Strengthening the Community by Activating the Skunk Creek Trail

A Fall 2019
Collaborative Project with
Arizona State University's
Project Cities & the
City of Peoria

ASU
Sustainable Cities Network
Arizona State University

Project Cities

PEORIA ARIZONA

This report represents original work prepared for the City of Peoria by students participating in courses aligned with Arizona State University's Project Cities program. Findings, information, and recommendations are those of students and are not necessarily of Arizona State University. Student reports are not peer reviewed for statistical or computational accuracy, or comprehensively fact-checked, in the same fashion as academic journal articles. Project partners should use care when using student reports as justification for future actions. Text and images contained in this report may not be used without permission from Project Cities.

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ACKNOWLEDGMENTS

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On behalf of the Julie Ann Wrigley Global Futures Laboratory, the Global Institute of Sustainability and Innovation, and the School of Sustainability, we extend a heartfelt thank you to the City of Peoria for enthusiastically engaging with students and faculty throughout the semester. These projects provide valuable real-world experience for our students and we hope that their perspectives shine light on opportunities to continuously improve Peoria's future livelihood and community well-being.

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To access the original student reports, additional materials, and resources, visit:
links.asu.edu/PCPeoriaSkunkCreek19F

ABOUT PROJECT CITIES

The ASU Project Cities program uses an innovative, new approach to traditional university-community partnerships. Through a curated relationship over the course of an academic year, selected Community Partners work with Project Cities faculty and students to co-create strategies for better environmental, economic, and social balance in the places we call home. Students from multiple disciplines research difficult challenges chosen by the city and propose innovative sustainable solutions in consultation with city staff. This is a win-win partnership, which also allows students to reinforce classroom learning and practice professional skills in a real-world client-based project. Project Cities is a member of Educational Partnerships for Innovation in Communities Network (EPIC-N), a growing coalition of more than 35 educational institutions partnering with local government agencies across the United States and around the world.

ABOUT SUSTAINABLE CITIES NETWORK

Project Cities is a program of ASU's Sustainable Cities Network. This network was founded in 2008 to support communities in sharing knowledge and coordinating efforts to understand and solve sustainability problems. It is designed to foster partnerships, identify best practices, provide training and information, and connect ASU's research to front-line challenges facing local communities. Network members come from Arizona cities, towns, counties, and Native American communities, and cover a broad range of professional disciplines. Together, these members work to create a more sustainable region and state. In 2012, the network was awarded the Pacific Southwest Region's 2012 Green Government Award by the U.S. EPA for its efforts. For more information, visit *sustainablecities.asu.edu.*

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ASU Sustainable Cities Network
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Project Cities

Sustainability Through Local Action

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ABOUT PEORIA

Ranked as the No. 1 place to live in Arizona by Money Magazine and the only Arizona city named as one of the best cities in the U.S. by Yahoo! Finance, the city of Peoria is currently home to more than 171,000 residents. The City enjoys a reputation as a family-oriented, active community with an exceptional quality of life. Peoria entertainment and recreational amenities include popular attractions such as Lake Pleasant, a large network of trails and open space, community parks, recreation centers, community theater, libraries, pools, and the spring training home for the San Diego Padres and the Seattle Mariners.

The city has demonstrated a strong commitment to sustainability, as evidenced by its directive to incorporate LEED building design standards, a council-adopted Sustainability Action Plan, and a dedicated full-time staff person to manage and coordinate organization-wide sustainability initiatives.

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Peoria is the place
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June 4, 2020

Dear Peoria community members,

It is with tremendous gratitude and excitement that we bring to your attention the results of the first year of our partnership with ASU's Project Cities program. This collaboration provided the opportunity to move beyond traditional resources, and explore all that is possible by working alongside faculty and students across several academic programs.

Project Cities is one of several partnerships we enjoy with ASU, and part of our ongoing strategy to learn from innovative community leaders as we address the complex challenges and opportunities we face as a fast-growing community. With a modest investment in this program, we received extensive research, creative recommendations, diverse perspectives, and innovative deliverables that take several key initiatives to the next level for us.

These include our efforts around water conservation, transit, placemaking, smart cities, and the possibilities around our Skunk Creek corridor near the P83 Entertainment District. Many of these efforts entailed public participation, and you may have participated by speaking to students at one of several Peoria events they attended, or by sharing your personal insight through a survey. By engaging students and faculty on these subjects, we have advanced our understanding and positions on each topic much more quickly than we could have without their assistance.

The project results provided us with invaluable insights into many of our most important opportunities and we are proud to see the students' deliverables advancing. We hold our partnership with ASU and Project Cities in high esteem and look forward to continuing this work on additional projects in the coming year.

Sincerely,

Cathy Carlat, Mayor

Jeff Tyne, City Manager

Peoria, Arizona

Proud partner of

ASU Sustainable Cities Network

Arizona State University

Project Cities

Rio Vista Recreation Center

Demographics

total population: **172,259**

median age: **39.5**

highly skilled and educated workforce of 85,252

11,997 veterans live in Peoria

73% of residents are homeowners

median property value: **$230,400**

31% of residents hold a Bachelor's degree or higher

median household income: **$73,039**

Schools

#3 of 131 Best School Districts for Athletes in Arizona

#5 of 40 Best School Districts in Phoenix Metro Area

#7 of 130 Best School Districts in Arizona

The Peoria Unified School District is one of the largest employers in the West Valley. The district consistently receives high ratings and offers signature programs such as the Career and Technical Education programs.

Peoria is also home to Huntington University, a liberal arts college offering digital media education in animation, broadcasting, film, graphic design and other digital media arts.

Leading industries

Peoria, Arizona is not just a scenic suburb of Phoenix, but also a thriving economic development hub with an educated workforce and high-end residential living. There are 22,470 employers and more than 75,000 people employed within Peoria. Leading industries include health care and social assistance, retail trade, and finance and insurance. Highest-paying industries include utilities, manufacturing and public administration. Beyond these industries, Peoria works actively to attract businesses from aerospace and defense, film and digital media, technology and innovation, hospitality and tourism, and research and development. Peoria is the place for business owners, developers and investors.

Health Care & Social Work

10,905 employees

Retail Trade

10,628 employees

Finance & Insurance

6,574 employees

History

Founded in 1886 by Midwestern settlers, Peoria is nestled in the Salt River Valley and extends North into the foothills around Lake Pleasant. Beginning as a small agricultural town, the economy received a major boost when a railroad spur line was built along Grand Avenue. The construction of the Roosevelt Dam in 1910 secured a reliable water supply, attracting more settlers to the area and business endeavors to the town center. Peoria's economy continued to have an agricultural focus for decades. Continually growing, Peoria assumed city status in 1971 with a population of 4,792. It has since grown into a city with a population over 172,000, and is renowned for its high quality of life and recreational amenities.

Sustainability

Peoria has demonstrated leadership in municipal sustainability efforts through a wide range of actions. Listed below are some of the City's sustainability accomplishments.

- Incorporation of LEED building design standards
- Appointment of a full-time city staff member who manages and coordinates sustainability initiatives
- Sustainable urban planning practices including open space planning and water management principles
- Sustain and Gain: Facebook page and brochures keep residents up to date on city sustainability efforts and ways to get involved
- Water Conservation Program: free public classes, public outreach at city events, and water rebate incentives for residents
- Council-adopted Sustainability Action Plan: this strategic planning document, in its second iteration, ensures city departments are developing sustainability-oriented goals, tracking success metrics, and encouraging cross-communication in the preparation of Sustainability Update presentations made to the Peoria City Council on an annual basis
- Sustainable University: courses and workshops to empower residents to make small changes that make Peoria a better place to live. Topics covered include residential solar, gardening, composting and recycling

Awards and recognition

- Received three Crescordia awards by Arizona Forward at the annual Environmental Excellence Awards in 2016
- 12th City for Green Space in the U.S. in 2019 *(Wallethub)*
- Top 15 Safest Cities in the U.S. 2017-2019 *(Wallethub)*
- 6th Wealthiest ZIP Code in 2020 *(Phoenix Business Journal)*
- Top 50 Hottest Hoods in 2018 *(Phoenix Business Journal)*
- 10th Best City to Raise a Family in 2018 *(Wallethub)*
- Top 100 Golf Course in U.S. 2017-2019 *(Golf Digest)*

Lake Pleasant

1886 — **2020**

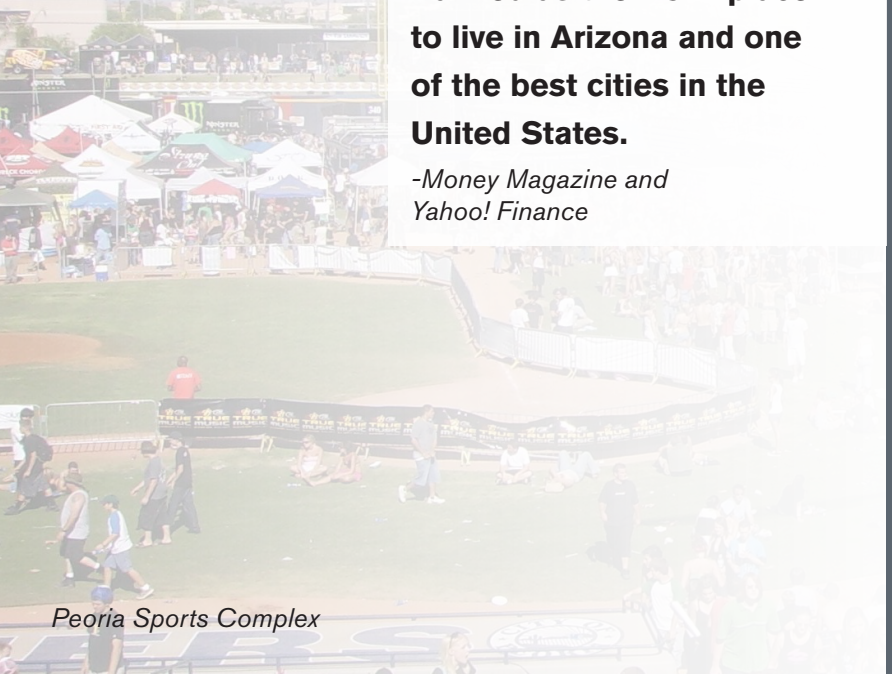
- **1889** — Peoria founded by William J. Murphy
- **1889** — First school district formed
- **1919** — Chamber of Commerce organized
- **1954** — Assumed city status with a population of 4,792
- **1954** — Peoria incorporated
- **1971** — Centennial celebration
- **1977** — Brewers spring training begins at Greenway Sports Complex
- **1986** — Theater for the Performing Arts and Rio Vista Recreation Center opened
- **1994** — Peoria Sports Complex opened
- **2007** — 20-year extension spring training agreement with San Diego Padres and Seattle Mariners
- **2012** — Selected as site of new $70M health clinic for Maricopa County Integrated Health System
- **2017**

Livability

Peoria is renowned as a great place to raise a family and start a career. A plethora of local amenities and attractions contribute to Peoria's livability. Beyond the tourist attractions of Spring Training and Lake Pleasant, the City offers many community facilities and recreational opportunities for all ages and interests such as an extensive public park system and annual community events. Peoria's dedication toward livability is also evident in the City's latest General Plan which addresses sustainable water use, housing, public services and more.

Ranked as the No. 1 place to live in Arizona and one of the best cities in the United States.

-Money Magazine and Yahoo! Finance



Peoria Sports Complex

Peoria strives to uphold these six major livability priorities in order to maintain an exceptional quality of life for its citizens.

- Arts, Cultural and Recreational Enrichment
- Economic Prosperity
- Smart Growth
- Superior Public Services
- Healthy Neighborhoods
- Integrated Transportation

Community facilities

- Peoria Community Center
- Rio Vista Recreation Center
- Peoria Sports Complex
- Peoria Center for the Performing Arts
- 36 neighborhood parks
- 2 libraries
- 3 swimming pools
- 6 golf courses
- 9 lighted multi-purpose ball fields
- 15 tennis courts

Lake Pleasant

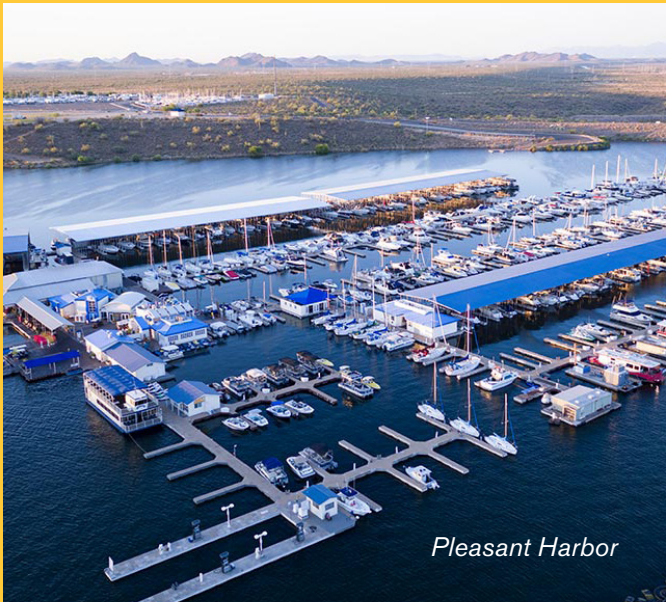
Urban ecology, ecotourism and recreation

Peoria is surrounded by the natural beauty of the Sonoran Desert and is home to Lake Pleasant, a 23,000-acre park and major recreational asset to the North Valley. The transient Agua Fria River and New River flow through Peoria, as do a multitude of washes and creeks. Most notable perhaps is Skunk Creek — known for the recreational trails running alongside it — which forges a connection between Peoria and Glendale. Northern Peoria is home to beautiful mountains and buttes including Sunrise Mountain, Calderwood Butte and Cholla Mountain.

Boasting over 300 days of sunshine annually, Peoria's ecotourism opportunities are a steady industry for residents and visitors. The City features over 60 miles of trails for walking, biking and horseback riding, as well as 570 total acres of accessible park land.

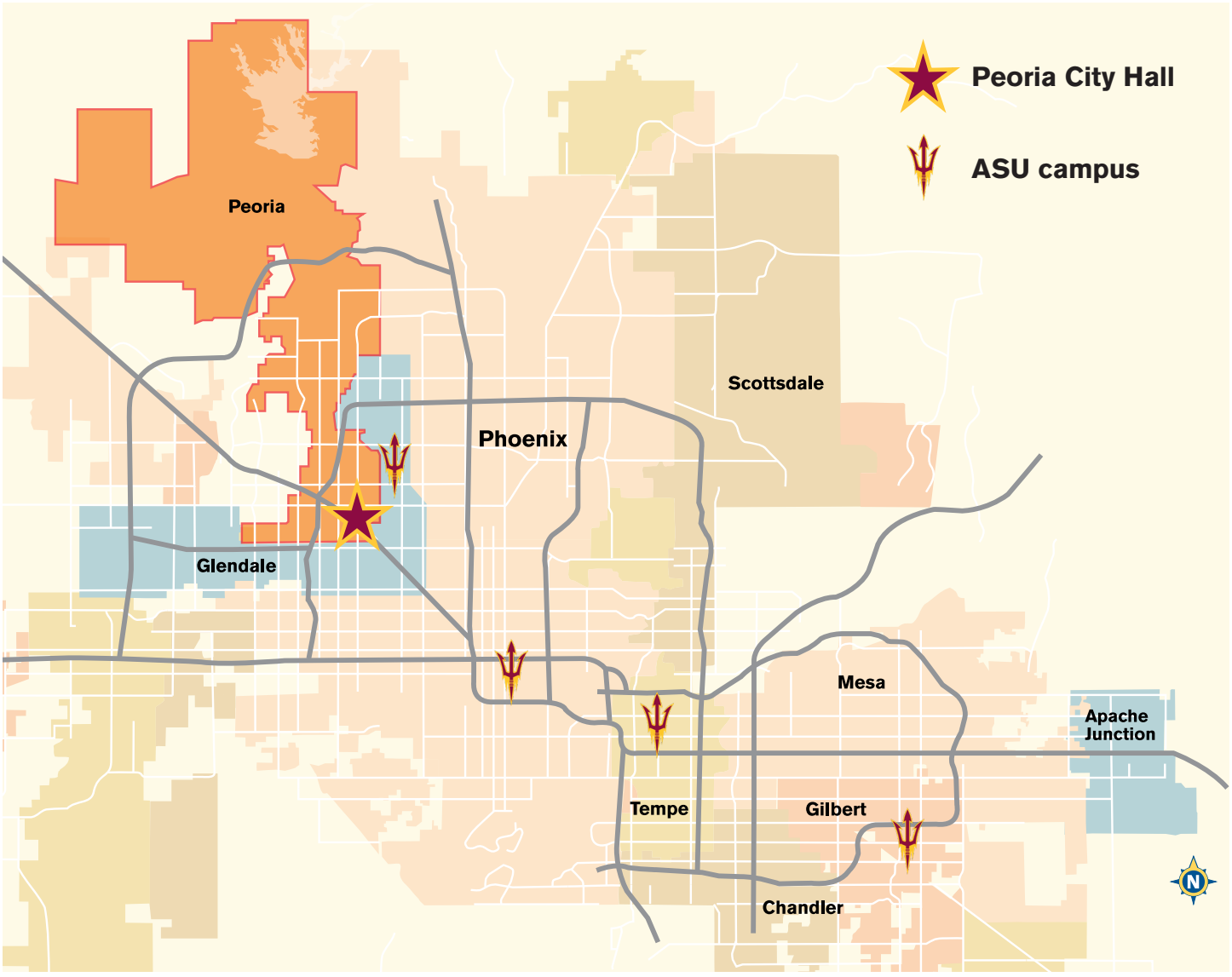
Lake Pleasant Regional Park contains a full-service marina, providing opportunities for water-oriented recreation such as kayaking, water skiing and even scuba diving. Visitors can also go horseback riding, take gliding lessons, hike, camp and more.

Skunk Creek



Pleasant Harbor

MAP OF PEORIA & GREATER PHOENIX, ARIZONA



The following report summarizes and draws highlights from work and research conducted by students in FSE 104/404 EPICS, for the Fall 2019 partnership between ASU's Project Cities and the City of Peoria.

To access the original student reports, additional materials, and resources, visit: **links.asu.edu/PCPeoriaSkunkCreek19F**

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Sustainability through local action

EXECUTIVE SUMMARY

The City of Peoria is known for its high-quality recreational amenities such as Lake Pleasant, 39 community parks and over 50 miles of trails, as well as attractions like the P83 entertainment district. Recreational amenities provide a high quality of life for city residents and engaging experiences for visitors. **Well-maintained trail systems act as gathering spaces for communities, foster a sense of community identity, promote wellness activity, and increases connectivity between key nodes within a city.**

A small group of students in FSE 104/404: EPICS Gold partnered with the City of Peoria and Project Cities to generate recommendations to improve the recreation and placemaking appeal of the Skunk Creek Trail area. Skunk Creek is an ephemeral stream and floodplain with walking trails bordering either bank. The trail divides a large residential area and the P83 shopping and entertainment district. The trail segment in this study also touches the Rio Vista Recreation Center, the Peoria Sports Complex, and a small riparian area. Current conditions of the trail vary from lushly vegetated to relatively bare, and a thin concrete canal runs down one end of the creek to prevent extreme flooding.

Currently, Peoria staff are in the early stages of identifying alternatives for transforming this mostly empty floodplain into an accessible, multi-use recreational amenity that better serves the community. Students conducted in-person and virtual site assessments, as well as collected 379 responses to a public input survey. For this project, the students propose a few new visions for the site, including amenities and services that will help transform the Skunk Creek corridor into a more popular local attraction.

Following this executive summary is a high-level list of the students' recommendations for the City of Peoria's Skunk Creek Trail area. In the ensuing class summary report, student researchers dive into the varying conditions of the corridor and present opportunities to highlight natural aesthetics, enhance accessibility, and increase usability. Proposed solutions include expanding the current trail layout, enlivening freeway overpasses with mural art, providing more opportunities for active recreation in the form of sport courts, adding user amenities such as restrooms and water fountains, and building identity and awareness around the area through signage (Piepho, et al., p.1).

GOALS & RECOMMENDATIONS

The goal of the project was to suggest opportunities for improvement along the Skunk Creek corridor that have a positive impact on the community's identity, local economy, and recreation. Students tiered their recommendations according to potential capital investment levels from highest to lowest: Gold, Silver, and Bronze Plans. A full description of these tiers and corresponding maps detailing locations of proposed amenities are available on page 38-42 of this report.

Figure 1 *Students brainstorm ideas for enhancing the Skunk Creek overpass area on their site visit.*

Figure 2 *Peoria leadership and other City officials view showcase presentations.*

RECOMMENDATIONS FOR ACTIVATING THE SKUNK CREEK CORRIDOR

Increasing connectivity at Skunk Creek

Add pedestrian bridges that cross Skunk Creek to boost connectivity between P83 and the surrounding communities (Piepho et al., p.16).

Implement pedestrian ramps connecting the upper Skunk Creek Trail system to the lower Rio Vista Park to increase accessibility to recreation sites and available parking spaces near the trail (Piepho et al., p.16).

Construct additional trail access points connecting adjacent neighborhoods to the Skunk Creek Trail system, increasing foot traffic, and walkability (Piepho et al., p.16).

Install shaded rest areas with water fountains along the trail system, to offer users more opportunities to relax, escape the heat, and hydrate (Piepho et al., p.16).

Incorporate restrooms along the trail to increase convenience, comfortability, and stay times on the trail (Piepho et al., p.16).

Enhance the aesthetic beauty of the trail by incorporating additional landscaping (Piepho et al., p.17).

Developing community identity

Strengthen the distinct sense of place by encouraging art initiatives such as painted murals or sculptures along the freeway underpasses that intersect the trail (Piepho et al., p.17).

Implement cohesive signage throughout the park to improve aesthetics and sense of identity. Recommended signage includes welcome signs that provide a sense of arrival, and informational signs displaying park features, amenities, and educational aspects of the local environment (Piepho et al., p.16).

Establish memorable gateway design elements for the park-trail interface to increase the placemaking appeal and attractiveness of trail entrances (Piepho et al., p.17).

RECOMMENDATIONS FOR ACTIVATING THE SKUNK CREEK CORRIDOR (CONT'D)

Activating underutilized space
Place hammock posts within and around the riparian area to provide passive recreation opportunities and enhance the usability of the floodplain (Piepho et al., p.16).
Install a dog park along the corridor, promoting interaction within the community (Piepho et al., p.16).
Build an amphitheater in an under-utilized space along the trail to provide an entertainment venue for future community events (Piepho et al., p.16).
Install park gazebos throughout the trail system to provide simple gathering locations with amenities such as outdoor grills (Piepho et al., p.16).
Provide active recreation sites along the trail such as courts for basketball and disc golf. (Piepho et al., p.16-17).

Figure 3 *EPICS Gold students on their Skunk Creek site visit.*

FACULTY
JOSHUA LOUGHMAN

FSE 104/404: EPICS
IRA A. FULTON SCHOOLS OF ENGINEERING, EPICS PROGRAM

Activating the Skunk Creek Trail

Strengthening the community by enhancing recreational amenities

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INTRODUCTION

The City of Peoria lies in the Northwest corner of the Phoenix metropolitan area. The city is known for its exceptional livability and availability of recreational amenities that showcase the surrounding natural beauty. Skunk Creek is an ephemeral stream and floodplain that bisects the southern part of the city. Multi-use trails border the floodplain on both its southern and northern banks. This corridor is an under-utilized and disconnected space, despite having an opportunistic location adjacent to both the Rio Vista recreation center and P83 Sports Complex, two major community attractions.

Student researchers involved in the EPICS Gold program aimed to assist the City of Peoria with the challenge of re-imagining the Skunk Creek Trail area as a multi-use recreation corridor. Students narrowed the scope of this project to designing trail amenities and facilities that would enhance the area's potential, and to better serve the community (Piepho et al., p.2). The Fall 2019 EPICS (Engineering Projects in Community Service) group consisted of four students from different engineering disciplines, including civil, chemical, industrial, and mechanical. The EPICS program is designed to provide engineering students with real-world projects that add value to communities. This group of interdisciplinary students applied their varied engineering experience to devise solutions that may help to improve the Skunk Creek Trail for the Community of Peoria.

Figure 4 *Typical water flows in the channel are minimal except during and after rain events, or monsoon season, as pictured here in early October 2019.*

Project area synopsis

This report focuses on the section of the Skunk Creek corridor highlighted in Figure 5, spanning from West Thunderbird Road near the Rio Vista Recreation Center to 75th Avenue. A basic paved trail runs along the south side of the creek; similarly, a path is currently under development along much of the north side of the creek (Piepho et al., p.3). The Peoria Sports Complex, home of the San Diego Padres' and Seattle Mariners' spring training, is visible to the North of the trail. Adjacent to the Sports Complex is P83, a popular shopping center (Piepho et al., p.3). South of the intersection of Skunk Creek Trail and the Loop 101, Rio Vista Park boasts impressive amenities, sports fields, and the Rio Vista Recreation Center. Rio Vista is also the site of a veteran's memorial and a fishing pond, open to the community (Piepho et al., p.4). Inherent in this project is an expression of Peoria's goals to provide community amenities that increase the quality of life for residents as well as protecting the creek's natural riparian habitat and the native wildlife within. Students presented a few ideas for Peoria's consideration in alignment with its budget and priorities.

It is home to many species of wildlife, and historically, four species of skunks. Today, the thirty-mile seasonal stream collects water from 65 square miles of hills and mesas, but this typically results in a small stream or a dry creek bed, except during rain events. Mainly used as a flood control device for many years, the creek and its adjacent trails are now transforming into an outdoor activity network that connects to other washes and canals. While much of the floodplain itself is still in a mostly natural state, Peoria's explosive population growth in the surrounding areas is leading city staff to eye the corridor for additional recreation and connectivity opportunities (Piepho et al., p.2).

Historically, the Skunk Creek corridor is believed to have served as a travel conduit and farming area for indigenous peoples, such as the area's early inhabitants, the Hohokam. Further along the wash, to the northeast of the project area, archaeologists have uncovered evidence of Hohokam agriculture and daily life, such as petroglyphs and pottery shards; some of this evidence is currently on display, accompanied by educational signage at the Deer Valley petroglyph preserve. This history is still not well understood in the Peoria portion of Skunk Creek, and warrants further research.

RESEARCH METHODS

Students conducted background research on the community and performed site visits to get a first-hand experience of the Skunk Creek corridor and adjacent areas. To get an idea of what residents want to see in the Skunk Creek area, student researchers surveyed community members as part of a more considerable omnibus survey effort. Peoria and Project Cities staff distributed an extensive survey on behalf of five ASU classes and collected over 800 responses. The Skunk Creek portion of the study received 379 individual responses to questions that focused on transportation habits, recreational preferences, and current recreational amenity usage. Students also interviewed community stakeholders, conducted a literature review, and researched existing and past site plans to guide their recommendations and ultimately establish three concept plans for the development of the area.

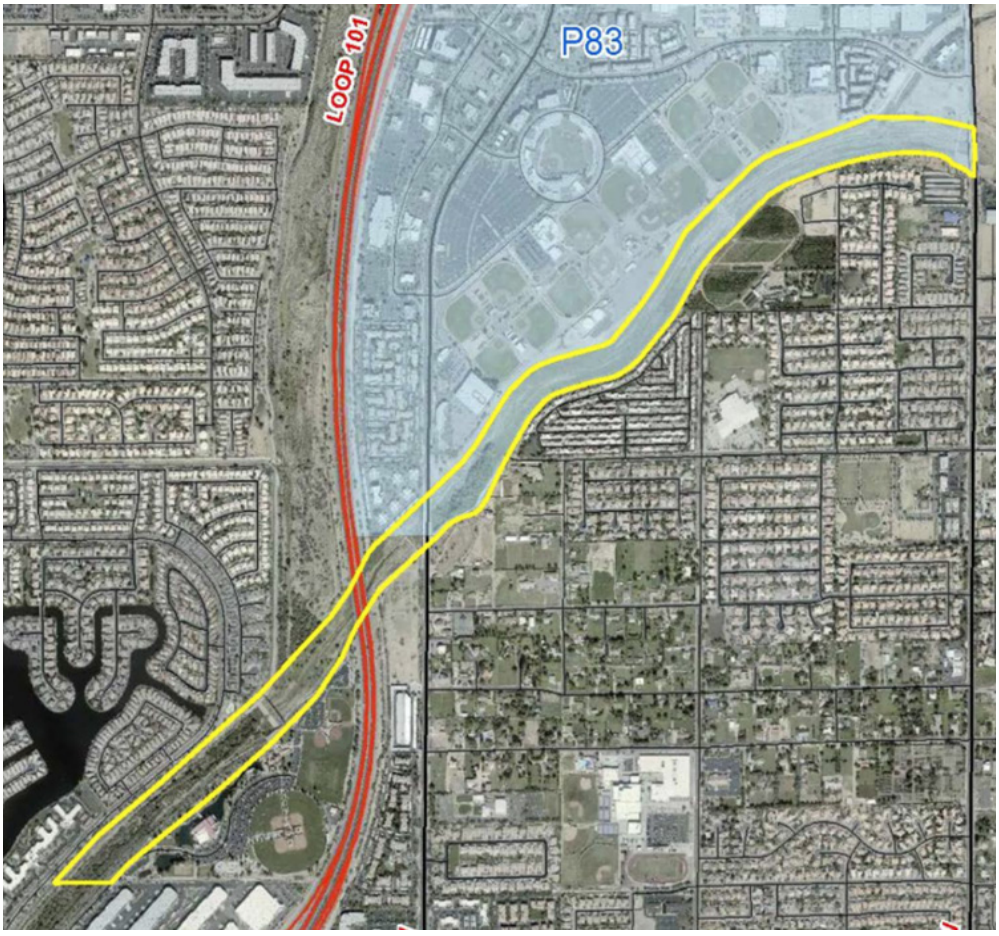

Figure 5 *Map of Skunk Creek study area*

EPICS@ASU overview

The **Engineering Projects in Community Service (EPICS)** program at Arizona State University is a design-based service-learning and social innovation program for students from an array of disciplines. EPICS students work on technically challenging, real-world, multi-semester projects that have direct community and social benefit. The EPICS program adopts a human-centered design approach that brings community partners into the teams with the students to enhance project communication, ideation, and delivery of projects.

While projects span four broad theme areas (sustainability, community development, health, and education) a common thread with all EPICS projects is the building of empathy for stakeholders and the contextualization of engineering projects in the social, political, economic, and environmental dimensions. Students work closely with industry and faculty mentors in teams to develop prototypes, conduct site visits, and deliver key deliverables to their community partners. The EPICS program builds critical engineering judgment, professional skills, and engages students in real-world impact.

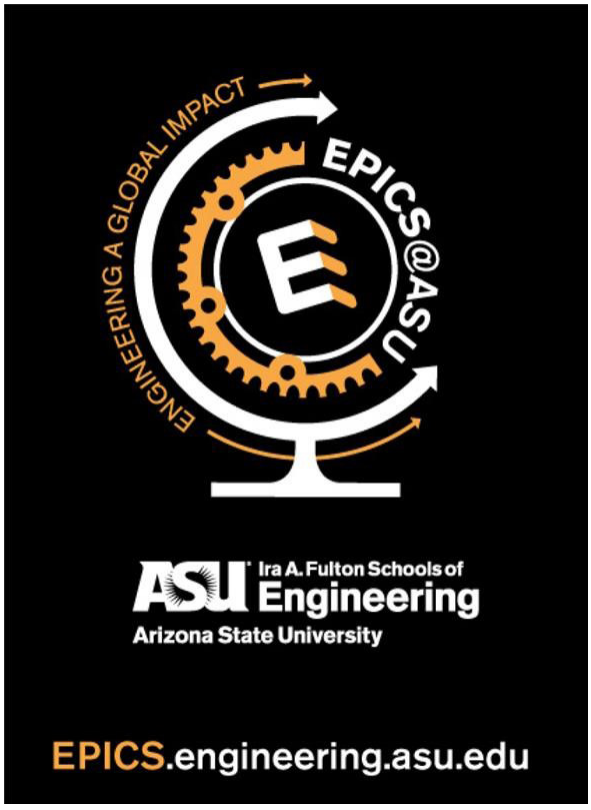

Figure 6 *Epics@ASU graphic element from website*

The design model

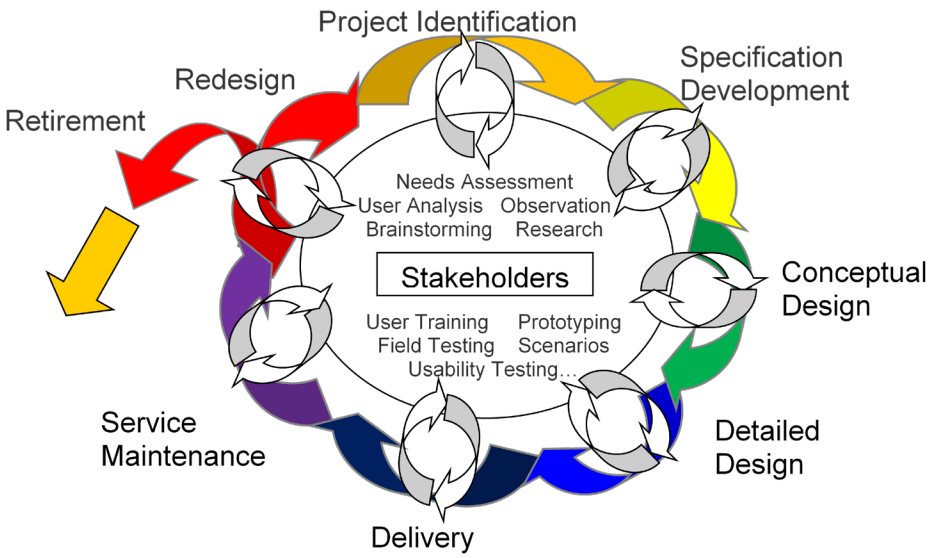

Figure 7 *Step-by-step cycle of the design process*

The EPICS design process

An iterative process with intentional overlaps as well as opportunities for the design team to return to previous phases as the project develops.

Student teams identify the community partner's desired outcomes. By working with their community partner and other stakeholders, EPICS teams author their own project plans and objectives.
Develop those initial plans into more fully developed project specifications. Prototyping and frequent stakeholder communication is critical throughout the process to "think by building" and effectively exchange ideas with stakeholders.
Design phase 1 (Conceptual design): The team and stakeholders brainstorm and evaluate several design alternatives while continuously monitoring project scope and other risks.
Design phase 2 (Detailed design): Team deliverables vary depending on projects but typically include sophisticated engineering assessments, designs, and recommendations.
For "closure," after the project deliverables are met, project teams plan next steps for the servicing and maintenance of the project, for the client.
Ultimately, when the project has reached a conclusion, the teams meet to carefully consider retirement of the project.

Active vs. passive recreation typology

Students utilized a common typology in the field of Parks and Recreation to categorize activation opportunities as “passive” or “active” recreation activations. Generally, passive recreation refers to an unstructured activity that users engage with by interacting with a space. Active recreation involves structured and coordinated activity, usually requiring specialized fixtures or equipment. A well-planned recreation space will incorporate a balance of the two types to serve a higher number of users’ interests. Accordingly, this typology is applied throughout to ensure students are balancing the interests of a more comprehensive array of residents.

	Active Recreation	*Passive Recreation*
Definition	Structured individual or team activities that require the use of special facilities, courses, fields, or equipment.	Recreational activities that do not require prepared facilities like sports fields or pavilions.
Examples	Baseball, football, hockey, tennis, golf, soccer, skateboarding	Camping, hiking, birdwatching, walking, picnicking, bicycling, running
Definitions taken from US EPA retrieved from https://semspub.epa.gov/work/11/174083.pdf		

Table 1 *Defining active and passive recreation*

Editor's Note

At times, an activity can land somewhere in between passive and active, making it challenging to make clear distinctions. Additionally, different practitioners and academics may hold varying views on the definitions in this dichotomy. This report utilizes the definitions as understood by this group of students, through conversations with city staff and additional research.

8A *Active recreation*

8B *Passive recreation*

Figure 8 *Examples of passive and active recreation*

TRAIL SYSTEM CONNECTIVITY AND WALKABILITY

Well executed urban trail systems provide passive and active recreational opportunities for both residents and visitors of a city. For Skunk Creek specifically, the opportunities and potential benefits of expanding the trail system are numerous to both improve utilization of the space and to enhance walkability for residents and businesses in the area. Cohesive trail systems like the one proposed can be easily understood and navigated by the public, have a low upkeep cost, and provide improved passive recreation opportunities for residents (Piepho et al., p.7).

Editor's Note
Students drew some inspiration from the Scottsdale flood control park which was awarded the ASU Resilience Prize in 2018.

In its current state, Skunk Creek represents a barrier to Peoria's goal of becoming a more walkable city (Piepho et al., p.4). In the project area, the north and south sides of the creek are connected by two high-traffic, car-centered bridges with pedestrian sidewalks and only one pedestrian bridge in the Rio Vista Park area. A few enhancements to the trail system could significantly increase connectivity and walkability for the residential areas that surround the trail (Piepho et al., p.4). Connecting the path to local business areas of the town also provides an opportunity for increased foot traffic and economic activity in the adjacent district (Piepho et al., p.11).

Figure 9 *Students walk a trail along Skunk Creek during the Peoria site visit.*

Findings and analysis

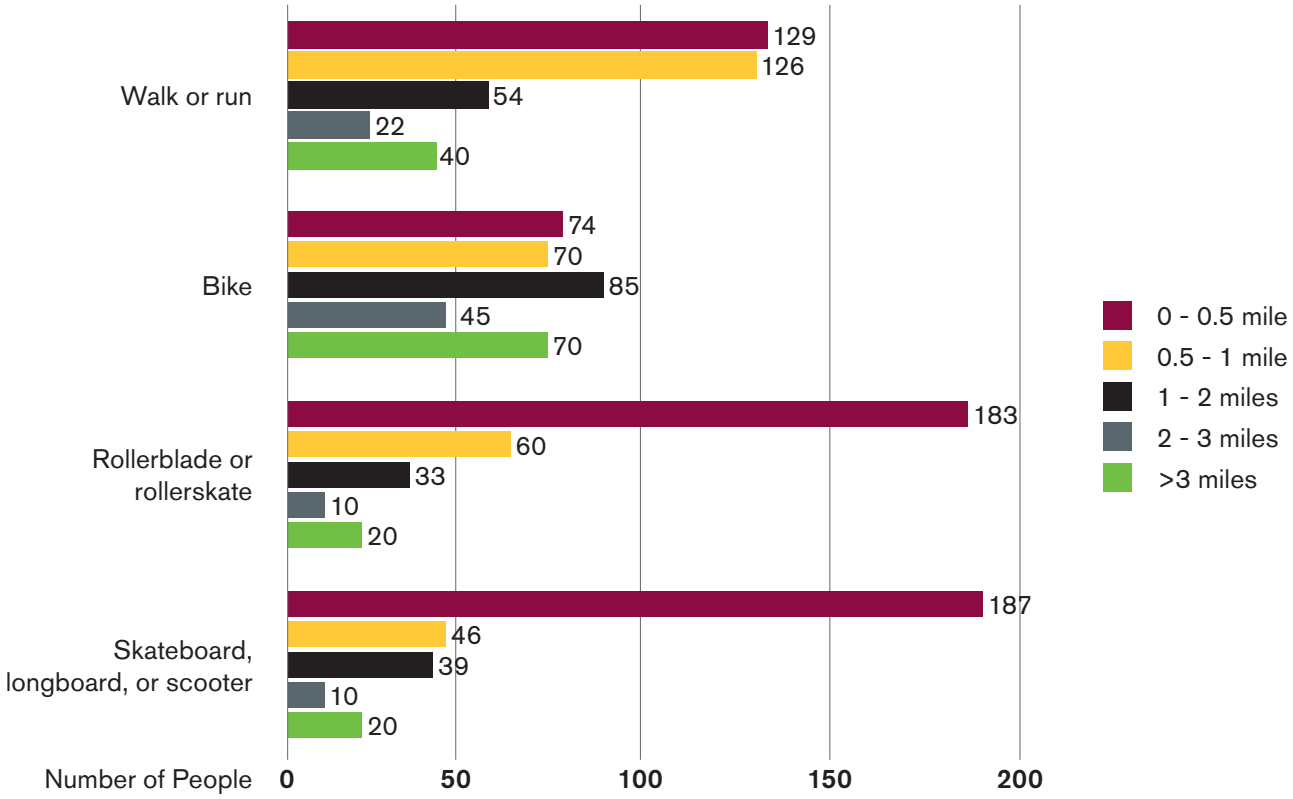

Figure 10 *Preferred transportation modes for travel to recreational sites. "How far would you be willing to travel via the following methods, in order to reach recreational sites in your area?*

Students surveyed Peoria residents about their travel habits, including walking, biking, rollerblading, and skateboarding. Survey results were used to better develop the recommendations from the vision expressed by the public. Generally, results in Figure 10 show many Peoria residents on average do not walk more than 1 mile, bike more than 2 miles, or skate/skateboard more than 0.5 miles (Piepho et al., p.12). Students predict that since the segment of trail in the study area is about 3 miles long, most residents would not walk the entire trail. This information helps identify convenient access points for community members to enter and exit the trail easily (Piepho et al., p.12). Considering that walking was rated as the most popular form of non-vehicular travel in the survey, incorporating pedestrian-friendly access points in or adjacent to neighborhoods can better enable residents to utilize the trail (Piepho et al., p.12).

Students concluded from these survey results that residents might be more likely to complete the entire length of the trail at one time by biking than any other form of activity (Piepho et al., p.12). Skateboarders and roller skaters reported similar results. Many of the survey respondents stated they are willing to use skateboards and roller skates over a distance, only up to a half-mile. Students interpreted this input to indicate that there could be very few skateboarders or roller skaters on the trail (Piepho et al., p.12). The survey responses insights into the different values that residents derive from the trail (Piepho et al., p.12).

Figure 11 *Example of lack of access between North and South sides of Skunk Creek and the riparian conditions present in the floodplain.*

Editor's Note

Presumably people on skateboards/roller skates could still use the trail, just for a shorter distance. This does not necessarily indicate the absence of skateboarders and roller skaters. There is a skate park in the Rio Vista complex that is heavily utilized. It is possible that sample bias influenced this result; the data do not indicate one way or the other.

Opportunities to enhance connections through Skunk Creek

Peoria has set a municipal goal to be a walkable city, and the existing Skunk Creek Trail situation currently works against that goal (Piepho et al., p.4). The creek fully bisects southern Peoria, connecting with neighboring Glendale. The south bank of the area is dominated by residential zones, with some commercial activity. In contrast, the north side is primarily business-oriented featuring P83 and the Peoria Sports Complex. The students and staff observed a lack of connection between the two districts that can discourage interaction (Piepho et al., p.4). In the project area, there are only three options for pedestrians, bicyclists, and other users to cross Skunk Creek without trekking off-road through the channel: one pedestrian bridge near Rio Vista, and two bridges for vehicular traffic along 83rd Avenue and 75th Avenue.

The channel itself is an apparent physical barrier that Peoria will need to overcome through the construction of bridges and trails. The current state of the corridor presents a lack of pedestrian-friendly options and lost opportunity due to the lack of connectivity between adjacent neighborhoods and the commerce and entertainment district. Limited accessibility is not only an issue concerning the crossing of Skunk Creek; there is also limited access to get to the trail from the surrounding residential and commerce areas (Piepho et al., p.4).

Note that even to access this area, visitors must first follow a long switchback from the trailhead (see Figure 12). Students suggest developing a more inviting path that has clear visibility to where it is going would be ideal (Piepho et al., p.5).

Figure 12 *One form of entry into Skunk Creek, unmaintained switchbacks.*

Figure 13 shows an embankment separating Skunk Creek Trail from the adjacent baseball fields and Rio Vista Recreation Center. Rather than walking around the large mound, pedestrians have worn a cow-path into the dirt to get from one side to the other, illustrating an evident public desire for an established pathway or staircase to be present at this location. In addition to this physical obstacle, the embankment also obstructs the view of Skunk Creek Trail from Rio Vista Recreation Center, potentially lessening the usage of the trail by keeping it hidden from recreation center users (Piepho et al., p.5).

Figure 13 *Embankment with a worn-in pedestrian path*

Recommendations to increase connectivity

Enhancing and building on the existing trail system will be the most impactful and efficient intervention for increasing accessibility, connectivity, and overall usability (Piepho et al., p.6). Students suggest implementing the five distinct types of trails described below with their reasoning for each:

- Create a floodplain-level trail system in the basin of the creek with paved trails that run the same route as the Street Level Loop that invites usage of the currently underutilized floodplain by park-goers (Piepho et al., p.6).
- Plan additional paved trails that cross the floodplain east-to-west, north-to-south, and diagonally to increase connectivity and usability (Piepho et al., p.7).
- Develop a paved street-level loop trail on the same topographical level of the overpasses, Rio Vista Recreation Center, and the neighborhoods. Interweaving trail systems in this way allows easy access for pedestrians and bikers without having to descend into the floodplain itself (Piepho et al., p.6).
- Connect the Street Level Loop and Floodplain Loop intermittently by utilizing stairs and paved ramps along the entirety of the route, which provides convenient fast access. Ensure ramps are appropriately spaced and ADA-compliant to provide access for wheelchairs and strollers (Piepho et al., p.7).
- Enhance the overpass multi-use pathways by providing additional space for users on the exterior side of the main road on each overpass over the floodplain that connects the pre-existing sidewalk along with the segments of roads in the community (Piepho et al., p.6).
- Increase the number of access points on all existing and proposed trails near Rio Vista Recreation Center, adjacent neighborhoods, McLendon's Select farm, P83, and the Peoria Sports Complex. Adding access points, especially at strategic locations, could increase overall usage and accessibility of the trail and floodplain area (Piepho et al., p.8).

BUILDING IDENTITY

Skunk Creek Trail and its surrounding areas would benefit from an identity redesign that creates a more cohesive, recognizable sense of place (Piepho et al., p.8). Currently, the trail area is viewed less as an opportunity for recreation and more of a utilitarian drainage zone. Students hypothesize this lack of identity stems from the current rough aesthetic, a limited identification of and access to destination points in the area, and a need for additional marketing around Skunk Creek Trail as a recreational amenity (Piepho et al., p.8).

Lack of identity

During their initial site visits, students observed a significant lack of "identity" along the trail, as well as by a lack of useful signage, generally, as well as inconsistencies in style and information. Students reported that much of the existing signage is usually not in good condition, and not exceptionally helpful. There are minimal informational signs throughout the area, causing visitors to be unaware of the trail layout, its recreational opportunities, and its natural resources, or even basic functions like road access, mile markers, and amenities.

There is little to no art in the study area. At the same time, large parts of Skunk Creek Trail go under major overpasses, with enormous blank concrete walls running along the length of each overpass. These areas are less attractive and inviting than the rest of the park, both visually and auditorially (due to loud traffic overhead). However, the students identified these challenges as opportunities for artistic and cultural activation. To improve these areas, students suggest inviting local artists to paint murals on the blank concrete of the overpasses (Piepho et al., p.8). This could help give the area a more welcoming feeling and help offset the otherwise jarring experience under the bridges. The students suggest leaving the subject matter entirely up to the artist, encouraging them to follow the park's theme, or letting them interpret the area's ecology and history in their work (Piepho et al., p.9).

A unifying park-wide theme could also serve to identify boundaries of the park, increase community identity, and provide a pleasing aesthetic for park-goers. Signs, structures, and potential artwork should tie back to the same theme to begin unifying the "feel" of currently segmented and incohesive areas. Themes could also be coupled with a park mascot to enhance their effects. Students suggested three potential theme ideas (Piepho et al., p.9).

Old Western	A homage to the historic settlement of the area
Native American	A homage to the native people that lived and continue to live in the area
Metallic	A homage to the historic mining industry of the area

Table 2 *Potential theme ideas when designing Skunk Creek*

Hosting community events such as cookouts or movie nights could increase public interest in the park. Though it is not a physical change to the area, providing an incentive to visit the Skunk Creek corridor could generate more interaction between residents and the park, allowing the community to get to know the area and be aware of the improvements the City is making. These actions would hopefully result in higher future usage of the trail system (Piepho et al., p.9).

Skunk Creek riparian area

Currently, the riparian area of the Skunk Creek corridor is limited to the first half-mile near the Rio Vista Recreation Center. The small pocket of riparian land is lush with an array of trees and other growth, attracting wildlife and projecting a sense of naturalist tranquility. A trailhead with scenic overlook connects via a switch back to the riparian area. While the riparian area projects a sense of natural beauty, as trail-goers move away from this lush, verdant landscape, the vegetation becomes sparse, and the landscape less exciting. Students suggest landscaping the trail not only to increase aesthetic appeal but also to expand the riparian habitat that provides shelter for native wildlife.

Editor's Note

Planting additional trees in an area like this can produce added "co-benefits" to the community, such as cleaning the air and reducing urban heat. The Arizona Department of Forestry and Fire Management provides multiple grant programs to fund and support urban tree planting initiatives directly.

Figure 14 *Peoria's Real Estate Development Officer, Scott Whyte, points out a pocket of lush riparian area adjacent to the trail on a site visit with students.*

Currently, there is no official access into the depths of this lush, vegetated area. However, people have forged their access to its interior by the existence of naturally worn paths cutting through parts of the vegetation. The lack of a dedicated nature trail leading humans to off road through the area could potentially result in people or wildlife finding harm (or both!). A small nature trail would also provide opportunities to include educational information and digital engagement with this unique urban ecological feature.

Currently, the riparian area is highly regulated by the Flood Control District of Maricopa County (FCDMC). There are no permanent structures permitted to be built in the area, and few allowed uses. Students suggest working with the FCDMC to navigate regulations as the City seeks to increase the use of the area. For instance, due to limitations on the use of the riparian zone, the City should consult with FCDMC if they wish to explore activations like an educational nature trail (Piepho et al., p.10).

Recommendations to improve the Skunk Creek riparian area

- Incorporate large, eye-catching welcome signage that display helpful information such as maps and park rules at each main access point, as well as key junctions within the trail network (Piepho et al., p.9).
- Place informational signage plaques that provide historical and ecological facts of the area intermittently along the trail network, especially at overlooks and points of interest (Piepho et al., p.9).
- Integrate a design theme in the area to unify the sense of place, such as Old Western, Native American, or Metallic (Piepho et al., p.9).
- Create a welcoming feeling to Skunk Creek by inviting local artists to paint murals on the blank concrete of the overpasses that captures the parks established theme, history and ecology (Piepho et al., p.9).
- Host public events in the Skunk Creek area to incentivize visiting and interacting with space, leading to the increased public interest in the park (Piepho et al., p.7).
- Develop an educational unpaved nature trail that invites users to venture into the riparian habitat with the use of educational signage that increases public awareness of urban ecology and access to this quiet, natural space (Piepho et al., p.7).
- Extend the riparian zone by adding more trees and native vegetation in the floodplain (Piepho et al., p.7).
- Landscape along the trail to improve the visual aesthetic and make transitions in the path less jarring (Piepho et al., p.7).

ACTIVATING UNUSED SPACE IN THE FLOODPLAIN

Much of the area adjacent to Skunk Creek Trail is an open floodplain. Due to regulations from the Maricopa County Flood Control District, this area cannot be developed. These regulations do not permit any permanent structures within the floodplain, leaving a large expanse of land underutilized (Piepho et al., p.10).

Passive recreation

Editor's Note
Low passive recreation usage in Figure 16 could be a result of respondents being unaware of the meaning of 'passive recreation.'

Figure 15 responses confirm that 274 residents agree with the statement, "The area in which I live would benefit from more passive recreation sites." Students think these results will provide valuable insight to assist Peoria in making informed design choices with any development in or around the Skunk Creek Trail area by informing the city staff of resident wants and needs. (Piepho et al., p.13).

Figure 16 indicated that 294 residents reported low passive recreation usage, either zero times per week or 1-2 times per week. Only 83 respondents reported using passive recreation sites 3-5 times or more per week (Piepho et al., p.13). These responses help illustrate the active dynamic of the surrounding communities, which students believe may help estimate the utilization rate of proposed passive recreation sites (Piepho et al., p.13).

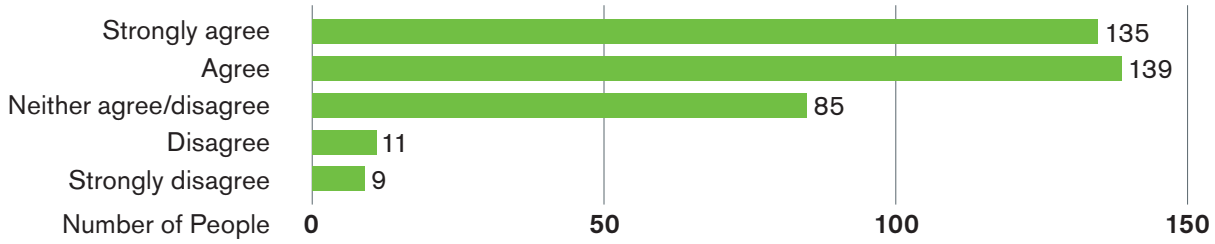

Figure 15 *Residents benefit from more passive recreation sites.*

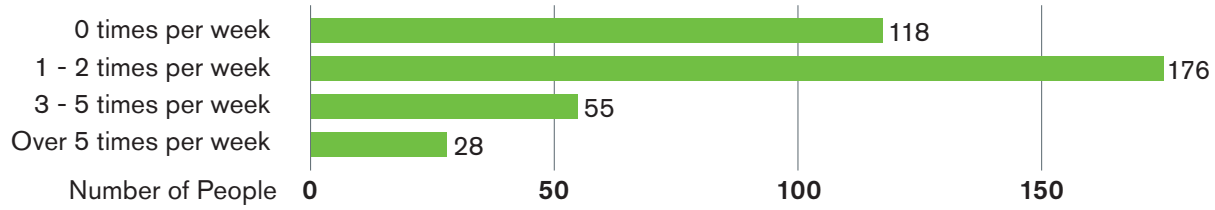

Figure 16 *Residents' usage of public passive recreation sites near them.*

Active recreation

Figure 17 shows that 264 residents agree that the area would benefit from active recreation sites. Students think this information will help guide deciding what types of amenities should be implemented, tailoring the activation plan to the residents' wants and needs (Piepho et al., p.14).

Figure 18 indicates that 356 respondents use active recreation sites (e.g. basketball courts, disc golf courses, volleyball courts, etc) 0 or 1-2 times per week. Only 22 residents reported they use active recreation sites 3-5 times or more per week. These results are important to predict future usage rates of proposed trail improvements by measuring the number of residents that may utilize additions to the trail system (Piepho et al., p.15).

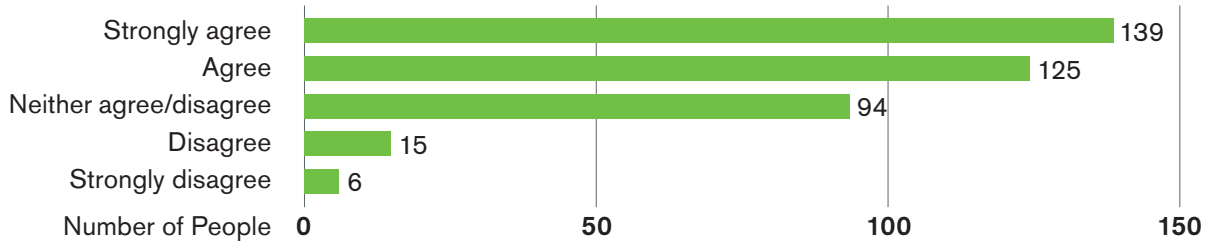

Figure 17 *Residents benefit from more active recreation sites.*

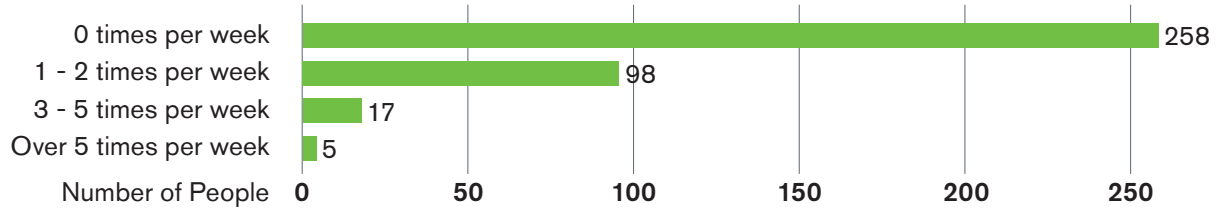

Figure 18 *Residents' usage of public active recreation sites near them.*

Editor's Note

Low usage of existing active recreational sites could stem from numerous causes such as a lack of activity sites or lack of access to website information, not necessarily a resident's level of interest in active recreational sites. Further research should examine those factors that influence utilization rates and further delve into specific user interests.

BRONZE, SILVER, AND GOLD RECOMMENDATION PLANS

Impact on community

Students hypothesize the activation of Skunk Creek Trail would beneficially impact the surrounding communities in a multitude of ways. Residents would have greater access to more passive and active recreational sites, and opportunities to be further involved with the community. Newly implemented recreational amenities such as gazebos and other gathering spaces could encourage community members to host events, strengthening Peoria's sense of community. With the new connections to the P83 commerce area, businesses may also experience benefits caused by the Skunk Creek Trail redesign, in turn increasing Peoria's overall economic well-being (Piepho et al., p.11).

Bronze, Silver, and Gold Plans

Students packaged their recommendations into a Bronze, Silver, and Gold plan for activating the Skunk Creek corridor and its surrounding areas. The rationale for having these three plans was that given a highly uncertain budgetary commitment to this project, scope could float across a spectrum of solutions. The Silver Plan is a middle-of-the-road plan that the students imagined would be a good compromise between cost and community benefit. The Gold Plan was an up-scoped version of the Silver Plan that would have higher costs but also higher community benefit. If cost-sharing and co-benefits are considered, this higher scope version could be seen as highly attractive. On the other hand, if cost constraints are high, the Bronze Plan represents a lower commitment of resources while still retaining high value community benefits.

Some suggestions in the following plans include amenities that would be built in the open floodplain area. The Flood Control District of Maricopa County (FCDMC) currently prohibits the construction of fixed structures in this area. However, the FCDMC has approved temporary installations and ensuring public use of the space. Additionally, the FCDMC has expressed willingness to review proposals for some small semi-permanent fixtures. Table 3 details new amenities in each plan, quantities of said amenities, and an explanation for how each element would benefit the community.

Bronze, Silver, and Gold Plans for Skunk Creek trail activation				
Amenity	**Bronze**	**Silver**	**Gold**	**Notes**
Off-leash dog park	0	1	1	An off-leash dog park is an appealing amenity to dog owners that also promotes social interaction in the community.
Pedestrian Bridge	0	1	2	Pedestrian bridges will boost connectivity between P83 and the surrounding communities. This comes with a substantial capital investment cost.
Ramps from trail to Rio Vista park	1	2	3	Additional access points connecting the trail to Rio Vista Park improve access to recreation and available parking space. Utilize ramps to accommodate ADA requirements and improve park accessibility.
Additional access points along the trail	2	3	5	Additional access points along the trail can strategically connect neighborhoods to the path, increasing foot traffic and walkability.
Amphitheater	0	0	1	An amphitheater would provide an entertainment venue as well as a location for community events.
Gazebos	1	2	2	Gazebos provide simpler gathering locations with opportunities to include other amenities such as barbecues and picnic tables.
Shaded rest spots	3	5	7	Shaded respite stations provide heat protection for users of the trail.
Water fountain	3	5	7	Ideally incorporated into shaded rest stop locations, water fountains are essential for user safety, especially during hot summer months.
Restroom	1	2	3	Restrooms can improve the attractiveness of other amenities located along the trail and also increase the duration people can engage with the trail.
Basketball courts	0	1	2	Provides active recreation opportunities along the trail. May be implementable within the floodplain with FCDMC approval.
Hammock posts in Riparian Area	0	2	4	Provides passive recreation sites as well as enhances usability of the riparian habitat.
Welcome Signs	5	6	9	Welcome signs will improve the aesthetic of the park and provide important information to help residents engage with the trail.
Informational signs	4	6	8	Informational signage will tell users more about what the park has to offer as well as education about the local environment and history.
Gateway treatment	1	2	4	Well-designed gateways could increase the placemaking appeal and attractiveness of trail entrances.
Landscape of Areas	2	3	5	Landscaping can enhance the attractiveness of the trail and provide opportunities to increase connectivity through the entire trail.
Frisbee golf course	0	0	1	Provides active recreation opportunities along the trail. May be implementable within the floodplain with FCDMC approval.
Bridge murals	0	1	2	Murals beautify a space and add to a sense of place and identity with the unique character of Skunk Creek.

Table 3 *Student-created Bronze, Silver, and Gold Plans for Skunk Creek Trail activation*

Editor's Note

Each map conceptualizes different plans to activate the Skunk Creek corridor. The maps do not necessarily build on each other, but instead focus on incorporating different types of amenities depending on a certain budget chosen by city leadership. Each scenario drafts up different ideas for activation, keeping in mind site restrictions and design values that residents revealed in the student's research.

Figure 19 *Student draft of Bronze Plan Map*

Figure 20 *Student draft of Silver Plan Map*

Figure 21 *Student draft of Gold Plan Map*

CONCLUSION

The City of Peoria and its residents express a clear desire to improve Skunk Creek Trail and the surrounding areas. **Results from the student researchers' surveys point toward the implementation of new passive and active recreation sites as the top priority to enhance the space.** Direct improvements to the trail, like paving and landscaping, could have a significant impact on usage and enjoyment of the area. An increase in amenities along the length of the trail will also increase its appeal and usability, especially during different seasons throughout the year. Crucial additions for safety and health include water fountains and shaded rest stops.

The City of Peoria will need to address several municipal tasks before further developing Skunk Creek Trail. A thorough feasibility report should be conducted. In this next step, clear right of way boundaries would need to be established and subsequently included in the overall planning of the trail and adjacent areas. Proposals for development within the flood zone will require consultation with the Maricopa County Flood Control District. Conducting a feasibility report should help outline clear boundaries and limitations on what improvements can safely be implemented within that space (Piepho et al., p.19).

The students recommend completing the Skunk Creek corridor planning process in two main phases. Phase 1 includes conceptual designing of the Skunk Creek Trail and the surrounding area, accompanied by cost analyses, site layouts, and assessment of maintenance and servicing needs. These elements should be completed for all conceptual designs. Phase 2 involves establishing a clear right of way boundaries and assessing the feasibility of specific activations. Upon completion of phases 1 and 2, final design options should be prepared for the City of Peoria to evaluate further. City staff and elected leaders can then make the final decision on the next steps for this vital community development project (Piepho et al., p.20).

REFERENCES

A., Piepho, Fisher, B., Gutierrez, J., Smith, R. (2019). *Project Cities: Skunk Creek.* Arizona State University.

To access the original student reports, additional materials, and resources, visit: **links.asu.edu/PCPeoriaSkunkCreek19F**