Agenda

Project Team

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Why a Tree Canopy   Assessment?

"An assessment of overall tree canopy in urban areas serves as a preliminary planning tool for communities embarking on an urban forestry program."

MILLER ET AL.: URBAN FORESTRY: PLANNING AND MANAGING GREEN SPACES

What do we have?

How are we doing?

What do we want?

How do we get what we want?

Why a Tree Canopy Assessment (TCA)?

Building on Commerce City's Existing Efforts:

▶ **Arbor Day:** Annual city events and school partnerships promote tree plantings and awareness.

▶ **Public Works:** Manages public landscaping; design standards are in Article IV, Division 4.4 of the Land Development Code.

▶ **City Plans:** Comprehensive and Parks Master Plans call for more canopy in parks, corridors, and redevelopment areas.

▶ **Sustainability Action Plan:** Sets goals to expand green space and canopy citywide.

▶ **Regional Collaboration:** DRCOG partnerships support broader sustainability and climate goals.

Project Overview - Project Methodology

The TCA "Recipe"

1 Obtain Source Imagery

2 Classify Land Cover

3 Convert to UTC / PPA

4 Summarize by Geographies

5 Report key findings

Key Terms

Urban Tree Canopy (UTC): The "layer of leaves, branches and stems that cover the ground" (Raciti et al., 2006) when viewed from above; the metric used to quantify the extent, function, and value of the urban forest. Tree canopy is generally taller than 10-15 feet tall.

Possible/Potential Planting Area (PPA): Areas of grass and open space where tree canopy does not exist, and it is biophysically possible to plant trees.
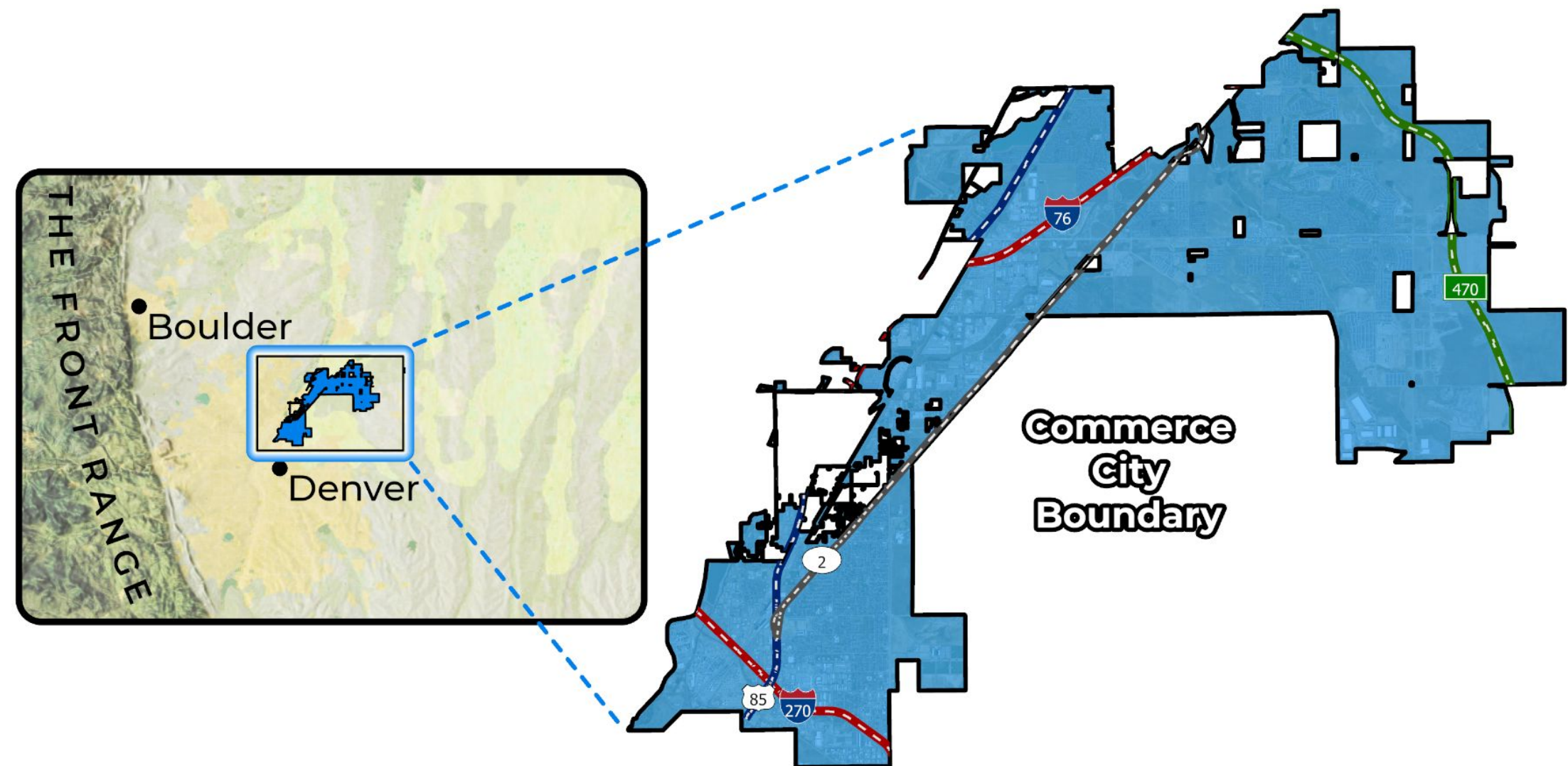
Unsuitable Vegetation: Areas of non-canopy vegetation that are not suitable for tree planting due to their land use (recreation fields, cemeteries, landfills, utility corridors, etc.)

Main Boundary: C3 Full City Limits (Not Just "City Core")

Additional Boundaries:

- ▶ Rights-of-Way (ROW)
- ▶ Public (Including Schools) vs. Private Property
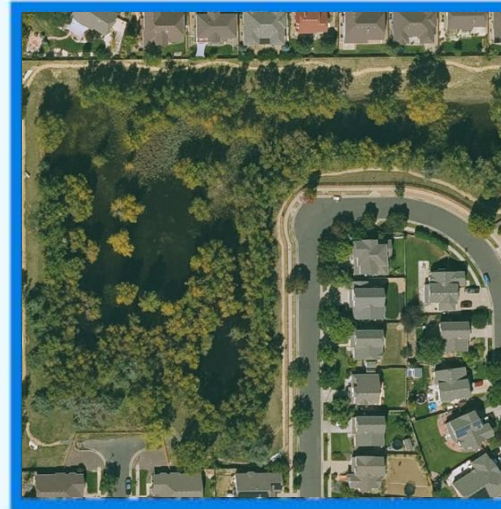- ▶ Neighborhoods
- ▶ Census Block Groups

Obtain source imagery

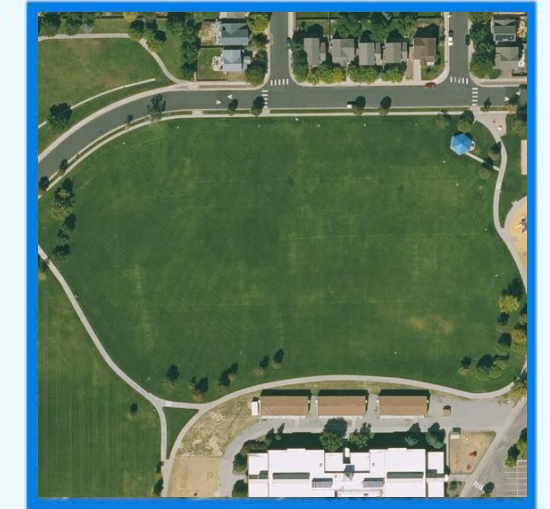USDA's National Agriculture Imagery Program (NAIP) 2023

- ▶ Flown ever 2-3 years
- ▶ High resolution (60cm)
- ▶ Taken during "leaf on" conditions

TREE CANOPY
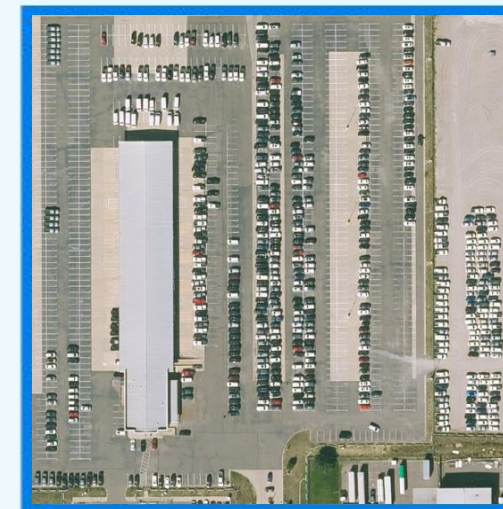LEAVES, BRANCHES, AND STEMS GENERALLY GREATER THAN 10-15' TALL

SHRUBS
WOODY PLANTS WITH MULTIPLE STEMS ARISING FROM THE BASE, GENERALLY LESS THAN 10' TALL

OTHER VEGETATION
HEALTHY GRASSES, HERBACEOUS PLANTS, OPEN PASTURES AND TURF GRASS

BARE SOIL AND DRY VEGETATION
EXPOSED EARTH, SAND, OR DEAD/DORMANT GRASSES
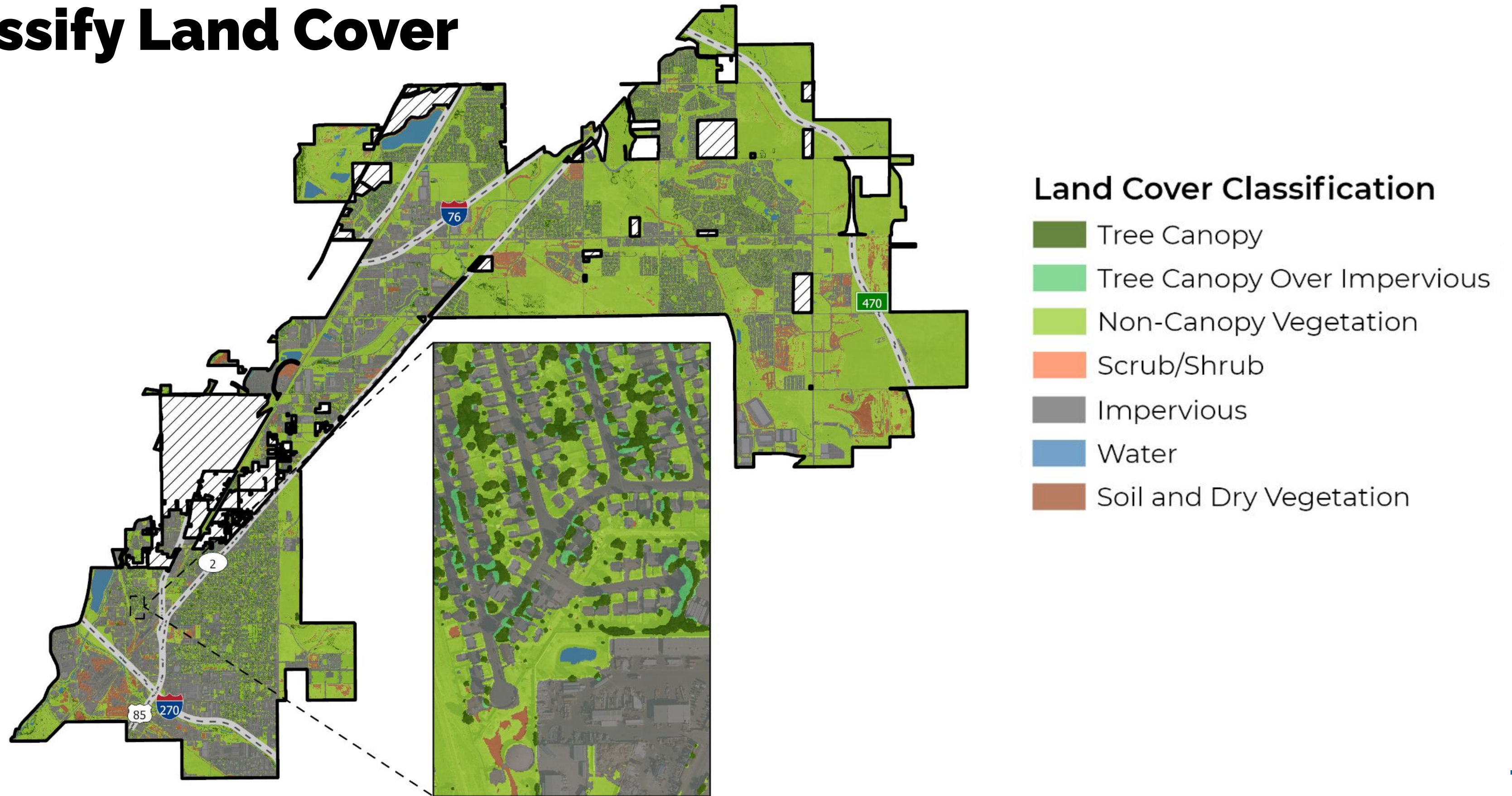
IMPERVIOUS SURFACES
ROADS, SIDEWALKS, PARKING LOTS, BUILDINGS, AND OTHER PAVED AREAS

WATER
RIVERS, LAKES, PONDS, RESERVOIRS, AND WETLANDS

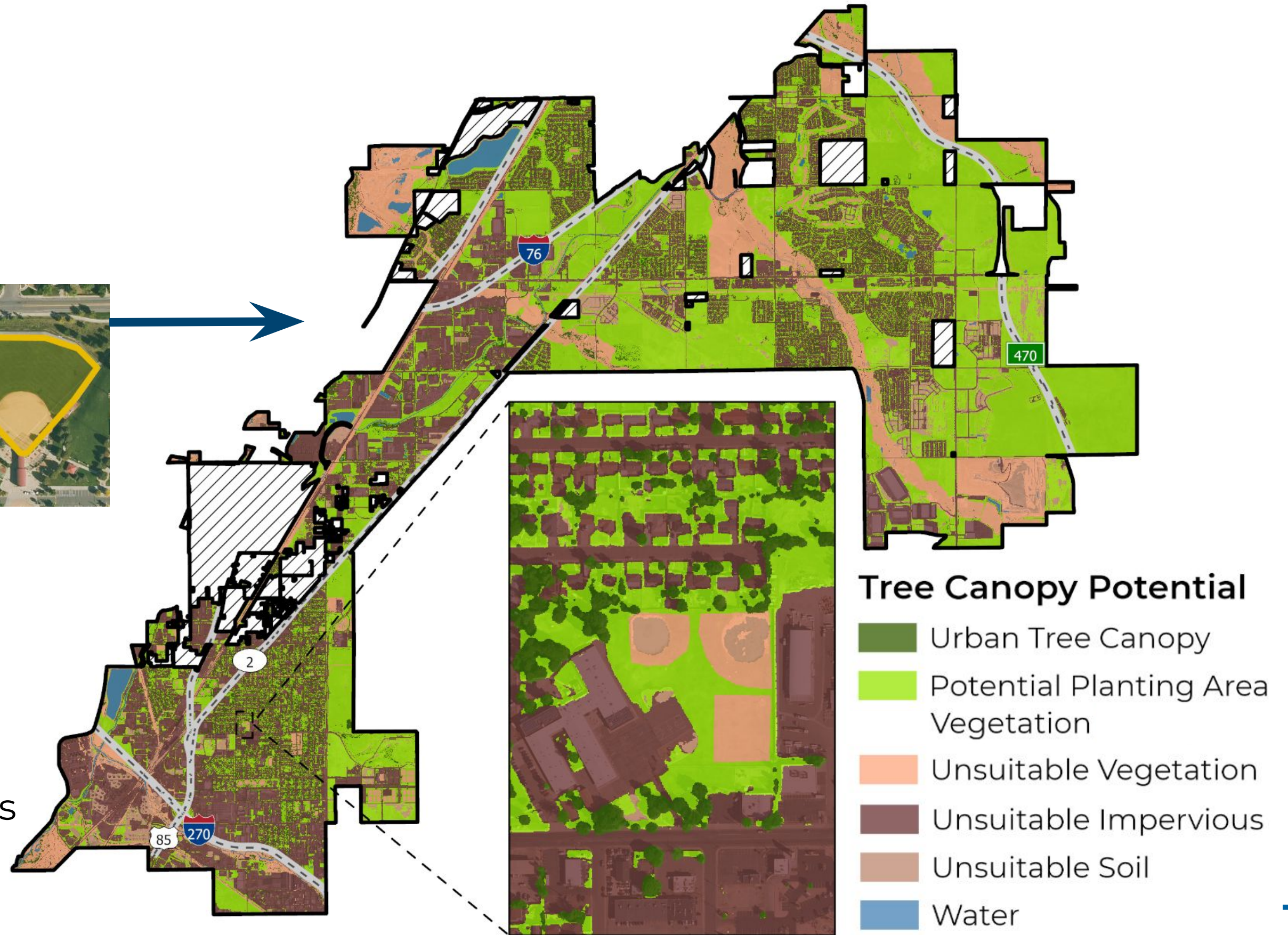# Project Overview – Land Cover Creation

Classify Land Cover

Land Cover Classification

- Tree Canopy
- Tree Canopy Over Impervious
- Non-Canopy Vegetation
- Scrub/Shrub
- Impervious
- Water
- Soil and Dry Vegetation

Convert to Urban Tree Canopy Potential

Delineating areas unsuitable for planting:

- ▶ Recreation fields
- ▶ Utility & railroad corridors
- ▶ Stormwater retention ponds
- ▶ Flood hazard zones

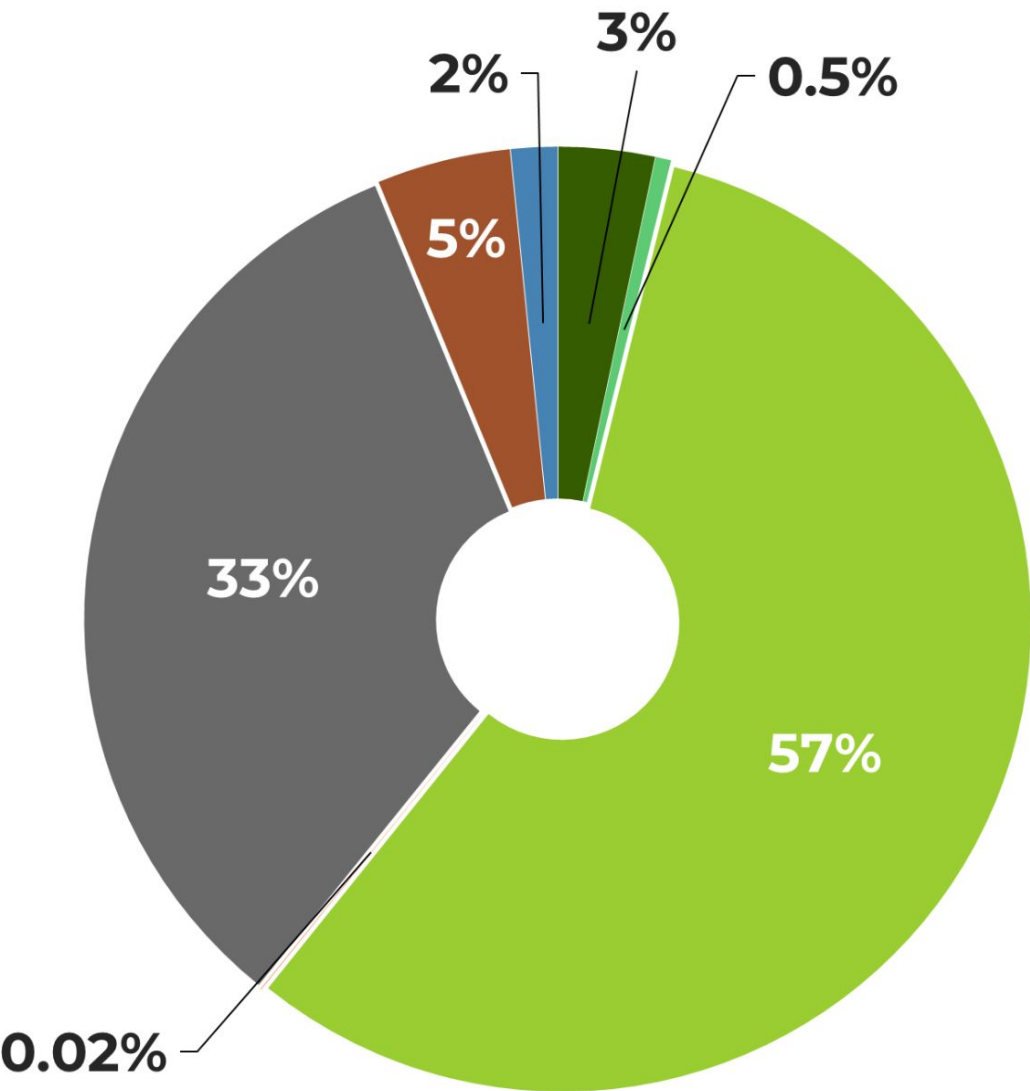**Tree Canopy Potential**

- Urban Tree Canopy
- Potencial Planting Area Vegetation
- Unsuitable Vegetation
- Unsuitable Impervious
- Unsuitable Soil
- Water

12

Key Findings

- ▶ TCA Results
- ▶ Planting Prioritization
- ▶ Ecosystem benefits

Findings of this Study

Land Cover Classes (including water)

2%
3%
0.5%
5%
33%
57%
0.02%

Urban Tree Canopy Potential Classes

4%
13%
5%
45%
34%

Commerce City has an overall tree canopy of **3.8%**

- Tree Canopy Over Pervious (3%)
- Tree Canopy Over Impervious (0.5%)
- Non-Canopy Vegetation (57%)
- Shrub/Scrub (0.02%)
- Impervious (33%)
- Soil & Dry Vegetation (5%)
- Water (2%)

- UTC (4%)
- Unsuitable Vegetation (13%)
- Total Potential Planting Area (45%)
- Unsuitable Soil (5%)
- Unsuitable Impervious (34%)

Key Findings - 2) Rights-of-Way (ROW)

- ▶ Provide 165 acres of canopy and 1,263 acres of potential planting area, equating to **4% UTC and 32% PPA.**

- ▶ The Derby area features an **above-average 6% canopy** in ROWs and two acres of plantable space along key pedestrian routes.

Urban Tree Canopy and Potential Planting Area in the Derby Neighborhood's Rights-of-Way:

City Parks
Rights-of-Way
Non-Park City Owned Property
Urban Tree Canopy
Potential Planting Area Vegetation
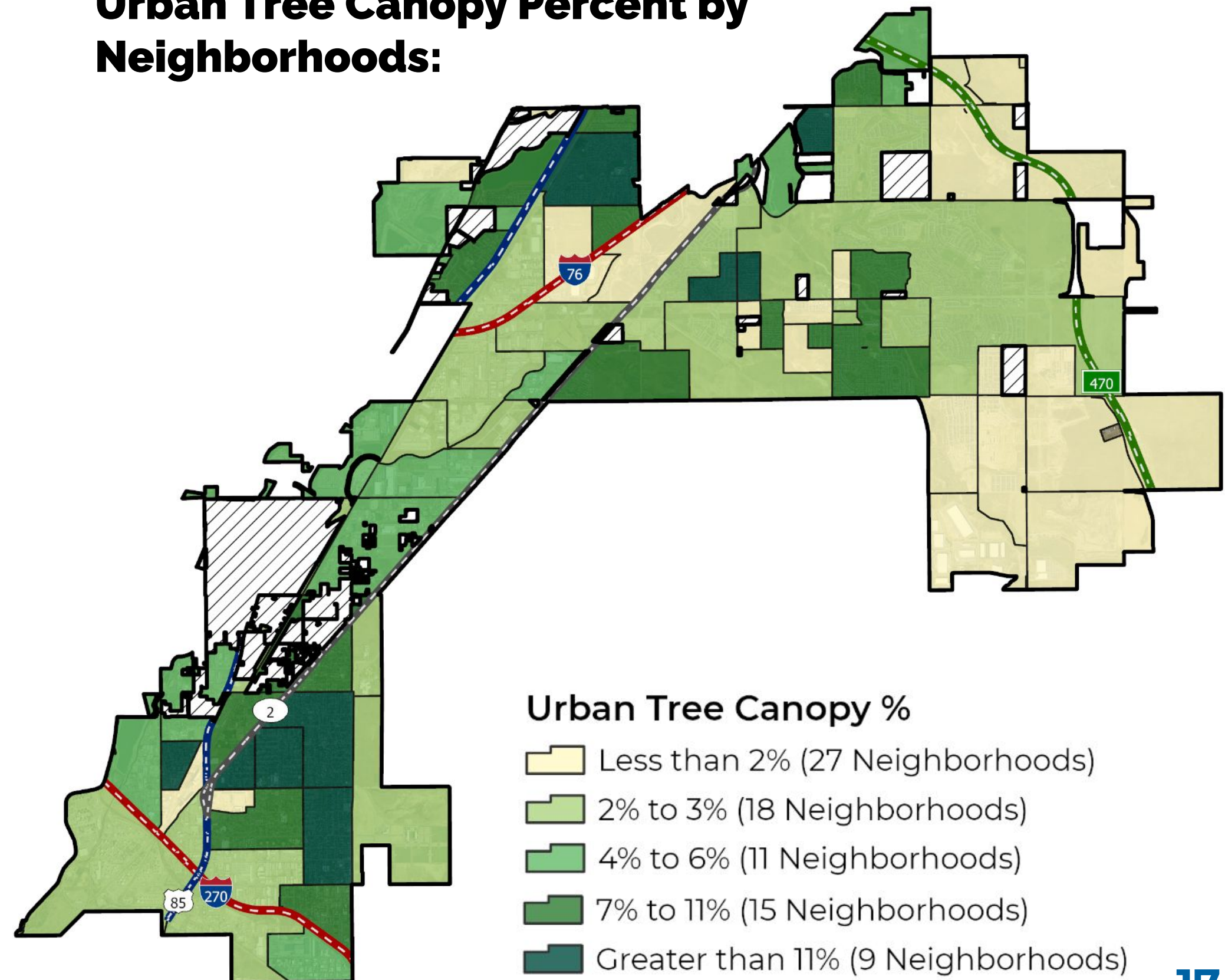
Key Findings - 3) Public vs. Private Property

▶ **Private properties** support 668 acres of tree canopy, accounting for **73% of the city's total canopy.**

▶ **Public properties** (excluding rights-of-way), contribute 75 acres of canopy (**8% of the citywide total**) and offer 1,075 acres of possible planting area, making up 10% of the PPA across the city.

▶ On average, assessed **schools maintain 3% UTC** and 38% PPA, totaling 8 acres of canopy and 97 acres of potential planting space.

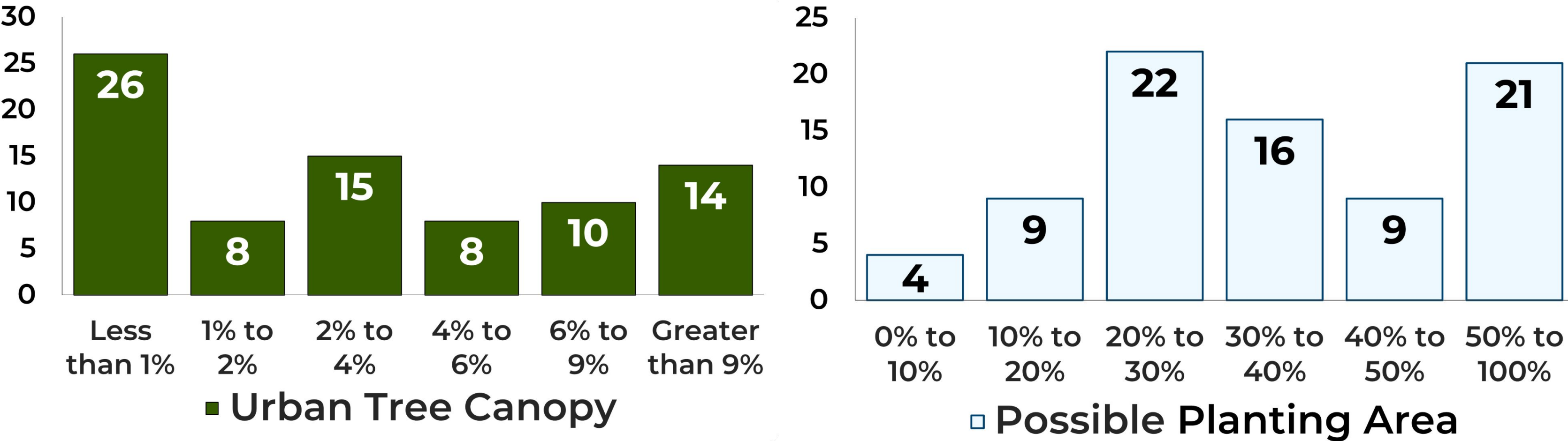| Area	Land Area Distribution Percent	Land Area Acres	Urban Tree Canopy Percent	Possible Planting Area Percent	Impervious Surface Percent
Private	88%	16,612	4%	49%	31%
Public	12%	2,369	3%	45%	11%

Key Findings - 4) Neighborhoods

- Coverage varies widely, ranging **from less than 2%** in 27 neighborhoods to **over 11%** in 9 neighborhoods.

- River Run and Memory Lane Gardens each exceed 17% UTC.

- The Historic Derby Neighborhood has 11% UTC.

- New developments on the eastern portion of the city have very low canopy cover (some **less than 1%**).

Urban Tree Canopy Percent by Neighborhoods:

Urban Tree Canopy %
- Less than 2% (27 Neighborhoods)
- 2% to 3% (18 Neighborhoods)
- 4% to 6% (11 Neighborhoods)
- 7% to 11% (15 Neighborhoods)
- Greater than 11% (9 Neighborhoods)

Key Findings - 4) Neighborhoods

Neighborhood Urban Tree Canopy and Possible Planting Area Percent Ranges:

Urban Tree Canopy chart:
- Less than 1%: 26
- 1% to 2%: 8
- 2% to 4%: 15
- 4% to 6%: 8
- 6% to 9%: 10
- Greater than 9%: 14

■ Urban Tree Canopy

Possible Planting Area chart:
- 0% to 10%: 4
- 10% to 20%: 9
- 20% to 30%: 22
- 30% to 40%: 16
- 40% to 50%: 9
- 50% to 100%: 21

□ Possible Planting Area

Key Findings - Ecosystem Benefits

MENTAL HEALTH
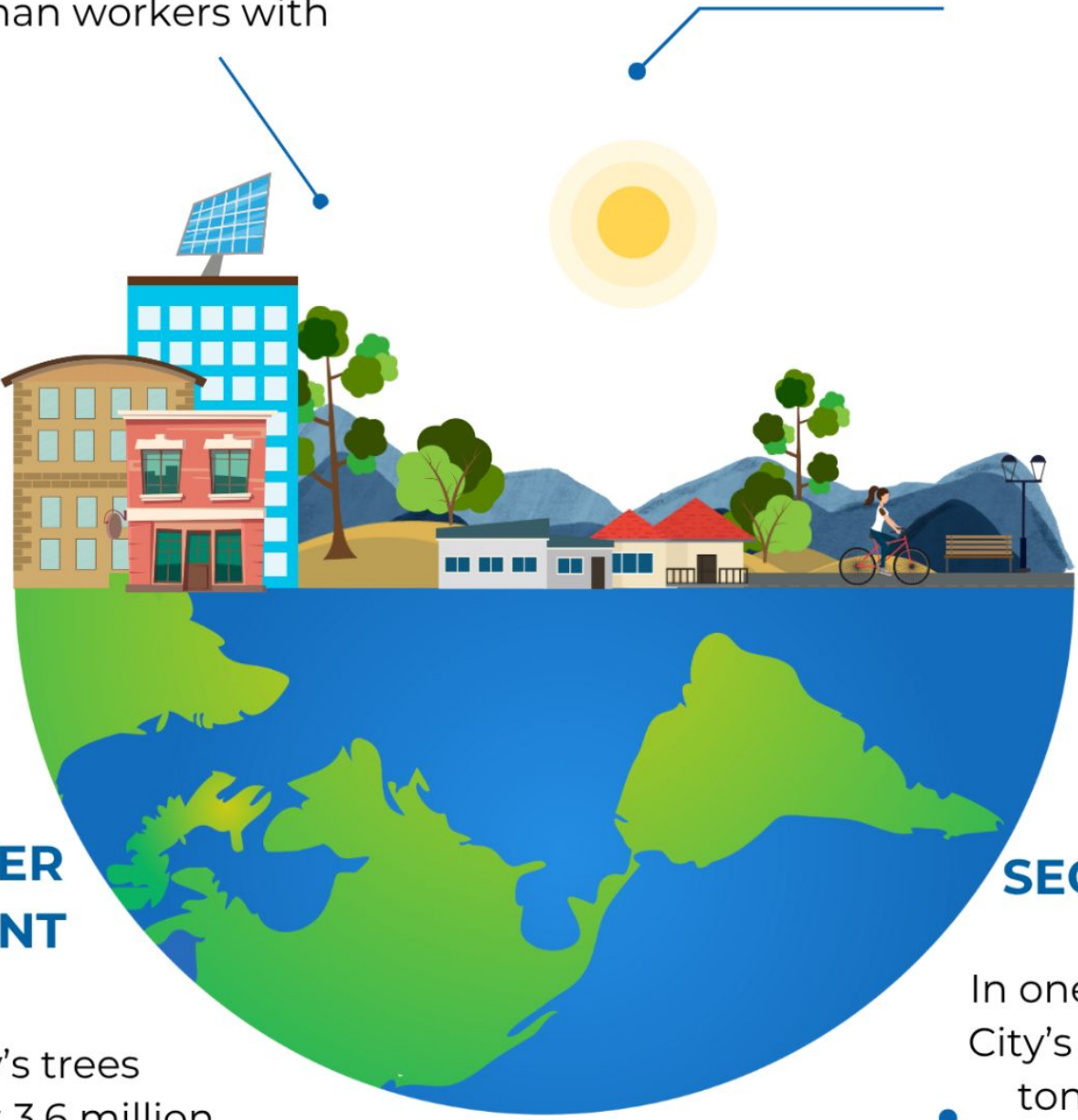People without views of nature from their desks claimed 23% more sick days than workers with views of nature.

TOTAL ANNUAL BENEFITS
Commerce City's trees annually provide **$421,188** in ecosystem benefits.
That equates to approximately $458 per acre of canopy.

CLEANER AIR
$16,096
Each year, Commerce City's trees remove 27 tons of particulate matter from the air.

CARBON STORAGE
$13,436,603
Commerce City's trees store 113,854 tons of CO_2.

STORMWATER MANAGEMENT
$32,627
Commerce City's trees intercept about 3.6 million gallons of runoff annually.

CARBON SEQUESTRATION
$372,466
In one year, Commerce City's trees absorb 3,156 tons of CO_2 from the atmosphere.

Values derived from the i-Tree Landscape tool and were refined using high-resolution 2023 canopy data. 19

Key Findings - 4) Neighborhoods

- Tree canopy patterns reflect both current concentrations and the age of neighborhoods.

- Newer **northern and eastern areas have lower canopy cover due to young trees that will mature over time.**

- Older **southern and central neighborhoods have mature trees nearing the end of their life cycles.**

- Balanced investment is needed to grow canopy in new areas and sustain it in older ones.

Urban Tree Canopy and Possible Planting Area within Three Commerce City Neighborhoods:

River Oaks

Reunion

Aspen Hills

City Parks
Non-Park City Owned Property
Urban Tree Canopy
Potential Planting Area Vegetation

Planting Prioritization

▶ Tree equity

▶ Socioeconomic, environmental, and climate driven factors

UTC Findings for Census Block Groups (CBGs)

▶ Of the 38 CBGs, **27 had a tree canopy percentage above the citywide average of 3.8%**. The remaining **11 block groups fell below this average**, comprising 64% of the city-wide area and thus lowering the average urban tree canopy.

▶ Sixteen block groups had over 30% of their area designated as plantable space, accounting for 80% of the citywide total. **However, available space is not the only factor to consider when planning opportunities to expand the tree canopy.**

▶ CBGs can be readily linked to demographic and socioeconomic data from the American Community Survey (ACS). Twelve planting prioritization variables were normalized and assigned equal weight, and the final score for each CBG was calculated by summing the normalized values for that CBG.

Planting Prioritization - Equity Analysis Criteria

Low Existing Tree Canopy: CBGs with less tree cover and more open land are prioritized for planting.

Possible Urban Tree Canopy: CBGs with more plantable space are prioritized for canopy expansion.

Poverty Rate: CBGs with more residents below the poverty line are prioritized to increase equitable benefits.

Unemployment Rate: CBGs with higher unemployment are prioritized to create planting opportunities.

Vulnerable Populations: CBGs with more residents under 18 or over 65 are prioritized to support vulnerable groups.

Median Household Income: CBGs with lower incomes are prioritized to address environmental inequality.

Educational Attainment: CBGs with fewer residents holding a high school diploma or GED are prioritized to improve outcomes.

Urban Heat Island: CBGs with higher surface temperatures are prioritized to reduce heat impacts.

Stormwater Mitigation Potential: CBGs with more plantable space near impervious surfaces and water bodies are prioritized to manage runoff.

Colorado EnviroScreen Score: CBGs with higher scores, indicating greater environmental and health burdens, are prioritized to advance environmental justice.
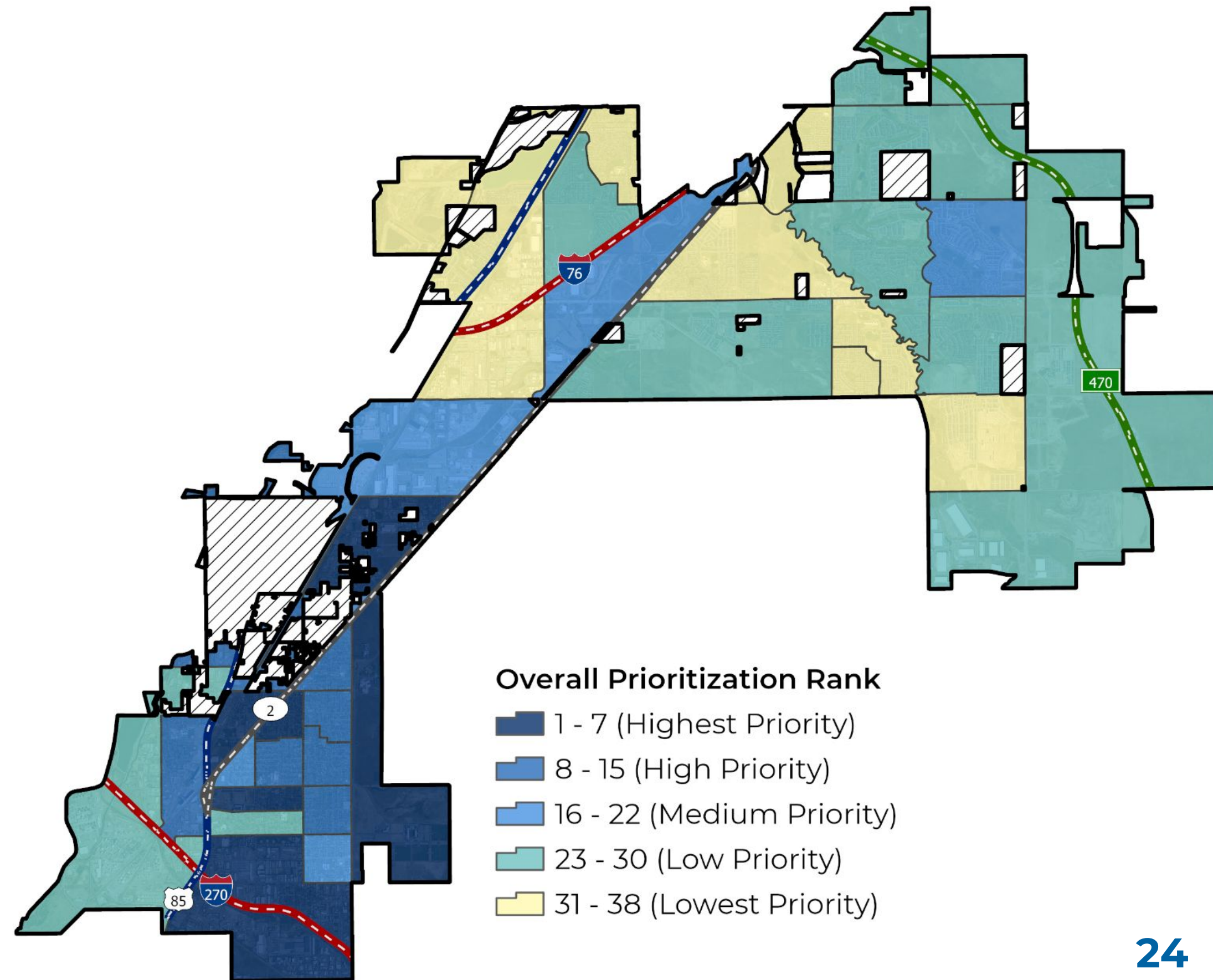
Soil Quality (K-Factor): CBGs with lower K-factor soils (less erosion-prone) are prioritized for better tree survival.

Soil Quality (Hydrologic Soil Group): CBGs with well-draining soils (Groups A & B) are prioritized for healthy root growth.

Planting Prioritization - Overall score

▶ Commerce City's **highest-priority areas** for tree planting are concentrated in the **southern and central portions of the city.**

▶ Actual site selection should also weigh factors such as community readiness, utility conflicts, stewardship capacity, and alignment with wider city programs.
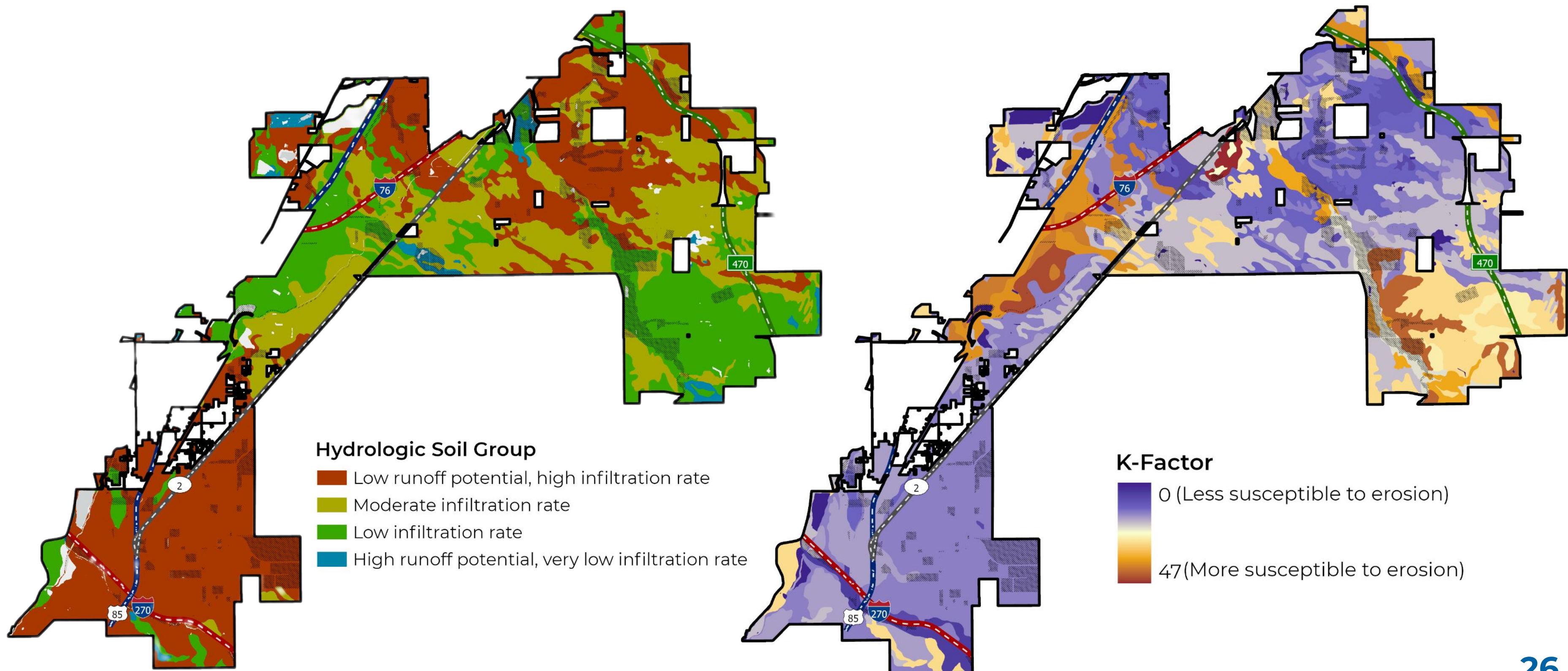

Overall Prioritization Rank
- 1 - 7 (Highest Priority)
- 8 - 15 (High Priority)
- 16 - 22 (Medium Priority)
- 23 - 30 (Low Priority)
- 31 - 38 (Lowest Priority)

Planting Prioritization - Planting Limitations

Soil Quality in Commerce City

▶ Commerce City's soils are mainly Aridisols (**dry, compact southern/eastern areas**) and Mollisols (**more fertile northern/western areas but still prone to compaction**).

▶ Most soils fall into Hydrologic Soil Group D, meaning they **drain poorly and make tree growth difficult**.

▶ K-factor levels vary across the city, with some areas more vulnerable to erosion during storms.

▶ **Expanding tree canopy will require soil improvements and treatments before tree planting, careful species selection, irrigation, and long-term soil management to ensure trees thrive.**

25

Planting Prioritization - Planting Limitations

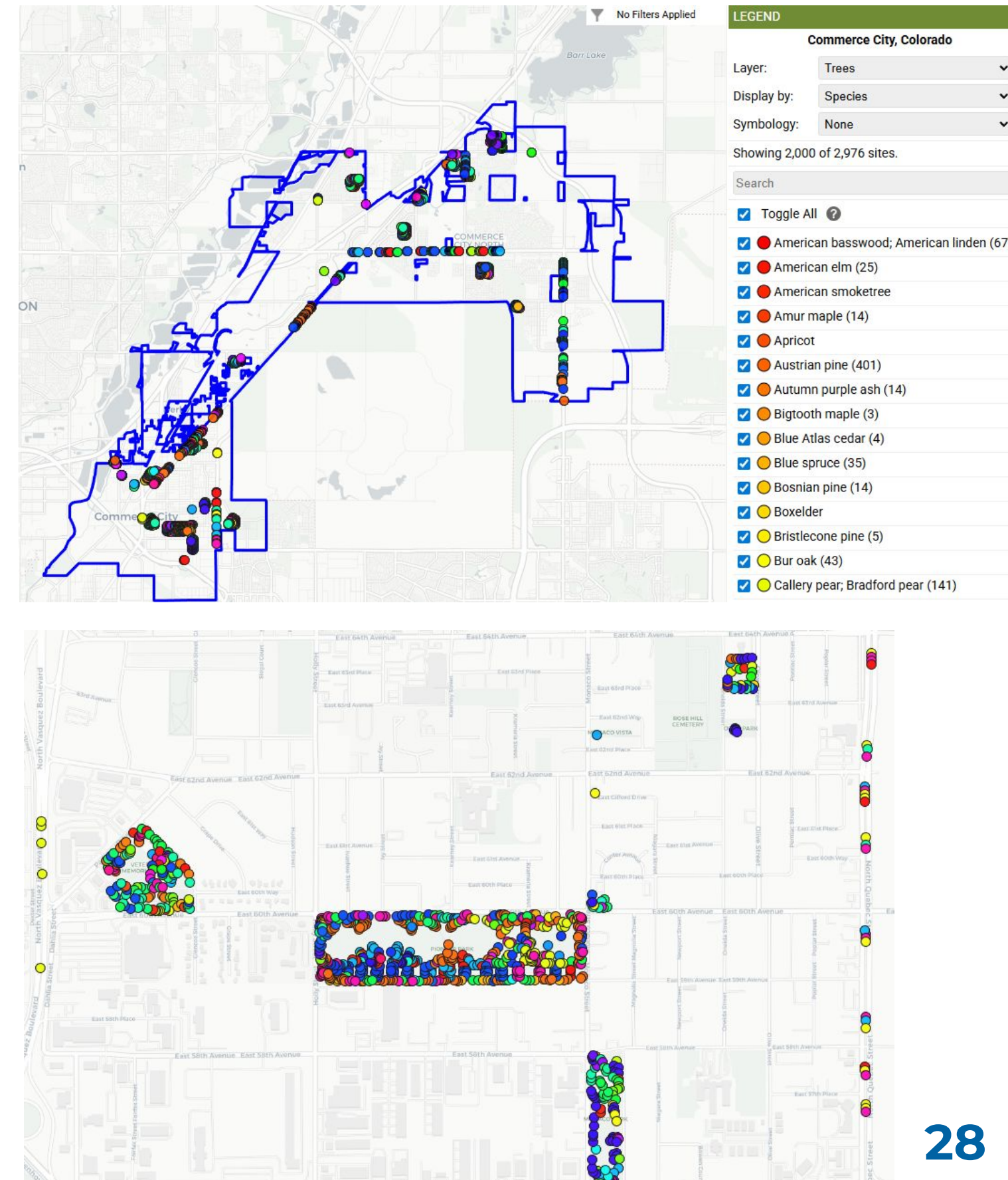**Distribution of Hydrological Soil Group and Soil K-Factor:**

Hydrologic Soil Group
- Low runoff potential, high infiltration rate
- Moderate infiltration rate
- Low infiltration rate
- High runoff potential, very low infiltration rate

K-Factor
- 0 (Less susceptible to erosion)
- 47 (More susceptible to erosion)

Recommendations

▶ Next steps for Commerce City's urban forest

Recommendations

▶ Partnering with CU Boulder's Masters of the Environment program in 2025, the city **assessed nearly 950 existing trees** and identified 139 high-priority planting sites **in a disproportionately impacted neighborhood**.

▶ A complementary citywide **public tree inventory (about 4,000 trees)** led by Public Works and PlanIT Geo will finish in 2026, giving Commerce City a complete picture of both public and private urban forests.

Recommendations

- **Grow Shade Where It's Needed Most:** Prioritize tree planting in underserved southern and central neighborhoods and increasing canopy in new developments, focusing on community spaces and providing bilingual outreach to advance equity and public health.

- **Make Trees Part of City Policy and Planning:** Embed canopy goals in planning documents, set annual planting targets, update codes to support greening, and launch pilot "early action" projects to demonstrate impact.

- **Engage the Community:** Since most of the city's UTC is on private property, residents play a crucial role. Expanding events, education, and tools that empower community members to plant, care for, and track trees can be enhanced through public-private partnerships. These collaborations can help overcome local government constraints.

- **Enhance Irrigation & Water Efficiency:** Improve and modernize irrigation systems, targeting hot, dry areas; use data-driven mapping, sensor technology, and partnerships for efficient water use. Invest in soils amendments to treat sites before they're planted.

ADA Accessible Tree Canopy Assessment Report coming soon! Detailed data and more recommendations shared

Urban Tree Canopy

Assessment

Commerce City, Colorado
January | 2026

Commerce CITY

PlanIT Geo
developers of TreePlotter

Questions & Answers

Commerce City, Colorado | Tree Canopy Assessment | 2026

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