baywork

bay area water/wastewater
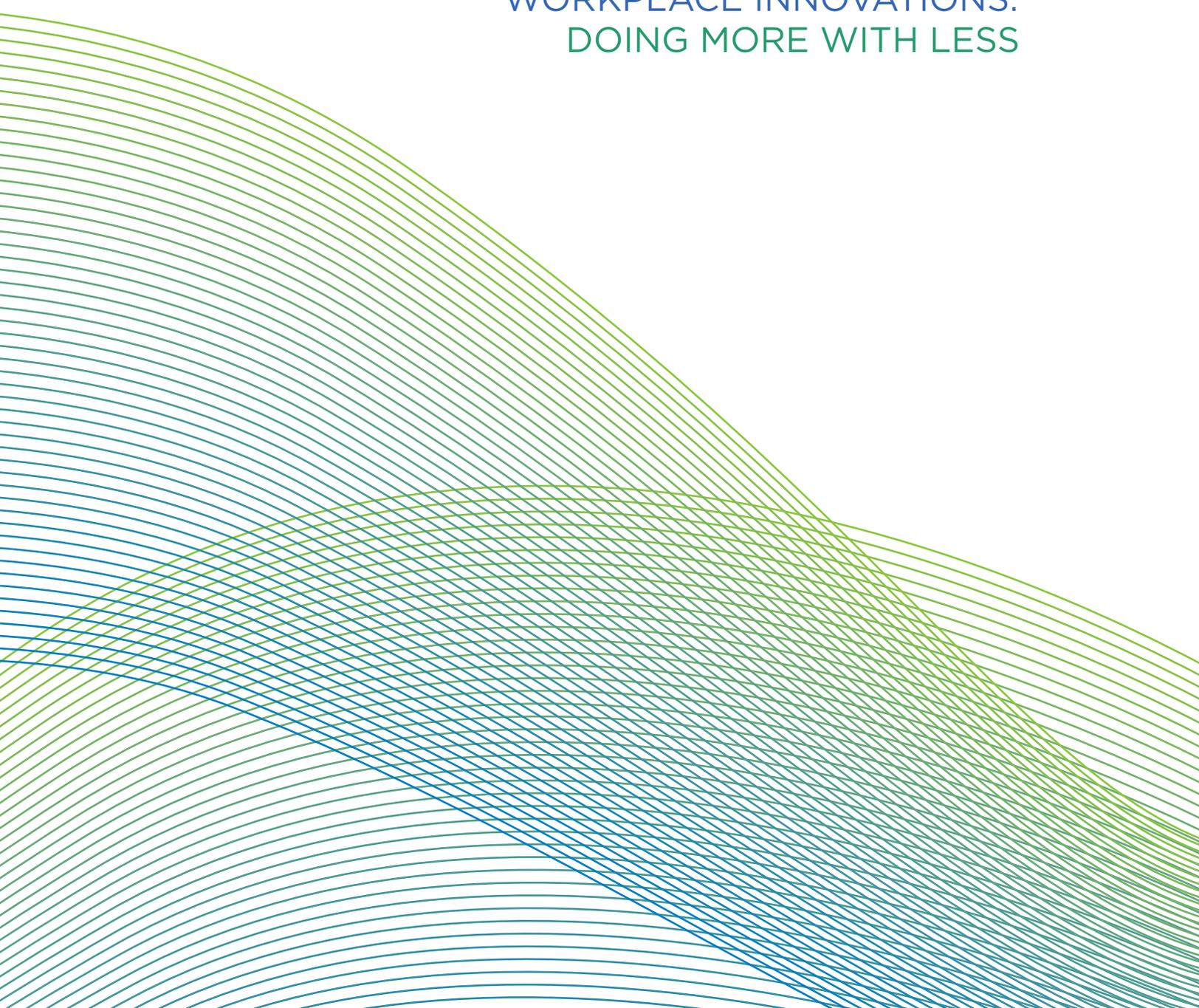workforce reliability

BAYWORK WHITE PAPER
WORKPLACE INNOVATIONS:
DOING MORE WITH LESS

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I. INTRODUCTION

BAYWORK, a collaboration of Bay Area water and wastewater utilities working together to create the workforce of the future, has developed a Roadmap which includes four strategies for supporting operational reliability:

Strategy 1 Get enough of the right people in mission-critical categories
Strategy 2 Provide staff with the information they need to do quality work
Strategy 3 Modify work processes to optimize use of available staffing
Strategy 4 Maximize the cost-effectiveness of workforce development investments through collaboration

Strategy 3 reflects our recognition that in a time of significant staff turnover, reduced revenues, and technical and regulatory change, forward-looking utilities that are serious about reliable customer service need to do more than find new people to perform work the old way. The qualifications, knowledge, and skills of workers entering the workforce to replace exiting Baby Boomers, combined with expanding options for use of information technology, create both the opportunity and the necessity to look for innovative ways to meeting ongoing responsibilities.

This report reflects a two-pronged effort by BAYWORK to investigate options for workplace innovation:

- A survey of workplace innovations implemented, in process, or being considered by Bay Area water and wastewater utilities (conducted by BAYWORK's Strategy 3 Committee) and
- A workshop to discuss these innovations and possible opportunities for the future (held November 3, 2010, in Foster City, California).

II.   SURVEY FINDINGS

BAYWORK focused on three primary approaches to modifying work in order to optimize use of available staffing:

- Increased use of information technology;
- Modification of work processes and classifications; and
- Organizational changes (e.g., inter-agency agreements).

The survey was distributed to water and wastewater utilities in six Bay Area counties. A copy of the survey form used to collect information on workplace innovations attached.) Sixteen utilities responded, providing information on 27 different workplace innovations. Some innovations included multiple components (e.g., increased use of technology plus a modification of work classifications). The utilities which submitted surveys were the following:

AGENCY NAME	AGENCY LOCATION
Contra Costa Water District	Concord, California
Ross Valley Sanitation District	San Rafael, California
San Francisco Public Utilities Commission	San Francisco, California
Union Sanitary District	Union City, California
East Bay Municipal Utility District	Oakland, California
San Jose / Santa Clara Water Pollution Control Plant	San Jose, California
City of Foster City / Estero Municipal Improvement District	Foster City, California
City of Daly City	Daly City, California
North Coast County Water District	Pacifica, California
North Marin Water District	Novato, California
City of Pittsburg	Pittsburg, California
San Jose Water	San Jose, California
San Leandro Water Pollution Control Plant	San Leandro, California
Santa Clara Valley Water District	San Jose, California
City of Sunnyvale Water Pollution Control Plant	Sunnyvale, California
Zone 7 Water Agency	Livermore, California

The survey described twenty-two workplace innovations that had been implemented; two whose implementation was in process; and three innovations which were recommended for future consideration. Some innovations included multiple components, but the tool most commonly cited was increased use of technology. Modification of work processes and classifications were cited almost as frequently.

There were also seven examples of inter-agency agreements and administrative changes. Interestingly, these were higher proportionately

among the "potential" workplace innovations than among those already implemented. This may indicate that the decentralization of water and wastewater services among various municipalities, districts, and private entities makes it easier for utilities to implement technical changes they can implement alone than changes which require cooperation among diverse organizational entities.

Examples of increase use of information technology were the following:

- Use of geographic information systems (e.g., by the San Jose/Santa Clara Wastewater Treatment Plant, the City of Pittsburg, and Contra Costa Water District) to reliably document and locate transmission and treatment infrastructure;
- Use of handheld devices to enter, access, and update work order information at the City of Sunnyvale's Water Pollution Control Plant;
- East Bay Municipal Utility District's use wiki software as a knowledge management tool, and creation of a web portal with information from diverse data bases;
- Santa Clara Valley Water District's use of hand-held devices to enter condition assessment data on facilities;
- The San Francisco Public Utilities Commissions (1) use of rugged laptops permanently mounted in the service vehicles of crafts workers (implemented) and (2) automated meter reading project (in process);
- San Jose Water's use of mobile workforce management system that increases efficiency by combining information on work orders with information on the field location of staff; and
- Union Sanitary District's plan to explore options for downloading instructional videos to hand-held devices to make them available for just-in-time training.

In reports on modified work processes and classifications, several innovations reflected current pressures to reduce staffing to address fiscal constraints. For example, Contra Costa Water District had implemented a program to re-evaluate classifications whenever a position was vacated. Similarly, the City of Foster City and Estero Water District had been able to reduce the overall size of their combined workforces through consolidation of responsibilities. East Bay Municipal Utility District had modified an in-house training program to begin at a higher entry-level classification in order to save in-house training costs, and had modified the hiring conditions for entry level wastewater operators and operators-in-training to require completion of pre-defined training requirements within a specified time period. Daly City had increased its operational flexibility by combining their water and wastewater treatment classifications. North Marin Water District had restructured its construction, operations, and maintenance groups, and had developed a rotational work program to expand the competencies of workers and increase flexibility on staff assignments.

In the category of organizational changes, there were many references to changes to the organizational culture of specific agencies. For example, a survey from North Coast County Water District discussed the benefits of creation of a learning community which reflected the principles of (1) zero degrees of separation based on organizational hierarchy; (2) learning from each other and those outside the utility, (3) active commitment to cross-training, and (4) use of interns. Santa Clara Valley Water District's survey reflected an investment in quality improvement processes (e.g., ISO 9001 and 14001 documentation and Malcolm Boldridge quality control processes).

However, some surveys reflected changes to divisions of labor among separate organizational entities. For example, the City of Foster City had partnered with Estero Municipal Improvement District to provide more efficient maintenance of streets, storm drainage infrastructure, levees and lagoons, and water and wastewater treatment. Additionally, Foster City had negotiated with a private business to abandon public ownership of a set of facilities (e.g., water mains and storm drains), with the option for the business to contract with the City for maintenance of the facilities.

Additional ideas for possible partnering between water and wastewater utilities were also suggested. For example, it was suggested that in situations where multiple wastewater agencies in a geographical areas provided wastewater and collection services, it might be feasible to replace their current model for graveyard shift staffing (a single operator with call-in of a second as needed) with roving multi-site capable employees who could work on preventive maintenance at one (rotating) plant and be available to fill in at others. Responsibility for providing the multi-site capable employees would rotate among participating agencies. Another suggestion was to increase inter-agency flexibility in sharing of resources (staffing, equipment, and supplies) on a more ongoing basis, rather than limit such collaboration to disaster scenarios.

In general, the factors motivating the changes described in the surveys and the workshop were the following:

- Improved staff efficiency in performing work, to improve customer service (e.g., less outage time during routine and emergency repairs);
- Cost savings;
- Increased operational flexibility in utilization of existing staff resources (e.g., through cross- training and combination of classifications);
- Improved staff morale (e.g., through elimination of uncertainty about the location of infrastructure:
- Improved performance accountability (e.g., in relation to completion of work orders); and

- Upgraded maintenance of facilities (e.g., use of hand-helds to gather information on condition assessments).

Barriers and challenges were also reported. Resistance to change among staff affected (e.g., to increased use of computers or changes to job expectations) was common. New tools also required different types of staffing support. For example, San Jose's use of GIS technology required support from an in-house team of experts familiar with Geographic Information Systems, Global Positioning Software, Ground/Penetrating Radar, and Conductive/Inductive Pipe location techniques. Other barriers to increased use of information technology included cost and the need to find hardware and software consistent with the business need (e.g., field conditions). In many cases, the challenge was not funding the information technology tool, but locating the information (given poor records and the loss of knowledgeable employees) and/or motivating current staff to use the tool to document what their knowledge.

Changes to performance expectations of employees sometimes required involvement of human resources staff and/or unions. Development of new relationships with new partners (e.g., community colleges, private businesses, and other utilities) often required negotiations and written agreements.

It was also necessary to provide the staff training needed in order for current staff to perform their work in new ways. In many cases, this involved upgrading the computer literacy of staff. However, in some cases job classifications were being broadened so that an employee was expected to acquire a wider range of technical knowledge, skills, and perhaps credentials (e.g., when a classification was created for a combined water/wastewater treatment operator). It was not enough to change the work—it was also necessary to provide employees with the skills needed to make the change.

The surveys and presentations provided by the pioneering utilities contributed to the study and the workshop included the following Lessons Learned:

1. *"Generally, staff are initially reluctant to use new techniques but through training they buy into the improved work environment."*
   Contra Costa Water District

2. *"[In attempting to make more integrated use of centralized data] you will always under-estimate the amount of time it takes to handle the sheer volume of data."*
   East Bay Municipal Utility District

3. *"It [comprehensive use of Geographic Information Systems] takes a lot of hard work and can't be done using outside consultant or*

interns on a one-time basis. It has to be done by GIS professional staff who are knowledgeable about the plant. Do not depend on record drawing as they may not reflect actual field conditions. Staff need to be knowledgeable about related GIS technologies. There was a 12-month learning curve to become familiar with plant facilities, assets and processes. Success cannot be achieved without the support of upper management. It takes aggressive dedication to field collection work and not being afraid to get dirty/smelly. It's an ongoing endeavor, not a one-time effort. It takes a personality that is keen to do what we call "detective work;" this involves questioning key staff on what they know, not once, but many times in many different ways over a period of time.
City of San Jose

4. *"Handhelds are relatively efficient for transaction with low amounts of data, such as preventive maintenance and "housekeeping" items… A test group to pilot the hand-helds would have been useful to identify and resolve "bugs" in the programming before the software product was released to a wider group of operators and mechanics.*
City of Sunnyvale Wastewater Pollution Control Plant

5. *"Complete a needs assessment prior to purchasing the hardware and software necessary to produce videos. Get management guidance on their expectation of what a good video looks like. Determine critical videos that you desire and do them first."*
 Union Sanitary District

6. *"[In use of automation via instrumentation and control systems] request early involvement of individuals with ownership and knowledge (such as technicians). End user input will eliminate communications problems and increase understanding of the process."*
San Francisco Public Utilities Commission

7. *"[In implementing Advance Metering Infrastructure] you should (1) ask for and manage realistic deadlines, (2) build relationships with other utilities, learn from their do's and don'ts, and adapt according to your own utilities needs and resources, and (3) provide enough flexibility in the contact to modify processes as needed for field efficiencies and streamline operations, but make sure the utilities utility's expectations are met and risks are covered."*
San Francisco Public Utilities Commission

8. *"[In development of a new training program] involvement of subject matter experts is key; their contribution needs to be acknowledged. Training opportunities are offered, but new*

employees need to understand that it is their responsibility to take advantage of them. Not every excellent operator makes an excellent trainer. A training program requires active management".
East Bay Municipal Utility District

9. *"[In order to develop a combined water/wastewater treatment classification we] cannot stress enough the importance of maintaining open dialogue at all times during the transition process. Open discussions helped facilitate interest and involvement: Never speculate. If you don't have an answer say so, and get back to the person when you do. Some speculative "in my opinion" comments were not helpful and had unintended consequences, so care is needed to remain factual with what you know".*
   City of Daly City

10. *" Culture changes can work if you are patient, focused, and persistent. One thing that definitely works is demonstrating the advantage of a proposed change so that those being requested to change have the opportunity to 'buy into' the change. 'Leading by Example' works."*
    North Coast County Water District

III.   WORKSHOP

The BAYWORK Strategy 3 workshop held in Foster City on November 3rd, 2010, provided participants with an overview of survey findings, as well as presentations on workplace innovations in all three topic areas. (The agenda of this workshop, power points presented in the workshop, and a video of the workshop are attached.) The workshop also provided the opportunity for participants to make suggestions about areas where BAYWORK might be able to contribute further to the work of the water industry in terms of workplace innovations. Key issues raised by workshop participants were the following:

How can we broaden the number of Bay Area water industry professionals who are participating in this discussion?

How shall we distribute the information we have gathered, so that it can be used by others?

How can we continue to learn from each other, and from those outside the water industry?

Can BAYWORK help us take a more in-depth look at options for increased use of technology?

IV.   NEXT STEPS

1.   BAYWORK is developing a website which will be used to post deliverables associated with the Workplace Innovations survey and workshop: individual surveys, a matrix summarizing survey results, this White Paper, the agenda and power-points associated with the workshop, and the video of the workshop. The website will also be used to update water/wastewater utilities and the stakeholders involved with workforce development on BAYWORK workshops, meetings, projects, and events.

2.   Based on input from workshop participants both during and subsequent to the workshop, the theme for the Third West Coast Water Utilities Workshop on Workforce Development will be Increased Use of Information Technology to Support Workforce Development. Several workshop participants have agreed to serve on the planning committee for this workshop. The tentative format which has been discussed is below:

   A. Morning

   Four sets of panel presentations (one for each BAYWORK strategy) would be held in which participants would provide examples of use of information technology to support the objectives of the strategy. Each panel would include one participant from outside the water industry, In each panel, one participant would be from outside the water industry, to widen our perspective on available options.

   B. Afternoon

   Facilitated work sessions on individual information technologies (e.g., geographical information systems, hand-held devices, automated meter reading, mobile laptops, wiki technology and record management systems, video technology, and use of on-line training). Subject matter experts would be designated to facilitate the sessions, but the intent would be for each participant to discuss ideas they are considering or have tried, their barriers and challenges, their questions about use of the technology, and any lessons learned.

3.   Continued active dissemination of BAYWORK deliverables relating to workplace innovations, through meetings, workshop, publications, and conferences at the regional, State, national, and international level.