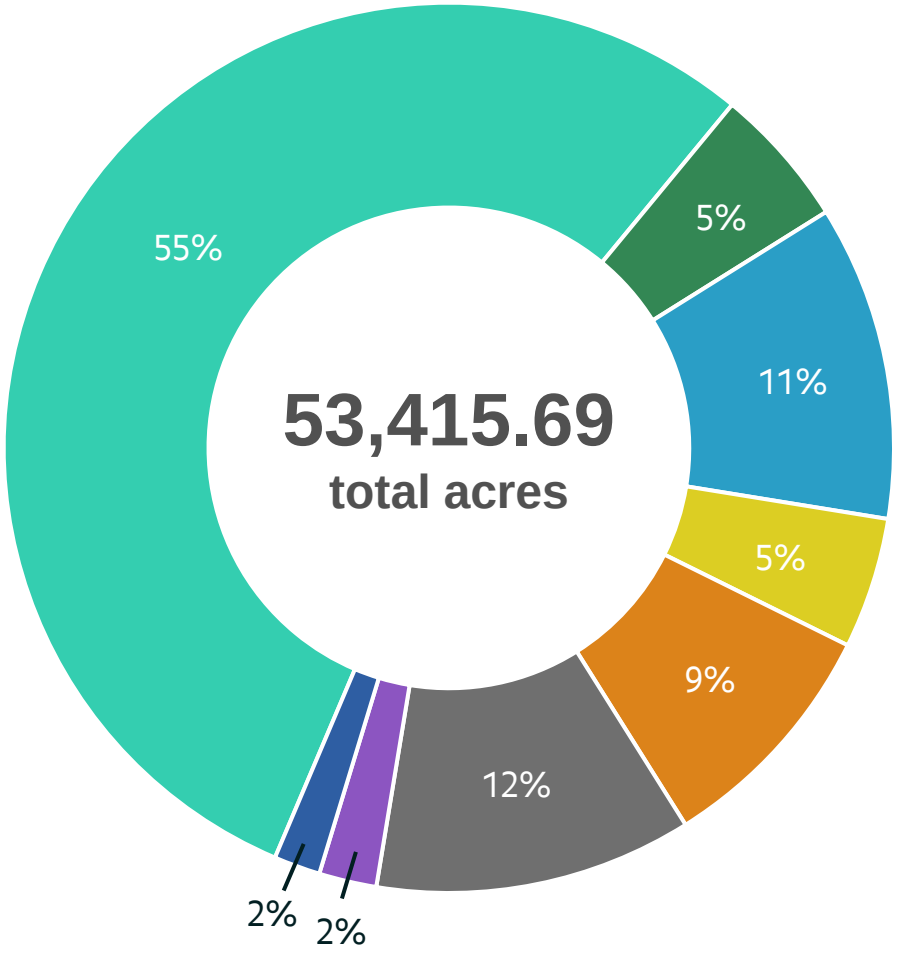
= net canopy loss of **255 acres**

The reasons for loss and gain in each area are complex – some examples:

- Summers getting hotter and drier
- Aging trees more susceptible to drought conditions and pests
- Large construction projects for utilities, transportation and other infrastructure
- Housing grew substantially during this period
- Trees protected and cared for so that they grow and add canopy
- New trees planted

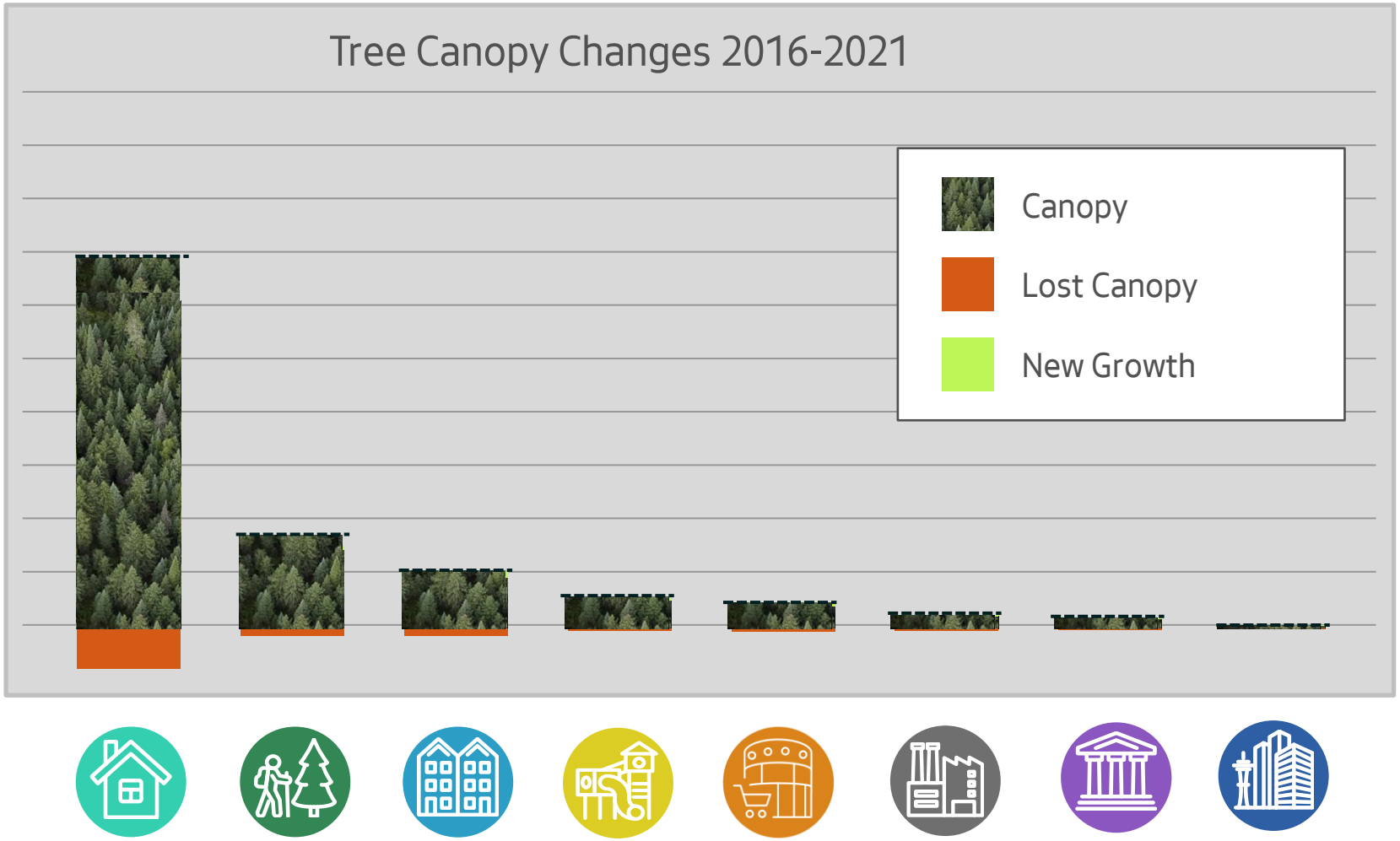
Canopy Changes by Management Unit

City Land Area by Management Unit



Management Area	Total Land Area
Neighborhood Residential	29,161.42
Parks Natural Area	2,735.72
Multifamily	6,117.81
Developed Parks	2,542.66
Commercial / Mixed Use	4,678.48
Manufacturing / Industrial	6,161.44
Major Institutions	1,118.00
Downtown	900.16

Canopy losses were greatest in Neighborhood Residential, Parks Natural Areas and Multifamily



Areas to focus for the future:

- Parks Natural Areas
- Residential – both Neighborhood Residential and Multifamily
- Protecting and maintaining existing trees
- Other City-owned land (i.e Developed Parks)

Canopy losses were greatest in Neighborhood Residential, Parks Natural Areas and Multifamily

Tree Canopy Changes 2016-2021

Management Area	2016 Canopy	Canopy Gains	Canopy Losses	Relative Change
Neighborhood Residential	9318	**1,054**	**1,131**	-0.8%
Parks Natural Area	2347	77	**199**	**-5.2%**
Multifamily	1457	**182**	**200**	-1.3%
Developed Parks	797	61	69	-0.9%
Commercial / Mixed Use	648	**83**	91	-1.3%
Manufacturing / Industrial	348	41	49	-2.2%
Major Institutions	278	26	38	**-4.2%**
Downtown	85	10	14	**-4.3%**

Losses and gains: Neighborhood Residential

Canopy

Lost Canopy

New Growth

2016 Canopy – **9,318 acres**

- 1,131 acres of canopy lost (trees removed or fallen)

+ 1,054 acres of canopy gained (growth of existing trees, newly planted trees)

= net canopy loss of **77 acres**

Reasons for losses and gains include:

Losses

- Trees removed for development
- Trees removed by residents to allow for other uses
- Trees fallen or removed as hazards
- Trees heavily pruned, removing branches and leaves from trees

Gains

- Protection and care of existing trees, allowing them to add more branches and leaves over time
- New trees planted in yards and in planting strips by residents alone or with support from Trees for Neighborhoods and other city programs

Residential Deep Dive: Development impacts on canopy

Methodology: Based on a data set of all residential parcels in the City, consultants are comparing canopy gains, losses, net change, and absolute and relative percent changes in canopy between those parcels where a development project was completed between 2017 and 2021, and those where no development took place.

The data analysis from this process is forthcoming.

Losses and gains: Parks Natural Areas

Canopy

Lost Canopy

New Growth

2016 Canopy – **2,347 acres**

- 199 acres of canopy lost (trees removed or fallen)

+ 77 acres of canopy gained (growth of existing trees, newly planted trees)

= net canopy loss of **122 acres**

Reasons for losses and gains include:

Losses

- Trees failing/losing limbs or falling due to age, drought stress and pest susceptibility
- Aging deciduous trees removed to allow for conifer establishment
- Trees removed as hazards near trails or parking lots

Gains

- Protection and care of existing trees, allowing them to add more branches and leaves over time
- New trees planted, typically bare-root to 1-gallon size
- New trees resulting from natural regeneration

Losses and gains: Developed Parks

Canopy

Lost Canopy

New Growth

2016 Canopy – **797 acres**

- 69 acres of canopy lost (trees removed or fallen)

+ 61 acres of canopy gained (growth of existing trees, newly planted trees)

= net canopy loss of **8 acres**

Reasons for losses and gains include:

Losses

- Trees failing/losing limbs or falling due to age, drought stress and pest susceptibility
- Trees removed as hazards
- Trees removed for park development or other infrastructure projects

Gains

- Protection and care of existing trees, allowing them to add more branches and leaves over time
- New trees planted (2.5" diameter and larger) as replacement trees or as part of new park development

Losses and gains: Right of Way

Canopy

Lost Canopy

New Growth

2016 Canopy – **3,486 acres**

- 424 acres of canopy lost (trees removed or fallen)

+ 414 acres of canopy gained (growth of existing trees, newly planted trees)

= net canopy loss of **10 acres**

Reasons for losses and gains include:

Losses

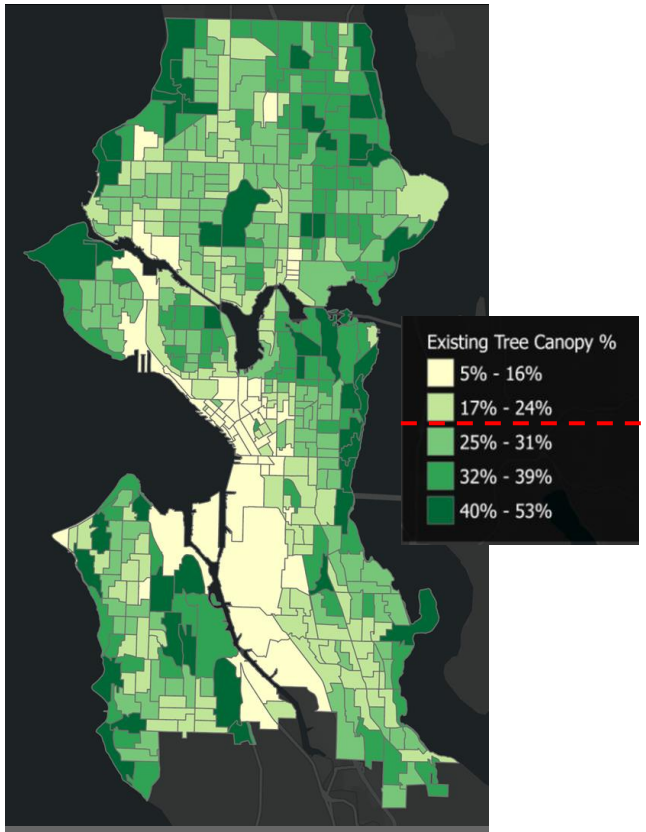
- Trees failing/losing limbs or falling due to age, drought stress and pest susceptibility
- Trees removed for transportation or other infrastructure projects

Gains

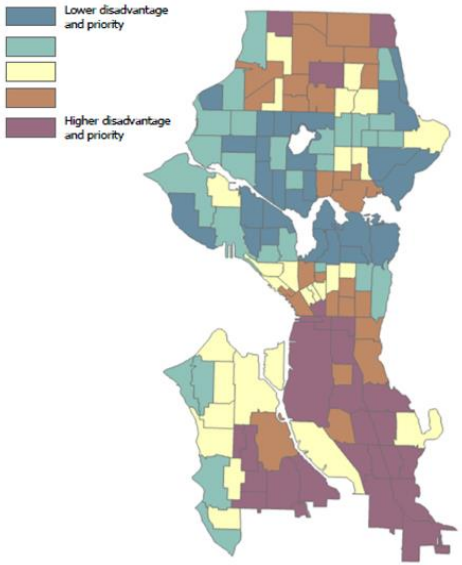
- Protection and care of existing trees, allowing them to add more branches and leaves over time
- New trees planted (2.5" diameter and larger) by city departments and by residents

Canopy Changes in Equity Priority Areas

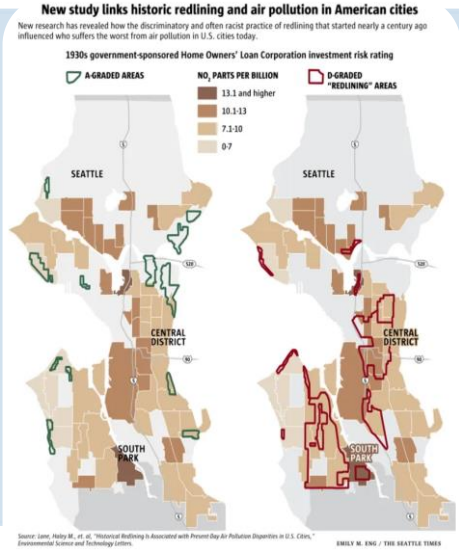
Inequities in our tree canopy follow other patterns of inequity



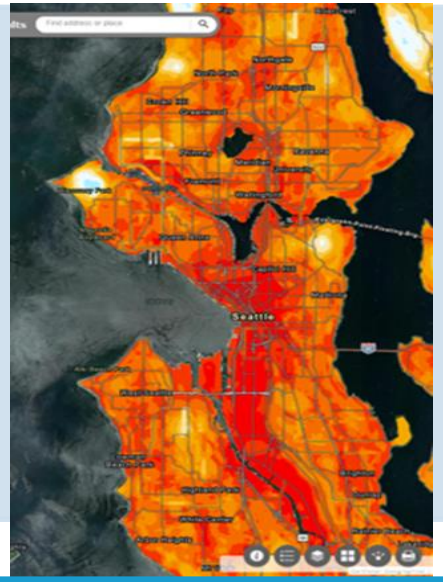
Existing Tree Canopy %



Racial and Social Inequity



Air quality

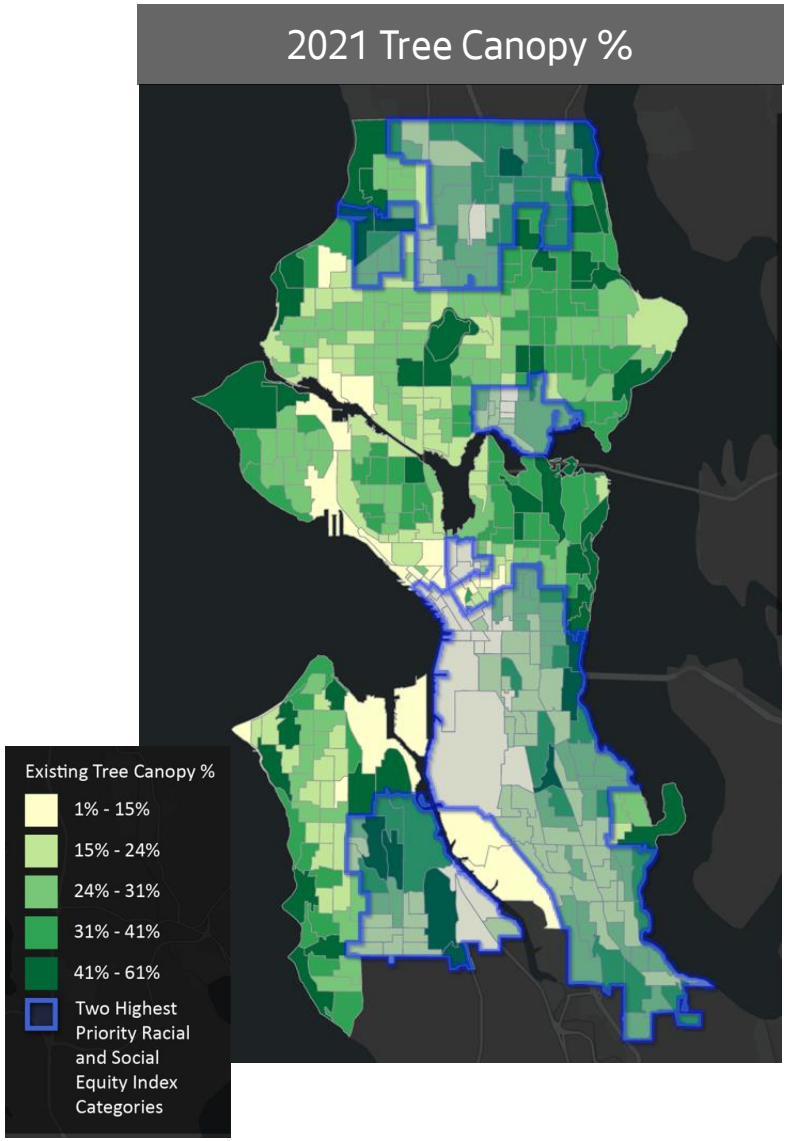


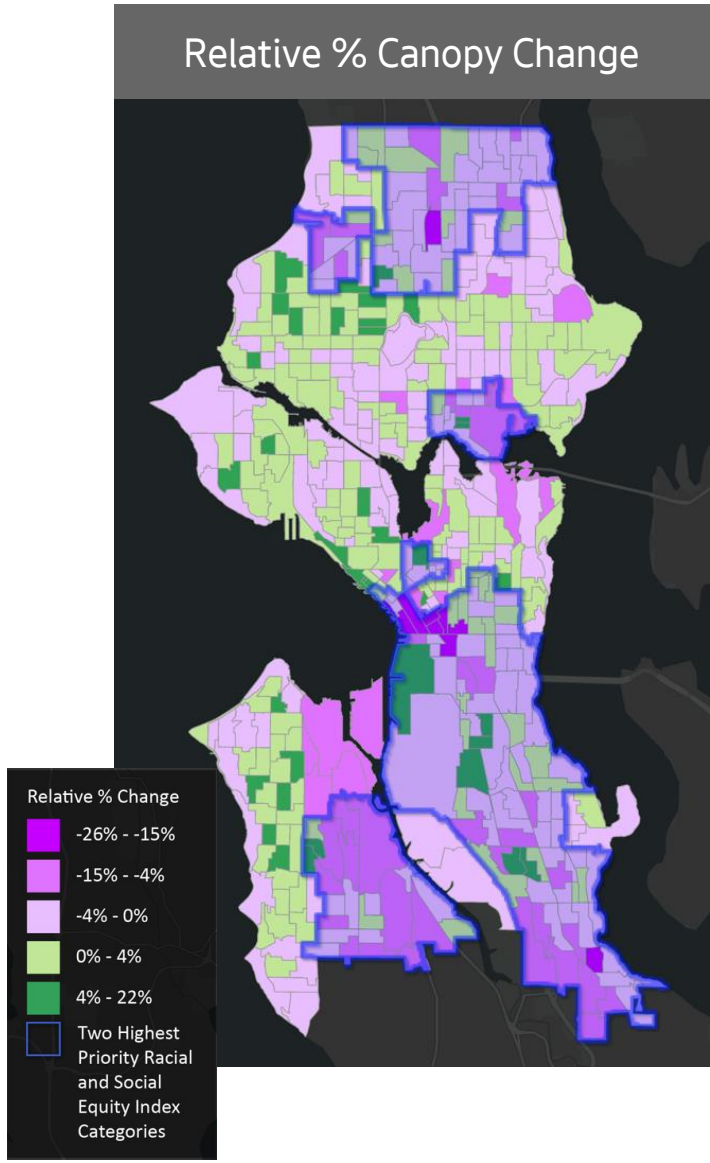
Heat island effects

Canopy data for equity priority neighborhoods

In neighborhoods of higher disadvantage, data show:

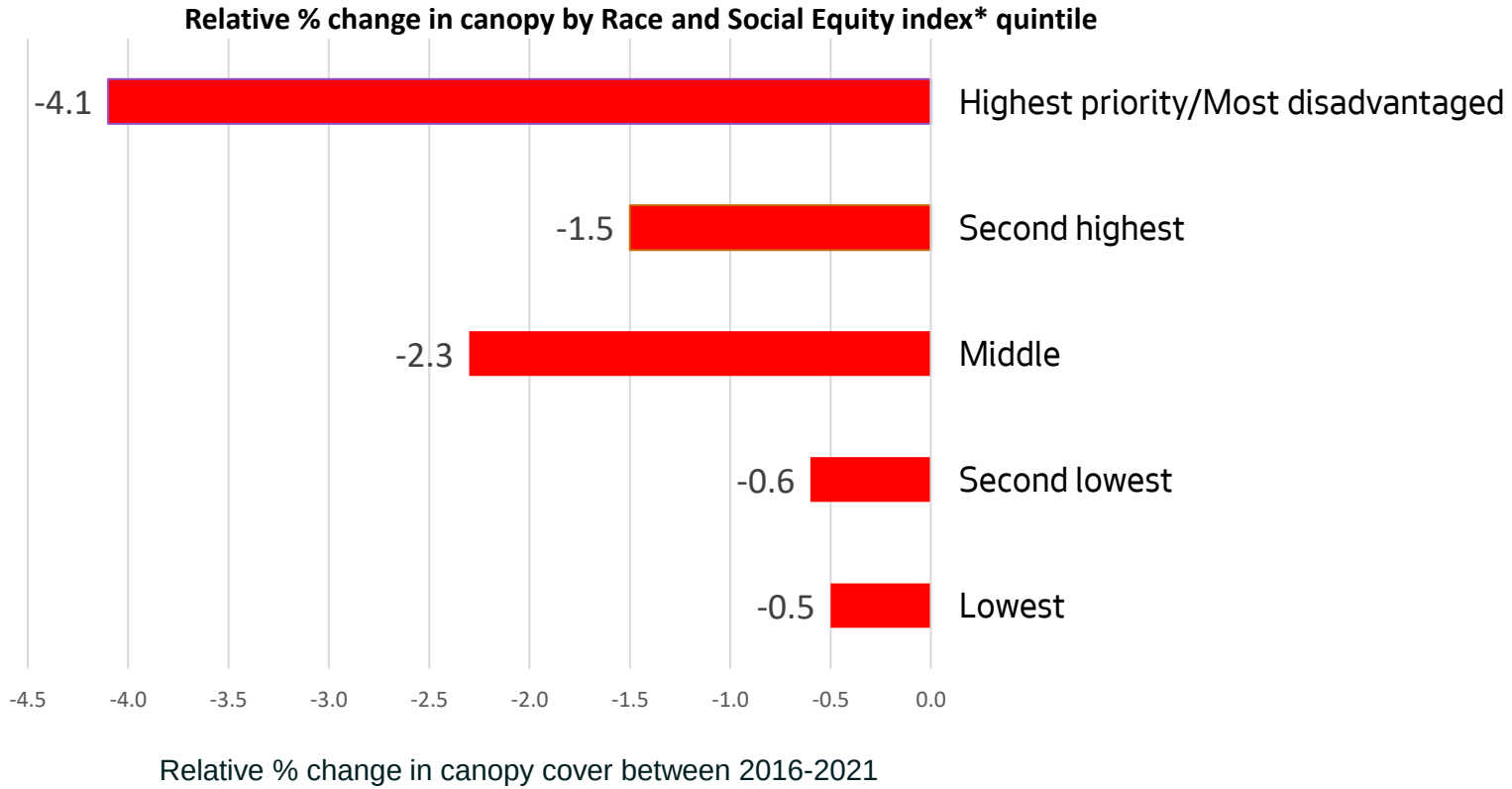
- Gains in some areas, e.g.:
  - East Duwamish greenbelt
  - Longfellow Creek
- Losses in more areas, e.g.:
  - Northgate light rail project area
  - West Duwamish greenbelt
  - Rainier Valley





Highest disadvantaged areas saw the highest losses

- Net loss happened everywhere
- Highest losses were in the highest disadvantage category
- Additional analysis of this data is forthcoming



*The **race and social equity composite index**, produced by the Office of Planning and Community Development, includes data on race, language, origin, socioeconomic disadvantage, and health disadvantage. It is used as a tool for City planning, program, and investment priorities. More information can be found at: https://www.seattle.gov/documents/Departments/SDOT/NSF/Race%20and%20Social%20Equity%20Map.pdf

Other measures of Seattle's canopy

968,000 Trees

37% Conifers

63% Deciduous

We are making progress in our goal to increase conifer component of our canopy – 2016 = 28%

Tree Count by Management Unit (preliminary)

trees on residential = 711,589

trees in parks = 147,794

Next steps

- Receive remaining data from consultant
  - Additional environmental equity neighborhood and heat island data
  - Development impact on canopy
  - Additional canopy measures – large trees/groves, canopy in/around schools & riparian corridors
- Conduct additional stakeholder engagement
- Final report available