Pilot Project to Establish a Long-Term R&R Program for Tampa Bay Water

Laura Baumberger, Scott Vanier, Dan Baker, Rebecca Overacre, and Ed Davis

Owners' Perspective

Tampa Bay Water (TBW) was formed by an interlocal agreement among six member governments in 1998 as a response to the "water wars" prevalent among governmental agencies in the Tampa Bay Region at that time. Its predecessor agency, the West Coast Regional Water Supply Authority, was formed in 1974. The original agency found itself in possession of relatively new equipment: originally 13 wells and a groundwater treatment plant constructed in the mid 1970s. As new facilities came on line, agency staff treated all equipment as new, with ongoing preventative maintenance and occasional repairs as needed.

The creation of Tampa Bay Water involved a transfer of all member government wellfields and distribution mains to TBW. Overnight, the total number of agency-owned production wells rose from 89 to 207. The average age of the transferred wells and mains was roughly 40 years. Many of these older wells still had original equipment in place—a testament to the skill of member government staff that kept these facilities operating, although it was soon realized that more than half of these recent additions needed major rehabilitation work.

Starting in 1998, the new agency took on a large-scale, very visible task of recreating the way it did business. Instead of relying solely on groundwater, TBW pursued surface-water treatment from rivers and canals, building a 15-billion-gallon reservoir and a large-scale desalination plant. When the needed transmission mains were added to the equation, the cost of these projects totaled nearly a billion dollars.

In the shadow of these large projects, TBW staff started their own "mini-projects" such as replacing motor starters and pumps, re-roofing and painting many of the more than 200 buildings, replacing isolation valves and pipe, adding air releases and vacuum breakers, and changing electrical services. All of these small projects were designed to get the older wells and equipment "up to par" and on the same footing as the newer wells and pipelines.

In 2008, TBW celebrated 10 years of growth and change. The agency now uses surface and desalinated water along with groundwater to meet the needs of its customers. Operators in a state-of-the-art facility can watch treatment processes in three counties and make needed changes instantly.

The water needs of 2.5 million people are met each day by a system consisting of hundreds of pumps, buildings, and analyzers scattered across three counties with thousands of large valves interspersed along 230 miles of large-diameter water mains. All of this infrastructure must work together to meet the goal of providing quality water to the Tampa Bay Region.

To maintenance personnel who joined the agency in the early 1980s, the "view" of the current system is almost unrecognizable. With realization of the current size, complexity, and diverse age of different components of the system came the understanding that current practice of deciding to replace components based on "gut feeling" and maintenance records was no longer sufficient. When coupled with the steady advance of time and the fact that the "new" equipment from the 1970s and 1980s was nearing the end of its service life, a different approach was needed.

On another front, most infrastructure staff members have been a part of the agency since the 1980s and are approaching retirement. For many, retirement will fall in the five-to-seven-year timeframe. It became evident that a knowledge retention and management effort was needed, as well.

In 2008, agency staff contracted with Carollo Engineers to begin the process of establishing a formal asset management program to better organize the response to the aging infrastructure, formalize and communicate future funding and engineering support needs to others within the agency, and begin the process of formally capturing the existing knowledge of the system.

Project Overview

A fundamental step in the development of an asset management program is to establish a repair and replacement (R&R) program to make long-term decisions on asset renewal and replacement. Developing an R&R program balances the requirements for continuing asset maintenance against the eventual need for rehabilitation or replacement. Establishing such a program can be complex, particularly for those who have not yet adopted an asset management mindset, because of the vast array of options in asset data storage, systems integration, condition assessment techniques, and prioritization methodologies.

This article presents the steps taken by TBW to develop an R&R program for estimating annual R&R funding requirements. The first phase of the project consisted of program visioning and a pilot program for the development and implementation of a system-wide R&R program.

A key component of the project was the upfront visioning workshops that helped determine the direction, format, and procedures of the R&R program. The workshops discussed software/data management options, coordination from other stakeholder departments, and selection of a pilot facility.

After program visioning, a pilot study was performed on the selected facility. A walk-through condition assessment was completed to visually assess the condition of the equipment. Based on information gathered, a risk determination for the individual assets and asset groups was performed to identify the vulnerability and criticality of the assets.

In a final workshop and report, the results of the pilot study were evaluated and a proposed list of facilities to be assessed was developed, based on preliminary asset priorities. To provide a roadmap for system-wide implementation, a schedule was developed to complete the asset inventory, assessment, valuation, and criticality analyses for all facilities.

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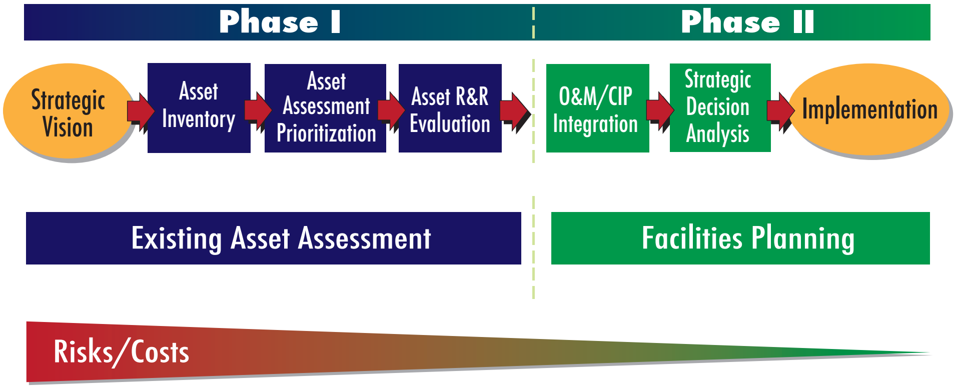

Figure 1: Repair and Replacement (R&R) Program Overview

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Tampa Bay Water R&R Program Objectives

TBW intends to implement an R&R Program to foster and develop its asset management activities and help optimize asset reinvestments. This program also is intended to serve as a communication tool, conveying strong environmental and fiscal stewardship to TBW stakeholders.

In this effort, TBW has identified a need to predict the cost and timing of R&R projects accurately, while minimizing the risk of failure of its assets. The program is also intended to provide a conduit for information sharing between various departments while capturing valuable institutional knowledge from its operations and maintenance staff.

The overall goal of the R&R program is to allow TBW to manage its assets from installation through disposal in a cost-effective manner. The specific objectives are to:

1. Evaluate and update the existing asset inventory.
2. Determine the remaining useful lives of the assets.
3. Establish the replacement costs of the assets under existing conditions.
4. Prioritize R&R of assets with a risk framework by assessing vulnerability and criticality.
5. Provide a tool to better predict and maintain infrastructure in a cost-effective manner.
6. Optimize CIP funding strategy to improve performance while minimizing rate increases.

Overview of R&R Program Steps

An R&R program typically consists of two major phases: existing asset assessment and facilities planning. These two phases are further broken down into seven major steps, as shown in Figure 1. These are: (1) developing a strategic vision; (2) performing a detailed inventory; (3) conducting assessments of facilities; (4) calculating value of the facilities; (5) integrating the repair and maintenance schedule into the CIP; (6) performing strategic decision analyses; and (7) implementing and continuing the asset management program.

R&R Program Software Options

Many options are available for information systems to support the development and management of an R&R program. An information system for such a program must include the ability to maintain an asset inventory, track the condition of assets, determine the risk and priorities for assets, and analyze service lives and life-cycle costs. Both commercial and custom software options exist that can meet these functional requirements.

One alternative to implementing commercial software for an R&R program is to develop custom software that extends the functionality of existing systems. This alternative has been used by many water utilities in the United States, primarily because of the lack of commercial software that meets all the needs and requirements to support a complete R&R program. Although multiple commercial software applications can perform the necessary functions for asset management and R&R programs, TBW has elected to modify its enterprise maintenance management system (EMMS) to include the functionality necessary for an R&R program.

R&R Program Methods & Standards

This section describes the methods and standards used for developing TBW's R&R program. Guidelines are provided for generally accepted industry practice for certain program elements. Other elements were customized for TBW throughout the pilot project.

Asset Inventory Development

R&R programs require a flexible asset inventory that can meet the needs of aboveground assets, which are typically hierarchical

Table 1: Tampa Bay Water Criticality Matrix

Criticality Category	Weight	Negligible = 1	Low = 4	Moderate =7	Severe = 10
Health/Safety for Public & Employees	25%	No injuries or adverse health effects	No lost-time injury or medical attention	Lost-time injury or medical attention	Loss of life
Financial Impact	10%	Absorbed within budget line item.	Absorbed within current budget and under GM signature	Requires Board, approval	Transfer between departments, new borrowing, or impact rates
Impact on Environment/ Regulatory Compliance	20%	100% compliance with permits & no impact on environment	Violation but no enforcement action &/or minor impact on environment	Minor enforcement action &/or moderate impact on environment	Enforcement action with fines &/or major impact on environment
Effect on Water Delivery	25%	No impacts on water delivery or customers	Minor disruption	Short-term; substantial disruption	Long-term impact; area-wide disruption
Ability to Return Asset to Service	20%	Service restored in < 2 hours	Service restored in 2 to 8 hours	Service restored in 8 to 24 hours	Not able to restore service for > 24 hours

in organization, as well as below-ground assets that are linear or point-to-point in organization. For R&R programs, the lowest level of data capture is typically at components that have a value of $5,000 or greater, or assets of great importance or criticality.

The TBW EMMS has an existing location hierarchy and list of equipment or assets. It did require some modification or addition to manage the equipment within this hierarchy. Additionally, the R&R program does not require the level of equipment detail currently contained in the EMMS equipment list.

Condition Assessments

Typically, a visual condition assessment is performed on assets of $5,000 value or greater, or those that perform critical functions. Each asset's likelihood of failure is assessed based on its observed condition. The condition, combined with the original useful life, results in the number of years the asset is expected to remain in service, based on its current condition. Lower remaining useful life corresponds directly to higher vulnerability.

To some extent, assets are also assessed based on obsolescence and availability of replacement parts. While an asset may be in satisfactory condition, unavailable replacement components can lead to that asset being out of service or requiring complete replacement. The condition of each asset is evaluated on a 1-through-5 ranking scale, based on the International Infrastructure Management Manual (IIMM).

Criticality Assessment

Criticality is a measure of the consequence of asset failure. Criticality ranking includes categories based on relative impact of failure. The following five categories were selected by TBW during a project workshop:

1. Health and Safety for Public and Employees
2. Financial Impact
3. Impact on Environment or Regulatory Compliance
4. Effect on Water Delivery and Customers
5. Ability to Respond and Return Asset to Service

Table 1 shows the scoring and weighting factors selected by TBW for use in the pilot study. The matrix may be modified during system-wide implementation as the program progresses. For each criticality category, the score can range from 1 (negligibly critical) to 10 (severely critical). The weight of each criticality category ranges from 10 percent (financial impact) to 25 percent (health and safety for public and employees, as well as its effect on water delivery to customers).

Vulnerability Assessments

Vulnerability is defined as the probability (or likelihood) of asset failure. "Failure" can occur as physical failure (breaking), performance failure (loss of efficacy or efficiency), capacity failure (not capable of meeting increased demands), or technological obsolescence. Accounting for physical failure of an asset as the most basic failure mode, the vulnerability of an asset can be represented by the inverse of the evaluated remaining useful life (EvRUL).

The repair percentages associated with each condition ranking are used to estimate the evaluated remaining useful life for each asset using a typical depreciation relationship. Original useful life (or design life) estimates are made for each asset type, and the number of years remaining are calculated based on the current observed condition, as opposed to the installation date.

Thus, an asset that is observed in the field as being in good condition is expected to have a large percent of its useful life remaining, regardless of how long ago it was installed. This reflects the logic that once an asset deteriorates to a below-average condition, its probability of failure increases and its remaining years in service decline more rapidly than for assets that are maintained.

Risk Assessments

Risk is the mathematical product of the criticality score and the vulnerability probability (defined as the condition fraction); it is a relative indicator of priority/need for corrective action. The equation used to determine the risk associated with an asset is:

Risk = Criticality x Vulnerability

At a minimum, assets with higher risk rankings must be monitored closely for corrective or preventative action, including maintenance, repair, or replacement. Based on the risk calculation, the maximum risk score an asset can have is 10 (assuming an asset with a remaining service life of one year or less and a criticality score of 10); the lowest risk score an asset can have is 0.01.

Replacement Cost Estimates

Replacement values are in-kind estimates of the total project cost to purchase and install similar assets. Final replacement costs will depend on actual labor and material costs, site conditions, productivity, market conditions, and other factors. Consequently, the final project cost may vary from the estimates included in the R&R program. Because of these factors, funding needs must be reviewed carefully before making final financial decisions. When rehabilitation is an option for an asset, the cost may be less than the replacement cost; however, replacement costs provide an upper benchmark for setting the R&R CIP budget. Optimizing the renewal strategy (e.g., rehabilitation vs. replacement) should be undertaken as each individual project nears.

R&R Program Pilot Study

A pilot study was conducted to demonstrate the approach of the R&R program developed during the visioning process. The pilot was conducted on October 21, 2008, and con-

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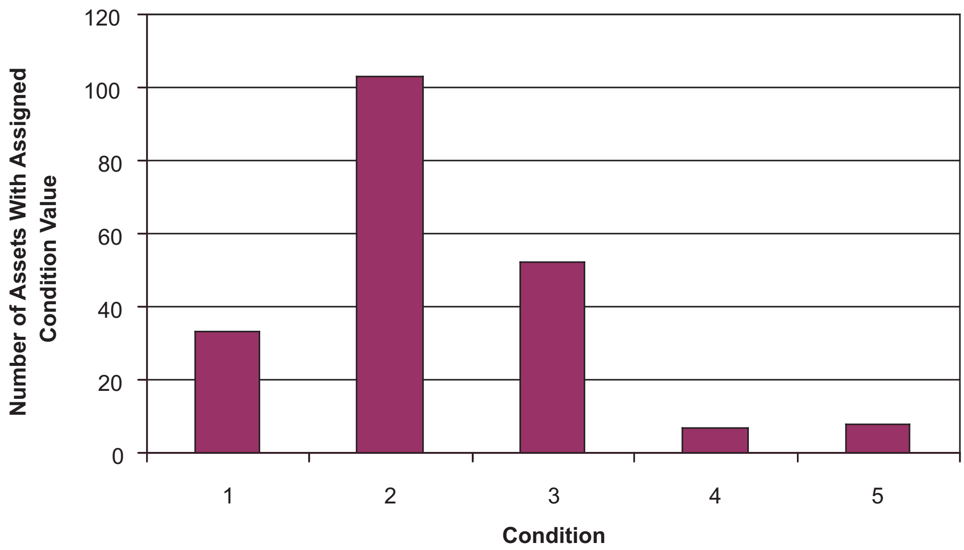

Figure 2: Pilot Facility Asset Condition Histogram

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sisted of a condition assessment walkthrough of all equipment, as well as discussions with operation and facilities staff to understand the role and importance of the assets within the TBW system.

Pilot Study Asset Inventory Development

Using references provided by TBW, Carollo compiled an inventory of aboveground assets with appropriate level of detail for system-wide capital project planning for the pilot study. The asset inventory was organized using the existing EMMS hierarchy. Also, since an R&R program does not require the level of detail as currently maintained in the EMMS, a flagged field was created to identify whether or not each asset should be included in such a program.

Pilot Study Condition Assessment Results

In general, the assets at the pilot facility were found to be in good condition, with an average condition ranking of 2.3, and they appear to be capable of performing their intended functions. Distribution of the condition ranking scores among the assets is shown in Figure 2.

The most significant issues observed were outdated or obsolete electrical equipment at some wells and at the water treatment plant, including the standby generator system. At the time of assessment, many of the electrical components were scheduled for replacement, including the generators, electrical switchgear for high service pumps, and other miscellaneous electrical improvements.

Pilot Study Criticality Assessment

Criticality scores were assigned based on the criticality matrix developed by TBW staff. Within the pilot facility, the average criticality score was 3.4 for all assets, with a maximum potential score of 10. The assets with the highest criticality included the buildings, fire suppression systems in each building, ground storage tanks, and chemical storage tanks.

Pilot Study Risk Assessment

Risk scores were calculated for all pilot facility assets. At a minimum, assets with higher risk rankings must be closely monitored and targeted for corrective or preventative action, including maintenance, repair, or replacement. A summary of pilot study assets with a risk score greater than 0.4 is provided in Table 2. These assets are calculated to have the highest risk either because of their criticality in the system and/or their vulnerability or likelihood of failure.

Pilot Study Replacement Cost Estimate

Carollo estimated replacement costs (comprised of total project costs) of the pilot study assets based on TBW historical records, past Carollo projects, and general industry standard practices. Replacement values were developed as in-kind estimates of the total project cost to purchase and install similar assets.

Potential Rehabilitation & Replacement Projects at Pilot Facilities

All pilot facility assets were sorted by risk in descending order. Assets exhibiting the highest risk were the standby generators and the motor starters at some of the wells. This equipment was considered either outdated or obsolete and in need of replacement.

The next-highest risk assets were the hypochlorite storage tanks. These assets were in generally good condition, and the high risk score was caused by the relatively low life expectancy of plastic storage tanks, and in part due to criticality, which was amplified by the potential environmental consequence of failure.

Most of the assets at the pilot facility were assumed to have minimal environmental consequence of failure; therefore, the criticality scores were comprised mainly of (1) effect on customers, (2) ability to respond and return asset to service, (3) safety, and (4) cost of repairs.

The asset list was then sorted by EvRUL to determine which assets should be prioritized based on estimated time of failure. EvRUL accounts for condition and asset type (mechanical, electrical, instrumentation, or structural). Sorted by ascending EvRUL, the same assets were at the top of the list, including the generators, some motor starters, and hypochlorite storage tanks.

Combining these approaches, projects identified in Table 3 were packaged as potential CIP projects within the next three to 12 years. All other assets had an EvRUL greater than 12 years. The projects shown in Table 3 reflect replacement costs for only those assets noted in the project description. TBW will consider which additional assets would likely be replaced as part of those projects. Furthermore, TBW will revise cost estimates in the preliminary design phase.

Future Program Implementation & Maintenance Activities

This section discusses the activities and

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Table 2: Criticality, Vulnerability, and Risk for Highest Risk Assets at Pilot Site

Asset	Criticality	Vulnerability	Risk
Main Generators	3.7	0.4	1.48
Select Wellfield Motor Starters	3.1	0.4	1.24
Hypochlorite Storage Tanks	5.2	0.1	0.52
Influent Water Quality Analyzers	4.9	0.08	0.41

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methods for implementing and maintaining TBW's R&R program in the future, along with the level of effort associated with the program's maintenance.

Table 3: Recommended Future R&R Projects at Pilot Facility

Order	Assets/Project	Cost [1]	Average EvRUL (yr)[2]	Average Risk [3]
1[4]	Stand-By Generators	$4,000,000	3	1.48
2	Motor Starters 5 at Wells	$68,000	3	1.24
3	Hypochlorite Storage Tanks	$70,000	10	0.52
4	Influent Water Quality Analyzers	$10,000	12	0.41
5	CYC-03 Flow Meter/Transducer	$6,500	12	0.23

Notes:
1. Estimated budget-level replacement project costs in November 2008 dollars.
2. Evaluated Remaining Useful Life, based on condition and type of asset.
3. Risk rating calculated from criticality and vulnerability scores based on an industry standard scale.
4. Cost estimated from current upgrade project, which includes two generators and new switchgear.

Database Management & Condition Assessment

Three major database management tasks need to be undertaken on an ongoing basis: (1) Add new infrastructure, (2) correct or fill in missing data, and (3) update data for existing infrastructure.

Condition assessments of each asset must be performed on a regular basis to update and maintain the R&R program. Typical duration between assessments can range from one to three years, depending on staff and/or budget availability.

Under the Governmental Accounting Standards Board Rule 34 (GASB34), when implementing modified asset depreciation accounting, systems assets must be assessed every three years. While TBW will not be adjusting its depreciation accounting methods, this assessment rule serves as a reasonable benchmark for any asset management program; therefore, it is recommended that continued asset evaluation occur every three years, or that a third of the assets are assessed each year.

Assessing all assets every three years limits the staffing time requirement during off years, but the process requires a significant effort in the assessment year. Assessing a third of the system every year requires an annual staffing commitment, but these annual assessments could be incorporated into a work order process and would help continuity of staff assessment methods.

Risk Assessment

Future risk assessments and prioritization will be made using updated criticality and vulnerability scores. The relative risks for each asset represent the priority for evaluating and addressing the needs of an asset's repair and replacement.

The risk values are useful in presenting reports of prioritized assets for evaluation and confirmation. The risk values can also be used in developing matrices and map-based reports of relative priority between assets at varying locations and within facilities. Risk will be evaluated on a regular basis to determine which assets are becoming higher-risk in the system and may warrant repair or replacement.

The ratings for criticality typically do not change over the life of the asset unless there are other capital improvements or operational modifications that change the function or role of the asset in the system. For below-ground assets, some refinements to the initial criticality rankings may be warranted as additional evaluation of the collection and distribution system occurs. The vulnerability score is calculated based on the evaluated remaining useful life, which is dependent on the original useful life and the condition rating. Since asset condition changes over time, the vulnerability score will also change with time.

Cost Evaluation &
Capital Improvement Plan

Future cost evaluations include developing or updating cost estimates for assets and potential projects. In addition, O&M and R&R CIP cost evaluations will be required to optimize both O&M and R&R CIP budgets. Replacement cost estimates, at a minimum, should be updated for each asset every one to three years.

R&R projects are developed by evaluating the rehabilitation and replacement needs, typically for the next three to five years, and assembling logical projects in terms of location, related facilities, and cost. Each project will contain specifics on the assets to be rehabilitated or replaced, a schedule, estimated costs, project justification, and a benefit/cost analysis. Multiple scenarios may be used in developing the projects for comparison purposes for timing and total costs.

System-Wide R&R Program Implementation

The system-wide R&R program implementation will be completed based on relative importance and criticality of the system facilities. TBW completed a vulnerability assessment in 2007 to prioritize and determine the most critical assets in its water system.

The vulnerability assessment designated all facilities as either Priority Group 1, 2, or 3 based on their importance in the system to deliver water to its customers. Carollo utilized the vulnerability assessment and also participated in discussions with TBW staff to develop a preliminary prioritization of facilities for completing the program implementation.

A system-wide implementation schedule was developed to incorporate all remaining TBW facilities into the R&R program. Timing of the facility condition assessments and other asset evaluations was selected based on facility priority. The schedule accounts for assessment of all facilities including confirmation/updating of asset inventory, condition assessments, criticality analyses, vulnerability analyses, replacement cost estimating, and data input.

The assets need to be evaluated for remaining useful life, included in cost/benefit analyses, and grouped into R&R projects. Once grouped into projects, additional time is needed for revising costs, development of short- and long-term CIPs, and strategic planning for reserve and funding strategies.

Future R&R Program Activities & Requirements

The successful implementation of the system-wide R&R program requires strong staff commitment and support. Over time, it is expected that the program will be fully integrated with staff's ongoing activities. Organizational commitment can be achieved by:

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1. Raising awareness of elected members and senior management of the benefits of R&R programs and asset management and the associated policy and financial implications.
2. Imparting ownership of the process by involving key players from the planning phase, including representatives from various departments of the organization.
3. Communicating R&R program objectives to staff, preferably in terms of practical, concrete examples where short-term results can be achieved and recognized.
4. Providing staff with the appropriate asset management information systems, training, and resources. It is difficult to develop a long-term vision when short-term asset development and/or crisis management activities are stretching current resources.
5. Retaining a focus on asset management at all levels by the continued involvement of key staff across the organization in the review processes and keeping staff fully informed of targets, progress, and achievements.

The R&R program requires staff to perform continued asset evaluations, updating the asset inventory database as assets are added or removed, and to manage the overall program. As staff becomes accustomed to the R&R program maintenance activities, it is expected that the required number of hours will decrease over time; however, in periods when there is a significant number of asset renewals, it is expected that more time will be required for cost evaluations, R&R CIP, and strategic planning tasks.

Several potential staffing alternatives were identified for further consideration for the R&R program implementation and maintenance:

1. Treatment and Operations Asset Data Managers—A significant portion of the program maintenance involves adding, updating, and maintaining asset data. Many of these updates also can be correlated with the timing of updates in the EMMS system; therefore, it has been suggested that the respective EMMS technicians also serve as asset data managers responsible for maintaining data within the R&R program.
2. R&R Program Manager—One common element of successful R&R programs across the U.S. is the assignment of a designated person for general program administration and management. Often referred to as the R&R program manager, this person is largely responsible for validating that program maintenance activities are being performed, as well as coordinating the annual R&R CIP cycles. Because of the responsibilities of the program manager, it is not uncommon that the work demands account for 50 to 100 percent of a full-time equivalent, depending on the water system attributes (size, age, level of renewals, etc.). Because of the significant benefits of an R&R program, many utilities that have made the commitment to develop a comprehensive program have also designated an R&R program manager to coordinate all program maintenance activities, as well as ensure the program's success.
3. R&R Program Oversight Committee—One additional staffing recommendation is to develop an R&R program oversight committee to assist in the preparation, review, and finalization of the R&R CIPs on an annual basis before submittal to the finance department. General changes to program strategies, refinements, etc., would also be discussed, reviewed, and approved by the committee. Similar oversight committees have been referenced as the equivalent to a "board of directors" for a utility asset management program. The R&R program manager would report regularly to the oversight committee as to the status, performance, and results of the program implementation and maintenance.

Summary Recommendations

This project outlined the plan for completing TBW's system-wide R&R program implementation, including facility prioritization, program schedule, and staffing needs. Also, it included a summary of procedures for updating and maintaining the program in the future. Key project findings and recommendations of this project were:

1. The overall R&R program vision was established with TBW staff during two visioning workshops. Key program visioning outcomes included the following:
   a. The program should clearly delineate what projects are needed, when, and approximately how much they will cost.
   b. The program will serve as a decision support system for R&R of tangible assets.
   c. The program will be used to develop R&R CIPs for future budgeting.
   d. The EMMS will be modified and enhanced for R&R program data management.
2. A pilot study was conducted to demonstrate the approach and outcomes of the R&R program developed during the visioning process. Assets were assessed for condition, criticality, vulnerability, risk, and cost to develop future R&R projects at this facility.
3. Staff selected a customized criticality matrix based on factors important to the organization: health and safety of employees and the public, financial impact, impact on the environment, effect on water delivery to customers, and the ability to respond and return assets to service.
4. The next phase of the R&R program is system-wide implementation, based on relative importance and criticality of system facilities. Carollo utilized Tampa Bay Water's 2007 vulnerability assessment and also participated in discussions with staff to develop a preliminary prioritization of facilities.
5. The system-wide R&R program implementation scheduled was developed to illustrate the timing necessary to assess all included facilities, including confirmation of the asset inventory, asset condition assessments, criticality analyses, replacement cost estimates, data entry, risk analysis and prioritization, and subsequent CIP budgeting and timing evaluations. R&R program implementation also includes time to review all information after data entry and risk calculations are complete. Analyses and decision-making are required to group asset renewals into projects and assign R&R dollars by year.
6. Initial estimates of labor hours needed to complete initial setup and implementation of the R&R program were developed. The estimate included a breakdown of hours required by engineers, project coordinator(s), field staff, and information technology staff.
7. Successful implementation also requires ongoing maintenance and support. The program requires staff to perform continued asset evaluations, updating the asset inventory database as assets are added or removed from the system, and overall management of the program. Carollo identified the continued staffing needs of the R&R program to perform these activities.

In summary, the successful implementation and maintenance of TBW's R&R program will be due in large part to the application of sufficient and effective resources for all activities in the program. TBW will be best served in sustaining the investment that has already been made in this important endeavor by building on the foundation of staff, activities, and systems developed by the pilot project in order to maintain a successful R&R program.