

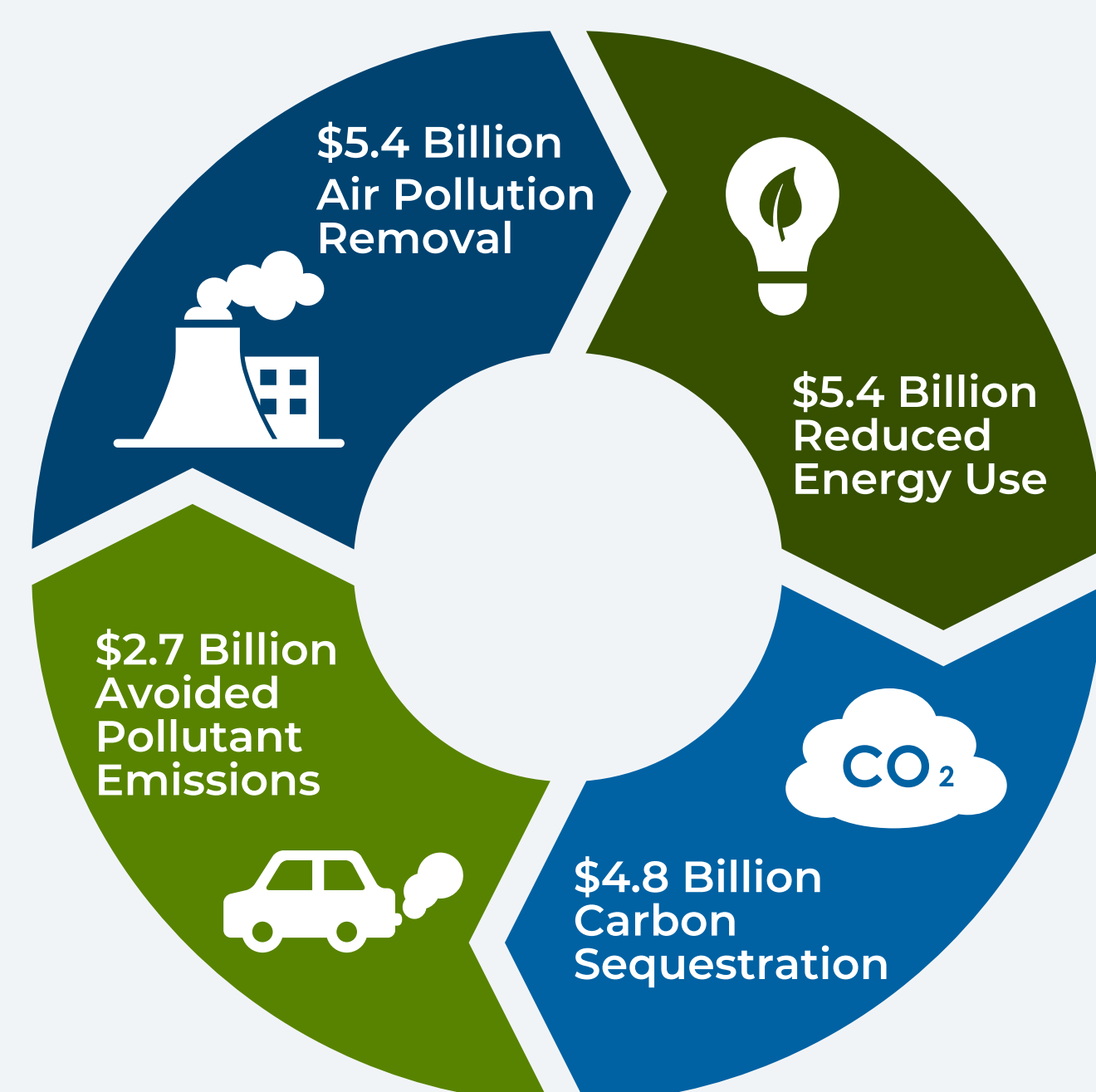


## URBAN FOREST VALUE

The sustainability and livability of our cities is inextricably linked to the urban forest. The 5.5 billion trees that make up America's urban forests account for just 19% of the forested land in the country but they have an outsized influence on the social, environmental, and economic success of communities.

### \$18.3 BILLION IN ECOSYSTEM BENEFITS

Created by US urban forests annually



\*Nowak, David J; Greenfield, Eric J. 2018. US Urban Forest Statistics, Values, and Projections. Journal of Forestry, 116(2): 164-177. <https://doi.org/10.1093/jofore/fvx004>

With over 80% of the US population living in urban areas, the management and preservation of urban forests is integral to ensuring equitable access to nature for a vast majority of the country. The trees that shade our urban parks and line our streets are essential infrastructure and they offer profound benefits.



SATELLITE IMAGERY    NEAR-INFRARED IMAGERY    LIDAR DATA    TREE CANOPY IDENTIFICATION

## WHY WE MEASURE URBAN TREE CANOPY

Measuring urban tree canopy is one of the best methods for capturing the complex distribution and benefits of an urban forest within a single metric. Since most of the benefits of trees are causally linked to a healthy spread of leaves and branches, canopy cover data can be used to estimate the dollar value of ecosystem services being created. Additionally, urban tree canopy assessments are excellent for tracking large-scale trends, setting canopy goals, and measuring the effectiveness of forest management strategies and planting initiatives.

## TREE EQUITY

In most cities, a **map of the urban tree canopy can also function as a map of race and wealth.** The benefits of a healthy urban forest should be available to all residents, but far too often the neighborhoods that could benefit the most from greenspace and urban trees have the least. With tree canopy data in hand, public departments and nonprofits can target their planting initiatives to the areas that will have the greatest impact.

## HOW ARTIFICIAL INTELLIGENCE IS CHANGING TREE CANOPY ASSESSMENTS

There are multiple methods for completing an urban tree canopy assessment that vary in scope, cost, and data output. The most accurate canopy assessments use remote sensing technology and high-resolution imagery and elevation datasets (LiDAR) to create detailed land cover data. These data inform all other aspects of the project by categorizing a given landscape into specific classes such as tree canopy, other non-canopy vegetation, impervious or hardscape, bare soil, or water.

“In a smaller municipality with tighter operating budgets, there is little opportunity to fund traditional large scale canopy assessments, and the updates PlanIT Geo made to TreePlotter CANOPY opened up a new opportunity to make that goal happen.”

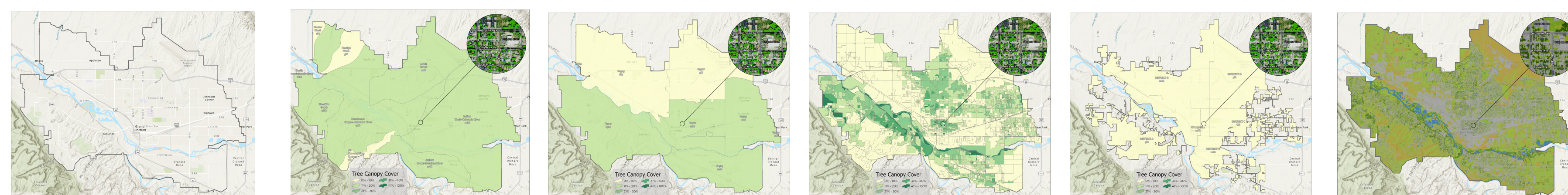
-Rob Davis, City Forester, Grand Junction

Historically, obtaining this type of tree canopy analysis is a lengthy process, requiring contracting a specialized company, lots of meetings, and special budgeting to absorb the large cost every 5 to 10 years. However, using artificial intelligence and machine learning, PlanIT Geo and Earth Define have made canopy assessments dramatically faster and less expensive with existing 60cm national data. Through an ongoing subscription with built-in data updates, the City will always have a pulse on its tree canopy.

## URBAN TREE CANOPY IN GRAND JUNCTION, COLORADO

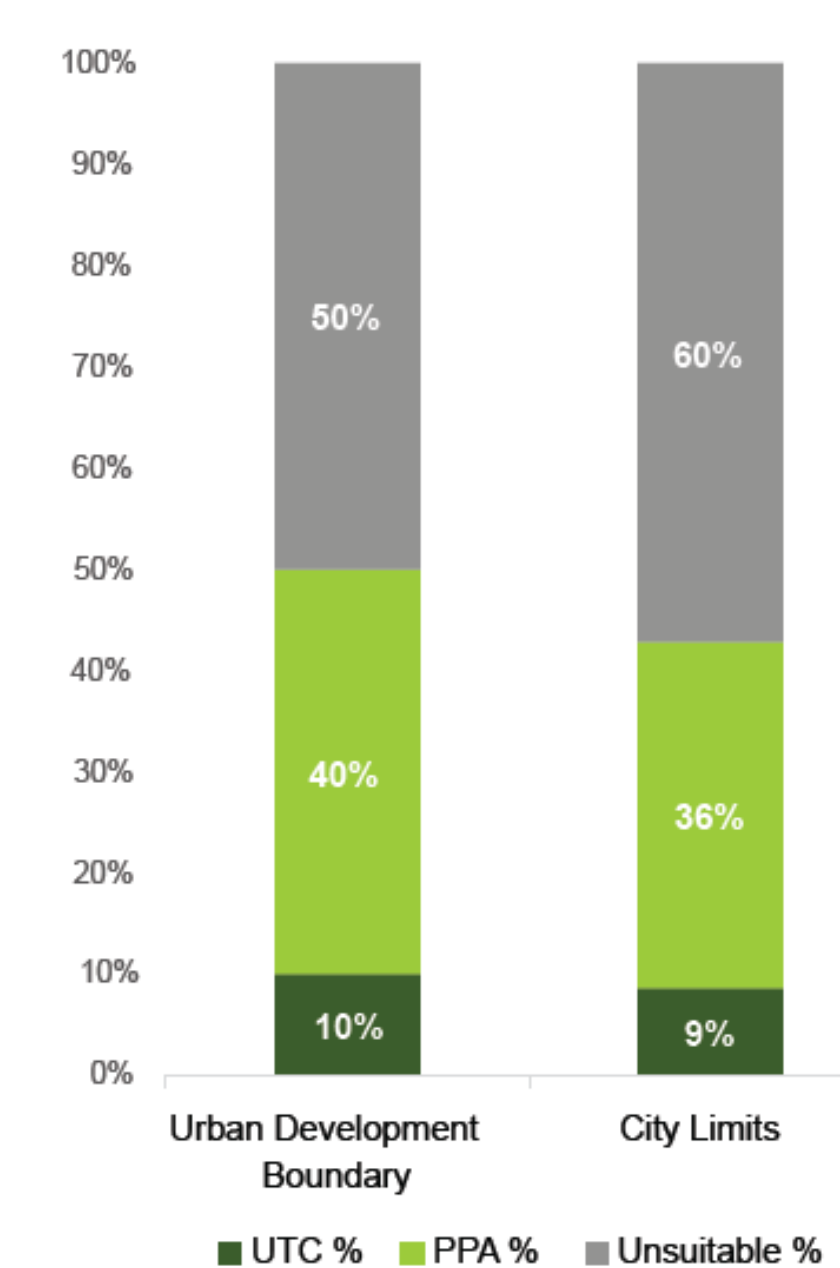
Grand Junction is in the arid intermountain west climate. The City has a well-established urban forestry program and has been a Tree City USA for 37 consecutive years. Thanks to advances in canopy assessment technology, the city was able to get their first tree canopy analysis completed this year. The assessment analyzed existing urban tree canopy (UTC), possible planting area (PPA), and areas unsuitable for planting.

This data was evaluated at multiple spatial scales, such as watersheds, council districts, and census blocks. Each boundary provides unique insights on how the tree canopy is distributed. This assessment evaluated change between 2011 and 2019. In 2019, Grand Junction had 11% urban tree canopy within the urban development boundary, up from 7% in 2011. The majority of The City's canopy is on residential property, where the largest gains occurred.



Base Map    Watersheds    Zip Codes    Census Blocks    Council Districts    Land Cover

### UTC POTENTIAL



### EXISTING UTC BY LAND USE

Land Use	Urban Tree Canopy			
	Acres	%	Dist.	Change %
Agricultural	441	5%	9%	1%
Airport/Industrial	54	1%	1%	1%
Commercial	59	4%	1%	2%
Manufactured Homes	65	18%	1%	4%
Multi-Family	47	14%	1%	4%
Office	85	7%	2%	3%
Open Space	496	18%	10%	7%
Parks	135	8%	3%	3%
Right-of-Way	544	9%	12%	3%
Schools	24	5%	1%	1%
Single-Family Attached	68	16%	1%	8%
Single-Family Detached	2,699	19%	57%	6%
Utilities	11	2%	0%	1%
<b>Totals</b>	<b>4,728</b>	<b>11%</b>	<b>100%</b>	<b>34%</b>

## PUTTING THE DATA TO USE

With this canopy data, the Grand Junction Forestry Division is educating leadership across city departments on the true value of tree canopy, and the impacts of development, pests/diseases, and water conservation on canopy. They are also utilizing the data for public outreach campaigns and to help justify changes to municipal code, influence development policies, and help drive future comprehensive plans.