PLANNING A SUSTAINABLE FUTURE

A SPRING 2018 COLLABORATIVE REPORT OF ARIZONA STATE UNIVERSITY'S PROJECT CITIES & THE CITY OF APACHE JUNCTION

Dear Apache Junction residents, community members, and report readers,

Once again, ASU has exceeded our expectations with four Spring Semester 2018 projects through ASU's Project Cities program. As the inaugural community partner for the program, we could not be more pleased with the relationship the city has developed with the students, professors, instructors, and Project Cities staff. This semester we were fortunate to have the opportunity to work with over 70 students on four projects that engaged five university professors and classes. The students and professors brought fresh perspectives and unique approaches to their work.

On behalf of the City Council, we can say that they are impressed with the relevant project work, and we are sure that it will help make Apache Junction a place people love to call home.

Four projects were undertaken in the Spring semester of 2018 (Positively AJ continued, Planning a Sustainable Future, Transitioning Mobile Home/RV Parks, and Exploring New Revenue Sources), and all have the potential to strengthen the community and prepare it for the next 40 years (AJ is just 40 years old this year). The project reports identified short- and long-range issues for the city and provided valuable information that will inform future council and community actions.

For example, the city is moving forward on the Sustainability and Solid Waste project from the Project Cities Fall 2017 project list. City council voted to direct city staff to prepare a Request for Proposals (RFP) for the coordinated collection of solid waste and recycling. This vote shows that the Project Cities program model is working and is invaluable to communities like Apache Junction.

While the projects are of great value to Apache Junction, we also know that they are equally valuable to the student researchers. Students have gotten to know the city, the challenges we face, and they were able to provide objective analyses and practical recommendations on the issues.

We look forward to working with ASU, the Julie Ann Wrigley Global Institute of Sustainability, and Project Cities long into the future!

With gratitude,

Jeff Serdy, Mayor   Bryant Powell, City Manager

ACKNOWLEDGEMENTS

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PART 3
ONLINE APPENDIX: *STUDENT REPORTS & PRESENTATION*

Consult the student materials in their entireties at **projectcities.asu.edu**. *They are located on the page "2017-2018 Partner: City of Apache Junction" found under the "Partner Cities" tab.*

ABOUT PROJECT CITIES

The Project Cities program of Arizona State University (ASU) is a university-community partnership. For an entire academic year, faculty members and students work with a single city to co-create strategies for better environmental, economic, and social balance in the places we live. Students from multiple disciplines research difficult problems chosen by the city and propose innovative sustainability solutions. Project Cities is a member of the Educational Partnerships for Innovation in Communities Network (EPIC-N), a growing network of more than 30 educational institutions partnering with cities throughout the U.S. and the world.

ABOUT SUSTAINABLE CITIES

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.*

Project Cities Team

Director
Anne Reichman
anne.reichman@asu.edu
480-965-2168

Program Manager and Partner Liaison
Paul Prosser
paul.prosser@asu.edu
480-965-5040

Report Writing Assistant
Anna Harmon, Masters of
Sustainability Solutions Student

Student Assistants
Erin Rugland, B.A. Justice Studies and
B.S. Public Policy Student

Lexie Fields-Austin, Masters of Sustainability
Solutions Student

ASU Sustainable Cities Network
Arizona State University

Project Cities

Sustainability Through Local Action

projectcities.asu.edu

ABOUT APACHE JUNCTION

The City of Apache Junction is well-situated on the eastern edge of Greater Phoenix, the 12th-largest metropolis in the United States, yet it has a small-town, Western feel. This character is both intentional and influenced by geography. Apache Junction sits at the base of the Superstition Mountains and Goldfield Mountains and is near attractions such as the Lost Dutchman State Park, Goldfield Ghost Town, Superstition Mountain Museum, Canyon Lake, Tortilla Flat, and the historic Apache Trail. Home to 40,500 residents, the city has a population that nearly doubles in the winter, when seasonal residents arrive to enjoy its pleasant weather and unique setting.

It was named Apache Junction because it is located at the intersection of US Route 60 and the historic Apache Trail, which was used by Native Americans and later stagecoaches to traverse the Superstition Mountains and for the construction of water-reclamation dams along the Salt River. The city also straddles Maricopa County and Pinal County. Incorporated in 1978, Apache Junction has arrived at another crossroads as it matures. While the city wants to retain its small-town character, it must prepare for an increasing population, and it has set out to develop greater economic opportunities. In the spring of 2005, Apache Junction debuted the first LEED-certified city hall in Arizona. It is Apache Junction's aspirations and potential for sustainability, and the unique challenges it is facing, that form the basis of its partnership with ASU's Project Cities.

Apache Junction Team

Project Cities Project Director
Larry Kirch, Development Services Director

Project Cities Project Managers
Matt Busby, Assistant City Manager
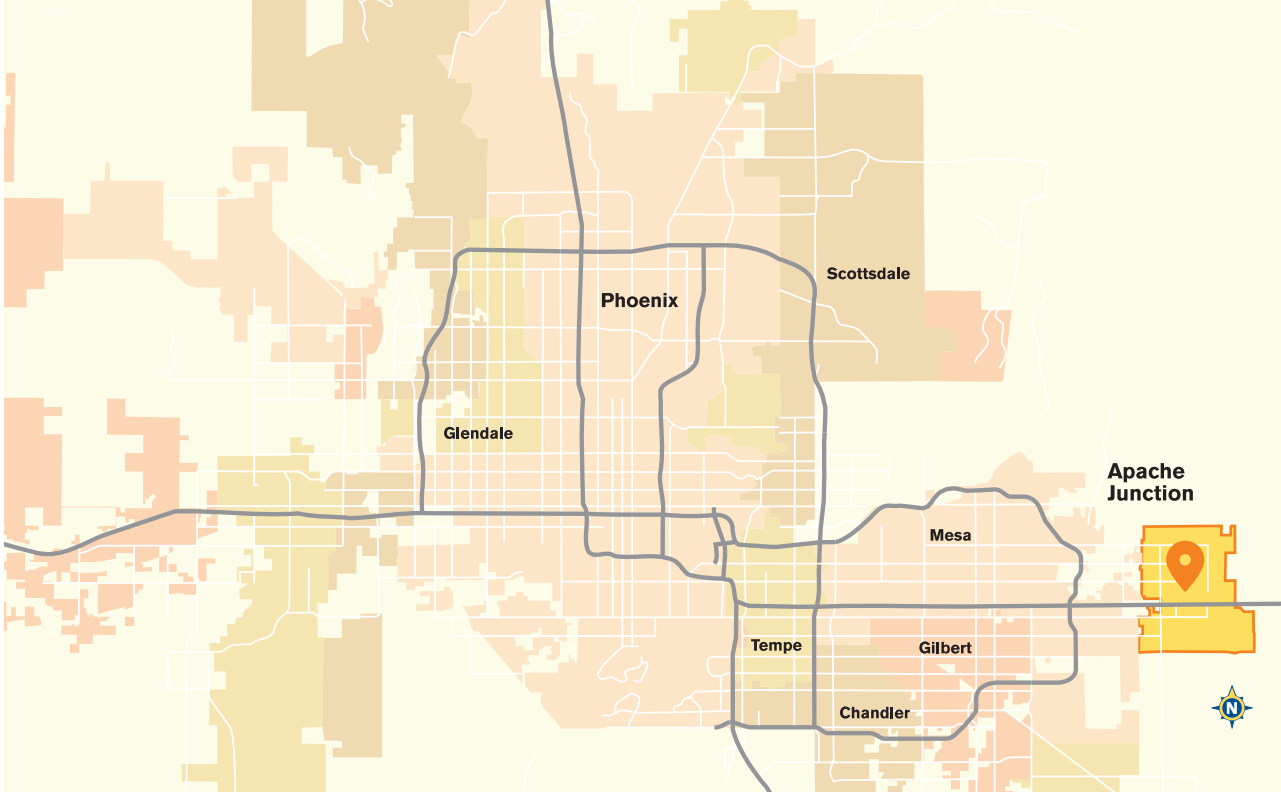Anna McCray, Assistant to the City Manager

Surrounded by Legends
ajcity.net

Map of the City of Apache Junction and Greater Phoenix, Arizona

Phoenix

Scottsdale

Glendale

Apache
Junction

Mesa

Tempe

Gilbert

Chandler

N

EXECUTIVE SUMMARY

According to the national nonprofit organization STAR Communities, a sustainable city has a healthy environment and a strong economy and cultivates well-being for its residents. STAR Communities, which stands for "Sustainability Tools for Assessing and Rating Communities," is a data-driven system created by local governments to enable them to assess their efforts, track progress, and create a roadmap toward a sustainable future. The seven goal areas of its framework for assessing cities are Built Environment; Climate and Energy; Economy and Jobs; Education, Arts, and Community; Equity and Empowerment; Health and Safety; and Natural Systems.

Apache Junction has already begun implementing sustainability efforts, such as hosting a farmers market, releasing ladybugs to control pests, and getting government buildings LEED-certified. Its 2010 General Plan acknowledges important aspects of sustainability such as energy efficiency. However, the city aspires to broadly integrate sustainability in an action-oriented way. Officials wants to know how the city is performing, what more it could do to be sustainable, and how to grow and evolve sustainably. Further, how can Apache Junction engage its community in these efforts? And finally, how can this be more thoroughly implemented in the 2020 General Plan Update?

To help Apache Junction answer these questions, the Spring 2018 Arizona State University course PUP 548: Planning for Sustainable Communities partnered with Project Cities to assess sustainability in Apache Junction using the STAR Communities framework. The students examined all seven goal areas, assessing the city's current performance and future needs while looking to peer cities to inform their recommendations. To do so, they reviewed city documents and used resources such as the U.S. Census Bureau's American Community Survey and the U.S. Department of Agriculture's Food Access Research Atlas. They also took part in seminars and meetings with the city, interviewed community members and city staff, and conducted onsite observation.

PUP 548: This graduate-level class was dedicated to assessing Apache Junction's sustainability performance and creating actionable recommendations for the city. To do so the students divided into pairs or individually tackled one of the seven Goal Areas, reviewing each objective of the goal areas and evaluating Apache Junction's performance. (While

there are eight Goal Areas, the eighth, "Innovation and Process," was added in 2016 and was not considered a main Goal Area for this report.) Based on these results, and in some cases through consulting case studies of peer cities, the students created recommendations for the city. For each goal area, they presented general recommendations for action and specific recommendations for the 2020 General Plan. Among the general and specific recommendations were: 1) Diversify water sources; 2) develop indicators that quantitatively measure the community's preparedness for environmental threats and create goals for these indicators; and 3) engage retirees in sharing their knowledge with and providing services for local businesses.

Student findings and recommendations, informed by research, an applied framework, and city-specific opportunities, are intended to help Apache Junction. However, any pursuit of the recommendations requires professional review and consideration. The course reports are meant to stimulate deeper conversations among managers, policy makers as well as staff, residents, and community groups.

Next in this report are the goal of the project and tables of the final student recommendations. Following these is a summary of the work done in the course, including the problem targeted, research methods used, research findings, resulting recommendations, and areas for further exploration. This report concludes with the students' report in its entirety, which should be consulted for greater depth and clarity about how recommendations were reached.

GOAL & RECOMMENDATIONS FOR PLANNING A SUSTAINABLE FUTURE

Goal

The goal of this report is to identify how Apache Junction might create a sustainable future using the STAR Community Rating System™ framework, which is based on social, economic, and environmental performance indicators.

Apache Junction has made strides toward sustainability but is not sure how to proceed. The City also desires to further integrate sustainability efforts into its upcoming 2020 General Plan Update.

7.7% Tree Coverage

10.7% Shrub Coverage

81.6% Other
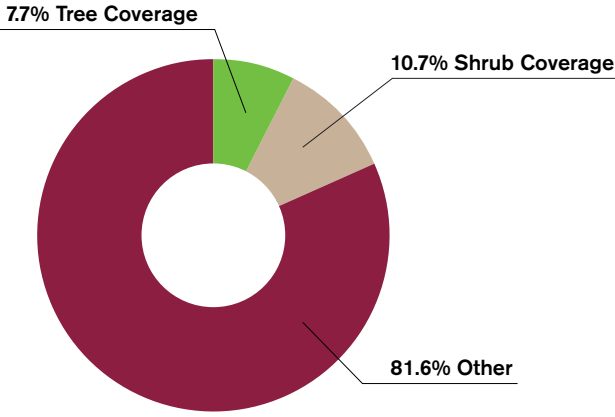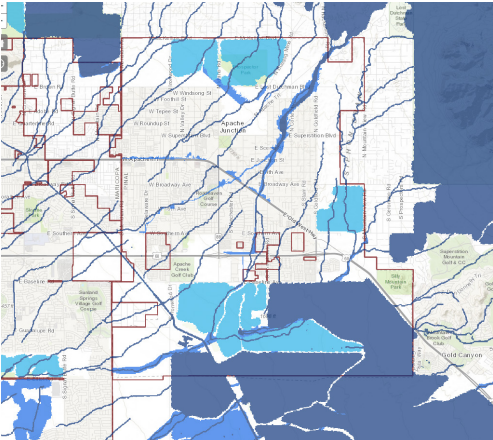
Clockwise from top left: CACZA hydrography of Apache Junction reveals water resources associated with 8,933.2 acres (p. 53); The amount of types of coverage in Apache Junction according to i-Tree (p. 55); Central Arizona College holds potential in the Economy & Jobs Goal Area (p. 39).

Recommendations for the Seven Goal Areas of the STAR Communities Rating System™

Built Environment: This Goal Area is focused on Apache Junction's design and development patterns and emphasizes "…livability, choice, and access for all where people live, work, and play," according to STAR.

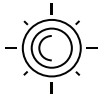| General Recommendations	Recommendations for the General Plan 2020 Update
Diversify water sources and manage all water sources and wastewater under a single system, rather than multiple systems.	Introduce a water resource strategy that will implement new sources of water, increase reclamation efforts for irrigation and other uses, and create a single system to manage water.
Consider adding trails that connect natural resources to the downtown area, creating a sense of place while increasing multimodal transportation options.	Create stricter guidelines and enforcement procedures for stormwater permitting and related activity on private lands.
Establish a cohesive inventory of infrastructure assets, which enables a city to be aware of its assets and their conditions.	Pursue a system to measure groundwater withdrawals on private land and quantify water supply being used in the city.
Set aside money to maintain city infrastructure and ensure that it is continually improved.	Develop a placemaking strategy that includes culture and arts, guides mixed-use development in downtown Apache Junction, and includes connectivity to natural resources and trails.
Begin planning how to connect to the Valley Metro Rail based on its extension plans.	Establish a cohesive asset management plan to inventory and assess city infrastructure.
For creative transportation planning on a tight budget, look to Curitiba, Brazil for inspiration.	Develop plans for connecting to Metro Phoenix public transit.
Prioritize connectivity to the Valley Metro Light Rail system and other Metro Phoenix systems. New possibilities are smart shuttle start-ups like Bridj and Chariot.	Develop a citywide vision to improve walkability based on walkability index maps available online. The most recognized is the EPA's National Walkability Index.
Enact a comprehensive transportation policy to support the development of a compact, complete, affordable transportation system.	Outline safety concerns, anticipated errors, and strategies for transitioning toward a multimodal transportation scheme.
	Create a scheme, guidelines, and goals to help build connections between different transportation modes.

Table 1. *Recommendations generated by the PUP 548 students who focused on the Built Environment Goal Area.*

Climate & Energy: This Goal Area aims to "reduce climate impacts and increase resource efficiency in order to create safer, healthier, and more resilient communities," according to STAR.

General Recommendations	Recommendations for the General Plan 2020 Update
Require greenhouse gas (GHG) emissions data be collected and considered in local decision-making and planning, including future growth. The U.S. Community Protocol for Accounting and Reporting Greenhouse Gas Emissions is a helpful tool.	Create a performance-measurement system that tracks overall GHG emissions. Provide neighborhood-level data.
Participate in a carbon climate registry to track and report climate targets and GHG emission reductions.	Report progress toward environmental adaptation goals on an annual basis.
Identify citywide vulnerability to future changes in environmental norms, assess risks from those projected changes, and develop adaptation strategies.	Consider GHG reduction and mitigation strategies.
Promote Salt River Project's shade-tree program that supports customers in planting trees in energy-saving locations surrounding their homes.	Develop indicators that measure the community's preparedness for environmental threats and create goals for these indicators, and then report findings and actions annually.
Develop a program for home landscape water audits to increase water efficiency through recommended technology.	Undertake building energy-use data collection to obtain accurate energy use information for commercial, residential, and other buildings. Ensure that data is transparent and accessible to residents.
	Develop a home landscape water audit program to increase water efficiency.
	Support community-driven environmental action and response efforts and create a related neighborhood network.

Table 2. Recommendations generated by the PUP 548 student who focused on the Climate & Energy Goal Area.

Economy & Jobs: The aim of this Goal Area is to "work together to promote equitably shared prosperity and access to quality jobs," according to STAR.

General Recommendations	Recommendations for the General Plan 2020 Update
Envision and invest in Central Arizona College (CAC) as an anchor institution to support residents and local businesses and built community identity.	Use the community college, retirees, and natural environment for economic development strategy.
Make CAC the hub for skill-building opportunities for local employees, workforce trainings, and youth and senior citizen activities, allowing for new types of networking and can result in a more cohesive community identity.	Create specific plans that lay foundations for targets and strategies and complement the 2020 General Plan Update. The specific strategies should have year of completion, target dates, and the roles of relevant stakeholders.
Encourage CAC to increase spending with local suppliers to spur local economic growth. The benefit to the college would be proximity, which facilitates shorter turnaround times for orders and reduced transportation costs.	Include strategies for how to create community engagement and partnerships, as community inclusion is vital for implementing and funding plans.
Provide mentorship, guidance, and strong support networks for local businesses by encouraging CAC to offer consulting service and networking opportunities.	
Engage retirees in sharing their knowledge with and providing services for local businesses.	
Make downtown Apache Junction the epicenter of tourist activities by connecting it to the natural landscape and open space that surrounds it. To do so, partner with local businesses, nonprofits, or community-development organizations to connect the downtown to trails and recreation activities.	

Table 3. *Recommendations generated by the PUP 548 students who focused on the Economy & Jobs Goal Area.*

Education, Arts, & Community: The intention of this Goal Area is to "promote an educated, cohesive, and socially connected community," according to STAR.

General Recommendations	Recommendations for the General Plan 2020 Update
Encourage the Apache Junction Unified School District to prepare annual progress reports for the public on its performance, which are useful for parents and schools.	Establish education funding to support students from low-income households in graduating from high school.
Support offering multiple pathways to graduation for students to improve educational outcomes.	Set a goal of improving the high school graduation rate.
Provide funding or other resources to local Head Start programs.	Establish an art education program to provide residents, especially youth, with marketable skills.
Work with public school districts to offer special arts education programs that align with a core curriculum, especially early elementary grades.	Interact with local artists and nonprofits to enhance and promote the Old West characteristic of Apache Junction through arts programming.
Collaborate with private, nonprofit, or regional organizations to increase access and participation in the arts.	Include a community cohesion plan to enhance public participation.
Adopt a strategic plan intended to enhance the community's arts and cultural resources and strengthen creative industries.	
Hire local artists to create public artwork, sculptures, or performances.	
Adopt neighborhood plans that guide future development, recommend strategies to create or preserve community venues, and address neighborhood-specific issues.	
Make information about community issues, programs, services, and activities accessible to non-English speaking residents.	
Provide programs that support the development of youth leaders, particularly in low-income and minority neighborhoods.	

Table 4. Recommendations generated by the PUP 548 student who focused on the Education, Arts, and Community Goal Area.

Equity & Empowerment: While other STAR goal areas and objectives address equity and empowerment, this is exclusively focused on promoting "equity, inclusion, and access to opportunity and community resources for all community members," according to STAR.

General Recommendations*
Educate residents about neighborhood hazards that they may be exposed to and what is causing them, such as waste storage. One way to do so could be the distribution of fliers.
Determine the neighborhoods that lack resources and reliable transportation, and then increase community resources and assets there.
To increase participation in City Council meetings, target disadvantaged communities and see what they need to be a part of decision-making. Such necessities may include holding the meetings outside of normal business hours or offering onsite daycare.
Encourage City officials to visit homes and talk with residents, which will demonstrate that the officials care about their opinions and may increase public participation.

Table 5. Recommendations generated by the PUP 548 student who focused on the Equity & Empowerment Goal Area.

*This group did not make implementation recommendations for the 2020 General Plan Update.

Health & Safety: This Goal Area encourages "proactive efforts to prevent disease, injury, and premature death by fortifying protective factors and reducing risk factors that undermine healthy outcomes," according to STAR.

General Recommendations	Recommendations for the General Plan 2020 Update
Consider employing pop-up food markets to increase access to healthful foods at a discounted price. This type of market also fosters a cohesive community and promote healthy eating and lifestyles.	Increase residential density around Apache Trail, which will help bring more residents closer to health facilities and grocery stores.
Add the performance of ongoing data collection, evaluation, and monitoring to track trends and identify emerging community needs to the Apache Junction Police Department Strategic Plan.	Support the establishment of neighborhood nodes in the more rural residential parts of the city to allow for sustainable development and decrease reliance on stores and facilities along Apache Trail. Aim for these nodes to have grocery stores that offer healthful food to reduce food deserts.
	Increase education and outreach for health and safety training to help the City determine what its related goals should be for its 2020 plan update and how it can plan to achieve them.
	Incorporate law-enforcement policies, as Apache Junction's General Plan has no policies or strategic goals addressing law enforcement.

Table 6. Recommendations generated by the PUP 548 students who focused on the Health & Safety Goal Area.

Natural Systems: This Goal Area is "intended help communities protect and restore the places that provide resources to support life," according to STAR.

General Recommendations	Recommendations for the General Plan 2020 Update
Solidify long-term preservation of wildlife corridors with state and federal landowners.	Prioritize open space and the environment.
Partner with Central Arizona Conservation Alliance (CAZCA) to integrate natural system information into the Apache Junction Geographic Information System (GIS).	Add green street infrastructure implementation intended to capture and naturally disperse rainwater.
Partner with BLM and the state government to transform BLM and State Trust Land around Apache Junction into a preserve.	Outline societal, economic, and environmental benefits of urban compactness.
Partner with schools to further public education about natural resources.	Encourage downtown development by enhancing financial benefits.
Use the trail connectivity plan presented by ASU students to Apache Junction in May 2016 to increase recreational usage of natural lands and maintain natural resources.	Adopt a tree ordinance like that of Scottsdale, which follows Tree City USA guidelines.
Participate in regional collaboration such as a county-wide committee that works on local standards and specifications for minimizing stormwater pollution.	
Collaborate with CAZCA to inventory, assess, and survey Apache Junction's natural resources, and then adjust development policy and building codes to maintain natural resources.	
Create promotion cards to showcase and solicit homebuilders or commercial developers to participate in Apache Junction's green building programs	
Introduce a tiered pricing system that increases development costs outward from the city center.	

Table 7, Part 1. *Recommendations generated by the PUP 548 students who focused on the Natural Systems Goal Area.*

Natural Systems, continued

General Recommendations	Recommendations for the General Plan 2020 Update
Create incentive programs to encourage landowners to adopt green infrastructure that links to broader green infrastructure systems.	
Upgrade public spaces and buildings based upon locally adopted or recognized best practices in green infrastructure and continue to create demonstration projects to enhance public support. (As pointed out by a City staffer, Apache Junction's City Hall is a premier example of this.)	
For development, use a Green Infrastructure Spatial Planning model that employs the six criteria of stormwater management, social vulnerability, greenspace, air quality, urban heat island amelioration, and landscape connectivity.	
Dedicate a percentage of funding to green infrastructure.	
Adopt STAR suggested actions for the preservation and development of lands, including educating the community about the importance of natural resources beyond scenery or economic impacts.	
Use nature-based design solutions to ensure ecosystem functions are protected, restore the functionality of degraded systems, help mitigate and adapt to climate change, and improve risk management. Benefits include carbon storage and pollution reduction.	

Table 7, Part 2. Recommendations generated by the PUP 548 students who focused on the Natural Systems Goal Area.

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FACULTY SARA MEEROW
SCHOOL OF GEOGRAPHICAL
SCIENCES & URBAN PLANNING

Identifying Paths to Sustainability Using the STAR Community Rating System™ Framework

PLANNING & SUSTAINABILITY

ACKNOWLEDGEMENTS

INTRODUCTION

Apache Junction is a city rich in natural resources and assets. As it grows, the City continues to make efforts to provide its residents with a high quality of life and involve them in the decision-making process. The update of the City's General Plan for the coming decade is a prime opportunity to identify how the city could be more sustainable and establish related goals and plans for achieving them. To support Apache Junction's efforts, the students of PUP 548 "Planning for Sustainable Communities" set out to assess the city's sustainability performance using the STAR Community Rating System™ (STAR) framework. A nationally recognized assessment tool, the STAR framework was developed by and for local governments to measure community sustainability based on social, economic and environmental indicators.

The project goal was to identify additional paths to a sustainable future. To assess Apache Junction's current conditions and sustainability practices, students in PUP 548 worked independently or in pairs to research one of the seven major STAR Goal Areas: Built Environment; Climate and Energy; Economy and Jobs; Education, Arts, and Community; Equity and Empowerment; Health and Safety; and Natural Systems. Each team gathered information on the city's performance in the STAR Goal Areas by inventorying and analyzing relevant data on the city, engaging with the community, and observing the city. Then they compared their findings with the STAR Leading Indicators and literature detailing best practices from other cities to assess the city's strengths and weaknesses and generate recommendations for Apache Junction's 2020 General Plan Update.

Students generated general recommendations for Apache Junction and specific ones for the city's 2020 General Plan Update for each of the seven STAR Goal Areas. A few of the recommendations included the following: establish an asset management plan to inventory and assess the condition of the city's infrastructure; invest in Central Arizona College as an anchor institution that can strengthen the local economy; and develop neighborhood nodes in the more rural, residential parts of the city to offer healthful food options to reduce food deserts. It is up to Apache Junction to identify the recommendations that have the most promise and determine how to incorporate them into its 2020 General Plan Update.

The remainder of this report explains the research methods the students used and then presents their findings. These include Apache Junction's strengths and weaknesses in each Goal Area. They also include recommendations for each Goal Area in two categories: 1) general; and 2) specific to the City's plan update.

PROBLEM

Apache Junction has plans to increase public facilities and ensure greater public health when it comes to air, water, and waste pollution. However, the City has a number of areas upon which it could improve, and it could also be more concrete in how it intends to execute its plans. As Apache Junction develops its 2020 General Plan Update, the city would like to identify how it can become more sustainable. Therefore, students set out to conduct a sustainability assessment of the City and develop recommendations for its 2020 General Plan Update.

RESEARCH METHODS

Students or pairs of students researched one of the seven major STAR Goal Areas (Figure 1). Each Goal Area has between five and seven objectives. Students used these objectives to assess Apache Junction's performance, focusing particularly on the STAR Leading Indicators. First, they gathered information through inventorying and analyzing public records, academic and government reports, community engagement, and observation. The report sections concluded with recommendations for the City, some of which were based upon researched case studies.

Data Gathering and Analysis: This research method involved collecting data from a range of validated sources and analyzing it to extract helpful information. For the report, student groups collected data about Apache Junction that related to their STAR goal area indicators. Broadly, data were gathered from online resources, scholarly databases, and from the City, including its 2010 General Plan Update and the Apache Junction Trail Connectivity, Downtown Visioning, and State Land Visioning report. Students also reviewed data specific to their Goal Area from range of sources like the U.S. Census Bureau. For example, for Natural Systems, the students examined data from the Apache Junction Geographic Information Science (GIS) site, Central Arizona

THE EIGHT GOAL AREAS OF THE STAR COMMUNITIES FRAMEWORK AND THEIR OBJECTIVES

Built Environment	Climate & Energy	Economy & Jobs	Education, Arts & Community	Equity & Empowerment	Health & Safety	Natural Systems	Innovation & Process
Ambient Noise & Light	Climate Adaptation	Business Retention & Development	Arts & Culture	Civic Engagement	Active Living	Green Infrastructure	Best Practices & Processes
Community Water Systems	Greenhouse Gas Mitigation	Green Market Development	Community Cohesion	Civil & Human Rights	Community Health	Biodiversity & Invasive Species	Exemplary Performance
Compact & Complete Communities	Greening the Energy Supply	Local Economy	Educational Opportunity & Attainment	Environmental Justice	Emergency Management & Response	Natural Resource Protection	Local Innovation
Housing Affordability	Energy Efficiency	Quality Jobs & Living Wages	Historic Preservation	Equitable Services & Access	Food Access & Nutrition	Outdoor Air Quality	Good Governance
Infil & Redevelopment	Water Efficiency	Targeted Industry Development	Social & Cultural Diversity	Human Services	Health Systems	Water in the Environment	
Public Parkland	Local Government GHG & Resource Footprint	Workforce Readiness	Aging in the Community	Poverty Prevention & Alleviation	Hazard Mitigation	Working Lands	
Transportation Choices	Waste Minimization				Safe Communities		

Figure 1. This shows the seven main Goal Areas of the STAR Framework, plus an eighth that was recently added, "Innovation and Process," which the students did not address.

Conservation Alliance (CAZCA) maps, an analysis from the i-Tree website (itreetools.org), and the U.S. Fish and Wildlife Service National Wetlands Inventory. Insight was also gathered from case studies of similar assets in other cities.

Seminars, Interviews, and Meetings: This research method involves generating data and information from personal interactions. Because not all context or details needed for the analysis or resulting recommendations could be collected from documents or website materials, these interactions with city staff or community members allowed students to understand the background, particulars, and specific needs of Apache Junction's planning process.

On-Site Observation: This method involve visiting a location to gain context and personally experience the space, which provides data and informs suggestions. In this project, students took an on-site tour of the City with Apache Junction staff and program instructors. This tour helped the students gain further insight into the City and create more integrated suggestions.

STAR Communities Rating System™ Sustainability Assessment Framework: This method applies the system created by STAR Communities, a nationally recognized organization, which is used by counties and cities around the nation to compare data and observations with designated objectives and purposes. If fully applied, the Framework includes assigning points for each goal area. However, only a couple student groups did so. (See Tables 8 and 9 for how students applied points for the Built Environment Goal Area.) Instead, students focused on reviewing the Leading Indicators of STAR Communities, which are spread out across the seven main Goal Areas, to identify the city's strengths and weaknesses. There are 21 Leading Indicators based on measures from the STAR Community Rating System that were developed in partnership with the Urban Sustainability Directors Network (see Figure 2).

THE 21 LEADING INDICATORS OF THE STAR COMMUNITIES RATING SYSTEM™

Built Environment
- Drinking Water Quality
- Safe Wastewater Management
- Housing and Transportation Costs
- Transportation Mode Split
- Transportation Safety

Climate & Energy
- Climate Adaptation, Vulnerability Assessment
- Greenhouse Gas Emissions
- Renewable Electrical Energy Supply
- Total Solid Waste

Education, Arts, & Community
- Third Grade Reading Proficiency
- High School Graduation Rate and Graduation Rate Equity

Equity & Empowerment
- Environmental Justice, Risk, and Exposure
- Equitable Access and Proximity to Foundational Community Assets

Economy & Jobs
- Businesses
- Employment
- Median Household Income
- Living Wages

Health & Safety
- Food Security and Assistance
- Access to Healthful Food
- Violent Crime Rate

Natural Health Systems
- Designated Green Infrastructure

Figure 2. The 21 leading indicators of STAR Communities.

Objective & Purpose	Total Points
BE-1 Ambient Noise & Light: Minimize/manage ambient noise & light levels to protect public health and the integrity of ecological systems	N/A
BE-2 Community Water Systems: Provide a clean and secure water supply for all local users through management of potable water, wastewater, stormwater, and other piped infrastructure	**7.5/15**
BE-3 Compact & Complete Communities: Concentrate development in compact, human-scaled, walkable centers and neighborhoods that connect to public transit, offer diverse uses and services, and provide housing options for families of all income levels	**10.9/20**
BE-4 Housing Affordability: Construct, preserve, and maintain adequate and diverse supply of location-efficient and affordable housing options	**3.5/7**
BE-5 Infill & Redevelopment: Focus growth and redevelopment in infill areas to reduce sprawl and ensure existing infrastructure that supports the community is in satisfactory working condition	**0/10, although have infill plans)**
BE-6 Public Parkland: Create a system of well-used and enjoyable public parkland that feature equitable, convenient access for residents throughout the community	N/A
BE-7 Transportation Choices: Promote diverse transportation modes, including walking, biking, and public transit, that are safe, low-cost, and reduce vehicle miles traveled	4.9/15
Totals	**26.8/67**

Table 8. This table features the quantitative results of the Built Environment assessment. (See page 4 of the student report online for more detail.) Each STAR Goal Area has several objectives that consist of several outcomes with point values that equal the objectives total. Students researched each applicable objective for their Goal Areas and assigned Apache Junction a point value that matched how well the city was meeting it. For example, Apache Junction received 3.75 points toward its score for the second Built Environment objective, "BE-2," because the students gave it the total 3.75 points available for the objective's first evaluation measure, "Drinking Water Quality" (see Table 9). This is because the city met the measure of: "Demonstrat[ing] that the community is not in violation of EPA's drinking water rules for chemical and microbial contaminants in water pipes and turbidity." Overall, the main improvement areas for Apache Junction are diversifying water supplies, creating placemaking guidelines, and making different modes of transportation available and accessible. (Any indicator with N/A was not examined by the students as they are not Leading Indicators of the Goal Area. This choice does not reflect on Apache Junction. However it is worth noting that Apache Junction has a Dark Sky ordinance and 796.5 acres of green space.)

Evaluation Measure	Description	Points
1: Drinking Water Quality	Demonstrate that the community is not in violation of the Environmental Protection Agency's (EPA) drinking water rules for chemical and microbial contaminants in water pipes and turbidity	**3.75/3.75**
2: Water Footprint	Option A: Demonstrate that the ratio of water withdrawals for human use to the total renewable water resources is less than 0.2 Option B: Demonstrate that the ratio of water withdrawals for human use to the total renewable, stored, and allocated water resources is less than 0.2 [Partial credit applies]	**0/3.75***
3: Safe Wastewater Management	Demonstrate that all EPA National Pollutant Discharge Elimination System (NPDES) permit holders, including publicly owned treatment works, are in compliance with Clean Water Act effluent and reporting guidelines	**3.75/3.75**
4: Safe Stormwater Management	Comply with all NPDES permit requirements for municipal separate storm sewer systems, construction activities, and regulated industrial activities	**0/3.75 (based on qualitative assessment)**

Table 9. *The specific evaluation measures and points assigned for the Built Environment STAR Goal Area's second objective, "Community Water Systems."*

*There are two water providers in Apache Junction, the public Apache Junction Water Community Facilities District and the private water utility, Arizona Water Company. Information from the former might change this result, since according to a City staffer, this utility gets high marks for innovation, conservation, and recharge.

FINDINGS & RECOMMENDATIONS

In their research, students delved into Apache Junction's performance in their STAR Goal Areas — Built Environment; Climate and Energy; Economy and Jobs; Education, Arts and Community; Equity and Empowerment; Health and Safety; and Natural Systems. Results from this process are primarily specific to the Goal Area. However, there were common encounters across several Goal Areas. One was a **need for complete data sources that a diverse group of residents and other stakeholders can access**, beyond what is currently available. Another shared finding was that **Apache Junction needs to create specific goals and guidelines to improve the likelihood that the General Plan objectives will be implemented**. There were also strengths and strategic areas for improvement that stood out among these findings. (See Figure 10.)

SUSTAINABILITY STRENGTHS OF APACHE JUNCTION

- Importance of community involvement and transparency in drafting the General Plan
- Adequate stormwater research and compliance
- Relatively safe transportation
- Natural resource assets such as the Superstition Mountains

AREAS OF OPPORTUNITY FOR APACHE JUNCTION

- Economic development plans that leverage natural assets
- Local community college
- Retirement community

AREAS FOR IMPROVEMENT FOR APACHE JUNCTION

- More transportation modes for residents
- Walkable communities with access to healthful foods and key community services
- More explicit social equity and empowerment initiatives
- The adoption of a climate change adaptation plan

Figure 3. Through assessing Apache Junction's performance in seven STAR Goal Areas and then reviewing case studies, opportunities, strengths, and strategic areas for improvement were revealed. Those in this figure were highlighted by students from the more extensive findings to follow.

Following the findings for each STAR Goal Area in this report are recommendations determined by those who worked on that area.

Recommendations included:

1. **improving public information sources to make them more complete and readily accessible to diverse stakeholders and**
2. **setting more specific, time-bound goals in the 2020 General Plan.**

For the specific Goal Areas, the following recommendations come in two forms: general recommendations and specific recommendations for the city's 2020 General Plan. A number of these recommendations are based on case studies or leading examples in communities similar to Apache Junction.

The Built Environment

This STAR Goal Area applies to Apache Junction's design and development patterns, and emphasizes "…livability, choice, and access for all where people live, work, and play."

Five Leading Indicators of the Built Environment Goal Area:
Drinking Water Quality
Safe Wastewater Management
Housing & Transportation Costs
Transportation Mode Split
Transportation Safety

The student group that studied the STAR Communities Built Environment Goal Area found that the main areas for improvement are: diversifying water supplies, creating placemaking guidelines, connecting with Metro Phoenix's public transit system, and providing local public transportation access. **Apache Junction is doing well on drinking-water quality and safe wastewater management, but it has room to improve its water footprint (the amount of water it uses) and safe stormwater management**. (See Table 9 for scoring). Although the City has demonstrated concern over its unique stormwater challenges—being home to a major wash and flood zones—its stormwater practices do not match the depth of concern. For example, on an observational tour, students noted a wash through a privately owned residential lot was regraded across a public roadway (see page 8 of the full student report online). This example illustrates why the students did not award Apache Junction points for safe stormwater management.

Housing + Transportation Costs % Income

| | < 24% | | 24-36% | | 36-45% | | 45-54% | | 54-66% | | 66-78% | | 78-87% | | 87%+ |

Figure 4. *Housing plus transportation costs for Apache Junction residents as a percent of area median income (page 10 of student report).*

The Infill and Redevelopment, or BE-5, indicator is focused on building on underdeveloped land in already developed areas and is intended to reduce sprawl while ensuring that infrastructure satisfactorily supports the community. In contrast to this objective, Apache Junction has larger average lot sizes that resulted from the original standards for residential development when the City was incorporated. It is also lacking medium- to high-density housing. However the City has shown interest in increasing density and decreasing sprawl through the use of tools like

a special zoning district for the downtown area and EPA grant funds for identifying infill development opportunities. It has had projects in its related redevelopment areas along Apache Trail. However, **Apache Junction has no specific record of whether its development has occurred in its designated infill zone or similar land** (like gray-field sites, which are underused, or failing real estate). Further, because the students were unable to acquire and analyze data such as an assets management report, they could not assess the City's infrastructure.* According to STAR, if a city has no record or inventory of its infrastructure, it does not meet the indicator's requirements, even if efforts are being made, and therefore does not receive any points (page 13 of student report).

Another aspect of the Built Environment is transportation. **The STAR threshold for the percentage of the typical household income dedicated to transportation is 15%. According to the students, in Apache Junction, it is 24%.** Residents near area median income and below also spend a relatively large amount on housing according to students; together, this spending could make it difficult for younger or working-class households to improve their livelihoods. (See Figure 4.) Vehicle miles traveled per person per day were also slightly higher than the metropolitan average. Further, nearly 80% of Apache Junction's residents drive to work and have a longer commute than the national and metro Phoenix averages. Although these findings lowered Apache Junction's score in the transportation category, it did get full points for safety, since there were no traffic fatalities there from 2015 to 2016.

According to City staff, Apache Junction has some, if not all, of this information, it is just not readily available or accessible in one report. The City likely has records of its road network because the Public Works department has a pavement rating system. The City also has a GIS layer of its sidewalk system and uses I-Works for repairing infrastructure like signs and lights. The Parks and Recreation department also has an inventory of its park assets. But all this information is not in one place. The City is currently looking at asset-management software to keep track of its infrastructure and maintenance.

The typical amount of household income dedicated to transportation in Apache Junction is 24%.

Strengths & Weaknesses

Strengths	Weaknesses
Apache Junction has taken steps to ensure a safe, clean, and sustainable supply of water	Apache Junction lacks data in key areas regarding water and needs to seek more sustainable water supplies
The City's flood-control structures are deployed well	Little data could be found on water quality and usage of private wells
The City worked with the EPA to identify infill development opportunities	Little data exists about private septic systems
Special zoning districts and target areas for development to increase infill downtown are in place	Stormwater management procedures are inadequate for preventing problems
Opportunities for creating livable spaces and a vibrant town center are ample	Access to neighboring cities is limited due to lack of public transit and the city's general car-dependence hurts the affordability of the city for residents near and below area median income
There are many features that can be leveraged to provide connection between natural areas, commercial centers, and residential communities	Housing plus transportation costs are high for residents near and below area median income
	Inventory of public infrastructure and its condition is inconsistent and difficult to access
	Lack of infill development
	The form of the city and current land-use practices encourage outward sprawl rather than internal infill
	Having two main water utilities with different owners (which could make it difficult to determine water quality and condition of water infrastructure)

See page 14 of student report for more detail.

Recommendations

According to the student team, the main opportunities for improvement in Apache Junction are diversifying its water supplies, creating placemaking guidelines, and focusing on local access and connectivity to Metro Phoenix public transit systems. (See page 16 of student report for further context of recommendations.)

General Recommendations

1. Diversify water sources and manage all water sources and wastewater under a single system, rather than multiple systems. As an example, see the Town of Buckeye's 2007 General Plan, which recognized its reliance on groundwater, focused on groundwater recharge, diversified water supplies to make water use more sustainable, and aimed to connect diverse sources into a single water system.

2. Consider adding trails that connect natural resources to the downtown area, creating a sense of place while increasing multimodal transportation options. Flagstaff is a peer city with examples to follow.

3. Establish a cohesive inventory of infrastructure assets, which enables a city to be aware of its assets and their conditions.

4. Set aside money to maintain city infrastructure and ensure that it is continually improved. For an example, review the capital improvement plan of the City of Phoenix.

5. Begin planning how to connect to the Valley Metro Rail based on its extension plans.

6. For creative transportation planning on a tight budget, look to Curitiba, Brazil for inspiration. Its guiding principles emphasize an organic, flexible, user-oriented approach that recycles capital and assets.

7. Prioritize connectivity to the Valley Metro Light Rail system and other Metro Phoenix systems. New possibilities are smart shuttle start-ups like Bridj and Chariot, which are looking for City partnerships. These shuttles may provide the flexibility and adaptability needed when major projects are too great of an investment.

8. Enact a comprehensive transportation policy to support the development of a compact, complete, and affordable transportation system. Providing public transportation modes

could decrease the amount of household income dedicated to private transportation (which result from repairs and insurance as well as gas). It could also enable economic growth around the downtown area by encouraging residents from nearby towns to visit, a cycle that would support local jobs.

Specific Recommendations for Apache Junction's 2020 General Plan Update

- Introduce a water resource strategy that will implement new sources of water, increase reclamation efforts for irrigation and other uses, and create a single system to manage water within the city.
- Create stricter guidelines and enforcement procedures for stormwater permitting and related activity on private lands.
- Pursue a system to measure groundwater withdrawals on private land and quantify water supply being used in the city.
- Develop a placemaking strategy that incorporates culture and arts, guides mixed use development in downtown Apache Junction, and includes connectivity to natural resources and trails.
- Establish a cohesive asset management plan to inventory and assess the condition of infrastructure in the city.
- Develop plans for connecting to Metro Phoenix public transit.
- Develop a citywide vision to improve walkability based on walkability index maps available online. The most recognized is the EPA's National Walkability Index.
- Create a scheme, guidelines, and goals to help build connections between different transportation modes (walking, bicycling, driving, and riding public transit).
- Outline safety concerns, anticipated errors, and strategies for transitioning toward a multimodal transportation scheme.

Climate & Energy

This STAR Goal Area aims to "reduce climate impacts and increase resource efficiency in order to create safer, healthier, and more resilient communities."

The student focused on this STAR Goal Area found that Apache Junction's 2010 General Plan Update contained a sustainable building policy and introduced a program to promote green-building principles and practices. In its zoning code, the City also adopted a green-building rating system for building standards that is mandatory for City buildings over 5,000 square feet and optional for all other City buildings. For commercial buildings, the City promotes the International Code Council's 2015 International Energy Conservation Code. In addition, the City provides energy efficiency credits and rebate programs to help homeowners improve the environmental impacts of their homes. Other local organizations also offer weatherization improvements for income-eligible homeowners. Qualifying residents may also be able to receive services through Apache Junction's Housing Rehabilitation Program to improve their home's energy efficiency. Finally, the City's electric utility, Salt River Project (SRP), also offers a variety of rebates (e.g., shade-screen rebates) and energy-efficiency information to its customers.

Five Leading Indicators of the Climate & Energy Goal Area:
Climate Adaption
Vulnerability Assessment
Greenhouse Gas Emissions
Renewable Electrical Energy Supply
Total Solid Waste

Renewable energy generates from 4% to 7% of SRP's retail energy. Compared to utilities regulated by the Arizona Corporation Commission renewable energy standard and tariff, SRP's unregulated renewables performance is on par. However, **the nonrenewable segments of SRP's energy sources are the source of a significant amount of Apache Junction's carbon-dioxide emissions, a primary contributor to climate change.** The student that focused on this Goal Area estimated that the City generated about 23,500 metric tons of greenhouse gas (GHG) emissions through residential fuel use (electricity, natural gas, liquefied petroleum gas, fuel oil such as kerosene, and biomass) in one year, between 2015 and 2016. (This is a rough estimate based on external information as Apache Junction does not track carbon dioxide emissions.) **Economic damages from climate change are projected to severely impact the state**, including losses (calculated as a fraction of income) estimated at 8% annually in Maricopa County between 2080 and 2099.

Strengths & Weaknesses

Strengths	Weaknesses
Apache Junction's 2010 General Plan Update suggested incentives for and education about green building	Lack of citywide climate change vulnerability assessment
2010 General Plan Update proposed developing and implementing an energy conservation policy plan	Lack of integrated climate-change adaptation action plan
The proposed water conservation plans of the 2010 General Plan Update such as water harvesting and xeriscape in new developments and redevelopments	Lack of data collected by City in areas related to energy data and greenhouse gas emissions
The proposal to conserve water in the 2010 General Plan Update by using renewable water supplies, landscape techniques, and groundwater recharge	Lack of information about how prepared public facilities are for climate change
	The City has not upgraded its infrastructure systems to increase water efficiency
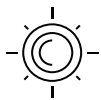
Recommendations

Because Apache Junction does not have a climate-change adaptation plan and has not monitored climate-change impacts, the following recommendations focus on this topic. Projected increases in future average temperatures, combined with the heat-intensifying aspects of hard surfaces like concrete in cities (i.e., the urban heat-island effect) are expected to negatively impact public health. In addition, these changes may affect electricity and water supplies and are expected to extend droughts, leading to more wildfires and other extreme weather events. (See page 24 of student report for further context of recommendations.)

General Recommendations

1. Require GHG emissions data be collected and considered in local decision-making and planning, including future growth. The US Community Protocol for Accounting and Reporting Greenhouse Gas Emissions is a helpful tool.
2. Participate in a carbon climate registry to track and report climate targets and GHG emission reductions (as Apache Junction's peer cities of Flagstaff and Tucson do).
3. Identify citywide vulnerability to future changes in environmental norms, assess risks from those projected changes, and develop adaptation strategies. For example, Chicago used an "analog city analysis" to identify its most vulnerable residents and target heat-vulnerability outreach, green infrastructure, and heat-island mitigation.
4. Promote SRP's shade-tree program that supports customers in planting trees in energy-saving locations around their homes.
5. Develop a program for home landscape water audits to increase water efficiency through recommended technology. (For an example, see Tempe's program.)

Specific Recommendations for Apache Junction's 2020 General Plan Update

- Create a performance-measurement system that tracks overall GHG emissions. Provide neighborhood-level data.
- Report progress toward environmental adaptation goals on an annual basis.
- Consider GHG reduction and mitigation strategies.
- Develop indicators that measure the community's preparedness for environmental threats, create goals for these indicators, and report findings and actions annually.
- Undertake building energy-use data collection to obtain accurate energy use information for commercial, residential, and other buildings. Ensure that data is transparent and accessible to residents.
- Develop a home landscape water audit program to increase water efficiency.
- Support community-driven environmental action and response efforts and create a related neighborhood network.

Economy and Jobs

The aim of this STAR Goal Area is to "work together to promote equitably shared prosperity and access to quality jobs."

The four Leading STAR Indicators for this Goal Area are businesses, employment, median household income, and living wages. In 2015, according to the US Census Bureau, Apache Junction had 851 businesses and 9,370 employees. Statistics indicate **21% of the city's employment was concentrated in educational services, health care, and social assistance, followed by retail trade at 16%**. The numbers parallel those in Maricopa and Pinal counties, the counties in which Apache Junction is located. **However, 10.9% of Apache Junction's 14,050 people in the labor force are unemployed**, higher than Pinal (9.4%) and Maricopa (6.8%) counties (see Table 10). Further, certain age cohorts are facing higher unemployment rates than those in the counties. With high unemployment rates come financial and social costs that stress individuals and the larger community (page 46 of student report).

The Four Leading Indicators of the Economy & Jobs Goal Area:
Businesses
Employment
Median Household Income
Living Wages

APACHE JUNCTION EMPLOYMENT AND UNEMPLOYMENT RATES IN 2016

Employment Status	Apache Junction	Maricopa County	Pinal County
Population 16 and Over	31,798	3,178,431	311,567
In Labor Force	14,050	2,012,129	155,847
Total Unemployment Rate	10.9%	6.8%	9.4%
Unemployment Rate by Age Cohort			
20 - 24	18.2%	10.4%	17.6%
30 - 34	13.2%	6.3%	11.0%
35 - 44	10.1%	4.9%	7.1%
45 - 54	15.1%	5.0%	7.4%

Table 10. Employment and unemployment rates in Apache Junction in 2016, sourced from the U.S. Census Bureau (page 42 of student report).

Of Apache Junction's 16,625 households, the median household income is $38,053, which represents 68% of Maricopa County's median household income and 74% of Pinal County's. **Households with the lowest median household incomes are concentrated in the center of the city, while high-income households are found on the outskirts**. Although the city has a comparatively low-median household income, **in 2016, 82.9% of Apache Junction households earn more than the average annual living wage** according to the Massachusetts Institute of Technology (MIT) Living Wages calculator. (According to the STAR Indicator, the living wage is the minimum income necessary to meet housing needs, food, clothing, and utilities.)

Strengths & Weaknesses

Strengths	Weaknesses
Employment by industry	Higher unemployment rate compared to the two counties of which it is part
Apache Junction's General Plan emphasizes quality employment and job market diversification	The effects of the high unemployment rate such as reducing goods and services spending and decreasing volunteerism (page 46, student report)
The City's diverse and impactful economic goals	Low median household income in comparison to its two counties
A high percentage of the households earn a living wage	A concentration of low-income households in city-center neighborhoods causes instability for downtown business owners and diminishes development incentive
	The 2010 General Plan Update lacks specific target dates or actions associated with strategies and objectives such as identifying potential resort and tourist locations along north Highway 88

$ Recommendations

The students' recommendations suggest using Apache Junction's current assets to spark economic development and support community inclusivity. These assets include Central Arizona College (CAC) (see Figure 5), retirees living in Apache Junction, and the natural landscape. According to the student team, each recommendation proposed will need community partnerships, a strategy with a timeline and target of completion, and guiding policies to ensure successful implementation. (See page 46 of student report for further context of recommendations.)

Figure 5. *Central Arizona College. (Photo via the college's website.)*

General Recommendations

1. Envision and invest in CAC as an anchor institution to support residents and local businesses and built community identity (p 47). (See Figure 6 for how the peer city of Brevard, North Carolina embraced its anchor institutions to support the local economy in its General Plan.)

2. Make CAC the hub for skill-building opportunities for local employees, workforce trainings, and youth and senior citizen activities, allowing for new types of networking and can result in a more cohesive community identity. One example is the summer sports camps for local youth at Bevill State College in Alabama,

which strengthens community and exposes kids to the idea of college.

3. Encourage CAC to increase spending with local suppliers, as exemplified by the University of Pennsylvania's "Buy West Philadelphia program" aimed at spurring local economic growth.

4. The benefit to the college would be proximity, which facilitates shorter turnaround times for orders and reduced transportation costs.

5. Provide mentorship, guidance, and strong support networks for local businesses by encouraging CAC to offer consulting service and networking opportunities.

6. Engage retirees in sharing their knowledge with and providing services for local businesses. For example, the City of Brevard in North Carolina created a Retiree Resource Network of more than 65 retired business people who provided top-quality consulting and advising services to businesses in Transylvania County free of charge.

7. Make downtown Apache Junction the epicenter of tourist activities by connecting it to the natural landscape and vast

BREVARD GENERAL PLAN OBJECTIVES

Objective 2.3: Retention and expansion of institutions, programs, and services that expand the knowledge, skills, and abilities of our citizens.

Policy 2.3.A: Advocate for the retention and expansion of the existing small-business incubator at Blue Ridge Community College.

Policy 2.3.B: Support the establishment of an arts-based business incubator within the city.

Policy 2.4.C: Engage schools, colleges, and area non-profit entrepreneurial support services to explore ways in which the city can assist in their efforts to foster entrepreneurialism and develop an adaptable and technologically proficient workforce.

Policy 2.3.D: Support Brevard College as a year-round community asset and resource.

Figure 6. *The Brevard General Plan objectives for using its institutions as a space to expand the knowledge, skills, and abilities of students and the community (page 49 of student report).*

open space that surrounds it. To do so, partner with local businesses, nonprofits, or volunteer-led community development organizations to connect the downtown to trails and recreation activities. For example, to boost tourism in Chimney Rock, North Carolina, the City worked with a volunteer-led community development association—which improved its ability to secure grant funding—to showcase its natural resources by improving the appearance of its downtown buildings and revitalizing a riverside walkway (page 49 of student report).

Specific Recommendations for Apache Junction's 2020 General Plan Update

- Use the community college, retirees, and natural environment for economic development strategy.
- Create specific plans that lay the foundation for targets and strategies and complement the 2020 General Plan Update. The specific strategies should have year of completion, target dates, and the roles of relevant stakeholders.
- Include strategies for how to create community engagement and partnerships, as community inclusion is vital for implementing and funding plans.

Education, Arts, and Community

The intention of this STAR Goal Area is to "promote an educated, cohesive, and socially connected community."

According to STAR, education is a Leading Indicator of a city's economy. A quality education ensures more stable futures for children who in turn contribute to society. **To be sustainable, a city should ensure equal access to education and community services.** The two STAR Leading Indicators related to education are high school graduation rate, graduate rate equity, and third-grade reading proficiency. Unable to locate data on Apache Junction's third-grade reading proficiency, the student who researched the Goal Area focused on the graduation rate for the population, which is readily available from the U.S. Census Bureau. Ideally the STAR indicator would be a cohort graduation rate.

The Three Leading Indicators of the Education, Arts, & Community Goal Area:
Third Grade Reading Proficiency
High School Graduation Rate
Graduation Rate Equity

APACHE JUNCTION'S PARKS AND RECREATION DEPARTMENT ARTS AND CULTURE EVENTS

Lost Dutchman Days
Concerts in the Park
Halloween Festival
Holiday Program & Light Parade
Superstition Sleepover

Figure 7. *Arts and culture opportunities in Apache Junction.*

As for community, according to the STAR Community Rating System™, at least 75% of residents should live within one mile of a community venue that is open to the public and offers free services and/or events. Only 20% of the residential area of Apache Junction is located within a mile of its Multi-Generational Center. This indicates more such venues are needed. However, the City does provide arts and culture opportunities (see Figure 7). Further, examples of encouraging community cohesion can be found in the City's 2010 General Plan Update, such as the Update on TV Channel 11 and its Citizen Leadership Institute (page 61 of student report).

Strengths & Weaknesses

Strengths	Weaknesses
Equal educational opportunities for female and male high school students	Room to improve high school graduation rates among the population
Abundant special arts and culture events for residents of all ages	No arts programs that support local artists or arts education
Adequate programs that support community cohesion	Unclear consideration of the public participation of minorities such as non-English speakers, based on the unavailability of documents in different languages on the City's website
A large community venue	

Recommendations

The recommendations of the student who researched this goal are focused on improving the school system (which in Apache Junction's case is separate from City government), increasing creative opportunities in the city, and strengthening access for minorities. (See page 63 of student report for further context of recommendations.)

General Recommendations

1. Encourage the Apache Junction Unified School District to prepare annual progress reports for the public on its performance, which are useful for both parents and schools (e.g., the annual progress report of Fort Dodge Community School District in Iowa).
2. Support offering multiple pathways to graduation for students to improve educational outcomes, which could be district- or community-based (e.g., Multiple Pathways to Graduation Mission of Portland Public Schools).
3. Provide funding or other resources to local Head Start programs.
4. Work with public school districts to offer special arts education programs that align with a core curriculum, especially early elementary grades.
5. Collaborate with private, nonprofit, or regional organizations to increase access and participation in the arts.
6. Adopt a strategic plan intended to enhance the community's arts and cultural resources and strengthen creative industries (e.g., the City of North Las Vegas's specific and practical goals in its 2018-2020 Arts and Cultural Strategic Plan, which included two exhibitions in the City Hall, two or more artist residency community projects, and bus tours to cultural sites).
7. Hire local artists to create public artwork, sculptures, or performances.
8. Adopt neighborhood plans that guide future development, recommend strategies to create or preserve community venues, and address neighborhood-specific issues.
9. Make information about community issues, programs, services, and activities accessible to non-English speaking residents.
10. Provide programs that support the development of youth leaders, particularly in low-income and minority neighborhoods.

- Establish education funding to support students from low-income households in graduating from high school.
- Set a goal of improving the high school graduation rate.
- Establish an art education program to provide residents, especially youth, with marketable skills. This could help Apache Junction offer new arts programs and improve its graduation rate. For example, Chicago's Gallery37 program improves high school graduation rates, expands arts and design workforce, and offers public performances.
- Interact with local artists and nonprofits to enhance and promote the Old West characteristic of Apache Junction through arts programming.
- Include a community cohesion plan to enhance public participation.

Equity and Empowerment

While other STAR Goal Areas and objectives address equity and empowerment—such as housing and transportation, education, and climate change vulnerability—this goal focuses exclusively on promoting "equity, inclusion, and access to opportunity and community resources for all community members." To be a sustainable city, all residents need to be afforded the same opportunities and fair treatment.

The Three Leading Indicators of the Equity & Empowerment Goal Area:
Environmental Justice, Risk & Exposure
Equitable Access
Proximity to Foundational Community Assets

For one indicator of this Goal Area, Environmental Justice, the student used the EPA resource EJSCREEN, a screening and mapping tool, to determine Apache Junction's population percentile for environmental indicators including ozone, cancer risk, traffic proximity, lead paint, hazardous waste, and wastewater discharge. **In eight of EJSCREEN's eleven Indicators, Apache Junction was over the 25th percentile.** This means that residents have equal or higher risk of or proximity to the

environmental hazard than 25% of the US population. The city was over the 25th percentile for the Indicators of NATA Respiratory Hazard Index, Traffic Proximity, Superfund Proximity, Hazardous Waste Proximity; **it was over the 75th percentile (the most-worrisome indicators) for ozone, National Air Toxics Assessment (NATA) Cancer Risk, Wastewater Discharge, and NATA Diesel Particulate Matter.** The city was under the 25th percentile for Fine Particulate Matter (PM 2.5), Lead Paint Indicator, and proximity to Risk Management Plan facilities.

The most worrisome environmental indicators for Apache Junction are ozone, NATA Cancer Risk, Wastewater Discharge, and NATA Diesel Particulate Matter.

These results indicate potential environmental-quality issues for Apache Junction. Further, if residents affected by them are disproportionately minorities or poor, this indicates environmental justice issues in the city. Often residents are not at fault for such exposure, or may not even know they are vulnerable to pollutants when buying a home or signing a lease. For example, many Apache Junction residents live in a flood plain, which makes it more likely they might have to deal with hazards presented by stagnant water such as dangerous bacteria. Although some residents have complained to the City about flooding issues, others may not know they exist when agreeing to buy or rent a home in a certain area. Further, the City's challenge of residential trash accumulation increases risk of injury and may deter children from wanting to spend time at home, resulting in an increase of other social problems. Finally, the proximity of its neighborhoods to roadways with high traffic results in increased diesel particulate matter (and other harmful airborne particulates) that could induce or worsen asthma. If potential or current residents do not know about this risk, they are unable to make informed decisions. If these neighborhoods are disproportionately older and/or poorer, they are at greater risk, as they have fewer resources to cope with hazards. Young children are also particularly vulnerable.

When it comes to public facilities, Apache Junction does have resources that engage its population and encourage community participation. However, these are located in a main hub in the northeastern section of the City further from most of the community and restricting access to those with limited transportation options. (The facilities include a community center, city hall, post office, park, library, police station, food pantry, and more.) Other facilities such as the aquatic centers on the southern side of the city may be insufficient to provide for the all of the

surrounding community's needs. Apache Junction has a good distribution of fire stations. However, it has only one police station, which increases response times for certain areas of the city and may raise safety concerns among residents.

According to the student in charge of this Goal Area, there are other important indicators of equity beyond what STAR covers, including the empowerment of women and stakeholder engagement. Apache Junction does have community resources for women in need such as a rehabilitation center, a domestic violence center, and a center for pregnant and parenting women. However, **Apache Junction has a higher than average number of single mothers and teenager mothers than the state of Arizona. These women may have to make sacrifices that hurt their future financial success if they are not adequately supported.** As for encouraging stakeholders to be engaged in meetings and decision-making, while Apache Junction acknowledges that it is important to make efforts to ensure representation and participation reflect the diversity of the City, it could strengthen its efforts to do so.

Strengths & Weaknesses

Strengths	Weaknesses
The discussion of public involvement and transparency in plan-making put forth in Apache Junction's 2010 General Plan	No mention of how to execute the inclusion of minority populations or engage community in public meetings
Plans to increase public facilities	No focus on putting new public facilities in disadvantaged communities
Plans to ensure better public health related to air, water, and waste pollution	Lack of focus on cleaning up areas that put certain communities at risk of negative environmental effects and their health consequences
	No mention in Apache Junction 2010 General Plan of ways to improve the lives of women or include them in decision-making

Recommendations

The student who focused on this area indicated that some Apache Junction residents are at risk of being exposed to health hazards. Further, while public participation is desired by Apache Junction, it is unclear how the City intends to promote it. Accordingly, the student's recommendations focus on rectifying these findings. (See page 75 of student report for further context of recommendations.)

General Recommendations

1. Educate residents about neighborhood hazards that they may be exposed to and what is causing them, such as waste storage. One way to do so could be the distribution of fliers.
2. Determine the neighborhoods that lack resources and reliable transportation, and then increase community resources and assets there.
3. To increase participation in City Council meetings, target disadvantaged communities and see what they need to be a part of decision-making, which may include holding meetings outside of normal business hours or offering onsite daycare.
4. Encourage City officials to visit homes and talk with residents, which will demonstrate that the officials care about their opinions and may increase public participation.

Health and Safety

This STAR Goal Area encourages "proactive efforts to prevent disease, injury, and premature death by fortifying protective factors and reducing risk factors that undermine healthy outcomes." Achieving this goal will help ensure a healthy, safe, and resilient community. According to the student researchers, there are many health services offered to Apache Junction residents, but these facilities are all located around Apache Trail. **Residents in the more distant parts of the city therefore may not have adequate access to services** (page 78 of student report). Further, according to a U.S. Census five-year estimate, 13.4% of the population lacks health insurance. The City may want to look into what groups in the city are at risk of low access to medical care, whether this is due to not having health insurance or proximity to facilities. This will indicate what medical services the City should prioritize.

The Three Leading Indicators of the Health & Safety Goal Area:
Food Security and Assistance
Access to Healthful Food
Violent Crime Rate

Apache Junction has a number of nonprofits that encourage healthy lifestyles, but few city parks and recreational facilities*. Further, its outreach program provides information on local and state resources, but does not have any goals about health research and education. Although the City could become a leader in health provision, it is prevented from doing so due to a lack of formal research on at-risk groups, citywide health goals, as well as limited parks and recreational facilities.

The Health and Safety Goal Area also includes food security and access to healthful foods. (STAR uses the term healthful, which indicates creating good health, rather than being healthy in itself.) In 2015, 14.7% of Pinal County residents were food insecure, lower than Arizona's percentage. However, **the rate for food insecurity for children in the County was 24%**. Of that number, 74% were likely eligible for federal nutrition programs. In 2015, 53.7% of children were living in households that received Supplemental Security Income, cash public
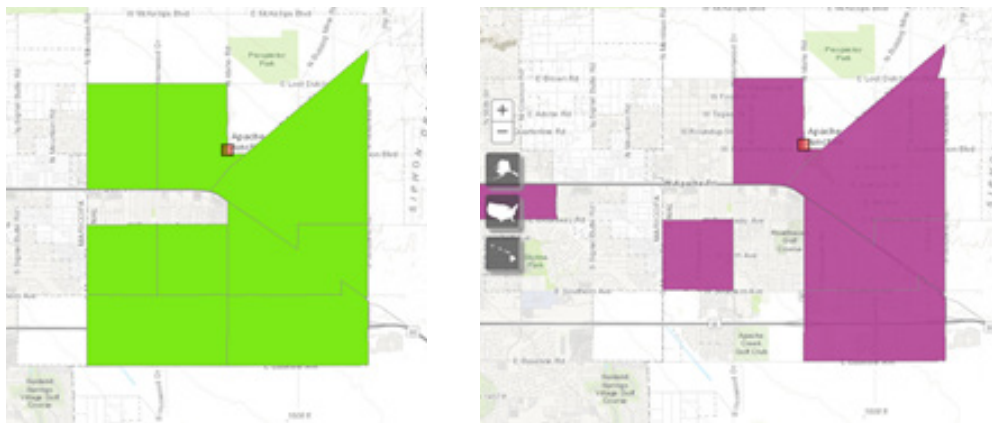

Figure 8, 9. The map on the left highlights low-income areas who are further than one mile from a grocery store, or further than 10 miles if they live in a rural area of Apache Junction. On the right are areas that may lack the transportation to access healthful foods (page 83 of student report).

***According to a City staffer, while there are few neighborhood-level parks, the City's intention is to focus on community-level parks. This is reflected in a number of private parks, small parks for children in subdivisions, and parks and golf courses associated with mobile home parks. Further, the Boys and Girls Club has a ball field, and the City partners with the school district for use of school facilities. If these outlets were taken into consideration, results may have been different.*

assistance income, or food stamp/SNAP benefits.

As for access to healthful foods, this is a matter of proximity and of economic and physical access to stores that carry them. Most of the city's food stores and restaurants are located along Apache Trail. **According to the U.S. Department of Agriculture Food Access Research Atlas, as of 2015, most of Apache Junction is a food desert**, meaning a large percentage of its population lived a mile or more from grocery stores (see Figure 8). Grocery store locations more than a mile away make it difficult for those who do not have a car to get healthful food (see Figure 9). If Apache Junction neighborhoods become denser, the demand for grocery stores in those areas will intensify, which could resolve this issue. In the meantime, **there are other ways Apache Junction could provide better access to food—from "pop-up" stores to moving markets** (page 89 of student report).

As for the violent-crime indicator of safety in Apache Junction, students determined that **the city was below the established STAR thresholds for all four evaluation measures of homicide rate, aggravated assault, rape, and property crime.** (See page 90 of student report.)

In terms of emergency management and response, the City only met one of three thresholds. Although the fire and medical district received an appropriate classification from the Insurance Services Office (ISO), the police department is not accredited by the Commission on Accreditation for Law Enforcement Agencies (CALEA), nor is Arizona, and therefore Apache Junction is not accredited by the Emergency Management Accreditation Program (EMAP).

Apache Junction has three high-vulnerability risk profiles for potential emergencies: flooding, severe wind, and drought.

When it comes to potential emergencies in Apache Junction, it has three high vulnerability risk profiles: flooding, severe wind, and drought. Several homes are located in the 1% chance annual flood hazard area because they are close to Weekes Wash. While two Maricopa County Flood Control District structures help reduce flooding hazards, a large number of the city's homes, businesses, and infrastructure are located in FEMA-mapped flood hazard areas. **Apache Junction also has a high number of manufactured and older homes that are susceptible to damage from high winds.** Although the City's 2010 General Plan Update does not have a section on hazard mitigation, it does address flooding and stormwater management in other sections, and is part of the Pinal County Multi-Jurisdictional Hazard Mitigation Plan 2016.

Strengths & Weaknesses

Strengths	Weaknesses
Nonprofits that offer education and outreach for residents to learn how to have healthier, safer lives	Services, stores, and amenities concentrated along Apache Trail
Alignment of goals in the Apache Junction police department's strategic plan with the STAR Community Rating System™ for action	Most of the city is a food desert
	Lack of health goals in the 2010 General Plan Update
	No comprehensive study on health amenities needed or wanted by residents
	No law enforcement strategies that address the safety goals in the City's 2010 General Plan Update

Recommendations

(See page 97 of student report for further context of recommendations.)

General Recommendations

1. Consider employing pop-up food markets to increase access to healthful foods at a discounted price. This type of market also fosters a cohesive community and promote healthy eating and lifestyles.
2. Add the performance of ongoing data collection, evaluation, and monitoring to track trends and identify emerging community needs to the Apache Junction Police Department Strategic Plan.

- Increase residential density around Apache Trail, which will help bring more residents closer to health facilities and grocery stores.
- Support the establishment of neighborhood nodes in the more rural residential parts of the city to allow for sustainable development and decrease reliance on stores and facilities along Apache Trail. Aim for these nodes to have grocery stores that offer healthful food to reduce food deserts.
- Increase education and outreach for health and safety training to help the City determine what its related goals should be for its 2020 plan update and how it can plan to achieve them.
- Incorporate law-enforcement policies, as Apache Junction's General Plan has no policies or strategic goals addressing law enforcement. For example, see the General Plan Envision Glendale 2040, which includes a goal to provide police education and assistance for community policing efforts, such as staff Block Watch programs, which adequately assign police officers as liaisons for specific neighborhoods. These types of policies could help align the police department with the City and the public.

Natural Systems

This STAR Goal Area is "intended to help communities protect and restore the places that provide resources to support life." Its approach recognizes the wide-ranging benefits of ecosystems, including food, water, natural regulation of climate and floods, and even cultural benefits like recreation.

The One Leading Indicators of the Natural Systems Goal Area:
Designated Green Infrastructure

According to the student researchers, **Apache Junction's 2010 General Plan acknowledges the importance of natural systems**. Natural systems are interconnected networks of waterways,

wetlands, woodlands, wildlife habitats, and protected lands. However, the City's General Plan does not outline how it intends to preserve the environment. **While Apache Junction has established an implementation action plan for the areas of environment and energy, the students could not find progress reports for the proposed programs, nor has a department been assigned to enact education efforts.**

As for how Apache Junction measures up in terms of a Goal Indicator, **at least 62% of the available land in the city is undeveloped, which is well above the 35% recommended by STAR Communities**. The largest amount of these areas are along the northern, southern, and eastern borders. It also has 2,142 acres of urban natural areas such as parks and recreational areas, which make up 9.6% of the City. According to the Central Arizona Conservation Alliance (CAZCA) and the U.S. Fish and Wildlife Service, **there are many valuable water resources including wetlands, waterbodies, watersheds, and floodplains in Apache Junction—totaling 8,933 acres or 40% of the city area—that need to be considered in decisions about development** (see Figure 10). If these patterns are disturbed, it could result in problems for development or new residents, as well as for the natural ecosystems. Apache Junction also has more than 14 identified wetlands that serve as natural paths and destinations for rain water runoff from the Superstition Mountains. But in Apache Junction, most of the undeveloped City land has no protected status and could be developed (see Figure 11). T**he development of natural land can fragment open spaces and deteriorate water resources.** Without ongoing assessment or steps for considering watershed distribution and stormwater usage, Apache Junction's natural systems could be unintentionally compromised or lost entirely.

Natural systems are interconnected networks of waterways, wetlands, woodlands, wildlife habitats, and protected lands.
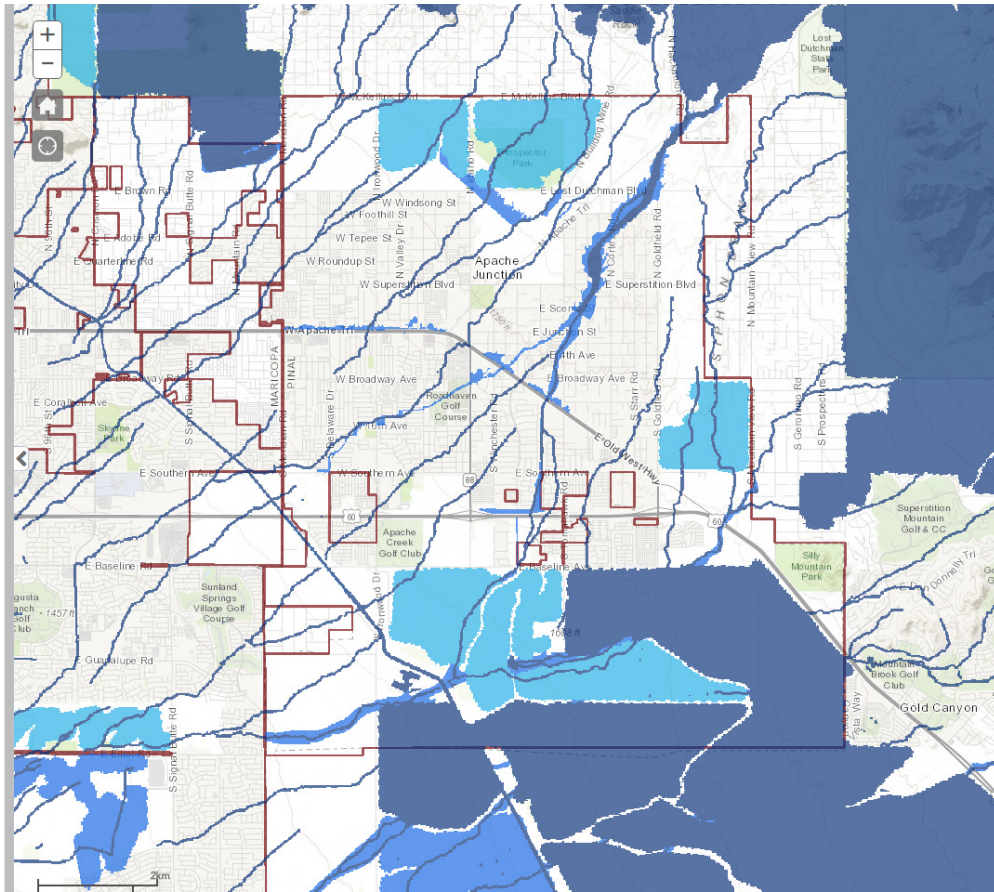
Figure 10. *The CACZA hydrography of Apache Junction reveals water resources associated with 8,933.2 acres in Apache Junction.*
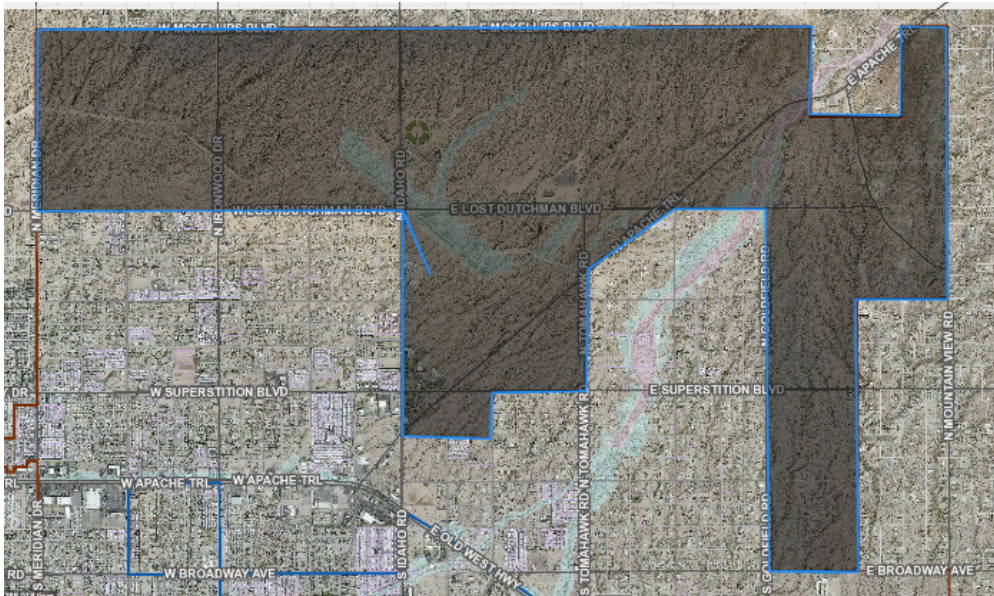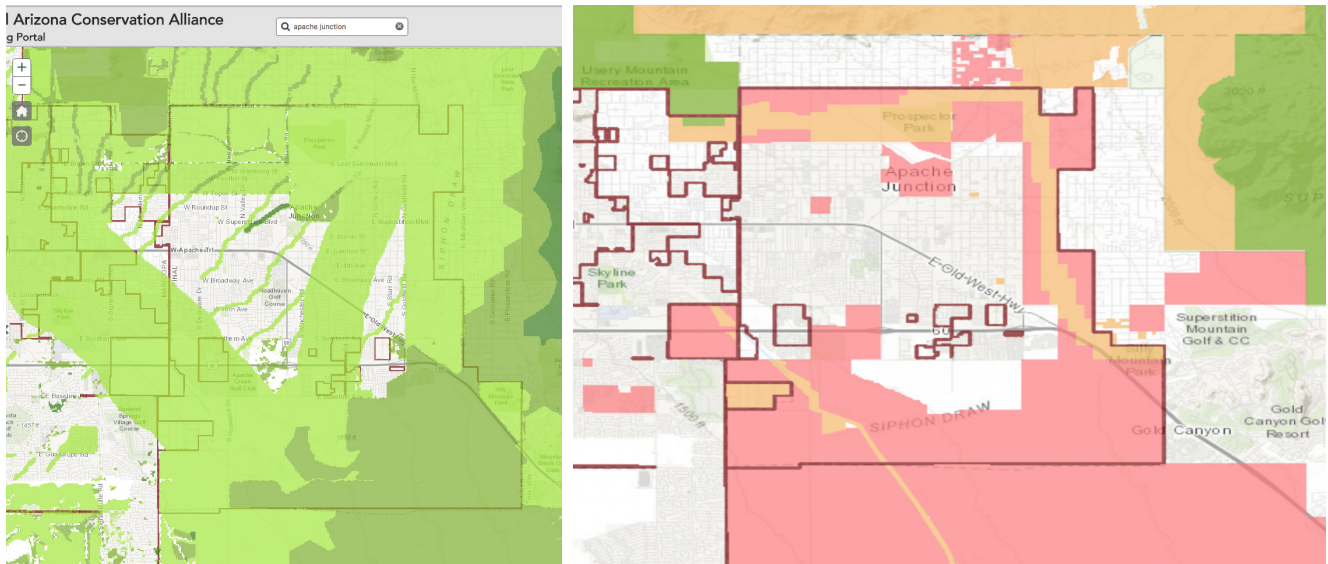

Figure 11. *Green space in Apache Junction totaling 13,796.5 acres, found using Apache Junction's GIS.*

Figures 12 and 13. *On the left, the 8,246.6 acres of Apache Junction necessary to ensure habitat integrity according to CAZCA. On the right, the undeveloped land that has no protection status (red) and could be developed in the future, as well as connected trails that are protected (orange) and provide a natural corridor for human hikers and biodiversity.*

About 53% of the land in the city is owned by other agencies, largely the Bureau of Land Management (BLM) or Trust Land managed by the Arizona State Land Department. The state and federal government own most of the valuable habitat areas and water resources. **There are significant water resource areas that run diagonally through the city and state land that should be considered when new infrastructure and developments are being built** (including if the City annexes state land for development). Further, 18,246.6 acres of the city are needed to ensure all types of habitat integrity (see Figures 12 and 13). According to the students, it is essential to preserve the undeveloped areas to support the city's ecological integrity, which in turn promotes the physical and mental health of residents. **Greenspaces preserve biodiversity, generate oxygen, remove dust and pollutants from the air, mitigate noise, cool temperatures, replenish groundwater, and provide many other ecosystem services.**

Green infrastructure is a tool that can be used to preserve greenspace and ecosystems while reducing energy consumption or water waste. Green infrastructure can be made of natural, semi-natural, and artificial networks of ecological systems including parks, reserves, trails, greenways, community gardens, streets, and waterways.

As it stands, in Apache Junction, **tree coverage is largely located in the western region of the city; the rest shows little to no such coverage**. (See Figure 14 for the percentages of tree coverage in Apache Junction). Trees can help cool city temperatures, reduce water runoff and air pollution, and offer residents respite.

APACHE JUNCTION COVER ASSESSMENT

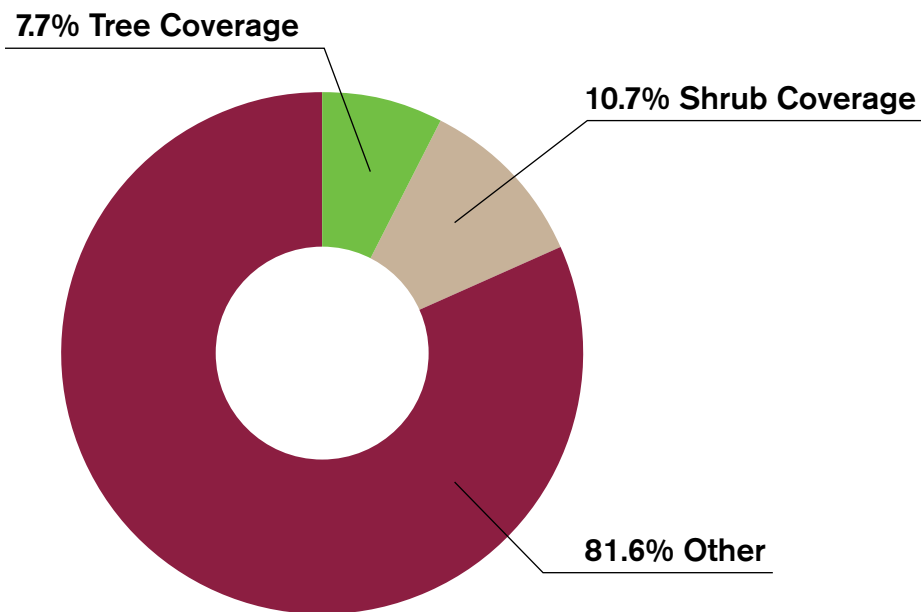**7.7% Tree Coverage**

10.7% Shrub Coverage

81.6% Other

Figure 14. The amount of types of coverage in Apache Junction according to i-Tree, a software suite provided by the U.S. Department of Agriculture. "Non-tree coverage" includes anything that is not tree canopy, which could be rocks, impervious surface, bare ground, etc.

Strengths & Weaknesses

Strengths	Weaknesses
Many valuable natural resources	Lack of active protection of natural resources
Large amount of undeveloped land	Low percentage of land with tree cover
Many recreational assets including trails	Lack of prioritization of the natural environment in future building development
Willingness to look for new ideas	No natural resources information on the Apache Junction website
	No partnerships with local jurisdictions to create a coherent plan for maintaining and using natural resources
	Lack of implementation strategies to reach current goals
	Lack of reporting systems to demonstrate progress in preserving natural resources

Recommendations

Although the student team found that the General Plan 2010 Update acknowledges the importance of natural systems, they indicated that it fails to outline specific actions to preserve the environment. Therefore, recommendations focus on generating such actions. (See page 114 of student report for further context of recommendations.)

General Recommendations

1. Partner with state and federal landowners to solidify long-term preservation of wildlife corridors.
2. Partner with Central Arizona Conservation Alliance (CAZCA) to integrate natural system information into the Apache Junction Geographic Information System (GIS).

3. Partner with BLM and the state government to transform BLM and State Trust Land around Apache Junction into a preserve connected to Usery Mountain Recreational Area trail system.
4. Partner with schools to further public education about enhancing natural resources (e.g., in Portland 15 neighborhoods participated in workshops on maintaining trees).
5. Use the trail connectivity plan presented by ASU students to Apache Junction in May 2016 to increase recreational usage of natural lands and maintain natural resources.
6. Participate in regional collaboration such as a county-wide committee that works on local standards and specifications for minimizing stormwater pollution.
7. Collaborate with CAZCA to inventory, assess, and survey Apache Junction's natural resources, and then adjust development policy and building codes to maintain natural resources.
8. Create promotion cards to showcase and solicit homebuilders or commercial developers to participate in Apache Junction's green building programs.
9. Introduce a tiered pricing system that increases development costs outward from the city center.
10. Create incentive programs to encourage landowners to adopt green infrastructure that links to broader green infrastructure systems.
11. Upgrade public spaces and buildings based upon locally adopted or recognized best practices in green infrastructure and create demonstration projects to enhance public support.
12. For development, use a Green Infrastructure Spatial Planning model that employs the six criteria of stormwater management, social vulnerability, greenspace, air quality, urban heat island amelioration, and landscape connectivity.
13. Dedicate a percentage of funding to green infrastructure.
14. Become a STAR Communities member and use its rating system for development.
15. Adopt STAR suggested actions for the preservation and development of lands, including educating the community about the importance of natural resources beyond scenery or economic impacts.
16. Use nature-based design solutions to ensure ecosystem functions are protected, restore the functionality of degraded systems, help mitigate and adapt to climate change, and improve risk management. Benefits include carbon storage and pollution reduction.

- Prioritize open space and the environment. (See Figure 15 for how the Town of Queen Creek did this in its General Plan.)
- Add green street infrastructure implementation intended to capture and naturally disperse rainwater.
- Outline societal, economic, and environmental benefits of urban compactness.
- Encourage development in the downtown area by enhancing the financial benefits.
- Adopt a tree ordinance like that of Scottsdale, which uses the following Tree City USA guidelines: "A community must adopt a tree ordinance; appoint a board, department or commission to advise the city on urban forest issues; spend at least $2 per capita on community forestry activities; and hold an Arbor Day celebration."

INTEGRATION OF ENVIRONMENT INTO QUEEN CREEK'S GENERAL PLAN

"Recreation, Parks, & Open Space Element
Goal 1: Develop a comprehensive park system to provide open spaces and recreation opportunities appropriate to a community the size of Queen Creek.

Environmental Element
Goal 3: Prevent pollution of the Queen Creek and Sonoqui washes and groundwater system.
Goal 4: Promote environmental sensitivity in the built environment. Goal 5: Maintain the desert character and environment in the San Tan Foothills"

Figure 15. How Queen Creek prioritized open space and the environment in its general plan.

Although student recommendations may be useful to the City, they will require some discretion. It is up to Apache Junction to determine which recommendations align best with its community, values, and vision. These suggestions may also serve as starting points for concrete plans that will make the city more sustainable. For details about how the recommendations were reached, consult the student report, which can be found online.

CONCLUSION

Apache Junction is looking ahead to a sustainable future for the City and its residents. In their research and assessments, students suggested a number of areas ripe for improvement. For example, residents spend too much of their income on transportation and may lack adequate access to healthful food. Further, while the City is rich in natural resources and assets, and holds sufficient undeveloped land according to the STAR framework, Apache Junction will have to think carefully about its development to ensure it does not increase inequality or disrupt the very nature it celebrates and that attracts many of its residents and visitors. Students also recognized that Apache Junction has the drive and potential to achieve this vision, and they generated recommendations to help the City put this desire for sustainable solutions into action. These recommendations included developing economic development plans that leverage natural assets, the local community college, and retirement community; a more multi-modal transportation system and public transit; promoting complete and walkable communities with access to healthful foods and key community services; outlining more definitive equity and empowerment initiatives; and developing a climate adaptation plan. Indeed, the students created a comprehensive report that should be consulted for further information and insight. Ultimately, Apache Junction has the capacity to map its way toward a more sustainable future.

**SPRING 2018 PUP 548
STUDENT MATERIALS ARE
AVAILABLE ONLINE AT:**

PROJECTCITIES.ASU.EDU

Consult the student materials in their entireties at
projectcities.asu.edu. They are located on the page
"2017-2018 Partner: City of Apache Junction" found
under the "Partner Cities" tab.