



Flagstaff's City Wide Resiliency Study

The city of Flagstaff is in the final process of completing a comprehensive Resiliency Study—concluding more than a year of work—that will help them prioritize their municipal service delivery investments and climate adaptation and resiliency efforts into the future. A diverse city team conducted a thorough analysis and developed key recommendations for the city's emergency services, energy systems, forest health, public health, stormwater, transportation, and water systems that were identified to be vulnerable and at risk from climate variability.

According to the study, over the past two years, "...Flagstaff has experienced record warming, severe winter storms, record low moisture, catastrophic wildfires and subsequent flooding events." The city's ongoing commitment to community sustainability and experience with severe weather events and climactic changes is partially what has led them to embrace climate adaptation and management early on. The Resiliency Study is the city's first step towards understanding the organization's capacity to respond to projected impacts of a changing climate and ultimately improving their preparedness and prevention efforts.

“For the City of Flagstaff we are less concerned with how the climate is changing and more concerned with how we respond and manage the impacts.”

- Stephanie Smith

The city's sustainability specialist Stephanie Smith says of the effort, "Building local resiliency within the municipal organization serves as an insurance policy against uncertainty and promotes continued prosperity for the city of Flagstaff. The Resiliency Study supports the notion that a resilient local government builds a foundation for a resilient community."



Photo credit: iCity of Flagstaff

In the summer of 2010 Flagstaff was recognized by ICLEI's Climate Resilient Community's Program as one of the 7 Inaugural Adaptation Communities chosen to receive individual technical assistance. Smith explains being chosen by ICLEI, "...was great because it recognized our existing commitment and efforts around building local resiliency, and our desire to do more."

In February of 2011 ICLEI's adaptation staff came to Flagstaff to beta test their vulnerability assessment methodology through a half day workshop. Their visit prompted the City Manager to invite a wide array of city staff who wouldn't have otherwise attended. Smith explains, "I've actually talked with other cities that are getting ready to start a vulnerability assessment and...I've conveyed to them the significance of the leadership he showed around the importance of this issue and the

opportunity for Flagstaff to test the methodology... it was really beneficial to have him be that initiator for that initial meeting.”

The workshop highlighted not only the importance of adaptation and resiliency planning, but also brought to light Flagstaff’s opportunity to make a difference in the way that the city equipped and prepared to manage their response and recovery to disasters and other climate impacts. While the half-day workshop allowed only a cursory assessment of a few areas of vulnerability, it helped create the foundation for the full scale, organization-wide Resiliency Study.

After the workshop Smith began working closely with the City Manager to put together a core team of internal city staff and stakeholders from outside agencies, including the county emergency manager, a local representative from the National Weather Service, and a public health manager charged with emergency preparedness for the county’s public health services district. Internal city staff on the core team included the city’s Deputy Fire Chief, Wildland Fuels Manager, Economic Development Manager, Finance Director, Planning Director, Acting Police Chief, Public Works Director, Risk Manager, Stormwater Engineer, Utilities Director, and Nicole Woodman, Sustainability Manager, and Stephanie Smith, Sustainability Specialist and Resiliency Study project manager.

The first meeting of the core team resulted in scoping the concept of vulnerability and risk on city operations. Adaptation and resilience were relatively new topics for city staff. Explains Smith, “It was something different and required taking the time to talk about the project, and not just meeting as a group, but also conducting individual meetings and work sessions. But we always reviewed the results as a group.”

To kick start their scoping process the team reviewed a recent report published by the Western Adaptation Alliance and ICLEI in 2011 that highlighted temperature and precipitation projections for the region into the future. Through a consensus building process the team used this information to identify seven primary systems (see box at right) that were at risk and that were directly connected *specifically* to city services and operations. Within these seven primary systems the team further identified 23 key planning areas. For example, “emergency services is one of the primary systems with police, fire, EMS, disaster response and public works as all being ‘key planning areas’ within that primary system,” said Smith.

FLAGSTAFF’S SEVEN PRIMARY SYSTEMS AT RISK FROM CLIMATE VARIABILITY	
PRIMARY SYSTEM	KEY PLANNING AREAS
Emergency Services	Police and Fire Services, EMS, Disaster Response, Public Works
Energy	Energy Delivery and Assurance, Energy Demand and Cost
Forest Health	Forest Management, Wildlife and Vegetation, Public Infrastructure
Public Health	Public Health Infrastructure, People, Public Services
Stormwater	Buildings, Infrastructure
Transportation	Public Transportation, Transportation Infrastructure, Public Access, Rail, Airport
Water	Water Treatment Quality, Water Resources, Water Infrastructure

To conduct the analysis of each system and its associated key planning areas Smith adapted methodologies and studies done by other cities to identify the risk assessment and vulnerability assessment methodology that would work best for Flagstaff. She and the team also used vulnerability rankings produced by ICLEI to determine high or low vulnerability for each of the 23 key planning areas of city operations. The team decided to conduct a two step process: (1) a sensitivity analysis for each key planning area in which according to Smith you “lay everything on the table to see what could happen” to assess how weather and climate currently affect the particular city operation and the magnitude of possible impacts; and (2) an adaptive capacity assessment, looking at “...the city’s ability to accommodate or adapt to the impact in consideration of the city’s existing economic, natural, institutional and community resources.”

The sensitivity analysis and the assessment of the city’s adaptive capacity together helped to form a ‘vulnerability ranking’ (see table below).

Table : Vulnerability Ranking

		Sensitivity: Low → High				
		S0	S1	S2	S3	S4
Adaptive Capacity Low → High	AC0	V2	V3	V4	V5	V5
	AC1	V1	V2	V3	V4	V5
	AC2	V1	V1	V2	V3	V4
	AC3	PO	V1	V1	V2	V3
	AC4	PO	PO	PO	V1	V2

Image credit: City of Flagstaff, Draft Resiliency Study

The city did not look at vulnerability alone to determine its priorities. In addition, the core team conducted a risk assessment. The risk assessment was conducted by determining the planning area’s function within city operations, estimating the degree of impact of climate change on each of the key planning areas, and by considering the likelihood that the impacts will occur. The degree of impact was estimated by considering the size of the affected population, whether the impacts could be life threatening and the estimated costs associated with impacts. The collective vulnerability and risk rankings help the city prioritize future policy, program, and infrastructure investments.

Where it Stands. Currently the study is in draft form and is nearing completion. Once finalized the core team will present the work and their recommendations to the city council who will decide on next steps. While the study is an excellent tool for guiding decisions, it is not a plan that formally incorporates adaptation into city operations, strategies, actions, or policies. Smith explains that the city is not looking to produce a ‘master plan on adaptation and resilience’ rather, “We are looking for the most efficient and direct strategy that weaves adaptation and resilience into all city policies, practices, plans, and operations in order to create a culture of building local resilience within municipal operations.” Smith concedes that the biggest challenge before them is how to integrate the findings and the core team’s recommendations into city processes in a way that supports existing efforts.

The Power of Leadership. Having the leadership of their city manager from the beginning, emphasizing the importance of this issue, was extremely valuable to this process and is something Smith continues to recommend to other cities looking to begin adaptation and resiliency planning projects.

Follow a Team Approach. The consensus based process Flagstaff implemented created buy-in from a diverse array of internal and external stakeholders on the team. In addition it was critical that the core team was engaged on ‘the ground floor’ of the project, which gave them a sense of ownership over the process and lent a sense of open participation. Smith said, “The team had a great skill set for out-of-the-box thinking and they all participated no matter what the topic. For instance we had our Police Chief talking about water as well as our Utilities Director, so they all engaged on the issues.”

Set Clear Expectations and Respectfully Manage Time. At the beginning Smith had to ensure that everyone was clear on the expectations and purpose of the project. Meetings could take up a lot of time and so Smith adapted and worked both through group meetings and one on one to gain feedback and move the project forward. Smith found value in a hybrid approach and occasionally assigned homework for the group, which proved successful at getting work done.

Get Everyone on the Same Page Before Proceeding. Smith recognized that climate adaptation and resiliency was a new issue to many of the core team members. To build a foundation she and others worked to put climate adaptation into a local government context to make the case for the importance of the assessment they were embarking upon.

*Thanks to Stephanie Smith, Sustainability Specialist.
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For More Information

Look for the report to be released in the future on the city of Flagstaff’s website:
<http://www.flagstaff.az.gov/>

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This case study was produced by the Institute for Sustainable Communities for our Sustainable Communities Leadership Academy. The Academy is a state-of-the-art training and technical assistance program on community-based climate solutions. Its purpose is to build the capacity of communities to take smarter, swifter, more effective action to increase energy efficiency, reduce climate pollution and dependency on fossil fuels, create green businesses and jobs, and strengthen their resilience to the local impacts of climate disruption.

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