Assembling the “Big Picture” Asset Management View

AMPLE

Asset Management Program Learning Environment
The AAM Model

Continuous Learning/Knowledge Management

The AAM Model

Capital Program Management

<table>
<thead>
<tr>
<th>Capital Planning</th>
<th>CIP Execution</th>
<th>CIP Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIP Project Content</td>
<td>CIP Financial Model</td>
<td>Metrics</td>
</tr>
<tr>
<td>Initial CIP Strategic Business Plan</td>
<td>Project Management</td>
<td>Cost control</td>
</tr>
<tr>
<td>Workshops</td>
<td>Construction Management</td>
<td>Reporting</td>
</tr>
<tr>
<td>Final CIP Strategic Business Plan</td>
<td>Permit Management</td>
<td>Outcomes management</td>
</tr>
<tr>
<td>“Best Appropriate AAM Practices”</td>
<td>“Best Appropriate AAM Practices”</td>
<td>Corrections &amp; adjustments</td>
</tr>
<tr>
<td>AAM Techniques &amp; Tools</td>
<td>AAM Techniques &amp; Tools</td>
<td></td>
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<tr>
<td>Enterprise Asset Management System (EAMS)</td>
<td>Enterprise Asset Management System (EAMS)</td>
<td></td>
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</tbody>
</table>

Sustained performance @ lowest life-cycle cost

Failure management: capacity, compliance, reliability, renewal, efficiency

“Best Appropriate AAM Practices”

Advanced Asset Management

Operations & Maintenance Program Management

<table>
<thead>
<tr>
<th>O&amp;M Planning</th>
<th>O&amp;M Execution</th>
<th>O&amp;M Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrective</td>
<td>Scheduling</td>
<td>Recording</td>
</tr>
<tr>
<td>Preventive</td>
<td>Skills teams</td>
<td>Tracking</td>
</tr>
<tr>
<td>Planned</td>
<td>Procurement</td>
<td>Costing</td>
</tr>
<tr>
<td>Preventive</td>
<td>Materials mgt</td>
<td>Monitoring</td>
</tr>
<tr>
<td>Unplanned</td>
<td>Info &amp; knowledge</td>
<td>Evaluating</td>
</tr>
<tr>
<td>O&amp;M Tactical Plan</td>
<td>Continuous improvement</td>
<td></td>
</tr>
<tr>
<td>Right work, right time, done right</td>
<td></td>
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</tr>
</tbody>
</table>

PARSONS / GHD
### The Five Core AM Questions

<table>
<thead>
<tr>
<th>Core Questions</th>
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<tbody>
<tr>
<td><strong>1. What is the current state of my assets?</strong>&lt;br&gt;  - What do I own?&lt;br&gt;  - Where is it?&lt;br&gt;  - What condition is it in?&lt;br&gt;  - What is its remaining useful life?&lt;br&gt;  - What is its economic value?</td>
</tr>
<tr>
<td><strong>2. What is my required sustained Level Of Service?</strong>&lt;br&gt;  - What is the demand for my services by my stakeholders?&lt;br&gt;  - What do regulators require?&lt;br&gt;  - What is my actual performance?</td>
</tr>
<tr>
<td><strong>3. Given my system, which assets are critical to sustained performance?</strong>&lt;br&gt;  - How does it fail? How can it fail?&lt;br&gt;  - What is the likelihood of failure?&lt;br&gt;  - What does it cost to repair?&lt;br&gt;  - What are the consequences of failure?</td>
</tr>
<tr>
<td><strong>4. What are my best “minimum life-cycle-cost” CIP and O&amp;M strategies?</strong>&lt;br&gt;  - What alternative management options exist?&lt;br&gt;  - Which are most feasible?</td>
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<td><strong>5. Given the above, what is my best long-term funding strategy?</strong></td>
</tr>
</tbody>
</table>
Core AAM Program Process Tools

System Layout; Data Hierarchy; Data Standards; Data Inventory

Condition Assessment Rating Methodologies

Expected Life Tables; Decay Curves

Valuation; Life Cycle Costing

Demand Analysis; Balanced Scorecard; Performance Metrics

Inventory Assets

Assess Condition

Determine Residual Life

Determine Replacement $ & Date

Set Target LOS

Assign BRE Rating (Criticality)

Determine Appropriate Maintenance

Determine Appropriate CIP

Fund Your Strategy

Build the AMP

FMECA; Business Risk Exp; Delphi Technique

Root Cause; RCM; PdM; ORDM

Confidence Level Rating; Strategic Validation; ORDM

Asset Mgt Plan, Polices & Strategy, Annual Budget

Asset Mgt Plan, Polices & Strategy, Annual Budget
### Steps In Developing Your AMP

**1. Existing Levels of Service:**
- Regulatory
- Customer related
- Internal operations

**2. Assess Existing Assets:**
- Physical Details
- Condition/Remaining Life
- Performance
- Capacity (Current / Ultimate)

**3. Predict Demand / Levels of Service:**
- Capacity / Demands
- Levels of Service
- Performance / Risk

**4. Predict Mode of Failure**
- Capacity (Due to Growth)
- Performance / Reliability
- Condition (Age) Integrity
- Cost of Service
Steps In Developing Your AMP

Predict Capital Program:
- Growth / augmentation
- Renewal / Reliability
- New levels of service
- Business Efficiency

Predict Operations & Maintenance:
- Growth (additional flows)
- New assets Levels of Service
- Age of overall portfolio

Predict Future Expenditure Model:
- Capital
- Operations
- Maintenance
- Administration

Predict Future Income Model:
- Rates
- Charges
- Other sources
- Total
Steps In Developing your AMP

Ask: Are Customers Willing to Pay?

No

Review program options (reduce cost)
• Reduce levels of service
• Dispose of under-utilized and under-performing assets
• Manage demand for service (pricing, regulation)
• Alter maintenance or operations
• Increase other income sources (grant funds, etc)
• Accept higher residual risk
• Rationalize project work in order of risk

Yes

Execute

Return to 1 Revise AMP Items as necessary

13

10

9

11

Parsons / GHD
Four Major Stages of AAM Program Deployment

1. Awareness (framework)
   - Initial Training / Orientation
     - Inventory Assets
     - Assess Condition
     - Determine Residual Life
     - Determine Replacement $ & Date
     - Set Target LOS
     - Assign BRE Rating (Criticality)
     - Determine Appropriate Maintenance
     - Determine Appropriate CIP
     - Fund Your Strategy
     - Build the AMP

2. Systematic Application (Structure)
   - “AM University”
     - “Delphi”; Use what we Have; BRE/CLR Level 1

3. Competency (Content & Process)
   - Gather & Load; Mentoring; BRE/CLR Level 2

4. Excellence (Sustainability)
   - Refine, “Acculturize” BRE/CLR Level 3

PARSONS / GHD
Fitting It All Together

Parsons/GHD AAM Model

1. What is the current state of my assets?
   • What do I own?
   • Where is it?
   • What condition is it in?
   • What is its remaining useful life?
   • What is its economic value?

2. What is my required sustained Level Of Service?
   • What is the demand for my services by my stakeholders?
   • What do regulators require?
   • What is my actual performance?

3. Given my system, which assets are critical to sustained performance?
   • How does it fail? How can it fail?
   • What is the likelihood of failure?
   • What does it cost to repair?
   • What are the consequences of failure?

4. What are my best “minimum life-cycle-cost” CIP and O&M strategies?
   • What alternative management options exist?
   • Which are most feasible?

5. Given the above, what is my best long-term funding strategy?
By the end of this workshop you should be able to address these five questions:

- **What is AM?**
  - Context
  - 3 Decisions
  - Definition
  - Principles
  - 5 Core Questions
  - Best Practices
  - Framework
  - TEAMQF

- **Why do AM?**
  - Benefits
  - Outcomes
  - Payoff
  - Vision

- **What “deliverables” do I get?**
  - TAMP
  - AMP
  - Validated CIP
  - Maint Program
  - Replacement Plan
  - Funding Strategy

- **How to do it?**
  - Core Processes & Techniques Toolkit

- **How do I move forward?**
  - 6 Approaches Gap analysis
Four Core Interests & Concerns of Participants Have Emerged

1. What exactly are the techniques involved, how do they work and how do they differ from what we do now?
2. Where to begin and how to proceed with an AAM program in my own organization?
3. How to persuade my policy officials to buy into an AAM program investment?
4. What role will regulators and Congress play?
Three Parallel Efforts of Note at the National Level Augment the Workshops

• The GAO report
• Efforts of Professional Organizations
• WERF’s “AMPLE” Project
The GAO Report (March 2004; *Water Infrastructure: Comprehensive Asset Management Has Potential to Help Utilities Better Identify Needs and Plan Future Investments.)*

- “Drinking water and wastewater utilities that GAO reviewed reported benefiting from comprehensive asset management but also finding certain challenges.”
- “Among other things, GAO is recommending that the Environmental Protection Agency (EPA) (1) better coordinate its own activities to facilitate information sharing and reduce the potential for duplication and (2) ensure that water utilities have access to information they can use by establishing a Web site focused on asset management. In commenting on a draft of this report, EPA generally agreed with the report and its recommendations.”
Efforts of Professional “Public Works” Organizations

- WEF / WERF
- AWWA/AWARF
- ASCE
- FHWA/TRB
- AMSA
- AMWA
- APWA
WERF’s “AMPLE” project (Asset Management Program Learning Environment)

• “A recent WERF Subscriber Survey indicated that asset management is a priority issue for utilities. Respondents ranked it fifth among 20 categories and 60 percent of respondents ranked asset management a first or second priority…

• The objective [of the research] is to present a means by which an intelligent but uninformed person could gain an understanding of the principles of asset management at the highest level; the essential components of a state-of-the-art asset management program at sufficient detail to gain a sound understanding; and enough "how to do it" information to begin a program.

• To make asset management comprehensible and to promote information exchange, a web-based Asset Management Program Learning Environment (AMPLE) is envisioned serving the above audience and designed to cater to various needs and experience levels.”
Asset Management Program Learning Environment (AMPLE)
Additional Skills Will Be Required to Become A Sustainable Business

The Focus Of Our Current Competencies

Existing Core Knowledge

- Leadership Skills
- Governance Skills
- Business System & Data Skills
- Asset Management Skills

The Opportunity For Growth On The Pathway to Excellence
Items of further interest to participants

Topics they would like more details on. List the four you think are most critical – four only.

• 1 Asset Inventories - 15%
• 2 Asset Valuation & Depreciation- 14%
• 3 Optimized Condition Assessments – 11%
• 4 Residual Lives- 8%
• 5 Levels of Service – 10%
• 6 Business Risk - 10%
• 7 Maintenance Budgets - 11%
• 8 Capital Works Justification – 13%
• 9 Succession Planning Data Recovery – 10%
What are the key issues you are facing? List three

1. Ageing assets / renewals.
2. Compliance issues:
   1. Combined sewer overflows (CSO's)
   2. Sanitary Sewer Overflows (SSO's)
   3. Discharge Quality - Treatment Capability
3. Cause of the compliance issue
   1. Capacity / Growth or
   2. Inflow Infiltration
4. Inadequate renewal programs.
5. Setting appropriate maintenance budgets.
6. Inadequate funding to complete the capital and O&M works you believe necessary for sustainable operation.
7. Justifying your CIP program.
8. Other issue - please list
9. Other issue - please list
10. Other issue - please list
# Reference AAM Web Sites

*The International Infrastructure Management Manual* can be purchased online from:

[www.ipwea.org.au](http://www.ipwea.org.au)  
for approximately $220 US

*Managing Public Infrastructure Assets To Minimize Cost and Maximize Performance*  
AMSA Publication - - [www.amsa-cleanwater.org](http://www.amsa-cleanwater.org)

**Other site of interest:**

1. [www.amqi.com](http://www.amqi.com)
3. [www.nams.org.nz](http://www.nams.org.nz)