

URBAN HEAT AND SHADE



2



Which areas are more susceptible to impacts of heat and sun?

URBAN HEAT AND SHADE

Tree Canopy Coverage

The Tree Canopy Coverage Map (Map 12) uses census tracts to provide an evaluation of tree and shade coverage in Tempe.¹

Most of Tempe's tree canopy coverage is between 5 and 13 percent. Areas with a higher percentage of coverage include Arizona State University, the neighborhood north of Scudder Park and southern Tempe.

Tree Equity Score

The tree equity score (TES) (Map 11) evaluates the tree canopy coverage in the City of Tempe and relates it to community composition factors. The Tree Equity Score was developed from a separate city study and creates a composite map with socioeconomic and demographic data and tree canopy coverage to understand equity in canopy coverage at a neighborhood scale. The TES shows each Census Block Group with a score from 0 to 100. 0 represents the lowest tree equity score and 100 the highest. More information can be found on the [Tree Equity Score methodology page](#).²

Most of Tempe has a tree equity score between 40 and 89. The areas surrounding Arizona State University, the neighborhood north of Scudder Park and southern Tempe have the highest tree equity score.



Tempe Canopy Cover

Percent coverage

- 5 to 9 percent Lowest Canopy Coverage
- 9 to 13 percent
- 13 to 17 percent
- 17 to 20 percent
- 20 to 25 percent Highest Canopy Coverage

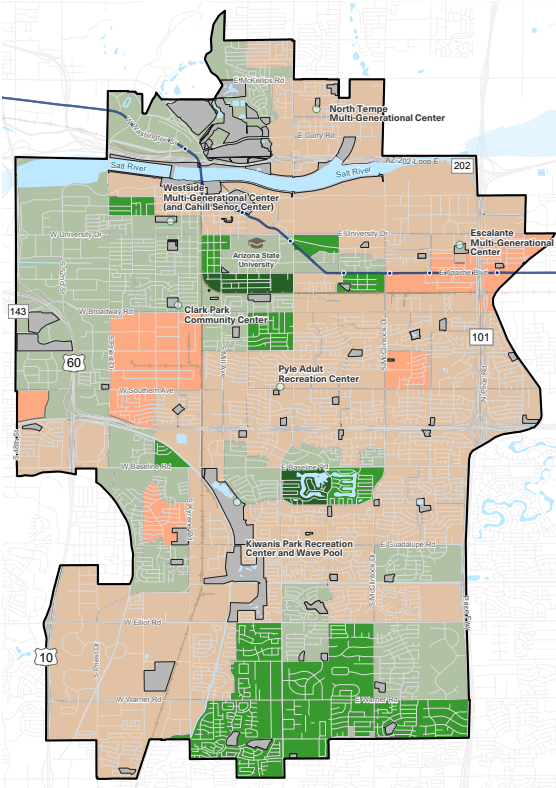
Legend

- City Tree Inventory*
- Tempe Parks and Recreation
- Recreation Centers
- Valley Metro Light Rail Stations
- Valley Metro Rail Line
- City of Tempe
- Arizona State University

*Includes city parks, street right-of-ways and municipally owned and managed facilities.

Map 11 Tree Equity Score Map

Source: Tree Equity Score <https://treeequityscore.org/>, City of Tempe GIS Data

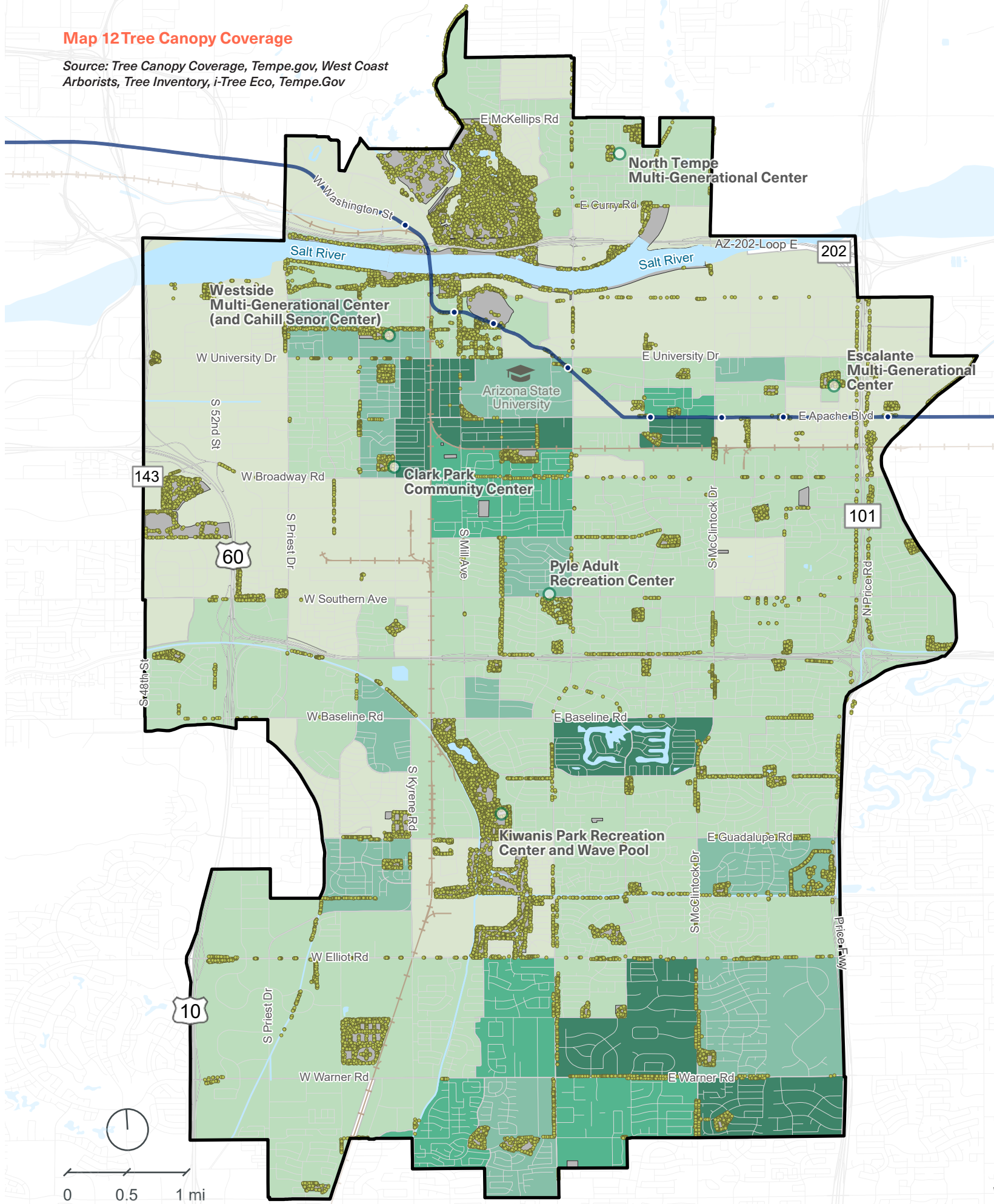


Tree Equity Score

- 40-63 Lowest tree canopy cover score
- 64-79
- 80-89
- 90-99
- 100 Highest tree canopy cover score

Map 12 Tree Canopy Coverage

Source: Tree Canopy Coverage, Tempe.gov, West Coast Arborists, Tree Inventory, i-Tree Eco, Tempe.Gov



1 <https://tempe-urban-forest-tempegov.hub.arcgis.com/>
2 <https://treeequityscore.org/>

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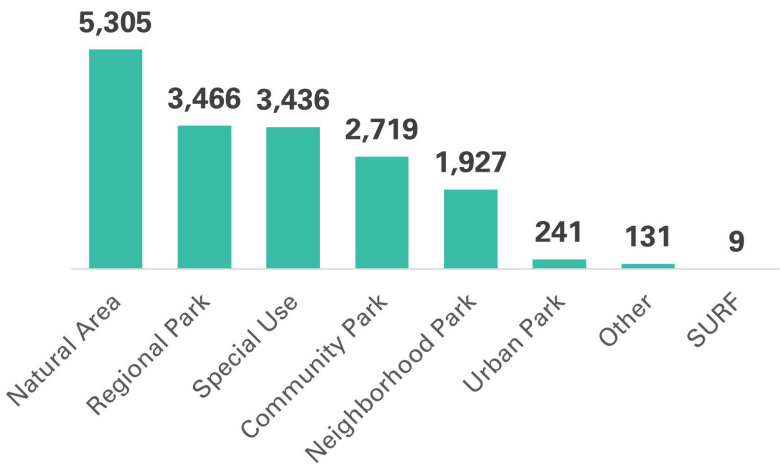


City Tree Coverage in Equity Zones Analysis

The Tree Coverage in Equity Zones Map (Map 13) looks at the relationship between the tree point data and parks in Equity Zones to determine if there are potential gaps.

The tree coverage in Equity Zones is determined by clipping the tree inventory point data to Tempe parks and recreation spaces. A 150 foot buffer around the parks is used to help capture city trees within parks and adjacent to right-of-ways. There are 26,264 city tree inventory points included in the city tree inventory. There are 17,234 tree inventory points within the 150 foot park buffer of parks (66% of trees within the inventory are within or adjacent to Tempe's parks). Natural areas have the most parks and urban parks the least.

Number of City Tree Inventory Points per Park Classification



Number of Existing Trees Per Acre

The tree point data is divided by the acres of each park (Table 6) to account for differences in park size. This allows for a more fair comparison of tree coverage.

Rating scale for Number of Existing Trees Per Acre

Tree Density Per Park Scale:

- No Trees: 0
- Very Low: ≤ 8
- Low: 8 to 13
- Medium: 13 to 30
- High: 30 to 100
- Very High: ≥ 100

Map 13 Tree Coverage in Equity Zones

Source: Design Workshop analysis, Tree Canopy Coverage, Tempe.gov, West Coast Arborists, Tree Inventory, i-Tree Eco, Tempe.Gov

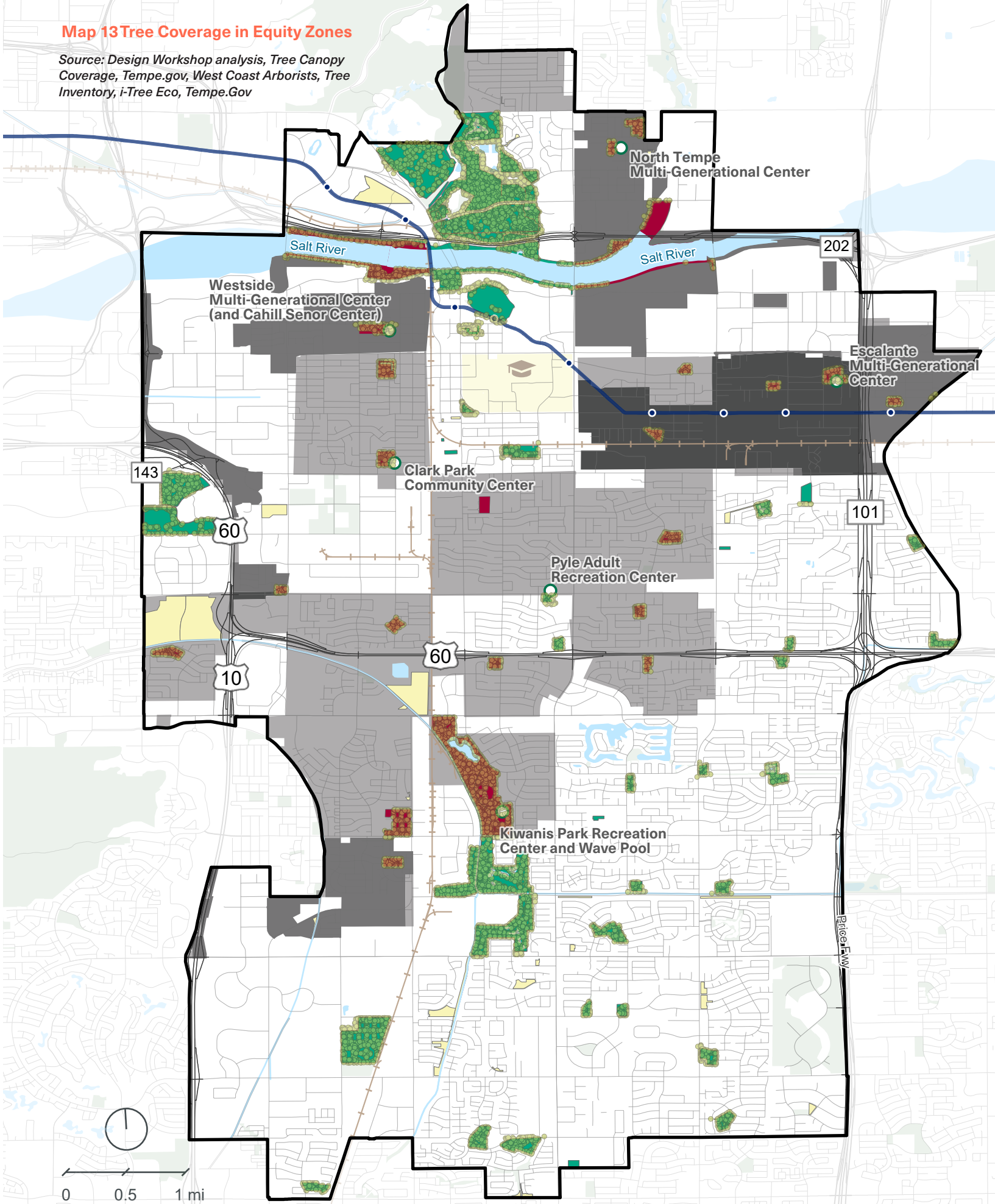




Table 6 Rating scale for Number of Existing Trees Per Acre

Name	Area Acres	Tree Inventory Points	Tree Per Acre	Score
Alegre Park	3.16	23	7.26	Very Low
Arredondo Park	3.53	69	19.55	Medium
Benedict Sports Complex	20.31	149	7.33	Very Low
Birchett Park	1.95	100	51.21	High
Campbell Park	6.51	81	12.44	Low
Celaya Park	5.73	105	18.33	Medium
Clark Park	9.13	110	12.05	Low
Cole Park	3.46	79	22.82	Medium
Connolly Middle School	6.44	9	1.40	Very Low
Corbell Park	13.85	104	7.51	Very Low
Corona del Sol High	2.48	0	0.00	None
Creamery Park	3.21	39	12.15	Low
Daley Park	14.07	290	20.60	Medium
Daumler Park	4.45	104	23.36	Medium
Diablo Stadium Complex	58.94	216	3.66	Very Low
Double Butte Cemetery	38.27	654	17.09	Medium
Dwight Park	5.49	58	10.56	Low
Ehrhardt Park	6.74	132	19.58	Medium
Escalante Park	9.62	206	21.41	Medium
Esquer Park	3.29	98	29.77	Medium
Estrada Park	7.58	185	24.40	Medium
Evelyn Hallman Park	37.09	661	17.82	Medium
Gaicki Park	2.87	66	23.03	Medium
Goodwin Park	7.68	127	16.54	Medium
Hanger Park	15.32	148	9.66	Low
Hayden Butte Preserve	42.28	156	3.69	Very Low
Hollis Park	4.20	104	24.77	Medium
Indian Bend Park	7.22	184	25.50	Medium
Indian Bend Wash Habitat	23.78	70	2.94	Very Low
Jaycee Park	11.29	209	18.50	Medium
Joyce Park	3.99	66	16.54	Medium
Ken McDonald Golf Course	153.57	1152	7.50	Very Low
Kiwanis Park	124.61	1900	15.01	Medium
Marcos de Niza High	1.40	0	0.00	None



Name	Area Acres	Tree Inventory Points	Tree Per Acre	Score
Mary and Moses Green Park	11.80	129	10.93	Low
McClintock High School	1.11	0	0.00	None
McKemy Middle School	6.11	0	0.00	None
Meyer Park	7.54	152	20.15	Medium
Michelle Brooks-Totress Park	4.05	51	12.61	Low
Mitchell Park	8.05	159	19.74	Medium
Moeur Park	7.95	448	27.49	Medium
Northside Multi-Gen	3.36	69	20.51	Medium
Optimist Park	10.21	109	10.67	Low
Palmer Park	4.33	77	17.80	Medium
Papago Park	8.31	551	40.06	High
Papago Preserve	1.32	3970	16.96	Medium
Parque de Soza	4.35	68	15.62	Medium
Peterson Park	2.85	73	25.62	Medium
Plazita de Descanso	0.15	18	116.15	Very High
Pyle Adult Recreation	2.25	62	27.55	Medium
Ragsdale-MLK Park	1.76	184	104.23	Very High
Rio - Arts Park	22.56	458	20.30	Medium
Rio - Giuliano Park	12.96	0	0.00	None
Rio - Marina	15.88	97	6.11	Very Low
Rio - Tempe Beach Park	18.66	223	11.95	Low
Rio Salado Park (Including Tempe Town Lake and non-named areas)	10.79	788	2.43	Very Low
Rolling Hills Golf Course	95.42	290	3.04	Very Low
Rotary Park	2.98	68	22.82	Medium
Scudder Park	3.66	86	23.52	Medium
Selleh Park	6.46	114	17.65	Medium
Stroud Park	5.63	97	17.22	Medium
Svob Park	7.54	171	22.69	Medium
Tempe High School	1.54	0	0.00	None
Tempe Sports Complex	60.16	627	10.42	Low
Tempe Woman's Club Park	4.50	333	73.89	High
Victory	0.11	15	133.31	Very High
Waggoner Park	3.65	93	11.89	Low

URBAN HEAT AND SHADE

Urban Heat

Urban Heat Severity Map

Map 15 identifies the relative heat severity in Tempe to help determine areas of the city with above average temperatures. The data shows heat severity from the summer months of 2019 to 2020 with a scale of lowest heat score (slightly above the mean for the city) and severe heat area (significantly above the mean).¹

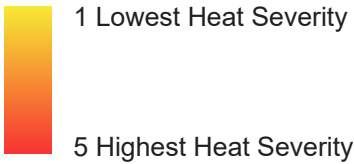
Heat Priority Score (HPS)

Map 14 displays the Heat Priority Score (HPS) in the City of Tempe. The Heat Priority Score was developed from a separate Arizona State University study² that assessed urban heat severity in relationship to areas of high percentages of the population being at most heat-risk (seven socioeconomic and health factors). The map rates census tracts on a scale of 'Very High Heat Risk' to 'Very Low Heat Risk'. The Heat Priority Score map shows almost all of Tempe's western border and the area surrounding ASU as 'High Heat Risk.' The Apache Boulevard corridor and blocks between Broadway Road and Southern Avenue are identified as 'Very High Heat Risk'.



Urban Heat Severity

Percent coverage

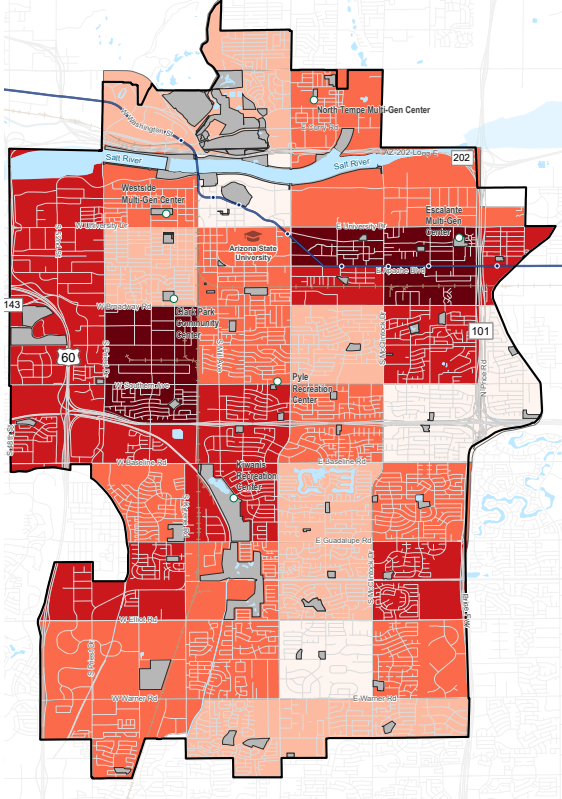


Legend

- Tempe Parks and Recreation
- Recreation Centers
- Valley Metro Light Rail Stations
- Valley Metro Rail Line
- City of Tempe
- Arizona State University

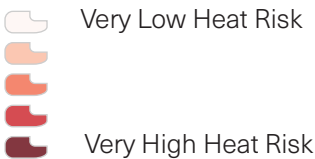
Map 14 Heat Priority Score (HPS)

Source: City of Tempe, ASU Technical Report, Tempe Urban Development II 2020



Heat Priority Score (HPS)

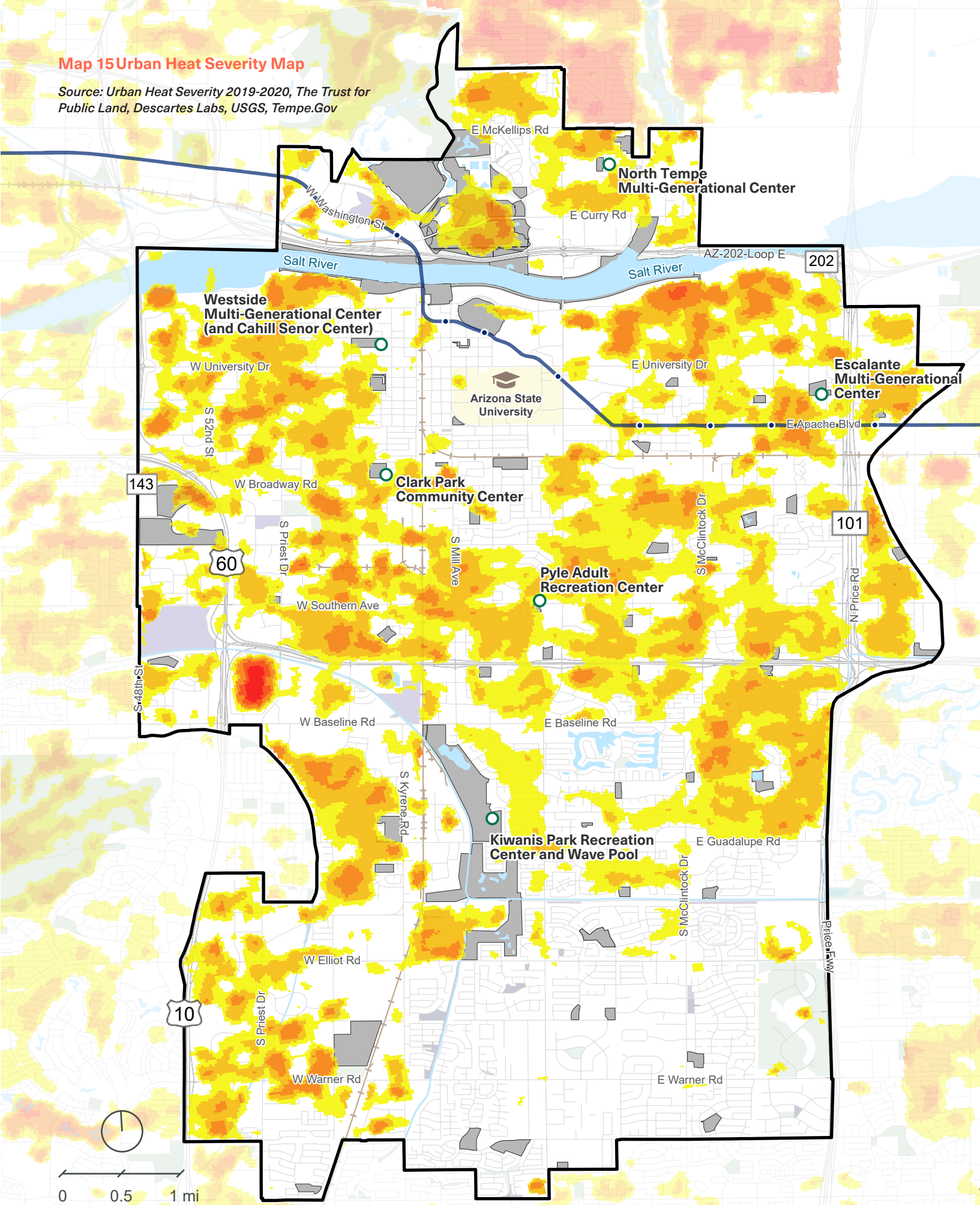
by Census Tract 2015 to 2020



¹ 2022 Trust for Public Land. www.tpl.org
² ASU Technical Report, Tempe Urban Development II 2020, Establishing an Urban Heat Exposure Severity Score for Infrastructure Prioritization in Tempe, Arizona, Using NASA Earth Observations and LiDAR

Map 15 Urban Heat Severity Map

Source: Urban Heat Severity 2019-2020, The Trust for Public Land, Descartes Labs, USGS, Tempe.Gov



URBAN HEAT AND SHADE

Urban Heat in Equity Zones Analysis

The Urban Heat in Equity Zones Map (Map 16) examines the relationship between heat severity and Equity Zones to determine which areas are the most susceptible to urban heat.

The urban heat severity aligns closely with areas of the city with Equity Zones, specifically areas surrounding ASU and downtown Tempe. The southeast corner of Tempe does not have high heat severity and is not within an equity zone.

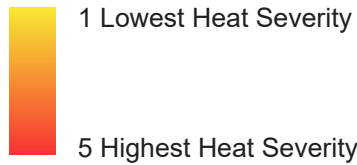


Equity Zones Composite

- Not an Equity Priority Area
- Medium Equity Priority
- High Equity Priority
- Very High Equity Priority

Urban Heat Severity

Percent coverage



Legend

- Tempe Parks and Recreation
- HOA/Private Parks
- Other County Parks and Open Space
- Recreation Centers
- Valley Metro Light Rail Stations
- Valley Metro Rail Line
- City of Tempe
- Arizona State University

Map 16 Urban Heat in Equity Zones

Source: Design Workshop analysis, Urban Heat Severity 2019-2020, The Trust for Public Land, Descartes Labs, USGS, Tempe.Gov

