APPENDICES

A Tree Inventories (Smucker Park & West Wetlands Park)

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Appendices are available for download on the City of Yuma website at
www.yumaaz.gov/community-development/tree-shade-master-plan/tree-and-shade-master-plan

Appendix A

TREE INVENTORIES

Smucker Park & West Wetlands Park

These tree inventories of Smucker Park and the Upper Bench of the West Wetlands Park were conducted by the Department o Forestry & Fire Management (DFFM)'s Arizona Urban Tree Map initiative with assistance from City of Yuma Parks & Recreation staff. The Smucker Park inventory was completed in 2015 and the West Wetlands inventory was completed in 2018.

Yuma Smucker Park
Population Summary of Public Trees
12/11/2015

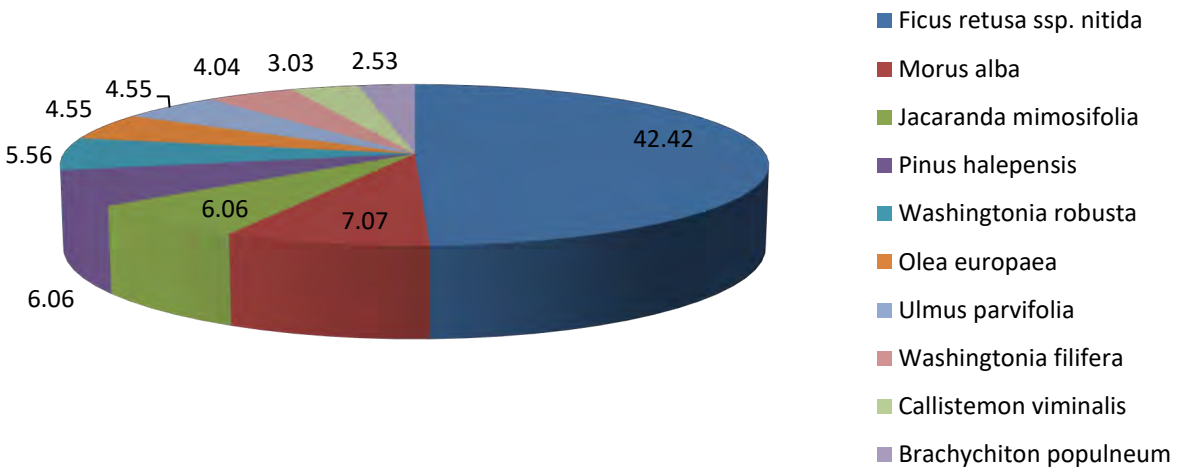
	DBH Class (in)										
Species	0-3	3-6	6-12	12-18	18-24	24-30	30-36	36-42	> 42	Total	SE
Broadleaf Deciduous Large (BDL)											
Fraxinus uhdei		2	0	1	1	0	0	0	0	0	4 (±0)
Gleditsia triacanthos		1	0	0	0	0	0	0	0	0	1 (±0)
Total		**3**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**5 (±0)**
Broadleaf Deciduous Medium (BDM)											
Morus alba		0	0	1	4	5	4	0	0	0	14 (±0)
Jacaranda mimosifolia		1	0	6	4	1	0	0	0	0	12 (±0)
Ulmus parvifolia		1	0	6	2	0	0	0	0	0	9 (±0)
Total		**2**	**0**	**13**	**10**	**6**	**4**	**0**	**0**	**0**	**35 (±0)**
Broadleaf Deciduous Small (BDS)											
Acacia farnesiana		0	0	1	1	0	0	0	0	0	2 (±0)
Bauhinia variegata		1	1	0	0	0	0	0	0	0	2 (±0)
Total		**1**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**4 (±0)**
Broadleaf Evergreen Large (BEL)											
Eucalyptus camaldulensis		0	0	0	0	0	0	1	0	0	1 (±0)
Eucalyptus species		0	0	0	0	1	0	0	0	0	1 (±0)
Eucalyptus polyanthemos		0	0	0	0	1	0	0	0	0	1 (±0)
Eucalyptus leucoxylon		0	0	0	1	0	0	0	0	0	1 (±0)
Grevillea robusta		0	0	1	0	0	0	0	0	0	1 (±0)
Total		**0**	**0**	**1**	**1**	**2**	**0**	**1**	**0**	**0**	**5 (±0)**
Broadleaf Evergreen Medium (BEM)											
Ficus retusa ssp. nitida		0	0	6	31	41	5	0	0	1	84 (±0)
Brachychiton populneum		0	0	4	1	0	0	0	0	0	5 (±0)
Ceiba pentandra		1	0	0	0	0	0	0	0	0	1 (±0)
Eucalyptus torquata		0	0	0	1	0	0	0	0	0	1 (±0)
Total		**1**	**0**	**10**	**33**	**41**	**5**	**0**	**0**	**1**	**91 (±0)**
Broadleaf Evergreen Small (BES)											
Olea europaea		0	0	2	7	0	0	0	0	0	9 (±0)
Callistemon viminalis		0	0	2	4	0	0	0	0	0	6 (±0)
Rhus lancea		0	0	3	1	0	0	0	0	0	4 (±0)
Schinus terebinthifolius		0	0	2	1	0	0	0	0	0	3 (±0)
Ligustrum lucidum		1	0	0	1	0	1	0	0	0	3 (±0)
Ficus microcarpa		0	0	1	0	0	0	0	0	0	1 (±0)
Total		**1**	**0**	**10**	**14**	**0**	**1**	**0**	**0**	**0**	**26 (±0)**
Conifer Evergreen Large (CEL)											
Pinus halepensis		0	0	0	0	3	6	2	0	1	12 (±0)
Cupressus sempervirens		0	0	0	1	0	0	0	0	0	1 (±0)
Total		**0**	**0**	**0**	**1**	**3**	**6**	**2**	**0**	**1**	**13 (±0)**
Palm Evergreen Small (PES)											
Washingtonia robusta		0	0	0	10	1	0	0	0	0	11 (±0)
Washingtonia filifera		0	0	0	0	1	6	1	0	0	8 (±0)
Total		**0**	**0**	**0**	**10**	**2**	**6**	**1**	**0**	**0**	**19 (±0)**
Grand Total		**8**	**1**	**36**	**71**	**54**	**22**	**4**	**0**	**2**	**198 (±0)**

Yuma

Species Distribution of Public Trees for Ray Smucker Park

12/11/2015

Species	Percent
Ficus retusa ssp. nitida	42.42
Morus alba	7.07
Jacaranda mimosifolia	6.06
Pinus halepensis	6.06
Washingtonia robusta	5.56
Olea europaea	4.55
Ulmus parvifolia	4.55
Washingtonia filifera	4.04
Callistemon viminalis	3.03
Brachychiton populneum	2.53
Other Species	14.14



Tree Inventory Summary

YWW Park, Yuma

Last inventory date 02/12/2018

community benefits of our urban trees

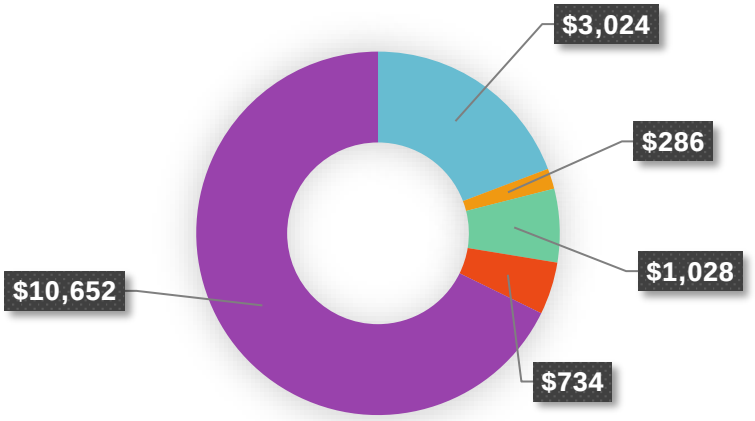
economic
- energy savings
- stormwater runoff reduction
- noise reduction
- separation of incompatible uses

health
- increased walkability
- decreased mental fatigue and blood pressure
- reduce UV exposure

environmental
- clean air
- clean water
- shade
- beauty

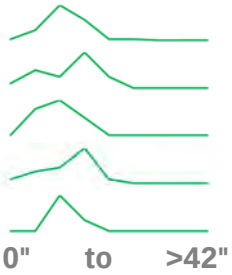
total annual benefits of 219 inventoried trees

$15,723



top 5 tree species

	count	diameter (DBH)	approximate canopy cover (sq ft)
Prosopis spp.	74		52,592
Dalbergia sissoo	36		13,755
Acacia spp.	18		10,383
Parkinsonia spp.	18		14,541
Olneya tesota	17		7,398



estimates calculated with i-Tree Streets
- energy = the contribution of the urban forest toward conserving energy by reducing natural gas use in winter and electricity use in summer
- CO2 = the amount of CO2 actually removed from the atmosphere annually
- air quality = air pollutants (O3, NO2, SO2, PM10) deposited on tree surfaces and reduced emissions from power plants (NO2, PM10, VOCs, SO2) due to reduced electricity use
- stormwater = the amount of water not entering the storm water system, saving money with reduced flow due to infiltration of water and interception of rain by trees
- property value / other = tangible and intangible benefits of trees reflected in increases in property values

Major funding provided by the USDA Forest Service's State and Private Forestry Program

Appendix B

5-YR TREE CARE & MAINTENANCE PLAN

This 5-Year Tree Care & Maintenance Plan, developed in conjunction with the Tree & Shade Master Plan, is used by City staff to prioritize, schedule, and financially plan for municipal trees and maintain the health of municipal trees. Although the City has been practicing urban forestry stewardship for many years, this type of comprehensive document summarizing the strategies and budgetary requirements had yet to be codified in written format. This Tree Maintenance Plan primarily serves the Parks and Recreation and Public Works Departments' staff, as it describes current practices and outlines current and future strategies for municipal tree care and maintenance.

Appendix C

LANDSCAPE GUIDELINES

Recommended Plants List

For long term success, it is critical to choose the right tree for the right place. In 2017, local experts helped City staff compile this list of recommended plants that flourish in Yuma's unique environmental conditions.

Residential Tree Requirement

The Landscape Regulations require one tree to be planted for each single-family residential lot over 5,000 square feet to be installed as part of new construction or remodel. General requirements for the tree are outlined in the attached document.

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RECOMMENDED PLANTS

This list provides guidance when selecting plants for your landscape design project. The City's Landscape Regulations state: "Landscaping materials are intended to contribute to the community-wide goals of beautification, energy conservation, and the conservation of the community's water resources through the use of drought tolerant plants, efficient irrigation, reduced turf areas, and proper maintenance and the fundamentals of xeriscape landscaping." Listed species are particularly well-adapted to Yuma's desert climate and have low to moderate water use needs. In addition to low water use, the information provided in the tables describes the basic growth characteristics and maintenance requirements of each plant, including the following:

Water Use: All plants included in this list are low-water-use species, but the Water Use column identifies the most water-conscious varieties. Each plant is classified as Low (L), Low to Moderate (L-M), or Moderate (M). Trees classified as Moderate water use will thrive in grassy areas with sprinkler irrigation.

Litter: All plants produce litter when flowers, seedpods, or leaves drop, but some plants produce more than others. Each species is classified as producing minimal (MIN), moderate (MOD), or high (HI) litter. Carefully consider the placement of high-litter plants as they do require more maintenance.

Pruning Season: Most plants need to be pruned only once a year. The best season to prune each species differs based on when it flowers, goes dormant, and other factors. Some species, particularly succulents and cactus, do not need to be pruned.

Hardiness: The number shown indicates the lowest temperature the plant is known to tolerate.

Evergreen: Evergreen plants (Y) leaf throughout the year, while deciduous plants (N) drop their leaves in the winter months. Semi-evergreen plants (SEMI) drop their leaves for a short period with sufficiently cold temperatures.

What is xeriscape?

Xeriscape is a style of landscape design requiring low irrigation and minimal maintenance. It is an important water conservation technique, particularly in desert climates. Xeriscape landscape design utilizes many water conscious strategies including low-water plants, efficient irrigation, and limiting the use of turf. The plants listed here are adapted to and, with proper care, will thrive in Yuma's local climate.

What is the difference between a shade, street, and accent tree?

This list categories trees into three types: street trees, shade trees, and accent trees. *Street trees* are those that grow to an average height of 30 feet or more, generally have a high branching pattern, and have an upright or rounded form. Street trees are planted within 5 to 8 feet of the sidewalk or street to provide shade to pedestrians and cars. The best species for street trees are low litter and low maintenance. *Shade trees* also grow to an average mature height of 30 feet or more and typically have a dense canopy that provides shade. Branching structure can be more spreading, vase-shaped, or layered than street trees. *Accent trees* are small, ornamental trees that typically grow to a mature height of 15 to 20 feet.

Can I plant something at my house not shown on this list?

This list provides guidance, but does not restrict private residents from planting any particular species. Lots used exclusively for one-family dwelling units, when not otherwise required as part of an approval process to provide landscaping, are exempt from the requirements of the Landscape Regulations. The regulations advise against the following species due to their pollen or seeds which aggravate allergies and other health problems: common Bermuda grass, mulberry, and olive (except the male or fruitless varieties).

NOTE: The Landscape Regulations can be found in Article 20 of the City of Yuma's Code of Ordinances, Title 15, Chapter 154. This information is provided as a general guide to the public. It is not intended to be a reproduction of all code requirements or text. If you need additional information contact Community Development at (928) 373-5175 or visit our office at One City Plaza, Yuma, AZ 85364. **(v.5 8/24/2017)**

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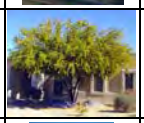
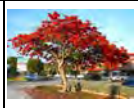
Trees

		GROWTH INFORMATION						RECOMMENDED AREA					
		WATER USE	LITTER	HARDINESS (degrees F)	EVERGREEN	MATURE SIZE (HxW)	TREE TYPE	PARKWAYS	MEDIANS	SUBDIVISION WALLS	RETENTION BASINS	GATEWAY ROUTES	PARKING LOTS
Acacia aneura [1] Mulga Acacia		L	MIN	15º	Y	15'X15'	ACCENT						
Acacia farnesiana [2] Sweet Acacia		L	MIN-MOD	15º	SEMI	20'X20'	ACCENT						
Acacia salicina Willow Acacia		L	MIN	20º	Y	30'x15'	STREET						
Acacia stenophylla Shoestring Acacia		L	MIN	15º	Y	30'x20'	STREET						
Brachychiton populneus Bottle Tree		L-M	MIN	15º	Y	30x20'	STREET						
Callistemon spp. Bottlebrush		M	MIN	20º	Y	10-30x6-15'	ACCENT						
Celtis reticulata Western Hackberry		L-M	MIN	-20º	N	30x30'	SHADE						
Ceratonia siliqua Carob (female only)		L	MOD	20º	Y	40'x40'	SHADE						
Chilopsis linearis [1 2] Desert Navajo Willow		M	MOD	0º	N	20x20'	ACCENT						
Delomix regia Royal Ponsiana Tabachin		M	MOD	0º	SEMI	30'x60'	SHADE						
Ebenopsis ebano [2] Texas Ebony		L	MOD	20º	Y	40'x30'	SHADE						
Eucalyptus citriodora Lemon-scented Eucalyptus		L	MIN	25º	Y	50'x30'	STREET						
Eucalyptus spathulata Narrow Leaf Gimlet		L-M	MIN	15º	Y	30'x20'	STREET						
Fraxinus velutina Arizona Ash, "Fan-Tex"		L-M	MIN	-10º	N	40x30'	STREET						

NOTES:

[1] Approved for use in some Yuma County Water Users' Association rights-of-way
[2] Approved for use near APS overhead lines, not within 15 feet
[3] Not allowed within City ROW

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Trees

		GROWTH INFORMATION						RECOMMENDED AREA					
		WATER USE	LITTER	HARDINESS (degrees F)	EVERGREEN	MATURE SIZE (HxW)	TREE TYPE	PARKWAYS	MEDIANS	SUBDIVISION WALLS	RETENTION BASINS	GATEWAY ROUTES	PARKING LOTS
Geijera parviflora Australian willow		M	MIN	15º	Y	30x20'	SHADE						
Gleditsia triacanthos Honey Locust		L-M	HI	15º	N	40x50'	SHADE						
Jacaranda mimosifolia Jacaranda		M	MOD	25º	N	30x30'	SHADE/ STREET						
Lysiloma spp. [1] Desert fern, featherbush		L-M	MIN	25º	N	15x15'	ACCENT						
Nerium oleander Oleander Tree		L	MIN	15º	Y	15'x15'	ACCENT						
Olea europaea [1] Fruitless varieties only such as Swan Hill and Wilsonii		L-M	HI	15º	Y	25'x25'	ACCENT						
Olneya tesota Ironwood		L	MIN	20º	N	30x30'	SHADE/ STREET						
Parkinsonia spp. (Cercidium spp.) [1 2] Blue Palo Verde and Foothills Palo Verde[2] species are preferred		L	MOD	20º	N	10-30x10-30'	ACCENT						
Phoenix canariensis [3] Canary Island Date Palm		L-M	MOD-HI	25º	Y	50x30'	ACCENT						
Phoenix dactylifera [3] Date Palm		L-M	MOD	15º	Y	40x20'	ACCENT						
Pistacia chinensis [1] Chinese Pistache		MOD	MIN	10º	N	40'x35'	SHADE/ STREET						
Pistacia lentiformis [1] Mastic Tree		L-M	MIN	20º	Y	15'x20'	ACCENT						
Pittosporum phillyraeoides [1] Willow Pittosporum		L-M	MOD	15º	Y	15x15'	ACCENT						
Prosopis ssp. Hybrid Mesquite		L-M	MOD	0º	N	30x30'	SHADE/ STREET						

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Trees

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		WATER USE	LITTER	HARDINESS (degrees F)	EVERGREEN	MATURE SIZE (HxW)	TREE TYPE	PARKWAYS	MEDIANS	SUBDIVISION WALLS	RETENTION BASINS	GATEWAY ROUTES	PARKING LOTS
Quercus virginiana Southern Live Oak		M	MIN	0º	SEMI	40'x50'	SHADE/ STREET						
Sophora secundiflora [1 2] Texas Mountain Laurel, Mescal Bean		L-M	MIN	10º	Y	15x15'	ACCENT						
Ulmus parvifolia cv. 'Sempervirens' Chinese Evergreen Elm		MOD	MOD	25º	N	30x30'	SHADE/ STREET						
Vitex agnus-castus [1 2] Chaste Tree		L-M	HI	-10º	N	20x20'	ACCENT						

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Shrubs

		GROWTH INFORMATION						RECOMMENDED AREA					
		WATER USE	LITTER	PRUNING SEASON	HARDINESS (degrees F)	EVERGREEN	MATURE SIZE (HxW)	PARKWAYS	MEDIANS	SUBDIVISION WALLS	RETENTION BASINS	GATEWAY ROUTES	PARKING LOTS
Acacia spp. [1] Acacia		L-M	MIN	SPRING	20º	Y	5x5'						
Aloysia spp. [1] Bee Brush		L-M	MIN	WINTER	15º	N	6x6'						
Buddleia marrubifolia Woolly Butterfly Bush		L	MIN	WINTER	10º	Y	5x5'						
Caesalpinia gilliesii [1] Yellow Bird of Paradise		L-M	MIN	WINTER	5º	SEMI	6x5'						
Caesalpinia pulcherrima Bird of Paradise		L-M	MOD	WINTER	18-30º	N	4-10'x4-6'						
Caesalpinia mexicana Mexican Bird of Paradise		M	MOD	WINTER	18-30º	Y	12x10'						
Calliandra californica Baja Fairy Duster		L-M	MIN	SPRING	25º	SEMI	4x4'						
Calliandra eriophylla [1] Fairy Duster		L-M	MIN	LATE SPRING	0-10º	N	2x3'						
Callistemon spp. Bottlebrush		M	MIN	LATE SUMMER	20º	Y	6-10'x 6-10'						
Callistemon citrinus 'Little John' [1] Dwarf Bottlebrush 'Little John'		M	MIN	LATE SUMMER	20º	Y	3x3'						
Chamaerops humilis Mediterranean Fan Palm		M	MIN	WINTER	10º	Y	10x15'						
Convolvulus cneorum Bush Morning Glory		L	MIN	NONE	20º	Y	2-4'x2-4'						
Cordia boissieri [1] Texas Olive		M	MOD	WINTER	20º	Y	10x10'						
Cordia parvifolia Little Leaf Cordia		L-M	MIN	LATE WINTER	18º	SEMI	3x4'						

NOTES:
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Shrubs

		GROWTH INFORMATION						RECOMMENDED AREA					
		WATER USE	LITTER	PRUNING SEASON	HARDINESS (degrees F)	EVERGREEN	MATURE SIZE (HxW)	PARKWAYS	MEDIANS	SUBDIVISION WALLS	RETENTION BASINS	GATEWAY ROUTES	PARKING LOTS
Encelia farinosa Brittlebush		L-M	MIN	SPRING & FALL	25º	N	3x4'						
Eremophila spp. Emu Bush		L-M	MIN	LATE SPRING	20º	Y	4x5'						
Euphorbia rigida [1] Gopher Plant		L-M	MIN	LATE SPRING	5º	Y	2x3'						
Gossypium harknessii San Marcos Hibiscus		L-M	MIN	WINTER	25º	Y	3x4'						
Justicia californica [1] Hummingbird bush or chuparosa		L-M	MIN	FALL	25º	SEMI	4x4'						
Lantana camara [1] Bush Lantana		L-M	MIN	WINTER	30º	N	3x3'						
Leucophyllum spp. Texas Ranger, Texas Sage, etc.		L-M	MIN	SPRING& FALL	0-5º	Y	8x8'						
Myrtus communis Myrtle		M	MIN	WINTER	20º	Y	5x4'						
Rosmarinus officinalis [1] Rosemary		L-M	MIN	SPRING	10º	Y	2-3'x4-8'						
Ruellia brittoniana [1] Mexican Petunia		L-M	MIN	WINTER	35º	Y	5x5'						
Ruellia peninsularis [1] Desert Ruellia		L-M	MIN	WINTER	28º	Y	3X4'						
Russelia equisetiformis [1] Coral Fountain Grass		L	MOD	WINTER	25º	Y	5X3'						
Tecoma spp. Tecoma, Yellow Bells		L-M	MOD	SPRING	28º	SEMI	6X6'						
Tecomaria capensis Cape Honeysuckle		M	MIN	SPRING	28º	Y	6X5'						

NOTES:
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Cactus & Succulents

		GROWTH INFORMATION						RECOMMENDED AREA					
		WATER USE	LITTER	PRUNING SEASON	HARDINESS (degrees F)	EVERGREEN	MATURE SIZE (HxW)	PARKWAYS	MEDIANS	SUBDIVISION WALLS	RETENTION BASINS	GATEWAY ROUTES	PARKING LOTS
Agave spp. [1] Agave species, Century Plant		L	MIN	NONE	0-20º	Y	VARIES 2-3x2-3'						
Aloe spp. [1] Aloe species		L	MIN	NONE	25º	Y	2x5'						
Bulbine frutescens [1] Shrubby Bulbine, Yellow bulbine		L-M	MIN	NONE	15º	Y	1x2'						
Carnegiea spp. [1] Saguaro Cactus		L	MIN	NONE	18º	Y	20x10'						
Dasylirion spp. [1] Desert spoon, Toothless desert spoon		L-M	MIN	NONE	0º	Y	4x4'						
Echinocactus spp. [1] Barrel Cactus		L	MIN	NONE	18º	Y	2x2'						
Echinocereus engelmannii [1] Hedgehog Cactus		L	MIN	NONE	10º	Y	1x2'						
Euphorbia antisyphilitica [1] Candelilla		L	MIN	NONE	15º	Y	1x2'						
Ferocactus spp. [1] Barrel Cactus		L	MIN	NONE	0-20º	Y	VARIES						
Fouquieria splendens [1] Ocottilo		L-M	MIN	NONE	0-5º	N	12x10'						
Hesperaloe parviflora [1] Red Yucca, Hesperaloe species		L	MIN	NONE	10º	Y	3x5'						
Nolina spp. [1] Beargrass		L	MIN	SPRING	0º	Y	3x4'						
Pedilanthus macrocarpus [1] Slipper Plant		L	MIN	NONE	25º	Y	3x3'						
Stenocereus thurberi [1] Organ pipe cactus		L	MIN	NONE	22º	Y	10x10'						
Yucca baccata [1] Narrow-leaved Yucca, Banana Yucca		L	MIN	NONE	0º	Y	3x5'						

NOTES:
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Groundcover

		GROWTH INFORMATION						RECOMMENDED AREA					
		WATER USE	LITTER	PRUNING SEASON	HARDINESS (degrees F)	EVERGREEN	MATURE SIZE (HxW)	PARKWAYS	MEDIANS	SUBDIVISION WALLS	RETENTION BASINS	GATEWAY ROUTES	PARKING LOTS
Acacia spp. [1] Trailing Acacia		L-M	MIN	FALL	15º	Y	1x10'						
Asparagus densiflorus cv. 'Sprengeri' [1] Sprenger Asparagus		L-M	MIN	NONE	25º	Y	1x4'						
Atriplex spp. [1] Saltbush		L-M	MIN	NONE	25º	Y	1-4'						
Baccharis pilularis [1] Coyote Bush, trailing desert broom		L-M	MIN	SUMMER	5º	Y	2x4'						
Baileya multiradiata [1] Desert Marigold		M	MIN	NONE	10º	Y	1'-6"x2'						
Chrysactinia mexicana [1] Damianita		L	MIN	NONE	10º	Y	2x4'						
Convolvulus mauritanicus [1] Ground Morning Glory		L	MIN	WINTER	15º	Y	2x3'						
Dalea spp. [1] Trailing Dalea, Dalea Bush		L-M	MIN	FALL	15º	Y	2x6'						
Eschscholzia mexicana [1] Mexican Gold Poppy		L	MIN	NONE	35º	Y	1'-6"x 1'-6"						
Gazania rigens [1] Clumping Gazania		L	MIN	FALL	25º	Y	1x6'						
Glandularia peruviana [1] Verbena Peruviana		M	MIN	WINTER	25º	Y	1x4'						
Lantana spp. [1] Trailing Lantana		M	MIN	WINTER	25º	Y	1x4'						
Rosmarinus officinalis cv. 'Prostratus' [1] Prostrate Rosemary		L-M	MIN	FALL	15º	Y	2x4'						
Wedelia trilobata [1] Yellow Dot		L-M	MIN	WINTER	30º	Y	1'-6"x6'						

NOTES:
[1] Plants approved for use in Yuma County Water Users' Association rights-of-way

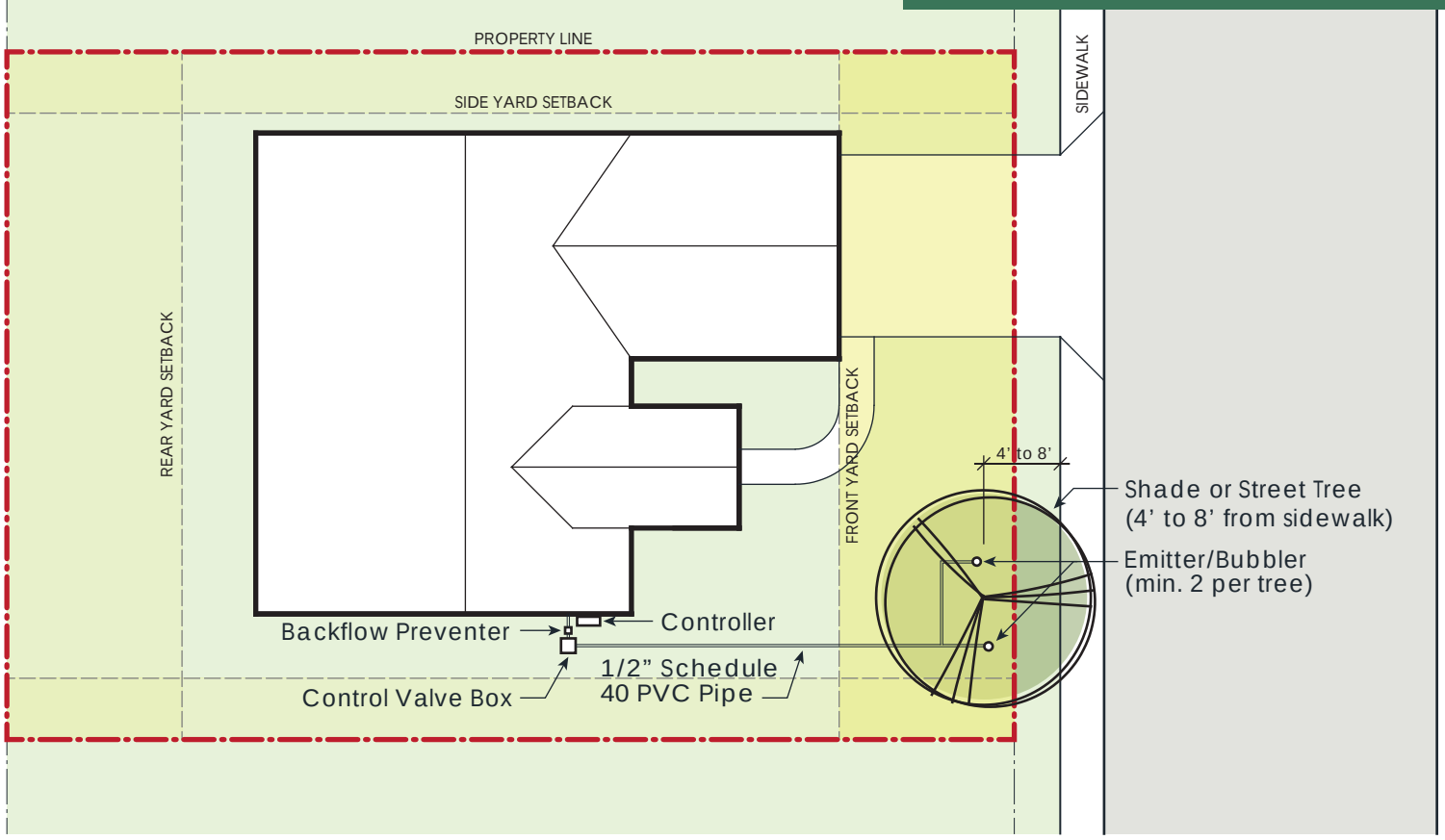
RESIDENTIAL SITE PLAN FOR STREET TREE

The Yuma City Code, Title 15, Chapter 154, Article 20 Landscape Regulations requires one tree to be planted for each single-family residential lot over 5,000 square feet to be installed as part of new construction or remodel. General requirements for this tree are summarized on this page, but please reference the full code language in Article 20, Section 4 (A) for complete details.

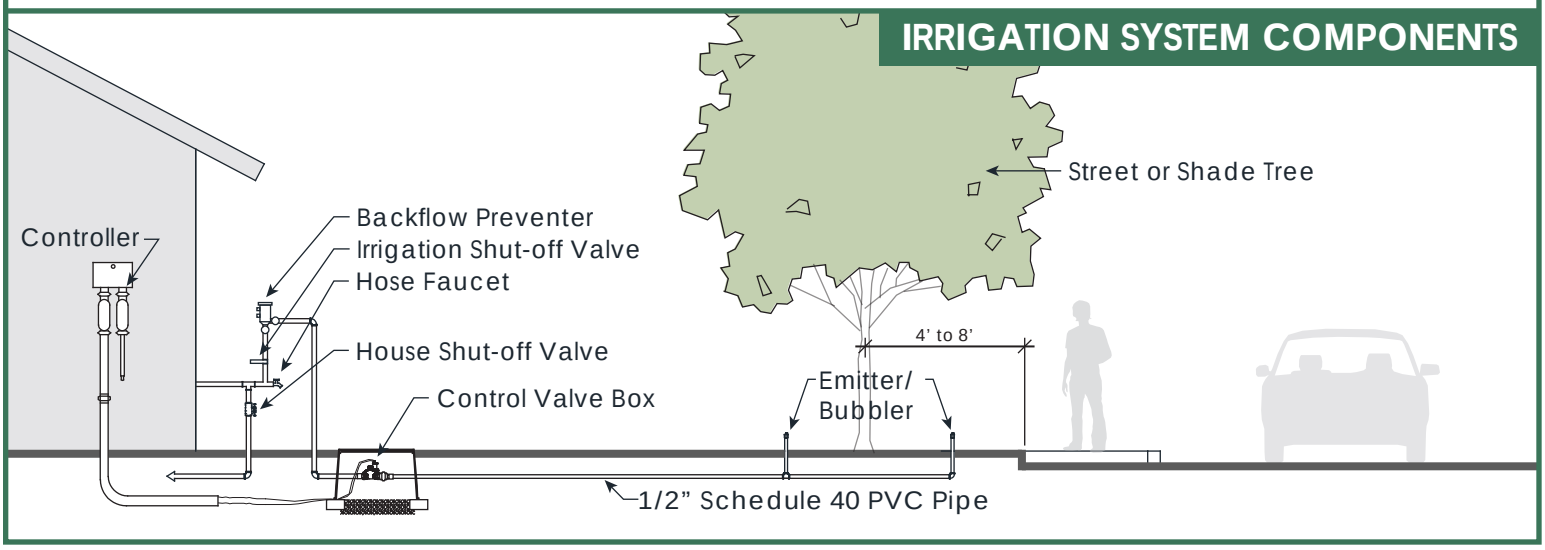
OVERVIEW OF REQUIREMENTS

- One tree required for single-family residential lots with an area of 5,000 sq. ft. or greater.
- One (15-gal) Shade or Street tree chosen from the Recommended Plants List must be planted in the front yard setback.
- Tree must have a permanent irrigation system.
- Tree requirement must be fulfilled before the final Certificate of Occupancy is issued.
- If the lot has an adjacent tree belt, the tree shall be located in the tree belt.

TREE & IRRIGATION LOCATION



IRRIGATION SYSTEM COMPONENTS



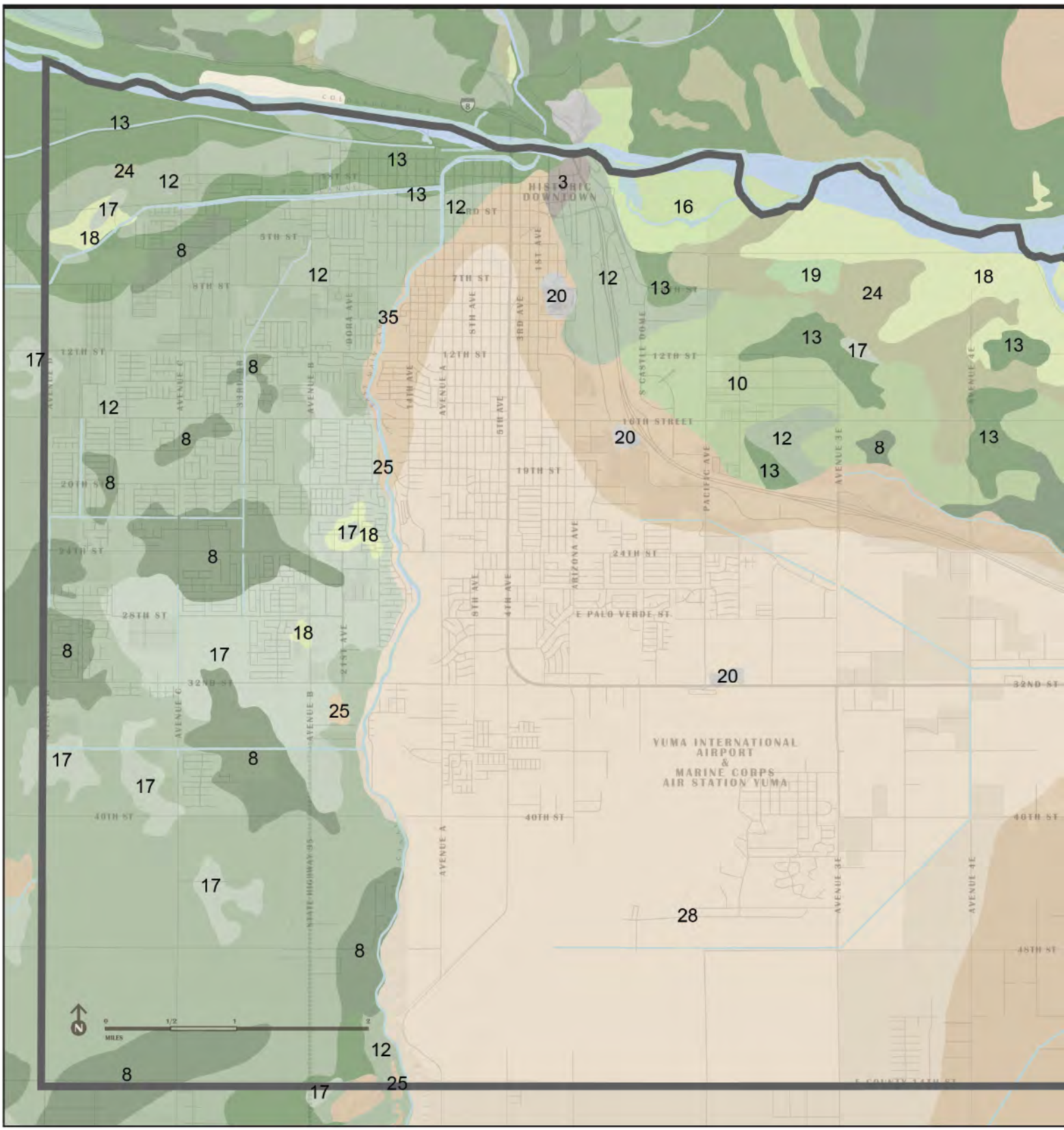
Appendix D

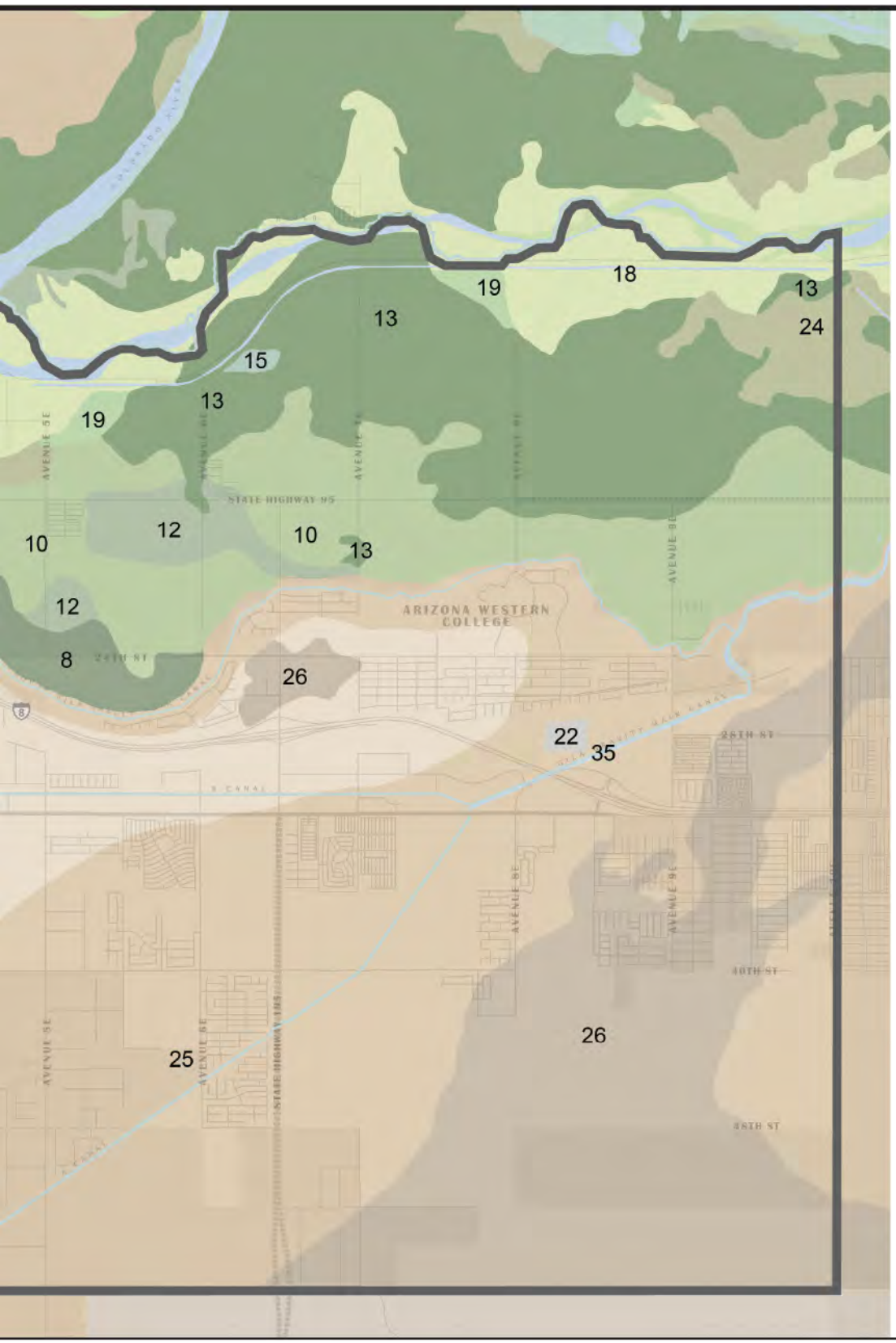
YUMA SOIL TYPES

The map shows the soil types found in Yuma, according to the USDA Natural Resources Conservation Service's Web Soil Survey. A description of the most predominate soil types, including information pertinent to growing conditions, is provided. The complete survey, along with descriptions of each soil type, can be accessed on the USDA website at *websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey*.

SOILS

USDA Web Soil Survey | February 2019





SOIL CLASSIFICATIONS

3	Carrizo very gravelly sand
8	Gadsden clay
10	Glenbar silty clay loam
12	Holtville clay
13	Indio silt loam, 0-1% slopes
15	Indio silt loam, strongly saline
16	Indio-Lagunita-Ripley complex
17	Kofa clay
18	Lagunita loamy sand
19	Lagunita silt loam
20	Laposa-Rock outcrop complex, 15-75% slopes
22	Pits, borrow
24	Ripley silt loam
25	Rositas sand
26	Rositas-Ligurta complex
28	Superstition sand
35	Water

PLANNING BOUNDARY

Selected soil type descriptions copied from the USDA's Soil Series website (https://soilseries.sc.egov.usda.gov/osdname.aspx)

GADSDEN SERIES

The Gadsden series consists of very deep, well drained soils formed in stratified stream alluvium. Gadsden soils are on flood plains and have slopes of 0 to 3 percent.

RANGE IN CHARACTERISTICS:
Clay content - Averages 35 to 60 percent in the control section
Salinity- Nonsaline to strongly saline

DRAINAGE AND PERMEABILITY:
Well drained; slow runoff; slow permeability.

USE AND VEGETATION: These soils are used for irrigated crops and for livestock grazing. Irrigated crops are cotton, alfalfa, sorghums, sugar beets, small grains and truck crops. Vegetation is creosotebush, desert saltbush, salt cedar, inkweed, and annual weeds and grasses.

GLENBAR SERIES

The Glenbar series consists of very deep, well drained soils that formed in stratified stream alluvium. Glenbar soils are on flood plains and alluvial fans and have slopes of 0 to 3 percent.

RANGE IN CHARACTERISTICS:
Salinity- Nonsaline to strongly saline

DRAINAGE AND PERMEABILITY:
Well drained; medium to slow runoff; moderately slow permeability.

USE AND VEGETATION: Used for livestock grazing and where irrigated, for cultivated crops and pastures. Alfalfa, cotton, grain and vegetables are common irrigated crops. Vegetation is creosotebush, mesquite, paloverde, ironwood, salt cedar, cacti, annual weeds and grasses.

HOLTVILLE SERIES

The Holtville Series consists of very deep, well drained soils formed in mixed and stratified alluvium. Holtville soils are on flood plains and basins and have slopes of 0 to 3 percent.

RANGE IN CHARACTERISTICS:

The upper 20 to 36 inches are silty clay, clay or silty clay loam (see remarks). Vertical tongues 1/2 to 2 inches wide of sandy or coarser soil fill old cracks to depths greater than 20 inches. Unfilled soil cracks range from 1 mm to greater than 1 cm wide at a depth of 20 inches or more. The material below the clay or silty clay is dominantly loamy very fine sand, but some thick strata are silt loam to loamy fine sand. Strata as much as 1 inch thick of contrasting texture are in both the fine-textured upper layers and the coarse-textured lower layers.

DRAINAGE AND PERMEABILITY:

Well drained; low runoff; slow permeability.

USE AND VEGETATION:

Irrigated areas are used for production of cotton, sugar beets, alfalfa, barley, carrots, and lettuce. Uncultivated areas have a sparse cover of desert shrubs and weeds.

INDIO SERIES

The Indio series consists of very deep, well or moderately well drained soils formed in alluvium derived from mixed rock sources. Indio soils are on alluvial fans, lacustrine basins and flood plains and have slopes of 0 to 3 percent.

RANGE IN CHARACTERISTICS:

Soil moisture - Intermittently moist in some part of the soil moisture control section during December - February and July - September. Driest during May and June. Typic aridic soil moisture regime.
Salinity: 0 to 51 dS/m
Sodium Adsorption Ratio: 0 to 523

DRAINAGE AND PERMEABILITY:

Indio soils are well or moderately well drained. Some irrigated areas with a water table have tile drains to maintain water below depths of 3 to 5 feet and to remove soluble salts. Runoff is slow. Permeability is moderate.

USE AND VEGETATION:

Used for irrigated cropland and livestock grazing. Common crops are cotton, barley, grapes, citrus, dates, and other crops. In other areas, the present vegetation is shadscale, bursage, arrowweed, and other plants. Such areas provide ephemeral grazing in unusually wet years.

KOFA SERIES

The Kofa series consists of very deep, well drained soils that formed in stratified alluvium from mixed sources. Kofa soils are on flood plains and have slopes 0 to 3 percent, but are generally less than 1 percent.

RANGE IN CHARACTERISTICS:
Soil Moisture - Intermittently moist in some part of the soil moisture control section during July - August and December - February. Driest during May and June. Typic aridic soil moisture regime.
Salinity- Usually has EC of 1 to 8 dS/m, but ranges to as much as 30

DRAINAGE AND PERMEABILITY:
Well drained; low runoff; slow permeability.

USE AND VEGETATION:
These soils are used mainly for irrigated cropland, but some areas are still used for livestock grazing. Crops grown are cotton, sugar beets, small grains, vegetables, bermudagrass for seed, and citrus. Native areas have sparse cover of bursage, paloverde and annuals.

LIGURTA SERIES

The Ligurta series consists of very deep, well drained, strongly saline soils that formed in fan alluvium weathered from a wide variety of rocks. Ligurta soils are on fan terraces with slopes of 0 to 6 percent.

RANGE IN CHARACTERISTICS:
Soil moisture: Intermittently moist in the soil moisture control section during July - September and December - February. Driest during May and June. Typic aridic soil moisture regime.

DRAINAGE AND PERMEABILITY:
Well drained; rapid runoff; moderately slow permeability.

USE AND VEGETATION:
Used for livestock grazing and wildlife habitat. The soil is nearly barren of vegetation except in the small drainages. Vegetation in the drainages is creosotebush, plantain, fiddleneck, filaree, turkshead, pencil cholla and saguaro.

ROSITAS SERIES

The Rositas series consists of very deep, somewhat excessively drained soils formed in sandy eolian material. Rositas soils are on dunes and sand sheets. Slope ranges from 0 to 30 percent with hummocky or dune micro relief.

RANGE IN CHARACTERISTICS:

Soil moisture: The soil is usually dry and is not moist for as long as 60 consecutive days. Driest during May and June. Typic aridic soil moisture regime.
Organic matter: less than 0.5 percent and decreases regularly with depth
Clay content: 0 to 10 percent.
Salinity: 0 to 8 decisiemens/meter

DRAINAGE AND PERMEABILITY:

Somewhat excessively drained; negligible to low runoff; rapid permeability.

USE AND VEGETATION:

Rositas soils are used for rangeland and wildlife habitat, and growing citrus fruits, grapes, alfalfa, and truck crops. Present vegetation is creosotebush, white bursage, desert buckwheat and mesquite.

SUPERSTITION SERIES

The Superstition series consists of very deep, somewhat excessively drained soils that formed in sandy eolian deposits. Superstition soils are on dunes and have slopes of 0 to 10 percent.

RANGE IN CHARACTERISTICS:

Soil Moisture: Usually dry but may be intermittently moist in some part of the soil moisture control section during July-September and December-February. Driest during May and June. Typic aridic soil moisture regime.

DRAINAGE AND PERMEABILITY:

Somewhat excessively drained; very low and low runoff; rapid permeability.

USE AND VEGETATION:

Superstition soils are used for livestock grazing and irrigated cropland. The present vegetation is creosotebush and bursage.

Appendix E

PLANNING TASK FORCE

To provide specific guidance on the plan, staff reached out to stakeholder groups, subject matter experts, and local organizations to form a Planning Task Force. The Task Force had 26 active members who represented various community groups such as local arborists, landscape professionals, garden clubs, community service organizations, health professionals, education professionals, development professionals, and City-appointed commissions. Each group brought a unique perspective about how and where trees could be planted; recommendations that are reflected in the plan. The Task Force met monthly for a total of nine meetings over the course of the year.

ACTIVE PARTICIPATING MEMBERS

	NAME	AFFILIATION/EXPERTISE	3/26	4/23	5/30	6/27	7/25	8/22	9/26	10/24	12/5
1	John Jackson	PARC, former Tree Board member, MCAS Project Manager	Y	N	N	Y	N	N	N	N	N
2	Bill Mowczko	Biologist, full-time Yuma resident	Y	N	Y	N	Y	Y	Y	Y	Y
3	JoAnne Mowczko	Clean & Beautiful Commission, Biologist	N	N	Y	N	N	Y	Y	Y	Y
4	Frank Saldana	Arborist, ArborTech Tree Service, Sunrise Rotary Club	Y	N	N	Y	Y	Y	N	Y	Y
5	Benjamin Pendleton	Arborist, Pendleton Tree Service	Y	Y	Y	Y	Y	N	N	Y	Y
6	Mark Headington	APS Forestry Pre-Inspector	Y	Y	Y	Y	N	N	Y	Y	Y
7	Janine Lane	Master Gardeners Program Coordinator, UofA Ag Extension	Y	N	N	N	N	N	N	N	N
8	Lois Weinstein	President of Pecan Grove Garden Club	Y	Y	N	Y	Y	Y	Y	N	Y
9	Suzanne Cooper	Program Coordinator of Arizona Health Zone	Y	Y	Y	Y	N	Y	Y	Y	Y
10	Gwenyth Stewart	Girl Scout	N	Y	Y	N	N	N	N	Y	Y
11	Garvey Blackwell	Girl Scout	Y	N	N	Y	N	N	N	N	N
12	Erica Stewart	BLM	N	Y	Y	N	N	N	N	Y	Y
13	Deirdre MacDonald	Master Gardener, Moody Gardens, UofA Ag Extension	Y	N	Y	N	N	Y	Y	Y	Y
14	Jeanne Elnadry	Palliative Care Physician, YRMC	Y	Y	N	N	Y	N	Y	N	Y
15	Karen Reichhardt	Retired US BLM Manager, Botanist	Y	?	N	N	Y	N	Y	N	N
16	Susan Reamer	Retired Software Developer, part-time Yuma resident	Y	Y	N	N	N	N	Y	N	N
17	Andrea Sinks	G.W. Carver Elementary School Eco Schools Program	Y	N	N	N	N	N	Y	N	N
18	Chris Hamel	Planning & Zoning Commission	Y	Y	Y	Y	N	N	N	N	N
19	Vianey Avila	YCNHA Environmental Program Coordinator	N	Y	N	N	N	N	Y	Y	N
20	Cathy Douglas	YCNHA, Management Analyst	Y	N	Y	Y	N	Y	N	N	Y
21	Phill James	JSA Company	X	N	Y	Y	Y	N	Y	Y	N
22	Glen Vandervoort	Retired member of date farming community	X	X	X	Y	Y	N	Y	N	N
23	Val Morrill	AZ Wildlife Federation, Native Plant Society	X	X	Y	Y	N	N	Y	N	Y
24	Janet Wheeler	Lowes SM	X	X	Y	N	N	N	N	N	N
25	Doris Weissman	Yuma Garden Club	X	X	Y	Y	Y	Y	Y	Y	N
26	Greg LaVann	Sr. Vice President, GYEDC	N	N	N	N	N	N	N	N	N
			18	**11**	**15**	**14**	**9**	**9**	**14**	**12**	**13**

INVITED OR OCCASIONALLY ATTENDING MEMBERS

	NAME	AFFILIATION/EXPERTISE	3/26	4/23	5/30	6/27	7/25	8/22	9/26	10/24	12/5
27	Ron Contreras	Sunrise Rotary President, Penn Signs	Y	N	N	N	N	N	N	N	N
28	Mary White	Sunrise Rotary Club, (Deputy County Attorney)	N	Y	N	N	N	N	N	N	N
29	Kevin Dahl	Dahl Robins Engineering	Y	N	N	N	N	N	N	N	N
30	Charles Gutierrez	YMPO	X	X	Y	N	N	N	N	N	N
31	MaryAnn Easterday	Clean & Beautiful Commission	X	X	X	Y	N	N	N	N	N
32	Allison Norris	High school student	X	N	N	N	N	N	N	N	N
33	Jerry Lococo	Development community	N	N	N	N	N	N	N	N	N
34	Chris Morris	Development, Building Advisory Board, Calculated Designs	X	X	X	N	N	N	N	N	N
35	Cody Beeson		N	N	N	N	N	N	N	N	N
36	Doug Sullins	JSA Landscape Company	N	N	N	N	N	N	N	N	N
37	Pat Fox	Yuma Nursery	N	N	N	N	N	N	N	N	N
38	Jeannie Wah-Gorman	Arborist, All Star Tree Service	N	N	N	N	N	N	N	N	N
39	Christina King	Girl Scout Leader	N	N	N	N	N	N	N	N	N
40	Matthew Buckley	G.W. Carver Elementary School Principal	N	N	N	N	N	N	N	N	N
41	Michelle Hetu-Norris	Local nurse	X	N	N	N	N	N	N	N	N

MEETING ATTENDANCE LEGEND
Y = Attended meeting
N = Absent
X = Not yet invited

TASK FORCE INVOLVEMENT

MEETING DATES & TOPICS

Over the course of the year, the Task Force met monthly at City Hall for a total of 9 meetings.

March 26	Introduction to the Tree & Shade Master Plan
April 23	Understanding the tree canopy and how to add to the canopy
May 30	Summary of the public survey (to date) and setting the tree canopy target
June 27	Round table discussions on how to increase canopy coverage through specific projects and outreach
July 25	Round table discussions on developing impactful projects and how to measure success
August 22	Discussion and development of specific tree projects
September 26	Further discussion and commitments to specific tree projects
October 24	Discussion about tree consortium and finalizing details of tree projects
December 5	Final discussion and review of final draft of Tree & Shade Master Plan

EVENTS

The Task Force was invited to attend the following events:

April 18	Arbor Day Celebrations (hosted by Parks & Recreation and Public Works)	Tree planting celebrations
June 1	Come Out & Play Day	Distributed surveys
June 6	Tree & Shade Master Plan Community Meeting	Attended to show support & answer questions
July 20	Back to School Rodeo	Distributed surveys
October 12	Spruce Up Your Park Day	Tree planting and park clean-up

Appendix F

PUBLIC SURVEY & RESULTS

From mid-May through mid-September of 2019, a survey open to the general public was conducted to gauge public opinion and preferences on the urban forest. The survey, presented in both online and paper versions and in both English and Spanish, had a total of 445 respondents. The survey and a summary of all responses are provided.

SURVEY RESULTS

Purpose

The City of Yuma's urban forest includes all the trees in the parks, along streets, and on private property throughout the city. Urban forests provide many environmental and health benefits, but unlike natural forests most trees in the urban forest are planted and cared for by people. The City is developing the Tree & Shade Master Plan to establish goals and actions necessary to ensure that future generations continue to enjoy the benefits of a healthy urban forest in Yuma. Responses to this survey are used to create the plan and guide the City in decision making. The survey was made available to the public in both English and Spanish and in print and online formats.

Total # of Responses

445

Distribution Dates

May 15 to September 8, 2019 (approx. four months)

Distribution Methods

Online version (via Google Forms)

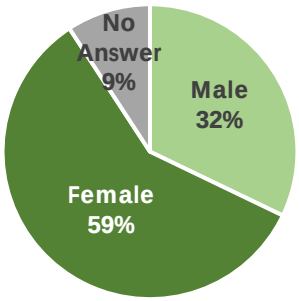
- Shared on City's social media (Facebook, Twitter, Instagram, and homepage) three times
- Shared by Parks & Recreation's in their monthly newsletter to nearly 12,000 subscribers in June, July, August, & September
- Shared on Parks & Recreation's Facebook account in May, June, and July with a reach of approximately 2,000 people and 15 clicks per post.
- Available on Department of Community Development's webpage

Print copies were distributed or made available at the following locations and events:

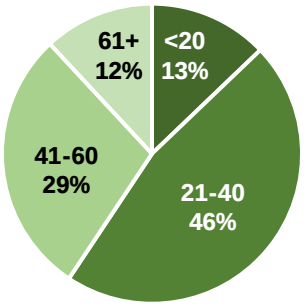
- Approximately 450 copies were distributed to local 5th Grade students at the following schools (one school from each district):
  - Desert Mesa Elementary School
  - Gary A. Knox Elementary School
  - G.W. Carver Elementary School
  - James B. Rolle Elementary School
  - Palmcroft Elementary School
- June 6 Community Meeting at Yuma Art Center
- City Hall
  - Lobby (in conjunction with the display)
  - Parks & Recreation Front Desk & hallway display
  - Department of Community Development Front Desk
- Shared by Task Force members
- Parks & Recreation's Events
  - Back to School Rodeo
  - Come Out & Play Day
  - Parks, Arts, & Recreation Commission

DEMOGRAPHICS

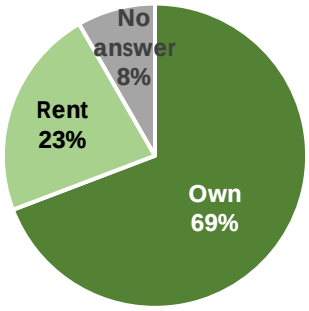
Gender



Age

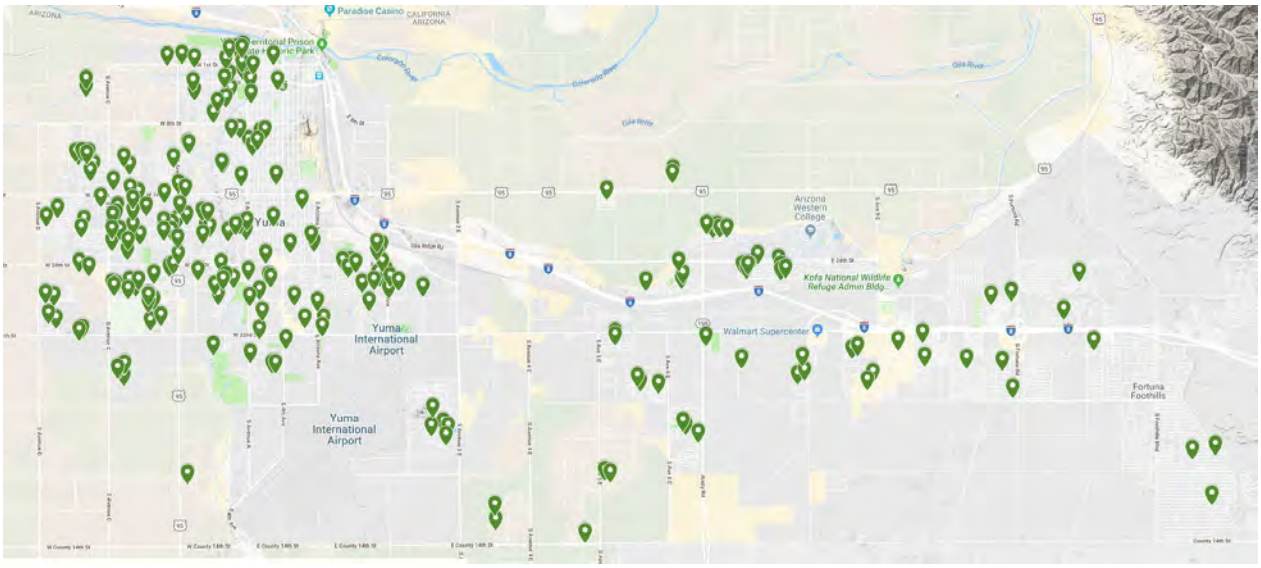


Rent/Own?



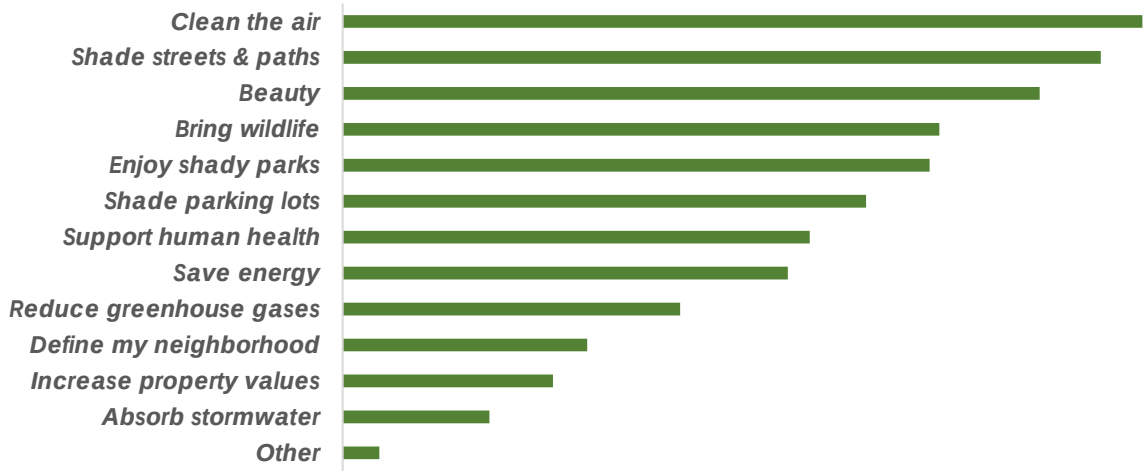
Neighborhood Map

The pins on the map below represent approximately where 237 of the respondents reside. Respondents were not required to identify their neighborhood or address, but those who chose to answer the question are mapped below.



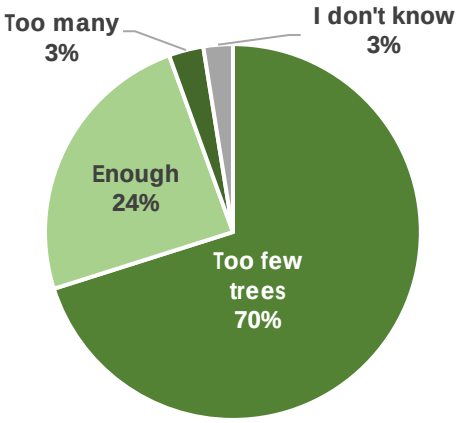
PREFERENCES & VALUES

#1: *I value trees for the following reasons:*

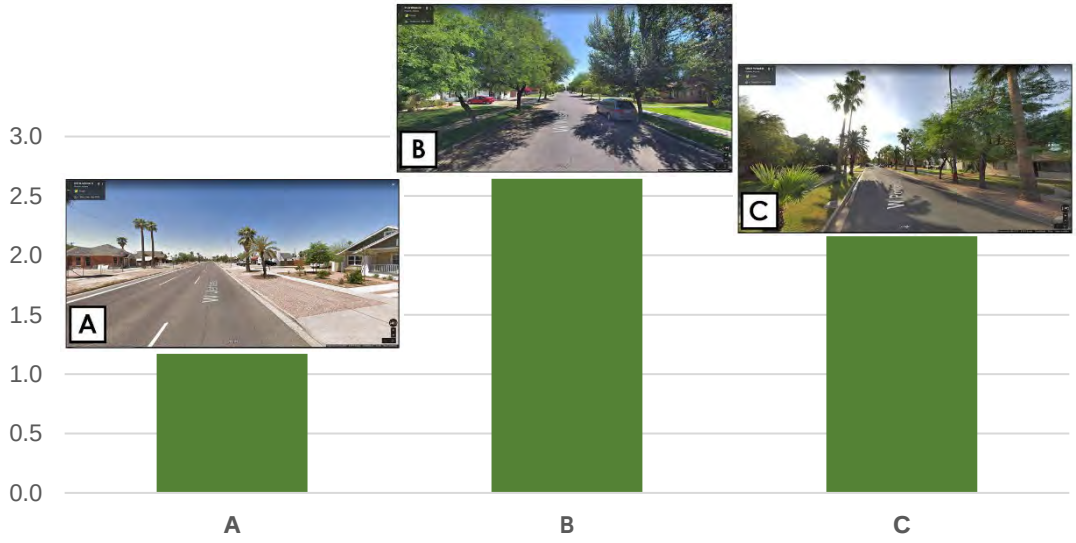


- *Unrealized Psychological effects of something living healthier*
- *Save the earth*
- *Decrease heat*

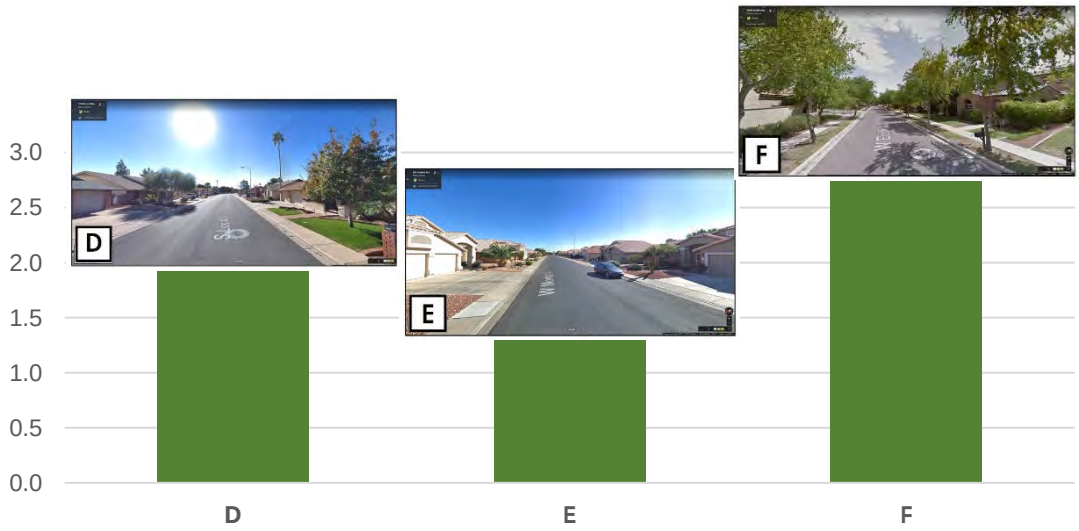
#2: *In your opinion, which best describes the number of trees in your neighborhood?*



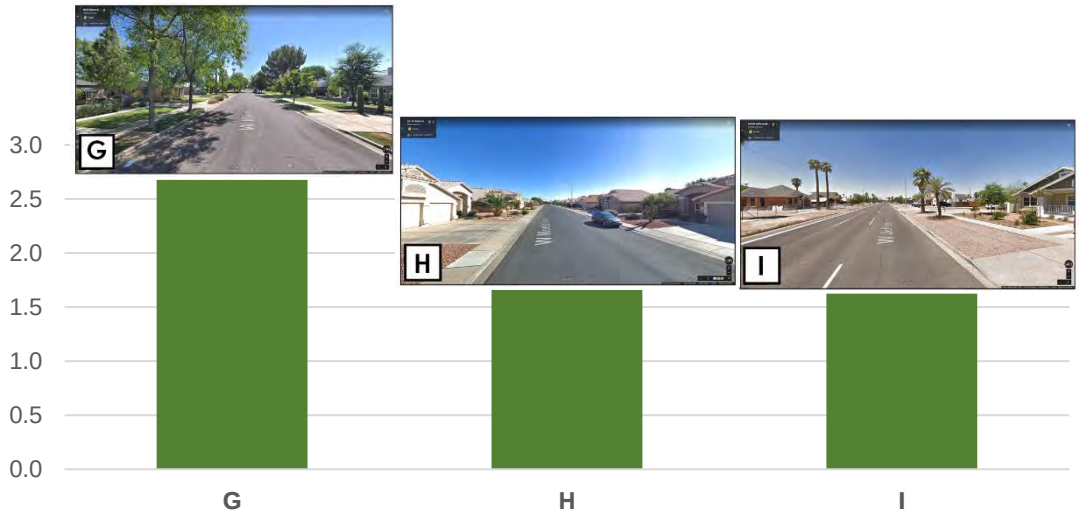
#3: *Which residential street shown below do you prefer?*



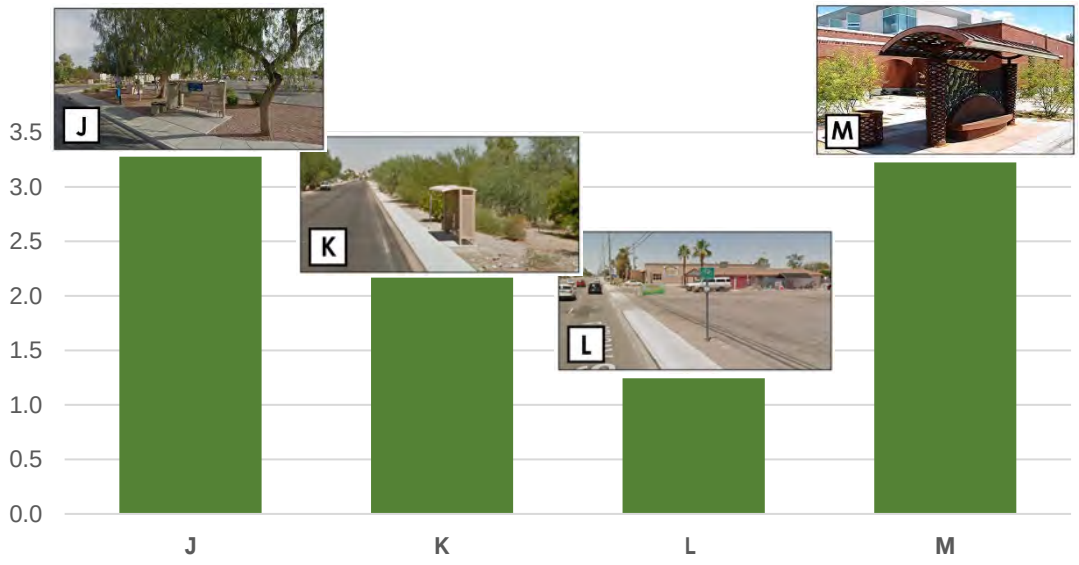
#4: ***Which residential street shown below do you prefer?***



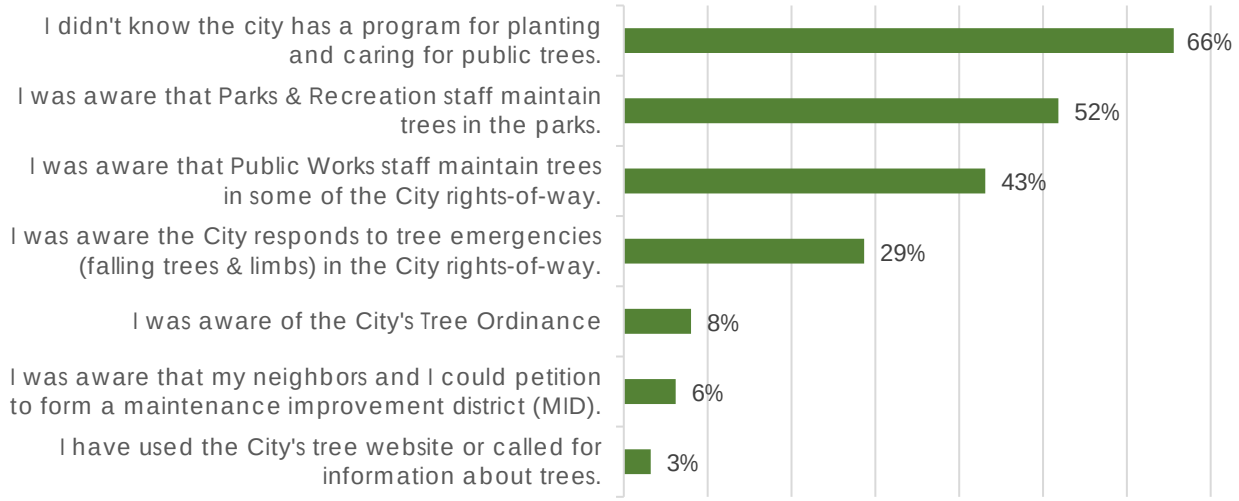
#5: ***Along which street would you feel most safe walking?***



#6: ***Which bus stop shown below would you rather wait at?***

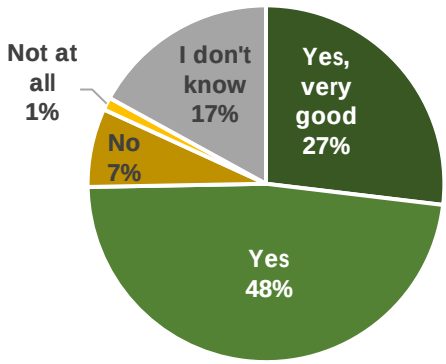


#7: *Did you know that the City has programs for planting and taking care of public trees?*



#8: *Do you think the trees in Yuma's parks are getting good care from the City?*

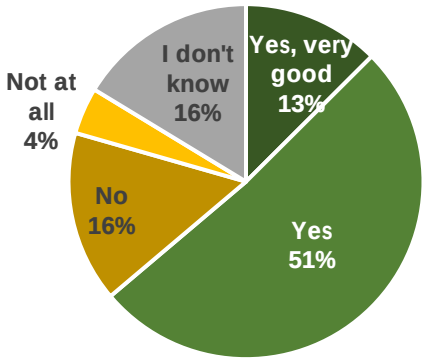
Parks & Recreation



Favorable View: 75%
Unfavorable View: 8%

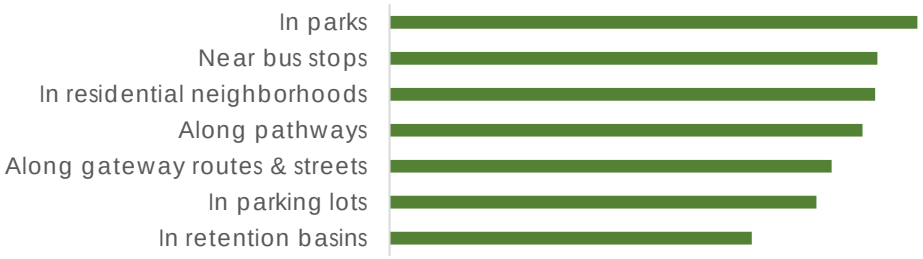
#9: *Do you think the trees in Yuma's streets, medians, and retention basins are getting good care from the City?*

Public Works

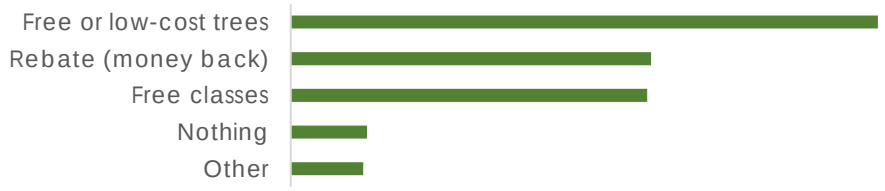


Favorable View: 64%
Unfavorable View: 20%

#10: *Where do you think the City should be encouraging tree planting?*

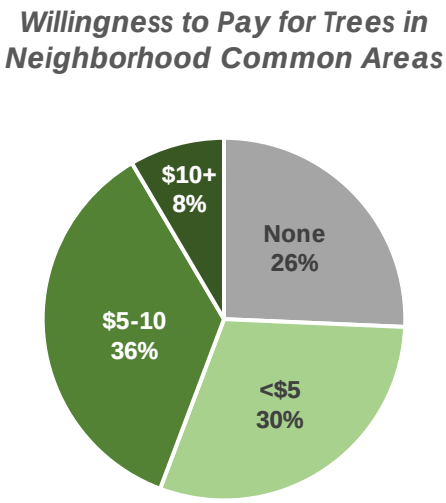


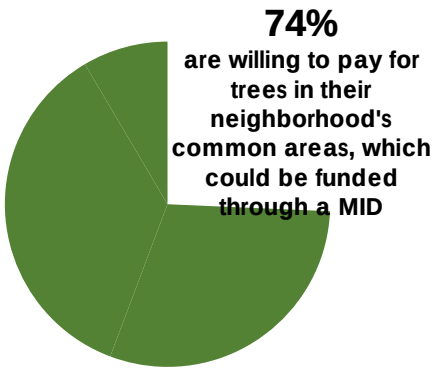
#11: *What would inspire you to plant more trees on your property?*



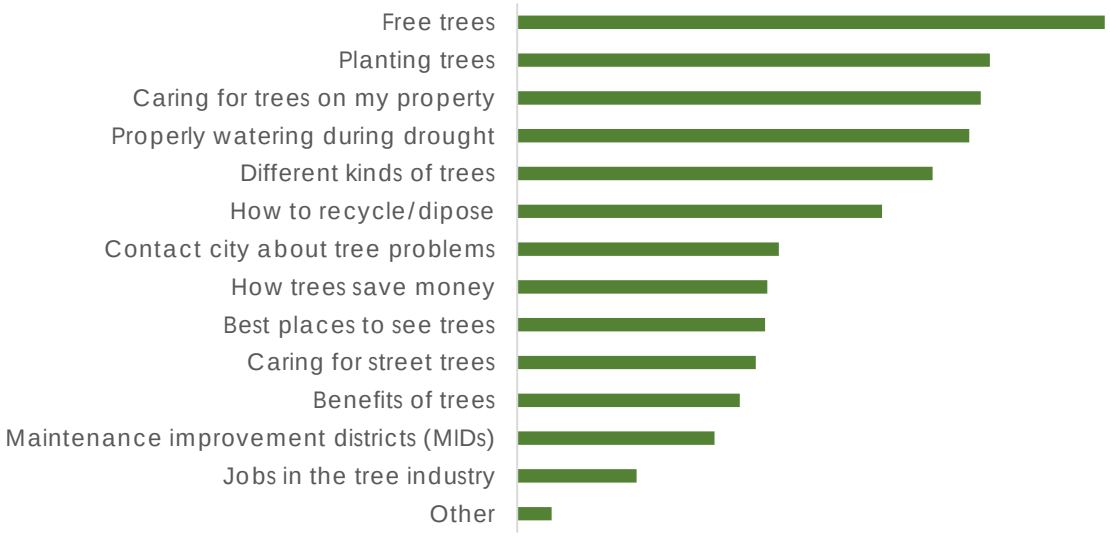
- *Maintenance rebate*
- *Vouchers or subsidy for landscape design*
- *Incentive to install drip system*
- *Reduced water rates*
- *If water cost would not be so high to maintain the trees*
- *Desert environment-water rates are too high. We live in a DESERT not a forest.*
- *Park owners agreeing to pay for water of trees.*
- *We live in a desert and we aren't using enough low water required plant and trees for here*
- *Knowing things like: growth rate or will it outgrow my house, cause problems, maintenance, best areas to plant*
- *We already have a tree in our front yard, however I've had issued with roots in our sewer lines in the past since they are so close to the house.*
- *Need some way to get rid of tree debris, used to throw it in the residential dumpster until it went to once a week pickup, hauling to the dump is difficult because of the new tarp ordinance*
- *To know about trees native to our region and resilient to our weather*
- *Maintenance is the hardest part for a lot of people, so anything educational in that aspect would help.*
- *Teaching the importance of trees and plants in the environment.*
- *Live in an HOA that regulates the trees.*
- *I rent an apartment. I will need permission from the property management company.*
- *I live in an HOA condo*
- *I live in a mobile home park. We are limited in the trees/shrubs we plant.*
- *Reduced prices, or a free tree trimming service offered every few years for residential areas.*
- *I'm getting to old to maintain trees myself and it is too expensive to pay someone.*
- *Having a bigger lot to fit more trees*
- *I need nothing to inspire me. I would plant as many as I desire.*

#12: *How much would you be willing to pay to have more trees in your neighborhood's common areas? Property owners can petition to form a maintenance improvement district (MID), which is a type of special taxing district formed to maintain landscape and trees in common areas, typically by a private contractor.*





#13: ***What topics would you like to learn more about?***



- *Public tree planting group/event*
- *The best trees to plant for Yuma and the care plan for such trees.*
- *Learning a tactful way to get neighbors to take care lawns and trees on their property.*
- *Landscape design that saves water & has a lush canopy*
- *How much water tree lined streets would require in a desert community in an area with constant draught concerns. How much damage to streets and sidewalks from roots?*
- *How to get Southwest Management to plant trees at La Fiesta Apartments.*
- *How can I control lead trees?*
- *Nothing, we live in a desert not a forest. Trees soak up the water.*
- *I want to be sure that private enterprise will not have to bear high costs for mandated tree numbers on their property, existing or newly developed.*
- *How to stop the City from TELLING ME WHAT TO DO WITH MY PROPERTY*
- *This survey is to long and set up to answer the way you want to hear it*
- *I already know about trees*
- *Nothing really. I know about tree care.*

General Support

- *WE NEED MORE TREES!!!*
- *More Trees!*
- *I'm very excited to see this master plan moving forward. Yuma needs a lot more trees.*
- *Let's Beautify this City!!!*
- *Good idea, great for the city and citizens, thank you*
- *I really like the idea of the City of Yuma wanting to plant more trees. Not only is good for Yuma, but make it a more appealing and livable community.*
- *Beautifying Yuma with more trees is one aspect in a larger movement to attract a greater number of higher paid specialists to our community. Most people, especially high earning professionals, want to live where it feels comfortable, looks appealing and where they can interact with nature easily. The more we can do to retain and attract these people to Yuma, the better our local economy will perform.*
- *I am very excited to see this topic being discussed and I hope it brings more beautiful trees to this barren, sunny city.*

- *Please consider adding more trees to our COY. The beautification and benefits of planting trees should be of importance. Thank you for considering this.*
- *I will be looking forward to seeing our city become green with trees, and possibly use rain water collection areas to form "desert oasis'"*
- *I LOVE THE IDEA OF MAKING OUR DESERT AREA LOOK GREEN :)*
- *I would hope this would help out here in the Foothills.*
- *I support more trees and good information about sustainable trees for our climate. If I had a larger home lot, I would plant more trees. I have 6 trees on my property (Sisoo; Grapefruit; Ornamental Plum; Bottle Brush; Hong Kong Orchid)*
- *Would like to see it grow*
- *I like to see towns, such as parts of Phoenix, with greens. I do not like concrete jungles as they are too hot, example, Phoenix downtown.*
- *Love this idea and brings the community together by protecting our world and makes Yuma look more welcoming not so boring and dull*
- *Finally this is happening! Very exciting for Yuma!*
- *Yuma is lacking tree coverage which presents a poor image of the community.*
- *I would love to see more natural shade for the future of my family and others.*
- *Livability and shade would be greatly improved with trees.*
- *Not enough trees. We love trees (plus people damage trees)*
- *I love Yuma's urban forest*
- *Save the forest or trees for shade*
- *The more trees the better in Yuma*
- *I'm strongly in favor of expanding Yuma's urban forest.*
- *Increasing the urban forest is an essential move and should move forward as quickly as possible.*
- *I think this is great and I look forward to being involved. I only heard about it through the children's art museum and a flyer they had. I just bought a home and it has a lot of plants and trees and I really want to take care of them but I don't fully know how.*
- *I support it*
- *Plant away! We have planted numerous trees on our property*
- *Good job*
- *Yuma needs more trees*
- *More trees & more shade which I think will have more kids outside in warmer months*
- *It is so hot and sunny we should shade the entire city*
- *We need more shade and greenery in Yuma.*
- *Love my street's tree canopy and fell in love with the city even more because of the well cared for city parks and trees.*
- *There are not enough trees and here we need more because of the type of weather*
- *We must plant many more trees, taking care that they provide shade, do not need so much water and maintenance (Hay que plantar muchos mas arboles, cuidando que den sombra, no necesiten tanta agua y mantenimiento)*
- *I would like to see more trees planted (Me gustaria ver mas Ã¡rboles plantados)*

Priority Areas

PATHWAYS

- *More shade trees are critically needed along the East Main Canal bike path.*

STREETS/PEDESTRIAN ZONES

- *Would lie to see shady trees along pedestrian zones downtown*

- *We need gathering spaces, current shopping centers and parks to have a better tree canopy. Subdivisions need to allow space along sidewalks or in between properties to plant native or drought resistant shade trees.*
- *We definitely need more trees in the poorer neighborhoods*
- *Trees belong in Parks, not along streets (too much $$$'s for maintenance). Palms would be a better chose for streets.*

PARKS

- *Joe Henry Park needs new trees or re- planting*
- *Only In parks.*

PARKING LOTS

- *We need more trees in parking areas and not be so dependent on solar panels to provide shade*
- *Parking lots trees or solar shade structures.*
- *Parking lot trees would be great.*
- *More trees in parking lots!*
- *Main library (I know county) cut all parking lot trees! hot cars and wasted money for planting. I and others would avoid going to and parking at places where no shade.*

SCHOOLS/PLAYGROUNDS

- *I also think the school playgrounds should have trees and our mobile park as well or something that would give children shade*

Recommendations

APPROPRIATE TREE SPECIES SELECTION

- *I'd like that any incentives focus on native or well-adapted trees that don't require additional water. Concerned about introduction of non-native trees.*
- *Plant trees that are root stable here and those that help more than average clean the air. Our climate must be of utmost concern in choosing trees.*
- *I think large trees like pecan trees need to be planted. Palo verde trees do not give much shade or help cool.*
- *I would like to see more green trees, than desert trees.*
- *City should plant trees require little to no maintenance*
- *While being mindful of the need to not sound too 'Big Brother' about it, I think the City should consider something along the lines of declaring the Salt Cedar/Tamarisk to be an 'invasive species' and find a way to encourage ("strongly motivate") their removal completely. Too much work has been put into removing these toxic, water wasting eyesores along the river, and now they are showing up more and more in landscaping (somehow) and in areas where weeds/brush are being allowed to grow. They waste what little groundwater is available and make the soil too toxic for other plants and trees to survive for years after they're gone, not to mention creating far worse fire hazards when they're not maintained compared to other 'wild' greenery.*
- *I would like there to be an emphasis on planting diverse groups of trees rather than large clusters of one type. Pests and infections can more easily wipe out the city's hard work if there isn't variety. Also, all of the reasons for wanting more trees in the beginning of the survey were good. I love trees, so it was extremely difficult to pick just five because I value all those things that trees provide. Thank you for asking for public comment and for creating a plan to plant more trees in Yuma.*
- *It would be amazing if they were trees that provide fruit*
- *Fruit trees and flower trees do more*

GREEN WASTE

- *When the city discontinued trash pickup 2 times a week and went to one trash pickup and one recycling pickup they made a huge mistake by not considering the amount of green waste hardship they placed on the homeowner.*

TREE CARE & MAINTENANCE

- *Trees do better with mulch. Get rid of all the gravel. All it does is radiate heat.*
- *Parks in Yuma are very well kept but some home residential owners do not care for trees or are unable to do it. There should be more guidance in appropriate care if trees.*
- *Good idea. Proper care of existing trees will help. A program to help people fix, save, repair their trees will help.*

Maintenance

- *The urban forest looks good on 20th St. between Ave B & C.*
- *Love the orange trees downtown*
- *The city has a history of cutting down trees in public areas and then not replacing them. Downtown, Big Curve, our grass belts at the front of our streets.*
- *Why do work men come and trim all the leaves and green off of existing trees?? It's stupid*
- *Beautiful trees cut down. Replaced by ugly xeriscaping which is not maintained.*
- *Trees that are cut down in retention basins are not replaced in my neighborhood.*
- *Xeriscaping is nice, when well maintained*
- *We need better weed control in our retention basin*
- *The City needs to replace shade trees along the roads that died as a result of poor city crew maintenance and pruning.*
- *We're sad so many trees got cut down at Main Library parking lot*
- *Main library (I know county) cut all parking lot trees! hot cars and wasted money for planting. I and others would avoid going to and parking at places where no shade.*
- *Trees that are cut down in retention basins are not replaced in my neighborhood.*
- *Trees are nice but who will take care of them once the subdivision is built? I believe it is the Street department. With flat budgets, it is hard to cover these expenses. We need our roads repaired. Time for the city to look at the big picture and not each department have their own agenda that affects other departments budget. Maybe they should go out on a crew and trim them to see the amount of work there is in requiring trees.*
- *Go to any median or common area in Yuma. You find watering, but no plants or trees, missing trees or plants. City doesn't either have a maintenance schedule or doesn't follow it.*
- *This city could be beautiful like Phoenix area but our city doesn't invest in the city scape.*
- *What about the drought & low levels of water required to water these trees. What about maintenance costs for irrigation? This is a terrible idea.*

Other Comments

- *Urban forests in Yuma should take into consideration plant benefiting out local wildlife and climate.*
- *1) Is the 5.5% canopy coverage good? I didn't see a definition for that percentage 2) Our private businesses are the worst for trees, e.g., Walmart on Pacific, Yuma Palms; 3) Our neighborhoods need new trees, but not ficus which definitely interfere with infrastructure; 4) Our schools need more trees, but certainly don't expect the state to*

give money towards that project; 5) Our parks are looking better, but parks there are only a few parks.

- *I have a huge problem with the City of Yuma telling me what I HAVE to do with my property. I don't like that fact that i will be FORCED to do it at all. It is unfair and ridiculous. Whoever came up with this plan, obviously thought that it is okay to impose on our private property. Not everyone is happy with the City telling us what to do!*
- *Why do we have an urban forest? The city needs to reconstruct neighborhood roads.*
- *Trees are nice! But so are roads that we can drive on without pot holes.*
- *We need more development and promotion.*
- *I plan on attending the open house on June 6th.*
- *There's an urban forest?*

Appendix G

TREE ORDINANCE (2019)

Adopted on December 4, 2019, the updated tree ordinance replaces Yuma's original tree ordinance that was adopted in 2007.

ORDINANCE NO. O2019-038

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF YUMA, ARIZONA, REPEALING AND REPLACING YUMA CITY CODE TITLE 13, CHAPTER 137: TREES, TO PROMOTE AND PROTECT THE PUBLIC HEALTH, SAFETY, AND GENERAL WELFARE BY PROVIDING FOR THE REGULATION OF THE PLANTING, MAINTENANCE, AND REMOVAL OF MUNICIPAL TREES, SHRUBS, AND CACTI AND PROVIDING A PENALTY FOR VIOLATIONS THEREOF

WHEREAS, Arizona Revised Statutes (A.R.S.) § 9-240(B)(9) authorizes the City of Yuma (City) to adopt and maintain regulations governing the planting, protection and maintenance of trees within the City's public grounds and rights-of-way; and,

WHEREAS, to protect, enhance and promote the health, safety and welfare of the City, City residents and City trees, on November 20, 2007, the Yuma City Council adopted Ordinance No. O2007-69, creating City Code Chapter 137: Trees, governing the maintenance of City owned trees, vines and other woody plants; and,

WHEREAS, the City of Yuma recognizes that trees are a valuable part of our community infrastructure and that well-maintained trees enhance the comfort of our community by providing shade, preventing erosion, moderating temperatures, reducing storm water runoff, absorbing air pollution and dust, and reducing energy needs; and,

WHEREAS, the City of Yuma recognizes that well-maintained trees increase property values, enhance the economic vitality of business areas, beautify our community wherever they are planted, and are a source of joy and spiritual renewal; and,

WHEREAS, the City of Yuma recognizes that accepted industry standards exist for the maintenance and care of urban trees, and that promoting these standards significantly increases overall tree health and reduces liability and risk, ensuring that our community forest will increase in value and benefits provided; and

WHEREAS, the City of Yuma recognizes that this ordinance is critical to continue to earn recognition as a "Tree City, USA," as bestowed by the National Arbor Day Foundation, a designation that will increase the opportunity for the City to pursue and successfully obtain grant funding specific to the establishment, promotion, and management of our community forest; and,

WHEREAS, the City's adoption of this Ordinance will repeal and replace Chapter 137: Trees, to further protect and maintain the City's trees, shrubs and cacti.

NOW, THEREFORE, BE IT ORDAINED by the City Council of the City of Yuma as follows:

SECTION 1: Yuma City Code Title 13, Chapter 137, Trees, is hereby repealed in its entirety and replaced with a new Chapter 137: Trees, three (3) copies of which are on file as public record in the office of the City Clerk of the City of Yuma, that was declared a public record through Resolution R2019-048, and is hereby adopted by reference and made a part hereof.

SECTION 2: If any section, subsection, sentence, clause, phrase or portion of this Ordinance is for any reason held to be invalid or unconstitutional by the decision of a court of competent jurisdiction, such decision shall not affect the validity of the remaining portions thereof.

SECTION 3: Violations of this ordinance are subject to the following penalties:

(A) Unless otherwise specifically provided for in this ordinance, any person or corporation who shall violate any provision of this ordinance shall be deemed guilty of a class 3 misdemeanor, and shall be punished as provided in § 10-99 of the Yuma City Code.

(B) Any and all amounts paid or collected pursuant to this ordinance, with the exception of enforcement and administrative costs, shall be deposited into the Municipal Tree Fund.

ADOPTED this 4th day of December, 2019

APPROVED:

Douglas J. Nicholls
Mayor

ATTESTED:

Lynda L. Bushong
City Clerk

APPROVED AS TO FORM:

Richard W. Files
City Attorney

October 2019

CHAPTER 137: TREES

Section 137-01 Purpose.

(A) This Chapter is enacted to further the following public purposes:

(1) To plant and maintain Municipal Trees in support of the citywide tree canopy goal of 7%, pursuant to the City's most current Tree & Shade Master Plan;

(2) To promote efficient and cost-effective management of the City's urban forest;

(3) To foster community support for the City's urban forestry programs and encourage good tree management on privately-owned properties by conducting an ongoing program of public outreach and education in order to promote public understanding of the City's urban forest;

(4) To maintain status as a "Tree City, USA", by the National Arbor Day Foundation, a designation that will increase opportunities for the City to pursue and successfully obtain grant funding specific to the establishment, promotion, and management of our urban forest.

Section 137-02 Definitions.

(A) "Municipal Tree" shall mean any tree owned or maintained by the City of Yuma, including those growing in City rights-of-way, parks, retention basins, and other facilities.

(B) "Street Tree" shall refer to, for the purpose of this article, any tree that grows to an average mature height of 30 feet or more, generally has a high branching pattern, and upright or rounded crown form. Street trees are planted near the sidewalk or street to provide shade to pedestrians and visual enclosure to the street. The best species for street trees are low maintenance and produce low litter. Street trees shall be pruned and maintained to allow for minimum of 12 feet of clearance over any roadway and seven feet of clearance over any sidewalk.

(C) "Removal" shall mean any intentional or negligent moving, carrying away, elimination or taking away of part or all of a tree.

Section 137-03 Applicability.

(A) This Chapter is applicable to all Municipal Trees, shrubs, and cacti on property owned or maintained by the City of Yuma, including public rights-of-way, parks, retention basins, and other facilities.

(B) Responsibility for the care and management of Municipal Trees is shared between the following: the Urban Forestry Subdivision of the Parks Maintenance Division of the Parks and Recreation Department; the Streets Maintenance Division and Basin Maintenance Division of the Public Works Department; and the adjacent property owners who are responsible for perpetual maintenance of all landscaped areas in the public right-of-way adjacent to their lot in accordance with Section 154-20.05 of this Code. All officers and investigators of the City Police and Fire Departments, the City building official, code enforcement officers, building inspectors, code enforcement specialists, and the City arborist are authorized to issue notices to comply and citations for violations of this Chapter within City jurisdiction.

(C) The responsible entities shall use their best efforts to ensure their activities are guided by the Tree & Shade Master Plan, or any superseding management plans. The City shall update and improve this Plan as necessary.

(D) The City may authorize an exception or partial exception to the restrictions in this Chapter under any one of the following conditions:

(1) A verifiable emergency exists that endangers life or property;

(2) There is an interruption of essential Public service;

(3) Public or other service for transportation is required where no other feasible means of providing such service exists;

(4) Public Works or maintenance work performed by or on behalf of the City; or

(5) Work is required by City, County, State or Federal regulation.

Section 137-04 Maintenance.

(A) All Municipal Trees, shrubs, and cacti shall be planted, managed, and cared for through adherence to the American National Standards Institute (ANSI), ANSI A300 Standards for Tree Care Operations - Tree, Shrub, and Other Woody Plant Management (most current revisions).

(B) With the exception of required maintenance, no person shall damage, cut, carve, attach any rope, wire, nails, advertising posters, or other contrivance to any Municipal Tree; allow any gaseous, liquid, chemical, or solid substance that is harmful to Municipal Trees to come in contact with them; or set fire or permit fire to burn when such fire or the heat will injure any portion of any Municipal Trees.

(C) Tree-topping shall not be allowed on any Municipal Trees.

Section 137-05 Tree Removal & Replacement.

(A) Municipal Trees shall not be removed without a permit issued by the City and

assessment by a certified arborist.

(B) Permit Required. It shall be unlawful for any person or corporation to remove any Municipal Tree without a valid encroachment permit for such work issued by the City Engineer, pursuant to Title 21: Streets and Traffic Code, Chapter 210 of this code.

(C) An abutting property owner who desires to remove a Municipal Tree shall apply to the City Engineer for an encroachment permit on forms provided for such purpose by the City. The City Engineer, or his or her designated representative, may grant or deny the permit in accordance with the following procedures and requirements.

(1) Replacement. If a permit to allow tree removal is issued, it shall require a tree or trees be planted on the site and within the right-of-way to replace the removed tree or the permit shall impose an in-lieu fee unless it makes written findings detailing the basis for waiving or modifying this requirement.

(a) Replacement tree(s) shall be chosen from the City of Yuma Recommended Plants List.

(b) If the tree to be removed has a diameter at breast height (DBH) of less than 6 inches or it is a non-desirable species as determined by the City Arborist, it shall be replaced with one (1) 15-gallon or larger tree.

(c) If the tree to be removed has a diameter at breast height (DBH) of 6 inches to 12 inches, it shall be replaced with two (2) 15-gallon or larger trees.

(d) If the tree to be removed has a diameter at breast height (DBH) greater than 12 inches, it shall be replaced with (3) 15-gallon or larger trees.

(2) In-Lieu Fees. If an encroachment permit is granted for tree removal and an in-lieu fee required, the in-lieu fee shall be determined by the City Arborist based on the estimated replacement value of the tree to be removed. In-lieu fees may be required if the lot in question is inadequate in size to accommodate the required replacement tree.

(3) Municipal Tree Fund. Monies collected from in-lieu fees shall be credited to the Municipal Tree Fund to be used for care and maintenance of Municipal Trees and to offset the loss of Municipal Trees due to removal, destruction, or death. Persons may donate money for the purpose of tree planting and maintenance and said donations shall be credited to the Municipal Tree Fund.

Section 137-06 Providing for Repeal of Conflicting Ordinances.

All ordinances and parts of ordinances in conflict with the provisions of this Chapter or any part of the Code adopted herein by reference are hereby repealed.

Section 137-07 Severability.

If any section, subsection, sentence, clause, phrase, or portion of this Chapter is for any reason held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions thereof.

Section 137-99 Penalty.

(A) Unless otherwise specifically provided for in this Chapter, any person or corporation who shall violate any provision of this Chapter shall be deemed guilty of a class 3 misdemeanor, and shall be punished as provided in § 10-99 of this Code.

(B) Any and all amounts paid or collected pursuant to this subsection, with the exception of enforcement and administrative costs, shall be deposited into the Municipal Tree Fund.

Appendix H

WATER USE OF TREES

Using water use recommendations from *Landscape Watering by the Numbers*, an irrigation guide designed for the Arizona desert, the average water use of a mature desert-adapted tree with a canopy of 20 feet in diameter was calculated to be approximately 4,500 gallons of water each year. The average annual cost of $10 for that water was calculated based on current City of Yuma water rates for residential and commercial properties. Adding 100,000 trees would equate to approximately an additional 450 million gallons of irrigation water annually, which is about 1.5% of the City's total water supply allocation. The following pages show the assumptions and calculations used to produce these estimates.

DESERT-ADAPTED TREES

WATER USE ESTIMATE

Based on Landscape Watering by the Numbers from Water Use for Arizona Desert (wateruseitwisely.com)

		FREQUENCY (DAYS BETWEEN WATERING)						WATER AMOUNT		
		DAYS BETWEEN WATERING			WATERING DAYS/MONTH			20' CANOPY TREE	235 GAL/WATERING	
		LOW	AVERAGE	HIGH	LOW	AVERAGE	HIGH	LOW	AVERAGE	HIGH
JAN	31	60	45	30	0.5	0.7	1.0	121	162	243
FEB	28	60	45	30	0.5	0.6	0.9	110	146	219
MAR	31	30	22	14	1.0	1.4	2.2	243	331	520
APR	30	30	22	14	1.0	1.4	2.1	235	320	504
MAY	31	30	22	14	1.0	1.4	2.2	243	331	520
JUN	30	21	14	7	1.4	2.1	4.3	336	504	1007
JUL	31	21	14	7	1.5	2.2	4.4	347	520	1041
AUG	31	21	14	7	1.5	2.2	4.4	347	520	1041
SEP	30	21	14	7	1.4	2.1	4.3	336	504	1007
OCT	31	21	14	7	1.5	2.2	4.4	347	520	1041
NOV	30	30	22	14	1.0	1.4	2.1	235	320	504
DEC	31	30	22	14	1.0	1.4	2.2	243	331	520
							ESTIMATED ANNUAL WATER USE/TREE (GALLONS)	**3142**	**4511**	**8167**

HIGH WATER USE TREES

WATER USE ESTIMATE

Based on Landscape Watering by the Numbers from Water Use for Arizona Desert (wateruseitwisely.com)

		FREQUENCY (DAYS BETWEEN WATERING)						WATER AMOUNT		
		DAYS BETWEEN WATERING			WATERING DAYS/MONTH			20' DIAMETER TREE	235 GAL/WATERING	
		LOW	AVERAGE	HIGH	LOW	AVERAGE	HIGH	LOW	AVERAGE	HIGH
JAN	31	30	22	14	1.0	1.4	2.2	243	331	520
FEB	28	30	22	14	0.9	1.3	2.0	219	299	470
MAR	31	12	9.5	7	2.6	3.3	4.4	607	767	1041
APR	30	12	9.5	7	2.5	3.2	4.3	588	742	1007
MAY	31	12	9.5	7	2.6	3.3	4.4	607	767	1041
JUN	30	10	8.5	7	3.0	3.5	4.3	705	829	1007
JUL	31	10	8.5	7	3.1	3.6	4.4	729	857	1041
AUG	31	10	8.5	7	3.1	3.6	4.4	729	857	1041
SEP	30	10	8.5	7	3.0	3.5	4.3	705	829	1007
OCT	31	10	8.5	7	3.1	3.6	4.4	729	857	1041
NOV	30	12	9.5	7	2.5	3.2	4.3	588	742	1007
DEC	31	12	9.5	7	2.6	3.3	4.4	607	767	1041
							ESTIMATED ANNUAL WATER USE/TREE (GALLONS)	**7054**	**8645**	**11263**

WATER USE IN CITY OF YUMA

Data from City of Yuma Utilities Department Water Conservation Plan

1 AC-FT (acre-foot)	=	325,851	GAL
1 HCF (hundred cubic feet)	=	748	GAL

WATER SUPPLY ALLOCATIONS

Colorado River Water	50,000	AC-FT	16,292,550,000	GAL
Converted Water (YCWUA) Estimated	25,000	AC-FT	8,146,275,000	GAL
Returned Water	8,793	AC-FT	2,865,207,843	GAL
Ground Water	2,788	AC-FT	908,472,588	GAL
	86,581	AC-FT	28,212,505,431	GAL

WATER DEMAND

2014 DEMAND	8,000,000,000	GAL/YR
PERCENT OF TOTAL ANNUAL WATER SUPPLY AVAILABLE TO CITY:	33%	
PER CAPITA DAILY	192	GAL/DAY
PER CAPITA ANNUAL	69,912	GAL/YR

WATER USAGE CHARGE

	RESIDENTIAL		COMMERCIAL & IRRIGATION	
	INSIDE CITY	OUTSIDE CITY	INSIDE CITY	OUTSIDE CITY
0-10 hcf	$1.56	$2.07	$1.75	$2.29
11-30 hcf	$1.83	$2.43	$1.75	$2.29
31+ hcf	$2.10	$2.79	$1.75	$2.29

COST OF ADDING TREES

Each year, one desert-adapted tree needs

4,500 GAL/YR

The water needed to support one tree costs the average resident:

$9.38 PER YR

The water needed to support one tree costs the average commercial property owner:

$10.53 PER YR

The goal set by the plan is to reach 7% canopy coverage by planting approximately:

100,000 ADDITIONAL TREES IN 10 YRS

If 100,000 trees are added over the next 10 years, the total water use will be:

450,000,000 GAL/YR
1,381 AC-FT/YR
1.6% OF TOTAL WATER ALLOCATION
$938,437 ADDITIONAL COMMUNITY-WIDE WATER COST/YR

The City maintains approximately 8.2% of the overall canopy within city limits. Therefore, the additional water cost of trees (at maturity) to be maintained by the City is estimated to be:

$76,952 ADDITIONAL CITY WATER COST/YR