

Funding sustainable water infrastructure solutions: a uniform approach

G. J. Knowles

New Mexico Environment Department, USA

Abstract

Located in the desert southwest New Mexico is a highly arid sparsely inhabited state mostly covered by mountains, high plains and desert. Water is a scarce resource. Over the past century drought has devastated the state. Water infrastructure funding is also increasingly scarce. Through a bipartisan effort New Mexico has implemented a sustainable water policy utilizing an interagency approach to water infrastructure project identification, prioritization and funding. Since inception the so-called Sustainable Water Infrastructure Management (SWIM) approach has logged over 800 proposed water/wastewater infrastructure projects in its growing knowledge bank. Of these projects more than 200 have been funded. Along with this, viable projects not yet funded receive ongoing assistance, guidance and support in their efforts to improve organization-wide performance utilizing management approaches and systems to increasingly move beyond utility management toward sustainability. Proposed projects not meeting initial uniform funding criteria also receive assistance in their efforts take actions to increase the likelihood of funding in the future. This paper is an overview of New Mexico's uniform funding approach to bring about secure and sustainable water infrastructure in the state.

Keywords: sustainability, uniform funding, sustainable water infrastructure management (SWIM), infrastructure funding system (IFS), water infrastructure needs system (WINS), sustainable infrastructure index (SII), knowledge bank.

1 Background

Located in the desert southwest New Mexico is a highly arid sparsely inhabited state mostly covered by mountains, high plains and desert. Water is a scarce



resource. Water infrastructure funding is also increasingly scarce. According to Matson [1] over the past century several periods of drought have devastated the state. In 1995-1996 a regional drought gripped the Southwest and southern Great Plains states. Depleted reservoirs and increased groundwater pumping interrupted public water and irrigation supplies. As a result, a regional drought response action plan was developed [2]. In New Mexico Republican Governor Gary Johnson created a Drought Task Force (DTF) to prepare a Drought Emergency Plan (DEP) to minimize the impacts of drought.

In 1998, Johnson issued an executive order [3] reemphasizing the need for continued action by agencies and departments to support drought management and preparedness efforts. Building on these earlier efforts New Mexico's 1999 Drought Plan (DP) expanded and replaced the previous DEP providing a framework for an integrated approach to minimizing the impacts of drought. The DP outlined measures to be used to mitigate the effects of drought and respond to drought conditions.

During 2002 the Governor issued an executive order [4] indicating that statewide reservoir levels were at their lowest point in the last 20 years. Snowmelt runoff was the lowest it had been since the mid-1970s. Runoff into some major streams had decreased to less than 5 percent of normal. Due to the 2002 drought D'Antonio [5] reported that more than 70 community water systems (CWS) experienced emergency loss of drinking water. What became evident was that a chronic lack of adequate management, maintenance and systems planning was the catalyst for these emergencies. As a result these systems were not robust enough to weather the stress of drought conditions.

Acknowledging the need to provide a basis for prioritizing infrastructure investment along with statewide continuity of policy and management relative to state water resources the DTF considered strategies for reducing vulnerability to drought along with ways to prevent such emergencies in the future. According to Rivera [6] the task force found that a lack of comprehensive planning for the management of water infrastructure along with inadequate funding to meet existing and future water needs coupled with funding at all levels of government historically limited for comprehensive review and coordinated planning was problematic.

2 Meeting the challenge

Evidently, to meet these challenges a restructuring and realignment of statutory, regulatory and institutional funding mechanisms to plan and manage water infrastructure investments was essential. Along with this New Mexico was experiencing exponential population growth coupled with significant anticipated economic growth and an increase in demand for water. These factors increasingly made the efficient use of water vital to extending water supplies. Further fears that water infrastructure may be deteriorating and in need of repair or replacement along with the need for the development of new water

infrastructure to maintain reliable water supplies to meet growing domestic, municipal, industrial and commercial needs were also cause for concern. Despite two precipitation events in 2003 resulting in improved conditions in the Northwest of the state D'Antonio [7] reported that drought conditions did not improve and actually worsened in the South.

Building on Republican led efforts to address drought and water scarcity concerns newly elected Democratic Governor Bill Richardson assembled a Blue Ribbon Task Force on Water (BRTFW) in 2003 to examine water policies and laws within the state. By executive order [8] he restructured and expanded the DTF creating sector specific work groups to address drought impacts. The Drinking Water Work Group (DWWG) was tasked with a broad spectrum of responsibilities for mitigation and response, working to prevent community water systems from reaching emergency status through improved planning and identifying new opportunities for multi-system collaboration. The DWWG was also charged with identifying methods for the domestic, commercial, and industrial sectors to reduce water use, through the use of techniques such as market-based incentives, changes in land-use regulations, and increased education and technical assistance.

In September 2003 a Drought Summit [9] was convened focusing attention on the on-going drought conditions along with strategies for minimizing its detrimental impacts. During this period various federal and state agencies began developing a process for coordinating water infrastructure funding. This resulted in a memorandum of understanding establishing a uniform funding application process for evaluating and prioritizing the utilization of funding with a single statewide point of contact.

2.1 Water infrastructure investment team

Although drought conditions eased in 2005 D'Antonio [10] reported that the long-term drought lingered in some areas. That year Governor Richardson created a Water Infrastructure Investment Team (WIIT) by executive order [11] specifically tasked with developing a long-range plan for secure and sustainable water and wastewater infrastructure. The WIIT was charged with ensuring the judicious investment of public funding to meet infrastructure needs by evaluating project requests and making certain that project funding went to entities both demonstrating fiscal and managerial capacity as well as meeting state and federal requirements. The WIIT was also tasked with recommending a funding plan utilizing a combination of funding sources and requirements for local contribution along with identifying, packaging, and prioritizing proposed water and wastewater projects. Specifically, the WIIT was charged with considering a Uniform Funding Application (UFA) for proposed water and wastewater infrastructure projects requesting state funding along with a process for reviewing such projects and making recommendations for funding coupled with conditions for projects to be funded through various sources.



The WIIT focused primarily on the need for statutory, regulatory, and administrative changes for implementing a new approach to water and wastewater infrastructure investment, and for planning and management. With a need to concentrate further on identifying, considering, evaluating, consulting, advising and recommending proposed water and wastewater projects for consideration for funding the Governor subsequently determined to broaden the roles and responsibilities of the WIIT tasking the team specifically with examining in-depth the viability of a Uniform Funding Approach.

2.2 House joint memorial 86

In November 2005, Representative Joseph Cervantes (D) [12] of the New Mexico House of Delegates proposed a House Joint Memorial (HJM86) requesting the development of criteria for water system planning, performance, and conservation as a condition of funding. Proposing that criteria should be established requiring a standard level of financial and operational planning and management capacity along with an accountability system for monitoring water use to encourage conservation and efficiency. HJM 86 recommended setting standards based on sound business practices along with providing technical support to assist systems meet standards; enforcing statutory and regulatory compliance requirements along with creating incentives to motivate systems by prioritizing grants and zero-interest loans to those meeting the standards.

2.3 Drought declaration

In 2006, as the state suffered through one of the driest winters in more than a century with some areas documenting the driest year ever recorded, the Governor declared a state of drought by executive order [13]. Meanwhile, the DTF technical team (TT) continued developing a policy to require hydrological and fiscal sustainability and Safe Drinking Water Act compliance for all water projects getting state funding. This included such requirements as regional collaboration among geographically proximate water systems, strong drought management and conservation plans, inter-jurisdictional cooperation, realistic rates structures, and aggressive leak detection along with draft policies, regulations and statutory changes as may be required to implement the policy. The TT also reviewed existing state statutes calling for water planning, conservation plans, drought plans and source water protection along with creating resources to help water systems with planning. The state engineer John D'Antonio [14] reported that the team also worked extensively on preparing a response to HJM 86.

2.4 Year of water

Governor Richardson declared 2007 the Year of Water proposing a three-pronged strategy focusing on improving water availability, investing in



innovation, and conservation of waterways and watersheds. He recommended boosting investments in funding to extend water infrastructure. In order to address these concerns he issued an executive order [15] establishing a Water Cabinet (WC), creating a new Water and Wastewater Infrastructure Development Division (WWIDD) within the New Mexico Environment Department (NMED) and ordering the implementation of a uniform funding process.

2.4.1 Water cabinet

The Cabinet was charged with promoting effective interagency collaboration, consultation, coordination, prioritization and consistent funding mechanisms of water policy and projects along with promoting a comprehensive approach to hydrological and ecological sustainability while maintaining adequate, high-quality supplies of fresh water in the state. The WC was also tasked with ensuring the implementation of a water infrastructure project evaluation and uniform funding process along with efficiently and effectively utilizing water and wastewater grant and loan funds by state funding agencies.

2.4.2 Water and wastewater infrastructure development division

The WWIDD was formed by bringing together two existing bureaus within NMED. Along with other duties, the division was tasked with overseeing interagency planning and policy development. It was also charged with providing expertise to assist the WC in defining and establishing water and wastewater infrastructure project evaluation methodologies. Along with this WWIDD was responsible for developing, implementing and administering a uniform funding process and overseeing capacity development efforts.

2.4.3 Community services group

In 2008, a Community Services Group (CSG) comprised of administrative, community, engineering, financial and water resource specialists was formed. The group oversees the implementation of the state's sustainable water infrastructure funding policy. In 2009, the group's lead developed a framework for action within a continual improvement approach fig. 1 giving direction to community efforts to ensure compliance, enhance capacity and move beyond utility management toward sustainability. The group identifies needs along with evaluating the viability and fundability of proposed projects. The group also coordinates all assistance, resources and support services. The CSG also plays a pivotal role working with funders to develop grant/loan funding bundles so as to optimize scarce resources and bring about sustainable solutions. This start-to-finish management system utilizes a Plan, Do, Check and Act (PDCA) framework that informs planning efforts, guides community action and assists funding agencies in the decision making process.



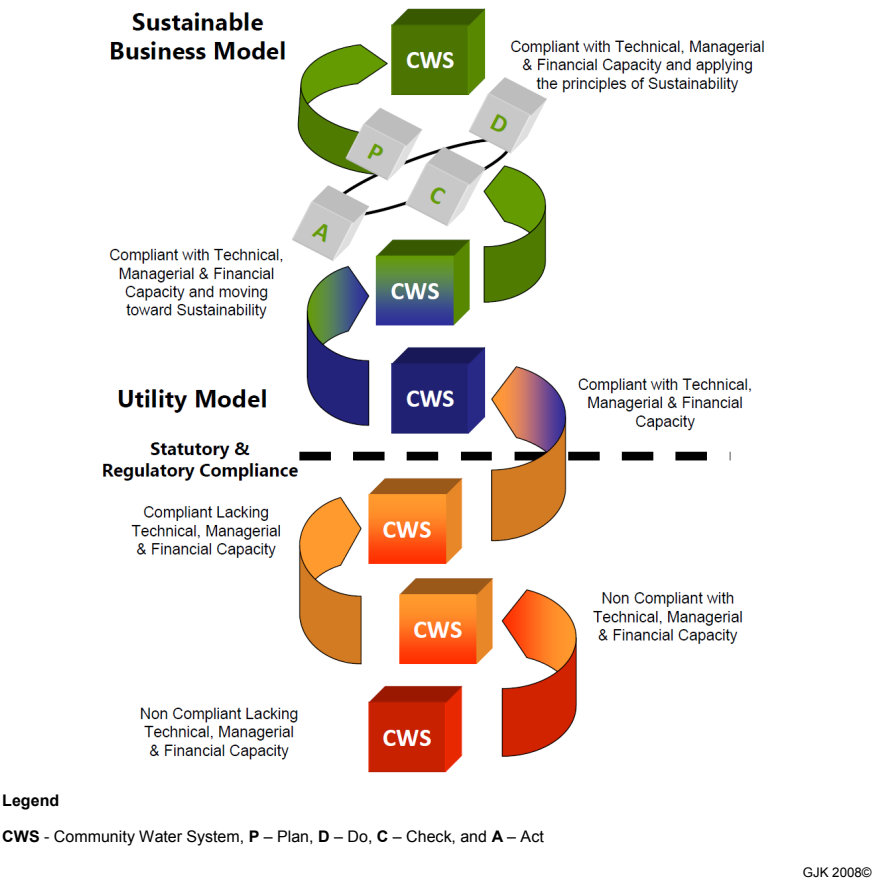


Figure 1: Compliance, capacity, sustainability continual improvement approach.

3 Sustainable water infrastructure management

This step-by-step “One-Stop-Shop” approach to water infrastructure funding provides a uniform method for identifying, capturing, evaluating, assisting, prioritizing, coordinating, freeing up and optimizing public funding for sustainable infrastructure solutions. As an integrated mechanism SWIM is a way for communities seeking to obtain funding to enjoy every consideration from participating federal and state agencies administering funding programs. Within this framework the CSG coordinates ongoing assistance to communities striving to become sustainable through better management, full-cost-pricing and water efficiency within a watershed approach as outlined by the U.S. Environmental Protection Agency’s Sustainable Water Initiative (SWI) [16].



3.1 Outreach and education

To inform communities about the SWIM approach and the enhance community knowledge, awareness and buy-in the CGS is actively involved in outreach and education efforts statewide. Community services representatives make personal visits to communities in assigned regions. The group also holds and/or sponsors workshops along with attending, presenting, and exhibiting at periodic funding fairs. Members of the group also attend, participate in and exhibit at state and local government conferences and meet with local officials. As invited, the CSG may attend and participate in system board meetings and/or trainings. Along with this the CSG provides “hands-on” community assistance as needed. An informational water commons hosted on the NMED web-page [17] also provides communities with funding information, resources and related materials.

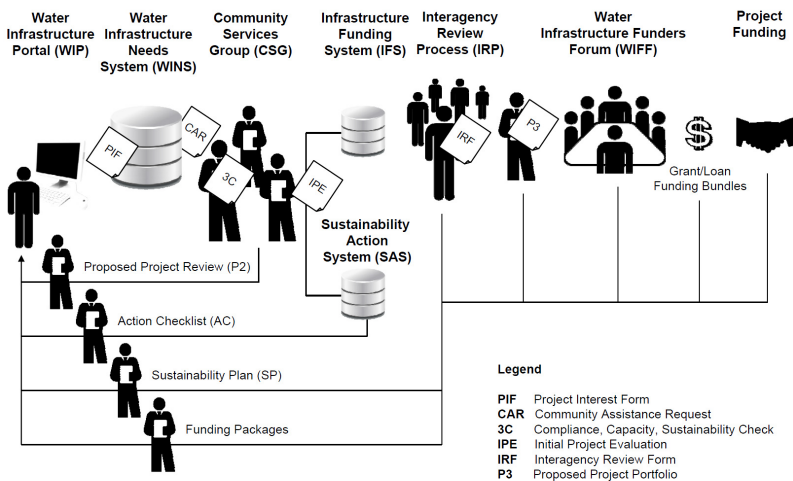


Figure 2: Sustainable water infrastructure management process.

3.2 Water infrastructure portal

Communities seeking assistance to obtain consideration for grant/loan funding for water, wastewater and solid waste projects may go to the dedicated Water Infrastructure Portal (WIP) [18] hosted by NMED. At the portal communities complete and submit a simple web-based, on-line Project Interest Form (PIF) providing contact, entity and related information along with a description of the scope of the proposed project. On occasion a community may request “hands-on” assistance from the CSG to complete and submit a PIF. At the request of and with the permission of community leaders a member of the group may complete and submit a PIF for and on behalf of the community.

3.3 Water infrastructure needs system

Each completed and submitted PIF is logged into the state's Water Infrastructure Needs System (WINS). This growing knowledge bank stores and retrieves proposed water infrastructure project data and organizes identified needs storing proposed community project information and allowing for data creation, maintenance, search and other access.

3.3.1 Community assistance request

Once a proposed project is logged into the WINS a Community Assistance Request (CAR) is generated triggering a response from the CSG assigned coordinator dedicated to serving the given geographical region. Typically, within five working days the community is contacted by the designated representative who sets up a Proposed Project Review (P2).

3.3.2 Proposed project review

A P2 review is conducted for each proposed project in the WINS database. Utilizing the initial information provided by the community on the PIF the CSG coordinator reviews with community representatives the nature, scale and scope of the proposed project. For convenience and/or to ensure a timely response the P2 review may be conducted in person, by telephone, email or a combination of communication methods. During this stage, the CSG representative is able to confirm and/or clarify any specific project related relevant information.

3.4 Compliance, capacity, sustainability check

On completion of the P2 review the CSG executes a Compliance, Capacity, Sustainability Check (3C Check). During this stage the group point person requests information regarding the regulatory and statutory compliance status of the community along with the financial, technical and managerial capacity and long-term sustainability status of the applying community from appropriate administrators, oversight and related resource support personnel. Added to the PIF and the R2 review the 3C Check provides an initial yet expansive "*snapshot*" of the community's current reality. Should further questions or concerns arise the CSG point person contacts the community. With all of the available information gathered and organized the CSG proceeds to conduct an Initial Project Evaluation (IPE) of the viability and fundability of the proposed project.

3.5 Initial project evaluation

During the IPE stage the CSG reviews all of the proposed project and community relevant information gathered to consider the viability and potential fundability of each project. The readiness to proceed along a funding track of each project is evaluated utilizing the state's Sustainable Infrastructure Index



(SII) criteria set forth in the response to HJM86. Projects meeting and/or exceeding the SII threshold are logged into the Infrastructure Funding System (IFS). Projects not meeting SII minimums are logged into the Sustainability Action System (SAS). At this stage the CSG informs the community of the status of the proposed projects funding likelihood.

3.6 Infrastructure funding system

Proposed projects meeting the SSI threshold and considered viable, potentially fundable and ready to proceed along a funding track are entered into the IFS. This system captures, organizes, classifies, stores and retrieves data in preparation for the Interagency Review Process (IRP). Thereafter, the system generates an interagency review form (IRF) inviting input from appropriate bureaus, agencies and related stakeholders in connection with the status of the proposed project or any other relevant information that may be deemed appropriate at the time. The CSG regional representative coordinates, gathers and organizes all of the interagency input. Ultimately, this information along with all other relevant candidate community and proposed project related information gathered throughout the SWIM process is compiled into a Proposed Project Portfolio (P3) in preparation for presentation to prospective funders at the periodically held Water Infrastructure Funders Forum (WIFF).

3.6.1 Sustainability plan

Proposed projects from communities logged into the IFS considered viable, potentially fundable and ready to proceed are invited to consider developing a so-called Sustainability Plan (SP). The objective a SP is to assist each community to better understand and increasingly work toward effective utility management and operations organization-wide within the rubric of a sustainable business framework. During this stage the CSG meets with and promotes the benefits of developing and implementing better management, full cost pricing, water efficiency and a watershed approach within a framework related to operations, infrastructure, customer satisfaction, community welfare, natural resource stewardship, and financial performance. The group offers information, assistance, resources and support along with reviewing effective management approaches and systems known to help water and wastewater utilities manage more effectively.

3.6.2 Interagency review

The IRP provides an opportunity for appropriate bureaus, agencies and stakeholders to provide specific input relating to the proposed project that may be beneficial during the funding decision making process. The assigned CSG representative coordinates the gathering and organizing of all interagency input and comments. The information gathered is added to all other project relevant information gathered from various sources and compiled into a Proposed Project Portfolio (P3).



3.7 Sustainability action system

Proposed projects not meeting the SSI during the IPE stage that are not considered fundable or ready to proceed at this are entered into the Sustainability Action System (SAS). This system captures, organizes, classifies, stores and retrieves the data. Utilizing information from the SAS the CSG develops an Action Checklist (AC) with recommendations to the proposing community for various actions that may be worth considering so as get the proposed project back on track and increase the likelihood of funding in the future. The CSG contact meets with and informs the community concerned about the status of the proposed project and to consider ways to *bridge the gap* between the community's current situation and actions that may move the project toward meeting minimum funding criteria.

3.7.1 Action checklist

The AC or assistance schedule clearly indicates specific action steps that the applying community may take to strengthen the viability and/or fundability of a proposed project. The CSG contact works with community leaders, local officials, assistance providers and interested stakeholders prioritizing and planning actions to get on the fundability track. The CSG point person bring to the attention of the community resources, services and associated assistance which may be mobilized in support of the community's efforts to become fundable.

3.8 Proposed project portfolio

The P3 is a compilation of all information generated from the various sources throughout the SWIM process. The P3 is an in-depth overview of the proposed project along with information concerning the project's viability, fundability and readiness to proceed. Ideally, a P3 will provide information on the compliance status and overall technical, managerial and financial capacity of the system along with supporting information in connection with efforts to move toward sustainability. Ultimately, the P3 package is the CSG script for making the case for a given project from a candidate community to prospective federal and state funders at the Water Infrastructure Funders Forum (WIFF).

3.9 Water infrastructure funders forum

The CSG convenes, oversees and administers the WIFF. Periodically, federal and state funders meet to review and consider proposed projects. Priority for funding primarily focuses projects on that are so-called "*Shovel ready*" which are in harmony with the State Water Plan. Prioritized consideration may also be given to projects that can be completed in a timely manner utilizing the funding that may be freed-up. Federal and state funding agencies also take into consideration agency specific program goals, funding criteria, eligibility parameters, funding cycles, priority listings and any other project specific issues. During the WIFF prospective funder's work together to consider the most



effective way to cobble together potential combinations of grant/loan funding bundles so as to leverage scarce water infrastructure dollars and optimize outcomes. Should further requests for information be generated by funding agencies at the time of the WIFF the CSG coordinates the gathering and submission of such information.

3.10 Project funding

Federal and state funders working cooperatively develop possible funding packages for proposed projects. Communities meet with specific funders to discuss proposed funding bundle options of leveraged packages available. Communities contrast, compare and consider the benefits of each funding option on offer. When the parties agree on a funding package the community reminded of their need to continue their commitment to sustainability through better management, full-cost pricing, water efficiency and a watershed approach.

4 Conclusion

Since inception over 800 water infrastructure projects representing more than \$3billion of need have been logged into the so-called WINS knowledge bank through the SWIM process. To date, more than 200 water and wastewater projects have been directly or indirectly funded. The CSG plays a pivotal role in continuing to coordinate the mobilization of assistance to communities striving to meet compliance requirements and seeking to enhance overall technical, financial and managerial capacity to meet funding criteria. The CSG is also instrumental in assisting communities developing long-term sustainability plans. Communities are increasingly utilizing the WIP enabling New Mexico's water infrastructure knowledge bank to continue to grow gathering important water infrastructure project needs information. This data is providing actionable information for long-term strategic statewide water planning efforts as well as resource allocation purposes. This integrated interagency effort continues to gain traction through increasingly broad-based institutional cooperation, interagency collaboration and community buy-in. SWIM is a novel approach integrating planning and project prioritization processes to fund sustainable water infrastructure solutions and bring about secure and sustainable water infrastructure by ensuring effective ongoing collaboration, consultation, coordination, cooperation, communication, planning, prioritization and consistent funding for water infrastructure in New Mexico.

References

- [1] Matson, D. Governor's Drought Task Force Programs Manager, *New Mexico Drought Task Force, New Mexico Drought Plan*, p.1, 1999.
- [2] Western Governors Association, *Drought Response Action Plan*, pp. 2-5, 1996.
- [3] NM. Exec. Order *No 1998-041* (October 9, 1998).



- [4] NM. Exec. Order *No 2002-19* (April 27, 2002).
- [5] D'Antonio, State Engineer, *Next Steps for Drought Management*, Drought Summit, September 2003.
- [6] Rivera, B. *New Mexico Drought Task Force, New Mexico Drought Plan*, Sec 5. p.1, 2002.
- [7] D'Antonio, J. *New Mexico Drought Task Force, New Mexico Drought Plan*, pp. 3-14, 2004.
- [8] NM, Exec. Order *No 2003-019* (May 30, 2003)
- [9] *New Mexico Drought Summit*, UNM Continuing Education Center, Albuquerque, NM, September 16, 2003 www.nmdrought.state.nm.us
- [10] D'Antonio, J. *New Mexico Drought Task Force, New Mexico Drought Plan Update*, pp.3-5, 2005.
- [11] NM, Exec. Order *No 2005-031* (May 30, 2003)
- [12] Cervantes, J. *NM State Legislature, House Joint Memorial 86*, 2005 (November 2005)
- [13] NM, Exec. Order *No 2006-012* (March 5, 2006)
- [14] D'Antonio, J. *New Mexico Drought Task Force, New Mexico Drought Plan Update*, Appendix G, 2006
- [15] NM. Exec. Order *No 2007-050* (October 31, 2007)
- [16] United States Environmental Protection Agency, Office of Water, *Sustaining Our Nations Water Infrastructure*, EPA-852-E-06-004, August 2006
- [17] <http://www.nmenv.state.nm.us/> accessed January 24, 2011
- [18] http://ufa.nmenv.state.nm.us/APPLICATION_open.php accessed January 24, 2011

