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UTILITY ADVISORY SERVICE Carolio

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DELIVE

How Business Intelligence is Bridging the Divide between Analysis and Presentation of Data

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Filling the Resource Gaps through Augmentation: Providing the Right Blend of Expertise and Staffing Assistance for **Cost-Effective Project Management**

plus

A Minute with **UAS Leaders**

Utilizing DBO for Santa Barbara's Desalination Facility

CPM Provides **Powerful Program** Management Toolkit | a Large CIP Project

Taking the Sting Out: How to Fund

How to Manage Aging Assets and Plan for the Future Introducing Carollo's new Technical Practice...

ADVISORY SERVICES

The combination of the Program Management Group and the Business Solutions Group

To further meet the needs of both our clients and Carollo's client services managers - while expanding our market presence within the management consulting arena – we have consolidated two technical practice areas: the Program Management Group and the Business Solutions Group. This consolidated group of experts is now known as Utility Advisory Services (UAS).

This new technical practice structure will allow us further integrate our capabilities within program planning, project delivery analysis and procurement, program controls, project management, finance and economics, asset management, and organizational support. We are here to help you further develop and grow the program management, owner's advisor, and management consulting markets. The benefit? We can better convey that Carollo is the provider of all necessary management support services across the interconnected disciplines within their organizations.



A MINUTE WITH UTILITY ADVISORY SERVICES LEADERS - SCOTT VANIER **AND KYLE RHORER**





Scott V.

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<u>(carollo</u>

Public agencies across the country continue to face challenges with capital project funding, large program planning, and project implementation. Staffing shortages and the loss of experienced management, engineering, and operations staff due to retirement or cutbacks make successful implementation of an agency's "once in a century" project very difficult to achieve.

To respond to these challenges, Carollo combined our Program Management and Business Solutions Groups into a new Practice: Utility Advisory Services (UAS). UAS leaders, Scott Vanier and Kyle Rhorer, briefly introduce UAS.

Q. Why launch the UAS practice now?



"Staff attrition is a huge issue with our clients, and UAS can help them continue to execute large-scale projects. This is true not just for project coordination, but financing issues as well. The UAS "toolkit" can help our clients meet these growing challenges."

Q. How is UAS different from traditional program management services?

"Traditional program management simply deals with how a project gets done. UAS helps a client decide if and when the project should be done. By focusing on the "big picture," we can help our clients make the best decisions for their agency and customers. In this issue of Currents, you'll read more about how Carollo's UAS group helps our clients focus on their "big picture," so they can make the best decisions for their agency, facilities, and customers."



Q. How can the UAS practice help clients overcome staffing shortage issues?



"Our goal is to support our clients, not take over their facilities. Carollo's UAS group can provide as much or as little help as a client needs or is comfortable with. Whether it's operational, financial, or just giving a second opinion on something, we have the staff, skills, and experience to make a difference for our clients."



UTILIZING DESIGN-BUILD-OPERATE FOR THE REACTIVATION OF SANTA BARBARA'S DESALINATION FACILITY

by Jason Garside, P.E. (jgarside@carollo.com)



(City) has experienced the consequences of an extended severe drought. The City's Long-Term Water Supply Plan included a drought plan that required reactivation of its existing seawater desalination facility and rehabilitation of its ocean water intake. The existing desalination facility was constructed from 1991-1992 in response to a prior severe drought that lasted from 1988-1992, but was placed in long-term standby mode in 1996.

Reactivation of the City's desalination facility faced numerous challenges, including fast-tracked design and construction and the City's lack of staff with experience in seawater reverse osmosis (RO) treatment plant operation. In consideration of these challenges, and with assistance from Carollo, the City completed a project delivery alternatives analysis that resulted in the selection of design-build-operate (DBO) delivery. It was determined that DBO delivery afforded the City the ability to accelerate the project schedule, receive operations and maintenance expertise from a firm specialized in seawater desalination, and assign the risk of project implementation and operation to a single point of responsibility (i.e., the Design-Build-Operator).

Upon the City's selection of DBO delivery, Carollo assisted the City in procuring a Design-Build-Operator, which involved developing the procurement documents (request for qualifications, request for proposals, and supporting documentation) and executing the steps necessary for selection of a Design-Build-Operator that provides the best value to the project and the City. As part of communicating the project technical requirements to prospective Design-Build-Operators, Carollo evaluated the existing condition of the desalination plant's facilities and equipment, identified the necessary permits, and developed a preliminary engineering report. Finally, Carollo collaborated with City staff and its outside legal counsel to confirm that the appropriate terms and conditions were included in the DBO contract, including consideration of the operations and maintenance, chemical and electrical usage, and water quality performance requirements that serve as the basis for the Design-Build-Operator's responsibilities.

Carollo continues to serve the City by overseeing the Design-Build-Operator's activities during design, construction, performance testing, and throughout the first year of plant operation. This effort illustrates Carollo's commitment to serving its clients by using its expertise and management skills to meet the needs of a complex project and delivery approach.

Carollo Project Manager Provides Powerful Program Management Toolkit

by Dan Baker, P.E. (dbaker@carollo.com)

Carollo has developed an industry-leading project management information system, called Carollo Project Manager (CPM), which implements standardized project management processes in a powerful and customizable web-based toolkit. CPM is based on the latest generation Microsoft[®] SharePoint and Office 365 technologies that integrate seamlessly with existing networks, information systems, and databases. CPM utilizes advanced security protocols to allow teams to collaborate using the system, including agency staff, contractors, and the public, while reserving access to sensitive project information only to those who have appropriate permissions.

CPM tools are being successfully utilized by hundreds of owner, consultant, and contractor staff on programs as diverse as City of Houston, TX, Northeast Water Purification Plant Expansion; Hi-Desert Water District, CA, Wastewater Reclamation Project; and City of Sacramento, CA, Accelerated Water Meter Program. Some key functions of CPM include:

PROGRAM DASHBOARDS	cPM includes customizable dashboa project performance, including metri capabilities provide powerful busines
SCHEDULE MANAGEMENT	Current schedules for the overall pro- industry-standard scheduling softwar deliverables can be updated and track
BUDGET/COST MANAGEMENT	CPM's powerful tools for managing a accounting requirements and allow for
RISK MANAGEMENT	CPM Risk Registers optimize progra qualitative and quantitative assessme
DOCUMENT MANAGEMENT	Web-based document management to folder structures, naming convention
REPORTING	As the centralized repository of prog reporting project performance on est easily configurable report templates.
	 Project stakeholders receive updates throu mitigation strategies, and financial impacts \$1.3-billion Northeast Water Purification
 ◆ Carollo's CPM tool tracks and reports progress on the City of Sacramento's \$230-million Accelerated Water Meter Program. CPM facilitates a collaborative project team across more than 25 construction projects and provides real-time information to all stakeholders. 	
	Received and Recei

ards that present executive summaries and data rollups of current rics of schedule, cost, and risk. Graphical charts with drilldown ess intelligence and data mining tools.

ogram and individual projects are integrated into CPM from are (i.e., Primavera P6, Microsoft[®] Project). Milestones and eked using simplified lists and Gantt charts.

and tracking actual expenditures versus budget conform to for easy reporting to key stakeholders.

am success by managing potential program risks, conducting ents, and identifying mitigation and response strategies.

tools are a core function of CPM, including standardized file and ns, and version control.

gram data, CPM provides the platform for documenting and tablished frequencies with









How BUSINESS INTELLIGENCE is

Bridging the Divide between Analysis and Presentation of Data

In the water and wastewater industry, it is exceptionally important to communicate the progress and impact of our work to a diverse set of stakeholders. Engineers, managers, councils, boards, and the general public all carry a vested stake in the work we do, whether it is a major designbuild, or a cost-of-service rate study. When communicating complex data analyses, results must balance nuance and specificity with accessibility and clarity in order to successfully connect with a broad, community audience. Business Intelligence (BI) tools offer an alternative approach to addressing this longstanding challenge of data communication by simultaneously serving as the tool for both analysis and presentation of data.

From Static to Dynamic: Building Applications Instead of Reports

BI platforms, such as Tableau and Power BI, have increased in popularity over the last several years. BI is essentially a new approach to "dashboarding" software, where users can create interconnected screens that present multiple data analyses, and toggle different scenarios and views to focus on the most important piece of information. While this previously required extensive programming and ongoing support to implement, these latest platforms have allowed users at all levels of utility management to not only interact with these dashboards, but develop and customize them as well. This allows us to present our data in a clear and concise reporting tool with carefully selected figures. When we need to change our report and meet a fast turnaround, BI streamlines the revision process, and allows quick, almost seamless updates to our data visualizations without the need for multiple platforms or extensive coding.

> The dynamic capabilities of BI platforms allow users, including the client, to make on-the-fly adjustments to underlying assumptions, such as inflation rates or demand levels, and immediately view the impacts. Instead of delivering a static PDF report with numerous scenarios spread across multiple sections, imagine delivering a web-based dashboard where the end-user can conduct a side-by-side review of those same scenarios simply by setting a few filters and see results in seconds, focusing only on the most relevant questions to that user.

Flexible and Versatile: Handling Data in its Native State

Prior to BI, unifying disparate data sources and communicating overlapping analyses meant developing several outputs from multiple staff members–GIS layers from one department, billing summaries from another, and operational data from another. With BI, however, we can connect directly to the raw data sources. For instance, we can unify GIS data with water billing data to highlight conservation opportunities geographically and bolster the revenue program.

CASE STUDY: Utility Beach, Florida

Like many utilities, Boynton Beach Utilities sought to streamline its data workflows and identify new, efficient ways of working with them. In the past, staff had to keep tabs on multiple data files and ensure the inputs were up to date. To streamline these processes and increase efficiency, Carollo built a new planning tool with BI software that enables operational, capital, and financial planning in one web-based platform. The tool allows staff members to model capital planning scenarios, monitor financial metrics and funding needs, and identify the expected rate impacts of any project implemented. Boynton Beach now has a data analysis tool that not only keeps data sources corrected and updated, but also allows multiple staff members to simultaneously plug-and-play different scenarios and view the impacts. This enables better-informed decision making.

The current data revolution is really shaping all industries, and ours is no different. With these latest suite of BI tools, utility managers can leverage this shift to their advantage and have better data insights at their disposal.



Our industry's ability to

analyze data has been far outpaced by the rate of data collection in the past several years. More data is available than ever before, thanks to rapid technological development: supervisory control and data acquisition (SCADA), flow statistics, online monitoring, air flows, and computerized maintenance management system (CMMS) data to name a few. Business Intelligence is helping us bridge these data sources and identify insights in these previously unanalyzed datasets.

DATA VISUALIZATION

REPORTING

by Mark Panny (mpanny@carollo.com)

CASE STUDY: Utility Management Optimization Plan, City of Boynton

With the new ability to quickly and seamlessly integrate geographic data with other data sources, Carollo can identify new trends that were previously unanalyzed. We have developed a tool that allows one agency to look at demand trends, and identify conservation opportunities within its service area.



FILLING THE RESOURCE GAPS THROUGH AUGMENTATION: Providing the Right Blend of Expertise and Staffing Assistance for Cost-Effective Project Management



Staff augmentation involves filling a program or project organization's resource gaps, bringing the right resources. skills. and



(1) Full program management professional program manager and governance support, comprehensive program and project control systems, document control systems, and other services.



are typically less staff provide specialist advice only when needed.

Water and wastewater utility owners often have to plan for and implement large capital improvement programs (CIPs) to address aging infrastructure and regulatory compliance issues. However, many owners lack the internal expertise, CIP-tailored management tools, and staff to meet these programs' demands. Utilities also quickly realize the impracticality of "staffing up" internally because the staff is needed short-term, is highly specialized, and is in high demand, and staffing needs change significantly throughout a project. Furthermore, owners need experience-based oversight and management support to manage staff and provide the necessary tools, processes, and procedures to finish the project.

To meet these needs, owners often turn to experienced consulting firms like Carollo and its Utility Advisory Services (UAS) group. As mentioned in the Introduction, UAS helps owners identify resource gaps in program delivery staffing and provides the right blend of specialists (consists of both clients and consultants) to meet those needs. This staff augmentation is often more effective and economical than stand-alone full-scale program management teams.





Acquisition/ Right of Way Program Delivery Team Environmenta Deputy Program MGR (OPM) ogram Design Coordinator (OP (CIP + Pe

Utility Provided Blended Staffing (Utility plus Staff Augmentation)

Program

Staff Augmentation

Carollo filled key management and technical roles of the City of Houston's \$1.3-billion Northeast Water Purification Plant program. The blended City/ Carollo team was an effective strategy for managing and delivering the largest single-contract water or wastewater project in the United States.



For the Metro Wastewater Reclamation District's, Denver, CO, \$475-million Northern Treatment Plant Program, Carollo helped with comprehensive management services through a

Advisor, helped the Metro Wastewater Reclamation District meet its staffing needs through each phase of the Northern Treatment Plant project. The graph illustrates the changing manpower needs over time.

Staff augmentation can also fill gaps in financing and rates, project delivery and packaging analysis, designer and contractor procurement, permitting, and many other services. The staff augmentation required depends largely on the complexity of a given program, the owner's capacity to staff delivery requirements, and the owner's desired program management approach.

There are a wide variety of program management approaches that owners can choose to deploy. Full program management and owner's advisor services are common approaches and represent different degrees of assistance. Each of these approaches is briefly described below.

Full Program Management Services

For programs and utilities with deeper staffing needs, near or full program management services are most appropriate. These services typically provide a professional program manager and governance support, comprehensive program and project control systems, document control systems, and other services. They usually entail full-time staff and can be completely contracted or, more commonly, involves a blended team of utility staff and the necessary program management staff.

This illustrates the full spectrum of program management approaches, from full program management to owner's advisor. A utility can use any approach along this spectrum.

08 //

by Lynn Norton (Inorton@carollo.com)

Owner's Advisor Services

Owner's advisor services are typically less staff intensive and are tailored to provide specialist advice only when needed. Typically, a few key full-time consultant-provided staff, supported by "reach back" specialists, is brought in to help with specific program tasks when needed. The number and types of staff vary widely with each program.

Because many utilities have little or no experience with alternative project delivery, they also use owner's advisor services for help analyzing, procuring, and implementing the best delivery method. With this approach, specialists are brought in, as needed, to evaluate and implement design-build, progressive design-build, and construction management at-risk delivery methods.

Few utility owners can handle the multiple complex projects of a major CIP program without help. Staff augmentation, involving Carollo's UAS group, can meet a utility's program management needs with specialists who can manage the programs and tailor them to their unique needs to deliver a well-managed program benefiting all parties involved.



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Taking the Sting Out: MOW TO FUND a Large CIP Project

by Jennifer Ivey, P.E. (jivey@carollo.com)

The Oklahoma City Water Utilities Trust (OCWUT) serves a population of over 1.2 million with approximately 200,000 water accounts and 185,000 wastewater accounts. OCWUT's water and wastewater operations are financially self-sufficient with funding for operating and capital requirements derived primarily from rate revenues and other miscellaneous charges. OCWUT plans to construct a second 100-mile raw water pipeline at a cost of nearly \$1 billion, \$614 million of which is anticipated to be spent during the next 5 years as shown in the figure below.

Like many utilities, OCWUT is faced with the challenge of funding a large CIP project while trying to minimize the impact on its customers' bills. Carollo is completing the second phase of a study to determine rates and charges required to generate sufficient revenue for the raw water pipeline. By looking ahead and implementing annual revenue increases, OCWUT is able to avoid a large revenue increase that can cause rate shock and a downward spiral of decreased usage and revenues.

Phase 1 resulted in a 3-year rate plan and financial strategy to satisfy all requirements through level system adjustments over a 10-year period, blending the use of cash and debt financing with a target of 40% cash and 60% debt and maintaining credit ratings. The compounding effect of annual revenue increases also creates a much healthier revenue level by the time construction begins, so funds are available to make additional debt service payments and meet debt service coverage requirements for

To ensure equity among customers, Carollo allocated costs associated with the raw water pipeline project to those customers who would benefit from it, so they would be the ones most affected by the increased capital spending. Carollo is also evaluating alternative rate structures in an effort to reduce

the impact on low usage customers.

As a result of the thorough planning and transparent process of Phase 1, the City Council voted to adopt the proposed 3-year rate plan. Phase 2 will recommend a multiyear rate plan to fully fund construction of the raw water pipeline.

Although the raw water pipeline creates a financial challenge for OCWUT, early comprehensive financial planning is helping the utility maintain financial sustainability and avoid rate shock.



How to Manage Aging Assets and Plan for the Future

by David Baranowski, P.E. (dbaranowski@carollo.com)

Located in the eastern part of the San Francisco Bay Area, the Central Contra Costa Sanitary District (CCCSD or District) collects and treats sewage for 471,000 residents and 3,000 businesses through 1,500 miles of sewer pipes covering 146-square miles. As these pipes age and deteriorate, the District must balance costs and customer needs while considering the impacts of rate payers.

To address this challenge, CCCSD collaborated with Carollo to further its Asset Management Program and meet its level-of-service goals in the most cost-effective way by identifying and prioritizing assets to repair, replace, or rehabilitate. The first of two phases was to assess the District's current practices to pinpoint where improvements should be made first. Based on its familiarity with CCCSD and thorough knowledge of asset management practices in the water and wastewater industry, Carollo evaluated the gaps between the District's current practices and industry best practices, highlighting areas of strength and weakness.

As a key part of this effort, a multi-year roadmap of projects and initiatives was delivered, which ultimately helped establish the District's Asset Management Program. A primary objective identified in this roadmap was to develop an Asset Management Plan as part of the upcoming Comprehensive Wastewater Master Plan. To achieve this objective during the implementation phase, Carollo designed a risk-based replacement model for the District's sewer pipes. By using closed-circuit television (CCTV) data, we gathered the information from critical facilities and identified the issues in the aging infrastructure. To meet the sanitary sewer overflows (SSOs) requirements specified by EPA consent decree, we recommended replacing 38 miles of pipes over the next 5 years and 265 miles of pipes over the next 20 years (see the figure on the right).

Carollo's efforts brought many benefits to CCCSD. With the sewer replacement model, CCCSD has a repeatable process in place that allows them to predict the needs of aging pipes and ramp up their replacement rate to meet long-term needs. This process is also more transparent and includes a process flow map showing how information is shared among various groups. As the District moves forward, they will be able to update the model internally and reproduce and refine the results to update future Asset Management Plans. Although managing aging assets can be difficult, with Carollo's help, the District now has a reliable plan to better serve its customers in the years to come.





PUTTING IT ALL TOGETHER

Public agencies looking at a "once in a century" treatment or conveyance capital investment need a project delivery consultant who understands the unique challenges of water engineering and construction.

Carollo's UTILITY ADVISORY SERVICES GROUP

can help you make effective strategic and financial decisions for your capital management cycle, support your staff, and be your advocate when working with regulatory agencies, contractors, and the public.

Let's talk about your next big project, and learn more about how Carollo's ability to bring together a diverse management talent pool can make sure your capital improvement plan is an unparalleled success!

PLAN

DELIVER

IN A WORLD OF GENERALISTS, A WATER SPECIALIST IS WHAT YOU NEED.

- Capital Program Planning
- Project Delivery Analysis and Procurement
- Program and Owner's Advisory Management
- Organizational Assessment and Support
- Program and Project Controls
- Financial and Economic Analyses
- Revenue Recovery and User Rate Analyses
- Asset Management

<u> carollo</u>

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