City of Flagstaff Resiliency Study

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Innovation Project Description

Like many cities, Flagstaff's municipal government is developing programs and policies that will affect the City in the long-term, and yet it has not created a plan to increase the City's resiliency to the future effects of the changing climate. To address this potential challenge to public service delivery, the City of Flagstaff completed a Resiliency Study. The project addresses a significant public service challenge: How can a local government reduce its vulnerability of and build local resilience to climate variability and climate related disasters? The Resiliency Study supports organizational innovation and improvement by serving as a vital bridge between policy development useful for addressing climate resiliency challenges and decision makers confronting those challenges.

The City's Resiliency Study builds awareness of how changes in climate conditions can impact critical resources and in turn, the City's priorities. The City's study assessed vulnerability of local systems relevant to municipal operations, such as water, public health and forest health that have some risk of extreme impacts due to climate variability.

Reducing vulnerability to the changing climate requires the City to identify how vulnerable it's operating efficiency, public health, infrastructure and economic competitiveness are to climate variability and where it lacks sufficient capacity to adapt, and what the risks are if it does not act. Using an innovative, consensus based approach, the City of Flagstaff conducted the internal assessment to identify vulnerable planning areas within City operations and assess the risks of the expected impacts. The Resiliency Study assessed local systems and key planning areas that share three things in common: each is important to the success and resiliency of the City of Flagstaff; can be impacted by City government; and is likely to be affected by climate change.

Jurisdiction and History

The Southwest is a region marked by rapidly changing socioeconomic and climate systems. The 2010 Census confirms that the Southwest is undergoing a dramatic demographic change, with the population of Arizona growing by almost 25 percent in the last ten years. At the same time much of the region has been in the grip of a drought that has persisted for more than a decade—exacerbated by soaring temperatures, increasing precipitation intensity, snowpack reductions and other climate-related changes. In the past two years, Flagstaff has experienced record warming, severe winter storms, record low moisture, catastrophic wildfires and subsequent flooding events. Flagstaff, like other Southwest communities, is increasingly in need of prioritizing the condition of the climate, this can be achieved by

integrating resiliency and adaptation into existing and future municipal policies and operations.

Description of Project Impact – Community Benefits

The City of Flagstaff and other local governments are on the frontlines of managing the impacts associated with climate variability, ranging from increased drought (straining water supplies) to increased flooding (straining stormwater management infrastructure) to more extreme heat and weather events (putting lives and property at risk). The City's efforts to address climate resiliency presents an opportunity to innovate and improve local service delivery and organizational capacity to achieve near-term results; to demonstrate the do-ability of practical, cost-effective, economy-enhancing resilient and sustainable solutions. The impacts of the Resiliency Study can affect Flagstaff's local economy, natural environment, community well being and the City's ability to deliver on its existing commitments. The City of Flagstaff demonstrated innovation and creativity by completing a local resiliency study. The study will help the City to protect lives, health, property and ecosystems from the negative impacts of climate related disasters.

How is it a quantum leap of creativity?

The City of Flagstaff's Resiliency Study is a quantum leap of creativity. Flagstaff is one of the first cities in the nation to assess local vulnerabilities to climate variability and commit to developing strategies and actions that protect assets and infrastructure, and keep community members safe. The Resiliency Study demonstrates innovation and accelerates the organizations existing commitment to climate adaptation and management.

Who has benefited from the innovation?

The identified innovation: the City of Flagstaff Resiliency Study benefits the entire municipal organization and the people who rely on the delivery of municipal services. The study identifies how the City is directly impacted by current and future climate variability and defines areas the organization can locally make a difference in building resiliency.

As climate and related weather conditions change, lives and livelihoods are increasingly at stake, as well as smart economic growth and community development. The Study better helps the municipal organization to respond to these increasing service delivery challenges by complementing response and relief efforts with preparedness and prevention measures.

How was the innovation initiated and implemented?

The City of Flagstaff's Resiliency Study was initiated by the City's Sustainability Program and supported by the City Manager. The study included two internal assessments: vulnerability and risk. The vulnerability assessment was conducted in two parts, through a sensitivity analysis and an adaptive capacity assessment. The level of climate-sensitivity was influenced by current and future stresses, exposure to climate, the relevant expected climate change(s), and the projected impacts of that change. The second step of the vulnerability assessment was to determine adaptive capacity. Adaptive capacity was estimated by assessing the ability to accommodate or adapt to the impact. Economic, natural, institutional and community resources can help or hinder a local government's ability to adapt to climate change, and have been considered in this assessment. A 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 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.

What risks were associated with planning and developing the innovation?

The climate has already changed and future changes are highly certain. In many parts of the world, the current climate is already noticeably different from the historical climate. In Flagstaff, annual average temperature increases have been observed and future projections indicate a rising trend. The changing climate has serious direct and indirect impacts and communities that engage in advanced planning can benefit. Local governments are making major development decisions today that will have long legacies; therefore, today's choices will shape tomorrow's vulnerabilities. It is important to build in the capacity to adapt to unforeseen circumstances including diversity, redundancy and network overlaps within municipal operations and service delivery. Infrastructure designed and built today could last anywhere between 30 and 100 years depending on materials. Moreover, homes permitted and built today are often expected to last 50 to 80 years; however, if built in tomorrow's floodplain, these positive developments could become major disasters.

What was the environment in which the innovation was created and sustained?

As a local government critically concerned with drought, climate variability, and the larger issues of sustainability, completing the Resiliency Study is both timely and critically important. The Resiliency Study is supported by an existing commitment to climate adaptation and management. The City of Flagstaff has a long history of promoting sustainable practices through a variety of innovative programs and policies.

Sustainability factors into many daily decisions and long-term planning objectives at the City of Flagstaff.

What were execution costs and savings?

Prioritizing climate resiliency is financially relevant to the City of Flagstaff. Planning now can save money, while inaction will lead to higher costs in the future. Paying for prevention upfront can avoid more significant costs in the future. For example, it has been found that one dollar of hazard mitigation today can prevent the expenditure of four dollars of post-disaster reconstruction in the future. This principle also extends to reducing the future costs of incremental climate change impacts.

The City of Flagstaff's Resiliency Study was conducted by an internal Core Team. Successfully working with an internal team saved the City money and enhanced the overall organizational capacity to develop and implement innovative climate resiliency goals.

What lessons were learned that could be shared with other local governments?

Learning from our experiences is an important factor in the success of the City of Flagstaff's Resiliency Study. City leadership proved to be critical in both the initiation of the Resiliency Study and the momentum for staff to complete the project. In addition, use of an internal team of City staff allowed for a more in-depth vulnerability and risk assessment that focused on impacts relevant to City operations.

Which department and/or individuals championed the innovation?

The City of Flagstaff Resiliency Study was championed by the City's Sustainability Program and supported by the City Manager. The project was managed by Sustainability Specialist, Stephanie Smith. A Core Team of City staff assisted with the vulnerability and risk assessments and consisted of experts within the City's internal operations in the areas most likely to be affected by the associated impacts of climate change and represented the following service delivery areas: public safety, economic development, public works, long-term planning, finance, risk management, and utilities. The Core Team worked through a consensus building process to identify and prioritize municipal operations at risk and vulnerable to changes in local climate. The team was diverse and illustrates the complexity of the issue and the potential widespread impacts across the organization. The Core Team also included participation from the National Weather Service's Flagstaff weather forecast office as well as Coconino County emergency management and public health officials.