TOP 4 ISSUES

SAN DIEGO REGIONAL CONSTRUCTION PROCUREMENT COMMITTEE

Exploring the current condition of the challenges and recommendations in the procurement and delivery of infrastructure projects, develop potential future goals for mitigation, and targets for the next decade.

July 8, 2014

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ABOUT THE SAN DIEGO REGIONAL CONSTRUCTION PROCUREMENT COMMITTEE

The San Diego Regional Construction Procurement Committee (RCPC) is comprised of representatives from San Diego's local major public works agencies.

The current member agencies include San Diego County Water Authority, San Diego Association of Governments (SANDAG) San Diego Unified Port District, City of San Diego, County of San Diego, Naval Facilities Engineering Command, San Diego County Regional Airport Authority, State of California Deparment of Transportation (CalTrans), San Diego Unified School District, University of California- San Diego, San Diego State University and San Diego Community Colleges.

The purpose of RCPC is to coordinate the procurement of major infrastructure projects within the region, discuss market issues and material shortages, share ideas for improving public agency construction procurement processes, encourage regional uniformity in procurement efforts, reach out to other agencies and contracting industry to foster communication and collaborations that benefits all local public agencies dealing with infrastructure growth and management.

ABOUT THE "TOP 4 ISSUES"

RCPC is concerned with the global issues that impact infrastructure growth and management with the region. In 2010, RCPC conducted a region-wide survey of infrastructure owners and industry leaders to determine what the top 4 issues that faced the Region at the time. The survey and subsequent white paper provided direction for the focus of government and industry leaders. In 2013, RCPC realized that following the deep recession, it was time to have another broad and deep discussion among all the infrastructure stakeholders in the San Diego region to identify the Top 4 public agency design and construction issues by holding a workshop with the same goal.

Ramin Abidi, San Diego County's Construction Engineering Manager, stepped forward to chair the steering committee for this process. Ramin formed the steering committee including Iraj Ghaemi (SD County Airport Authority), Bill Prey (SANDAG), Vic Bianes (SD County Water Authority), and Mohsen Maali (City of San Diego). In addition, this effort gained the support of CMAA-San Diego Board Advocacy team, Dan Fauchier (The ReAlignment Group), and Miles Phippen (Vanir Constructors LLC).

The statements in this document constitute forward-looking statements or statements which may be deemed or construed to be policy related. No representation or endorsement is made by RCPC or any members of the RCPC. Forward-looking statements involve, and are subject to known and unknown risks, uncertainties and other factors which could cause the results or achievements to differ materially from the future results expressed or implied by such forward-looking statements.

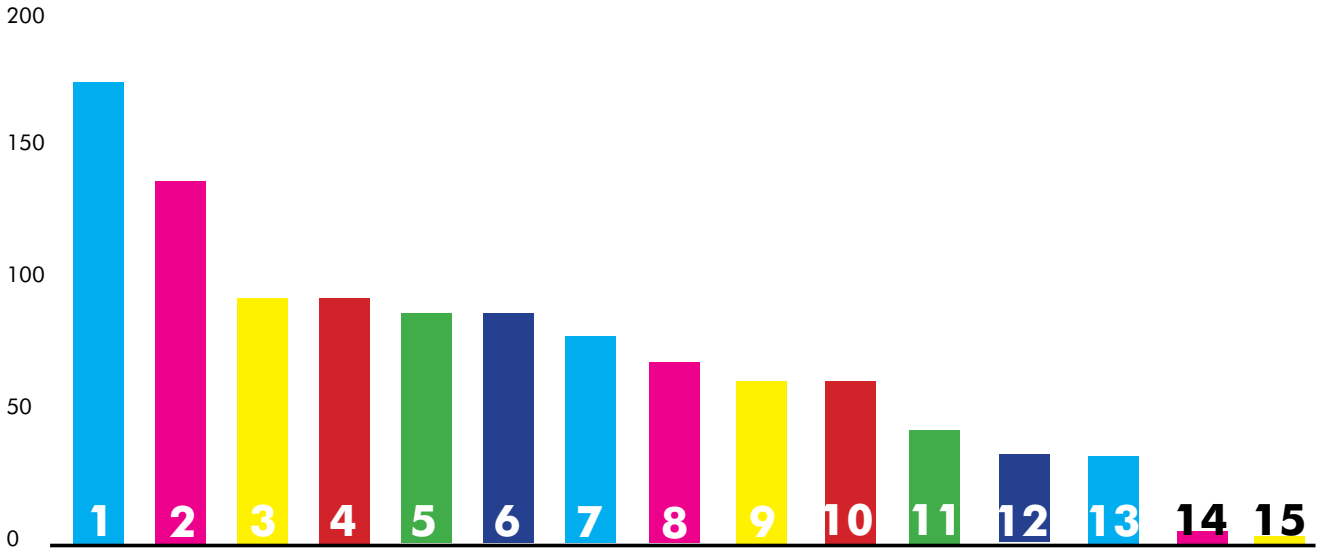
METHODOLOGY

In the second iteration of the Top 4 Issues in 2013, the RCPC created a list of suggested topics to guide the discussion of this second effort:

- Regional Comprehensive 5-year Capital Improvement Program Outlook
- Regional Public Agencies Collaboration and Resource Sharing
- Life-cycle Cost Management- Innovative and Balanced Funding (new and existing facilities)
- Succession Planning and Staff Retention—Regional Training Program
- Technology Strategic Planning (e.g. ePM, Electronic Bidding, etc.)
- San Diego Regional Cost Benchmarking Studies
- Public Outreach and Education of Capital Improvement Program and the People Behind It
- Sustainability in Public Works
- Assessment of Regional Infrastructure Conditions – Critical Projects
- Competing Interests From Communities Affecting Project Development
- New Environmental Regulations and Impacts to CIP
- Energy-Increasing Regional Demand, Limited Resources and Increasing Costs

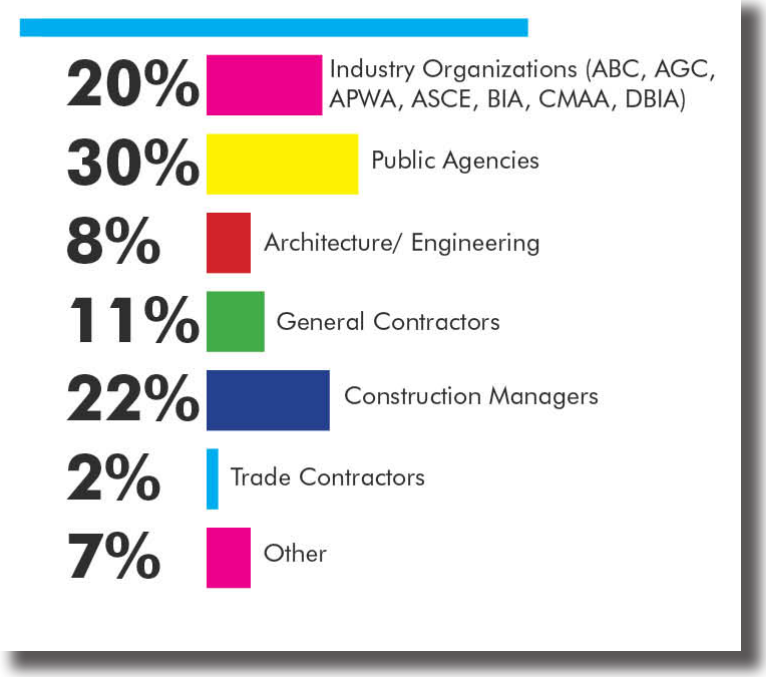
A survey format was used to gather the information distributed to the following constituents: Associated Builders and Contractors (ABC), Association of General Contractors (AGC), American Public Works Association (APWA), American Society of Civil Engineers (ASCE), Building Industry Association (BIA), Construction Management Association of America (CMAA), Design-Build Institute of America (DBIA), various public agencies, architecture/ engineering consultant firms, construction management consultant firms, general contractors, specialty trade contractors, manufacturers, and suppliers in a marketed strategy of communication via e-blasts and professional social media outlets like LinkedIn.

The results were reported as follows:



1. Assessment of Regional Infrastructure Condition - Critical Projects: 150 Respondents
2. Regional Comprehensive 5-Year Capital Improvment Program Outlook: 137 Respondents
3. Sustainability in Public Works: 97 Respondents
4. Life Cycle Cost Management- Innovative and Balanced Funding: 95 Respondents
5. Regional Public Agencies Collaboration and Resource Sharing: 89 Respondents
6. New Environmental Regulations and Impacts to CIP: 89 Respondents
7. Energy-Increased Regional Demand, Limited Resources and Increasing Costs: 82 Respondents
8. Technology Strategic Planning: 65 Respondents
9. Public Outreach and Education on Capital Improvement Program and the People Behind It: 55 Respondents
10. Succession Planning and Staff Retention Regional Training Program: 46 Respondents
11. Competing Interests From Communities Affecting Project Development: 42 Respondents
12. San Diego Regional Benchmarking Studies: 36 Respondents
13. Alternate Project Delivery Methods - Best Practices: 37 Respondents
14. Addressing Water Conservation and Stormwater Management
15. All Other Topics

286 respondents took the survey including about 30% employees of public agencies, 20% employees of a general contractor, and 10% employees of a construction management firm, with the remaining 40% consisting of other design professionals and specialty trade contractors.



The results were then synthesized by members of the RCPC to establish the Top 4 Issues:

1. Aging Infrastructure
   a. Innovative Approach to Condition Assessment of Critical Infrastructure
   b. Regional Comprehensive 5-year Capital Improvement Program Outlook
   c. Public Outreach and Education on Capital Improvement Program and the People Behind It.

2. Sustainability in Public Works
   a. Life-Cycle Cost Management- Innovative and Balanced Funding
   b. Increasing Demand for Energy and Related Costs and Resources

3. New Environmental Regulations Impacts
   a. Impacts to Capital Improvement Program
   b. New MS4 Storm Water Permit and Implementation Best Practices
   c. Air Quality – Emission Control

4. Regional Collaboration in developing the next generation of Public Works Projects
   a. Regional Procurement
   b. Resource Sharing
   c. Succession Planning and Staff Retention
   d. Regional Training Program

With the identification of these topics, a symposium of the region's top subject matter experts was conducted in January 2014 resulting in this white paper.

Each of the Top 4 Issues was discussed by a separate team of subject matter experts. The teams took a structured approach utilizing a typical A3 Process format[1], as follows:

1. **BACKGROUND**
Why are we talking about this issue? Why is it a Top 4 Issue?

2. **CURRENT CONDITIONS**
Where do things stand today? What are the major problems/symptoms?

3. **GOALS/TARGETS**
What specific 5-year and 10-year outcomes are needed?

4. **ANALYSIS**
What are the root causes of the problems related to this issue? What is working and not working?

5. **PROPOSED BEST PRACTICES**
What have the SMEs found are Best Practices that have proven to work as countermeasures to the root causes of the problem?

6. **PLAN**
What activities will be required for implementation of Best Practices in any agency? What are the indicators of performance or progress?

7. **FOLLOW-UP**
What Issues can be anticipated? How can we, as a region, continuously capture and share learning?

8. **Overview of Group's Conclusions**

1 A3 is a structured problem solving and continuous improvement approach, first employed at Toyota, and typically used by Lean practitioners." (Wikipedia) The most cogent and comprehensive explanation of this is found in Shook, John, Managing to Learn (2008).

ISSUE 1: AGING INFRASTRUCTURE

CONDITION ASSESSMENT OF CRITICAL INFRASTRUCTURE

INTRODUCTION

American Society of Civil Engineers (ASCE) released its 2013 report card related to the condition of our Nation's infrastructure. No surprise to those in the infrastructure management industry the grade given for the entire nation was a D+. California fared only slightly better with a grade of "C" with San Diego County rating the same.

The ASCE 2012 Report Card summarized the challenge for our region very well,

"Local and regional infrastructure programs managed by local decision-makers are most likely to be the most responsive and relevant to the needs of the communities they serve. But in order to have a competent and sustainable public infrastructure, there are several key elements needed to make that a reality:

- *Thoughtful long-term planning,*
- *Adequately designed systems,*
- *Durably constructed facilities,*
- *Proactive maintenance, and*
- *Reliable funding sources.*

What are difficult to manage are the infrastructure programs that require multiple layers of decision-makers or remotely located decision-makers. "

The members of the Regional Construction Procurement Committee recognized these facts and the importance of addressing these challenges which was clearly reflected in the RCPC Top 4 Issues survey. Assessment of Regional Infrastructure Condition was the highest ranking issue among those surveyed. A close second ranking issue was the Development of a Regional 5-Year Comprehensive Capital Improvement Program. Since these two issues go hand-in-hand the RCPC developed a focused group of Subject Matter Experts (SME) to discuss and address the following three related issues:

1. Innovative Approaches to Condition Assessment of Critical Infrastructure.
2. Public Outreach and Education on Capital Improvement Programs and the People Behind them.
3. Regional Comprehensive 5-year Capital Improvement Program Outlook.

2012
San Diego County
Report Card

	2005	2012
Aviation	-	C+
Bridges	-	C+
Land and Sea Ports of Entry	C	C-
Levees/Flood Control/Urban Drainage	C-	C-
Parks/ Recreation/ Environment	B-	C
School Facilities	C+	C
Solid Waste	-	B
Surface Transportation	C	D+
Wastewater/ Treatment	B	B+
Wastewater/ Collection Systems	B	B+
Water	B	B

Source: ASCE 2012 Report Card

This document serves as a guideline for public agencies to incorporate best practices as they manager their aging facilities and seek public, political, and financial support for critical infrastructure.

BACKGROUND

How are condition assessments currently done?

Public Agencies differ on the frequency of conducting their facility condition assessments. Critical facilities are evaluated more often and typically require "boots on the ground" to evaluate the current condition and any maintenance requirements. The condition assessment is typically done with internal staff, part time employed college interns, or third party consultants. The data is collected and evaluated and priorities are established for replacement or repairs. The following are current methods used for condition assessment:

- Performing assessments annually of critical infrastructure and periodically for non-critical facilities
- The use of non-destructive technology such as ultrasonic, acoustic, eddy current, magnetic, thermal oil analysis, vibration, robotic, and drone applications to evaluate the condition of a facility. This is typically used in the water and sewer assessments.
- Use of part time staff such as college interns to assess right-of-way facilities
- Utilization of the public and formal planning committees to identify failing infrastructure
- Public feedback via websites and social media
- Condition information collected from staff during routine maintenance or other routine activities

What approaches are used to define issues and translate them into your CIP?

Public agencies can either use off-the-shelf commercial software, customized software (commercial or open-source) developed by a third party or in-house, or a simple spread sheet to collect and track facility data. Based on the public agencies' criteria, facilities are prioritized based on several factors such as health and safety concerns, stakeholder input, operational risk (consequence and probability of failure), future cost to repair and available budget.

For vertical construction such as work done at colleges and schools, establishing clear scopes of work that can be completed within tight schedules, when school is out of session, is critical to their ability to replace infrastructure.

A priority list of projects is established and funding sources identified. Public agencies will then establish budgets for higher priority projects. Projects that are lower in priority and do not have sufficient budget will be placed on a waiting list until a funding source is determined.

The prioritized list is then shared with the policymakers to seek scope, budget and schedule approvals. The prioritization of information is displayed in a way that all key stakeholders can understand the prioritization criteria and the issues that need to be addressed with the proposed projects. Information can be displayed and presented to stakeholders using photos of the problems, maps of the areas, 3 dimensional models and maps (such as Google Earth), data sheets, risk matrices identifying the prioritized projects, tables, and other graphs and charts. The approved list becomes the agency's Capital Improvement Program. Agency staff is then assigned to implement the projects.

What approaches are used to ensure a measurable outcome?

For every agency, the execution of a CIP is essential to ensure continued support from the public and policymakers. Key tasks including cost and schedule are downloaded into project managing software such as Primavera. Agency staff then track their execution against the planned schedule to ensure an outcome. Costs are also tracked and adjustments are made to ensure the project staffs within budget.

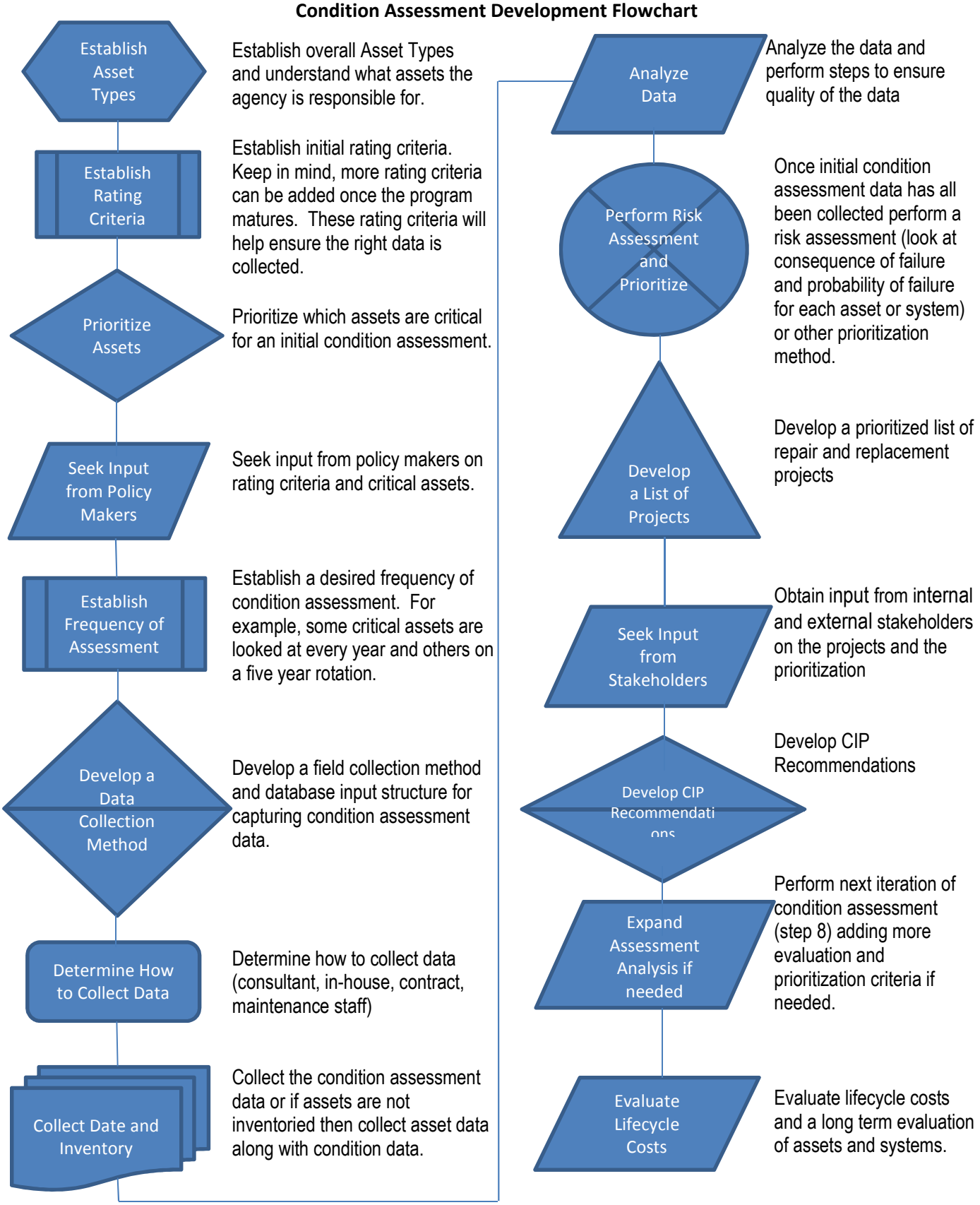
How is the assessment presented to boards and councils to seek support?

All public agencies have established opportunities for infrastructure information to be presented to their policymakers. These are either done annually through their budget process or periodically based on need. The City of San Diego has established a committee that is chaired by a councilmember that focuses only on the agency's infrastructure.

The City's Infrastructure Committee's area of responsibility includes Capital Improvement Program (CIP), Oversight of CIP Streamlining, Infrastructure Finance, Regional Transportation Improvement Program, Asset Management, Infrastructure Condition Assessment Monitoring and Implementation, Neighborhood Input on Infrastructure Needs and Priorities, Stormwater Infrastructure, Public Facilities Financing Plans, Development Impact Fees, Facilities Benefit Assessments, Wastewater Infrastructure, Water Infrastructure, City Facilities, Park Infrastructure, Multi-Year Capital Improvement Program Plan, and Transportation Infrastructure. The committee's responsibility includes individual infrastructure projects related to water, wastewater, storm water, and parks.

What challenges exist in these approaches?

Condition Assessment Development Flowchart



San Diego public agencies have faced increasing challenges with regards to the developing comprehensive condition assessments for critical infrastructure, leading to the possibility of lost funding opportunities, fiscal & schedule impacts due to uncertainty of scope, and unanticipated increased project costs. In order to improve the way each agency conducts condition assessments in the development of Capital Improvement Projects, a group of SMEs from various agencies reviewed and discussed the state of current approaches in the development of condition assessments for assets. The largest challenge was immediately evident in the sheer size and number of assets that are managed in our infrastructure system. The current challenges include:

- Insufficient funding to address infrastructure needs;
- Educating the public and policymakers on the need and support to take appropriate actions; and
- Regionally standardizing the assessment criteria for public agencies to utilize for level service grading

ANALYSIS

Condition Assessment Overall Considerations

- Public Input via Social Media – Develop a method of filtering and prioritizing input.
- Asset Management Database
- Prioritize Asset Assessment – What is critical to assess and spend resources on?
- Regional Standards for level of service grading

PROPOSED BEST PRACTICES

Condition Assessment Development
Establish Overall Asset Types (A flowchart of the following process is provided on the next page)

1. Establish initial rating criteria. Keep in mind, more rating criteria can be added once the program matures. These rating criteria will help ensure the right data is collected.
2. Prioritize which assets are critical for an initial condition assessment.
3. Establish a desired frequency of condition assessment. For example, some critical assets are looked at every year and others on a five year rotation.
4. Develop a field collection method and database input structure for capturing conditions assessment data along with condition data.
5. Determine how to collect the data (consultant, in-house, contract, maintenance staff)
6. Collect the condition assessment data or if assets are not inventoried then collect asset data along with condition data.
7. Analyze the data and perform steps to ensure quality of the data
8. Once initial condition assessment data has all been collected, perform a risk assessment (look at consequence of failure and probability of failure for each asset or system) or other prioritization method.
9. Develop a prioritized list of repair and replacement projects.
10. Obtain input from internal and external stakeholders on the projects and the prioritization
11. Develop CIP Recommendations
12. Perform next iteration of condition assessment (Step 8) adding more evaluation and prioritization criteria if needed.
13. Evaluate life-cycle costs and a long term evaluation of assets and systems.

INNOVATIVE IDEAS AND CONSIDERATIONS

Through the collaborative effort of defining a "best practices" approach, the SMEs captured the following key ideas and considerations that may result in additional value in the implementation of these best practices.

- Develop a Regional Standardization for Level of Service Rating
- Combine asset replacements (public and private) into one project to mitigate community impacts
- Obtain Operation and Maintenance and User Impute prior to finalizing the project scope of work
- Form a policy committee focusing on the agencies infrastructure needs
- Develop consensus regionally on prioritizing critical infrastructure and seek political support
- Utilize dedicated staff, consultant or existing staff for conditions assessments
- Conduct lessons learned from project stakeholders for continuous improvement
- Coordinate the bidding of work regionally to avoid competition

PUBLIC OUTREACH AND EDUCATION ON CAPITAL IMPROVEMENT PROGRAMS AND THE PEOPLE BEHIND THEM

BACKGROUND

A closely related issue discussed by this group of SMEs was the challenge in maintaining positive perception related to the development and delivery of CIP projects. This perception presents challenges in the planning, design, construction and funding of critical needed projects. Providing education to the general public, policy makers, financial institutions and agency representatives offers the opportunity to effectively implement critical infrastructure improvement needs and obtain/maintain the necessary funding. The greatest challenges seemed to be based around the most effective way of communicating to the public and policy makers as well as effectively dissecting and integrating the information from stakeholders.

The SMEs identified the top current challenges as:

- Development of Strategic Plan to educate Policy makers
- Securing public support to fund infrastructure projects
- Navigating through increased regulatory regulations

GOALS AND TARGETS

What perception problems are encountered related to CIP projects being delivered?

The Group 1 SMEs chose to take an approach of identifying practices that combat some of the most common conditions that perpetuate the negative perception by the general public related to the projects and funds being spent on their behalf through our various agencies. Too often we see reactions such as:

- The "why not in my neighborhood" reaction?
- Lack of understanding of how the CIP is developed.
- Competing priorities among constituent representa tives.
- Lack of communication and information dissemination.
- Misunderstanding of Funding Constraints and the "color of money"
- Lack of consistent transparency in issue prioritization and resolution.

ANALYSIS

What approaches can be implemented to secure stakeholder support?

In addressing the challenges of effectively educating the public about our CIP projects and priorities, there must first be a comprehensive understanding of stakeholder perspectives and needs.

Stakeholder Considerations

- Advocates and Opponents
- Manage the uninformed
- Politicians
- Legacy opportunities
- In-house awareness of Political Landscape

Methods of Engaging Stakeholders

- Surveys
- Committees
- Workshops
- Ad Hoc Committees
- Data Collection (IT, Repositories, Filters)

Outreach Mechanisms

- Publications
- E –distribution
- Social Media
- Hard Print

PROPOSED BEST PRACTICES

Our analysis included a robust group brainstorming session identifying "best practice" elements to combat the above challenges. The group then identified those practices that resonated to the entire SME group based on their "lessons learned"

- Develop education based on Stakeholder Perspective
- Surveys to understand stakeholder perspective
- Find Community Champions for the cause
- Politicians and Constituent Representatives
- Focus on Legacy or Spotlight (what do they want to leave behind?)
- Provide Risk assessment on failures – Identify the

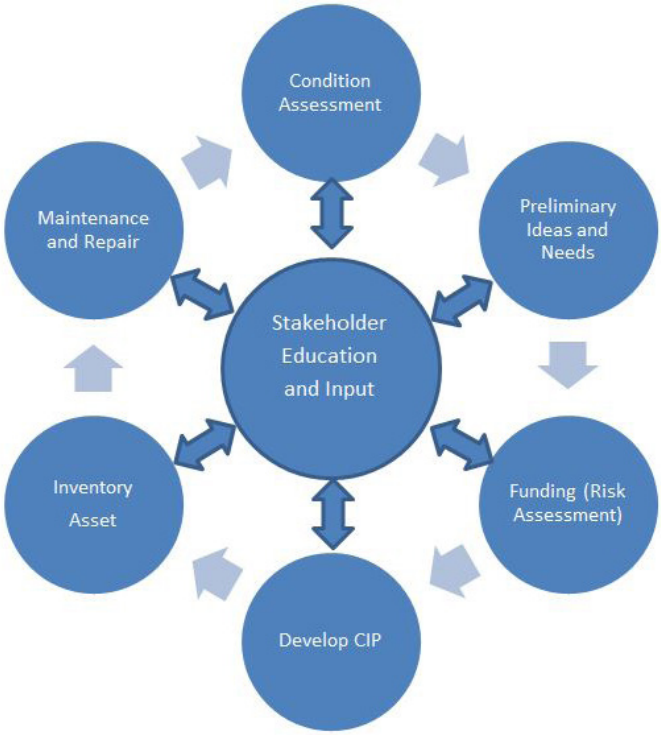
"cost of not doing something"
• Presentations that provide before and after information, using visual impacts
• Public Outreach Application and Social Media development
• Utilize AdHoc Committees, Find the outspoken influential citizens or groups

Finally the overriding factor to a successful implementation of the "best practices" is that it must be done at every level of the process to ensure the education is at each phase of the development of the CIP.

IMPLEMENTATION PLAN

Regional Comprehensive 5-year Capital Improvement Program Outlook

Capturing a comprehensive outlook of Regional interagency CIP projects may offer new collaborative opportunities in procurement, delivery, and fiscal benefits. In order to determine benefits and opportunities through Regional CIP development, it was recommended that a list be developed that highlights the many regional projects that are planned for the next 3 to 5 years. Many projects still lack scope and funding and the list is to only be used for information purposes. If the reader requires additional information, it is recommended that you contact the responsible agency directly.



ISSUE 2: SUSTAINABLE INFRASTRUCTURE

BACKGROUND

We are at the crossroads of crisis with respect to sustainable strategies and practices in the greater San Diego region.

The sustainability break out group evaluated a number of issues impacting sustainable development in the region ranging from the water-energy nexus, the need for innovative extra-municipal financing mechanisms, life-cycle cost management and total cost of ownership of facilities assets, and the need for education of public employees, elected officials, and the general population on these subjects. The reason that San Diego is in crisis regarding natural resources can be attributed to two things:

1. Consumptive culture
2. Inadequate policy updates to keep up with necessary crisis mitigation measures

With the reality of a current unsustainable model, our region must realize that we cannot keep building our way out. The question then becomes:

How do we integrate sustainability into our facilities infrastructure required to meet the demands of our population?

San Diego public agencies do not currently implement sustainable life-cycle considerations into the public infrastructure assets capital planning and implementation consistently, nor robustly. Public entities have the responsibility to be leaders in this arena and in educating the public and their publicly elected officials in understanding the culture shift that needs to take place. The recommendation of the group is to develop a holistic approach for sustainable practices in planning, designing, constructing and operating our region's infrastructure. This should be focused in two areas:

1. Total Cost of Ownership & Life-cycle Cost Management
2. Water/ Energy Nexus

This will require elements of technical, political, and advocacy strategies as part of a holistic solution.

This paper will explore the translation of historical data into providing possible solutions that can be implemented by local agencies.

CURRENT CONDITIONS

Understand that there is a problem

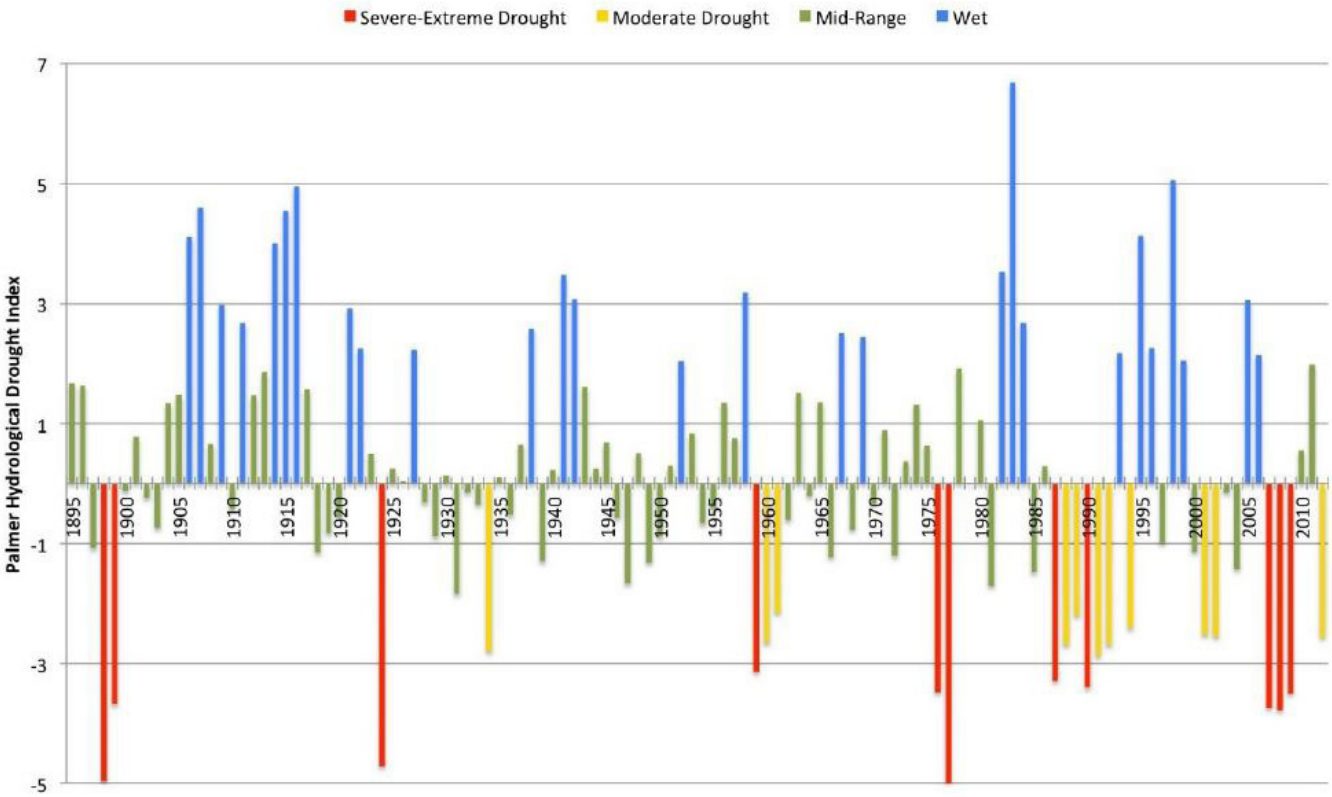
Our societal culture's negligence of sustainable resource management practices spanning multiple generations has given very little consideration to the global repercussions of our decisions. California expends 20% of its energy usage to water-related energy consumption, according to the California Energy Commission. For that percentage, the embedded energy costs account for 30% of the natural gas consumption and 88 billion gallons of diesel fuel every year to transport water, as stated by the County of San Diego's Strategic Energy Plan 2013-2015. Water conveyance captures 31% of the estimated energy intensity components in a report by the National Resources Defense Council called "Energy Down the Drain: The Hidden Costs of California's Water Supply."

The same report says that the bulk of the energy used falls under the End Use category defined as the "further treatment of water (e.g. softeners, filters), circulating and pressurizing it (e.g. with building circulation pumps or irrigation systems), and heating and cooling it." The Union Tribune article called "Can San Diegans Save More Water?" published in February 2014 stated that speeding up your shower by two minutes can save about five gallons of water each day and piping leftover shower water to your lawn can conserve 25 gallons a day – or more than 9,100 gallons in a year.

The region imports at least 45% of its water from other sources that require extensive amounts of energy to transport, according to the San Diego County Water Authority. California has implemented regulations that severely curtail the option of additional fossil fuel or nuclear power plant construction and prompted a more urgent examination of regional plans moving forward. In addition, the closing of the San Onofre power plant equated to 2700 MW of lost power production compounding the effect on an already diminishing supply in the greater San Diego region. The relationship of energy and water is critical to updating conservation strategies.

San Diego County Water Authority stated that per-capita water use in their service area is down 23 percent despite a population increase of roughly 140,000 people, between 2007 and 2013. California is currently in

Figure 1: Palmer Hydrological Drought Index, 1895-2012 for California



a severe drought with a recently declared state of emergency by Governor Jerry Brown. Figure 1 shows precipitation in California since 1895 and the Palmer drought index. In our current state of reliance on sources of water outside southern California, those sources have recently declared themselves in crisis as well.

Tied to this water crisis are alarming trends in power generation, transmission and distribution within our region. The September 2013 rate increase, as SDG&E stated on their website, was attributed to environmental costs that support the use of green resources and enhancements to the electric system making it more reliable, safer and secure. Mitigation efforts by SDG&E will need to be re-evaluated as energy's current base rate could stand to triple over the next four years, without residential rate restructuring, reported by the Union Tribune.

Infrastructure

The American Society of Civil Engineers (ASCE) gives the country's infrastructure a grade of D+ in its 2013 report card on the state of our nation's infrastructure (ASCE, 2013). They estimate that the U.S. needs an investment of $3.6 trillion by 2020, with an expectation to fall short of that goal by $1.6 trillion.

The San Diego region's infrastructure is dated and failing to meet the current demand, much like the national trend. In an article titled "14 U.S. Cities That Could Disappear Over The Next Century, Thanks To Global Warming" featured in the Huffington Post Green section, local news station KPBS reported that San Diego could see rising tides of 18 inches to four feet by the year 2050 that will make the need for infrastructure upgrades much more critical. The question becomes a matter of financing. Councilman Mark Kersey, who heads up the City of San Diego's infrastructure committee, told the Union Tribune that the price tag for necessary infrastructure upgrades is at least $1 billion, possibly upward of $2 billion (Union Tribune, September 25, 2013).
Most San Diego public agencies are focused on initial capital cost (first cost) of infrastructure rather than total cost of ownership over the life of the asset. Some public agencies share that there is a lack of knowledge how to evaluate life-cycle costs and lack of specialized training with maintenance and operations staff.

The Institute for Sustainable Infrastructure http://www.sustainableinfrastructure.org/ has recently developed the Envision™ rating system for use in sustainable infrastructure. Envision™ provides a holistic framework for evaluating and rating the community, environmental, and economic benefits of all types and sizes of infrastructure projects. It evaluates, grades, and gives recognition to infrastructure projects that use transformational, collaborative approaches to assess the sustainability indicators over the course of the project's life-cycle.

Policy
The current state of public infrastructure discussed above, in tandem with overloaded transmission lines, forces the entire region to search for innovative funding sources and creates a need for public and private partnership, despite SDG&E's best efforts to keep up with current demands.

On the policy front, our current tax codes are written to expect a rate of return within 7 years where infrastructure projects of this magnitude would require 30 year terms for a public private partnership to become an option. The private sector and real estate community can become partners with the right education. At the Urban Land Institute's 2013 Fall Meeting, a Fundamentals in Real Estate series brought to light the importance of city officials' understanding of how developers evaluate profitability in deals to show private investors how these infrastructure projects can prove to be a lucrative endeavor and mutually beneficial to all parties involved.

Current California Energy Code is targeting a goal of all new buildings to be net-zero energy from a power perspective by 2030. The new Title 24 requirements that go into effect July 1, 2014 are a significant step towards this goal requiring all new buildings to be solar ready and with significant changes that increase energy efficiency requirements.

Crisis is a driver that changes a mindset
The ramifications of deferred infrastructure maintenance have begun to affect the land development community. Interim Mayor of San Diego, Todd Gloria, was quoted at an Urban Land Institute breakfast held locally saying, "My district is starting to say no to projects because of the lack of infrastructure --- parks, libraries, etc., that were promised but aren't there."

GOALS AND TARGETS

How do we get that culture shift to happen sooner?

Shift towards a long-term focus
(Political Leadership) From a behavioral psychology standpoint, one needs to understand what perception of responsibilities motivates consumptive behaviors in order to begin the public campaign to address them. Beginning with decision makers, there is a need to create an understanding of the link between water and energy both of which are vital to a region's livelihood. Through education, significant movement towards real mitigation of these environmental issues may commence. San Diego imports 60% of its power and water from outside of California which makes educating consumers and public agencies about the current drought conditions as well as the drought emergency declaration in California and throughout the Colorado River basin so critical. Educating public decision makers is the first step to building the necessary critical mass in order to shift the paradigm.

(Agencies) The shift of San Diego public agencies' mindset needs to be geared towards a more proactive approach in anticipating the requirements of life-cycle cost management through training, collective discussion, and appropriately timing the involvement of policy makers.

The Urban Land Institute recommends that due to the magnitude of capital requirements and the multi-jurisdictional scope of most infrastructure improvements that a closely coordinated approach to closing the gap between funding provided though federal, state, regional, and local governments is a necessity.

(Individuals) For the general public, emphasis must be made on accepting the premium of conservation measures with a collective long term benefit in mind.

ANALYSIS

The first step is to examine where sustainability has been integrated successfully in environments similar to San Diego. With familiarity of what works, the region can move forward with establishing our own benchmarking study for our current and future infrastructure assets.

Currently, the San Diego County Water Authority is evaluating a diversification of our water supplies through recycled water and groundwater with emphasis on regional control of our resources. They are exploring reuse strategies as well as desalination, even though this requires significantly more energy than traditional water treatment methods. From an operational perspective, the Authority is shifting much of their costs away from the purchase of water to more fixed asset costs in an effort to practice fiscal sustainability.

SDG&E offers incentives for charging of electric vehicles during off-peak hours to alleviate demands on the grid. They are also working towards refining the price structure and developing technology to evaluate actual usage.

An increasing awareness of the total cost of ownership associated with public infrastructure has prompted a need to assess the condition of the region's assets with the intent of moving towards a more holistic approach. Many public agencies are structured with different sources of funding for capital projects and ongoing maintenance and operations of existing infrastructure assets. Because of this, many organi-

zations have developed specialized departments with a focus on capital planning, development, and construction which are independent of departments responsible for ongoing energy management, facilities maintenance and operations. Because of this disconnect and insular nature of departments, there has historically not been an awareness of the impacts made during design and construction that may lower initial first cost, but significantly increase the total cost of ownership over the life-cycle of an infrastructure asset through higher utilities consumption and cost, higher maintenance costs, and higher operational expenses. First costs of buildings typically represent only 10 to 20% of the total cost of ownership over the life of the building. Greater awareness is required to facilitate sound analysis and understanding of how assets are maintained and operated over their useful life when designing and funding new capital construction.

A Total Cost of Ownership Example
An example of total cost of ownership is presented below for a hypothetical 100,000 square foot public building that is 100% financed through general obligation bonds issued at 5.0% annual interest rate for 30 years. At a construction cost of $300 per square foot and associated soft costs for design, permitting, commissioning, and inspection of 15% of the total construction costs, the design and construction costs total $34.5M. The financing costs of this project over 30 years are $32.2M. Annual operating costs were estimated at $5 per square foot annually for maintenance, operations and utilities. Assuming a 3% annual inflation rate, these costs total $56.4M over 50 years. Separate from maintenance are the major renewal and replacement of building systems that will be required at various intervals in a building's life. APPA recommends the use of 2% annually of the current replacement value for major capital renewal, or $77.8M in this case. So a building costing $34.5M in a capital improvement program may ultimately cost taxpayers as much as $200M over its expected 50-year life-cycle. As can be seen in the figure below, the initial capital costs for design and construction in this example represent only 17% of the total cost of ownership of the building. This is one of the primary reasons why public agencies should be considering life-cycle considerations in their capital planning and design to reduce fiscal impacts on operating budgets post-construction. There are established methodologies for determining total cost of ownership. These methodologies consider numerous additional details and variables, but the primary lesson is that the real value of investment in the design and planning of a facility is not the cost in design fees, but what the team can save over the life of the building.

EDUCATION/ OUTREACH

What are the current literacy levels by local jurisdictions and the public at large of sustainable best practices? By understanding these levels, an appropriate education plan can be enacted to ensure that both agencies and consumers are technically knowledgeable in the arena of current best practices.

PROPOSED BEST PRACTICES

These efforts will not happen on their own and will require a collective effort between the public and private sector to create the policy to support initiatives and establish the means to enforce implementation.

Public Private Partnerships
Engineering News Record's December 30, 2013 issue reported that Public Private Partnerships (P3) are an important part of the solution. In addition to their short-term benefits, a critical but often overlooked advantage of P3s is their whole-life approach, offering greater cost and schedule certainty over time. In a typical P3 contract, operations and maintenance (O&M) costs must be accounted for during the life of the concession and cannot be deferred.

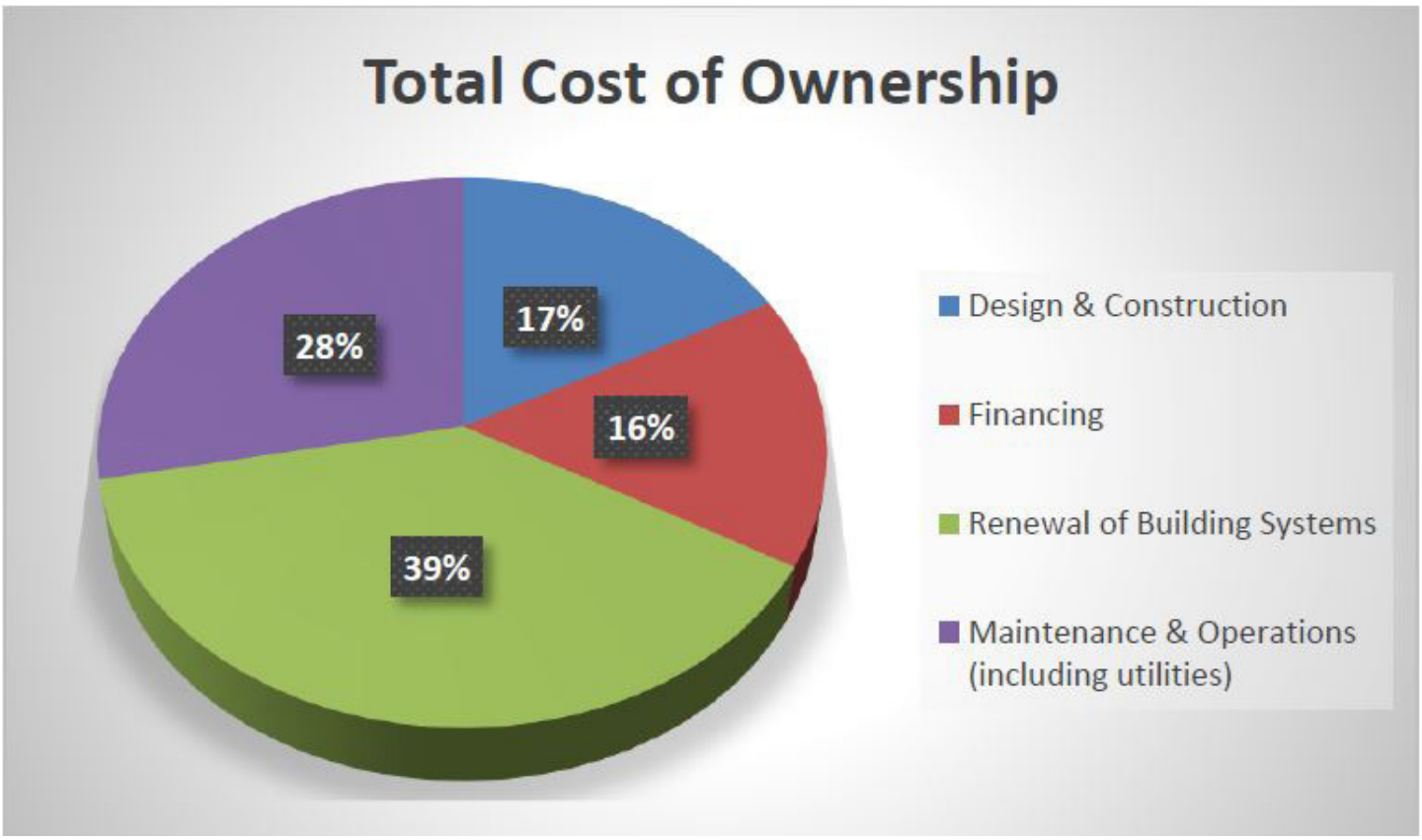
Creating Value at Point of Sale
Regulations that assign value to water and energy conservation measures in point of sale transactions will create a market demand for those conservation features built into projects moving forward. Adoption of the Property-Assessed Clean Energy program is just one way to gain traction on financing energy efficiency, water efficiency and renewable energy projects.

Establishing a return on investment formula for water, similar to the formula for energy which factors in tax depreciation on equipment, net operating costs, property appreciation, can persuade property owners to consider implementing sustainable strategies into their projects.

Life-cycle Cost Analysis and Total Cost of Ownership
The following are recommended best practices for evaluating life-cycle costs and the total cost of ownership of publicly funded assets:

1. For existing infrastructure, benchmark current facilities conditions with facilities condition assessments.
2. Require life-cycle cost analysis as part of each project during funding and development.
3. Implement continuous commissioning of buildings and assets through smart metering, advanced controls technology, data analytics and dashboards.

Operating physical facilities assets sustainably is the



most logical solution by minimizing over-consumption with the mantra in mind that "the best energy is what is not used." Enforcement standards combined with a well-structured incentive program seem to offer the most qualified method for assuring that updates on conservation limits are maintained, aiming for higher than the current energy codes.

4. Develop a model policy for total cost of ownership analysis for use by San Diego public agencies.

IMPLEMENTATION PLAN

Life-cycle Cost Analysis and Total Cost of Ownership

With respect to shifting to a more holistic approach to the total cost of ownership and sustainable infrastructure, the following steps are recommended for public agencies.

1. Develop an education plan that explains life-cycle cost analysis, total cost of ownership, return on investment approach, and why it is important.
2. Develop a protocol and procedure for life-cycle cost analysis for each project. Consider utilization of the Envision™ rating system where appropriate.
3. Develop a resource plan to address implementation of total cost of ownership. Who should participate within an agency and with what parameters?
4. Develop comprehensive funding plans for both capital project development and ongoing maintenance, operations and utilities costs.
5. Leverage technology (current and future) to reduce
6. Require life-cycle cost analysis for each project as part of project development and funding.
7. For the existing infrastructure portfolio that will require ongoing capital renewal, benchmark existing conditions.
8. Develop comparative metrics system that can be used by San Diego public agencies to evaluate their benchmarking and ongoing performance related to peer organizations.
9. Address anticipated ongoing costs as part of governing body's project approval.
10. Develop a sustainable culture and processes for continuous improvement within the organization.
11. Draft a model policy for total cost of ownership analysis for San Diego public agencies use and potential adoption by their respective governing authorities.

Focus on New Construction

Updating and implementing more stringent building codes focused on water and energy will encourage the collective effort towards regional climate resiliency. Adoption of new policies is required by agencies to consider

life-cycle cost analysis and Total Cost of Ownership. Public agencies need to lead by example in the construction and continuous commissioning of public facilities. Offering incentives for home energy ratings as a standard could also motivate the general public to participate in their responsibility to the environment.

Rewarding Good Behavior
Adopting policies that incentivize leadership in conservation in new projects and requiring accountability of infrastructure performance over time through continuous commissioning would support the regional goals of climate resiliency. Creation of an enforcement standard would also ensure that the region's assets are operating at optimal capacity for the duration of the project's life-cycle.

Deliver the Message to Policymakers
As discussed previously, policymakers need to be at the forefront of the sustainability effort in education and practice. Creating regulations and policies towards the goal should be an important focus of decision makers. Leadership by example in enacting legislation or adopting policies showing a commitment to the environment is a responsibility that elected officials have to their communities.

Elected officials also have the ability to consider renewable energy as an alternative strategy that would certainly exceed the current region usage. Distributed generation is another alternate strategy for consideration to augment other power sources. This effort could help utilities in building a model to maintain the base load creating a reliable local source, with the exploration of energy storage solutions.

Creating a Regional Education Campaign
Public officials' responsibility to their communities is to provide education that will enable decision making that benefits the long-term goals of the environment. Implementing a two-fold, region-wide education program targeting agencies and the general population to see the rewards with a long-term focus is the first step to shifting culture standards about conservation. This program should teach the entire professional spectrum of community building advisors to be technically knowledgeable in areas integral to decision making and implementation of climate change mitigation and resilience. The result of an aggressive education campaign will be a region-wide adaptation of emerging technologies that move our region towards achieving climate resiliency.

POTENTIAL METRICS

As part of the evaluation of the plan, potential metrics that may be considered to benchmark initial public infrastructure asset conditions and monitor improvement over time may include:

- Cost per square foot for maintenance
- Cost per square foot for capital renewal of existing assets
- Energy intensity usage (Btu/square foot)
- Number of projects with total cost of ownership calculations
- Facility condition index of existing facilities
- Carbon dioxide/greenhouse gas emissions per square foot

FOLLOW-UP

Use the Regional Construction Procurement Committee forum as an opportunity to:

1. Develop a draft education plan on benefits and importance of life-cycle cost analysis and total cost of ownership
2. Draft a model total cost of ownership analysis protocol
3. Identify regional benchmark metrics for peer comparison
4. Draft a model policy for governing Board consideration and adoption
5. Enlist policymakers as champions asking the right questions when approving projects

To achieve these goals, it will be necessary to work with public officials to implement these recommendations. Furthermore, this will support the symposium's intent to provide a collaborative avenue for public agencies and the design and construction communities to improve how the region builds sustainably with considerations to the total cost of ownership of an asset and mitigate the effects of climate change. Persistence in educating the public about our impact of our resource management decisions and creating a means of accountability will be the key to successfully addressing the issue of community resiliency.

Attachments:
Definitions

DEFINITIONS

Continuous Commissioning - the ongoing evaluation of a building's energy consumption and systems to ensure that it continues to perform as designed

Capital Renewal - a systematic management process to plan and budget for known cyclic repair and replacement requirements that extend the life and retain usable condition of facilities and systems and are not normally contained in the annual operating budget. Included are major building and infrastructure systems and components that have a maintenance cycle in excess of one year.

Distributed Generation - electricity that is produced at or near the point where it is used

Envision™ Rating System - a rating system based on a holistic framework for evaluating and rating the community, environmental, and economic benefits of all types and sizes of infrastructure projects. It evaluates, grades, and gives recognition to infrastructure projects that use transformational, collaborative approaches to assess the sustainability indicators over the course of the project's life-cycle.

Facility Condition Assessment - an industry term that describes the process of a qualified group of trained industry professionals performing an analysis of the condition of a group of facilities that may vary in terms of age, design, construction methods, and materials

Facility Condition Index (FCI) - used in facilities management to provide a benchmark to compare the relative condition of a group of facilities. The FCI is primarily used to support asset management initiatives of federal, state, and local government facilities organizations. It is defined as the total cost of Maintenance, Repair and Replacement Deficiencies Costs divided by the Current Replacement Value of a facility.

Life-Cycle Cost Analysis (LCCA)- a tool to determine the most cost-effective option among different competing alternatives, when each is equally appropriate to be implemented on technical grounds. For example, for a highway pavement, apart from the initial construction cost, LCCA takes into account all the user costs, (e.g., reduced capacity at work zones), and agency costs related to future activities, including future periodic maintenance and rehabilitation. All the costs are usually discounted and totaled to a present day value known as net present value (NPV).

Net Zero Energy - the total amount of energy used by the building on an annual basis is equal to the amount of renewable energy created on the site.

Public Private Partnership - a contractual arrangement between a public agency (federal, state or local) and a private sector entity. Through this agreement, the skills and assets of each sector (public and private) are shared in delivering a service or facility for the use of the general public.

Sustainable Infrastructure - a broader, sustainable approach to water, wastewater, storm water, solid waste, and energy systems with a focus on climate-friendly strategies.

Sustainability – practices and philosophy of development which meets the needs of current generations without compromising the ability of future generations to meet their own needs. Requires the reconciliation across the "three pillars" of economic demands, environmental resilience, and social equity.

Total Cost of Ownership - a financial estimate intended to help owners determine the direct and indirect costs of a product, system, or asset which includes total cost of acquisition, operating costs and disposal over its life.

Water-Energy Nexus - the relationship between how much water is evaporated to generate and transmit energy, and how much energy it takes to collect, clean, move, store, and dispose of water.

ISSUE 3: NEW ENVIRONMENTAL REGULATIONS

SAN DIEGO COUNTY MS4 PERMIT

BACKGROUND

The San Diego Regional Water Quality Control Board (San Diego Water Board) adopted Order No. R9-2013-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from The Municipal Separate Storm Sewer Systems (MS4s) Draining The Watersheds Within The San Diego Region at its May 8, 2013 Board Meeting. The Regional MS4 Permit (Permit) will regulate MS4 discharges to inland surface waters, bays and estuaries and coastal waters throughout the three counties within the San Diego Region.

The Permit will eventually cover 39 municipal, county government, and special district entities (referred to jointly as Copermittees) located in Southern Orange County, Southwestern Riverside County, and San Diego County who own and operate large MS4s which discharge storm water (wet weather) runoff and non-storm water (dry weather) runoff to surface waters throughout the San Diego Region. The Copermitees will be covered by the new Permit in a phased manner as their current MS4 permits expire or upon request for earlier coverage prior to permit expiration.

Why is this a Top 4 Issue for the region?
The new Permit imposes more stringent requirements on project development and implementation. This Permit will have major financial impacts on all future new development and redevelopment projects in the region.

CURRENT CONDITIONS

The 21 Copermittees in San Diego County are working individually to address water quality within their jurisdiction and not necessarily concerned with the conditions of water run-off at a watershed level. The Copermittees are transitioning from the 2007 Permit to the 2013 Permit which was adopted on May 8, 2013. The Permit is updated and reissued approximately every five years. The 2013 Permit was a shift to a watershed based approach. Guidelines and procedures are being developed at this time in preparation for full Permit implementation by the end of 2015. Additionally, the Copermittees are working on developing watershed based plans, referred to as Water Quality Improvement Plans (WQIP), for the watersheds within the regional boundaries.

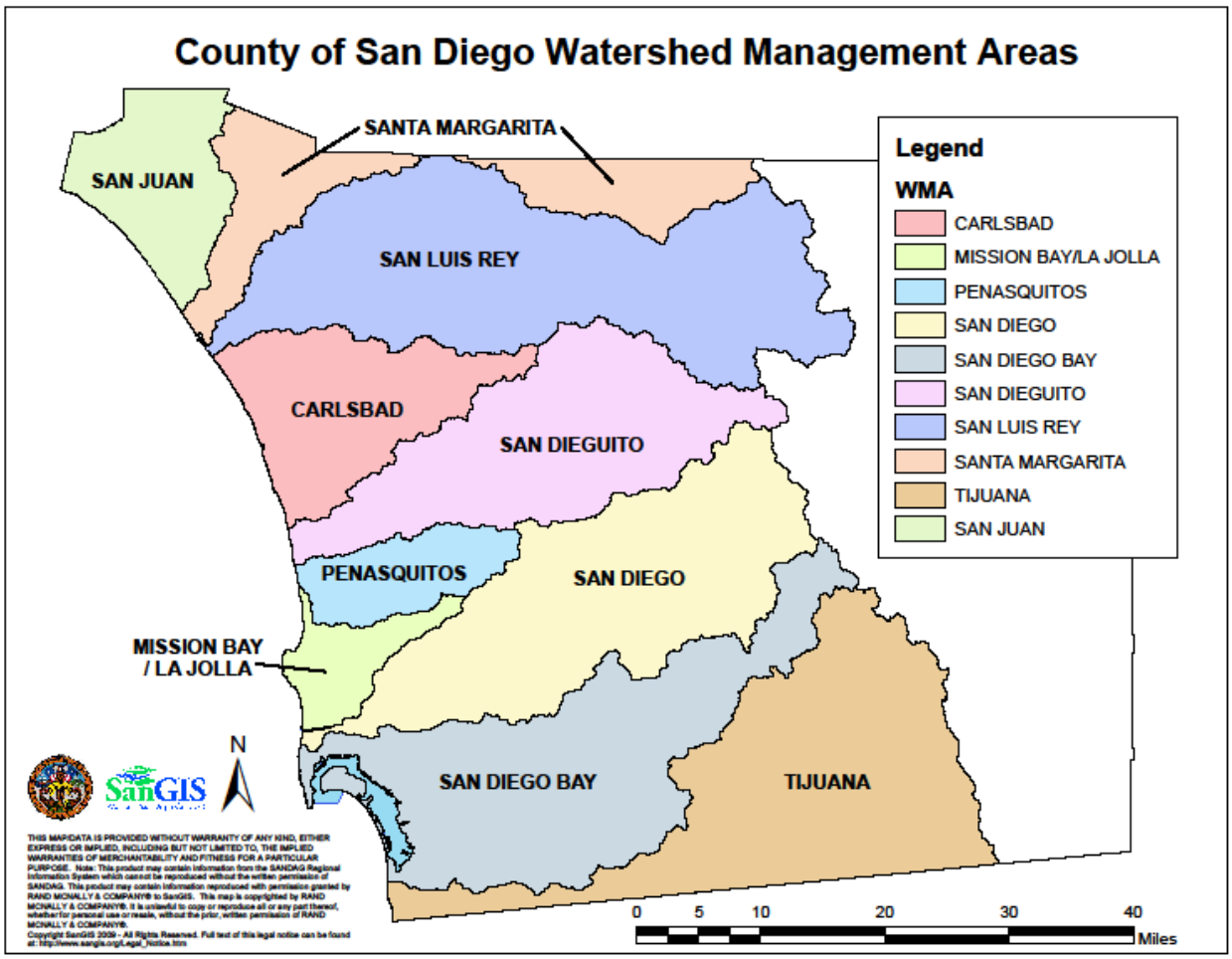
Copermittees have been complying through a "check the box" approach, with the goal of completing a series of actions. Also, with the Region divided into three separate permits, The San Diego Regional Water Quality Control Board was having difficulty in regulating multiple permits. To address these issues, the Regional Board sought to combine the permits into one and focus on a watershed based outcome approach and to include specific numeric targets for pollutants, called Total Maximum Daily Loads (TMDLs).

The 2007 Permit requires development and redevelopment projects to implement source control and site design measures aimed to minimize the generation of pollutants. Additionally, this Permit requires new development and significant redevelopment that exceeds certain thresholds, referred to as Priority Development Projects (PDP), to implement structural storm water Best Management Practices (Structural BMPs) to reduce pollutants in storm water runoff.

The 2013 Permit expands the definition of PDP to include more restrictive thresholds. Additionally, the performance standards for pollutant control measures and volume control become more stringent, increasing the need to incorporate retention and Low Impact Development (LID) to meet compliance.

What are the major challenges?

1. Impacts to Regional Capital Improvement Program (CIP)
2. The need to build facilities to integrate water quality and also meet the service needs of the facili-



ty (both public facilities and private facilities).
3. Lack of infrastructure for harvesting and retaining storm water
4. Receiving waters limitation language
5. Difficulty and feasibility in complying with permit requirements

GOALS AND TARGETS

The overall goal for the Region is to protect the ecosystem and quality of life through full compliance with the Permit by December 2015. In order to achieve this, the Region's Co-permittees need to accomplish the following:

2007 Permit:
1 Project = $1M

2013 Permit:
1 Project = $1.4 to 2.3 M

1. Develop consistent and adaptable standards and specifications
a. Achieve consistency in the Water Quality Improvement Plans (WQIP) from each watershed to minimize risks and optimize implementation costs
b. BMP Design Manual as a model for the Copermittees
c. Cost data to assist budget decisions for project owners
2. Address Financial Impacts and Resultant Needs
a. Identify a "facilitator" to facilitate regional discussions and collaborations
b. Identify Funding Sources
3. Implement the requirements of the 2013 Permit on all development subject to the conditions of the Permit
4. Provide public education and outreach to the general public, industry such as engineering firms and developers, maintenance and operation departments, and contractors

ANALYSIS

1. **Impacts to Capital Improvement Programs**

a. The definition of PDPs has been expanded to include more projects that will have to meet the new retention and modified hydromodification requirements. PDPs will need to retain the entire volume of the 85th percentile storm event which in San Diego varies from a 2-year up to a 10-year rain event depending on location.
b. All development projects subject to the 2013 Permit are mandated to implement Low Impact Development (LID) Best Management Practices (BMPs) to achieve permit compliance. Examples of LID BMPs include maintaining buffer zones for natural water bodies, conserving natural areas, constructing facilities to minimize the project's impervious footprint, using permeable materials, and using vegetated areas to receive and infiltrate, retain or treat runoff from impervious areas.
c. PDPs will also be required to implement more stringent hydromodification (the erosion and degradation of natural channels and increased sediment loading in receiving waters caused by increased impervious surfaces and increased flow rates) requirements.
d. The 2013 Permit includes more stringent requirements for water pollution control plans, monitoring, inspection, documentation, tracking and reporting on construction projects.
e. Residential areas are required to prevent over irrigation and reduce or eliminate other forms of non-stormwater runoff.
f. New regulations will increase construction and maintenance costs for public infrastructure facilities. For example, the cost of projects that will meet the Bacteria Total Maximum Daily Load (TMDL) numeric targets will increase $2.8 to $5.1 Billion over the next 15 years.

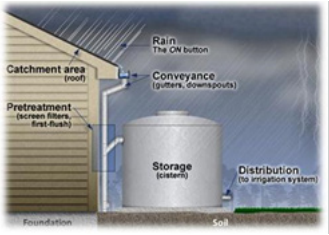
The increase in project costs will either decrease the number of projects or decrease the level of services to the public.

2. **The need to upgrade existing infrastructure to integrate water quality and meet the service needs of the facility (both public facilities and private facilities).**

a. For example, if an agency adds a lane to an existing street, the entire project is subject to the requirements of the 2013 Permit.
b. There is a need to strike a balance between growth to meet the needs of the public and maintaining the environment for future generations.
c. Include Green Streets concept, which is a deviation from previous standard practices, such as pervious pavers and pervious concrete. The County of San Diego is exploring an approach to green streets to help reduce the costs to build the facility. On average, the incorporation of Green Streets elements reduced the initial construction cost by 30%, maintenance and rehabilitation cost by 59%, and total 20 year life-cycle cost by 36%.

3. **Is Harvesting Rainwater a viable option?**

a. Where to store the water?
b. What to do with the water and how to treat it, if needed?
c. Who owns the water?
d. Is it cost effective to hold the water until it's needed?
e. Can captured water be used indoors or for irrigation? Will the extensive changes required to the current plumbing codes be cost effective?



4. **Receiving water limitation language**

a. Show water quality improvement through monitoring.
b. Subject to civil penalties and lawsuits for non-compliance

5. **Difficulty in complying with the permit requirements**

a. Are the targets or standards, some or all, achievable?
b. These standards are here to stay, so compliance with the permit is not an option.
c. Create revenue sources which require educating the public
d. Civil penalties and lawsuits are a risk for non-compliance.

PROPOSED BEST MANAGEMENT PRACTICES

1. Utilize information from various available studies to understand the barriers of implementation, for example the City of San Diego study of LID technol-

ogies.
2. Adopt a uniform Standards and Specifications for MS4 Permit Compliance
3. Collaboration through co-permittee work groups:
   a. Land Development Standards, including BMP Design Manual
   b. Monitoring
   c. Watershed based Water Quality Improvement Plans
   d. Education and Outreach
   e. Work with Top 4 Issues Infrastructure Group
   f. Examine the brightest global ideas world-wide and determine "How they can be applied to the San Diego Region" to leap ahead of the current standards and needs to achieve permit compliance
4. Form an Ad-Hoc Regional Committee to achieve full compliance with the permit through a regional uniform implementation manual that is adaptable
   a. Group to consist of a cross section of SME'speople that examines the brightest global ideas world-wide and determine asks "How theycan can be applied we apply them to the San Diego Region" to leap ahead of the current standards and needs to achieve permit compliance.
5. Require contractors to include a certification of compliance for on-road and off-road equipment at the time of bid or soon after.
6. Ballot referendums for funding and education
7. Public-Private partnerships for creating regional detention facilities similar to wetland mitigation banks
   a. Review Integrated Watershed Management Plan for funding sources such as grants

PLAN

1. Present the white paper to agencies and industry:
   a. City Managers
   b. Decision Makers
   c. Boards
   d. Water Quality NGOs
   e. Private industries and landowners
   f. Water Quality Regulators
   g. Grant Funders
   h. Politicians
2. Encourage more collaboration between groups (agencies, regulators, construction contractors, engineering firms, planners, landscape architects)
   a. Practical solutions
   b. As a group, review the BMP Design Manual when it's out for public review (Who is writing this manual? City of San Diego, County of San Diego?)
   c. SME group to continue with future discussions on achieving consistency with water quality standards, WQIPs, and funding. To be facilitated by the RCPC sub-committee.

FOLLOW-UP

There are 21 different Copermittees for the San Diego MS4 permit. The permit is valid for 5 years. These Copermittees have been working together to develop standards for implementation, including an LID Design Manual. The goal is to finish the manual within 18 months and to achieve compliance with the MS4.

REFERENCES

Link to SDRWQCB MS4 Page
(http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml)

Project Clean Water for the San Diego Region
(http://www.projectcleanwater.org/index.php)

Cost Comparisons
(http://www.owp.csus.edu/research/papers/papers/NPDES_Stormwater_costsurvey.pdf)

San Diego MS4 Economic Impact
(http://sandiego.surfrider.org/cost-considerations-for-ms4-permit-update)

AIR QUALITY & EMISSION CONTROL

CURRENT CONDITIONS

CARB began to enforce the off-road regulation's restrictions on fleets adding vehicles with older tier engines on January 1, 2014, in phases, as described below:

- As soon as enforcement commences, a fleet may not add a vehicle with a Tier 0 engine to its fleet.
- As of January 1, 2013, a large or medium fleet (fleets with over 2,500 HP) may not add a vehicle with a Tier 1 engine to its fleet. The engine tier must be Tier 2 or higher.
- As of January 1, 2013, a small fleet (fleets with up to 2,500 HP) may add a vehicle with a Tier 1 engine if and only if the vehicle either had an equipment identification number (EIN) assigned by CARB to the vehicle prior to January 1, 2012, or entered the State of California for the first time after January 1, 2012 (both the fleet selling and the fleet purchasing the vehicle with Tier 1 engine must have reported to the ARB by January 1, 2012). Effective January 1, 2016, a small fleet may not add any vehicle with a Tier 1 engine. The engine tier must be Tier 2 or higher.
- Beginning January 1, 2018, for large and medium fleets, and January 1, 2023, for small fleets, a fleet may not add a vehicle with a Tier 2 engine to its fleet. The engine tier must be Tier 3 or higher.

CARB began to enforce the emissions performance requirements for large fleets on January 1, 2014 and then continue annually each January 1st thereafter. The emission performance and compliance dates for medium and small fleets will be enforced upon their effective dates as shown below:

- January 1, 2017, for medium fleets; and
- January 1, 2019, for small fleets.

The emission performance requirements continue annually until 2023 for large and medium fleets and 2028 for small fleets. To meet annual emissions performance requirements, fleets must either:

1. Meet the fleet-average emissions targets, or
2. Meet the Best Available Control Technology (BACT) requirements.

In general, if a fleet does not meet the fleet-average emissions targets, then it must apply BACT each year on a certain portion of its fleet until it does meet those targets. In order to meet BACT requirements, fleets can either:

1. Turn over to newer, cleaner engines or vehicles, or
2. Install ARB-verified exhaust retrofits. "Turn over" means retiring (selling) a vehicle, designating a vehicle as a permanent low-use vehicle, repowering a vehicle with a higher tier engine, or rebuilding the engine to a more stringent emissions configuration.

Fleets that fail to comply with the Off-Road Regulation will be subject to enforcement action, including potential fines. Health and Safety Codes authorize civil penalties for the violation of the programs for the regulation of toxic air contaminants.

What are the major challenges?

1. Impacts to Regional Capital Improvement Program—the fiscal impacts of upgrading equipment and on local contractors, particularly the small and large.
2. Lack of understanding of the regulations, what is required, and what agencies need to do to demonstrate compliance—creating a consistent knowledge base for the contractor community regardless of size.
3. Creating a level playing field is needed for contractors and a consistent enforcement approach.

GOALS AND TARGETS

In order to achieve compliance with the air quality regulations, agencies must facilitate discussion between CARB and the industry to review fleet vehicles and equipment, discuss the regulations, and develop action plans for achieving compliance. Translating this discussion into an education plan is the next step by providing information and updates on the available training and educational programs available through CARB. The third step is to reference the regulations in construction contract specifications and have agencies enforce the specifications. Compliance can be achieved by implementation of requiring contractors to submit a compliance certificate from CARB's Diesel Off-road On-line Reporting System (DOORS) to verify their fleet is in compliance with the specifications (https://ssl.arb.ca.gov/ssldoors/doors_reporting/doors_login.html).

ANALYSIS

Considerations for the costs of upgrading equipment

range from $15,000 to $50,000 per vehicle for particulate filters, $50,000 to $100,000 per engine repower, or up to $1,000,000 per vehicle replacement. It poses a difficult scenario for both large and small contractors with regard to regional equipment availability. Contractors with the larger fleets are leaving the State of California due to the regulations, which raises the costs for everyone as equipment becomes scarce. Small business contracting goals are harder to achieve as these are the contractors who cannot afford to comply and they are also leaving the state. The reality is that local agencies do not have the jurisdiction or resources to verify compliance, with potential considerations for resources allocated to upgrade their fleets to meet new requirements as well.

Creating a knowledge sharing culture will help address the lack of understanding of the regulations, what is required, and what agencies need to do to demonstrate compliance. The current conditions are that larger contractors understand the regulations and have been implementing changes. However, small contractors and owner/operators have not started to implement policies to prepare for the regulations as they are phased in. With this imbalance, The County of San Diego Air Pollution Control District is working on identifying those contractors and owner/operators that can be helped with grants, which can reimburse up to 80% of the costs to upgrade equipment.

A level playing field is needed for contractors with a consistent enforcement approach. Contractors that implemented the changes early are competing against those that have not implemented changes due to the extended deadlines. In some cases, CEQA and CARB regulations are sometimes in conflict which leaves contractors fearful to buy new equipment now, based on potential regulations change which would make the equipment obsolete or out of compliance. Another variable to consider is conflict with the new regulations and OSHA. The additional equipment (retrofits) could impede operator vision, causing a safety issue. This could lead to full replacement of the piece of equipment at a much higher cost.

PROPOSED BEST PRACTICES

- Require contractors to include a CARB certification of compliance for on-road (https://ssl.arb.ca.gov/ssltrucrstb/trucrs_reporting/reporting.php) and off-road (https://ssl.arb.ca.gov/ssldoors/doors_reporting/doors_login.html) equipment at the time of bid or soon after.
- Pursue local or regional grants and loans to be used by agencies to assist with early compliance and achieve good air quality:
    - Carl Moyer Equipment Replacement Program
    - Carl Moyer Voucher Incentive Program (VIP)
    - CARB Providing Loan Assistance for California Equipment (PLACE) Program
    - EPA National Clean Diesel Campaign
- Partner with technology developers to help accelerate the next generation of advanced technology vehicles, equipment, or emission controls
    - CARB AB 118 Air Quality Improvement Program

PLAN AND FOLLOW-UP

Creating a consistent knowledge base for the contractor community, consistently monitoring contractor compliance, and documenting contractor training and public outreach on the regulations and funding programs is the path agencies must take to address this issue.

AB 32 GLOBAL WARMING SOLUTIONS ACT OF 2006

WHAT ARE THE CURRENT CONDITIONS REGARDING AB 32?

On September 27, 2006, then Governor of California Arnold Schwarzenegger signed into law the Global Warming Solutions Act of 2006, or AB 32. The law seeks to fight climate change through a comprehensive program reducing greenhouse gases (GHG) emissions from virtually all sources statewide. The Act requires the California Air Resources Board (CARB) to develop regulations and market mechanisms that will cut the State's GHG emissions to 1990 levels by 2020—a 25% reduction statewide.

These efforts have put California on course to achieve the near-term 2020 emissions limit, and have created a framework for ongoing climate action that can be built upon to maintain and continue reductions beyond 2020 as required by AB 32.

The progress made by AB 32 includes:

1. **Cleaner and More Efficient Energy:** As the State's first priority for providing for its energy needs, ongoing efficiency efforts—like new green building standards now in effect for homes and businesses and new standards for appliances, televisions, and other "plug loads"—continue to reduce energy use and emissions, make our businesses and economy more efficient, and cut energy costs. Currently, about 23 percent of the State's electricity comes from renewable power. This will increase to at least 33 percent by 2020 under new requirements set in place by Governor Brown and the Legislature in 2011. Renewable energy is rapidly coming down in cost and is already cost-effective in California for millions of homes and businesses, and in certain utility applications.

2. **Cleaner Transportation:** California has taken a number of innovative actions to cut emissions from the transportation sector. Collectively, the State's set of vehicle, fuels, and land use policies will cut in half emissions from passenger transportation and drivers' fuel costs over the next 20 years. California's Low Carbon Fuel Standard (LCFS) is beginning to drive the production of a broad array of cleaner fuels and California's vehicle GHG standards are delivering both carbon dioxide (CO2) reductions and savings at the pump. The transition to a fleet of lower-emitting, more-efficient vehicles in California will continue beyond 2020, as these rules cover model years through 2025, and turnover of the fleet will deliver additional benefits from these rules for many more years. California's pioneering zero emission vehicle (ZEV) regulation is also driving a transformation of the fleet. As a result, California will see 1.5 million zero emission vehicles on the State's roads by 2025. California is also making major strides toward reducing the number of miles people drive, through more sustainable local and regional housing, land use, and transportation planning. To date, seven Metropolitan Planning Organizations have adopted Sustainable Community Strategies such as smart growth principles.

3. **Cap and Trade Program:** California successfully launched the most comprehensive greenhouse gas Cap-and-Trade Program in the world. As the emissions cap is gradually reduced over time, and as additional sources are brought under the cap to include the vast majority of emissions in the State, the program will ensure that California remains on track to continually reduce emissions and meet the 2020 limit.

What are the major challenges?

1. Impacts to Regional Capital Improvement Program (CIP)
2. Where will revenue from Cap and Trade program go, how will it be utilized?
3. Use of personal vehicles versus use of public or alternate modes of transportation.

GOALS AND TARGETS

The overall goal for the region is to do its part in ensuring California remains on track to continually reduce emissions and meet the 2020 limit. In order to achieve this, the Region needs to accomplish the following:

1. Identify impacts to local agencies.
2. Identify long term goals and strategies for beyond 2020.
3. Educate local agency staff on the goals and action items of AB 32.

ANALYSIS

1. The potential impacts to agency capital improvement programs include:
   a. Increased rates for electricity
   b. Increased gas prices, potentially up to $2.50 per gallon.
   c. Local agencies receiving fair share of revenue raised from AB 32.
   d. Industries leaving California rather than meet standards, which translates to loss of revenue.
   e. Increased capital costs to develop infrastructure geared towards public transportation.
2. Where will revenue from Cap and Trade program go, how will it be utilized?
   a. Some funding has been delivered from Cap and Trade program.
   b. Governor and legislation will use the revenue for general budget items.
   c. Ensure the region receives its fair share of revenue for new projects to cut emissions.
3. Use of personal vehicles versus use of public or alternate modes of transportation.
   a. Majority of public prefer to use personal vehicles for transportation, rather than public transportation.
   b. Current infrastructure is geared towards the public using personal vehicles.

PROPOSED BEST PRACTICES

The approach has three components:
1) Local agency discussions;
2) Energy efficient policies for new developments and code/standard updates for current developments; and
3) Creating a culture shift towards the use of alternative modes of transportation.

The first component includes facilitating discussions between local agencies and SANDAG, MTS, NCTD early on during the transportation planning process to create more public transportation opportunities and improve the dialogue. The next component requires developing new land use planning approaches and update standards and codes to be more energy efficient. The third component is to engage the public, particularly the younger generations, who, based on surveys, want to live in walkable cities, use alternate modes of transportation, and who tend to not want to own a car. This data can help cultivate a public education campaign for alternative modes of transportation programs that will promote accessibility and convenience.

PLAN AND FOLLOW-UP

- Send local agency representatives to public meetings and provide appropriate public comments on updates to the scoping plans of AB 32.
- Advocate for Cap and Trade funds to be used on local projects for public or alternation alternative transportation.
- Review climate action plans (required in any planning update from a local agency).

ISSUE 4: REGIONAL COLLABORATION

BACKGROUND

San Diego public agencies have faced increasing challenges with regard to the procurement of design and construction services, resource sharing, regional training and succession planning. As each agency develops strategies to address these challenges, each is presented with many of the same jurisdictional and legislative barriers. With varying internal agency guidelines, policies and procedures, many agencies have experienced a silo effect in establishing effective solutions to address these challenges. In order to achieve viable, cost effective solutions to these challenges, agencies have recognized the need for regional collaboration.

CURRENT CONDITIONS

Currently, public agencies are faced with regulatory requirements, decreasing budgets and limited resources with which to address some of their biggest challenges. For the purpose of this symposium, SMEs determined that there were four critical areas of concern:

- Procurement of Design and Construction
- Resource Sharing
- Regional Training
- Succession Planning & Staff Retention.

In each of these areas, agencies are limited in several capacities. Each one faces an increasing demand to procure design and construction services for aging and dilapidated infrastructure and facilities. Severely limited by available funding and staffing, they often struggle to find or share resources with which to manage and implement these capital improvement projects. This results in a business model which employs a mix of agency staff and consultant staff. In an economy where the cycle of funding is inconsistent, this forces many agencies into a "rich then poor" cycle that prevents efficiency and limits their ability to train and retain staff for succession.

In order to address these economic challenges, each agency has developed its own set of policies and procedures in which they must operate. The purpose of doing so is to establish cost effective and efficient operating protocols, however these efforts often result in isolation and segregation from other agencies.

Some examples include the process of advertising and bidding which is different for each agency. Currently, San Diego agencies are utilizing over 50 different websites to advertise and solicit design and construction services. Since they are not coordinated or shared, this results in overlapping solicitations that hinder competition and prevent efficiency/best value. Varying design and construction standards and specifications among agencies also contribute to a lack of success among agencies to address these challenges. Standards and materials approved by one entity may conflict with those in another, resulting in inconsistent pricing and quality outcomes. Multiple prequalification requirements among agencies cause an additional drain on staff resources and result in inconsistent industry response to solicitations.

Finally, agencies are currently implementing each of their master plans without sufficient input or knowledge of other agencies. This has resulted in waste and inefficiency with regards to re-work and overlapping of infrastructure and systems as well as scope gap between them. For example, various infrastructure projects have been performed by one agency, only to have another agency procure design and construction services to remove and replace these newly installed segments of infrastructure.

Some agencies have made progress towards regional collaboration by utilizing contract vehicles that allow piggybacking onto other agency solicitations, however this is uncommon and quite often the exception to the rule. While this is a step in the right direction, a more intentional and global regional collaboration effort in procuring design and construction services is essential to the success of our agencies.

GOALS & TARGETS

The goal is to establish a community of practice among San Diego public agencies that will allow us to collaborate for the purpose of eliminating waste and adding value within our respective organizations. Ultimately this community of practice will set in motion an intentional effort by public agencies to effectively collaborate in our procurement of design and construction services,

sharing of resources, training of staff and planning for staff retention. As we grow and learn from each other, we will continuously improve in our collaborative efforts.

Our agencies should be able to intentionally collaborate for the purpose of procurement, resource sharing, training and succession planning. Doing so will result in a comprehensive review and creation of common processes and procedures across agencies (Advertising, Bidding, Business Practices, CIP Plans & Schedules, Contracts, Delivery Vehicles, Legal Tools, Prequalification Processes, Resources, Standards & Specifications, etc…).

This collaboration process should be transparent and efficient. Each of our agencies should determine where it makes sense to collaborate and where it doesn't, depending on whether or not it adds value to the organization or the process.

SMEs believe that a starting point would be to create a common platform or source for all agencies to utilize for sharing and collaboration (i.e. GIS platform which shows multiple agency projects…) will help to not only share resources, but also to coordinate projects and timing.

ANALYSIS

At the root of the problems we face is the fact that we are by nature separate and unique entities. Each of us is governed and/or legislated by certain laws and regulations, and we have learned how to live within those boundaries. In addition, we are all constrained by political and legislative restrictions that have taught us to think inside the box, and to avoid interrupting the way things are supposed to be done. Since each of us has figured out how to do this most effectively for our organizations, we have a tendency to believe that we have the best practice or policy, and that we don't have much to learn from other agencies. Those outside of our agency may not understand our laws or regulations, or they may not comprehend how we do business, and therefore we dismiss their input or suggestions. This mindset has led us to operate in a way that prohibits collaboration. We suffer from a lack of effort to actually try and collaborate!

PROPOSED BEST PRACTICES

In order to address the root causes of our main problems, we believe that we should employ some effective countermeasures.

- Develop Intentional Interagency Collaboration - By working through local professional organizations such as CMAA, AGC, etc... We can establish a regional forum for the purpose of sharing ideas and information. This forum would include a platform for posting and editing information that will serve as a host for multiple agencies.
- Work towards standardizing design and construction documents, specifications, pre-qualifications, etc...
- Share our CIP plans and schedules with each other to coordinate projects and take advantage of the bidding community for competition and value.
- Leverage technology in a way that will simplify our bidding and procurement processes (RFP's, Proposals, Bids, Solicitation Websites, etc...)
- Educate our elected officials to help them understand how we do business, the challenges we face, the opportunities for improvement and efficiency, potential pilot programs, etc...
- Share the lessons we have learned, so that we can continuously improve together.

PLAN

We understand that our proposed best practices will take time to accomplish, however we believe that we can take some steps towards achieving them in the near term.

Within the next six months:

- Continue participating in RCPC Regional Committee Planning - Set up a platform for sharing information (Linked-In, Basecamp, CMAA, etc... TBD). This forum will include a forum for committee members to share information and ideas.
- Each agency will review its internal administrative code for cooperative procurement and partner with at least one other agency for an over-the-shoulder review.
- As we discover similar agencies (Water Authority/ City Water Dept) we can begin to collaborate with them to share information and ideas. (i.e. County to host a regional procurement forum. Agencies to obtain a comprehensive review of their standards to identify differences & similarities - rekindle the regional standards committees.)
- Consolidate CIP websites into one location (via the platform established earlier)
- Yearly CIP workshop showing the status of the assets and/or systems that the officials are responsible to oversee… show needs, timing of workshop, etc…
- Agencies to participate in local version of regional benchmarking process (Those that don't participate should start) Continued collaboration as an RCPC committee. Agencies to provide "State of the Union" type reporting.

- Regional Training – Providing career growth opportunities (internships). Agencies should be committed to train staff to deal with the complexities of delivering projects. Collaborate to share in training between agencies (i.e. posting of upcoming opportunities and seats available). Agencies should take advantage of training offered by outside entities (i.e. CMAA, AGC, LCI, DBIA, Design/Const. "Brownbag" lunches, etc…). Agencies should consider participating and/or supporting educational type intern programs (i.e. SDSU, OMWD/AGC, etc…)
- Succession Planning & Staff Retention – Agencies should consider recognizing and educating their workforce to establish a culture where employees want to stay (i.e. providing growth opportunities and training). Agencies should understand what is important to those people that they are trying to hire and retain (recognizing the generational differences in effect today vs. previous generations… What is my career path, growth opportunities, how does my job matter, Etc…?

FOLLOW-UP

In order to measure our success in accomplishing our goals and implementing our proposed best practices, we recognize the need to follow up. The indicators of performance or progress are as follows:

- Establish Platform & Participation of the members in the collaboration process going forward (i.e. platform, forum, sharing resources, etc…)
- Completion of Agency procurement code and partnering session with another agency - Posted on platform
- Completion of comprehensive review of agency standards and comparison with similar agency - Posted on platform
- Form web consolidation committee to begin the process of consolidating CIP websites or information
- Schedule a yearly CIP workshop for all agencies to participate
- Complete "State of the Union" agency reports - Posted on platform
- Schedule training sessions available - Posted on platform
- Similar agency - Posted on platform

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PROPOSED BEST PRACTICES QUICK REFERENCE GUIDE

1: AGING INFRASTRUCTURE

A. Condition Assessment Development

1. Establish initial rating criteria.
2. Prioritize which assets are critical for an initial condition assessment.
3. Establish a desired frequency of condition assessment. For example, some critical assets are looked at every year and others on a five year rotation.
4. Develop a field collection method and database input structure for capturing conditions assessment data along with condition data.
5. Determine how to collect the data (consultant, in-house, contract, and maintenance staff).
6. Collect the condition assessment data or if assets are not inventoried then collect asset data along with condition data.
7. Analyze the data and perform steps to ensure quality of the data.
8. Once initial condition assessment data has all been collected, perform a risk assessment (look at consequence of failure and probability of failure for each asset or system) or other prioritization method.
9. Develop a prioritized list of repair and replacement projects.
10. Obtain input from internal and external stakeholders on the projects and the prioritization.
11. Develop CIP Recommendations.
12. Perform next iteration of condition assessment (Step 8) adding more evaluation and prioritization criteria if needed.
13. Evaluate life cycle costs and a long term evaluation of assets and systems.

Implementation Plan

1. Develop a Regional Standardization for Level of Service Rating.
2. Combine asset replacements (public and private) into one project to mitigate community impacts.
3. Obtain Operation and Maintenance and User Input prior to finalizing the project scope of work.
4. Form a policy committee focusing on the agencies infrastructure needs.
5. Develop consensus regionally on prioritizing critical infrastructure and seek political support.
6. Utilize dedicated staff, consultant or existing staff for conditions assessments.
7. Conduct lessons learned from project stakeholders for continuous improvement.
8. Coordinate the bidding of work regionally.

B. Public Outreach and Education on Capital Improvement Programs and The People Behind Them

1. Develop education based on stakeholder perspective.
2. Surveys to understand stakeholder perspective.
3. Find Community Champions for the cause.
4. Politicians and Constituent Representatives.
5. Focus on Legacy or Spotlight.
6. Provide Risk assessment on failures e.g., identify the “cost of not doing something.”
7. Presentations that provide before and after information, using visual impacts.
8. Public outreach application and social media development.
9. Utilize Ad Hoc Committees, Find the outspoken influential citizens or groups.
10. Finally the overriding factor to a successful implementation of the “best practices” is that it must be done at every level of the process to ensure the education is at each phase of the development of the CIP.

Implementation Plan

1. Develop Regional Comprehensive 5-year Capital Improvement Program Outlook.

2. Capturing a comprehensive outlook of Regional interagency CIP projects may offer new collaborative opportunities in procurement, delivery, and fiscal benefits.

3. Many projects still lack scope and funding and the list is to only be used for information purposes. If the reader requires additional information, it is recommended that you contact the responsible agency directly.

4. Develop a list that highlights the many regional projects that are planned for the next 3 to 5 years (i.e., Regional Comprehensive 5-year Capital Improvement Program Outlook for information only.

2: SUSTAINABLE INFRASTRUCTURE

Public Private Partnerships

Engineering News Record's December 30, 2013, issue reported that Public Private Partnerships (P3) are an important part of the solution. In addition to their short-term benefits, a critical but often overlooked advantage of P3s is their whole-life approach, offering greater cost and schedule certainty over time. In a typical P3 contract, operations and maintenance (O&M) costs must be accounted for during the life of the concession and cannot be deferred.

Creating Value at Point of Sale

Regulations that assign value to water and energy conservation measures in point of sale transactions will create a market demand for those conservation features built into projects moving forward. Adoption of the Property-Assessed Clean Energy program is just one way to gain traction on financing energy efficiency, water efficiency and renewable energy projects.

Establishing a return on investment formula for water, similar to the formula for energy which factors in tax depreciation on equipment, net operating costs, property appreciation, can persuade property owners to consider implementing sustainable strategies into their projects.

Life Cycle Cost Analysis and Total Cost of Ownership

1. For existing infrastructure, benchmark current facilities conditions with facilities condition assessments.
2. Require life cycle cost analysis as part of each project during funding and development.
3. Implement continuous commissioning of buildings and assets through smart metering, advanced controls technology, data analytics and dashboards.
4. Operating physical facilities assets sustainably is the most logical solution by minimizing over-consumption with the mantra in mind that "the best energy is what is not used." Enforcement standards combined with a well-structured incentive program seem to offer the most qualified method for assuring that updates on conservation limits are maintained, aiming for higher than the current energy codes.
5. Develop a model policy for total cost of ownership analysis for use by San Diego public agencies.

Implementation Plan

1. Develop an education plan that explains life cycle cost analysis, total cost of ownership, return on investment approach, and why it is important.
2. Develop a protocol and procedure and require life cycle cost analysis for each project as part of project development and funding.
3. for life cycle cost analysis for each project.
4. Consider utilization of the EnvisionTM rating system where appropriate.
5. Develop a resource plan to address implementation of total cost of ownership.
6. Develop comprehensive funding plans for capital project development and ongoing maintenance, operations and utilities costs.
7. Leverage technology (current and future) to reduce require life cycle cost analysis for each project as part of project development and funding.
8. For the existing infrastructure portfolio that will require ongoing capital renewal, benchmark existing conditions.
9. Develop comparative metrics system that can be used by San Diego public agencies to evaluate their benchmarking and ongoing performance related to peer organizations.
10. Address anticipated ongoing costs as part of governing body's project approval.
11. Develop a sustainable culture and processes for continuous improvement within the organization.
12. Draft a model policy for total cost of ownership analysis for San Diego public agencies use and potential adoption by their respective governing authorities.

D. General

Implementation Plan

1. Use the Regional Construction Procurement Committee forum as an opportunity to:
   a) Develop a draft education plan on benefits and importance of life cycle cost analysis and total cost of ownership.
   b) Draft a model total cost of ownership analysis protocol.
   c) Identify regional benchmark metrics for peer comparison.
   d) Draft a model policy for governing Board consideration and adoption.
   e) Enlist policymakers as champions asking the right questions when approving projects.
   f) Work with public officials to implement these recommendations.
2. Focus on New Construction:
   a) Adoption of new policies is required by agencies to consider life cycle cost analysis and Total Cost of Ownership.
   b) Public agencies need to lead by example in the construction and continuous commissioning of public facilities.
   c) Offering incentives for home energy ratings as a.
3. Rewarding Good Behavior
   a) Adopting policies that incentivize leadership in conservation in new projects and requiring accountability of infrastructure performance over time through continuous commissioning to support the regional goals of climate resiliency.
   b) Creation of an enforcement standard would to ensure that the region's assets are operating at optimal capacity for the duration of the project's life cycle.
4. Deliver the Message to Policymakers
   a) As discussed previously, policymakers need to be at the forefront of the sustainability effort in education and practice.
   b) Creating regulations and policies towards the goal should be an important focus of decision makers. Leadership by example in enacting legislation or adopting policies showing a commitment to the environment is a responsibility that elected officials have to their communities.
   c) Elected officials also have the ability to consider renewable energy as an alternative strategy that would certainly exceed the current region usage.
   d) Distributed generation is another alternate strategy for consideration to augment other power sources. This effort could help utilities in building a model to maintain the base load creating a reliable local source, with the exploration of energy storage solutions.
5. Creating a Regional Education Campaign
   a) Public officials' responsibility to their communities is to provide education that will enable decision making that benefits the long-term goals of the environment.
   b) Implementing a two-fold, region-wide education program targeting agencies and the general population to shift culture standards about conservation. This program should teach the entire professional spectrum of community building advisors to be technically knowledgeable in areas integral to decision making and implementation of climate change mitigation and resilience. The result of an aggressive education campaign will be a region-wide adaptation of emerging technologies that move our region towards achieving climate resiliency.

ISSUE 3: NEW ENVIRONMENTAL REGULATIONS

San Diego County MS4 Permit

1. Utilize information from various available studies to understand the barriers of implementation, for example the City of San Diego study of LID technologies.
2. Adopt a uniform Standards and Specifications for MS4 Permit Compliance.
3. Collaboration through co-permittee work groups:
   a) Land Development Standards, including BMP Design Manual.
   b) Monitoring.
   c) Watershed based Water Quality Improvement Plans.
   d) Education and Outreach.
   e) Examine the brightest global ideas world-wide and determine "How they can be applied to the San Diego Region" to leap ahead of the current standards and needs to achieve permit compliance.
4. Ballot referendums for funding and education.

5. Public-Private partnerships for creating regional detention facilities similar to wetland mitigation banks. Review Integrated Watershed.

Implementation Plan

1. Encourage collaboration between groups (agencies, regulators, construction contractors, engineering firms, planners, landscape architects):
   a) Form an Ad-Hoc Regional Committee to achieve full compliance with the permit through a regional uniform implementation manual that is adaptable.
   b) As a group, review the BMP Design Manual when it's out for public review.

Air Quality and Emission Control

1. Require contractors to include a CARB certification of compliance for on-road https://ssl.arb.ca.gov/ssltrucrstb/trucrs_reporting/reporting.php) and off-road (https://ssl.arb.ca.gov/ssldoors/doors_reporting/doors_login.html) equipment at the time of bid or soon after.
2. Pursue local or regional grants and loans to be used by agencies to assist with early compliance and achieve good air quality:
3. Carl Moyer Equipment Replacement Program.
4. Carl Moyer Voucher Incentive Program (VIP).
5. CARB Providing Loan Assistance for California Equipment (PLACE) Program.
6. EPA National Clean Diesel Campaign.
7. Partner with technology developers to help accelerate the next generation of advanced technology vehicles, equipment, or emission controls.
8. CARB AB 118 Air Quality Improvement Program.

Implementation Plan

1. Creating a consistent knowledge base for the contractor community, consistently monitoring contractor compliance, and documenting contractor training and public outreach on the regulations and funding programs.

AB 32 Global Wamring Solutions Act of 2006

1) Local agency discussions between local agencies and SANDAG, MTS, NCTD early on during the transportation planning process to create more public transportation opportunities and improve the dialogue;
2) Energy efficient policies for new developments and code/standard updates for current developments; and
3) Creating a culture shift towards the use of alternative modes of transportation. This is to engage the public, particularly the younger generations, who, based on surveys, want to live in walkable cities, use alternate modes of transportation, and who tend to not want to own a car. This data can help cultivate a public education campaign for alternative modes of transportation programs that will promote accessibility and convenience.

Implementation Plan

1) Send local agency representatives to public meetings and provide appropriate public comments on updates to the scoping plans of AB 32.
2) Advocate for Cap and Trade funds to be used on local projects for public or alternation alternative transportation.
3) Review climate action plans (required in any planning update from a local agency).

ISSUE 4: REGIONAL COLLABORATION

1. Develop Intentional Interagency Collaboration - By working through local professional organizations such as CMAA, AGC, etc... We can establish a regional forum for the purpose of sharing ideas and information. This forum would include a platform for posting and editing information that will serve as a host for multiple agencies.
2. Work towards standardizing design and construction documents, specifications, pre-qualifications, etc...
3. Share our CIP plans and schedules with each other to coordinate projects and take advantage of the bidding community for competition and value.
4. Leverage technology in a way that will simplify our bidding and procurement processes (RFP's, Proposals, Bids, Solicitation Websites, etc...)
5. Educate our elected officials to help them understand how we do business, the challenges we face, the opportunities for improvement and efficiency, potential pilot programs, etc...
6. Share the lessons we have learned, so that we can continuously improve together.

Implementation Plan

1) Resource Sharing:
   a) Set up a platform for sharing online. This forum will include a forum for committee members to share information and ideas.
   b) Each agency will review its internal administrative code for cooperative procurement and partner with at least one other agency for an over-the-shoulder review.
   c) As we discover similar agencies (Water Authority/City Water Dept) we can begin to collaborate with them to share information and ideas. (e.g., County to host a regional procurement forum. Agencies to obtain a comprehensive review of their standards to identify differences & similarities - rekindle the regional water agency standards committees (i.e. WAS).
   d) Consolidate CIP websites into one location (via the platform established earlier)
2) Regional Training:
   a) Providing career growth opportunities (internships). Agencies should be committed to train staff to deal with the complexities of delivering projects. Collaborate to share in training between agencies (i.e. posting of upcoming opportunities and seats available).
   b) Agencies should take advantage of training offered by outside entities (i.e. CMAA, AGC, LCI, DBIA, Design/Const. "Brownbag" lunches, etc…). Agencies should consider participating and/or supporting educational type intern programs (i.e. SDSU, OMWD/AGC, etc…)
3) Succession Planning & Staff Retention:
   a) Agencies should consider recognizing and educating their workforce to establish a culture where employees want to stay (i.e. providing growth opportunities and training).
   b) Agencies should understand what is important to those people that they are trying to hire and retain (recognizing the generational differences in effect today vs. previous generations… What is my career path, growth opportunities, how does my job matter, Etc…?
4) Progress Indicators:
   a) Establish Platform & Participation of the members in the collaboration process going forward (i.e. platform, forum, sharing resources, etc…)
   b) Completion of Agency procurement code and partnering session with another agency - Posted on platform.
   c) Completion of comprehensive review of agency standards and comparison with similar agency - Posted on platform.
   d) Form web consolidation committee to begin the process of consolidating CIP websites or information.
   e) Schedule a yearly CIP workshop for all agencies to participate.
   f) Complete "State of the Union" agency reports – Posted on platform.
   g) Schedule training sessions available - Posted on platform.
   h) Similar agency - Posted on platform.
   i) Yearly CIP workshop showing the status of the assets and/or systems that the officials are responsible to oversee… show needs, timing of workshop, etc…
   j) Agencies to participate in local version of regional benchmarking process (Those that don't participate should start) Continued collaboration as an RCPC committee. Agencies to provide "State of the Union" type reporting.

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