PUBLIC MEETING AGENDA

Sustainability Commission

MEETING DATE
Monday September 21, 2020
4:30 p.m.

MEETING LOCATION
Virtual Meeting
Join Microsoft Teams Meeting
+1 480-498-8745 United States, Phoenix (Toll)
Conference ID: 906 589 523#

AGENDA ITEM	PRESENTER	ACTION or INFORMATION
1. Public Appearances The Sustainability Commission welcomes public comment for items listed on this agenda. There is a *three-minute time limit* per citizen.	Kendon Jung, Commission Chair (4:30 – 4:33 pm)	Information
2. Approval of Meeting Minutes The Commission will be asked to review and approve meeting minutes from the August 17, 2020 meeting.	Kendon Jung, Commission Chair (4:33 – 4:35 pm)	Action
3. Water Rate Study Staff will provide updates.	Terry Piekarz, Municipal Utilities Director (4:35 – 4:55 pm)	Information
4. Draft Parks and Recreation Masterplan & Rio Salado/Beach Park Masterplan Staff will provide updates.	Craig Hayton, Deputy Director Community Services - Parks (4:55 – 5:20 pm)	Information
5. Sustainability and Resilience Grants Update ASU Faculty will provide updates.	Paul Caseo, ASU (5:20 – 5:40 pm)	Information
6. Climate Action Plan 2021 Update Staff will provide updates.	Braden Kay, Sustainability Director (5:40 – 6:15 pm)	Action
7. Climate Action Budget Acceleration Staff will provide updates.	Braden Kay, Sustainability Director (6:15 – 6:20 pm)	Information
8. Housekeeping Items Service award pins	Kendon Jung, Commission Chair (6:20 – 6:25 pm)	Action
9. Future Agenda Items Commission may request future agenda items.	Kendon Jung, Commission Chair (6:25 – 6:30 pm)	Information

According to the Arizona Open Meeting Law, the Sustainability Commission may only discuss matters listed on the agenda. The City of Tempe endeavors to make all public meetings accessible to persons with disabilities. With 48 hours advance notice, special assistance is available at public meetings for sight and/or hearing-impaired persons. Please call 350-2775 (voice) or 350-8400 (TDD) to request an accommodation to participate in a public meeting.

Minutes
City of Tempe Sustainability Commission
August 17, 2020

Minutes of the Tempe Sustainability Commission meeting held on Monday, August 17, 2020, 4:30 p.m. at a virtual meeting on MS Teams, through City Hall 31 E. 5th Street, Tempe, Arizona.

(MEMBERS) Present:
Kendon Jung (Chair)
Ryan Mores (Vice Chair)
Barbie Burke
Sukki Jahnke
John Kane
Steven Russell
Gretchen Reinhardt

(MEMBERS) Absent:
Stephanie Milam-Edwards
Snigdha Nautiyal
Katja Brundiers

City Staff Present:
Braden Kay, Sustainability Director
Grace DelMonte Kelly, Energy Management Coordinator
Samantha Zah, Sustainability & Local Climate Coordinator
Valencia Clement, Office of Sustainability USDN Fellow

Guests Present:
Hannah Moulton Belec, Neighborhood Advisory Commission Chair
David Sokolowski
Stella Carr

Chair Jung called the meeting to order at 4:35 p.m.

Agenda Item 1 – Public Appearance

Chair Jung asked the guests to introduce themselves.

Agenda Item 2 – Approval of Meeting Minutes

Chair Jung introduced the minutes of the July 20, 2020 meeting. Commissioner Burke made a motion to approve the minutes. Commissioner Russell seconded.

Motion: Commissioner Burke
Second: Commissioner Russell

Decision: Approved 7-0

Voted to Approve:

Kendon Jung (Chair)
Ryan Mores (Vice Chair)
Barbie Burke
Sukki Jahnke
John Kane
Gretchen Reinhardt
Steven Russell

Agenda Item 3 – Summer Intern Update

Sustainability Director Braden Kay introduced Equity, Diversity and Inclusion Fellow Valencia Clement to talk about the work she is doing at the City during her 15-week fellowship. Valencia said she is working with the Urban Sustainability Directors Network (USDN). The organization was founded in 2008 and their mission is to connect local government practitioners to accelerate urban sustainability in the United States and in Canadian communities and to create equitable engagement opportunities.

This fellowship includes meetings with a cohort of six sustainability professionals. We talk about justice for people and planet, for example, during Hurricane Katrina, services for front line communities were interrupted such as bus service, which has not been restored. Local governments need to include the community in the conversation. There is coaching as part of the fellowship. We talk about ways to engage underserved communities. The fellowship includes coaching and cohort group meetings. It's all virtual. This fellowship is the first of its kind in the State of Arizona and focuses on dismantling structural racism and reducing barriers to equitable engagement in government decision making.

We hope to expand our partnership. We want to be respectful and mindful of historic context and current context. Valencia said her work has four components:

1. To co-create an equitable community engagement framework
2. Translate the framework into Tempe's CAP2021 update
3. Art based project (spoken word video)
4. Pilot project brainstorming

Braden thanked Valencia and said Valencia and he meet with nine professionals who represent different communities to get their perspectives. The meet on a semi-monthly basis. They have done a Government 101 session to talk about how cities work, about budget and policies. They look at Guadalupe, Victory Acres, pop-up homeless shelters in Tempe. Who are Tempe's front line communities? How can we service them? We will engage them and we can use that framework to identify liaisons, representatives and find out what barriers prevent participation. How do we overcome those barriers?

Chair Jung thanked Valencia for the presentation.

Agenda Item 4– Sustainability and Resilience Grants Update

Braden Kay introduced Samantha Zah. Samantha said she is working on GLOCULL grant, Global to Local Urban Living Labs, developing an Arizona Indigenous Foodways Yearbook. It will be published in September and will be distributed to local, state, tribal and national organizations. The next grant they are working on is a Robert Wood Johnson Foundation grant. Braden Kay, Paul Caseo and Katja Brundiers had a semi-finalist interview. It went well.

The panel asked how are we engaging youth? How do we facilitate that shift in dynamics? They asked about cooling projects in Tempe. They said we'll find out next week who gets funded.

The next grant is the National Endowment for the Arts Our Town Grant of $150,000. The principal contact is Professor Wanda Dalla Costa. She is the lead for Re-indigenization of Tempe: Designing for Equity, Inclusion and Diversity, showing what indigenous design principles in Tempe could look like and collaborating with communities, creating an idea book for designing with equity, inclusion and diversity in mind.

Braden thanked Sam and Valencia for their hard work and dedication and said they are examples of young leaders that work on equity and climate action work.

Agenda Item 5– Climate Action Plan 2021 Update – Listening Sessions

Sustainability Director Braden Kay introduced Hannah Moulton Belec. He said she is the new chair of Neighborhood Advisory Commission. Hannah said thanks, I am interested in cross-commission collaboration. I'm interested in budgeting for social justices. We are trying to be more pro-active. We are interested in sharing knowledge and teaming with other commissions. Thanks for inviting me to this meeting.

Braden said Stella Carr is listening in. Stella received a Master's in Public Administration at ASU and interned at the City of Tempe. She is now the Sustainability Director in Lexington, MA, 12 miles from Boston. Stella works with their sustainability commission and asked how we collaborate, so Braden invited her to the meeting.

Agenda Item 6 – Housekeeping Items

There were no housekeeping items.

Agenda Item 7 – Future Agenda Items

A motion was made to adjourn.

Motion: Commissioner Burke
Second: Commissioner Russell
Decision: Approved 7-0

Voted to Approve:

Kendon Jung (Chair)
Ryan Mores (Vice Chair)
Barbie Burke
Sukki Jahnke
John Kane
Gretchen Reinhardt
Steven Russell

The meeting was adjourned at 6:30 pm.

Prepared by: Grace DelMonte Kelly
Reviewed by: Braden Kay

2020 Water and Wastewater Rate Study Recommendations

September 17, 2020

Tempe

Making waves in the desert

Council Priorities and Performance Measures

- 1.13 – Achieve or exceed Safe Drinking Water Act compliance regulations for water quality 100 percent of the time.

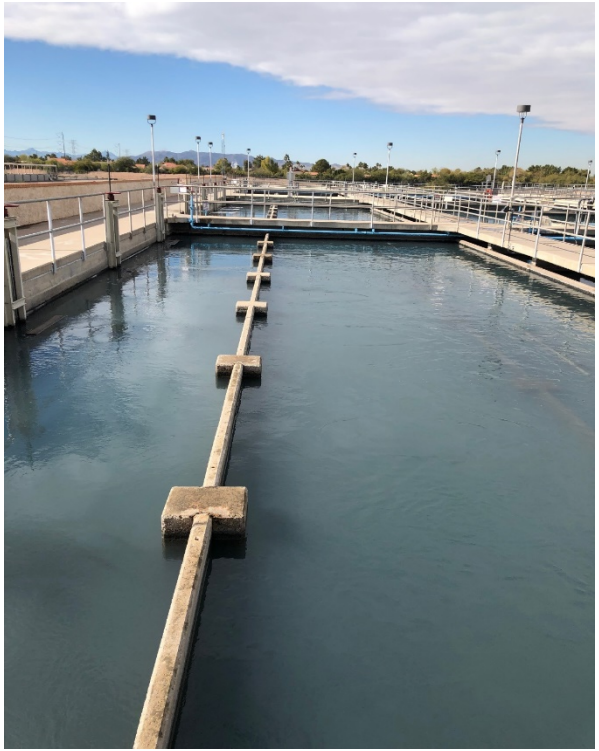
- 2.02 – Achieve satisfaction ratings of “Very Satisfied” or “Satisfied” with the “Quality of Customer Service” greater than or equal to the top 10% of the national benchmark cities as measured in the Community Survey.

- 4.03 – Achieve the Council adopted water conservation goal of less than or equal to 110 gallons of residential water use per capita per day.

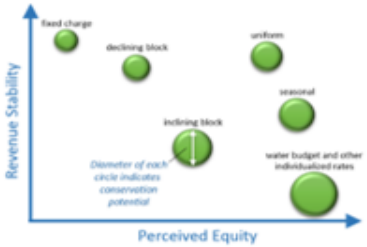
- 5.01 – Achieve ratings of "Very Satisfied" or "Satisfied" with the "overall level and quality of business services provided by the City of Tempe" greater than or equal to the national benchmark cities as measured in the Business Survey.

Background and Assumptions

- March 2020 policy guidance
  - Cost-based approach
  - Advanced Metering Infrastructure (AMI)
  - Water conservation and water efficiency
  - Flood irrigation cost recovery



Rate Study Process



Revenue Requirements

- Operating Costs
- Capital Costs
- Financial Policies
  - Debt Coverage
  - Reserves

Cost Allocation

- Evaluate Available Data
- Establish Classes
- Identify Methodology
- Compare Results to Current Revenue

Rate Design

- Evaluate Objectives
- Identify Structures
- Set Parameters
- Customer Impacts

Communication

- Explain Process/Data
- Adjustment Drivers
- National Trends
- Local Practices

Active Stakeholder Participation

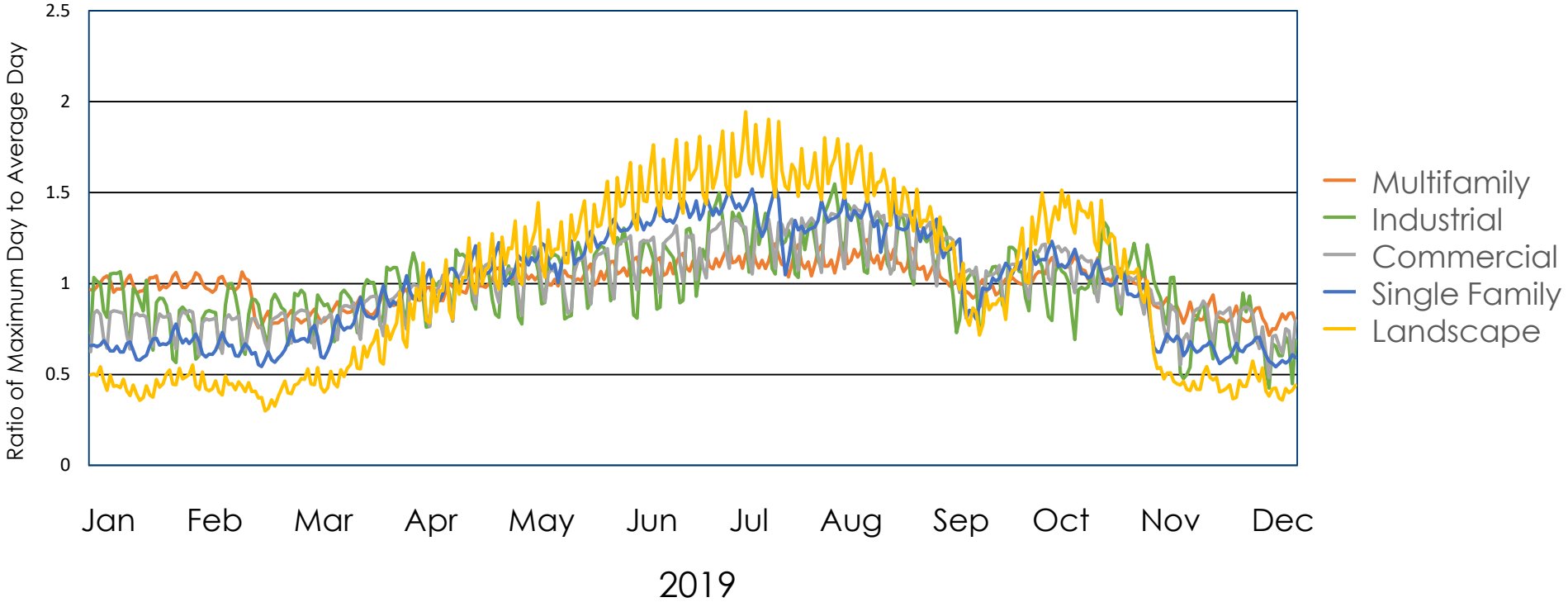
Customer Engagement

- Enhance customer input via community stakeholder group
  - Four working sessions
  - Ten members representing multiple customer classifications
- Live public webinar held in June

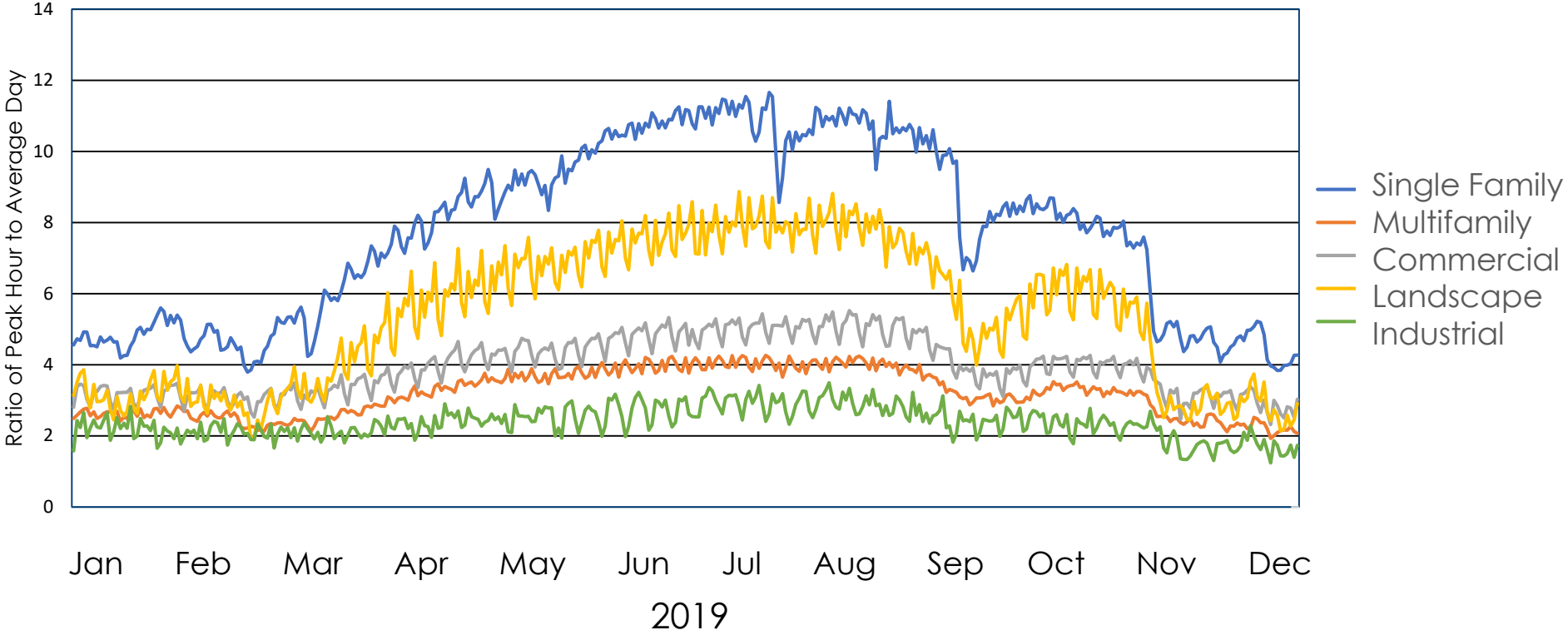
Large Volume Residential Customer Outreach

- Approximately 3,346 large volume residential customers (LVRCs) reach Tier 5 water usage for at least one month every year
- 62 customers have enrolled in the Water Efficiency Certification (WEC) Pilot Program
- Pilot program concludes in March 2021

Maximum Day Water Demand Analysis

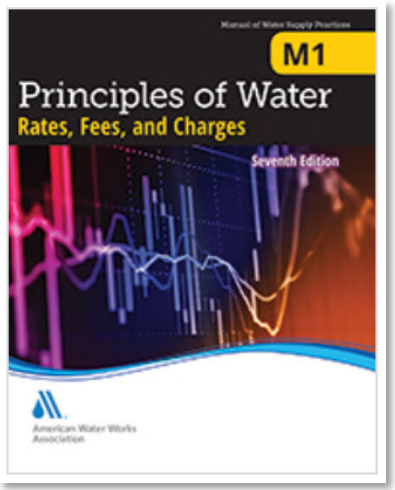


Peak Hour Water Demand Analysis

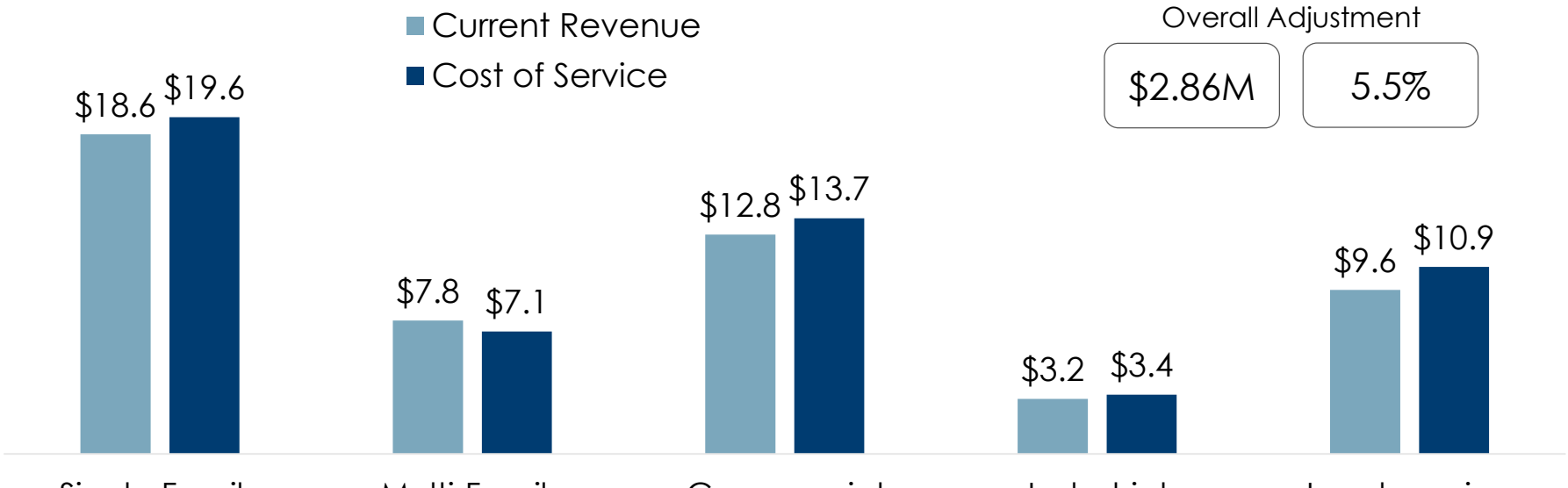


Rate Study Recommendations

- The water utility requires 5.5 percent revenue increases, annually, over the next 10 years.
    - A single revenue increase will be recommended to Council for adoption.
    - Revenue requirements will be reviewed each year.
- The wastewater utility does not require a revenue increase at this time.
- The flood irrigation program requires a 9.7 percent revenue increase
    - Required to maintain 50 percent cost recovery.



Cost Allocation Adjustments



Customer Class Adjustments	Single Family	Multi-Family	Commercial	Industrial	Landscaping
	$1.00M 5.5%	$(0.64)M -8.5%	$0.94M 7.2%	$0.23M 7.2%	$1.33M 14.1%

Monthly Service Charge

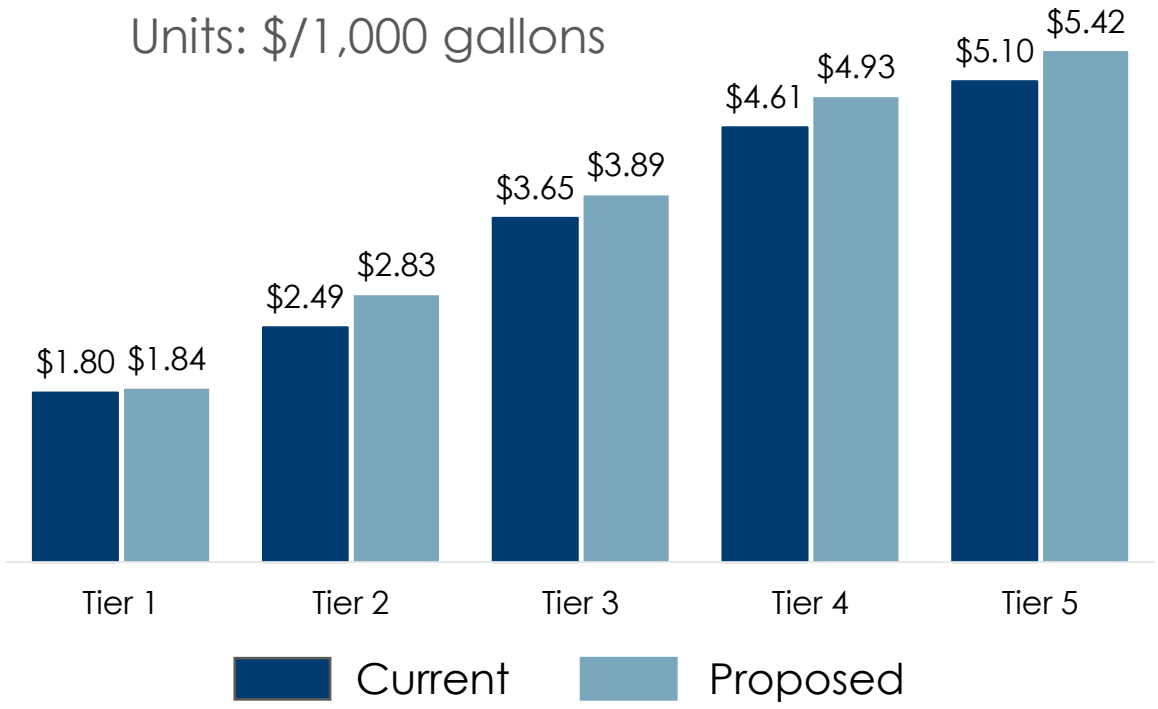
Meter Size	Current Fixed Monthly Service Charge	Recommended Fixed Monthly Service Charge
5/8"	$11.50	$13.15
3/4"	$15.70	$14.85
1"	$23.50	$22.15
1.5"	$41.60	$47.00
2"	$67.90	$91.60
3"	$154.00	$207.25
4"	$302.00	$298.70
6"	$599.00	$1,148.55
8"	$1,400.00	$2,004.35

Metered Volume Charges For Other Customer Classifications

Customer Classification	Current Rate ($/1,000 gal)	Calculated Rate ($/1,000 gal)
Multi-Family	$2.51	$2.05
Commercial	$2.59	$2.65
Industrial	$2.63	$2.77
Landscaping	$3.51	$3.96
Construction	$4.07	$4.07

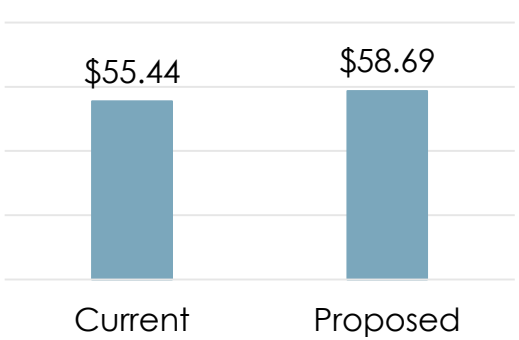
Single Family Metered Volume Charges

	Tier Size (in 1,000 gal)
Tier 1	0-6
Tier 2	7-12
Tier 3	13-20
Tier 4	21-40
Tier 5	40+



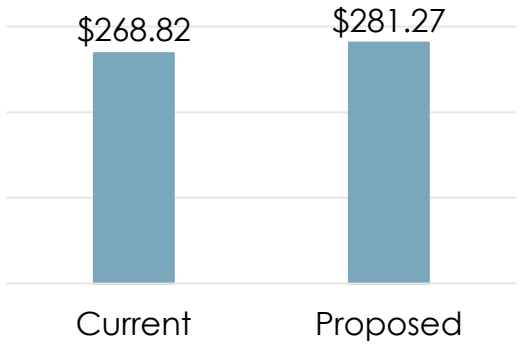
Single Family Monthly Bill Impact

5/8" Meter, 10,000 gallons water, 7,000 gallons wastewater



% Change:	5.90%
Total Fixed Change:	$1.65
Metered Volume Change:	$1.60
Total Change:	$3.25

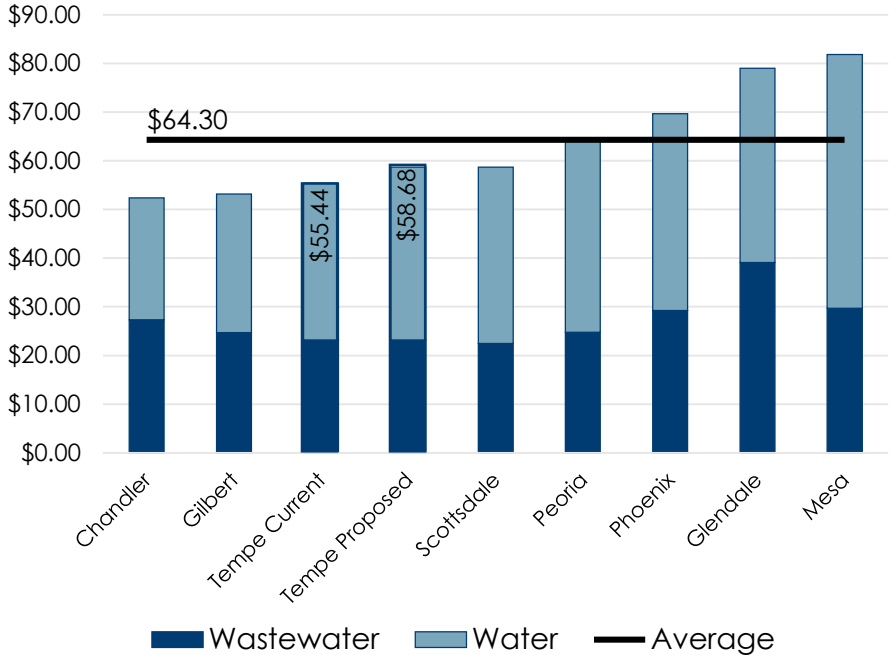
1" Meter, 50,000 gallons water, 20,000 gallons wastewater



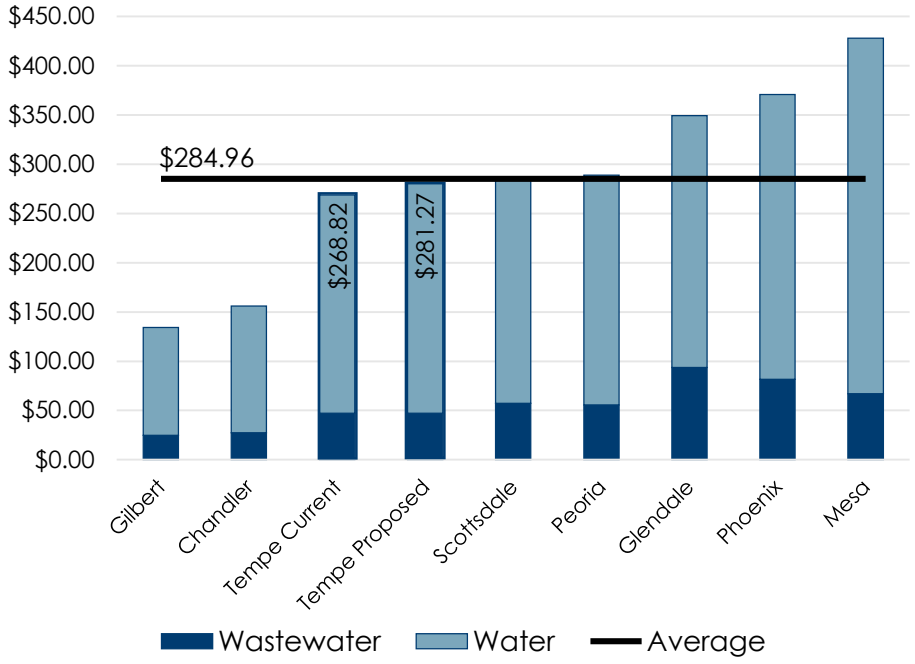
% Change:	4.60%
Total Fixed Change:	-$1.35
Metered Volume Change:	$13.80
Total Change:	$12.45

Single Family Monthly Bill Comparison

5/8" Meter, 10,000 gallons water, 7,000 gallons wastewater

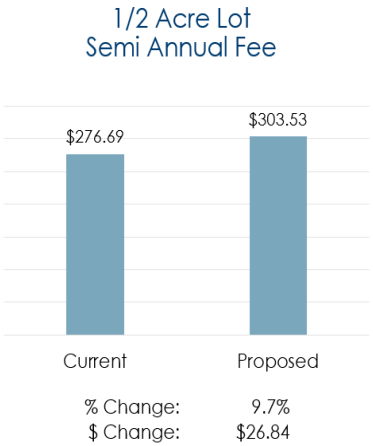


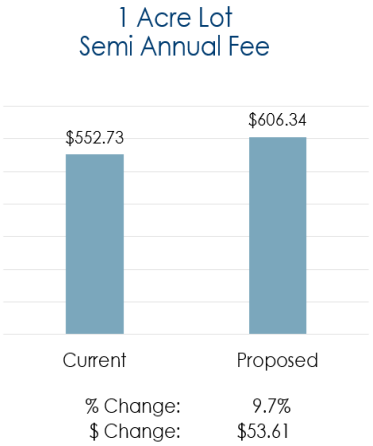
1" Meter, 50,000 gallons water, 20,000 gallons wastewater



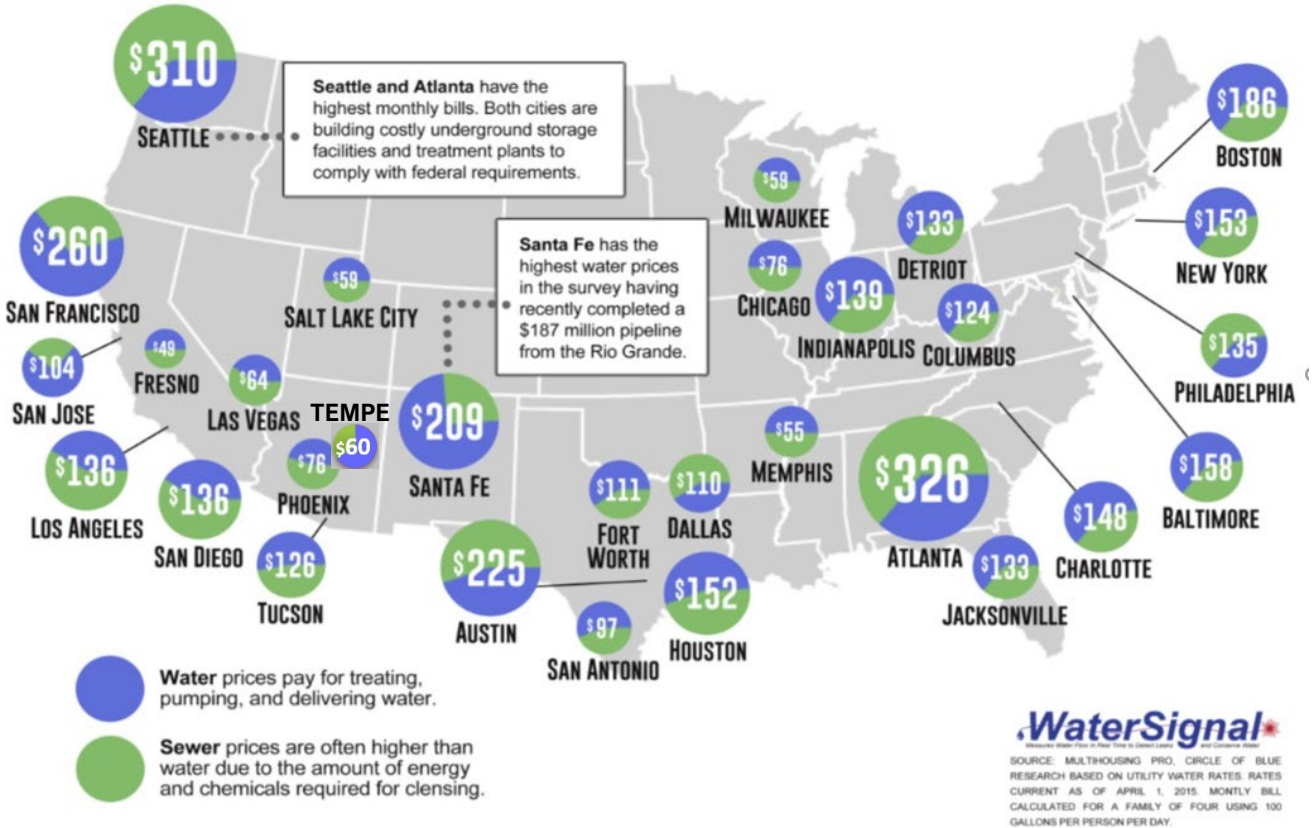
Flood Irrigation Program Revenue Requirements and Impacts

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Adjustment Factor:	9.7%	2.2%	2.2%	2.2%	2.2%
Revenue					
Flood Irrigation Revenue	$329,100	$336,340	$343,706	$351,096	$358,644
Transfer in from GF	$119,573	$122,204	$124,880	$127,565	$130,307
Total Revenue	$448,673	$458,544	$468,586	$478,661	$488,952
Cost Recovery:	50.0%	50.0%	50.0%	50.0%	50.0%
Expenses					
Capital Expenses	$261,597	$261,597	$261,597	$261,597	$261,597
Operating Costs	$635,948	$655,027	$674,677	$694,918	$715,765
Total Expenses	$897,545	$916,624	$936,274	$956,515	$977,362





National Utility Rates Comparison

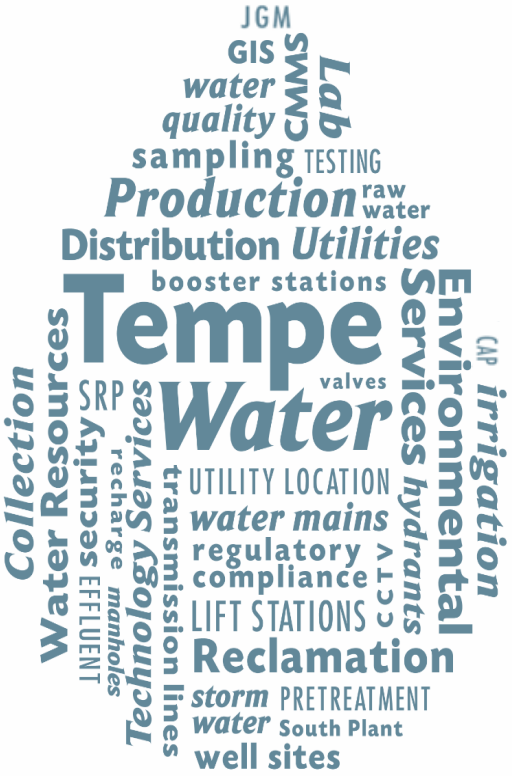


WaterSignal

SOURCE: MULTIHOUSING PRO, CIRCLE OF BLUE RESEARCH BASED ON UTILITY WATER RATES. RATES CURRENT AS OF APRIL 1, 2015. MONTLY BILL CALCULATED FOR A FAMILY OF FOUR USING 100 GALLONS PER PERSON PER DAY.

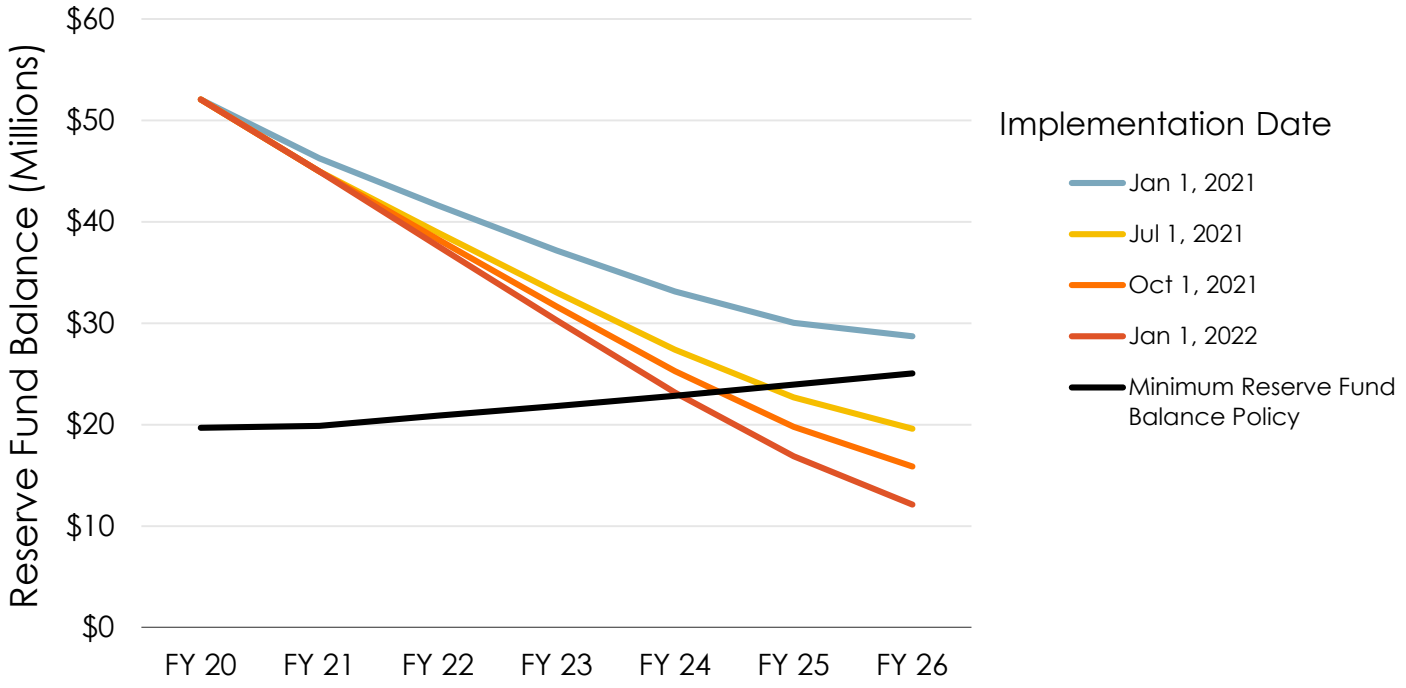
Summary of Recommendations

- 5.5 percent annual water revenue increase
- Adjust proportional cost recovery for each customer classification
- Adjust monthly service charge to increase fixed cost recovery
- 9.7 percent flood irrigation revenue increase
  - Required to maintain 50 percent cost recovery.
- No change required in wastewater revenue at this time

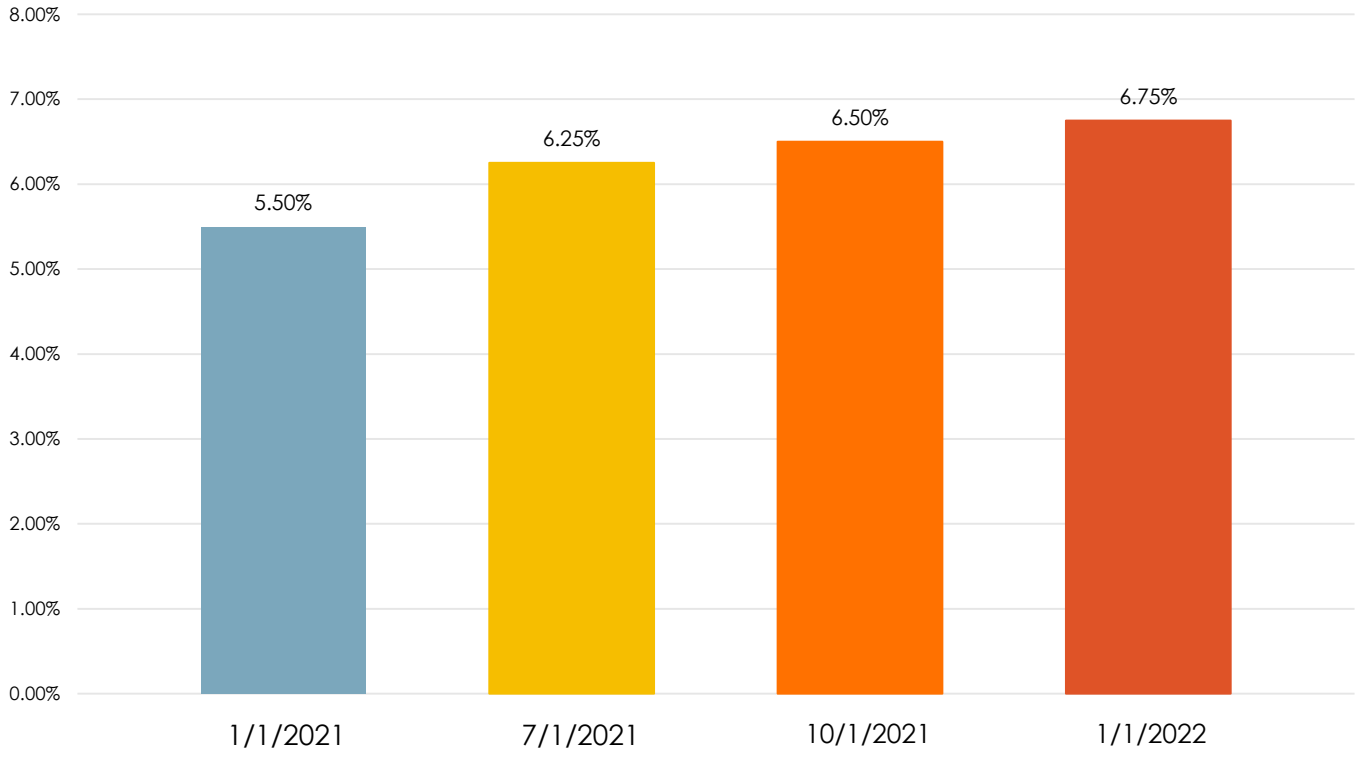


Impact of Delaying Water Revenue Increase on Minimum Reserve Fund Balance

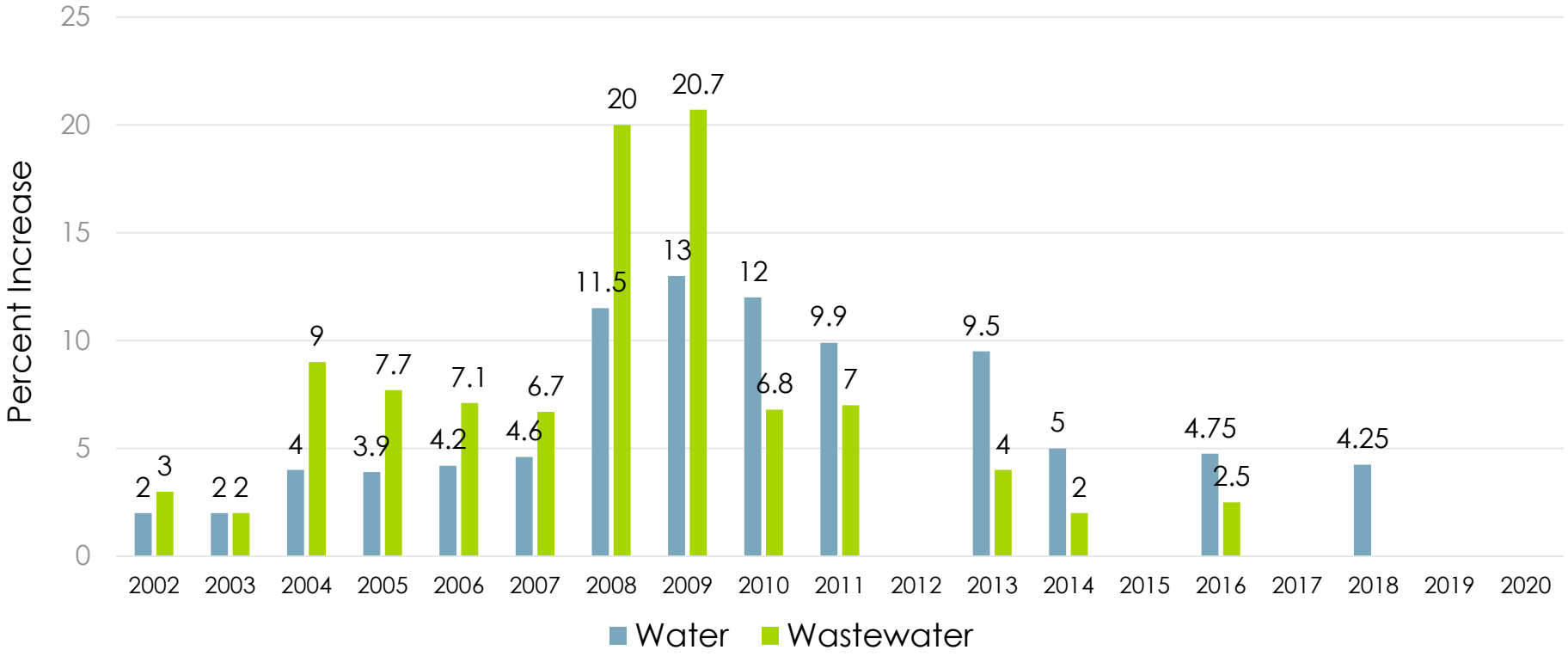
An annual 5.5 percent revenue increase is required, starting in January 2021, to meet forecasted expenses and stay at or above the utility's minimum reserve fund balance



Future Revenue Increases to Maintain Minimum Reserve Fund Balance Policy



Historical Revenue Increases



Next Steps

- Public outreach
  - Public meeting (live webinar)
  - Neighborhood Advisory and Sustainability Commissions
  - Website, Tempe Today, Wrangler News, social media
- December 3, 2020, Regular Council Meeting, to consider rate adoption
- If adopted as recommended, rate changes would become effective January 4, 2021

Parks & Recreation Master Plan Update

Tempe Sustainability Commission
September 21, 2020

Tempe

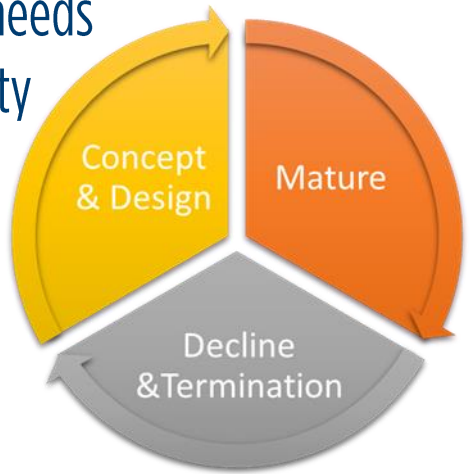
Making waves in the desert

Presentation Overview

- Planning process updates
  - Recreation program assessment
  - Levels of service analysis
  - Park classifications
- Plan format
- Next Steps/timeline
- Questions & comments

Program Assessment Strategies

- Framework for providing recreation programs and services
  - Philosophy and plan for program and service delivery
- Broad range of recreation programs and services that meet community needs
  - Social equity programs and services to engage our diverse community
- Enhance administrative procedures and performance indicators
  - Use the program and service lifecycle analysis
- Develop comprehensive marketing plan
  - Community engagement through outreach, awareness, focus groups and conversations



Levels of Service Analysis

- Amenity analysis by ratio of population
- Evaluates capacity to meet future needs
- Identifies gaps in service
- Recommends quantity of facilities
- Guides new infrastructure investments & potential expenses
- Helps support & determine programming priorities

LOS Recommendations

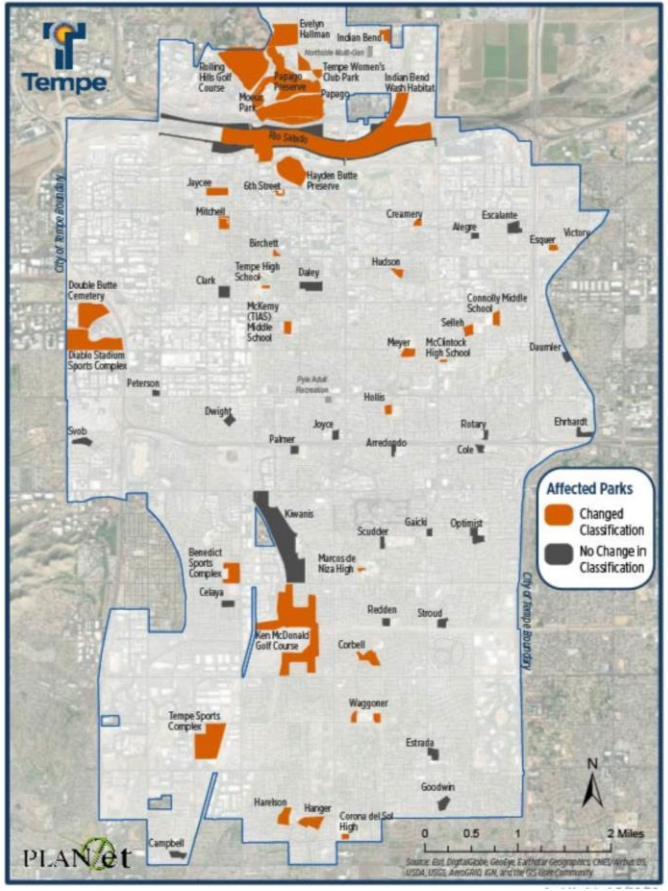
TYPE OF FACILITY	TOTAL CURRENT	RECOMMENDED LOS (PER 10,000)	TOTAL NEEDED 2020	ADDITIONAL RECOMMENDED 2020	TOTAL NEEDED 2030	ADDITIONAL RECOMMENDED 2030
		POPULATION	190,000		217,000	
BASEBALL/SOFTBALL FIELDS	37	1.70	32	0	37	0
DOG PARKS	6	0.32	6	0	7	1
VOLLEYBALL	33	1.74	33	0	38	5
PICKLEBALL	12	0.63	12	0	14	2
SKATE PARKS	4	0.21	4	0	5	1
SOCCER FIELDS	37	1.00	19	0	22	0
TENNIS COURTS	51	1.45	28	0	31	0
PLAYGROUNDS	43	2.26	43	0	49	6
PICNIC RAMADAS	81	4.26	81	0	93	12
SPLASH AND SPRAY PADS	4	0.21	4	0	5	1
COMMUNITY CENTERS	5	0.26	5	0	6	1

Park Classification Update

- System of defining & organizing
- Aided by comparison LOS jurisdiction definitions
- Determined by facilities/amenities, service area & size
- Guides facility/amenity type & scale
- Impact maintenance standards, programming & service areas

Park Classifications – 2001 vs. 2020

2001 Plan	2020 Plan
Regional Parks	Regional Parks
Community Parks	Community Parks
Neighborhood Parks	Neighborhood Parks
Mini-Parks	Urban Parks
Other	Natural Areas
	Shared-Use Recreation Facilities (SURF)
	Special-Use Areas



Plan Format: GIS StoryMap

- Online, interactive & explore-able guide
- Tells our story through maps, text & media
- Engages & enhances the user experience
- Visually attractive & user friendly format
- Print option

About the Parks and Recreation Master Plan

May 5, 2020

About This Plan

Parks and recreation facilities and programs contribute to Tempe's quality of life, economy, environment, and the health of it's residents. This Plan offers goals and action strategies which support the City's strategic priorities and guide the provision of City parks and recreation facilities that accommodate the desires of current residents and provide adequate capacity for future population growth.

How to Use this Online Document

This document is provided in an on-line format and can be viewed from a smartphone or computer. A printable version of the PLAN is available HERE. To view this digital document, use your mouse or arrow keys to scroll down. Some maps are interactive provide detailed statistics. To view this information, click on any image or shape in the map. Links to other resources are underlined. Detailed information on how to use this online & interactive document can be accessed by clicking HERE

Click to Access Table of Contents

Benefits of Parks & Recreation Programs & Facilities

Social Benefits

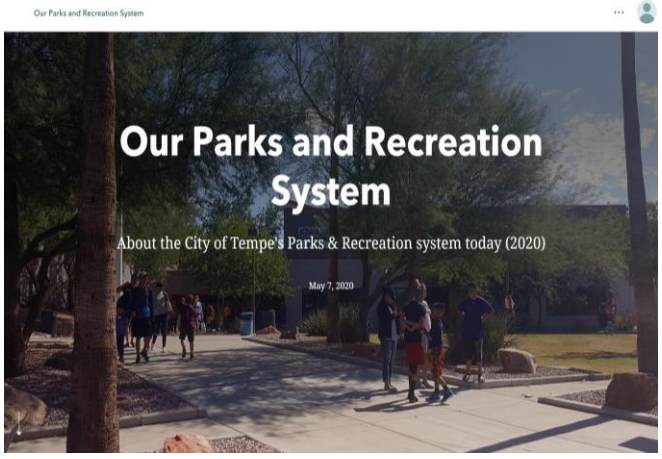
People use parks and recreation programs and facilities to connect to one another - through play, organized events, shared experiences, and informal interactions. Parks and recreation programs can also enhance inclusion in community activities of under-represented groups, such as low income, minority, and people with disabilities.

Economic Benefits

Parks contribute to our economy. Tempe's Tourism Office found that in 2018, 16% of the City's tourism supported jobs were in recreation, and visitors spent $103 million on recreation.

Environmental Benefits

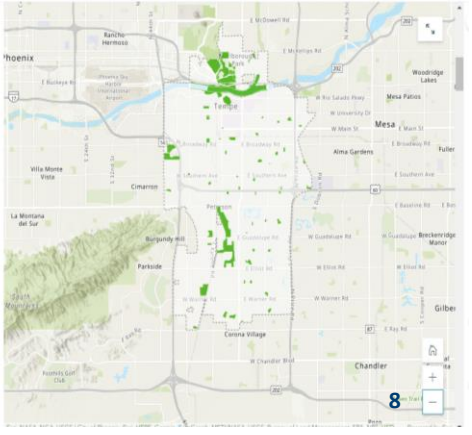
Parks are the City's Green Infrastructure. A 2017 U.S. Environmental Protection Agency (EPA) report states that green infrastructure partnerships between park and other agencies



Park & Recreation Facilities

City of Tempe Recreation Sites

The City of Tempe owns and manages 75 recreation sites totaling over 1,500 acres. These 79 sites include 59 parks (including 13 recreation sites at around Tempe Town Lake), two golf courses, six recreation centers, three sports complexes, four specialty parks, and an historic cemetary. The city also partners with schools to provide six additional recreation sites.



Timeline

Summer 2019 | Jan 2020 | Summer 2020* | Fall 2020*

- Online Survey
- Community Trends Analysis
- Benchmarking/LOS
- Programs Assessment
- Park Classifications Update
- Develop Draft & Final Master Plan
  - Costs, Funding & Financing
  - Priorities
  - Implementation

*WSS, Boards/Commissions & Public Comment:

- Summer 2020
- Fall 2020

Questions or Comments?

Rio Salado & Beach Park Master Plan Implementation

Tempe Sustainability Commission

September 21, 2020

Tempe

Presentation Overview

- Background
- Review of Concepts
- Questions

Master Plan: Review

- Purpose
- Guiding Principles
- Activity Zones
- Implementation Strategies

Rio Salado Park Masterplan Vision

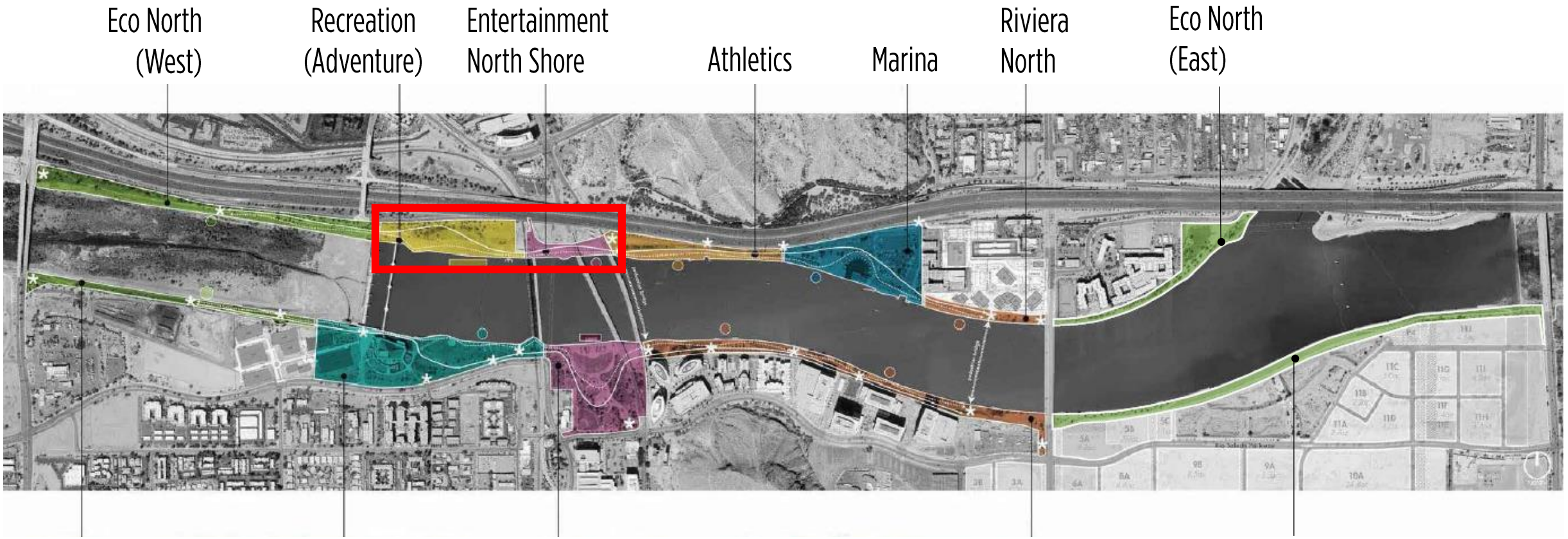
Tempe.

prepared by:
Holly Street Studio and Floor Associates
for:
City of Tempe, Arizona

Fall 2018

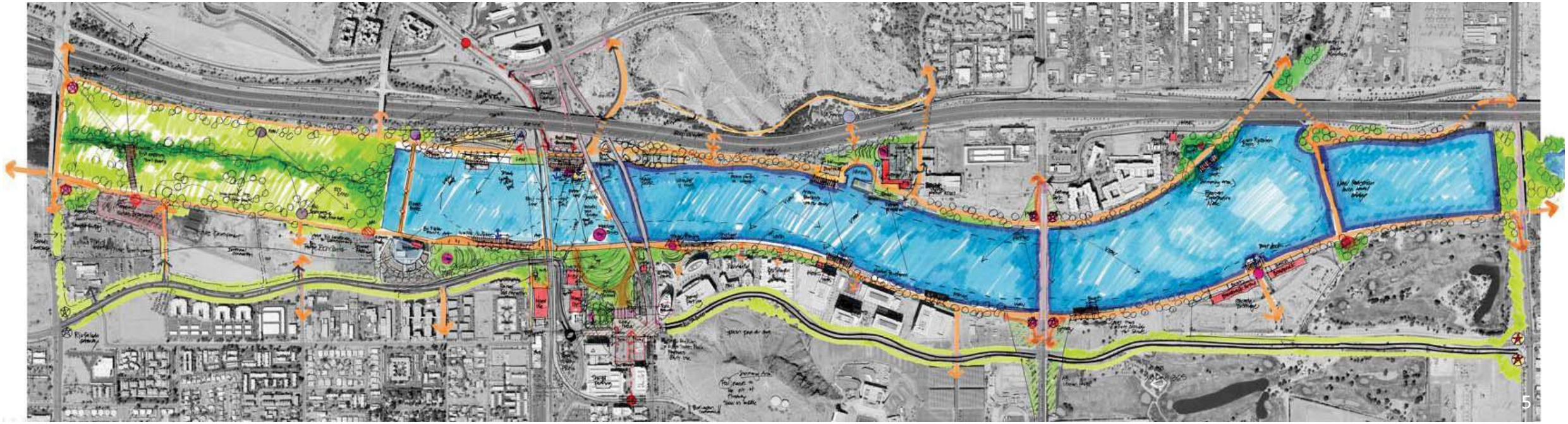
Implementing Improvements: Methodology

Activity zones were scored & prioritized by gauging improvement impacts & improvement potential.



Implementation Improvements: Funding

- **Public**
  - Capital Improvement Program
  - Grants
  - Land Sale
- **Private**
  - Private Development
  - Public Private Partnerships → **RFI**
  - Naming Rights
  - Sponsorships



Request for Information (RFI)

- RFI – Overview and Purpose
- Responses
- Other Waterfront Projects/Ideas

Review of Concepts

CATEGORY LAND (L)
L1 – Observation Tower
L2 – Rockwall
L3 – Fitness Court
L4 – Skate Rink
L5 – Bike Ramps
L6 – Playground
L7 – Swings
L8 – Carousel
L9 – Themed Gardens
L10 – Museum
L11 – Birding and Nature

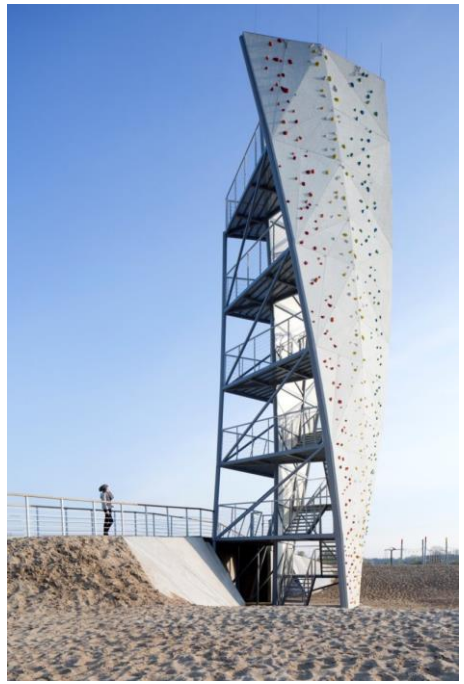
CATEGORY AERIAL (A)
A1 – Zipline
A2 – Adventure/Challenge Course
A3 – Sky Ride
A4 – Bungee Jumping

CATEGORY WATER (W)
W1 – Obstacle course
W2 – Slide
W3 – Cable wakeboard/Flowboard/Surf Pool
W4 – Brew boat/ Cycle boat/ Tour boat
W5 – Lazy River
W6 – Floating Movies
W7 – Fountain/ Splash Play

CATEGORY SUPPORT (S)
S1 – Food
S2 – Transport
S3 – Restrooms
S4 – Parking

LAND (L)
L1 – Observation Tower
L2 - Rockwall

Observation towers provide unobstructed views of the surrounding areas. Climbing walls allow multiple people of varying skill levels to simulate rock climbing. The structures can be combined to reduce the footprint.



LAND (L)
L3 – Fitness Court
L4 – Skate Rink
L5 – Bike Ramps
L6 - Playground

Active land-based amenities can include things such as adult fitness courts, bike ramps, ice rinks that doubles as a walking path, and children's play equipment.

LAND (L)
L7 – Swings
L8 – Carousel
L9 – Themed Gardens

Land-based activities can also be more passive in nature such as swings, carousels and themed gardens.

LAND (L)
L10 – Museum
L11 – Birding and Nature

Educational opportunities can take the form of museums and nature walks, self-guided or instructor-led.

Do you see a hawk-like bird fly overhead?
Two "raptors" harvest fish from Tempe Town Lake.

Bald Eagle

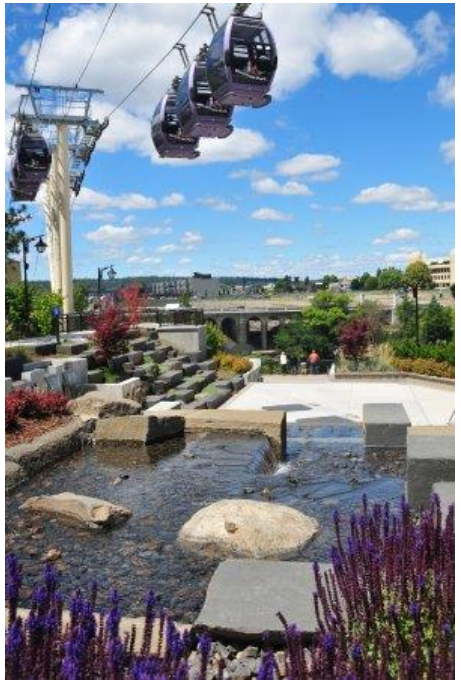
Osprey

AERIAL (A)
A1 - Zipline

Ziplines can take riders across the lake at speeds up to 25 miles per hour.

AERIAL (A)
A2 – Adventure/Challenge Course
A3 – Sky Ride
A4 – Bungee Jumping

Other Aerial adventures take you above the city in sky rides or challenge courses. Bungee jumping and free-fall experiences let the user defy gravity.

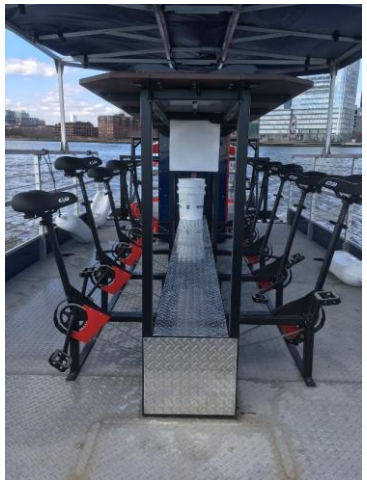


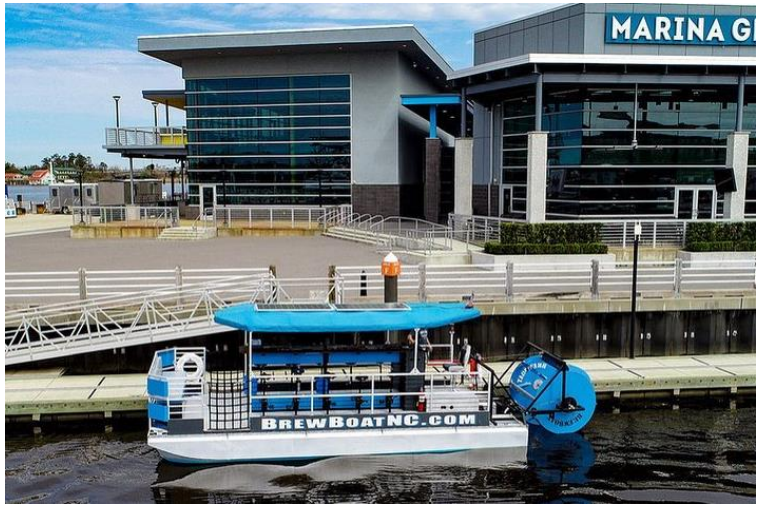
WATER (W)
W1 – Obstacle Course
W2 - Slide

Large inflatables installed on the water provide obstacle and challenge courses. Outdoor slides can be installed on water or land, with water landing or foam pit landing.

WATER (W)
W3 – Cable wakeboard/Flowboard/Surf Pool

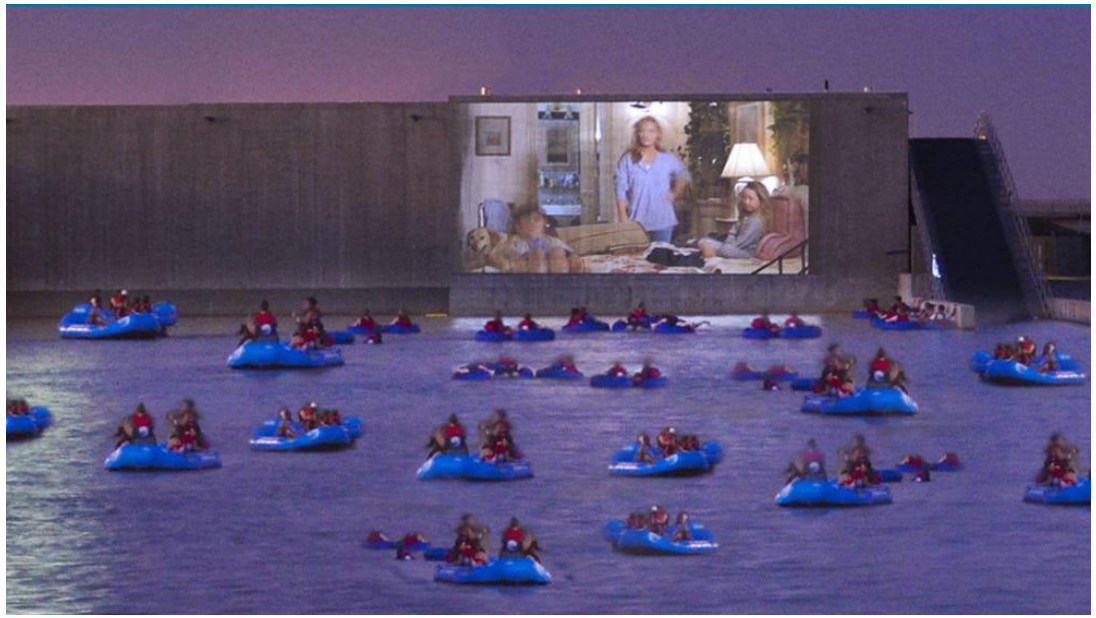
Flowboarding, surf pools and cable wakeboarding provide surfing and wakeboarding experiences with artifical waves to simulate ocean surfing.
No boat is required





WATER (W)
W4 – Brew boat/Cycle boat/Tour boat

Tour boats, cycle boats, and brew boats can all offer cruises and tours around the lake and can be chartered for private events and parties. The difference with a cycle boat is that passengers power the boats at pedal stations.



WATER (W)
W5 – Lazy River
W6 – Floating Movies
W7 – Fountain/Splash Play

Other water-based activities are fountains and splash areas, lazy river floats and movie watching.

SUPPORT
Food
Parking
Restrooms
Transport

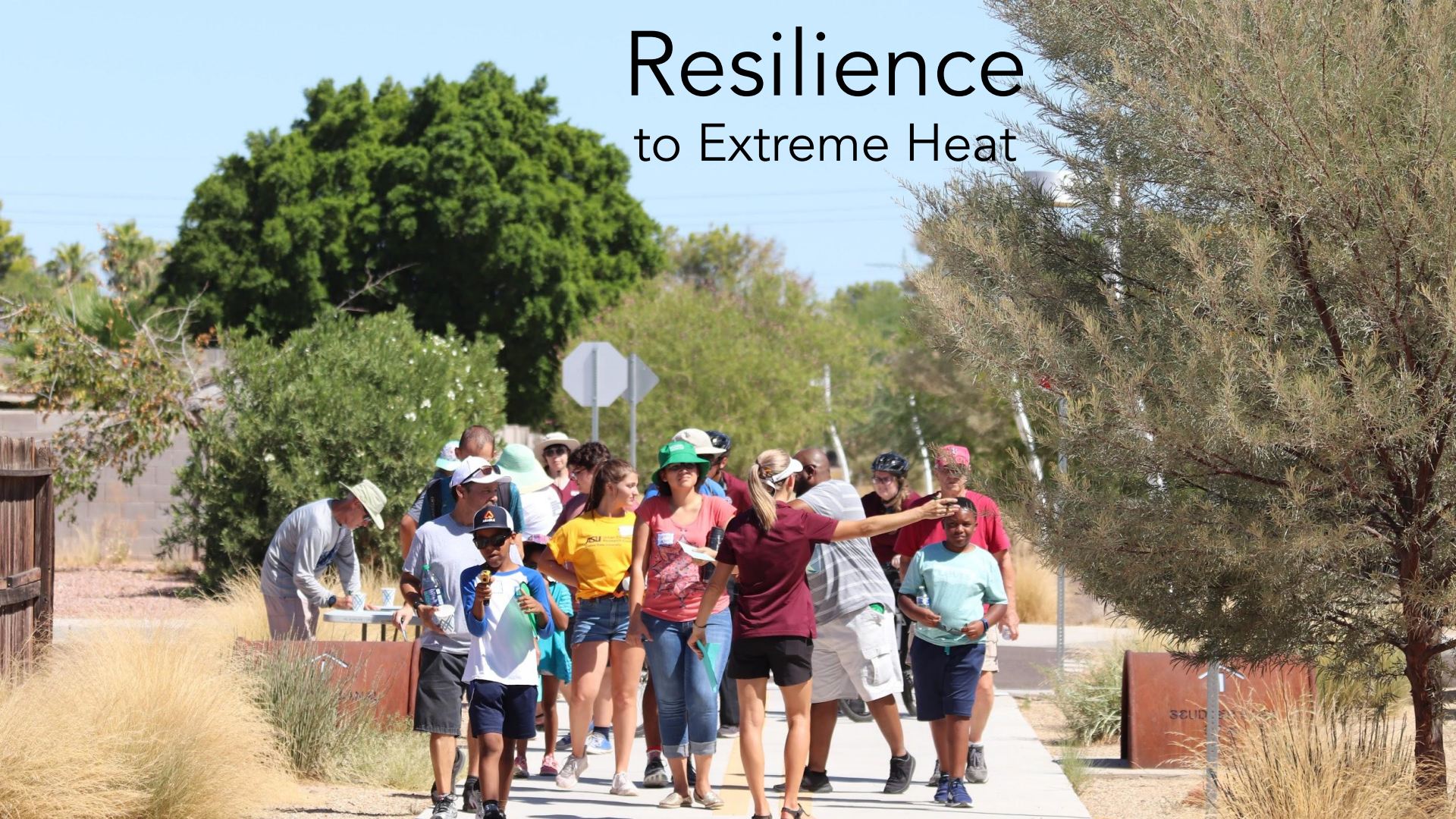
Support amenities provide important contributions to the overall experience.

Next Steps

- Survey open September 2 – October 1: tempe.gov/forum
- City Council Presentation November 5
- Request for Proposal to design, build, operate
- Request for Proposal to complete conceptual design

Questions?

Resilience
to Extreme Heat

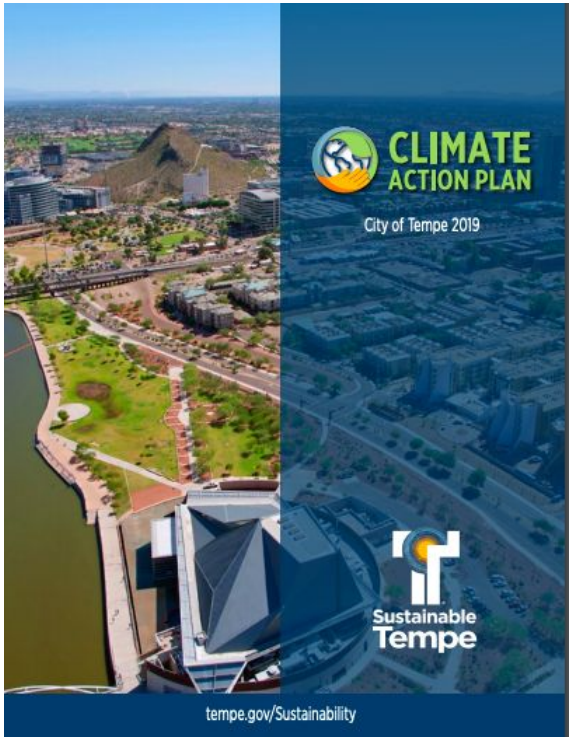


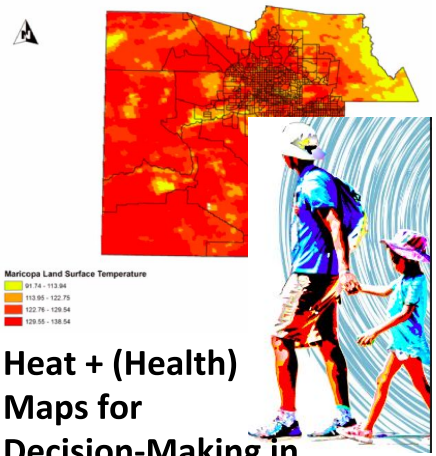
Emergency Management, Resilience & Sustainability

Sustainability: intra- and intergenerational justice, people/land/water, viable livelihoods

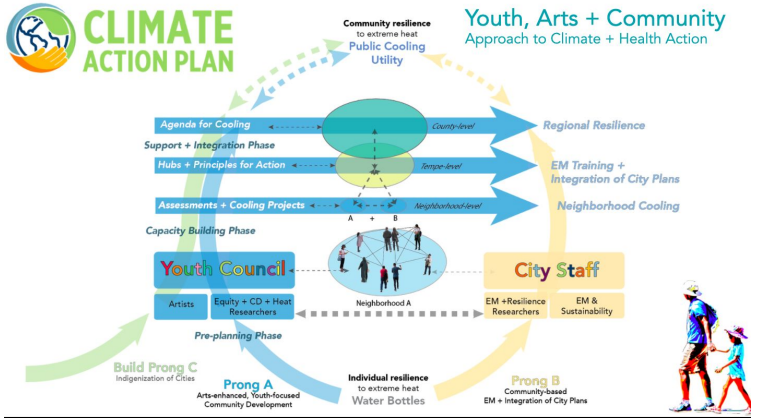
Mitigation → **Preparedness** → **Resilience** – absorbing, recovering, and learning from shocks → **Response** → **Recovery** → **Mitigation**

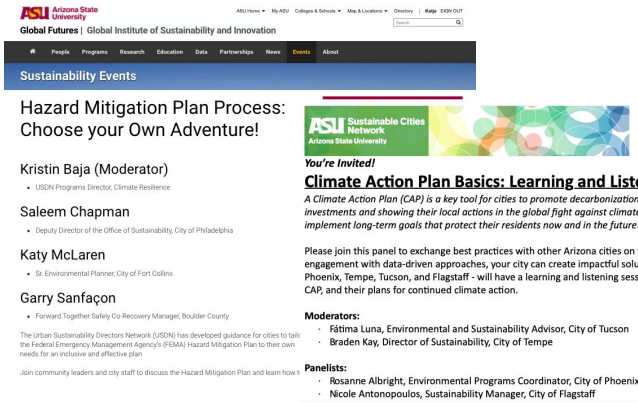
Projects





Heat + (Health) Maps for Decision-Making in Tempe



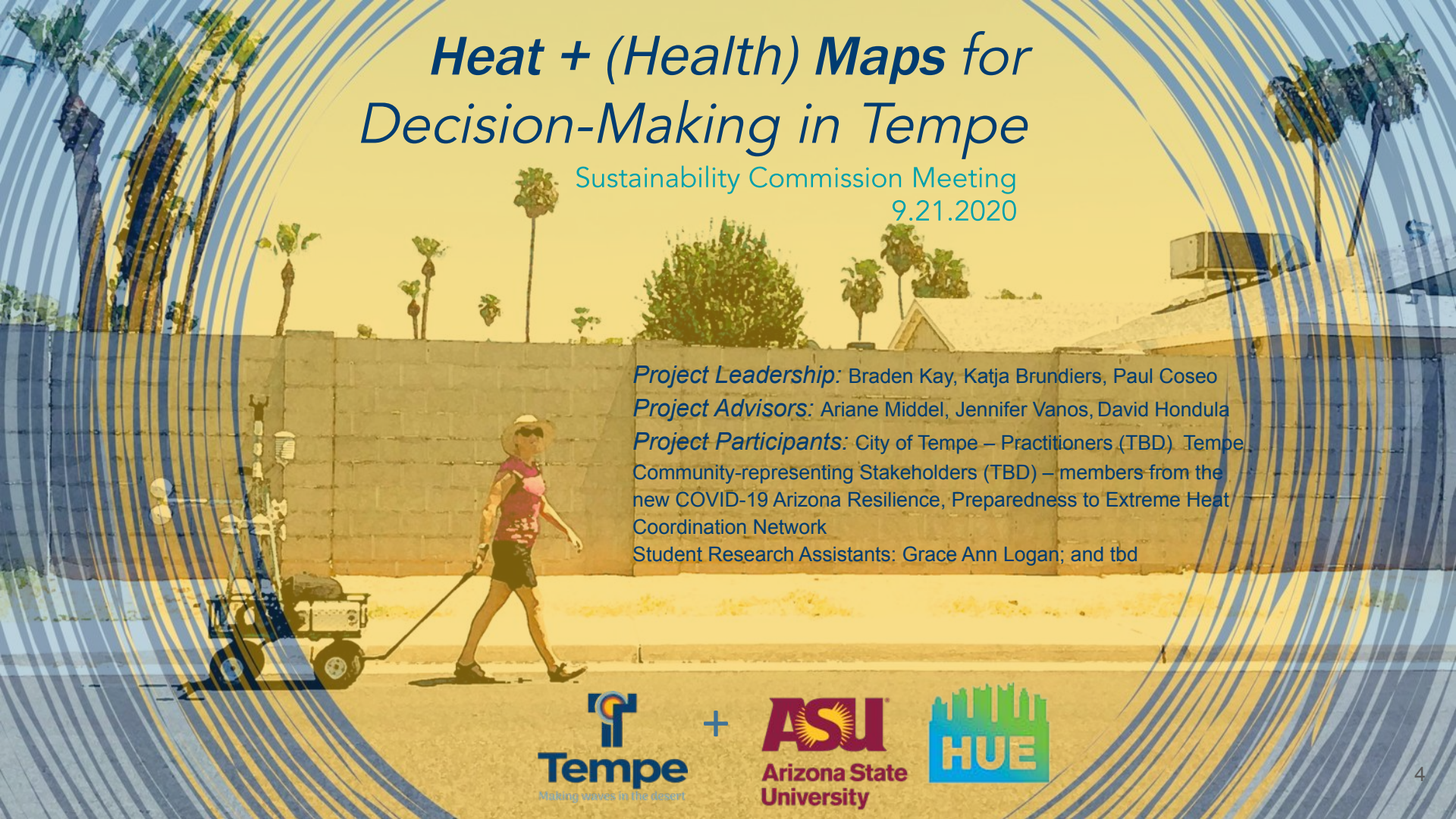


Intervening where it matters:

A scalable decision protocol for building community resilience through civic engagement

Heat + *(Health)* ***Maps*** *for Decision-Making in Tempe*

Sustainability Commission Meeting
9.21.2020



Project Leadership: Braden Kay, Katja Brundiers, Paul Coseo

Project Advisors: Ariane Middel, Jennifer Vanos, David Hondula

Project Participants: City of Tempe – Practitioners (TBD) Tempe Community-representing Stakeholders (TBD) – members from the new COVID-19 Arizona Resilience, Preparedness to Extreme Heat Coordination Network

Student Research Assistants: Grace Ann Logan; and tbd

Tempe
Making waves in the desert

+

ASU
Arizona State University

HUE

CLIMATE ACTION PLAN

Tempe Office of Sustainability

Tempe

Streets R.O.W + Streets

Multi-use Paths

Stormwater Infrastructure

Transportation

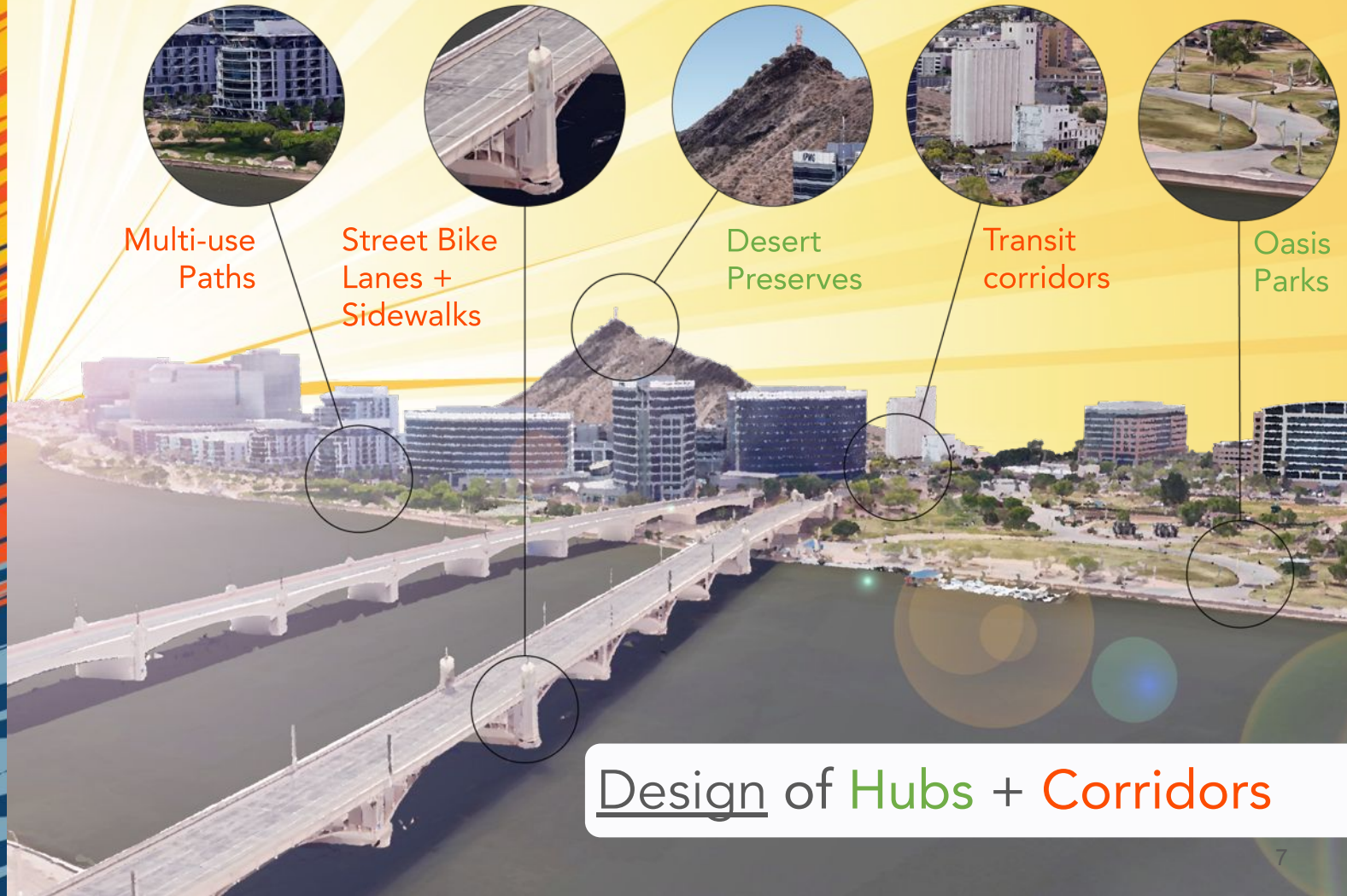
Parks Master Planning and Amenities

Desert Preserves

at City Scale

Placement of Cool Infrastructure

Tempe.



Design of Hubs + Corridors

Developing a vision...

Climate Action to Increase *Thermal Wellbeing*

- *All Tempe residents have access to city infrastructure that supports outdoor physical activity in the summer months by providing adequate protection from and awareness of dangerous heat and sunlight conditions.*
- *The Tempe city government and residents have high awareness/ competency/ interest of/ in thermal comfort.*
- *Tempe is a city where heat-health risks and thermal comfort are well-integrated in planning and budgeting processes that impact current and future infrastructure; residents have a sufficient level of climate literacy to equitably engage in civic advocacy and action around extreme heat.*

CLIMATE ACTION PLAN

Our Equity Approach

Questions to keep in mind to inform how we gather data

How are we taking a people-centered approach?

How are we focusing on unjust impact of heat on frontline communities and people of color?

How are we using climate + weather (exposure) + sensitivity data to reprioritize climate actions?

a) Macro data to inform decisions related to placements of cooler pedestrian infrastructure that prioritize frontline communities
b) Micro data to reduce impacts on site through design for comfort

Project Objectives (June 2020- June 2021)

1. Support existing researcher-city staff relationships
2. Support overarching synthesis of data in context of user experience
3. Inform prioritization of placement of investments (macro) and inform design of site scale infrastructure (micro)

Placement Team (Macro-level Data)

City Staff + ASU Researcher

City Engineer
Emergency Mgmt
Equity & Inclusion
GIS: Transportation, Community Dev
Parks
Stormwater
Strategic Mgmt
Streets ROW
Transportation Planning
Urban Forestry

Design Team (Micro-level Data)

City Staff + ASU Researchers

Hubs:

Parks (playgrounds) & Rec Centers (Cooling Centers)

Corridors:

Transportation
Urban Forestry
Community Development

Project Deliverables

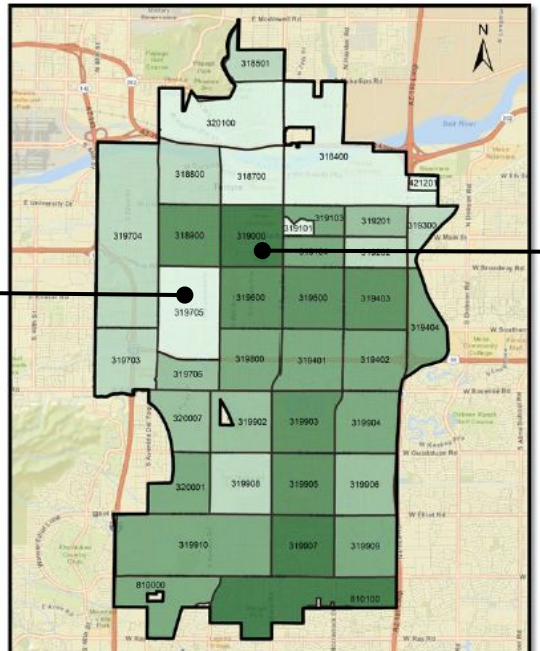
1. Integrated heat + public health maps, complementing macro-scale maps (location) with micro-scale maps for action
2. Document heat + health experiences to ground heat + health maps in lived experiences
3. Heat + public health information + training to support decision-making using the heat and public health maps
    a. Including educational videos for broader public

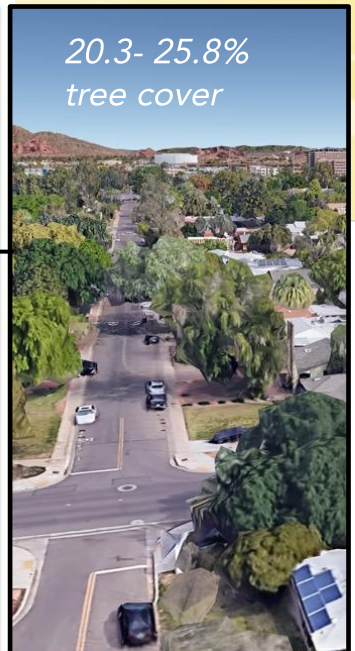
Macro = Placement for thermal equity

The right measure for the right scale

Climate data + Infrastructure data +

People data



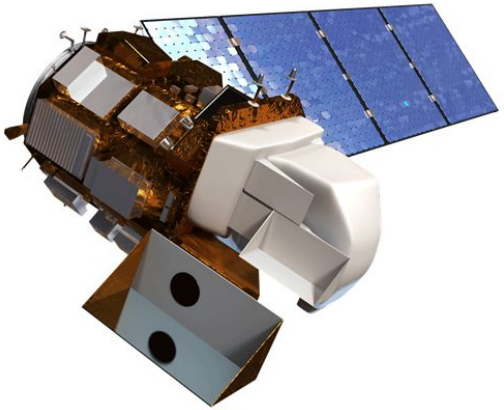


Vulnerable Communities

Tempe Communities

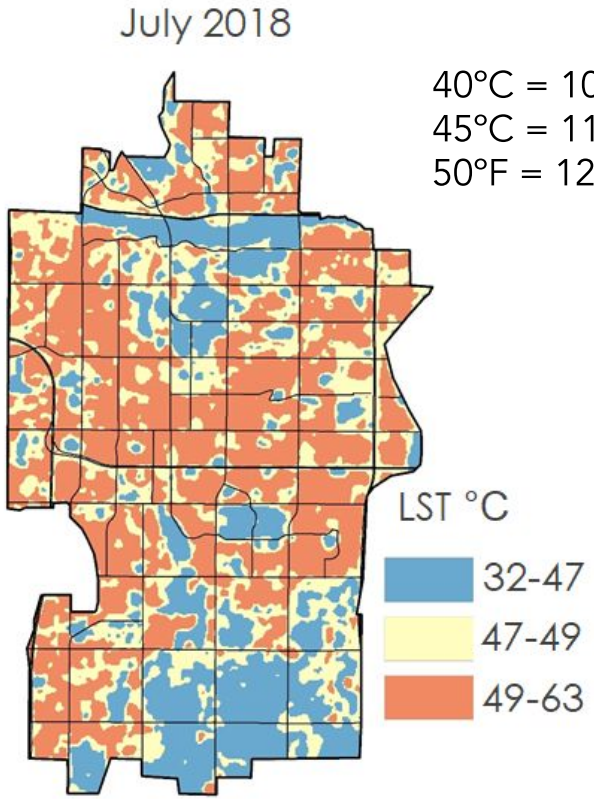
Measuring city-scale (macro) patterns in urban heat

What are the hottest places in Tempe?



Land Surface Temperature (LST)

- Measurement of the surface temperature
- Includes both bare soil and vegetation temperatures



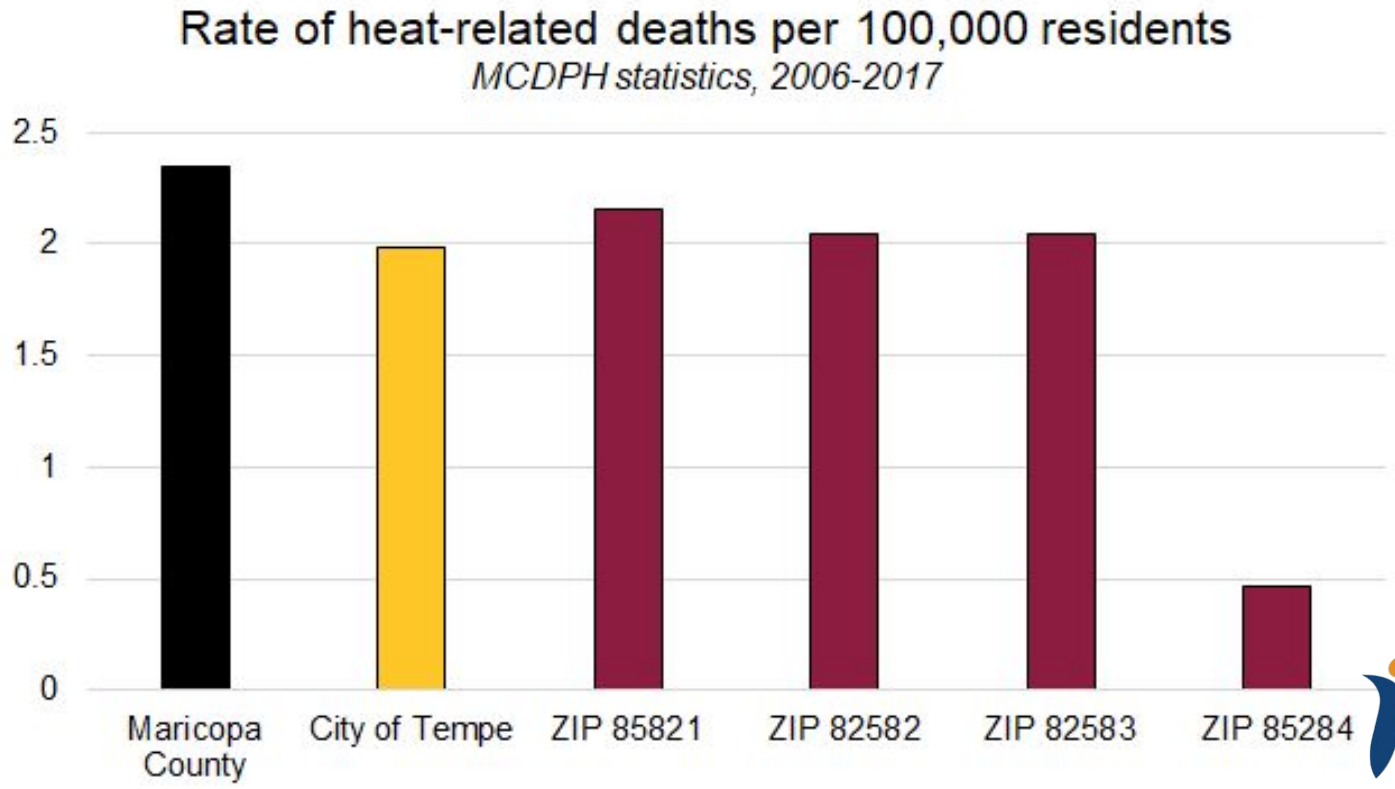
NASA Partnership

40°C = 104°F
45°C = 113°F
50°C = 122°F

Name	Mean LST (°C) (2018)	Percent Grass (2010)	Percent Building (2010)	Percent Soil (2010)
Papago Park	49.7	8.7	0.2	68.6
Victory Park	49.5	15.0	0.0	24.7
Moeur Park	49.5	12.3	0.0	69.5
Rotary Park	49.2	36.7	17.9	15.4
Esquer Park	49.0	39.0	1.6	44.5

City-scale data on heat impacts + perceptions

County Public Health Data



Maricopa County Public Health
WeArePublicHealth.org

City-scale data on heat impacts + perceptions

How are residents coping with heat?
How do they feel about city services?

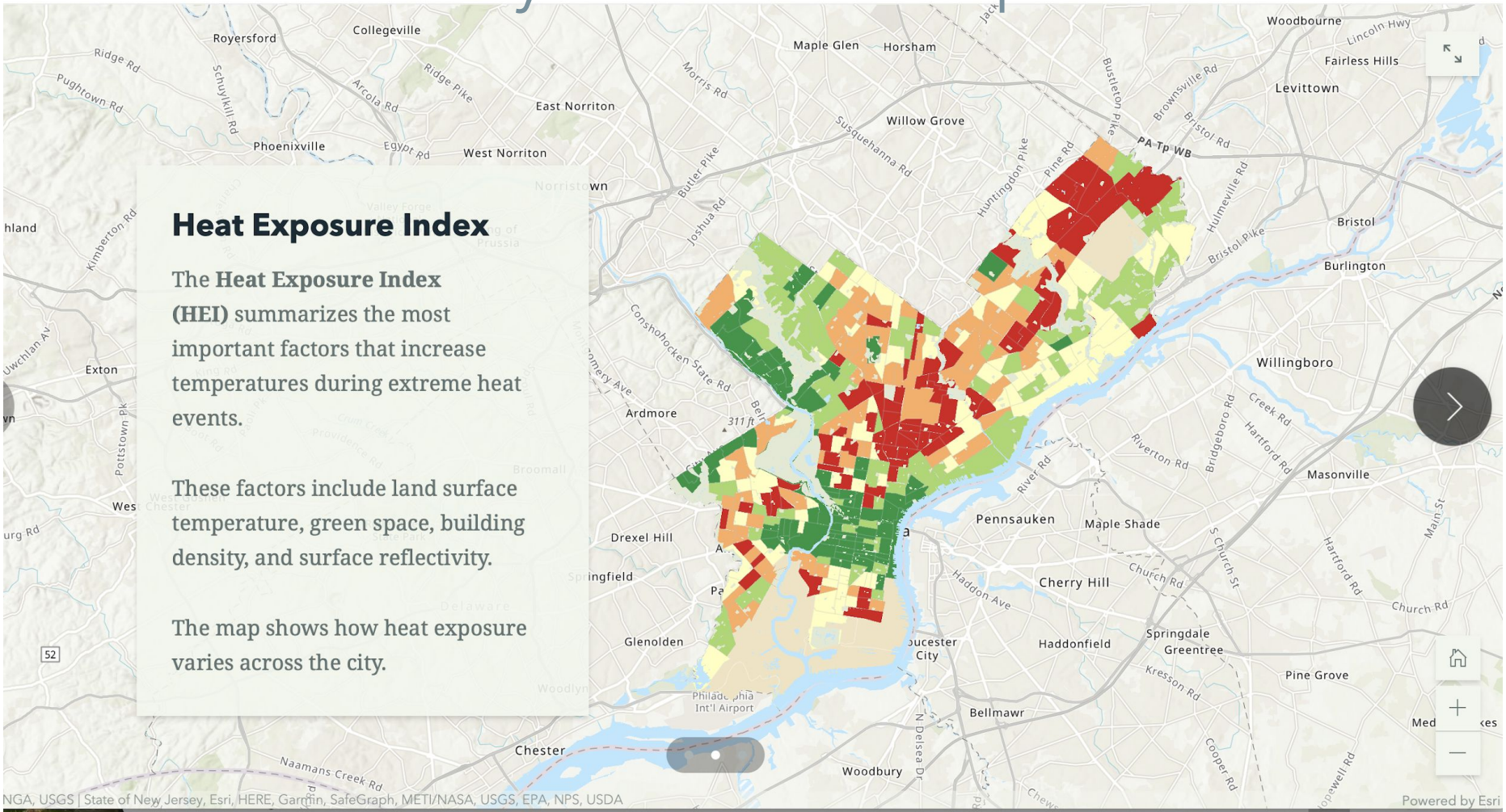
The city program or service that I find most helpful for dealing with summer heat in Tempe is:

*"The **splash pads** and **public pools**. Wonderful for families like ours that have little kids. We have a pool, but love the splash pads."*

*"Anything that **reduces my commute time** to and from work, allowing me to get back into a temperature controlled area sooner."*

*"I **don't know of any** city program or service that deals with summer heat. Tempe needs to promote these programs and services to there residents. So all residents can participate."*

Philly DEVELOP Example



Heat Exposure Index

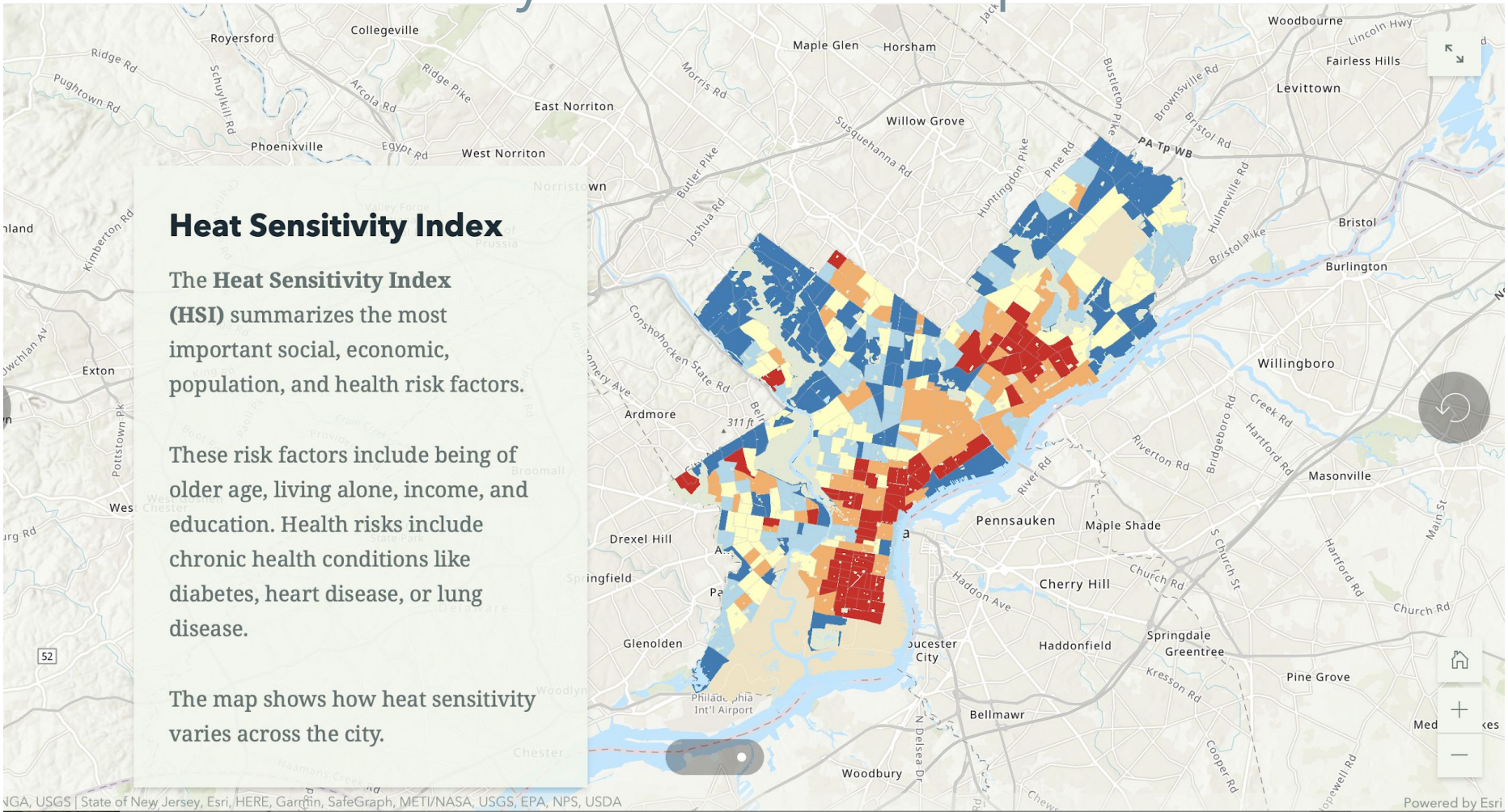
The **Heat Exposure Index (HEI)** summarizes the most important factors that increase temperatures during extreme heat events.

These factors include land surface temperature, green space, building density, and surface reflectivity.

The map shows how heat exposure varies across the city.

Philadelphia Heat Vulnerability Index

Philly DEVELOP Example



Heat Sensitivity Index

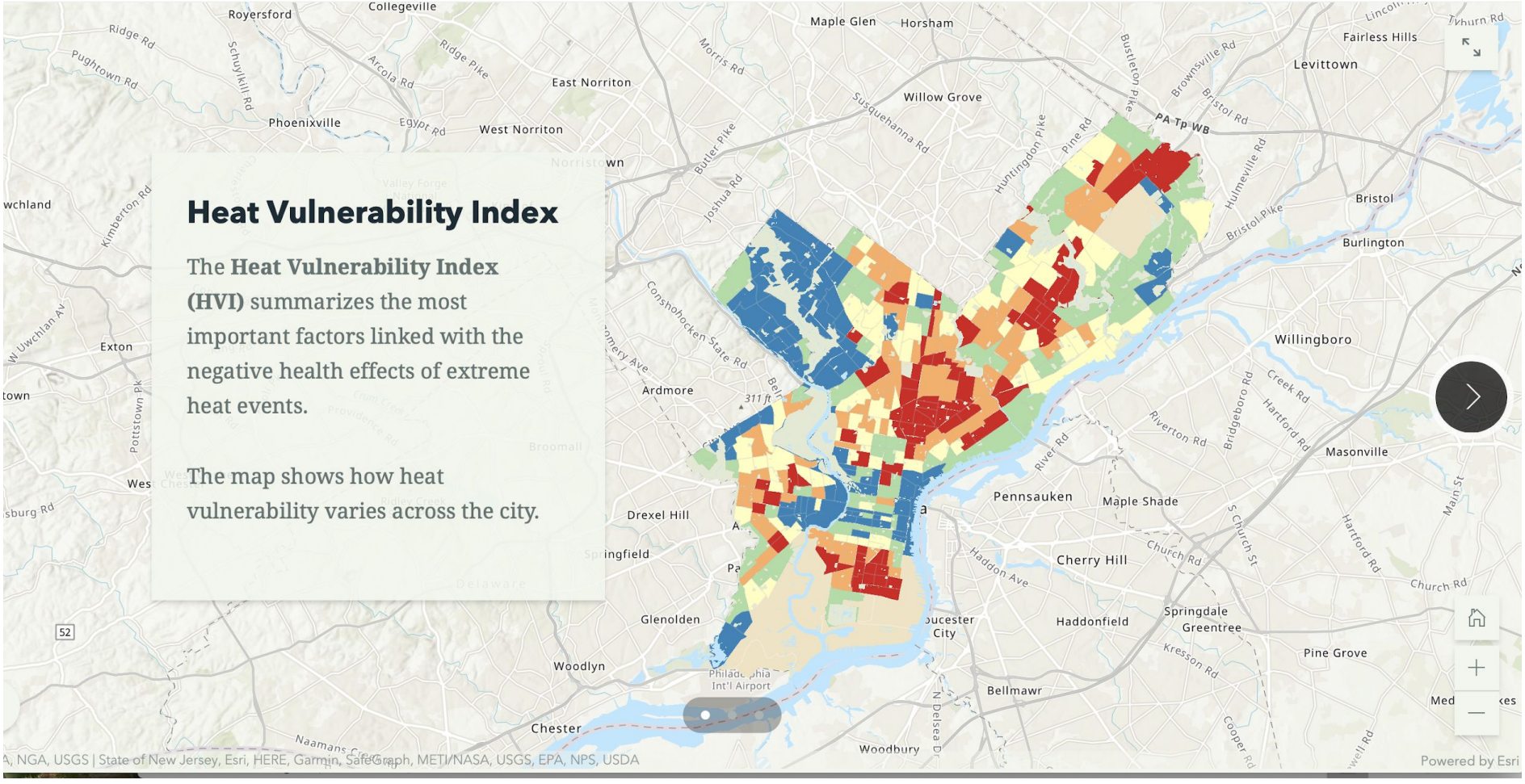
The **Heat Sensitivity Index (HSI)** summarizes the most important social, economic, population, and health risk factors.

These risk factors include being of older age, living alone, income, and education. Health risks include chronic health conditions like diabetes, heart disease, or lung disease.

The map shows how heat sensitivity varies across the city.

Philly DEVELOP Example

Philadelphia Heat Vulnerability Index



Micro Data

What is design for comfort and health?

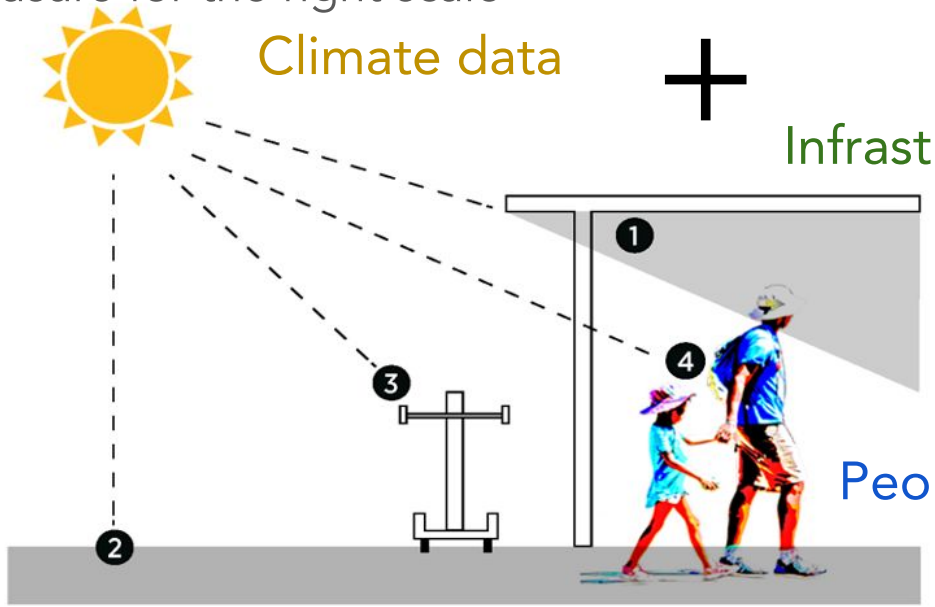
Kiwanis Park, Tempe, August 25, 2019 during 7-8pm

high 103F
low 85F

Tempe

Micro = Design for thermal equity

The right measure for the right scale

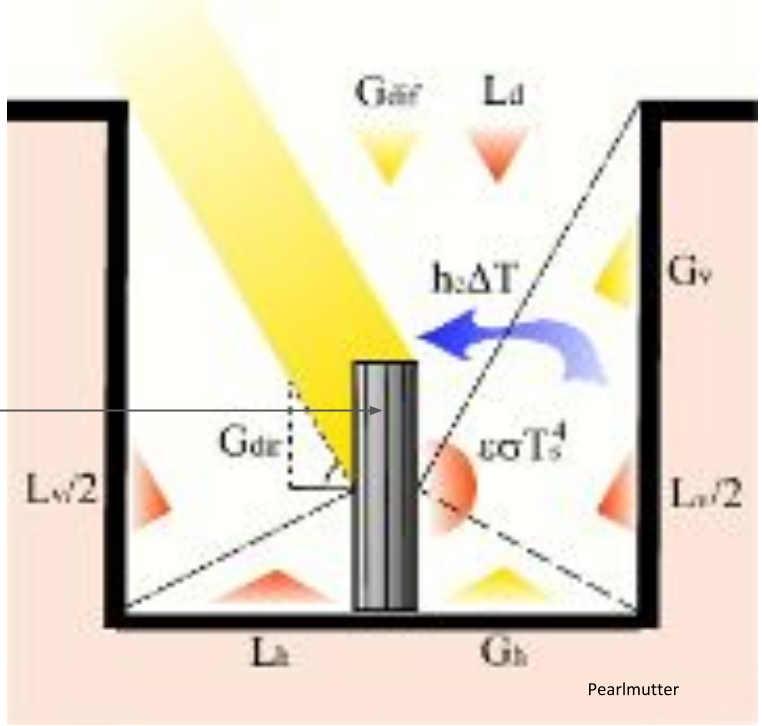


Tools for assessment

Types of Temperature Data:

1. Air Temperature
2. Surface Temperature
3. Mean Radiant Temperature (MaRTy)
4. Thermal Sensation / Experience

What is Mean Radiant Temperature (MRT)?



Micro = Tool 3 -Multi-use paths MRT assessment

- Up to a 69.3° F shift in MRT from shaded to unshaded areas
- Explore a threshold MRT performance metric (more to come)
- Socialize metric with City staff and residents to evaluate how meaningful it is as part of a suite of heat performance metrics

Tempe

Micro = Tool 5 – Heat walk

Heat stories + conversations

- 40 Participants Tempe Heat Walk (photo below)

Results Based Accountability

Proposed Performance Metric:

The mean radiant temperature (MRT) performance threshold metric for sidewalks and multi-use paths.

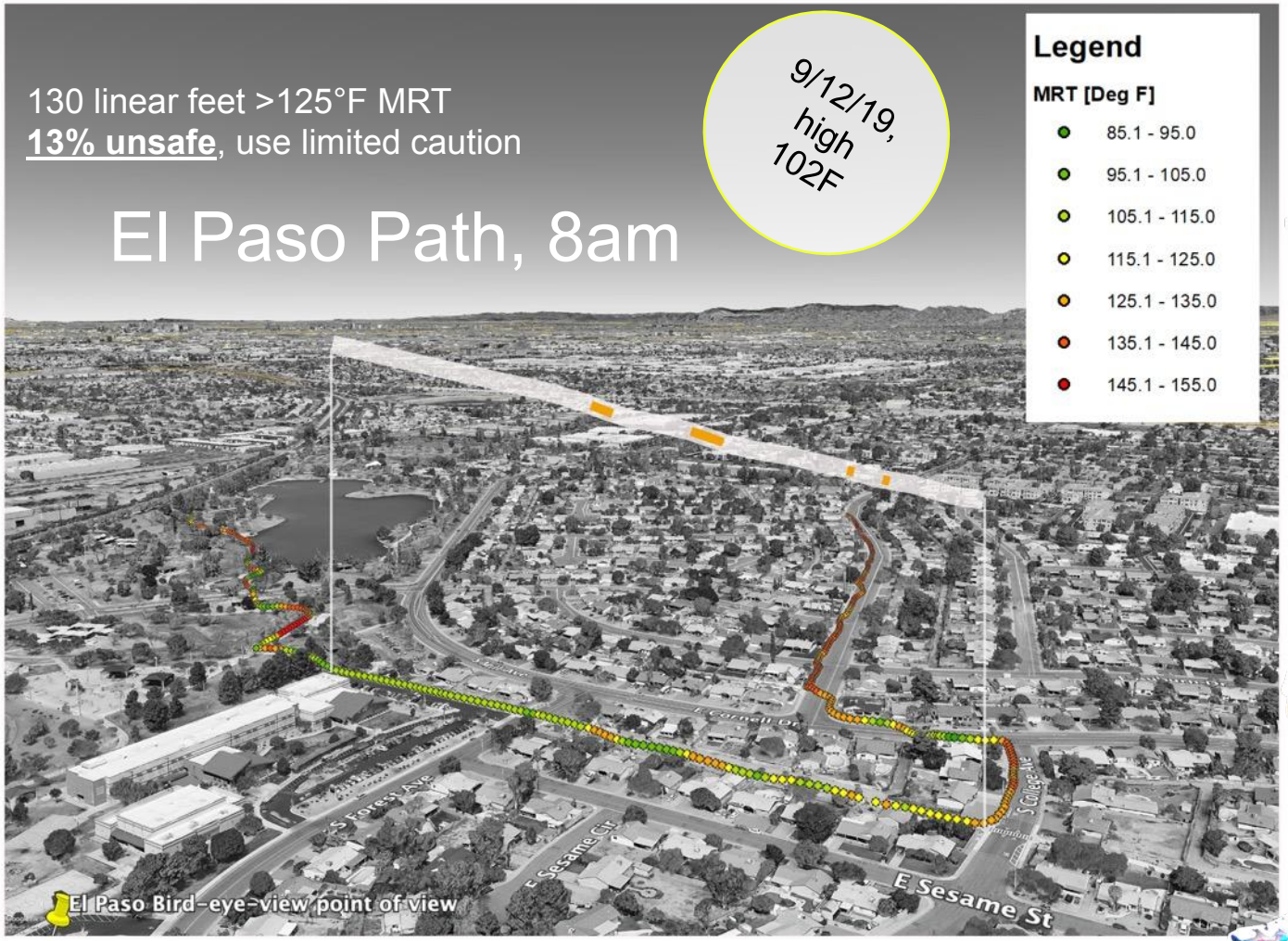
To calculate the percentage, we used the following calculation:

$$\textbf{\% unsafe} = \frac{\textit{(linear feet over 125°F MRT / total length)}}{\textit{100\%}} X$$

130 linear feet >125°F MRT
13% unsafe, use limited caution

El Paso Path, 8am

9/12/19, high 102F



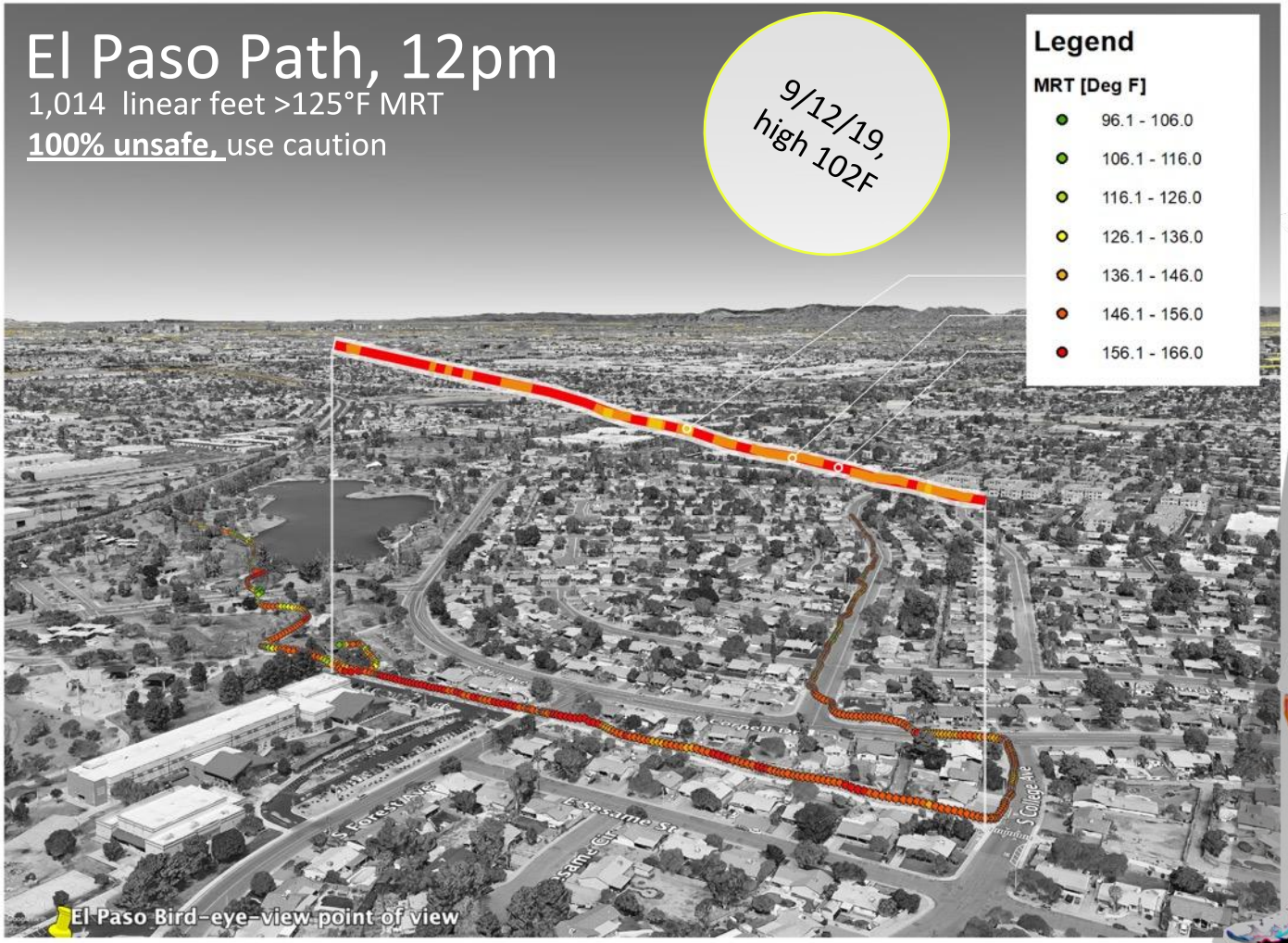
Mostly safe in full sun

El Paso Path, 12pm

1,014 linear feet >125°F MRT

100% unsafe, use caution

9/12/19, high 102F



Protection recommended

1,014 linear feet >125°F MRT
100% unsafe, use caution

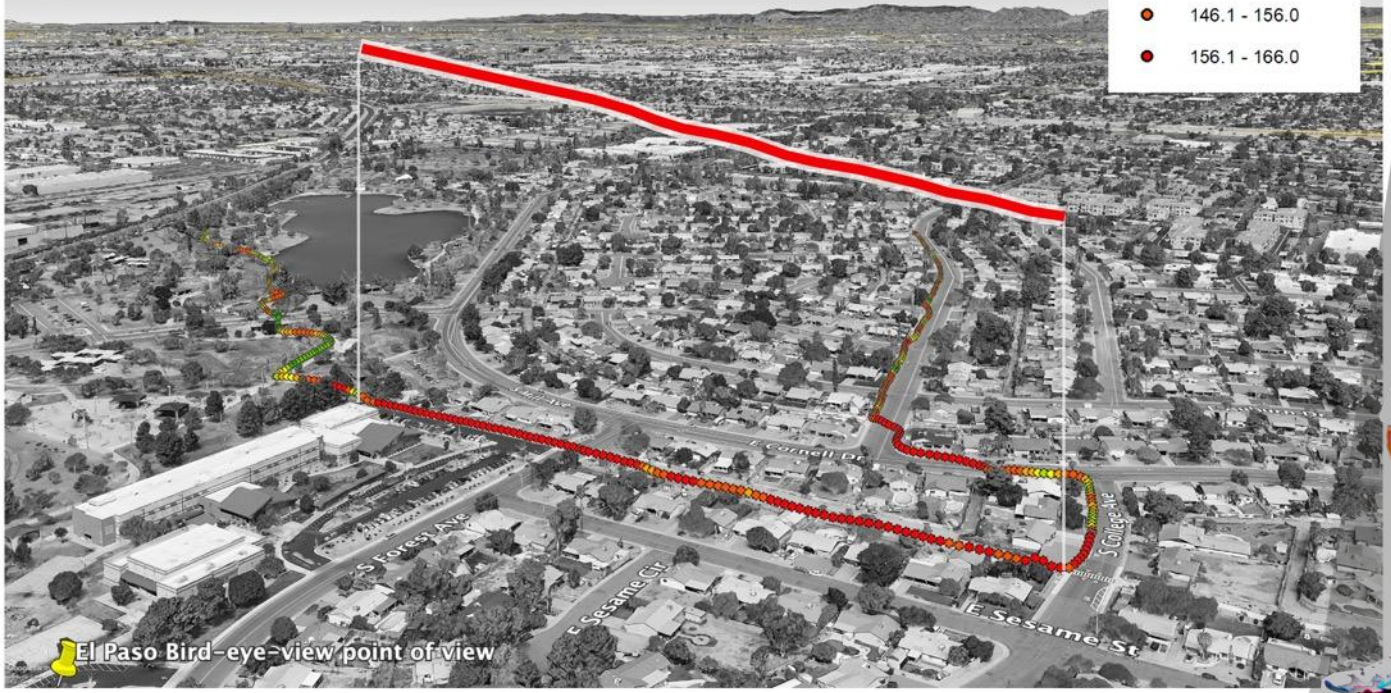
El Paso Path, 3pm

9/12/19, high 102F

Legend

MRT [Deg F]

- 96.1 - 106.0
- 106.1 - 116.0
- 116.1 - 126.0
- 126.1 - 136.0
- 136.1 - 146.0
- 146.1 - 156.0
- 156.1 - 166.0



Protection recommended

0 linear feet >125°F MRT
0% unsafe, 100% safe

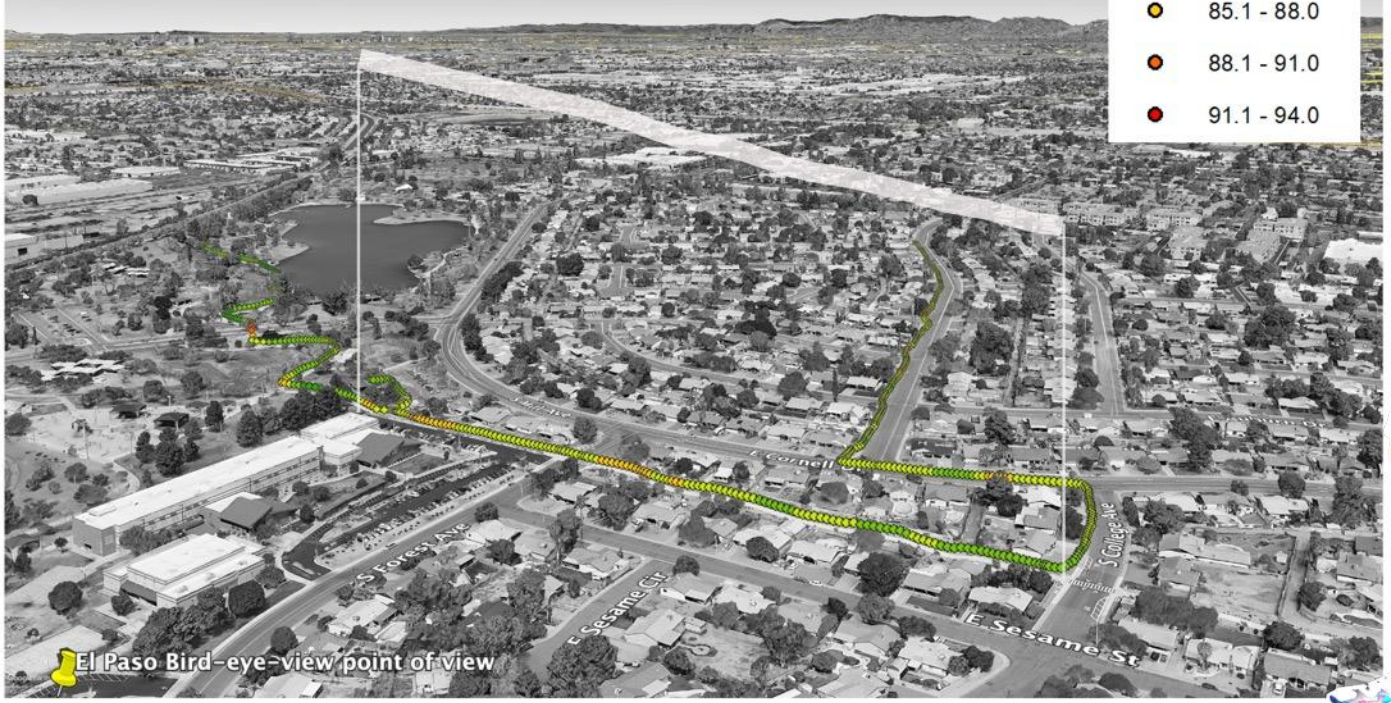
El Paso Path, 7pm

9/12/19, high 102F

Legend

MRT [Deg F]

- 76.1 - 79.0
- 79.1 - 82.0
- 82.1 - 85.0
- 85.1 - 88.0
- 88.1 - 91.0
- 91.1 - 94.0



Safe

CLIMATE ACTION PLAN

…. Develop, test, and deploy heat-mitigation and air-quality improvement strategies and technologies for a healthier city and population across Maricopa County.

HUE

Rising Nighttime Temps

City/County Collaborations

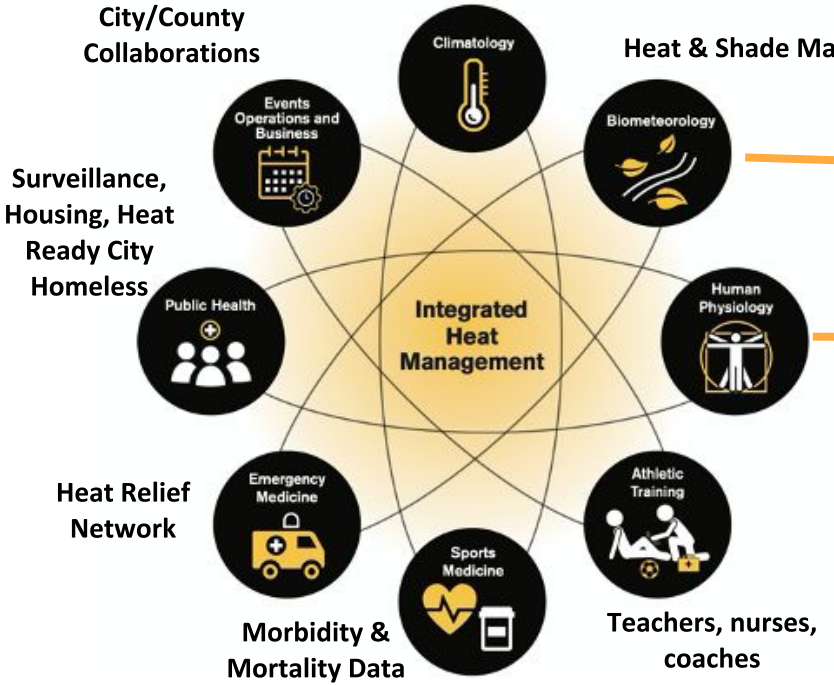
Heat & Shade Mapping

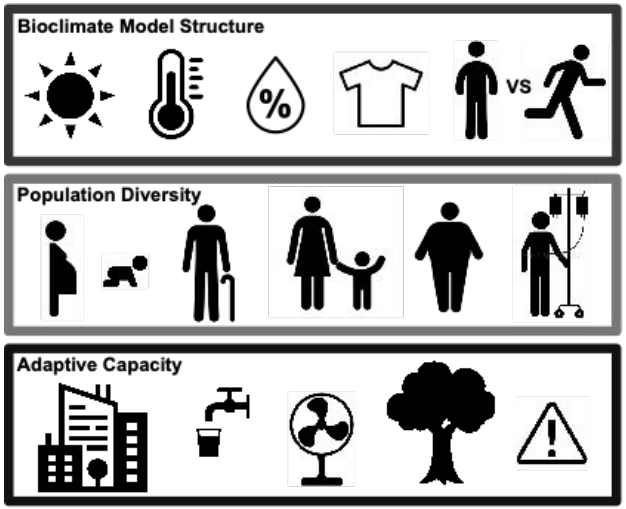
Surveillance, Housing, Heat Ready City Homeless

Heat Relief Network

Morbidity & Mortality Data

Teachers, nurses, coaches





Trees & Shade; Reflective Surfaces; Coping Resources; Social Connections

September 15, 2020 Updates

1. Virtual Zoom Engagements
2. Weekly Work
3. Partnerships/Projects
4. Communication & Outreach

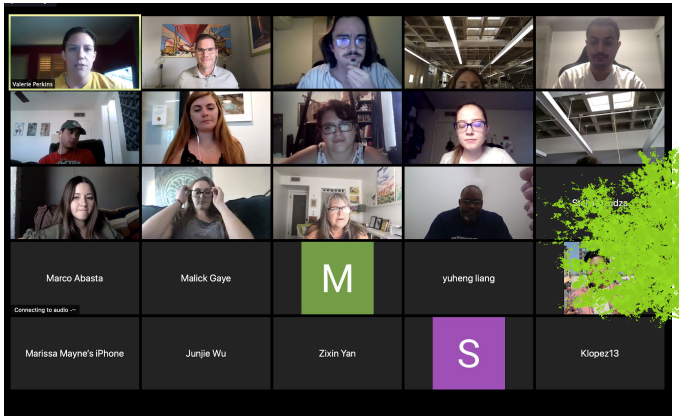
Project remains the same, adjusted for COVID-19 virtual engagement

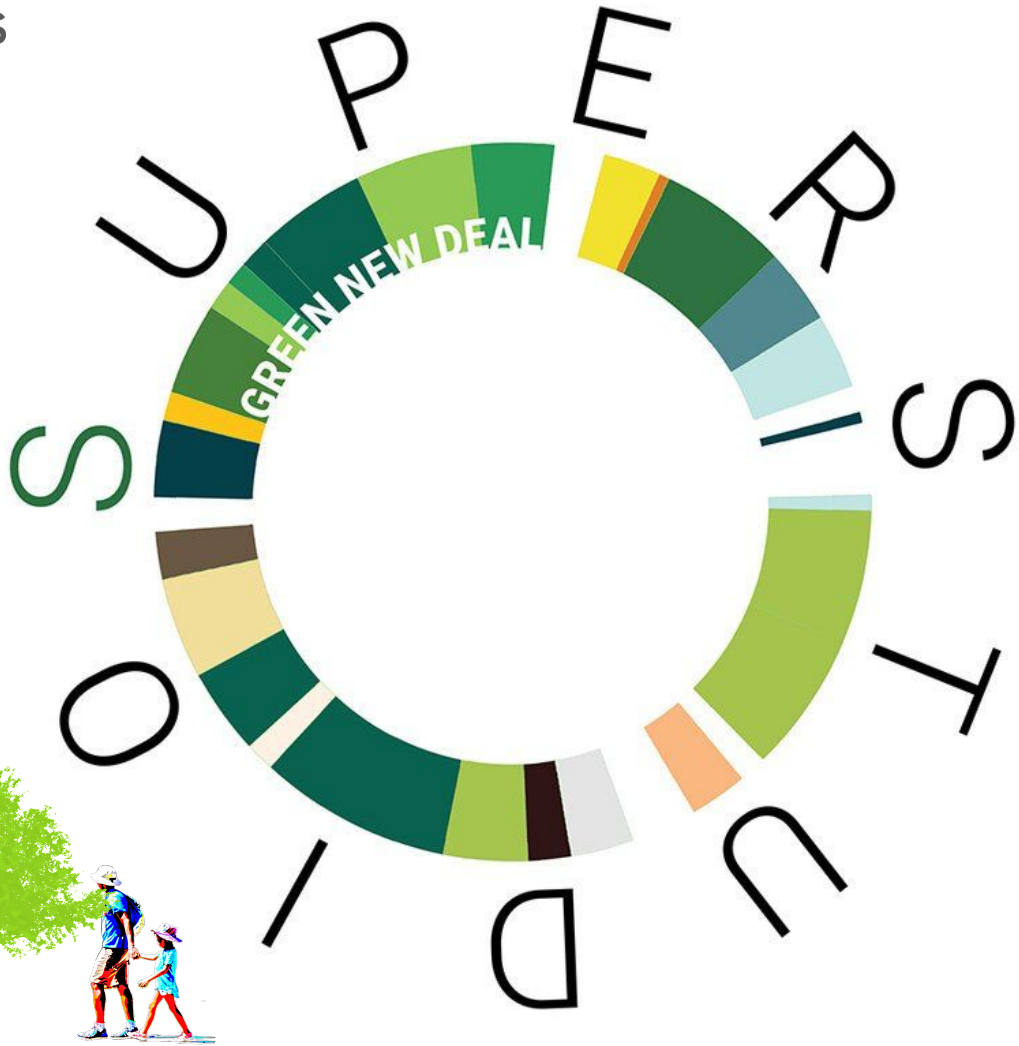
Tempe

Complementary Partnerships

National [Green New Deal Superstudio]

- Fall 2020 semester
- Senior undergraduate Landscape Architecture studio (24 students)
- City-scale (macro) green infrastructure plans based on four climate scenarios:
  1. 20-min City
  2. Cool hub & Corridors
  3. Water is Life
  4. Food Forest Network





Questions discussed on Aug 6, 2020:

Always prompt participants to contribute through chat while others present

1. *What are some characteristics of "Desk-ready" heat maps for Macro + Micro cooling infrastructure decisions?*
2. *What existing effective data tools at the City should we be learning from as a prototype?*
3. *What should heat assessments look like in Tempe?*
4. *What are your biggest challenges with making decisions?*
   a. *On where to place cooling infrastructure in the city?*
   b. *when designing site scale cooling infrastructure?*

Tempe.

CLIMATE ACTION PLAN

HUE

Thank you!

Appreciation for:

Healthy Urban Environments
City of Tempe
Arizona State University

Please send questions to:
Braden_Kay@tempe.gov, or
Katja.Brundiers @asu.edu, or
Paul.Coseo@asu.edu

Zoom Virtual engagement activities since July 1, 2020

1. Two virtual participation events with HUE research community
   Result: Learning + coordination between HUE projects
2. One kick-off virtual event with City partners
   Results: identification of hurdles in achieving desktop ready maps
3. Two meetings with user-audiences (select City staff leads)
   Result: Refined hurdles to decision-making

Jenni Vanos presenting previous data at the virtual kick-off meeting with city staff on 8/6

Weekly work

- Holding bi-weekly meetings with Macro- and Micro-teams and their city-partners to develop approaches to address each of the hurdles.
- Goal: ongoing collaboration to co-produce deliverables

Complementary Partnerships

- with NASA DEVELOP that will help us with creating a heat vulnerability index for Tempe
- with Master of Sustainability Solutions MSUS students who approached us with interest in supporting our research
- Green New Deal Superstudio

Communication & Outreach

- submitted presentation abstract to the Council of Educators in Landscape Architecture for March 2021

Tempe.

Weekly work

- Holding bi-weekly meetings with Macro- and Micro-teams and their city-partners to develop approaches to address each of the hurdles.
- Goal: ongoing collaboration to co-produce deliverables

Complementary Partnerships

- with NASA DEVELOP that will help us with creating a heat vulnerability index for Tempe
- with Master of Sustainability Solutions MSUS students who approached us with interest in supporting our research
- Green New Deal Superstudio

Communication & Outreach

- Association of Pedestrian & Bicycle Professional, July 2020
- submitted presentation abstract to the Council of Educators in Landscape Architecture for March 2021

Tempe.

Hurdles to Heat + Health Decision-making

from Kick-off Meeting question #4 on 8/6 with city staff

Hurdle 1 [data]: Comparable decision-making benchmarks: How to measure the results from different infrastructure options in order to compare and prioritize them?

Hurdle 2 [data]: Data integration: Ability to layer heat & health data with other GIS data used to manage related performance measures (i.e. ADA, shade canopy, 20 minute city, Vision Zero bike/ped crash data); and with socio-economic character of the area

Hurdle 3 [process]: Stakeholder coordination: Need coordination across city departments and with external stakeholders (residents, developers)

Hurdle 4 [process]: Regulatory & budgetary constraints (connect macro- and micro-levels): utility locations, budget, accessibility/ADA, cost, archaeology impacts, not all residents want trees, space constraints in the right-of-way. Planting strips are great locations for planting trees; however buses, large trucks often impact our ability to plant in them.

Action items were identified to overcome each hurdle

- *on Macro level - placement of cooling infrastructure*
- *on Micro level - design of cooling infrastructure*

Next steps:

1. *Macro:* Preparation for next milestone with our city partners on 9/24 event with purpose of identifying key infrastructures for which priority decisions need to be made from an equity and health perspective

2. *Micro:* identified four "buckets" for design specific questions, next will map out a "decision-tree" with options to improve design/site specific decisions with equity and health in mind.

3. Mid-November All Partners Meeting to review existing and pilot new data products and co-create more "desktop ready" products

4. Data and "desktop ready" Prototype sprint to end of 2020, with review and revisions planned for Spring 2021

Project Objectives (June 2020- June 2021)

1. Support existing researcher-city staff relationships
2. Support overarching synthesis of data in context of user experience
3. Inform prioritization of placement of investments (macro) and inform design of site scale infrastructure (micro)

Placement Team (Macro-level Data)

City Staff + ASU Researcher

City Engineer
Emergency Mgmt
Equity & Inclusion
GIS: Transportation, Community Dev
Parks
Stormwater
Strategic Mgmt
Streets ROW
Transportation Planning
Urban Forestry

Design Team (Micro-level Data)

City Staff + ASU Researchers

Hubs:

Parks (playgrounds) & Rec Centers (Cooling Centers)

Corridors:

Transportation
Urban Forestry
Community Development