Water Security in Texas

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Executive Summary

PURPOSE

This capstone group set out to examine the current water security challenges faced by Texas municipalities and to identify the strategies a select group of cities have employed to address these challenges. This report synthesizes interviews with municipal water professionals with technical reports and management documents from local and state governments to provide readers with a better understanding of these water security challenges and the strategies and technologies used to resolve them. This report does not seek to evaluate these water security strategies, but rather to present possible options for municipalities looking to become more water secure. In summary, this report seeks to answer the question “what options do Texas municipalities have to become more water secure?”
Framework of Research

There are no one-size-fits-all solutions to water security in Texas, but municipalities can benefit from learning best practices of other municipalities in the state of Texas. Preliminary research revealed that the most widespread water security challenges facing Texas municipalities are population growth, irregular drought patterns, and aging infrastructures, but a diverse array of unique challenges exist in different communities. Given the diversity of water challenges, available water sources, management strategies, and technologies, it is critical that municipal water professionals properly assess the particular water needs of their respective cities.

For the purpose of this report, a “three phase” framework was developed to categorize the strategies and technologies identified from the literature review, a review of technical documents, and interviews with water professionals. To facilitate the studying of options Texas municipalities had to become more water secure, we found categorizing municipalities based on similarities of strategies or technologies utilized to be useful in identifying patterns across cities. We categorize municipalities into one of three phases - “Phase One”, “Phase Two” and “Phase Three” - and we organize each phase as a particular set of strategies or technologies that are similar to each other. Municipalities are identified by the highest phase strategy they utilize. We are deliberate in our use of the term “phase”, rather than simply using the term “category”, to reflect the fact that municipalities vary in what types of strategies they use.
Takeaways

**PHASE 1**
DECREASE DEMAND OF WATER THROUGH THE UTILIZATION OF CONSERVATION EFFORTS
1. An important first step for Texas municipalities is to diversify their water portfolio and take full advantage of available water resources.
2. Advanced metering infrastructure to decrease water usage, rebate programs to incentivize behavior changes, educational programs and social media campaigns are all useful strategies to encourage limiting water consumption..

**PHASE 2**
INCREASE SUPPLY OF WATER THROUGH PARTNERSHIPS OR ADVANCED TECHNOLOGY
1. Utilizing non-potable water reuse and recycling technologies allow municipalities to expand their water supply, which may be needed when municipalities cannot sufficiently meet their water demand through management strategies alone.
2. Adopting new city code requirements to mandate that new developments connect to existing reuse water systems is an innovative way to facilitate the continued expansion of municipal reuse capabilities.
3. Engaging in inter-municipality partnerships is an innovative way to share and build capabilities.
4. The TWDB offers financing programs to assist Texas communities in expanding reuse capacities.

**PHASE 3**
DIVERSIFY WATER SUPPLY THROUGH DIRECT POTABLE REUSE OR DESALINATION TECHNOLOGY
1. For municipalities facing severe water security issues, the most expensive and technologically advanced water management strategies include direct potable reuse (DPR) and desalination, which tend to supplement existing water systems.
2. These types of infrastructure require foresight and long term planning as these types of infrastructure require large capital investment, organizational capacity, and project management coordination.
3. While both DPR and desalination are expensive strategies, the TWDB has provided financial assistance through loan programs to help finance both systems.