
A Strategic Blueprint to Create Communities of Best Asset Management Practice in the United States

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American Trade Initiatives

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TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	5
Chapter 1: INTRODUCTION.....	13
BACKGROUND	
STUDY OBJECTIVES	
STUDY APPROACH	
DEFINITIONS	
Chapter 2: SUMMARY OF CASE STUDIES.....	19
Chapter 3: OBSTACLES, SUCCESS FACTORS & OBSERVATIONS.....	21
OBSTACLES	
SUCCESS FACTORS	
OBSERVATIONS	
Chapter 4: OPTIONS & RECOMMENDATION.....	31
IMPLEMENTATION OPTIONS	
EVALUATION PROCESS	
DISCUSSION & PRINCIPLES	
RECOMMENDATIONS	
NEXT STEPS	
APPENDICES.....	60
A. DETAILED CASE STUDIES	
1. U.S. EXPERIENCE.....	60
BACKGROUND	
STATE EXPERIENCE	
REGIONAL EXPERIENCE	
2. INTERNATIONAL EXPERIENCE.....	92
AUSTRALIA	
CANADA	
NEW ZEALAND	
UNITED KINGDOM	
B: PROJECT REVIEW COMMITTEE.....	133
C: DEFINITIONS OF ASSET MANAGEMENT.....	134
D: ORGANIZATIONS CONTACTED.....	136
E: SURVEY QUESTIONS.....	137

ACRONYMS

AM	Asset Management
AMUG	Pacific Northwest Asset Managers Group
AASHTO	American Association of State Highway Transportation Officials
EPA	Environment Protection Agency
FHWA	Federal Highways Administration
GASB	Government Accounting Standards Board
IAM	Institute of Asset Management
IPWEA	Institute of Public Works Engineering Australia
LGA	Local Government Authority
NAMS-NZ	National Asset Management Group
NAMS.AU	IPWEA brand name for asset management committee
NEWEA	New England Water Environment Association
NMEFC	New Mexico Environmental Finance Center
TAM	Transportation Asset Management
TAMC	Michigan Transportation Asset Management Council
TAMP	Transportation Asset Management Plan
U.K.	United Kingdom
U.S.	United States

Executive Summary

Currently U.S. communities lack a systematic way to evaluate infrastructure needs. State and local governments need the capability to inventory public infrastructure, define performance and target needed investments based on life cycle costs that achieve desired service levels. Uniform regional approaches are needed to rate infrastructure condition, communicate results and fairly distribute resources to address the most critical needs.

Federal, state and local governments are each responsible for managing parts of transportation, water, and wastewater networks. Approximately 39,000 local governments in the U.S. manage road networks, the majority of which are small or rural agencies. Three-fourths of U.S. bridges are located in rural areas. Local agencies own and manage over 40 percent of the water supplies that serve almost 90 percent of the U.S. population.

About one-third of U.S. “metropolitan” growth since 1980 occurred in rural counties that are incorporated from the fringe of metropolitan areas. Investment strategies to solve problems experienced on U.S. highway, road, drinking water and wastewater networks must flexibly address local government and urban priorities.

Asset management is seen as a systematic way to begin to sustainably manage community infrastructure.

The Federal Highway Administration (FHWA), American Association of State Highway and Transportation Officials (AASHTO) and the National Cooperative Highway Research Program (NCHRP) sponsored an International Technology Transportation Asset Management Scan in 2005. The purpose of the scan was to “investigate asset management experience, techniques, and processes in the world,” and to share the findings with U.S. federal, state and local transportation agencies as they seek ways to improve the organizational culture, policies, tools and methods used to target infrastructure investment decisions. A key observation of the scan team was that world leaders in asset management actively create and support a community of asset management practitioners.

The scan team identified creation of a National Asset Management Steering Committee (NAMS) as critical to successful U.S. asset management implementation and recommended actions be taken to determine how a NAMS could be established in the U.S.

Project Purpose

Acting on the recommendations of the 2005 Transportation Asset Management International Technology Scan, the Federal Highway Administration’s Office of Asset Management commissioned this project. The purpose was to evaluate

existing networks of asset management (AM) practice to identify ways to improve communication and knowledge transfer of sustainable infrastructure management practices, tools and techniques in the U.S.

Project objectives include:

- Document national and international asset management peer networks.
- Identify factors which influence or challenge success
- Identify alternatives for implementation in the U.S.
- Recommend the best approach for U.S. implementation prior to Congressional discussions of transportation funding reauthorization spring 2009.

Project Approach

The project was guided by a Review Committee representing the FHWA, the Environmental Protection Agency (EPA), state DOTs, the Transportation Research Board and NAMS-Australia. Each member is actively involved in facilitating the exchange of AM knowledge and practices.

Research for the project included an examination of:

- Findings from the 2005 international scan of best asset management practice
- Proceedings from a 2007 meeting of FHWA and EPA with over 21 U.S. and international leaders in AM
- Literature about U.S. and international peer AM networks.
- Contacts with peer networks in Australia, Canada, New Zealand, the United Kingdom, and the United States.

Through a series of questions and interviews, the author compiled information as to the rationale for the development of each peer network's creation, their organization and funding structure, the drivers and obstacles to their success along with each group's definition of asset management.

The author developed six implementation options and criteria to rate and rank options for Review Committee consideration. Options represented ways to improve dissemination of AM knowledge and practice while building the capacity and capabilities in AM planning and management in the U.S.

The project's Review Committee met in a one-day meeting to review findings and discuss the six options

Key principles adopted by the Committee guided the evaluation process:

1. Build on the findings and recommendations of the 2005 international scan of best asset management practice.
2. Ensure a cross-asset, local government focus that provides on-going and continuous support for asset management training and networking.

Six options were rated based on adopted criteria:

1. Focus on local government
2. Bottom up focus on practitioners
3. Cross-asset approach
4. Simplified approach focused on implementation
5. Provide incentives, not mandates
6. Minimize costs, leverage resources
7. Regional strategy and state as a hub
8. Supports communication at all levels, across sectors
9. National coordination
10. Addresses professional association concerns
11. Benefits state
12. Addresses transportation

Findings

In an era of fiscal constraint at every level of government, initiatives—both in strategy and service delivery—are being examined that reduce governmental overlap and improve co-ordination between national, regional, state and local agencies. This is true in all countries studied. **Asset management is seen as a systematic way to begin to sustainably manage community infrastructure.** By connecting U.S. with international experience, and connecting pockets of excellence in the U.S. there is an opportunity to change how long it takes to adopt asset management in the U.S. and how well it is done.

The project observed the following:

- U.S. asset management guidance and the tools have primarily focused on state transportation agencies and larger water and waste water agencies.
- There is no nationally adopted AM terminology, implementation guidance or network of peers across U.S. infrastructure; efforts to date have been transportation or water sector-specific.
- Regional and statewide groups of AM practitioners are emerging in the U.K., Australia and the U.S. These have the benefit of sharing best practice examples, collaborating on implementation strategies and utilizing the skills of knowledgeable practitioners.
- There are three regional peer networks that offer simplified implementation strategies with specific case study examples for local or regional levels of government in the U.S. This has increased from two in 2006.
- Asset management principles and practices are being implemented by agencies throughout the world. Initiatives are underway in Australia, New Zealand, Canada and the U.K. to develop greater knowledge and experience in AM that integrates infrastructure information, lifecycle planning and long range financial management and reporting. Each country is seeking to address the needs across all levels of government and sectors of

infrastructure. Canada is in the process of adopting a national performance framework that will allocate revenues based on a consistent set of metrics. A Canadian Network of Asset Managers meets annually. England awarded \$45 million in July 2008 to regional beacons stepping forward with innovations in AM implementation. All of Scotland's local road authorities are conducting workshop-based AM implementation as are all six Australian states. In 2008 England's Department of Transport has directed that guidance be simplified and directed to local agency implementation. In March 2009 Australia will publish the *Australian Infrastructure Financial Management Guidelines*. The United Kingdom, Australia and New Zealand have adopted AM frameworks and imposed reporting requirements for local governments. New Zealand requires local authorities fully fund asset maintenance and replacement and report annually.

- Each country increasingly refers to the New Zealand/Australian *International Infrastructure Management Manual* as a guide to AM terminology and guidance across infrastructure types; this is true of U.S. regional communities of AM practice.
- In the U.S. current planning and political processes do not provide a long-term focus; limited infrastructure information is available in some key areas and long term financial plans are not linked to infrastructure information.
- All countries have recognized that adequate technical assistance is lacking in rural and small communities making access to AM knowledge and practice difficult.

Success Factors to Communities of AM Practice

Examples of asset management excellence exist in Australia, Canada, New Zealand, and the U.K. across infrastructure sectors, and within the U.S in transportation and water sectors. Similar elements create successful networks of AM practitioners. These elements include:

- Consistent leadership by champions who are passionate about AM
- Funding to support cross-sector advisory councils, training, and development of tools
- Exposure to “common sense” AM concepts
- Dedicated resources, including people, tools and guidance
- Creation of teams with clearly defined roles and responsibilities for driving process improvement
- On-going communication between stakeholders at all levels and across functions and sectors
- Incentives, mandates and regulations that support and guide the consistent development and implementation of asset management

Obstacles to Communities of AM Practice

While valuable gains have been made by individual asset management practitioners and networks, there are significant challenges remaining.

- Lack of standardization. There is currently no U.S. national forum for practitioners or professional associations to provide a consistent base of knowledge. This lack of a standard approach can lead to a poor understanding of long-term financial needs and a lack of confidence in the accuracy of reported infrastructure renewal needs. Inconsistent definitions and access to the network of international, national, state and local practitioners are obstacles to adopting AM policy, practice, information tools and reporting techniques in the U.S.
- Structural obstacles. Many agencies and organizational entities – both public and private – have an interest in how infrastructure is designed, built, funded and operated. Competing interests make it difficult to reach agreement on adopting a national asset management framework.
- Awareness of long term financial sustainability. The understanding among elected officials and top managers regarding the long term implications of growth on operating expenses and renewal investment has led to a low level of community understanding of the real costs of infrastructure service commitments. There is a lack of consistent communication between national, state, regional and local authorities concerning community needs, priorities and strategies to manage assets on a financially sustainable basis.
- Lack of resources. Additional staffing resources and a wider range of skills are needed in most agencies to implement asset management. The resource issue is particularly acute for smaller local agencies that have a narrower range of resources from which to draw.
- Dependence on “volunteerism”. Volunteer asset management networks, dependent on a local champion, are somewhat fragile. Time and resource demands can prevent all-volunteer networks from moving beyond the initial phase of formation.

In spite of these obstacles, there is a demand for AM information and assistance in skills building at the state, regional and local levels in the U.S. Pockets of asset management excellence within each level of government can be found in each country, including the U.S. This study documents three regional asset management communities of practice in the U.S., and one statewide effort that support asset management training. Regional efforts in the Pacific Northwest, southwest and northeast U.S. present local and international case studies based on best practice and the experience of practitioners that apply to community service delivery. Based on the growing demand for training provided by these regional communities of practice, the study examined six implementation options (beginning on page 31) and recommends the following course of action corresponding to an immediate, medium and longer timeframe.

Recommendations

Simplified implementation strategies with specific case study examples and a network of peers are needed at the local and regional level. Statewide strategies are needed to provide consistent AM terminology, and practices.

Greater support for a cross-asset, local government focus for AM training and networking within a state or region is recommended with some urgency. Knowledge of practical implementation steps of AM relies on access to regional communities of practitioners. An implementation plan is needed to document the staffing, strategy and support to ensure ongoing success. This should include a communication plan that targets the role of elected leaders, top management and asset managers throughout a state. The aim is to **build a statewide network of asset management champions and practitioners who can assist each other** with practical examples based on experience, innovation and best practice. This recommendation incorporates the strategic objectives of the 2005 scan team and suggests targeting an area of the country where political support for developing comprehensive AM planning capabilities can be demonstrated and champions exist to lead the effort. Initial support would be contingent on their acting as a regional example and a resource for other areas and states in the U.S. A cross-asset approach is recommended to ensure sustainable infrastructure management in support of sustainable communities.

The sustainability of small and rural communities is an immediate concern in each country when examining aging infrastructure, devolving responsibility to lower orders of government, and rising costs. Frequently the costs to provide community services are greatest per capita and per mile in the fringe of urban areas and smaller communities. These same communities have the greatest challenges accessing asset management information and implementation assistance. Few commercial or public highway or road users can distinguish which level of government “owns” sections of the network, or manages the safety of the water supply. All communities must understand infrastructure requirements to ensure that communities receive consistent and reasonable levels of service, irrespective of ownership. A second, short term recommendation is to **adopt simplified statewide asset management guidance, training, and tools that improve the ability of local governments** and smaller communities to sustainably develop, manage and fund infrastructure services.

The study recommends courses of action corresponding to an immediate, medium and longer timeframe.

SHORT TERM

1. **Pilot Simplified Guidance, Training and Tools for Statewide Regional Rollout as Regional Beacon**

Greater support for cross-asset, local government asset management training and networking within a state or region is recommended with some urgency.

Target an existing state or region that provides asset management training and networking in a region of the U.S. Evaluate political, statutory, professional association and state resource support for on-going and continuous training targeted at local communities and the services they deliver. Successful pilots would provide a platform for distributing information, providing practical implementation guidance, training, tools and templates while featuring U.S. and international case studies AM implementation.

Develop a timeline for developing simplified asset management guidance, and implementation training. Examine the availability and appropriateness of international models of asset management guidance, templates and techniques appropriate for community infrastructure planning.

Develop funding strategies that ensure on-going, continuous resources (staffing, support services, communication tools) leading to financial self-sufficiency within a specified timeframe. Include performance indicators to track progress toward effectiveness and increasing financial self-sufficiency.

Include a communication strategy that notifies and encourages the involvement of elected officials, planning, finance, engineering, government professionals and consultants supporting these professions.

Successful pilot project participants will develop a business plan that includes a communication strategy, training and staffing plan with required funding. Collaboration with Local Technical Assistance Program (LTAP) and professional associations should be explored to see if joint training is possible.

Once funding is dedicated, year one requires that efforts (successes and difficulties) are documented, and that in the second year the participating organization acts as a regional leader for other state's interested in developing similar asset management communities of practice.

2. Target Small and Local Communities

The sustainability of small and rural communities is an immediate concern in each country when examining aging infrastructure, devolving responsibility to lower orders of government, and rising costs.

Develop a strategy that addresses training, guidance and tools for implementing AM in small communities. Address simplified tools and techniques appropriate for asset management planning in local communities. Funding and partnerships between transportation and water/wastewater

sectors should be explored that support implementing existing tools and training in the U.S.

MEDIUM TERM

3. Statewide Financial Sustainability Study

Examine the support and interest in a grant-funded study assessing the financial sustainability of local governments within a state. This option would require the assistance and support of the Local Government Association, and possibly state government. The objective of this study would be to elevate the appreciation of elected officials and senior managers of AM and its benefits. When pursued in New Zealand, Australia and the U.K., similar studies had the effect of garnering legislative, political and financial community support to address needed improvements.

LONGER TERM

4. National Asset Management Resource Center

Building on grassroots regional efforts, create an improved web library of documented case studies, asset plan examples, presentations and lists of practitioners available for training and assistance. Include links to international communities of asset management practice. Seek to build on international best practice, guidelines, tools and templates, as well as regional asset management guides across infrastructure (transportation, water, waste water). Conduct an annual National Asset Management Conference scheduling presentations from all levels of government across infrastructure.

These four recommendations address the current lack of adequate guidance at the local level, the need for state guided leadership in rolling out asset management, and the benefit of a national asset management framework and resources.

Together, these recommendations provide a roadmap for improving asset management knowledge, skills and practices which play a foundational role in sustainably managing communities in the United States.

Chapter 1: INTRODUCTION

BACKGROUND

The Federal Highway Administration (FHWA), American Association of State Highway and Transportation Officials (AASHTO) and the National Cooperative Highway Research Program (NCHRP) sponsored a Transportation Asset Management International Technology Scan in 2005.

The purpose of the scan was to investigate asset management experience, techniques, and processes in leading countries in the world and to share the findings with U.S. federal, state and local transportation agencies. The goal was ultimately improve the organizational culture, policies, tools and methods used to target infrastructure investment decisions.

A key observation of the scan team was that the countries examined are actively creating and supporting a community of asset management practitioners. The Scan Team, in its implementation plan, identified the establishment and support of asset management communities of practice as important next steps in assuring continued growth and application of asset management principles throughout all of government.

The 2005 Scan Team identified key drivers for adopting an asset management approach.

- Asset management training for all levels of officials is an important contributor that changes the culture of an organization and establishes asset management expectations among key stakeholders.
- Active asset management professional associations and user groups, frequently spearheaded by local officials, developed outreach materials aimed at both elected officials and public professionals. These initiatives were lead by local government associations or national working groups.
- Conveying elected officials' role in strong stewardship of community assets, including demonstrating the link between investment and performance and the effect on the community of investing in infrastructure.
- Conducting tradeoffs among asset categories and linking this to broad community and agency goals.
- National or state agencies worked cooperatively with local governments to provide a consistent approach to asset management among different levels of government guidance and /or participated in user groups (Canada, England, New Zealand and Australia).

Developing an asset management culture in an organization can start with modest efforts. Assigning asset management responsibilities is a foundation for

effective management efforts. Cross-functional teams, serve as the best means of understanding the many different aspects of asset management.

The recommendations from the 2005 scan team included targeting a state or region to take a holistic view of the entire public asset inventory and provide increased funding flexibility to address community needs. A regional linkage was suggested between transportation planning, programming and asset management at the metropolitan planning organization (MPO) level. Specifically, the recommendation was to:

“Join with other efforts, agencies and resources to embed asset management onto existing efforts on an ongoing basis. Create a National Asset Management Steering Committee (NAMS) in the United States. Such an effort provides a platform to distribute information, provide training and document best practices on transportation asset management nationally and abroad. Develop an easy-to-understand toolbox for asset management that can be applied at different levels of government. The tools should look beyond transportation to best practices in other industries. These tools should be available on a web site for free downloading.”

Strategic implementation objectives from the scan team include: 1) Document the state of practice at the state and local transportation agency level in the United States as part of establishing a national approach to transportation asset management; 2) join efforts between FHWA and EPA; 3) integrate U.S. efforts to document and provide resources on best practice with existing international efforts; 4) develop a resource clearinghouse for all levels of transportation agencies—state, Metropolitan Planning Organization (MPO) and local; and 5) track progress with a national asset management forum across infrastructure and federal agencies.

Successful use of asset management depended in part on active support and training in the countries the 2005 scan team visited. Many U.S. professional associations, transportation and water government agencies, educational association and some international organizations provide resources for those seeking improved understanding of asset management.

FHWA and EPA convened a meeting March 12, 2007 in Washington D.C. with over 21 leaders in asset management from around the U.S., Canada, Australia and New Zealand in Washington D.C. The one-day discussion examined whether existing industry-specific associations, cross-industry associations or stand alone grassroots efforts would provide the most successful source of national level coordination of forums, tools and education regarding best asset management practice.

Meeting attendees recognized the importance of establishing a common framework for asset management for the public works community. While FHWA, AASHTO, and EPA efforts were recognized as moving industry-specific AM, the consensus was that another association, possibly the American Public Works Association (APWA) might want to take a leadership role that could reach cities, counties and other public works agencies. This organization could provide one point of information dissemination and contact for those seeking contact with others on the topic of asset management.

FHWA and EPA are committed to encouraging information sharing that advances the state-of-the-practice of asset management and recognize that various levels of government are partners as they address critical infrastructure needs in communities.¹

The purpose of this project is to identify ways to support or improve existing efforts to communicate and transfer knowledge of sustainable infrastructure management practices, tools and techniques in the U.S. Existing efforts, including those outside the United States and beyond transportation communities of practice, are evaluated so that their success and challenges are understood. Alternatives for implementing or further supporting successful communities of asset management practice are evaluated. A recommended course of action for the U.S. is included.

PROJECT OBJECTIVES

The project objectives included:

1. Document national and international asset management peer networks.
2. Identify factors which influenced or challenged success – content, membership, funding, and structure.
3. Identify alternatives for implementation in the U.S.
4. Recommend best approach for U.S. implementation prior to Congressional discussions of transportation funding reauthorization spring 2009.

PROJECT APPROACH

Literature on U.S. and international peer asset management networks was reviewed. Representatives of these networks were interviewed. The causes for each group's creation, their organization and funding structure, the drivers and obstacles to their success along with each group's definition of asset management were documented.

Research findings and options for implementing a peer network in the U.S. were drafted and examined by a Review Committee of U.S. and international asset

¹ "Memorandum of Understanding "Infrastructure Asset Management Technology Exchange," 2006

management experts.² Committee members represented a cross section of transportation and water infrastructure professionals, state and local governments, educational research institutions and international professional associations involved in creating or managing the facilitated exchange of asset management knowledge. Recommendations are those of the Review Committee.

DEFINITIONS

Asset Management

Many definitions of asset management exist.³ For purposes of this report, the following definition, adopted by the American Association of State Highway Transportation Officials (AASHTO) was used.

Asset management is a strategic and systematic process of operating, maintaining, upgrading, and expanding physical assets effectively throughout their lifecycle. It focuses on business and engineering practices for resource allocation and utilization, with the objective of better decision making based upon quality information and well defined objectives.

Principles of Asset Management

Rather than a program, asset management is a philosophy of doing business in which information is shared and accountability and performance reported. Services are based on explicit strategy. Service outcomes are funded at the desired level of service based on community consultation and the least cost over an asset's life cycle.

Effective asset management is based the following principles:⁴

- Policy-driven
- Performance-based
- Analysis of options and tradeoffs
- Decisions based on quality information
- Monitoring to provide clear accountability and feedback

The following are identified as core elements of best asset management practice and guidelines⁵:

- Taking a lifecycle approach
- Developing cost-effective management strategies for the long-term
- Providing a defined level of service and monitoring performance
- Understanding and meeting the impact of growth through demand management and infrastructure investment
- Managing risks associated with asset failures

² See Appendix A: NAMS-US Blueprint Review Committee

³ See Appendix B: Definitions of Asset Management

⁴ Federal Highway Administration, <http://www.fhwa.dot.gov/infrastructure/asstmgmt/ampp.htm#20>

⁵ *International Infrastructure Management Manual*, NAMS-NZ, 2006

- Sustainably using physical resources
- Continuously improving asset management practices.

Maturity of Asset Management Development

Asset management follows a path of continuous improvement.⁶ Basic or core practice is based on the knowledge of what public assets are owned, asset condition, location, materials and age. This is followed by adopting explicit strategies and examination of tradeoffs given current condition, future demands, required funding and resulting future condition, utilization and performance.

Basic or core practice which addresses legal or financial requirements evolves to more detailed and aligned business processes, strategies and performance measurement, integrated information systems, assigned roles and responsibilities based on shared information and collaboration across disciplines (engineering, maintenance, operations, information technology, finance and communications).

The use of risk analysis identifies those assets and services that are critical. Future investment strategies identify service levels for the least cost and best performance, or the “best bang for the buck.” Management, elected leaders and the community served can then select the desired level of service based on understanding the cost and long term consequence of options.

“Sustainable infrastructure management” requires linking infrastructure investment with financial policy. Transferring knowledge of these concepts, business processes, technology and performance-based communication methods is successfully facilitated by peer asset management networks in Australia, Canada, England, New Zealand and parts of the U.S.

Community of Practice

A community of practice is a self selected group with a common interest seeking to improve their understanding of asset management based on sharing their experiences and the expertise of others.

As groups mature and develop, they may expand their mission to commit to a more formal working relationship with assigned roles and tasks that are aimed at achieving agreed upon goals.

Regardless of their evolution, it is acknowledged that these communities of practice nurture new knowledge, stimulate various innovations, and most importantly share existing tacit or “unstructured” knowledge of individuals with common interests within and across organizations. They tend to attract leaders,

⁶ *Transportation Asset Management Guide*, Cambridge Systematics, Inc. et al. 2002. *International Infrastructure Management Manual*, National Asset Management Steering Group, 2006. *NCHRP Synthesis 371: Managing Selected Transportation Assets: Signals, Lighting, Signs, Pavement Markings, Culverts and Sidewalks*, Mike Markow, 2007

risk takers and innovators in their field. By creating and supporting communities of practice, documenting or managing this knowledge is possible.

Benefits of communities of practice are promoting education and the sharing of best practices. Increased organization effectiveness leads to greater innovation, better customer experiences, consistent good practices, and accessible knowledge for organizations physically separated.

By encouraging information exchange among peers, organizations can benefit as well. Organizational walls can be broken down and employees involved with design and problem-solving functions can accomplish tasks more quickly and efficiently.⁷ Communities of practice have become associated with knowledge management, learning organizations and continuous improvement.⁸ These are all aspects of an organization that has successfully embedded asset management into its business practice.

⁷ "Transportation Asset Management Today: Communities of Practice in the Transportation Industry," Transportation Research Record: Journal of the Transportation Research Board, No. 1885, TRB, National Research Council, Washington, D.C. 2004, pp. 88-95.

⁸ *The Fifth Discipline: The Art and Practice of the Learning Organization*, Peter Senge, 1990.

Chapter 2: SUMMARY OF CASE STUDIES

Existing networks of asset management practitioners in Australia, Canada, New Zealand, the United Kingdom, and the United States were evaluated. Participants in the study included:

- U.S.:
 - Michigan Asset Management Council
 - Northeast Water Environment Association's Asset Management Committee
 - New Mexico Environmental Finance Center
 - Pacific Northwest Asset Management User Group
- International
 - Australia's NAMS. AU
 - Canadian initiatives, including Infraguide, National Asset Managers Working Group, National Round Table for Sustainable Infrastructure and the Canadian Network of Asset Managers
 - New Zealand's NAMS.NZ
 - United Kingdom's Institute of Asset Management (IAM), the Society of Chief Officers of Transportation in Scotland (SCOTS), Road Liaison Group Asset Management Committee

Representatives of existing communities of practice were contacted. The causes of each group's creation, their organization and funding structure, the drivers and obstacles to their success along with each group's definition of asset management were documented.⁹

⁹ See Appendix B: Definitions of Asset Management, C: Organizations Contacted, Appendix D: Survey Questionnaire, and Appendix E: Detailed Case Studies.

The following table summarizes elements of asset management communities of practice evaluated for this project.

- **Mandates.** Most efforts to gather and report asset information were initially a response to accounting requirements or legislation. However mandates alone have not provided sufficient guidance on asset management planning and practices.
- **Organizational Support.** The most successful examples blend professional staffing, support of professional associations, and involvement of local government practitioners to guide their efforts.
- **Asset Focus and Information Sources.** All countries are moving toward asset management principles and examples that address multiple community assets and recognition of international standards of best asset management practice.

Table 2.1 Summary of Communities of Practice

Criteria	Mandate			Organizational Support			Asset Focus		Information Sources	
	Legislation	Exec. Order	Accounting Requirement	Volunteer	Prof. Staff	Prof. Assoc.	Cross-Asset	Industry-Specific Orientation	Industry-Specific Best Practice	International Best Practice
Organization										
U.S.										
▪ Michigan TAM Council	✓		✓	✓	✓			✓	✓	
▪ AMUG			✓	✓			✓			✓
▪ NEWEA			✓	✓		✓		✓	✓	✓
▪ NMEFC	✓	✓	✓		✓			✓		✓
INTERNATIONAL										
NAMS.AU			✓	✓	✓	✓	✓			✓
Canada			✓	✓			✓			✓
▪ CNAM			✓	✓			✓			✓
▪ NAMWG			✓	✓	✓	✓	✓			✓
▪ NRTSI			✓	✓	✓		✓			✓
NAMS.NZ	✓		✓	✓	✓	✓	✓			✓
UK										
▪ IAM	✓		✓		✓			✓		✓
▪ Road Liaison Group AM Committee.	✓		✓			✓		✓	✓	
▪ SCOTS	✓		✓			✓		✓		✓

Detailed case studies are in Appendix A.

Criteria developed from this research were used by the project’s Review Committee to rank options for U.S. implementation. See Chapter 4: Options, Evaluation & Recommendation, for a more detailed description of this process.

Chapter 3: OBSTACLES, SUCCESS FACTORS & OBSERVATIONS

There are a range of criteria that impede or support successful communities of asset management practice. The following are gleaned from interviews with AM training providers, participants in existing networks of AM practice and documentation of the AM journey experienced by various countries, states and municipalities leading sustainable infrastructure management implementation.

3.1 OBSTACLES

Lack of Standardization

1. There is no U.S. national forum for practitioners or professional associations to provide a consistent understanding and knowledge of asset management. AM information and resources are usually directed at one sector (transportation, water or wastewater) or one professional specialty (finance, planning, engineering, or information technology) not incorporating whole-of-government or cross-asset strategies needed to manage community assets in a financially sustainable manner. This lack of standardization (too many organizations saying and doing different things) leads to the use of confusing terminology and AM approaches. Agencies that must guide resource allocation across community services find it confusing with no one source of AM contacts or information.
2. The lack of a standard AM approach frequently leads to a lack of confidence in the accuracy and reliability of infrastructure renewal needs (e.g., Canada). This can result in dismissal or confusion on the appropriate actions that address unfunded public infrastructure needs.
3. Studies in the U.K., Canada, and New Zealand document that local governments have a poor understanding of their long term financial sustainability because they lack adequate strategic planning and funding strategies that address requirements for maintaining and providing the desired community services and physical assets that deliver them.
4. There is no mandate to implement asset management planning or fund long term infrastructure maintenance and renewal in the U.S.

Structural Obstacles

5. More than one U.S. leader cited the inability to determine the “win” for all of the many parties who have an interest in infrastructure as the most significant obstacle to creating a national community of AM practice. There are many different types of agencies, consultants, and organizations who have an interest in how infrastructure is designed, built, funded, and operated in communities. Some of these entities have competing interests which has made it difficult to reach agreement on adopting a national AM framework.
6. Federal agencies are large, their missions differ and sometimes coordination within and between them on strategic initiatives, like asset management, is difficult.

7. Asset management must compete with other priorities. This is in spite of the majority of divisions having received asset management training.
8. Environmental regulations and transportation programs can drive project selection that is not based on the greatest community need or priorities. These in fact may inhibit communities' long term sustainable financial planning based on asset management. (Ironically, environmental regulatory compliance is also a driver of asset management, see below.)
9. The short term cycle of most elected positions hampers solid commitments to addressing maintenance and renewal needs in communities, and additional human resources, training and tools needed to implement and maintain AM functions.
10. Engineering consultancies, while concerned about long term client relationships, must balance this with the need for profitability in the short term. This tends to lead to repeatable, design engineering projects. This is cited as an obstacle to asset management practice based on considerations of lifecycle management. Current engineering training is beginning to introduce concepts of asset management in university curriculum.
11. In every country, consulting services are being used to assist AM implementation. This is occurring as many consultants in the U.S. are only just now becoming aware of AM. Reliance on external assessments and advice is not sufficient to achieve a true change in an agency's culture of decision making based on the link between sound asset management planning and long range financial planning.

Simplified Guidance, Links between Long Term Strategy, AM, & Communication

12. A 2008 study of 100 U.K. local authorities lists key obstacles to achieving consistent and high quality asset management processes and Transportation Asset Plans. These are the lack of:
 - Simplified implementation guidance on asset plan development, and how they fit in the hierarchy of statutory and operational local authority documents
 - Guidance on life cycle planning, risk management and inventory collection, asset valuation, and level of service. It is this last, level of service, which is targeted as the key link between tying AMPs with long term community plans and financing.
 - A link between strategic long term planning efforts in local authorities and AM implementation, usually located in the maintenance part of the organization.
 - Communication on AM status, requirements and ties between Department for Transport (national) and local authorities.

AM Resources & Small Communities

13. Additional staff resources and a wider and different range of skills are needed to implement asset management. The additional budget for

- training and more or different human resources have not always been available, especially in small agencies.
14. Even when agencies have initiated asset management, loss of champions leads to a slippage in progress. This effect is true in all countries and especially acute in small local authorities (cited in the U.S. and New Zealand).

Role of Champion & Volunteerism

15. Volunteer AM networks are somewhat fragile, often dependent on one or more champions or individuals who emerge on their own and devote extra time to achieve a vision for creation of an AM peer network. These all-volunteer networks risk not moving beyond the initial formation phase as these individuals cannot devote sufficient time to the effort, move to other employment, or retire.

3.2 SUCCESS FACTORS

Common Elements of Network Success

1. Excellent examples of AM implementation exist in each country at each level of government and within both the transportation and water sectors. Many of the same elements that drive asset management implementation within a U.S. government or industry sector are the same leading to creation of successful networks of asset management practitioners. These are:
 - Presence of a champion(s) passionate about AM and its usefulness
 - Exposure to “common sense” asset management concepts that help answer five key questions: what do I own, what condition is it in, what is most critical, what is the minimum cost to provide services at a certain level of performance, how do I pay for this long term?
 - Dedicated resources (people, tools, guidance)
 - Creation of teams with clear roles and responsibility for driving process improvement
 - On-going communication between stakeholders at all levels, across functions and sectors
 - Incentives, mandate or regulation (e.g., GASB 34, EPA regulation for clean water, Michigan Act 51 amendments)
2. While several states are implementing AM, a notable state-wide example of implementing TAM in the U.S. is in Michigan. Elements of their success include:
 - Presence of a champion at the state level
 - Statutory incentives grant local agencies flexibility in use of some state revenues if an AM plan is adopted and being implemented
 - Creation of a cross-sector advisory council directing local agency training and practice
 - Use of state funding to support training, tools development, and a cross-sector advisory council

- Provision of tools and one repository for data that provides basic road inventory and condition information state-wide; tools go beyond road surface rating into transportation infrastructure management (inventory, condition and tradeoff analysis) for more than roads and bridges
- Leveraging existing state training resources by using LTAP for AM training; LTAP now embeds AM in all operational training courses

Some Michigan road agencies are successfully using information to target the desired level of service and garner support for revenues that support them. This local success is creating more AM champions in the state. This is leading to a more active statewide network of AM leaders and practitioners.

3. AMUG presents cross-asset management case studies and training. This cross-asset approach has found immediate and growing success among sectors, levels of government and disciplines (engineering, maintenance, finance, e.g.). NEWEA and NMEFC have evolved to this cross-asset training and begun to attract practitioners beyond the water and wastewater industries. All regional networks refer to the IIMM as their source of a best practice AM guide and framework for implementation.

Approaches and Drivers to AM Implementation

4. There is no common approach to implementing AM among U.S. case studies. However, in each case, the role of champion is required to get efforts off the ground.
5. New Zealand, Australia and the U.K. are beginning to adopt simplified, consistent AM implementation approaches and provide training and templates. This move is seen as critical to shifting general AM awareness to implementation.
6. Mandates have provided the greatest impetus for AM implementation (Australia, New Zealand, Canada, U.K., U.S.). Most frequently, these initiatives come from the financial and accounting communities in each country. While initially helpful in bringing attention to long term investment and infrastructure needs, these accounting standards do not provide a consistent way of describing needs, or the local support needed to set priorities and raise additional revenues. In fact, there is some evidence that the large size of these backlogs limits support for finding solutions (Canada).
7. U.S. states have provided flexibility and incentives (Michigan, New Mexico) that reward funding (state transportation funding, community block grants) for those communities able to show asset management plans or planning as the approach for identifying infrastructure need. New Mexico's approach is being examined by Oregon's Economic Development Division. The Oregon Governor's Executive Order directs that AM be included in future CBG funding allocation.

8. U.S. environmental regulations are driving communities to seek information on asset management as a way to target resources.

The Role of Funding Support by Others

9. Some U.S. regional AM training (NMEFC) relies on federal financial support, or professional association affiliation (NEWEA) to offset costs. This, in part, makes these efforts successful.
10. New Zealand and Australia represent national models for structuring AM networks of practice. Both have professional contract administrators, cross-sector volunteer boards and business models for long term financial sustainability. Documented guidance has been developed by practitioners for practitioners. Their focus is on practical advice and implementation assistance for local governments.
11. Canada's InfraGuide represents another cross-sector effort to document AM guidance from the practitioners' perspective. Infrastructure Canada cancelled funding for InfraGuide in 2007. The Canadian Municipal Asset Managers Network (CMAMN) was then created "by municipalities, for municipalities" and holds annual conferences.
12. A July 2008 initiative of the U.K. national government provides incentive funding that recognizes regional examples of asset management. The effort is aimed at creating regional champions and a national network that improves communication between central and local government and between local authorities' AM implementation teams to help "facilitate sharing examples of good practice and self help... through support networks." This incentive is aimed at the local authority level, and creating regional champions as a condition of funding.

Communication's Role

13. Communication targeted at the stewardship role of elected officials and senior managers are used in New Zealand, Australia, Canada and the U.K.
14. The U.S. is beginning to develop communication describing the importance of stewardship specifically for top management and elected officials (EPA).

National Framework

15. New Zealand, Australia and the U.K. now cite the *International Infrastructure Management Manual* and approach as the key source of asset management information and approach.
16. In 2007, Australia Institute of Public Works Engineers Australia (IPWEA) began rolling out subscription-based asset management templates and simplified guidelines, NAMS.PLUS. Four workshops teach agencies to develop an asset management plan and long range financial plan. All 6 Australian states are now involved. IPWEA is equivalent to the U.S. American Public Works Association (APWA), a municipal or local government engineering and maintenance professional association. A

Scottish local council and Canada's British Columbia province are now considering or have subscribed to NAMS.PLUS.

17. In Canada, current efforts are focused on identifying the "State, Performance and Management of Canada's Core Public Infrastructure," adopting technical and non-technical performance measures of assets and services across all levels of government. Adoption of a five-year work plan to implement a national performance framework was scheduled for November 2008.

3.3 OBSERVATIONS

The Needs of Local Government

1. Investment strategies to solve unmet infrastructure needs must flexibly address local government and urban priorities.
 - About one-third of U.S. "metropolitan" growth since 1980 has been in rural counties that are incorporated from the fringe of metropolitan areas
 - Over three-fourths of the U.S.'s 4 million miles of roadway and over half of U.S. bridges belong to county and municipal governments.
 - Ninety-eight percent of U.S. wastewater treatment facilities are municipally owned and serve 73 percent of the U.S. population.
 - Forty-three percent of drinking water systems belong to local government with almost 90 percent of these systems serving communities with more than 10,000 people.
2. There is increasing recognition and concern that small communities need technical assistance to implement AM (Canada, N.Z., U.K., U.S.).
3. To date, U.S. AM guidance is aimed at one sector or state level agencies.

AM and Local Government

4. Australian, New Zealand, and Canadian AM networks and guidance have focused on local government.
5. In July 2008, the U.K. announced an initiative rewarding local authority AM innovation.
6. Audits of local government sustainability conducted in Australia, New Zealand and the U.K. conclude that AM is still not consistently supported within the public sector other than among those practitioners directly involved in its implementation.
7. Scotland local road agencies have funded AM workshops to raise AM awareness, and to develop an asset plan template. Beginning in 2009 transportation asset plans will be developed by each agency.
8. Regional and statewide groups of asset management practitioners are emerging in the U.K., Australia and the U.S. These have the benefit of sharing best practice examples, collaborating on effective implementation strategies and effectively utilizing the skills of knowledgeable practitioners within an area.

The AM Journey Common to All

9. Australia summarizes the path to AM acceptance in each country studied.

These are:

- Accounting standards (moving from cash to accrual)
- Asset registers and valuations
- Adopting a national framework
- Awareness and understanding—a realization of the need for practical tools and guidelines to assist implementation
- Financial sustainability studies—driven at a state level and successful in obtaining elected official and senior management commitment and political will
- Technical capacity—development of industry skills in asset management, availability of practitioner developed tools and guidelines
- Buy-in by finance professionals—acknowledging the need to move from annual budgeting to long term financial plans, the need for information sourced from sound asset management plans, and the need for guidelines for accounting for infrastructure
- Legislation—10 year- financial plans founded on 20-year asset management plans; not overly prescriptive to encourage a management instead of a compliance approach
- Levels of Service—linking cost and budgets to levels of service
- Continuous improvement—sustainable management of infrastructure is a journey of continuous improvement

The Role of Incentives and Mandates

10. Legislation is a key driver of local government pursuit of AM in New Zealand, Michigan and some Australian states.

11. Accounting requirements drive adoption of minimum mandated inventory and valuation reporting, however not necessarily adoption and use in integrated long range financial planning, management and reporting.

12. While all countries studied have adopted new accounting standards, sustainability studies by the financial industry are the key driver bringing state focus to AM in Australia, New Zealand and the U.K.

U.S. National Efforts

13. U.S. transportation and water agencies are investing significant resources to support AM implementation; these efforts are primarily aimed at the state level or a sector of community services (e.g., transportation, or water and wastewater).

14. Current U.S. regional TAM conferences and webinars are seen as very helpful but do not provide forums for practitioners seeking on-going or more in-depth implementation help.

15. Some state DOTs are incorporating a preservation strategy as their core strategic focus while other states have begun legislating the use of life-cycle costing or preventive maintenance strategies or granting greater local agency

funding flexibility when they demonstrate the use of asset management planning.

Conflicting and Incomplete Backlog Information, Future Focus on Performance

16. Although there is a general perception that the national level government is not spending enough on maintenance, Canada and the U.K. cite the lack of consistent and accurate information about the cost and backlog of managing and maintaining key assets.
17. Similar to the U.S., Canada is moving national efforts to adopt asset and service performance metrics for core infrastructure. All levels of government and technical experts are involved in developing this national framework.
18. An Asset Management Program is called for in the *Rebuilding America* policy study. The Study Commission expects “states and local governments (to) raise additional revenues as part of the effort to increase investment” in the transportation network. Information on network performance is called for as a method for receiving federal funding.
19. Most agencies currently use AM for highway management, their greatest investment, and are now expanding to other modes of transportation. However, as stated in a recent report “The definitions of TAM are as numerous as the (state transportation) organizations purporting to have endorsed its principles.”¹⁰ This will make comparing U.S. transportation network performance and need difficult.

Cross-Asset and Uniform Advice Needed

20. A 2007 U.S. meeting of 21 professional public works associations, federal departments and international AM experts and educators reached consensus that one organization is needed to lead AM excellence applicable to all community assets.
21. In each country a decline in public resources leads to an increasing reliance on specialized engineering, maintenance and financial management consulting services to manage public sector assets. These specialties are just now improving their understanding of AM elements based on preservation and financial sustainability. The skills and data gathering techniques required to produce performance reports relies on knowledge of the asset base—the number, and condition, existing and future needs. Training is needed for consultants and the public sector to ensure the same principles, tools and techniques are in hand prior to privatizing public sector AM.

Network of AM Practitioners as Useful Advisor

22. Networks of AM practitioners in each country are seen as the best source of practical information and strategies for AM implementation.
23. Involvement of all road stakeholders in Michigan’s Transportation Asset Management Council has led to overcoming a historic lack of trust among key transportation actors in the state. The best examples of U.S. AM

¹⁰ *Applying Transportation Asset Management in Connecticut*, Draft Report, October 2008

implementation assistance are statewide (Michigan) or regional (AMUG, NEWEA, NMEFC).

24. Common elements in U.S. regional peer networks studied include: the presence of a champion, a cross-asset approach, leadership by practitioners and use of the *International Infrastructure Management Manual* and approach. These peer to peer networks provide valuable “how to” opportunities for others seeking specific implementation ideas and answers. They move practitioners from general exposure to AM concepts to applying more rational approaches to capital investment and renewal. Training is simplified, relies on case studies and is tailored to the needs of the audience.
25. U.S. regional AM networks successes have relied on the efforts of a few champions and are typical of loosely formed communities of practice (i.e., effort relying on a few motivated volunteers with competing, paying work priorities). These efforts have limited staying power or possibilities for long term success. There is a threat an all-volunteer effort (AMUG) will not evolve beyond this start-up phase.
26. Support by all levels of government—some providing financial resources and other staffing and human capital, academia, and consultancies produced Canada’s *InfraGuide* best practice guides and case studies. *Infraguide* is still used as a reference by Canadian agencies seeking best asset management practices and examples. The network of contributing practitioners responsible for its content led to creation of the Canadian Network of Asset Managers (CNAM) following *InfraGuide*’s discontinuation.

Role of Communication

27. A change in corporate culture is required for sustained AM practice. This requires support from top elected officials and senior managers to ensure that on-going support and resources (people, tools and processes) are provided to link asset management and long term financial planning.
28. Communication plans directed at each level of decision making (elected, senior management, and field personnel) and stakeholder (public and private) are required to have meaningful, sustained change in how resources are allocated. While this need has been identified, effective communication strategies do not exist today in the U.S. in the transportation or water/wastewater sectors.
29. The 2008 U.K. review of 100 local authorities’ AM practice cites the importance of communication and reporting links between national and local authorities and between local authorities as a key success factor that needs to be addressed.

Guidance

30. On-going training is needed especially at basic or core level of AM. This is true for all levels of government (federal divisions, state DOTs, local agencies and utilities). This reflects the natural shift in assigned personnel within an agency, as well as the anticipated retirement of the “baby boom” generation of workers. Training is also needed to ensure AM is embedded as a corporate

- philosophy and supported by top management, rather than seen as a program accomplished by a few tactical personnel.
31. Case studies, peer exchanges, self assessments and best practice examples are all seen as benefiting those seeking “how to” examples of implementation and ways to improve acceptance of AM.
 32. Australia defines a national asset management framework as having three key elements: asset planning and management, financial planning and reporting, and criteria for assessing financial sustainability.
 33. U.K. 2008 studies call for raising awareness of AM’s potential by providing simplified step by step guidance, workshops and training.
 34. Efforts are underway in the transportation, water and wastewater industry in the U.S. to simplify guidance and tools that help small and mid-size agencies achieve AM planning. Training guides are being rewritten (NMEFC and NACWA¹¹, Michigan) for this audience based on simplified approaches and international best AM practice.
 35. Both New Zealand’s NAMS Group and Australia’s NAMS.AU provide leading examples of networks for public works practitioners (web-based dialogue, conferences, awards for innovation and workshops). They are originating simplified AM tools, techniques and guidelines. These organizations are professionally managed and have business plans that deliver on-going AM education, guidelines and skills development that improve AM in Australia and internationally.
 36. Better notification of U.S. webinars, national AM reports, technical reports and training opportunities are suggested to support AM champions and AM agency efforts.

Flexible and Accountable Implementation

37. State by state flexibility in AM training and implementation is needed. Each state’s variability and perception of what constitutes AM “excellence” varies. Peer exchanges within a state are seen as the next step to integrating an approach to AM. Vision, guidance, funding and encouragement are all cited as necessary elements of implementation, as well as dedicated funding.
38. While AM networks don’t want to be treated like other work groups, some indicators of performance would be valuable to illustrate their benefit. Contact between regional networks and use of their guides, tools and approaches to teaching would benefit U.S. implementation at all levels of government across sectors and professional specialties.

¹¹ National Association of Clean Water Associations (NACWA)

Chapter 4: OPTIONS, EVALUATION & RECOMMENDATION

4.1 IMPLEMENTATION OPTIONS

Option 1: National AM Center of Excellence

Proposal

Create a Center of Excellence that adopts a national asset framework encompassing a common set of terminology and approach to implementing long term asset management planning for public and private acceptance and use. A national forum involves those who govern, fund, plan, account, and manage infrastructure. This national-level asset management “user group” would address standards in asset management and promote best practice and definitions in the U.S. Regular meetings would adjust asset management concepts and practices needed to support sustainable communities in the U.S.

Assumption

This approach Incorporates industry organizations as stakeholders, recognizing this is a requirement for success. A business case evaluation (BCE) process is needed to show the benefit and value for industry organizations, as well as for other beneficiaries. (Required)

Rationale

Today in the U.S., there are grass-root efforts occurring across and within industry sectors leading to a lack of coordination nationally as well as duplication of effort, competing programs, alternative frameworks and strategies, and misunderstanding of terminology and definitions.

Adoption of a national framework, funding and chartering of a National Center of Asset Management Excellence could resolve some of these inefficiencies in implementing asset management principles, business processes, tools and techniques in local, regional and state governments, and utilities. This would provide uniformity in understanding asset management for those in the public sector and those in the private sector supporting implementation.

Existing industry organizations (planning, finance, local government, transportation, public works, water, wastewater, pavement management, information technology, e.g.) are seeking to inform their membership about asset management. A strategy which recognizes their interests and involves these organizations is therefore necessary for the long term success of a National AM Center of Excellence.

Implementation Approach

Conduct a business case evaluation identifying the benefits and value to industry organizations for a National Center of AM Excellence. This evaluation will address long term strategy, guiding principles, short and long term objectives that achieve desired outcomes, and impacts on participants. At a minimum, a business case is needed that specifies the organization, roles and responsibilities, governance structure and funding requirements.

Possibilities follow which would be clarified and adopted by stakeholders.

Organization

Establish an organizational model similar to the Water Environment Federation (WEF), or the American Water Works Association (AWWA).

Staffing

- Steering Body
- Executive Director
- Directors
- Technical Staff (e.g., IT or System Administration)
- Administrative Staff/Office Support
- Volunteers

Budget

Salary Executive Director
Salary Executive Director Administrative support (estimate 2)
Sector Directors (estimate 6)
Sector Director Administrative Support (estimate 2-4)
Non-Technical Directors (estimate 6)
Non-Technical Administrative Support (estimate 2-4)
Expenses (office(s), supplies, etc)

Estimate 20-25 full-time staff	\$2,000,000 - \$2,500,000 annual labor budget
Benefits Package	\$ estimate – maybe 30% of salaries
Expense Budget	\$ estimate – maybe 10% of labor budget

Tentatively, the approach to funding is:

- a) Initial government seed money for defined number of years; and
- b) Eventual self-sufficient funding through annual membership subscriptions plus revenue for services (conferences, exhibitors, periodicals, training, sponsorships, etc).

Governance Structure

(see Sample Organizational Chart next page)

Executive Committee
Executive Director
Administrative and Technical Support
Combined Sector Committee Representatives (planning function)
Sector by Sector Technical Committees Led by Directors (execution function)
Non-Technical Committees (planning and execution)

Executive Committee – provides overall governance with volunteer positions such as president, vice-president, secretary, and finance.

Combined Sector Committee – provides common practice definitions and commercial arrangements between Sector by Sector Technical Committees. Here is an opportunity for existing industry associations and key stakeholders to provide guidance and planning support to the organization. See Common to Unique Sector Practices graphic on next page.

Sector by Sector Technical Committees – brings multiple groups with more specific use of best and unique practices. Groups may include: water/wastewater, transportation, power, healthcare, higher education. This approach would allow current organizations such as WEF, APWA, AWWA, and IFMA to continue to see a revenue stream from training seminars thus drawing them in as a supporter of the new organization. (See Common to Unique Sector Practices graphic).

Non-Technical Committees – provides coordination and support for Government Affairs/Policy/Regulation, Communication (Newsletter/Web Site), Research Coordination, Certification, Conference Arrangements, College Curriculum Coordination.

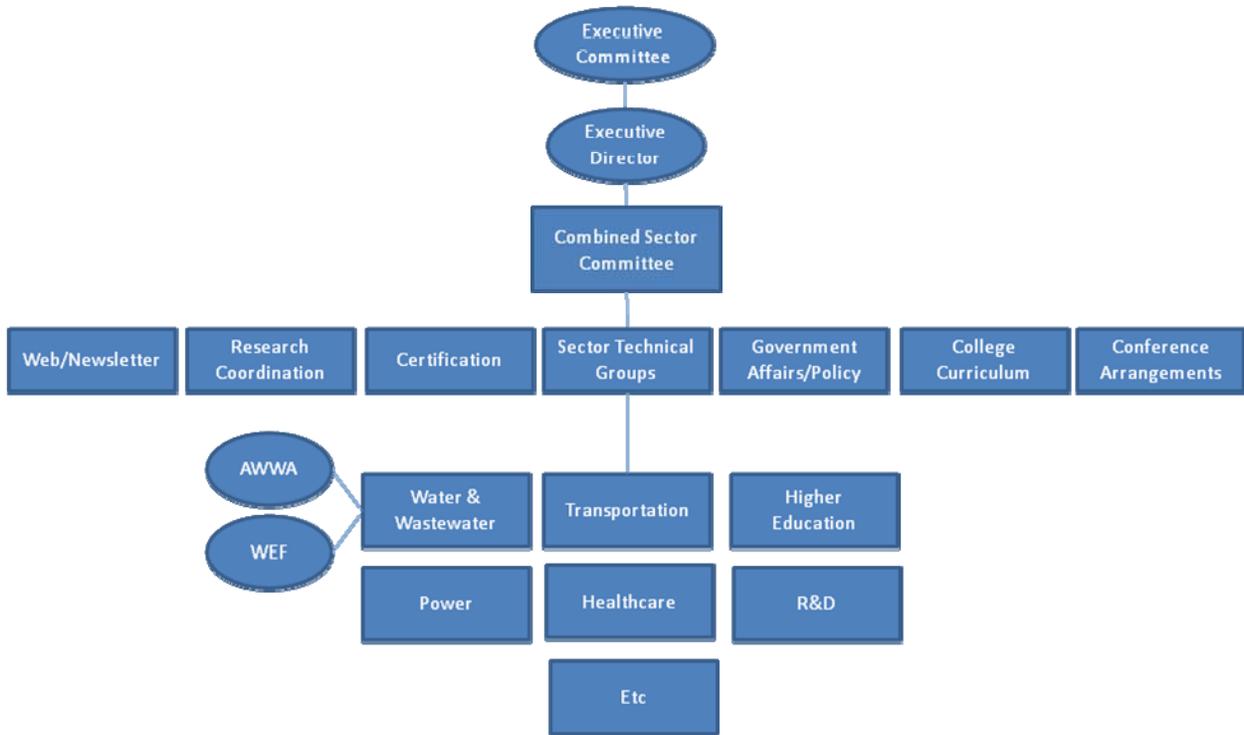


FIGURE 4.1 National AM Center of Excellence Sample Organization Chart

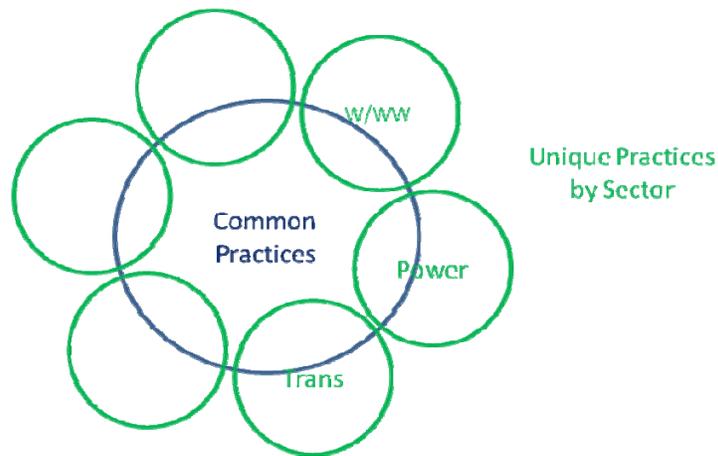


FIGURE 4.2 Common to Unique Sector Practices Coordination

Costs

- Difficult to reach agreement on benefits to professional associations who see asset management training opportunities competing with their own source of revenues, training and mission
- Initial and on-going staff and operational costs
- Business case evaluation costs

Benefits

- Clear focus on cross-sector asset management requirements for infrastructure management – A Clearinghouse of Asset Management best practices, terms, case examples and methods
- Efficiency – provides coordination between sector AM advancement efforts avoiding duplication of work
- Benefit to Others - Worthwhile for other established industry associations so these resources and associated best practices are leveraged. Business interests of impacted organizations would be recognized and hopefully enhanced.
- Supports recommendations of the *Report of the National Surface Transportation Policy and Revenue Study Commission Transportation for Tomorrow* helping communities target investments based on benefit-cost analysis and performance-based outcomes
- Supports 2005 TAM scan recommendations

Option 2: Regional AM Center of Excellence

Proposal

Support existing efforts and charter a Regional Center of AM Excellence that adopts an asset framework encompassing a common set of terminology and approach to implementing long term asset management planning for public and private acceptance and use. This option is similar to Option 1, except focused regionally. Implementation Approach has two possibilities, at least (see below).

Assumption

Incorporates state chapters of industry organizations as stakeholders. Existing industry organizations are seeking to inform their membership about asset management. A strategy which recognizes their interests and involves these organizations is therefore necessary for the long term success of a Regional AM Center of Excellence. (Required)

Rationale

A framework based on best AM practice and core elements (asset register, level of service and risk) is needed in the U.S. to reduce redundant efforts, reduce confusion in terminology and AM approaches.

Funding regional efforts that embed AM have the greatest chance for success in the U.S. and greatest impact on creating sustainable communities.

Today in the U.S., there are four notable regional or state efforts working to provide asset management information and link practitioners (see AMUG, Michigan, NEWEA and NMEFC case studies) in support of creating sustainable communities. These efforts lack coordination nationally as well as duplicate efforts.

Each relies on the presence and efforts of AM champions. Their efforts are dependent on either volunteers (AMUG), affiliation with a professional association (NEWEA) or a blend of federal, state and local agency support (NMEFC, Michigan). All present AM as a set of business processes, and tools that help communities target resources to meet long term needs while understanding tradeoffs. Two are focused on providing basic AM understanding and provide data collection tools (Michigan and NMEFC), and assistance in data collection and mapping (NMEFC).

A more business-like approach is needed to sustain volunteer-only efforts to disseminate AM information and a network of AM peers.

Funding and chartering of a Regional Center of Asset Management Excellence could resolve some of these inefficiencies in implementing AM by

bringing uniformity in understanding to those agencies and professional organizations within a state that support AM implementation.

Implementation Approach

Similar to the U.K. IAM, a Regional Center of AM Excellence would promote a cross-asset community of asset management practice, sponsor events, identify collaborative projects, networking opportunities and membership services to individuals and corporate members. While there are no membership restrictions, a Center of Regional AM Excellence would primarily represent a network of asset management practitioners representing community services, such as transportation, water, wastewater and related consultancies.

Organization

At least two approaches are possible.

1. Similar to NEWEA, establish a Special Interest Group or AM Committee relationship to state chapter of a professional organization (e.g., APWA). Office and event support is provided by service contract. Offices and related costs are potentially provided at a discount rate by participating organizations. Participation by local universities is welcomed but not critical.

The benefit and value for industry organizations would be required. This evaluation will:

- Define long term purpose, strategy, guiding principles, short and long term objectives that achieve desired outcomes
 - Organization, roles and responsibilities, governance structure and funding requirements
 - Impacts on participants
2. Tax free legal entity with volunteer board and professional director and staffing. The governing board is elected to represent various membership categories. Most of the work is carried out by committees, some of which have delegated authority. The board would meet regularly or approximately four times a year. It reviews and approves committee proposals and activities.

Both models require professional staff to direct on-going operation, including developing a budget for board consideration, managing and procuring office services, planning events and communicating with membership, including a website.

Funding

Option 1, above, would support efforts via professional association affiliation and fees for events and training.

Option 2, would require initial government seed money for defined number of years. Eventually, self-sufficiency is achieved through annual membership subscriptions plus revenue for services (conferences, exhibitors, periodicals, training, and sponsorships).

Costs

- Affiliation with state chapter of professional association required
- Documented benefit to membership would be required; may be difficult if AM training is seen as competing for training revenues
- Unless consortium of professional associations participates, network will be seen as sector specific, or level of government-specific (state, county, local)
- If network has tax free legal status, government funding contribution questionable
- Requires AM champion within professional organizations
- Doesn't create national clearinghouse for AM best practices, terms, and methods

Benefits

- Clear focus on cross-sector asset management requirements for infrastructure management – A Clearinghouse of Asset Management best practices, terms, case examples and methods
- Efficiency – provides coordination between sector AM advancement efforts avoiding duplication of work
- Benefit to Others - Worthwhile for other established industry associations so these resources and associated best practices are leveraged. Business interests of impacted organizations would be recognized and hopefully enhanced
- Possibly easier to find state chapter sponsorship (versus national)
- Supports recommendations of the *Report of the National Surface Transportation Policy and Revenue Study Commission Transportation for Tomorrow* helping communities target investments based on benefit-cost analysis and performance-based outcomes
- Supports 2005 TAM scan recommendations

Option 3: Establish Regional Beacons as Asset Management Leaders

“Asset management is not just about engineering, or finding the right technical solution at the best price. It's about ensuring the asset provides the service that the public want from it. Good asset management starts with knowing what assets you have, what condition they are in and what you want to use them for. This extra funding will help local authorities to gather and use the data they need to ensure they get the best from the infrastructure they manage.”

Rosie Witherton, Minister of State
U.K. Department of Transport, July 2008

Proposal

Federal funding would be provided as incentive to local governments demonstrating innovative ways of using inventory, condition and valuation information to develop asset management plans with a link to long term financial plans. Incentives would be granted every one to two years based on an applicant's willingness to become a regional “beacon” for others in their region and the U.S.

Rationale

The changing relationship between U.S. national, state and local governments is leading to expectations that state and local governments must raise additional revenues as part of the effort to increase investment in the nation's infrastructure. Increased revenues alone will not meet the infrastructure renewal needs of U.S. communities. States have unique statutes and local government charters that stipulate many community priorities and obligations. U.S. state and regional networks of AM practitioners provide the best source of practical information and strategies for AM implementation. Targeting AM leaders and building AM excellence from the grassroots level in the U.S. has the greatest chance of success. Accountability at the local and regional level improves the likelihood that communities within a state will support user fees and full cost of service revenue strategies.

Implementation Approach

This option is similar to the recent 2008 central government initiative in the U.K. (see U.K. case study). Regional beacons are required to serve a minimum of two years. The first year, innovative strategies would be evaluated that result in asset information used to develop an asset management plan and long term financial plan. Innovations in asset inventory data collection, condition and valuation reporting for important community

assets would be evaluated. These must be above the minimum reporting requirements of GASB 34 and federal inspection mandates.

Every local government has different data needs and uses of information. Each government will define the information needed for effective asset management, compared to data already managed. Funding can be applied to data collection, but the award will be given to those articulating a clear vision of what is to be achieved and how information gathered will be used to provide results. This is a reward for innovation and progress toward achieving sustainable infrastructure management.

At a minimum, an asset management approach for transportation assets (including all road networks within a region, sidewalks, signals, street lights, signs, pavement markings, bridges and structures, and other community assets deemed important) would be considered. Demonstrated use of information gathered, use of new data sources or combination of data to support a community's long term asset management and financial planning would be rewarded. Additional recognition would be granted to those applicants using a cross-asset (e.g., transportation and water/wastewater assets) or "whole of government" approach to decision making within the region or state.

Awards would only be given to those applicants willing to share their approach, experience and expertise with others.

Awards would be made by Federal Highways Administration or a panel of representatives to ensure uniformity in criteria and overall geographic fairness. A maximum award will be established based on total roadway length (or other metric). An independent advisory panel would review and make recommendations for Federal Highway consideration.

General criteria would be based on the following criteria in priority order:

- outcomes
- customer and community engagement and empowerment
- leadership vision and strategy
- partnerships
- actions
- sharing best practice (including documenting experience in case study, participating in a learning exchange event based on practical implementation advice, interactive workshops featuring successful approaches used by beacons, opportunities to network and share experience, act as and sponsor key note speakers, provide information to other asset management forums)

Costs

- A two-year commitment as a beacon is supported by consultants and support staff. Forums and documentation of regional beacons' experience would require professional assistance.
- Marketing program would require coordination.
- Criteria selection and evaluation panel services would involve key stakeholders or professional staffing to ensure buy-in, sector and geographic fairness and excellence.
- Longer term national impact to build network of regional beacons.
- If transportation-only focus, may not address perceived differences in AM implementation approaches nationally.
- Does not necessarily address role of state.

Benefits

- This helps a region build asset management capacity while building a national network of regional examples of excellence. Asset management practices are disseminated within a region, then across other states and regions. Impacts are initially local and regional with long term national benefit.
- This option rewards leading local authorities that demonstrate innovative strategies to use asset inventory, condition and valuation information in their communities; it rewards practical examples that move data to decision making and information to knowledge.
- It recognizes that state statutes and conditions differ. Local resources and priorities are best directed by states, regions and their local governments.
- This alternative supports the drive for governments seeking practical ways to improve decision making across jurisdictional boundaries and may have the benefit of reducing governmental overlap and improved co-ordination between regional, state and local agencies as consistent approaches are developed to assess service needs, adopt resource allocation priorities, and communicate with stakeholders.
- This option rewards a shift to data collection that supports outcomes-based decision making.
- Supports sustainable infrastructure management "on the ground."
- Recognizes and supports the importance of a champion in leading successful asset management implementation. It elevates this role in a region and would lead to creation of a network of regional champions to provide leadership for the long term. Collective experience of these regional champions could be the basis of a national network of asset management excellence.
- Acknowledges that building asset management capacity is needed to support devolution of powers and resources to states, regions and local authorities.

- Supports recommendations of the *Report of the National Surface Transportation Policy and Revenue Study Commission Transportation for Tomorrow* helping communities target investments based on benefit-cost analysis and performance-based outcomes.
- Supports 2005 TAM scan recommendations

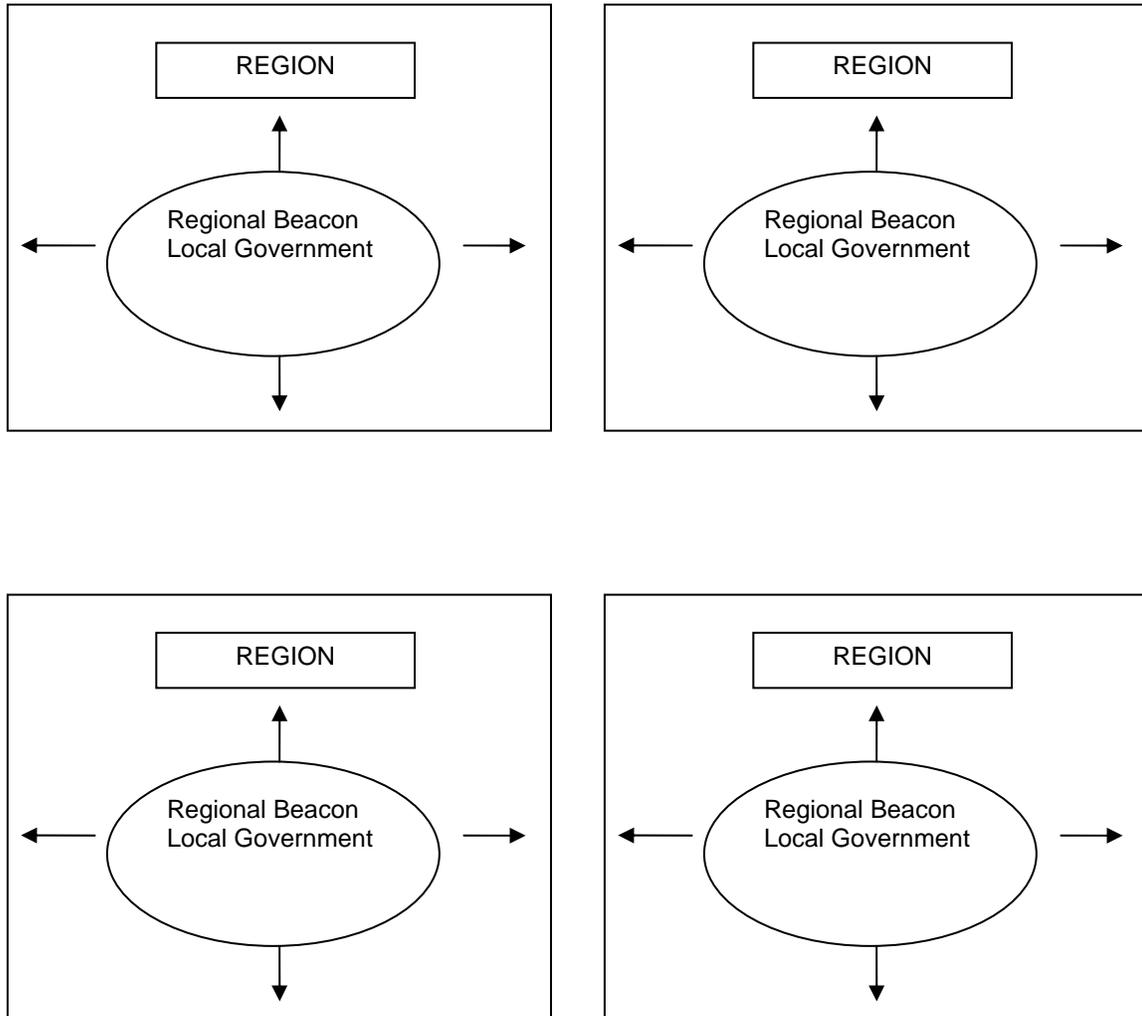


FIGURE 4.3 National Network of Regional Beacons

Option 4: Initiate Statewide Analysis of Local Government Financial Sustainability

“The strategy of increasing... revenues by itself will not resolve the underlying problem of sustaining the infrastructure. Councils will need financial strategies that are backed by strong leadership and supported by well-researched and targeted asset management.”

Minister for Local Government, State of Victoria, Australia 2003

Proposal

Evaluate state-wide long term financial sustainability of local governments based on AM core elements (asset register, level of service, funded strategies based on risk and tradeoff analysis). Move to a sustainable level of infrastructure management nationally by taking a state by state approach. Recognize that each state’s resources, needs and opportunities differ. Conduct assessment of a state’s financial sustainability based the adequacy of its local governments’ long term infrastructure financial management.

Rationale

State and local governments manage community assets within a state. A state’s financial sustainability relies on the adequacy of its infrastructure having an adequate long term funding plan. Total revenues should cover asset maintenance costs over the long term. Frequently, asset renewal activities are incorrectly categorized as maintenance thereby understating true renewal needs.

As assets deteriorate, local and state’s risks increase. Few governments have documented community risks or have a comprehensive strategy for addressing them. The cost to bring assets to a satisfactory standard is based on the professional judgement of engineers, rather than desired community-based outcomes such as quality, function, risk and safety.

The largest value assets are transportation, water and sewer assets. The precise value of these assets is unknown because asset valuation used for financial reporting required by GASB 34 typically represents historic value and not current value. When reported, the amount stated as necessary to deliver satisfactory levels of service far exceeds current expenditure levels and yet the majority of councils do not have asset management plans, risk management plans or long term funding models that match long term revenues with asset related services.

Assumptions

- Requires gubernatorial support and championship.
- At a minimum, the assessment will address the state's transportation network.
- All levels of government must participate, or be informed of the evaluation.
- Prior to start of project, contact with the transportation and water sector would be required.
- State selection is voluntary and is limited to one state sustainability study at outset.

Implementation Approach

Seek collaboration between a state's APWA chapter with state Local Government Association chapter to undertake a local government sustainability study. This assessment will go beyond assigning a grade to the adequacy of a state's infrastructure (condition) and look at the financial planning and intergovernmental arrangements (including financing) required to manage long term infrastructure sustainability within local governments in a state.

At a minimum, the assessment will address the state's transportation network. A cross-asset assessment should be considered to support long term sustainable community services and the infrastructure that delivers services. Ideally, all levels of government and sectors will be assessed focusing on the people, tools, decision processes and policies required to ensure the state's financial sustainability.

Recommendations on the way forward will be tailored to the state's AM gaps, opportunities that move sustainable infrastructure management forward in a state, actions that will result in maximum short term impact, and use of existing resources.

Implement 3-year work plan that addresses:

- What is the condition of state and local government infrastructure?
- What will it cost to bring it to a satisfactory standard and fund its renewal in future?
- What is the status of state and local governments' current asset management practices?
- What should be done to move toward long term financial sustainability?

Costs

- Resources to conduct study
- Involvement of states' leaders, governments and sectors; requires coordination with governor and each authority

- Collaboration among those conducting study (representatives of APWA and Local Government Association) and those studied (local governments and state)

Benefits

- Top down evaluation and comprehensive nature of assessment addresses root causes of unsustainable practices and way forward to address them state by state
- Voluntary nature of effort would draw leading states
- Reflects successful approach taken in U.K., Australia and New Zealand to move local and state governments toward sustained AM
- Could be companion to other options that provide AM training and networking in a state
- Supports recommendations of the *Report of the National Surface Transportation Policy and Revenue Study Commission Transportation for Tomorrow* helping communities target investments based on benefit-cost analysis and performance-based outcomes

Option 5: Implement AM in a Statewide Approach

Proposal

The federal and state governments provide financial incentives and technical assistance to enable all public entities within three years to adopt a total asset management (TAM) system with consistent asset accounting practices. TAM covers the registration, valuation, depreciation, condition assessment, planning, design, acquisition, funding, maintenance, operation, replacement and disposal of all physical assets within a state. Provide two-tiered AM training aimed at: 1) good stewardship for all governments, utilities, community leaders, and professional associations in a state; and 2) AM practitioners. Use international AM framework and practitioner developed tools and guidelines. Train governments in a state to develop an asset plan and long-term funding plan, which get incorporated within a state's long-term strategic and financial plan.

Rationale

Currently, a variety of resources are being used within a state to teach AM. These efforts occur across and within industry sectors leading to a lack of coordination as well as duplication of effort, competing programs, alternative frameworks and strategies, and misunderstanding of terminology and definitions.

Asset management is not the sole responsibility of any one area of an agency, sector of government or industry. To be effective the technical, operational, financial, risk, information technology, elected officers and senior management in a state need to be involved.

The changing relationship between U.S. national, state and local governments is leading to expectations that state and local governments must raise additional revenues as part of the effort to increase investment in the nation's infrastructure. States have unique statutes and local government charters that stipulate many community priorities and obligations.

There are many overlapping efforts to teach AM. Clear outcomes, an asset plan and long term financial plan, and the approach needed to develop these are not well understood by local government. Resources are limited, especially in smaller communities.

Successful training is occurring within a few states by regional user groups. The simplified approach is based on accepted international AM framework (U.K., Australia, and New Zealand) and provides the best source of practical information and strategies for AM implementation.

Implementation Approach

Target AM training assistance to a state. This has the greatest chance for cumulative impact in the U.S. Identify a state's readiness using the *U.S. Domestic Scan of Best Practices in Transportation Asset Management Scan Report*, July 2007.

Two levels of training are needed. First, provide initial training for state and local government leaders on the role of stewardship, relationship to AM adequacy and sustainable communities. Develop a communication program for top state leaders (including federal, state, regional and counties/cities), and state chapters of professional associations that influence the AM peer network and training.

Second, provide more detailed training using successful training methods and materials for asset plan and long range financial plan development.

Invite city and county associations and other state organization's whose mission is to assist in best practice training throughout the state. Provide "train-the-trainer" AM orientation as a first step.

Examine use of AM training materials used by states (Michigan LTAP, New Mexico EFC) and regions (New England Water Environment Association and Pacific Northwest Asset Management User Group). Examine U.K. and Australia method of workshops leading to asset plan and long range financial plan development.

Practical "how to" training materials need to address:

- Process and Practices
- Information Systems
- Data and Knowledge
- Service Delivery
- Organizational Issues
- People Issues
- Asset Management Plans
- Long term financial plans

This option could be combined with the "Regional Beacon Option", above. Federal funding is provided as incentive to local governments demonstrating innovative ways of using inventory, condition and valuation information to develop asset management plans with a link to long term financial plans. Incentives are granted every one to two years based on an applicant's willingness to become a regional "beacon" for others in their region and the U.S.

Costs

- To be effective, resources are needed to plan and manage initiative based on more detailed work plan. An ombudsman is needed to identify opportunities within a state and work with U.S. communities of practice to detail approach and work plan.
- Requires top state leadership to champion the approach (governor, mayors and county executives)
- Communication plan needed to incorporate cooperation of professional organizations and assure them of non-competing nature of proposal

Benefits

- This helps a state build asset management capacity while building a peer network of asset managers. Asset management practices are disseminated within a state
- Addresses role of elected officials and senior management in AM
- Coordinates state professional organizations in “train the trainer” AM orientation.
- Uses existing experience of U.S. AM groups (AMUG, Michigan LTAP, NEWEA, NMEFC) for teaching approach, materials and “hands on” experience. Leverages U.S. and international implementation experience
- If “Regional Beacon” option included, rewards leading local authorities who demonstrate innovative strategies to use asset inventory, condition and valuation information in their communities; it rewards practical examples that move data to decision making and information to knowledge
- Acknowledges importance of state in U.S. AM implementation
- Supports recommendations of the *Report of the National Surface Transportation Policy and Revenue Study Commission Transportation for Tomorrow* helping communities target investments based on benefit-cost analysis and performance-based outcomes

Option 6: Statewide AM Assistance for Small Communities

“Capacity building for asset management and identification and dissemination of best practice in asset management are an essential element of preparing local government to deal with the asset renewal challenge.”

Local Government Inquiry:
Infrastructure Sustainability & Practice in New South Wales, 2006

Proposal

Provide funding for AM on-demand training and one-on-one assistance to communities not able to afford assistance or consulting services.

Rationale

The transfer of services and responsibilities to local governments from state and federal government and rising public expectations and demands for accountability along with reporting requirements have increased costs with no commensurate new revenues. Increased environmental regulations cause strain on community resources. Local governments, in particular, rural and small agencies, do not have extra staff or resources to provide these increased services. Asset management falls to a low priority as it is seen as a new “program.”

Even when local communities and public works professionals seek information on asset management information, guidance to date has largely focused on state governments or larger utilities. Practical and simplified guidance is needed that is targeted to local governments. Providing information in support of developing an asset management plan is needed that is clearly linked to supporting service outcomes.

Experienced practitioners and a network of peers are seen as the most efficient way to share positive and negative experiences and issues faced as organizations attempt to embed sustainable asset management practice in their organization. However, regional peer networks to date are volunteer oriented and not well funded or staffed.

To move to a sustainable level, a more structured and business-like approach is needed to ensure information builds on core AM elements, agencies receive a full assessment of data, processes and tools used to manage community services, and that assistance corresponds to their unique needs.

Funding state-wide efforts to embed AM have the greatest chance for success in the U.S. and greatest impact on creating sustainable communities.

Implementation Approach

Provide extra federal funding and greater funding flexibility for states as an incentive to fund AM training, gap assessments and assistance for local governments within a state. AM training and individual technical assistance will target basic inventory data collection, mapping, analysis and reporting. Provide assistance based on clear AM implementation guidance, interactive workshops and steps leading participants to develop an asset management plan, and a long term financial plan.

Similar to NMEFC, fund permanent training, database and mapping assistance for local agencies willing to commit to an increased level of accountability and reporting. Participation in a statewide local agency AM network would be part of the requirement.

Target a U.S. state ready for implementation assistance that desires going beyond reporting renewal needs and wants to move the state to use of information and knowledge to guide service delivery across the state. (Oregon, for example, is currently initiating an ASCE Report Card project, has a gubernatorial mandate to allocate CDBG funding using AM, and has pockets of local government, and the state DOT implementing AM. Regional AM training is available, but sporadic.)

Create a Steering Committee reporting to the Governor or Transportation Commission, (similar to Michigan TAMC), and direct sufficient funds to hire an AM state Coordinator.

Conduct gap assessment of state and local government tools, business practices and data. Develop 3-year improvement plan that: 1) trains small communities; 2) gathers inventory, condition and value of important community assets. Desired project outcomes are:

- improved statewide AM awareness and
- use of AM principles in maintenance and renewal decisions
- development of asset plans and adoption of long term financial policy and plans.

If successful, use this as a showcase for other states.

Require participating communities to share their knowledge and experience building AM capacity in statewide conferences and forums.

An intergovernmental agreement could stipulate a second step for successful participants providing additional asset renewal and enhancement funding for projects that can demonstrate they achieve local, regional or state policy objectives.

Utilize existing training resources in other states as contractors (NMEFC and Michigan LTAP) for “train-the-trainer” approaches and concepts. The

approach would be modified for other states' adoption based on documented experience.

Costs

- Federal funding for the cost of contract staff needed to provide on-going training and assistance, as well as coordinate resources and document/guide project
- Federal incentives to states that redirect current funds (e.g., 1-2%) to asset management capacity building within state
- Possibly reduces 1-2% of state resources and redirects to local communities to build AM capacity

Benefits

- Leverages a state's ability to help smaller, local governments who can no longer attract and retain technical and professional services
- State flexibility whether to adopt strategy that redirects funding as AM "opportunity capital"
- Builds state network of experienced practitioners
- Provides access to training within the state and technical database and mapping assistance for small communities
- Helps small communities build asset management capacity so that data provided rolls up to state-wide reporting on asset maintenance and renewal needs (similar to Michigan model)
- Potentially joins EPA and FHWA resources as national model for cross-asset and whole of government approach to priority setting, addressing needs of small communities in a state-by-state approach
- Long term, if proceeding to second step, uses AM to tie funding to desired regional, state and national policy priorities
- Leverages experience of other AM training resources (NMEFC, AMUG, Michigan LTAP)
- Supports recommendations of the *Report of the National Surface Transportation Policy and Revenue Study Commission Transportation for Tomorrow* helping communities target investments based on benefit-cost analysis and performance-based outcomes

4.2 EVALUATION PROCESS

“...we need to prioritize investments in institutions and processes for advancing human capital, not just physical or economic capital. Creativity and innovation are the keys to competitiveness, both for nations and for individuals...Synergy and collaboration should be expected and demonstrable for any infrastructure investments. Collaboration between public and private, local and national, city and suburb, urban and rural should be the norm.”

Ethan Seltzer, Director, School of Urban and Regional Planning, Portland State University and Carol Coletta, CEOs for Cities
October 2008

Criteria were used to initially rate and rank six implementation options, including noting whether a criterion was required. This process was used to focus discussions and develop recommendations.

1. Focus on local government (Required)
2. Bottom up focus on practitioners
3. Cross-asset approach
4. Simplified approach focused on implementation
5. Provide incentives, not mandates
6. Minimize costs, leverage resources
7. Regional strategy and state as a hub
8. Supports communication at all levels, across sectors (Required)
9. National coordination
10. Addresses professional association concerns (Required)
11. Benefits state (Required)
12. Addresses transportation (Required)

Recommendations reflect Review Committee discussions.

Ranked results are shown in the following table.

Table 4.2.1 Option Ranking

NAMS-US BLUEPRINT PROJECT									
EVALUATION OF IMPLEMENTATION OPTIONS									
Criteria				Implementation Options					
				Op. 1 National Center of Excellence	Op. 2 Regional Center of Excellence	Op. 3 Regional AM Beacon	Op. 4 State-wide Local Govt. Sustainability Study	Op. 5 Statewide AM Roll Out	Op. 6 State-wide Small Community Roll Out
	Criteria	Required?	Weight						
1	Focus on local government		3	0	1	2	3	3	2
2	Bottom up, focus on practitioners		3	0	2	3	0	3	2
3	Cross-asset approach	R	1	1	1	1	1	1	1
4	Simplified approach focused on implementation		3	0	1	2	0	3	2
5	Provide incentives (not mandates)		3	0	1	2	3	3	2
6	Minimize costs, leverages resources		1	0	1	1	1	1	1
7	Regional strategy & State as hub		3	0	2	3	3	3	2
8	Supports communication at all levels, across sectors	R	2	1	1	2	2	2	1
9	National coordination		3	3	0	2	1	1	1
10	Addresses professional association concerns	R	1	0	1	0	1	1	0
11	Benefits state	R	1	0	1	1	1	1	1
12	Addresses transportation	R	1	1	1	1	1	1	1
Total Weighted Score				13	28	50	39	57	39
Rank				5	4	2	3	1	3

4.3 DISCUSSION & PRINCIPLES

The project Review Committee adopted key principles to guide their recommended approach.

1. Build on the findings and recommendations of the 2005 international scan of best AM practice

The 2005 international scan of best asset management practices identified drivers for adopting an asset management approach including:

- Asset management training for all levels of transportation officials is an important contributor that changes the culture of an organization and establishes asset management expectations among key stakeholders.
- Active asset management professional associations and user groups, frequently spearheaded by local officials, developed outreach materials aimed at both elected officials and public professionals. These initiatives were lead by local government associations or national working groups.
- Convey elected officials' role in strong stewardship of community assets, including demonstrating the link between investment and performance and the effect on the community of investing in infrastructure.
- Conducting tradeoffs among asset categories and link this to broad community and agency goals.
- National or state agencies worked cooperatively with local governments to provide a consistent approach to asset management among different levels of government guidance and /or participated in user groups (Canada, England, New Zealand and Australia).
- Developing an asset management culture in an organization can start with modest efforts. Assigning asset management responsibilities is a foundation for effective management efforts. Cross-functional teams (engineers, finance analysis, operations and communications professionals) can serve as the best means of understanding the many different aspects of asset management.

The recommendations from the 2005 scan team included targeting a state or region to take a holistic view of the entire public asset inventory and provide increased funding flexibility to address community needs. A regional linkage was suggested between transportation planning, programming and asset management at the metropolitan planning organization (MPO) level. Specifically, the recommendation was to:

“Join with other efforts, agencies and resources to embed asset management onto existing efforts on an ongoing basis. Create a National Asset Management Steering Committee (NAMS) in the United States. Such an effort provides a platform to distribute information, provide training and document best practices on transportation asset management nationally and abroad. Develop an easy-to-understand toolbox for asset management that can be applied at different levels of government. The tools should look

beyond transportation to best practices in other industries. These tools should be available on a web site for free downloading.”

Documenting the state of practice at the state and local transportation agency level in the United States as part of establishing a national approach to transportation asset management was called for. Joining efforts between FHWA and EPA was also suggested. Integrating U.S. efforts to document and provide resources on best practice with existing international efforts was also called for. Developing a resource clearinghouse for all levels of transportation agencies—state, MPO and local—was an implementation strategy objective. A national asset management forum across infrastructure and federal agencies was to track to progress.

2. Ensure a cross-asset, local government focus that provides on-going and continuous support for asset management training and networking.

These principles draw directly from the 2005 scan and current project findings. Implementing strategies support efforts to develop a national asset management agenda and policy.

4.4 RECOMMENDATION

“Great nations build and invest for succeeding generations...like our parents and grandparents did. Access to what is referred to as “economic infrastructure”, that being high quality transportation and utilities is the underlying difference between first world and third world countries. Reliable electricity, clean water and communications along with highway systems, railroads and airports make our modern economy possible.”

Peter Rahn, President, AASHTO
November 2008

The project Review Committee recommends a phased approach with short, medium and long-term strategies that address the greatest gap in asset management training and resources, local government, provide a statewide approach to solutions, and build asset management resources and assistance for all levels of United States government across infrastructure.

4.4.1 Pilot Statewide Asset Management Training Creating Network of Regional Beacons (Short Term)

Target an existing state or region that provides asset management training and networking in a region of the U.S. Evaluate political, statutory, professional association and state resource support for on-going and continuous training targeted at local communities and the services they deliver. Successful pilots would provide a platform for distributing information, providing practical implementation guidance, training, tools and templates while featuring U.S. and international case studies of asset management implementation.

Develop funding strategies that ensure on-going, continuous resources (staffing, support services, communication tools) leading to financial self-sufficiency within a specified timeframe. Include clear performance indicators that track progress toward effectiveness and increasing financial self-sufficiency.

Include a communication strategy that notifies and encourages the involvement of elected officials, planning, finance, engineering, government professionals and consultants supporting these professions.

Successful pilot project participants will develop a business plan that includes a communication strategy, training and staffing plan with required funding. Collaboration with LTAP and professional associations should be explored to see if joint training is possible with or under the auspices of these organizations.

Once funding is found, year one requires that efforts (successes and difficulties) are documented, and that in the second year the participating organization acts as a regional leader for other states interested in developing similar asset management communities of practice.

4.4.2 Simplify Guidance, Training and Tools that Address Small and Rural Community Needs (Short Term)

In each country, the sustainability of small and rural communities are an immediate concern when examining aging infrastructure, devolving responsibility to lower orders of government, and rising costs in communities. Frequently the costs to provide community services are greatest per capita and per mile in the fringe of urban areas and smaller communities. These same communities have the greatest challenges accessing asset management information and implementation assistance.

Asset management tools, guidance and communication to these areas need to be simplified and improved. Some simplified cross-asset management e-guidelines, templates and training for developing an asset management plan are now available and used in Scotland, and in each Australian state. Western Canadian provinces are evaluating their use. It is recommended that the applicability of these or other simplified implementation guidance and tools are evaluated for use in the U.S.

Develop a strategy that addresses simplified tools and techniques appropriate for asset management planning in local communities. Funding and partnerships between transportation and water/wastewater sectors should be explored that support implementing existing tools and training in the U.S.

4.4.3 Statewide Financial Sustainability Study (Medium Term)

Examine the support and interest in a financial sustainability assessment of local governments within a state. This option would require the assistance and support of the Local Government Association, and possibly state government. Evaluate the support for a grant-funded study assessing the financial sustainability of local governments including infrastructure asset management practices. The objective of this study would be to elevate the appreciation of elected officials, senior managers and asset managers of asset management and its benefits. When pursued in New Zealand, Australia and the U.K., these studies have the effect of garnering legislative, political and financial community support to address needed improvements.

4.4.4 National AM Resource Center (Long Term)

Building on grassroot regional efforts, create an improved web library of documented case studies, asset plan examples, presentations and list of practitioners available for training and assistance. Include links to international communities of AM practice. Seek to build on international best practice, guidelines, tools and templates, as well as regional AM guides

across infrastructure (transportation, water, waste water). Conduct an annual National Asset Management Conference inviting and scheduling presentations from all levels of government across infrastructure.

4.5 NEXT STEPS

- Review findings and recommendation with the Federal Highways Administration's Director of the Office of Asset Management. Present findings and recommendations to the January 2009 meeting of the TRB/AASHTO Subcommittee on Asset Management.
- As appropriate, project recommendations should be forwarded as a part of the U.S. Congress's transportation funding reauthorization discussions.
- As recommendations are accepted, target a U.S. state or region as a pilot for implementing short term recommendations. Provide initial funding for development of a more detailed implementation plan. At a minimum, this plan should address short term recommendations, provide a timeline and performance measures that ensure objectives are met. Joint funding by FHWA and EPA is recommended to ensure continued federal collaboration, cost sharing, and to minimize the chance of diverging approaches and definitions of asset management excellence.
- E-publish project report and present findings at next National Transportation Asset Management Conference, and other water, waste water and public works professional meetings, as appropriate. This is to ensure others considering or participating in U.S. asset management learning networks, or seeking these contacts are aware of opportunities for their participation and leadership.

APPENDIX A: DETAILED CASE STUDIES

A-1: U.S. EXPERIENCE

A-1.1 BACKGROUND

The United States public infrastructure is owned and managed by all levels of government. Over 75% of the nation's 4 million miles of roadway and over half of its nearly 600,000 bridges belong to county and municipal governments. Local governments own and manage three-quarters of total highway miles in 2004; states 20.4 percent; and the federal government 3.1 percent.¹² While only 1% of this total mileage is the Interstate Highway System, it carries 24% of total travel.¹³

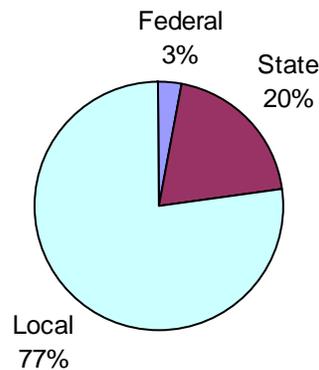


FIGURE A-1.1 U.S. Highway Ownership – 4 Million Miles

Approximately 39,000 local governments in the U.S. manage road networks, the majority of which are small or rural agencies.¹⁴ Cities and counties in many urban areas own much of the highway and street network, including a share of the Federal-aid System. Investment strategies to solve problems experienced on U.S. highways must flexibly address local government and urban priorities.

¹² http://www.transportationfortomorrow.org/global/did_you_know.aspx

¹³ *Transportation Asset Management for Local Government Agencies: Threshold Levels and Best Practice Guide*, Midwest Regional University Transportation Center, May 2006

¹⁴ *Meaningful Use of Collected Local Roads Data and Information*, Project 06-05, Midwest Regional University Transportation Center, March 2008. *Status of the Nation's Highways, Bridges, and Transit: Conditions & Performance*, 2006.

Table A-1.1 Country Comparisons

	U.S.	Canada	Australia	New Zealand	U.K.
Population, Millions (2008 est.)	302	33	21	4	61
Area, million mi ²	3.5	3.9	2.7	.8	.8
Levels of Government	3+	3	3	2	2
States/Provinces & Districts/Territories	50/1	10/3	6/2	0	0
Counties & Cities	39,000	4,000	717	86	229 ¹⁵
Highway Miles (million)	400 ¹⁶	.6	.5	.057	.171
Water Agencies					
-wastewater	16,000	n/a	n/a	n/a	n/a
-water	170,000	n/a	300	90	n/a

n/a = Not Available

In the U.S., there are 16,024 publicly owned treatment works for treating municipal wastewater; 98 percent are municipally owned and serve 73 percent of the U.S. population. Of the almost 170,000 public water systems, 54,000 systems are community water systems providing drinking water for 264 million people in the U.S. In contrast to the wastewater treatment industry, only about 43 percent of drinking water systems belong to local governments with almost 90 percent of these systems serving communities with more than 10,000 people.¹⁷

Accounting Standard

The Governmental Accounting Standards Board Statement No. 34 (GASB 34) establishes accounting and financial reporting standards that more than 84,000 state and local governments follow when disclosing information to auditors, creditors, elected officials, the public and others. All government entities have been required to follow this standard since 2004. GASB 34 requires reporting on the value of infrastructure assets, including roads, bridges, water and sewer facilities and an assessment of all assets if the “modified” approach is used. The modified approach allows state and local government to report on condition of assets and the effectiveness of efforts to preserve existing infrastructure, not merely reporting the costs associated with infrastructure depreciation. As in other countries, this accounting standard intends to increase public accountability over the costs and financing of public investments in infrastructure.

¹⁵England: 149, No. Ireland: 26, Scotland: 32, Wales: 22

¹⁶ Status of the Nation's Highways, Bridges, and Transit: Conditions & Performance, 2006

¹⁷ The Clean Water and Drinking Water Industry Infrastructure Gap, USEPA, 2002.

Transportation

Adoption of airport pavement management systems by U.S. state and local transportation agencies in the late 1960s and early 1970s represents the earliest adoption of structured asset management. Currently, all 50 states, the District of Columbia, and Puerto Rico have implemented a pavement management system. Forty-two states include a method of prioritization in their pavement management systems, and 20 states recommend optimized investments for investment planning and programming.¹⁸

In 1991, Congress passed the Intermodal Surface Transportation Efficiency Act (ISTEA), which prescribed the federal funding program for surface transportation modes for the next six years. Among its requirements, ISTEA mandated that all state transportation agencies designated to administer Federal Transportation Trust Fund monies implement a number of management systems to improve the cost-effectiveness of their programs. Among these were pavement management systems and bridge management systems, which were intended to provide structured approaches and documentation to better manage the preservation of pavements and bridges. While this mandate was subsequently removed because of the difficulty of enforcement, the Federal Highway Administration continued to support these initiatives through training and technical assistance. Early adopters of management systems spurred some state and local road agencies in the use of infrastructure management software and decision making.¹⁹

Some state DOTs are incorporating a preservation strategy as their core strategic focus while other states have begun legislating the use of life-cycle costing or preventive maintenance strategies or granting greater local agency funding flexibility when they demonstrate the use of asset management planning. Michigan and Ohio have comprehensive approaches to asset management that integrate organizational decisions and reporting based on strategy, performance and lifecycle. Other states have outlined comprehensive approaches and are at the initial stages of implementation, such as Oregon and Utah.²⁰ Progress to embed transportation asset management (TAM) is noted in Colorado, Connecticut, Florida, Maryland, Missouri, Minnesota, New York, North Carolina, Vermont, Washington, and Wisconsin. Most agencies currently use AM for highway management, their greatest investment, and are now expanding to other modes of transportation. As stated in a recent report “The definitions of TAM are as numerous as the (state transportation) organizations purporting to have endorsed its principles.”²¹

Federal Highway Administration Office of Asset Management

Recognizing the increasing emphasis on asset management, the Federal Highway Administration established the Office of Asset Management in 1999 to

¹⁸ *Applying Transportation Asset Management in Connecticut*, Draft Report, October 2008

¹⁹ *Ibid.*

²⁰ *Best Practices in Transportation Asset Management Scan Report*, NCHRP Project 20-68, July 2007

²¹ *Applying Transportation Asset Management in Connecticut*, Draft Report, October 2008

focus on the management, economic, and systems implications of asset management approaches applied to transportation agencies at the federal, state, and, more recently, at the local levels. Several years ago, the American Association of State Highway and Transportation Officials (AASHTO) established a Task Force on Asset Management to document and promote asset management techniques among state transportation agencies.

FHWA), AASHTO and the NCHRP sponsored a scan of best transportation asset management in 2005. The purpose of the scan was to “investigate asset management experience, techniques, and processes in the world,” and to share the findings with U.S. federal, state and local transportation agencies as they seek ways to improve the organizational culture, policies, tools and methods used to target infrastructure investment decisions. A scan team recommendation was to explore ways to improve asset management training and guidance in the U.S., collaborating with others seeking to do the same.

FHWA and EPA convened a meeting in Washington D.C. in March 2007 with 21 other agencies and professional associations, including Australian and New Zealand representatives. The purpose was to discuss how sustainable management of infrastructure and communities can be supported in the United States. In regard to the cross-asset nature of public works, there was general consensus that APWA was well placed to take a leadership role at both a grassroots level through its chapters, and at a national level through coordination and provision of forums, tools and education. This recommendation was forwarded to the APWA Board.

*Transportation Asset Management Today*²² provides guidance on transportation asset management best practices while the FHWA *Asset Management Website*²³ includes a variety of case studies. Investment modeling and tradeoff tools have been developed, including the Highway Economic Requirements System (HERS). Quarterly Webinars on transportation asset management topics are provided by the Office of Asset Management, along with 5 free regional conferences in 2008, providing occasional “forums for practitioners, researchers, and others to share asset management experiences, and provide opportunities to learn about new tools and techniques.”²⁴ Guides document the principles and practices of asset management practice.²⁵

However, transportation asset management guidance in the United States has largely focused at the national level on state departments of transportation. As stated in the announcement creating the Office of Asset Management, “the Office of Asset Management agrees with AASHTO that:

²² <http://assetmanagement.transportation.org>

²³ www.fhwa.dot.gov/infrastructure/asstmgmt

²⁴ <http://www.fhwa.dot.gov/infrastructure/asstmgmt/ramc.cfm>

²⁵ *Transportation Asset Management Guide*, NCHRP Project 20-24, 2004; Transportation Research Board (www.trb.org) and AASHTO (www.aashto.org).

- Asset management needs to be flexible to address the varying needs of each state.
- Implementation of asset management must be voluntary.
- Asset management should involve a great deal of communication and education.”

It is recognized that transportation assets are primarily owned by state and local government not federal government. Guidance has focused on information system integration. Very little guidance on implementing asset management has been provided to local agencies.²⁶

FHWA Divisions & National Review of Asset Management

A 2008 Federal Highways Administration national review team examined the obstacles and success factors to embedding asset management in U.S. divisions. A survey was administered to all divisions and a team traveled to four locations in the U.S. Forty-five divisions responded to the survey. Two-thirds (63%) of FHWA Division responding indicated that AM roles and responsibilities are not a part of their Stewardship and Oversight agreements. Two-thirds (67%) have attended some AM training.

Water Industry

The U.S. has approximately 54,000 community water systems and 16,000 wastewater systems. Water and wastewater service providers doubt the ability of federal and state agencies to oversee a mandatory asset management requirement. Without this, the U.S. water sector lives with ambiguity or finding alternative ways to bring about a common understanding of the asset management principles and practices.²⁷

The Need

A 2004 and 2007 EPA Gap Analysis Report established the baseline renewal needs of the water industry.²⁸ These reports are cited as bringing unfunded maintenance needs into focus. A paradigm shift is called for, that of moving from the concept of building the engineered environment to one of managing the engineered environment.

Champion

A senior EPA manager in charge of strategic initiatives has led most initiatives to highlight asset management as a way to strategically target investment and streamline business practices.

²⁶ *Asset Management Guide for Local Agencies in Michigan*, Michigan Transportation Asset Management Council, 2007

²⁷ “Finding a Sustainable Pathway for Water and Wastewater Services,” UIM, November 2005

²⁸ *The Clean Water and Drinking Water Infrastructure Gap Analysis Report*, EPA, 2002

MOU between EPA and Federal Highways Administration

In July 2006 EPA and Federal Highways Administration signed a memo of understand which encouraged cooperation between these federal agencies as asset management approaches, policy initiative and information.

Statement of Support between Professional Associations and Water Agencies

In May 2007, EPA and 6 water and wastewater professional associations signed a statement of support for the management attributes and further development of a sector strategy that includes performance measure for water utilities.²⁹ Basic management attributes include product quality, customer satisfaction, employee and leadership development, operational optimization, financial viability, infrastructure stability, operational resiliency, community sustainability, water resource adequacy, and stakeholder understanding and support.

SIMPLE

An existing wastewater website is being redeveloped for U.S. drinking water and wastewater utilities to help embed strategic asset management (SAM). The Water Environment Research Federation (WERF) is managing a \$2.5 million project to develop the Sustainable Infrastructure Management Program Learning Environment (SIMPLE). SIMPLE tools include a gap analysis, cost-benefit analysis as well as seven elements that guide practitioners into understanding their utility and better management practices. These elements include asset inventory, data standards, level of service, risk-failure analysis, capital improvement plans, life-cycle costs and maintenance. In 2006, WERF launched a four year program with four objectives:

- Develop a communication package targeted to public and private key stakeholders (elected officials, rate payers and senior utility managers)
- Develop progressive guidance for water sector utilities
- Develop a national database for use in an optimization model, tools and methods to target water asset investment based on performance and life cycle embedding this in SIMPLE

STEP and CUPPS

EPA conducted strategic planning workshops around the U.S. in 2000. A guide for small water utilities was developed to assist them in strategic planning. The STEP Guide provides worksheets and related tools to help systems organize data and systematically assess their strengths, weaknesses, challenges, and opportunities.

Building on the STEP program, the Check Up Program for Small Systems (CUPSS) was developed.³⁰ CUPSS introduces a basic framework for asset management based on answering five core questions:

²⁹ Associations of Metropolitan Water Agencies, National Association of Water Companies, American Water Works Association, National Association of Clean Water Agencies, Water Environment Association, American Public Works Association

³⁰ CUPSS@epa.gov

- What Is the current state of the utilities assets?
- What is the utility's required sustained level of service?
- Which assets are critical to sustained performance?
- What are the utility's best minimum life cycle cost capital, and operating & maintenance strategies?
- What is the utility's best long term financing strategy?

CUPSS participants sign up by e-mail and receive access to:

- Free, simplified software
- A PowerPoint "Asset Management 101" slide show for use by water/wastewater utilities use as they introduce basic asset management concepts to their management and staff
- A 7-step process to develop an asset management plan
- A CD and website to support trainers

Obstacles

- Federal agencies are large, their missions differ and coordination between them on strategic initiatives, like asset management, can be challenging.
- Asset management must compete with other Federal Highway Division priorities. This is in spite of the majority of divisions having received asset management training.
- Intergovernmental relationships — Federal agencies regulate water and wastewater local service providers that are responsible for day-to-day water and wastewater infrastructure operations and management decisions. Federal and state statutory regulations and requirements have frequently relied on litigation to define priority projects, rather than allowing local communities to set service and project priorities.
- Sustainable rates based on full cost of service and ability to pay—Full cost recovery is a driver for developing user fees. Rates reflect the cost of service needed to provide safe, accessible water services. These methods and approaches for setting service levels can cause tension between the local agency that must document, articulate and provide leadership within the local community paying for these services, and the state and federal regulators imposing new requirements and standards.
- Subsidized services and number of water providers—The complex number of organizations providing water services leads to some who are unable to provide safe water or protect the environment without subsidized rates. This relationship has allowed inefficiency in services and does not encourage good asset management or sustainable water infrastructure services.
- Compliance and regulation versus sustainable management—There are disconnects between designated water and wastewater uses, reporting and permit writing, setting of enforcement priorities and negotiating consent degrees, which led to prioritizing work based on regulation versus the knowledge of local experts and service providers.

- The lack of funding for training or a network of asset management practitioners has led to confusion from lack of standardization between the many transportation and water organizations taking different approaches to asset management. The size of the transportation and water utility audiences makes coordination and collaboration difficult.
- The lack of knowledge of the CUPPS, SIMPLE and SAM initiatives, and lack of a multi-sector institutional structure promoting asset management are identified as barriers to their acceptance and use.

Success Factors

- AM Champions in Federal Highways Administration and EPA
- Leadership by AASHTO in development of research and tools that speak to state DOTs' need for tradeoff analysis for high value pavement and bridge assets
- EPA in-depth training on asset management and cross asset approach to sustainable infrastructure management

Observations

1. FHWA's Office of Asset Management and EPA represent national champions leading efforts to adopt a consistent asset management approach in the U.S.
2. Efforts to jointly agree on strategic management between professional associations and the federal government are continuing.
3. There are still overlaps and gaps between these two agencies' efforts to embed best asset management practice within their agencies, and transportation and water agencies at the state and local level.
4. Similar initiatives exist to develop web-based tools and training for transportation and water audiences. Current efforts to target small agencies and regions of the country reflect the current trend by both agencies to pass information, training and tools along to smaller, more regional audiences.
5. The SIMPLE and CUPPS initiatives reflect international terminology and approach in their 5 question approach to asset management. Consulting resources used in training and software development reflect the adoption of this approach as documented in the *International Infrastructure Management Manual*.
6. Environmental regulations have led to tension between levels of government and funding projects that may not be the highest risk or greatest need in a community based on asset management principles.
7. The lack of a multi-sector national network hampers practitioners and federal agencies' desire to share information and implement asset management in the U.S.

A-1.2 STATE EXPERIENCE

MICHIGAN ASSET MANAGEMENT COUNCIL

“...asset management takes a statewide initiative, innovative thinking, and a willingness to engage approaches and relationships that have not been tried before.”

Terry McNinch, Director, Michigan LTAP

Background

State, County and Municipal Structure

There are an estimated 617 agencies within Michigan managing road network assets, including the Michigan Department of Transportation, County Road Commissions, cities and villages, regional planning organizations and metropolitan planning organizations that are also involved in the project selection and funding process.³¹

Infrastructure ownership and funding sources

There are 39,700 centerline miles (84,500 lane miles) of roads eligible for federal aid in Michigan. In addition to the federal-aid roads there are some 80,000 miles of local roads and streets in Michigan. There are almost 7,000 bridges in the state.

Historic Timeline Leading to Asset Management

- 1998 Michigan legislature establishes bipartisan committee to study transportation funding issues consulting state and local agencies, and transportation stakeholders in business and industry; Act adopts capital maintenance as cornerstone of asset management practice
- 1999 Michigan bipartisan committee studies changes to funding formula for distribution of state transportation funds
- 2000 *Transportation Funding for the 21st Century* report recommends long-range asset management process to manage Michigan transportation infrastructure and move from project-based decision making to viewing needs based on holistic road network
County Road Association of Michigan (CRAM) and Michigan DOT agree to pilot project to develop and test guidelines for collecting, storing, reviewing and analyzing roadway data; pilot recommends legislation that moves Michigan to statewide asset management (not simply documenting needs), principles of asset management based on setting performance targets, life cycle management and using a customer focus
- 2002 Michigan legislature passes Act 499 which amends Act 51 and establishes Transportation Asset Management (TAM) Council that advises State Transportation Commission on strategy, procedures and tools to implement strategy. TAM Council involves state, regional, and 600 local agencies receiving state transportation funding
- 2003 Center for Geographic Information (CGI) of Michigan Department of Information Technology used as central data storage agency in Michigan and a single GIS state map
- 2004 TAM Council works to define consistent terms for data and investment for routine maintenance, preventive maintenance and structural improvements and corresponding outcomes; allows an increased transfer of funds from major streets to local streets if cities have adopted an asset management plan. Council adopts a two-tiered training program for local agencies:
 - Introduction to Asset Management and Pavement Management [taught by Michigan Local Technical Assistance Program (LTAP)]

³¹ *Michigan's Roads & Bridges 2007 Annual Report*, Michigan Transportation Asset Management Council, 2008

- Advanced Asset Management
 - Advanced Pavement Management taught by the National Center for Pavement Preservation (NCP) at Michigan State University
- 2006 Act 338 allows cities and villages greater flexibility in use of Act 51 revenues if asset management plan is adopted and being implemented, cited as cause for increasing local agency interest in asset management
TAM Guide for Local Agencies (updated in 2007)
Michigan Road and Bridge 4th Annual Report
- 2007 TAM Council Annual Report to legislature recommends strategy for on-going and comprehensive education and training program that provides local and state road agencies with the information needed to develop and implement asset management programs

Current Directions and Drivers

The Need

In 1998, the Michigan Legislature established the Act 51 Transportation Funding Study Committee. This committee's final report, the *Transportation Funding for the 21st Century*, recommended that 1) a consistent set of condition data and 2) a consistent asset management process were needed to accurately assess Michigan's transportation infrastructure needs and resource requirements.

Legislation

In 2002, the Michigan Legislature passed Act 499 amending Act 51 and establishing the Transportation Asset Management Council (TAMC) to implement an asset management approach throughout Michigan. The Council advises the state Transportation Commission on a statewide, cost-effective asset management strategy, and the processes and tools needed to implement such a strategy. The Council reports annually to the legislature and state Transportation Commission on the current condition of the federal aid eligible roads and bridges, road agency expenditures and needs for maintaining and preserving roads and bridges within the state. The Council was first charged with addressing the federal-aid eligible highway system, and then expanding to include county and municipal roads.

Implementing Michigan Asset Management

Asset management is defined in Michigan as:

“an ongoing process of maintaining, upgrading and operating physical assets cost - effectively, based on a continuous, physical inventory and condition assessment.” [MCL 247.659(a)]

It is further defined as “knowing what you have, knowing the condition it is in, knowing the cost of maintaining or replacing it, and following a strategy to keep it in the best condition at the least cost.”³²

The TAM Council includes 11 members from associations and organizations that represent the estimated 617 agencies that manage road network assets in the state, and those responsible for project selection or funding. Voting members

³² *Michigan's Roads & Bridges 2007 Annual Report*, Michigan Transportation Asset Management Council, 2008

include the Michigan Municipal League (MML), Michigan Department of Transportation (MDOT), County Road Association of Michigan (CRAM), Michigan Association of Counties (MAC), Michigan Townships Association (MTA), Michigan Association of Regions, and the Michigan Transportation Planners Association. There is one additional non-voting member from the Center for Geographic Information (CGI), which serves as the central repository for all of the data collected by the Council. Members serve 3-year terms and are eligible to be reappointed.

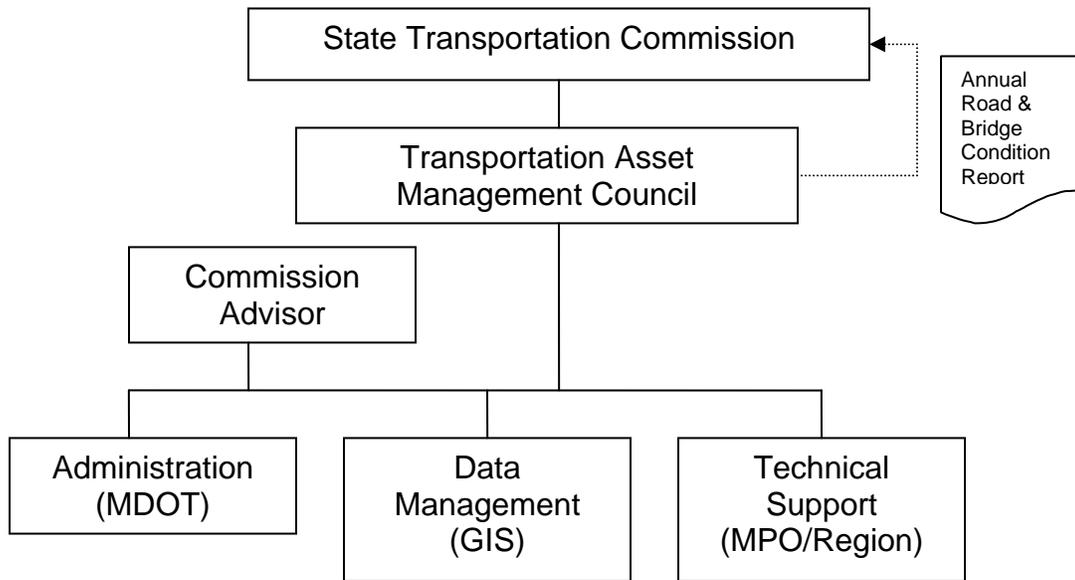


FIGURE A-1.2.1 Michigan Transportation Asset Management Council Organization

MDOT provides administrative support for the Council while metropolitan and regional planning organizations provide support for data collection and reporting. The Council reports to the State Transportation Commission; the Commission Advisor serves as liaison between the Commission and Council. The Commission approves Council members and the Council’s annual budget request. The Council must report to the Commission and the Legislature annually regarding its activities.

Guiding principles for the Council include:

- The methods employed should be cost-effective and efficient;
- The asset management strategy and the implementation of it should be a coordinated, unified effort; and
- Existing resources should be used where possible.

The \$1.6 million annual Council budget is approved by the Michigan Transportation Commission. Asset management training is provided by contract with the Michigan Local Technical Assistance Program (LTAP) at Michigan Tech University. Pavement management is also taught by LTAP. RoadSoft, the

transportation infrastructure management system, is jointly funded by MDOT and provided at no cost to Michigan's local road agencies. The system is developed and supported by the Technology Development Group at Michigan Tech University. RoadSoft provides pavement condition prediction for various budget scenarios. Tradeoffs are shown assuming various pavement treatments including the cost per year over a ten-year horizon, and remaining service life of roads and their condition. Additional inventory modules include: culverts, signs, driveways, curb & gutter, sidewalks, pavement markings, traffic counts and traffic crashes. Pavement prediction for various treatments and a common GIS statewide are used to communicate outcomes based on investment strategy.

Activities of the Council include:

- Data collection
- Education and training
- Strategic analysis and reporting

The 2007 Annual Report of the TAM Council to the Legislature reports that over 1,000 individuals have received training in asset management over the last four years representing 240 agencies including 114 cities and villages, all 83 county road commissions, all metropolitan planning organizations and regional planning organizations, and MDOT. The Council's education and training activities involve the MPOs and regional planning organizations, the Michigan Local Technical Assistance Program (LTAP) at Michigan Technological University and the National Center for Pavement Preservation at Michigan State University. The extent of the training covers basic asset management principles, PASER pavement condition ratings, and in-depth training on pavement preservation. In addition to this training, Michigan's LTAP provides operational training (e.g., Gravel Road Maintenance, Motor Grader Training) in which asset management principles are presented. Altogether, an estimated 4,000 individuals have received LTAP's training in 2007.

The 120 TAM workshops held (with 70% local agency participation) address the stewardship role of elected officials and relationship to TAM, use of pavement inspection methods, and road information. TAM-specific training sessions are:

- Introduction to TAM for Elected and Appointed Officials (30 workshops to date)
- TAM Workshop (4 times per year)
- Statewide TAM Conference (2 per year)
- Pavement (PASER) Condition Inspection Training (10 per year)
- RoadSoft Training (8 per year)

While the road rating process has been working well, collecting information on investments to the system (i.e., where and when improvements have been made and for how much) has been challenging. Issues cited in the TAM Council's 2007 report include the need to:

- Simplify the Internet Reporting Tool, the method by which local agencies submit their pavement condition and investment inputs to the Council. There were no templates for asset management plans incorporated in training.
- Provide additional training for decisions makers and the public, including the possibility of developing a DVD or video for use.
- Pavement condition data has been submitted by all agencies. Improve compliance with investment information by counties and cities through the Investment Reporting Tool (IRT) website.³³

Future Directions

In 2008, the Council reduced the rating of roads to every other year, requesting agencies to rate only 50 percent of their federal aid roads. This cycle of rating is believed to be sufficient to adequately monitor and report on the condition of the system following analysis of four years of condition information. With the rising cost of fuel, this will mitigate the cost of data collection.³⁴ The Council redesigned an investment report in 2008 with further refinements anticipated. Piloting of new technologies for rating pavements aimed to improve the quality of pavement ratings and reduce costs has been put on hold. The collection of pavement condition on the local system is the new priority with the Council approving funding for about 25% of the system.

A study of use of pavement management systems in the upper Midwest shows that more local agencies are using pavement management software to inform decision making in Michigan and Wisconsin, where legislation has supported the use of asset management techniques.³⁵ LTAP reports that local agencies seen as early adopters of asset management have increased the use of maintenance treatments and a “mix of fixes” strategy. Some agencies have successfully requested new revenues to address pavement needs. These agencies attended available training, collected data on pavement condition and used the strategy analysis functions of RoadSoft to successfully communicate the current condition and future road performance given various funding scenarios.

The Council also recently completed a strategic planning effort aimed at reviewing past accomplishments and identifying and prioritizing work yet to be accomplished towards implementing its mission. As part of this process, the Council revised its mission statement to:

³³ Collection of condition data on the federal aid network between 2004-2008 is near 100% compliant for MDOT and local agencies. Collection of condition on the local system is not required, but because over 280 agencies use PASER and RoadSoft, a significant portion of the local network has been collected. In the 3rd quarter of 2008, the TAMC offered to reimburse local agencies for data on the local network. Local agency requests exceeded the reimbursement budget and approximately 25% of the local network is expected to be submitted.

Submission of investment data has not been as successful. Agencies complained that the data being requested was not readily accessible in the requested format and the submission process was cumbersome and confusing. A wide variation in the submitted data made statewide investment analysis unreliable. Alternative approaches are being considered.

³⁴ There is evidence that data collection cost savings have been absorbed by other, increasing administrative costs.

³⁵ de Melo e Silva, F., T. McNinch, and J. Dong. *Meaningful Use of Collected Local Roads Data and Information*, Midwest Regional University Transportation Center, University of Wisconsin, Madison, WI, 2008, pp 2-5. http://www.mrutc.org/research/0605/06-05_FR.pdf.

“Support excellence in managing Michigan’s transportation assets by:

- Advising the Legislature and state Transportation Commission
- Promoting AM principles
- Providing tools and practices for road agencies

Observations

1. Michigan is an excellent example of allowing greater state funding flexibility as an incentive to those agencies that use asset management.
2. Involvement of all road stakeholders in Michigan’s Transportation Asset Management Council has led to overcoming a historic lack of trust among key transportation providers in the state. It is notable that this on-going connection has provided the needed direction, resources and full participation of road agencies and planners. While limited resources are impacting overall roads condition, more efficient strategies and credibility are laying the groundwork for future success in minimizing lifecycle costs of the road network.
3. LTAP’s customization of asset management training reflects their knowledge of how to communicate with road agency managers and leaders responsible for making budget allocation decisions, and practitioners in the state responsible for collecting information on road conditions. Fitting the training to the audience has been a hallmark of Michigan LTAP effectiveness.
4. Leading cities within the state are successfully garnering additional funds to meet desired community levels of road services.
5. Software development, training and access to PASER and RoadSoft tools required to collect information and analyze investment tradeoffs fill a resource gap in technical training and tools in communities throughout the state. Even though data reporting is not yet comprehensive and the Investment Reporting Tool requires improvements in ease of use, comparison of investments across the state are becoming possible.
6. This full complement of a champion at the state level, involvement of all stakeholders, use of a consistent AM approach, collection of consistent information, access to software and analysis tools at no cost to the agencies, and flexible use of funding make an effective statewide approach to embedding asset management in the U.S.

A-1.3 U.S REGIONAL EXPERIENCE

A-1.3.1 PACIFIC NORTHWEST ASSET MANAGEMENT USER GROUP (AMUG)

"People, teams, partnerships are the number one Asset. "

Barry Buchanan, Board President, AMUG

Background

The Pacific Northwest Asset Management User Group (AMUG) is a volunteer organization of local agencies facilitating the transfer of asset management principles and training. U.S. and international examples of asset management are presented in one and two-day training sessions to local, county and state asset managers at minimal cost. Municipal water, wastewater and transportation case studies are showcased representing U.S. and international best practice.

As articulated in its first meeting, the vision of AMUG is to:

Facilitate the successful implementation and use of asset management across all utilities and services.

This cross-asset, cross service orientation of AMUG makes it unique as a community of asset management practice in the United States.

The purpose and goals of AMUG are centered on education, training and networking for asset management practitioners. They are to:

- Facilitate the dissemination of asset management information
- Enable quick information transfer between asset management practitioners
- Provide an education base for asset management

Since 2005, six networking and training sessions have drawn attendees from water, wastewater, transportation, parks, housing, finance, and information technology professionals representing local, county and state levels of government, and the consultants that provide asset management services to these agencies. While the majority of registrants come from Oregon and Washington, attendees have come from as far as Japan, and have represented all western U.S. states and some federal agencies. There is growing attendance from counties within the Portland metropolitan area and the state of Washington.

Meeting Topics

The Oregon Association of Clean Water Association (OCWA) sponsored an EPA two-day asset management training session in Portland February 2005 based on

international best practice.³⁶ It was attended by 170 local government and utility senior and mid-level managers and consultants.³⁷

A meeting in May 2005 in Washington, D.C. drew over 100 attendees from the water and waste water industries, including a senior water program manager from a Northwest local agency. Among other topics, creation of a National Asset Management group, or NAMS-US was discussed. A “whole of government” approach competed with proposals to take a water-industry-only focus. After consultation with EPA the fledgling NAMS-US effort was dropped.³⁸ These two initiatives in 2005—consideration of creating a NAMS-US and conducting an EPA training exercise in the Pacific Northwest—led to the first meeting of AMUG in Portland, Oregon. The first meeting was initiated by the water program manager from City of Salem, the lead proponent of taking a whole of government approach to asset management.

The first AMUG meeting in November 2005 was attended by water, waste water, transportation, state, and county managers as well as consultancies involved or interested in asset management. A presentation oriented attendees to international best asset management practice, and all manuals of the NAMS.NZ Group were made available to attendees.

The second meeting in February 2006 discussed ways to formalize the organization and provide communication “tools” which would link available best practice and national associations’ initiatives to AMUG participants. Ideas included:

- Library of data, information and effective communication examples and presentation materials
- Definition of common terms
- Website for posting
 - Examples of asset inventories, lifecycle analysis and ways of conducting tradeoffs
 - A list of resources
 - Contacts
 - Related websites and interested associations (ACWC, AWWA, APWA, Infraguide, NAMS-NZ and AU, Michigan DOT, Orange County Sanitation, Seattle Public Utilities, and King County)

³⁶ OCWA is a private, non-profit statewide association of 118 wastewater treatment and storm water management agencies & associated professionals.

³⁷ Based on a story line called “Tom’s Bad Day,” root causes of a wastewater pump station failure use asset management principles to answer five core questions. These answers enable the manager of the pump station to build an asset plan, look at failure causes, risk to collect sufficient information for an asset register, condition assessment, and long term solutions and strategies that result in an asset and long term financial plan.

³⁸ Efforts have proceeded within the water industry to develop more comprehensive asset management training and tools at Pennsylvania State University.

- A list of tools that are available including standards, asset categories and hierarchies, and self assessment questionnaire
- Developing an activity or task for AMUG itself as a way to catalyze the organizational identity and provide value to participants.

The dominant feeling of the group was that since most were attempting to initiate asset management, case studies and networking would be of greatest value to the group.

The third meeting in April 2006 provided:

- an overview of asset management as a culture (not a program)
- a case study of Portland Transportation's asset management implementation
- Portland Transportation's adoption of a generic lifecycle process that was used to select an interstate intersection redesign that involved city and state transportation agencies, and
- Portland's move to whole of government reporting on the condition, value and renewal needs across city infrastructure.

The fourth meeting sponsored the EPA's two-day training session in November 2006. While prior meetings were attended by approximately 20 people, this meeting was attended by 140 people (space limited attendance to this number) including attendees from Japan, California and most western U.S. states. AMUG garnered \$9,000 above expenses from training registration fees. In order to deposit these revenues, AMUG filed for a non-profit tax status and formed a board of directors in late 2006. Board members represent water, transportation, and waste water asset managers.

Only one meeting was sponsored by AMUG in 2007. This all-day session, attended by 70 practitioners, was presented by the president of New Zealand's National Asset Management Steering Committee president. Modules presented overviews of the core tenets of international best asset management practice, including: lifecycle management of infrastructure; levels of service; Council's guide to asset management; condition and performance monitoring; management strategies; growth and demand; data, systems and processes; asset valuation and financial forecasting, risk management and improvement planning; preparing asset management plans, optimized decision making; and collaborative procurement.

A sixth all day training session occurred in August 2008. Approximately 60 attendees from local, county and state agencies and utilities attended representing west coast states (Oregon, Washington, and California). A shift occurred with this AMUG session registration. Larger county and state agency and utility contingents of asset management staff (e.g., Washington County, Oregon; Oregon Department of Transportation; Sacramento Sanitary District)

and successors to experienced asset managers (Portland Office of Transportation) attended.

Advertised as “Local Asset Management from Around the World,” the all-day presentations included:

- The results of a self assessment survey administered to attendees and Australia’s AM practitioners website. The survey was sent out with notice of the day’s training, and to IPWEA’s asset management Internet discussion forum.
- The CEO of the Institute of Public Works Engineers Australia (IPWEA) and NAMS-Australia outlined Australia’s roll out of NAMS.PLUS, a subscription-based set of four workshops aimed at providing guidelines and templates that result in local agencies’ development of a basic asset management plan and long range financial plan.
- An Australian local government asset manager presented use of NAMS.PLUS and the resulting work (asset and financial plan) for Queensland’s Sunshine Regional Coast Council.
- The use of risk to rate cross-asset funding investment priorities by the City of Portland’s Asset Manager Group. The Mayor requested the Group advise City Council so that excess property taxes could be allocated to address the City’s infrastructure needs.
- Portland Water Bureau’s asset management coordinator presented the Water Services Association of Australia (WSAA) Benchmarking findings based on their participation.
- The City of Gresham presented its wastewater asset management implementation.

Obstacles

- Perhaps the key obstacle to AMUG’s success is that, similar to other volunteer-based organizations, the network is somewhat fragile. Dependent on the passion and efforts of a few motivated individuals, effort is largely unstructured, volunteer and therefore difficult to regulate by rules.
- AMUG suffers from a sporadic meeting schedule and has no long-term strategy for training and education that moves individuals or agencies from basic principles and understanding of asset management to more advanced practice and implementation. Agendas are initiated largely due to the contacts or work of board members. The last two trainings were coordinated through a board member’s contact with leaders of the New Zealand and Australian National Asset Management Committees who planned to be in North America on other business and agreed to present to AMUG at no cost.
- No resources have been assigned to developing a website; e-mail is based on prior registration and “borrowing” other organization’s mailing lists.

Success Factors

- The vision and leadership for AMUG came from a water utility planning program manager within Oregon's local government sector involved in U.S. water utility industry efforts to launch asset management nationally. Educated and trained in New Zealand, he worked for consultants in New Zealand, and the privatized water industry in the U.K., Thailand, Argentina and Puerto Rico. This international knowledge of and experience led to connection with the network of water industry leaders in the U.S. He participated in the May 2005 meeting in Washington, D.C. that drew over 100 attendees from the water and waste water industry discussing infrastructure needs in the U.S. Among other topics, creation of a NAMS-US was discussed.
- The customer focus and cross-functional orientation is a core tenet of AMUG's training and networking opportunities. Influential in this orientation was the belief by local government participants that asset management must address community needs across "the whole of government", considering all services and physical assets, not just one service in isolation.
- This same whole of government perspective represents best practice as documented in the *International Infrastructure Management Manual*, developed jointly in New Zealand and Australia. All manuals written by NAMS-New Zealand were made available at the first AMUG meeting held in November 2005. Local government transportation and wastewater representatives who were also aware of international best practice and seeking to embed this approach within their agencies found this commitment to whole of government and the face-to-face networking with peers an impetus for continued involvement in AMUG.
- National and international leaders in asset management best practice reside within the Portland Metropolitan and Willamette Valley areas of Oregon. Experts are recognized in the water and transportation local government sector. These individuals' recent and on-going efforts have had helped move the City of Portland to whole of government decision making model through their City Asset Managers Group. Participation in international water and wastewater benchmarking projects and on-going participation in national water and transportation research projects and committees continue to move Portland's corporate decision making model toward whole of government as resources are allocated across community service needs. EPA and FHWA documented this case study in 2008 as part of a national review of asset management excellence. AMUG provides a venue for presenting this local and international work to local audiences and is responsible for strengthening this local network of asset management practitioners.
- While organized as a non-profit with a board of directors, some revenues have accrued simply based on registration fees exceeding expenses. Meeting space has been donated and events have been organized by volunteers which has substantially lowered costs.

Observations

1. Similar to NEWEA (see case study below), impetus for AMUG's creation is a consequence of an asset management champion's vision and efforts. AMUG's training sessions reflect the connections board members have to international and national best practice and leaders. EPA-subsidized training was instrumental in providing in-depth awareness training. The free assistance by the leaders of internationally asset management associations, as well as within the state of Oregon, have provided case study examples of exemplary work to Pacific Northwest AMUG attendees.
2. Attendees at the August 2008 training expressed frustration that on-going communities of practice are not available to them for mentoring and coaching as basic awareness is moving to implementation of software, asset plans and culture change in their organizations.
3. One-off trainings and sporadic events reflect the voluntary nature of AMUG. The lack of professional association support (see U.S. NEWEA, NMEFC or U.K.'s IAM), or membership dues or a business plan (see NAMS-NZ or NAMS-AU) reflect the weakness in AMUG as currently structured.
4. AMUG represents the only cross-asset user group of practitioners in the U.S. The consistent response by west coast attendees—from transportation, water, waste water, parks, buildings, finance and local, county, state government and utilities—indicates the demand for technical and practical assistance as communities seek information to further the implementation of asset management.

A-1.3.2 NEW ENGLAND WATER ENVIRONMENT ASSOCIATION (NEWEA)

“There is still great need country wide for asset management information, practice and contact with peers who can share their experience. In particular, there is a need for these approaches and tools for smaller communities.”

John Fortin, past Chair, NEWEA Asset Management Committee

Background

The New England Water Environment Association (NEWEA), a chapter of the Water Environment Federation (WEF), formalized an asset management committee (AMC) in January 2004. This committee was created to address local governments’ and public utilities’ need to incorporate asset management practices within their core business functions. NEWEA’s AMC is dedicated to the education, implementation, and progression of asset management.

The AMC is currently the only committee within the WEF organization that is entirely focused on asset management. As such, the AMC is committed to promote and support the practice of asset management among all members of NEWEA and WEF, including collaboration with the U.S. EPA.

The mission of the AMC is:

1. To be the focal group for developing association policies / programs on asset management, and for educating members on the technical and cost-benefit aspects of adopting optimal asset management practices.
2. To review technical practices and disseminate information available to the membership regarding asset management and life cycle management terminology, technologies, and techniques.

The overall objective of the AMC is to serve as a clearinghouse for asset management information and specifically:

1. To track changes in federal and New England state asset management policies, guidelines, and regulations.
2. To recruit technical papers for presentation at association meetings and to coordinate with the program committee to develop technical sessions at the annual conference or spring meeting.
3. To disseminate information related to asset management regulations, legislation, policies, or guidelines to association members.
4. To provide a local and more recently national forum for the exchange of information on issues related to asset management.

Definition of Asset Management

NEWEA recognizes two definitions of asset management:

“the combination of management, financial, economic, engineering and other practices applied to physical assets with the objective of providing the required level of service in the most cost effective manner”

(*International Infrastructure Management Manual*)

"a comprehensive and structured approach to the long-term management of assets as tools for the efficient and effective delivery of community benefits"

American Public Works Association



Figure 1
Asset Management Model

NEWEA relies on information from the *International Infrastructure Management Manual* as well as U.S. and international case studies, workshops, technical sessions at conferences, manuals, and research projects. NEWEA’s Asset Management Committee is in contact with consultants and agencies throughout the country as well as the EPA, research federations and professional associations for the water, waste water, and buried underground utilities.

Historic Timeline Leading to Asset Management

2002

- A NEWEA member and asset management practitioner from the Massachusetts Water Resources Authority solicited NEWEA Executive Committee to establish ad-hoc Asset Management Committee for a 2-year period to test interest prior to becoming an “official” standing technical committee
- 4 industry volunteers chartered the AM committee

2002-04

- Added AM topic to official “Call for Abstracts” for Annual Conference
- Provided focus to spring meeting seminar Program discussions
- Teamed with two other established NEWEA committees 1) Collection Systems and 2) Small Communities and provided “joint” Specialty Conferences to membership
- Created first industry clearinghouse web site (www.newea.org/AMRC) called the Asset Management Resource Center. Content developed by volunteer committee members based on industry practices.
- Published articles in association Journal and Newsletter to communicate the Committee’s work and Asset Management information
- Solicited committee involvement and grew from 4 to about 25 members

2004

- Executive Committee converted AM Committee from “ad-hoc” to “standing” committee based on demonstrated value and need by membership
- Committee restates its charge differentiating itself from the newly created Utility Management Committee within NEWEA

2007

- Committee completed 2-day Specialty Conference with public & private sector focus
- Committee creates an annual Asset Management Excellence Award for utility/person contributing to the advancement of AM concepts

- Committee creates a national Asset Management Excellence Exchange e-mail network. The network is multi-sector, not only wastewater
- Committee creates Position Paper on Asset Management definitions, need, benefits
- Continue to publish articles in association Journal and Newsletter to communicate the Committee's work and Asset Management information
- Annual Conferences begin to draw AM abstracts, panelists and practitioner attendance from across U.S.
- Committee membership grows to over 40 and becomes one of the largest technical committees in NEWEA

Drivers for Development of Asset Management

Local governments' and public utilities' need to incorporate asset management practices within their core business functions led to the NEWEA AMC.

In 2002, a NEWEA member and an asset management practitioner from the Massachusetts Water Resources Authority solicited the NEWEA Executive Committee to establish a temporary (ad-hoc) Asset Management Committee for a 2-year period to test interest prior to becoming an "official" technical committee. Four water resource industry volunteers chartered the AM committee. NEWEA formalized the AMC at their Annual Conference in January 2004.

Organization of NEWEA's Asset Management Committee

Organization

A non-profit group, NEWEA's AM Committee is composed of over 40 volunteers from industry (utilities, consultants and vendors). The Committee Chair and Vice-Chair positions are both volunteers.

Committee activities are completed by volunteers with assistance from three paid NEWEA staff members (note: these paid staff members serve the whole NEWEA organization, not just the AM committee). Information exchange occurs with other volunteer-based asset management committees, such as the Pacific Northwest Asset Manager Users Group (AMUG).

Training

NEWEA sponsors asset management specific workshops, technical sessions, and conferences to share knowledge. NEWEA believes that the most successful help for practitioners trying to understand basic or core asset management principles and practices is case study presentations from peers and consultants at conferences and training workshops, including panel discussions.

NEWEA'S 2008 annual conference focused on asset management with 18 technical presentations including one panel discussion with six speakers. Topics included case studies/lessons learned on: technologies (Computerized Maintenance Management Systems (CMMS)/GIS, e.g.), Risk-Based Decision Making, Condition Assessment, Reliability Centered Maintenance (RCM), Preventive Maintenance, Planning for Asset Management During the Design Phase, Change/Communication, Asset Replacement/Lifecycle Planning,

Benchmarking, Getting Started and Overviews on Overall Asset Management Programs.

Communication

Information between members is typically passed along to others via email, workshops, conference technical sessions, books, and research projects. There is much contact with associations representing water, wastewater, buried underground utilities, environmental research foundations, consultants and regulatory agencies throughout the country.

An Asset Management Resource Center on the organization's website is dedicated to AM.³⁹ In addition, an email network (Asset Management Excellence Exchange) has been developed to share information to a larger group in the U.S.

Obstacles

- No regulatory or legislated drivers exist to implement changes; it usually requires a catastrophic event to get organizations thinking about asset management
- No funding
- Inability to reach smaller communities with current resources
- Lack of acceptance of change
- Lack of standardization (too many organizations saying and doing different things)
- Use of new terminology is confusing
- No real asset management standards or certification program. Each organization and consultant firm has a slightly different definition/approach to asset management. There are currently over 15 different asset management definitions alone.
- Lack of elected official training on asset management concepts and benefits and support for asset management implementation funding
- Lack of case studies on actual benefits (cost savings) from asset management implementations

Success Factors

- Networking, conferences/seminars, committees, open forums, the internet, certification and periodicals
- Reaching out to and including experts (especially practitioners) from throughout the country in activities
- A few passionate individuals on the AMC are dedicated to advancing the concepts because they have seen the value of asset management first hand

³⁹ www.newea.org/AMRC

Recommendations for Way Forward

There is still great need country wide for asset management information, practice and contact with peers who can share their experience. In particular, there is a need for these approaches and tools for smaller communities. The creation of a national organization (i.e. Center of Asset Management Excellence) would be the best approach to implement the following actions:

- A standardized approach/systems
- Understanding of cost/benefit
- Improved coordination among various organizations
- Training on the basic and advanced concepts
- A Certification program. A phased training program would be needed (AM101, 201, 301) to progress practitioners from initial understanding of asset management concepts to advanced practice, development of an asset management plan and development of a sustainable financial plan.
- Adjustments to college curriculums should include asset management concepts.



Observations

1. The role of practitioner as champion is responsible for the recognition of NEWEA's AMC as a U.S. leader in asset management.
2. NEWEA's AMC defined asset management and its practices for NEWEA's membership in order to minimize confusion and advance acceptance of new practices.
3. NEWEA's AMC is led by volunteers but assisted by the relationship with a professional association and its support staff.
4. NEWEA's industry-specific focus (water resource management) tends to limit the exposure of NEWEA's asset management information and contacts to the water resource industry. This is beginning to shift to those outside the water and buried underground communities of practice.
5. Some efforts have been made to connect with other U.S. regional AM communities of practice.

A-1.3.3 NEW MEXICO ENVIRONMENTAL FINANCE CENTER

“It is difficult to get asset management moving in communities without any mandate at all.”

Heather Himmelberger, Director, NMEFC

Background

New Mexico Environmental Finance Center (NMEFC) assists states and local governments with broad financial aspects of environmental regulation and compliance. NMEFC was formed by the EPA in 1992 as a pilot initiative of the EPA’s Environmental Finance Program. The Environmental Finance Center (EFC) concept stemmed from the states’ concerns regarding “unfunded mandates” from EPA. States requested resources to address these unfunded mandates. Since EPA could not provide monetary resources, it provided technical resources in the form of the EFCs. These EFCs were able to assist the states and local governments with innovative approaches to help alleviate the strain placed upon them by increased regulation. Ten centers form the Environmental Finance Center Network. The EFCs work independently and collaboratively to serve all EPA Regions.

NMEFC was the very first center and was originally located at the University of New Mexico. The EFC is currently located within the Institute of Research and Applications (IERA) which is a program of New Mexico Institute of Mining and Technology’s (NM Tech) Energetic Materials Research and Testing Center (EMRTC). The intent was to have state and local water and waste water agencies address the “how to pay” issues of environmental compliance and regulation. Following the establishment and success of the NMEFC, the EPA created centers at 8 other universities.

Definition of Asset Management

In 2006, NMEFC developed an asset management guide titled, “Asset Management: A Guide for Water and Wastewater Systems” and documented a case study.⁴⁰ In this guide, asset management is defined as:

“Maintaining a desired level of service (what you want your assets to provide) at the lowest life-cycle cost (best appropriate cost, not no cost.)”⁴¹

This definition is modified from the EPA Advanced Asset Management Training based on the *International Infrastructure Management Manual (IIMM)*. NMEFC’s definition of asset management “explains the process in terms audiences would understand.” Beyond the *IIMM*, other asset management resources include:

- articles from the American Water Works Association

⁴⁰ <http://nmeffc.nmt.edu/AssetManagement.php>

⁴¹ Definition adapted from the EPA Advanced Asset Management Training which stemmed from the *International Infrastructure Management Manual*. NMEFC’s modified the definition of asset management “to explain the process in terms audiences would understand.”

- site tours of Australia and New Zealand
- asset management workshops and conferences in the U.S. and Australia, and
- EPA Advanced Asset Management training materials

Drivers for Development of Asset Management

Environmental Regulation

New administrative systems and management tools were needed that allowed water and waste water agencies to adapt to the increased regulatory requirements and environmental complexities. In 2006 the NMEFC, the New Mexico Rural Water Association and Rural Community Assistance Corporation collaborated to develop three guidebooks to assist water and wastewater agencies in addressing sustainable business management. These included:

- Water Use Auditing: A Guide to Accurately Measure Water User and Water Loss
- Financial Planning: A Guide for Water and Wastewater Systems
- Asset Management: A guide for Water and Wastewater Systems.

Combined, these basic guides move small water and wastewater agencies to a “business model” for long term sustainability that helps address the issues of new and stricter regulatory requirements, growing populations, increased service demands, limited water supplies, a highly variable climate, aging infrastructure, and limited state and federal funding.⁴²

Executive Order

In May 2003, New Mexico’s governor created a governor’s Finance Council charged with targeting the state’s critical infrastructure priorities in transportation, employment, schools, affordable housing, higher education, water, energy and healthcare. In April 2005 a governor’s executive order addressed the mission of the Finance Council to include the state’s environment and water, improving infrastructure on tribal lands, and high technology implementation. The 19-member Council works collaboratively with the private sector to make recommendations on current and future statewide infrastructure needs and priorities. A Water Infrastructure Investment Technical Team (WIIT) was created by executive order to develop a long-range sustainable water and wastewater infrastructure plan. The WIIT was charged with streamlining New Mexico’s water infrastructure investment, including the development of a uniform application process for all water and wastewater projects requesting state funding. The WIIT was to bring additional accountability, technical support and oversight into New Mexico’s efforts to modernize its water systems.

In October 2007 New Mexico’s Governor signed Executive Order 2007-050 creating a Water Cabinet to unify the direction of all executive agencies responsible for water resources within the state including promoting interagency coordination of water and wastewater infrastructure funding. The Governor’s

⁴² *Asset Management: A Guide for Water and Wastewater Systems*, New Mexico Environmental Finance Center, 2006

executive order established the Water and Wastewater Infrastructure Development Division (WWIDD) within New Mexico's Environment Department to provide interagency leadership through a uniform application process with recommendations for efficient and effective use of water and wastewater loan funds.

Uniform Funding Application

The electronic Uniform Funding Application was designed as a mechanism for all New Mexico State and federal funding that provides funding for water and wastewater improvements. This provides a single entry point for determining eligibility for state funding.

Counties and incorporated municipalities must apply for New Mexico Small Cities Community Development Block Grant (CDBG) funds, a program to assist local communities with basic infrastructure and community development needs distributing appropriations from the U.S. Department of Housing and Urban Development. CDBG procedures include a definition of asset management:

a systematic process of maintaining, upgrading, and operating physical assets cost-effectively. It combines engineering principles with sound business practices and economic theory, and it provides tools to facilitate a more organized, logical approach to decision making. It is a planning process that ensures the most value from each asset with a plan to rehabilitate and replace them when necessary. An accurate and up-to-date asset management plan will help communities comply with the Government Accounting Standards Board's Statement #34 (GASB 34), an accounting standard for publicly owned systems.⁴³

An asset management plan is identified as a non-mandated element of the comprehensive plan needed to obtain CBG funds. Water rate structures must "support the long term operation, maintenance, repair and replacement of the system or facility" and an asset management plan is required to demonstrate that "water and wastewater infrastructure is managed within a strategic framework driven by program and service delivery needs." The NMEFC's "Asset Management" guide is cited as the model to be used by applicants. Of the total application points possible, 10 points are assigned if an applicant develops rates that demonstrate "support (for) the long term operation, maintenance, repair and replacement of the system or facility." NMEFC assists communities as they develop rate structures and asset management plans and practices to support their application for CBG funds.

Organization

NMEFC funding sources include federal, state and local governmental agencies. The NMEFC consists of eight full time staff members. The EFC is a flat organization with one director and seven staff members with equal

⁴³ New Mexico Administrative Code Title 2: Public Finance, Chapter 110: Local Government Grants, Part 2: Small Cities Community Development Block Grant.

responsibilities. The Director of the EFC answers to the Director of IERA who in turn answers to the Director of EMRTC. The Director of EMRTC answers to the President of NM Tech. The director and two staff members lead asset management efforts while three positions assist on specific aspects of asset management.

The desired outcome of NMEFC's efforts is to change the perspective of people attending training or receiving assistance to think of managing assets and services using asset management principles. Communities who choose to develop an asset plan (even if incomplete) as a consequence of training are considered a success as it represents a shift in thinking overall. Evaluation forms are occasionally used with some groups who are trained, or progress reports are written if a community engages NMEFC's assistance in rate setting, asset plan development or database or mapping services. NMEFC and other EFCs report annually to EPA's Environmental Finance Program.⁴⁴ This report summarizes all NMEFC's activities, including those related to asset management.

Training Format and Advertisement

The NMEFC has offered a variety of asset management trainings from 20 minutes to 2 days. There is no "standard" approach, other than an attempt to make the training as interactive as possible. All trainings are tailored to the specific audience and geared toward the parts of asset management that most fit that audience. Trainings occur on an "as requested" basis, generally at least once per month, sometimes more frequently. Increasingly, NMEFC training services are requested from non-New Mexico communities.

Obstacles

- The biggest obstacle is the inability to determine the "win" for all of the many parties who have competing interests in infrastructure in communities. A variety of entities – politicians, agencies, consultants, engineering firms, citizens and neighborhood groups – all have a stake in how infrastructure is designed, built, funded, and operated in communities. Limited funding creates a tension between the demand to construct new projects today versus investing in maintenance and preservation that will extend the life of existing assets.
- NMEFC sees the voluntary nature of asset management across most states as leading to a variety of interpretations of its meaning between communities within a state and between states. Interpretations of its principles and how asset management is implemented vary greatly depending on who is providing the assistance. Those providing assistance may encourage information systems that perform one part of asset management (e.g., inventories and mapping) but don't address other aspects, such as lifecycle management.
- Communities lack sound decision making processes regarding when to repair, rehabilitate or replace infrastructure from an asset management

⁴⁴ . <http://www.epa.gov/efinpage/efcn.htm#pubs>

- perspective (i.e., what is desired given the lowest lifecycle cost of assets, demands for services and resources available to address community needs).
- One of the most significant components of asset management, according to NMEFC, is level of service. Many providers feel it is not necessary to consult with their communities about service levels because of liability concerns. There is also difficulty conveying the importance of the concept of setting goals through level of service and then determining if goals are met. However, NMEFC feels that without this understanding, a community is missing one of the core building blocks that constitute asset management. The lack of a “standard” approach to asset management in the U.S. will hamper attempts to improve sustainable infrastructure management in the future.

Success Factors

- The biggest reason for NMEFC’s training success with agencies is cited as the “common sense nature of asset management” which, once understood, motivates people to see its value. Interactive training and use of “down to earth” examples that help people see “what’s in it for me” leads communities to embrace asset management for their future practice. Putting all elements of asset management into place does not occur immediately, but changing attendees’ thinking is seen as the necessary first step. This is considered the key indicator of NMEFC’s success. Helping agencies take initial implementation steps, such as developing a basic asset inventory and map, has greatly assisted small communities.
- There is increased discussion within New Mexico of asset management which is seen as a useful tool that improves the operations and management of infrastructure. This exposure leads to acceptance of asset management as the way of doing business. NMEFC sees these trends driving asset management from both the bottom up and top down.
- Incentives or mandates for asset management present the biggest opportunity to influence top managers and elected leaders. Examples of these are EPA’s technical assistance in NMEFC’s work documenting small agency guides, and the New Mexican Governor’s executive orders implementing a uniform CDBG application process which incorporates definitions and assigns points for communities’ incorporation of asset management investment strategies and planning. Making asset management a funding requirement helps anchor asset management as the standard approach to managing infrastructure in New Mexico. The more the process can be mandated or encouraged, the greater the chance of success.

Recommendations for Way Forward

1. A holistic approach is needed which is used by all involved in community service provision—those who provide funding, planners, communities,

regulators, state and federal government. Agreement on what asset management is, how it needs to be promoted and supported will ensure that communities, agencies and consultants are not at cross purposes with each other.

2. Support mechanisms for communities engaged in asset management are needed for asset management practitioners.
3. State enacted incentives or mandates that encourage asset management are needed; without them it is difficult to get asset management moving in communities.
4. Adopting and promoting the core components of a standard framework for asset management for all providers, communities, states, and varying systems and types of assets.
5. Identifying “wins” for engineering firms and elected officials. Working with these two key constituents to accept a new paradigm of prudent stewardship and least cost value for services over their lifecycle is critical to seeing value in asset management. This will require some effort to achieve.
6. It is critical to establish a national-level asset management “users group.” The NAMS Group in New Zealand has had a very positive impact on the advancement of asset management. A similar structure is needed involving those who govern, fund, plan, account, and manage infrastructure. Regular meetings of this group are needed to adjust asset management to reflect the needs of the communities.
7. Communities need to have opportunities for peer to peer interaction and learning provided by a well-structured users group. A national level group would address standards in asset management and promote best practice and definitions in the states. State level users groups would provide peer exchanges for those implementing asset management in their communities.

Observations

1. NMEFC provides an excellent example of a professional staff dedicated to helping train communities in sustainable infrastructure management principles and practice. Permanent staff fulfill not only training opportunities for New Mexico water and wastewater agencies, but provide technical assistance in mapping and database services. Jointly funded by federal, state and local communities, NMEFC provides the best example of practical assistance for small communities in the U.S.
2. Impetus for NMEFC’s success came from the need to comply with EPA water regulations, a gubernatorial executive order creating a unified application process for all water and wastewater projects, and application criteria giving points for asset management planning. This statewide approach of training, incentives and mandates provide the leadership and resources needed to implement asset management in small U.S. water and wastewater communities.
3. Exposure by the NMEFC director to international asset management practice and subsidies by EPA led to development of a simplified guide for

small water and wastewater agencies. The director as asset management champion led these efforts.

4. Demand for the NMEFC's asset management training is expanding beyond the water and wastewater communities of New Mexico to other states, becoming a recognized regional leader in asset management training and implementation services.

Appendix A-2: INTERNATIONAL EXPERIENCE

A-2.1 AUSTRALIA

“(There is) limited access for some councils to strong financial and asset management skills which are critical to identifying sustainability problems, optimizing renewals expenditure and improving revenue streams.”

National Financial Sustainability Study of Local Government
Australian Local Government Association 2006

Background

National, Provincial, Municipal Structure

The Commonwealth of Australia is a federation composed of a national government, 6 state governments, territories, and hundreds of local government bodies.

Infrastructure ownership and funding sources⁴⁵

The Commonwealth government collects more than 70 percent of the public sector revenue but is responsible for just over half of public sector expenditures—the remainder is transferred to lower levels of government. Commonwealth budget responsibilities include national defense, immigration, outpatient services and pharmaceuticals, social security and welfare and others. State responsibilities include most public sector spending on education, hospitals, public safety, and infrastructure. Local responsibilities include local roads and parks, libraries, and land-use planning.

Commonwealth revenue comes primarily from income taxes, sales taxes, and custom and excise duties. State revenue comes mainly from payroll, business franchise, and stamp taxes, as well as Commonwealth transfers in the form of general and specific purpose grants, and a national goods and services tax. Local government revenue comes from property taxes, charges, fines, and a portion of the Commonwealth grants to the states.

Historic Timeline Leading to Asset Management

early 1990s, Move to restructure and make local governments more efficient. Increased government service contracting leads to need for new information to better price goods and services, manage assets and liabilities, administer contracts, and new ways to measure the costs of performance

1993 New South Wales Local Government Act requires reporting revenues needed to bring assets up to desirable condition

1993 Accounting Standard AAS 27 requires local government accrual accounting, asset registers, valuing assets, depreciating assets and reporting revenues needed to bring assets up to desirable condition

⁴⁵ <http://www.gao.gov/archive/2000/ai00057.pdf>

- 1994 Institute of Municipal Engineering Australia (formerly IMEA, now IPWEA) publishes *National Asset Management Manual* which outlines asset management principles and guidance on asset management plan development for local government agencies
- 1995 Competition Policy Reform Act 1995 amends the competitive conduct and extends coverage to State, Territory and local government businesses and unincorporated bodies
- 1994-95 Commonwealth Departments fully transition to reporting operations on a full accrual basis and publishing financial statements audited by the Australian National Audit Office (ANAO)
- 1996 A comprehensive review of government operations by the National Commission of Audits (NCOA) emphasizes the new public sector reform agenda: (1) putting the public sector on a more businesslike footing, (2) fostering a more competitive environment, and (3) building a performance culture
- 1997 The Commonwealth Government sets Fiscal Year 1999-2000 as implementation of accrual based outcome and output budgeting
- 1998 All Commonwealth departments, agencies and ministers agree on the desired outcomes and the contributing outputs to achieve those outcomes
- 1998 *Facing the Renewal Challenge, Victorian Local Government Infrastructure Study*, Department of Infrastructure describes unfunded liability and decline of asset condition for Victorian local government
- 1999 Commonwealth Departments and agencies assigned accrual-based prices to outcomes
- 1999-2000 Budget reported the Australian Accounting Standard No. 31 'Financial Reporting by Government' (AAS31)
- 2000 *International Infrastructure Management Manual* published by Australia and New Zealand
- 2002 STEP program introduced into Victoria to mentor an organizational culture towards asset management
- 2002 Management of Roads by Local Governments, Victorian Auditor General
- 2004 National Asset Management Strategy (NAMS) Committee Australia re-established
- 2006 National Financial Sustainability Study of Local Governments, Australian Local Government Association
- 2008-9 Australian Infrastructure Financial Management Guidelines, IPWEA (companion to IIMM, publication early 2009), to set guidelines and consistent key performance indicators for annual financial reporting of infrastructure

Current Directions and Drivers

Three major initiatives are seen as influencing the creation of an active community of asset management practice in Australia: accounting standards, sustainability studies, and adoption of a national asset management framework supported by practical tools & guidelines.

The economic recession of the early 1990s led the Australian financial community to promulgate accounting standards (AAS27) which required that government agencies report asset inventories, value assets, depreciate assets and report revenues needed to bring assets up to desirable condition. This was seen as a reporting requirement and did not effectively create an ethic of stewardship or management practices to address the economic impact of annual budget decisions and sustainability of fiscal policy.

Following adoption by most Australian states, Australia moved to accrual accounting in the late 1990s which led public entities to record transactions in the period revenues are earned, resources are consumed, or liabilities increased. This financial reporting method recognizes the long-term cost implications of current commitments and decisions. The move to accrual accounting is seen as instigating improved public sector management by linking long term financial implications with management decisions, a first step in answering whether decisions were financially sustainable.

Given the mandate to report on assets and their value and consumption, a need for guidelines emerged led by the local government engineering sector. The *National Asset Management Manual*, a guide published in 1994 by the Institute of Municipal Engineering Australia (later to become IPWEA), helped local authorities comply with the accounting standard (AAS27). Seen as a national asset management framework and summation of best asset management practices, the manual was updated in 2000 by New Zealand and Australia with participation by local government, the auditor general, water, waste water, recreation, information managers, and supporting consultancies.

The third initiative was a series of sustainability studies conducted by the Australian Local Government Association and state associations in the mid 2000's. These studies contributed to Australia's awareness of the growing financial stress facing infrastructure providers and local government in particular. Each evaluated the financial sustainability and technical capacity of local governments. The ALGA Study estimated that 35% of Councils are "not financially sustainable" (excluding capital grants). Reasons cited are similar to those documented in other countries, including: growing demand for services; expansion of infrastructure inventories; growing unfunded renewal liability; a focus on new assets at the expense of renewal of assets; failure to recognize and address ongoing operation and maintenance costs associated with providing assets and their services; the effect of dramatic cost increases; the transfer of services and their costs; and restricted ability to raise revenues.⁴⁶

Studies led by the National Commission of Audits and the Victorian Auditor General concluded:

- asset management should be seen as a corporate, not a technical, responsibility;
- better information is needed on asset condition and cost, adopting life-cycle costing methods;
- more rigor is required in assessing competing maintenance, renewal, upgrade and growth demands and their influence on infrastructure;
- the need for community involvement in setting service based on an understanding of their cost implications; and
- greater use needs to be made of performance measurement.

⁴⁶ "Legislation for Sustainable Management of Community Infrastructure in Australia," Institute of Public Works Engineering Australia (IPWEA) National Asset Management Strategy Group (NAMS.AU), May 2008

Implementing Community of Asset Management Practice

Sustainable infrastructure management teaching, practices and guidelines have evolved particularly from Australia's local levels of government, and engineering professionals. The Institute of Public Works Engineering Australia (IPWEA), the national professional organization providing advocacy for public works and engineering community, is the leader in developing training, guidelines and templates for developing asset management plans providing input into long term financial plans.

- 1993 Institute of Municipal Engineering Australia (IMEA) establishes National Asset Management Committee
- 1994 IMEA publishes National Asset Management Manual
- 1999 IMEA changes name to Institute of Public Works Engineering Australia (IPWEA) and expands focus from local government to public works and all levels of government and private practice
- 2000 IPWEA and New Zealand's INGENIUM publish International Infrastructure Management Manual (IIMM) (updated in 2002 and 2006)
- 2004 IPWEA re-establishes National Asset Management Strategy (NAMS-AU) Committee as a special committee of the Board
- 2007 IPWEA's NAMS.AU develops subscription-based NAMS.PLUS, a series of workshops and suite of on-line asset management planning templates and guidelines, and help desk support, for developing asset management plans as input into long term financial plans

Association & Structure of NAMS.AU

Beginning in 2004, IPWEA established a special committee and created the NAMS.AU brand name. This committee's vision, as stated in its 2007 business plan is:

To be the leading organization for all persons involved in the sustainable management of public works infrastructure, community assets and services.⁴⁷

An eight point mission outlines the purpose of the NAMS.AU committee:

- Improve the asset management skills of practitioners
- Provide national coordination and guidelines
- Identify future research and directions for asset management
- Raise awareness of commitment to sustainable management of assets among the community and by decision makers.
- Develop and provide for exchange of ideas, information and technology
- Develop strategic asset management, its processes and achieve practical outcomes
- Provide leadership and support to stakeholders
- Provide public policy advice and advocacy to advance asset management issues for the betterment of the wider community

⁴⁷ "National Asset Management Strategy Australia (NAMS.AU) Corporate Plan 2006-2009 and Business Plan 2006-2007," Institute of Public Works Engineering Australia

Led by professional contract staff, NAMS.AU achieves this mission based on communication and consultation with IPWEA's Board, state divisions and "invited" stakeholders. While the board is volunteer based, partnerships within industry are also acknowledged as a key to achieving deliverables.

A committee of IPWEA's Board, NAMS.AU expressly states its operations do not duplicate the work of other organizations or state-level divisions of IPWEA. It develops and maintains relationships with other professional organizations and corporate "partners" to add value to operational activities while providing an acknowledged source of income to achieve its goals.

The products of NAMS.AU (e.g., the *International Infrastructure Management Manual*) are part of providing national assistance to stakeholders while supporting operations on a financially sustainable basis. The fee-based structure of educational materials, guidelines and workshops (e.g. asset management training, conferences and NAMS.PLUS) is aimed at ensuring financial solvency of NAMS.AU operations while meeting business objectives laid out in the three-year corporate plan and one-year business plan. Principles of asset management (stating desired outcomes, key results areas that achieve long term goals with specific short to medium term objectives based on 3-year strategies and one-year action plan) are used in their business plan.

Achieving strategic priorities are measured by five critical success factors:

1. Recognition by practitioners and stakeholders
2. Networking of practitioners
3. Ability to attract and generate funding for operation of the committee and projects
4. Strength of relationships with stakeholders
5. Ongoing sustainability of the committee

An annual report reviews performance against key results areas set out in the business plan:

1. Leadership & innovation
2. Skills & Awareness
3. Networking & Information Exchange
4. Policy & Advice
5. Strategic Alliances
6. Committee Capability

This practical results-oriented approach to NAMS.AU's business plan and organizational structure reflects the strong industry and practitioner approach to the development of its widely adopted tools and guidelines. What is unique is the leadership provided by the Institute of Public Works Engineering (IPWEA). IPWEA also actively seeks the involvement of financial professionals,

management, auditor-generals, valuer-generals⁴⁸, consultants, local government associations, and other national and state associations to collaborate in the development of sustainable infrastructure management principles, skills development, guidelines, and technology among community practitioners and decision makers.

Resources for NAMS.AU rely on IPWEA national and state division contributions, and income generated through national projects, some grant funds, IPWEA's own resources, and stakeholder partnerships.

Opportunities cited by NAMS.AU include: the federal government is seeking policy advice on asset management; demand from practitioners for advice and support; growing awareness by councils of infrastructure problems; ability to generate funding; ability to influence audit and financial regulation and national policy. Obstacles or threats include: a plethora of organizations involved in asset management resulting in a fragmented, not national approach; resource limitations; difficulty or reluctance by states and governments to accept national approach (pre NAMS.AU); difficulty influencing financial and audit regulators; and stakeholders seeking or perceiving asset management leadership from other sources.

“Commercially sound” projects or “value added” research of “national significance” with timelines and resources are specified that obtain desired results. Notable asset management projects listed in their 2007 annual report include:

- Developing e-guidelines and templates with implementation workshops, known as NAMS.PLUS, for development of asset management plans and long range financial plans. This is now deployed to six Australian states with 190 subscribing local councils. Four workshops accompany subscription to NAMS.PLUS: 1) Asset register data, condition assessment and remaining/useful life review template, asset management plan template; 2) Levels of service, infrastructure risk management plan template; 3) Financial modeling, new assets from growth, renewal planning, expenditure projects; 4) Managing the funding gap, completing the asset plan, improvement plan, links to long term financial plan. Templates include:
 - Remaining/useful life assessment
 - Asset management plan and guidelines
 - Infrastructure risk management plan and guidelines
 - Infrastructure risk register
 - Growth, renewal and expenditure projections model and guidelines
 - Sustainable asset management capability self assessment tool & analysis
 - Asset management policy and guidelines

⁴⁸ Valuer-generals are responsible for setting of valuation standards for municipal rates and land tax valuations by state statute.

- Production of a DVD and training module for elected members and senior management on the role of stewardship in sustainably managing community assets
- A major update of the website incorporating web pages for all states. Within this website is AssetMates, a free, membership-based discussion forum which notifies subscribers of recent postings asking questions or posting case study examples. Categories for discussions include: Asset Management Plans, Accounting for Assets, Condition Assessment, Levels of Service, General Issues, Asset Classes, and Suggestion Box for NAMS.AU. Nearly 700 postings have occurred since the websites inception in 2004.
- The 2006 update of the *International Infrastructure Management Manual* in association with the NAMS Group in New Zealand, and its broad adoption internationally.

Future Directions

A current initiative seeks legislation to embed sustainable management of community infrastructure within Australia's local state and national government. The lead local government engineering association, IPWEA, has adopted a policy position recommending such legislation that spells out a national framework encouraging use of long range asset management (covering 20 years) and financial plans (covering 10 years) as essential parts of sustainably managing an organization. IPWEA stresses such legislation should not be directed at compliance but require annual reporting that demonstrates to communities that they are financially sustainable in the long term. Legislation is viewed as addressing a significant obstacle to embedding sustainable asset management practices: the lack of commitment by top-level management and elected officials who authorize the necessary resources and provide public policy impetus. Their support through legislation and policy adopting is seen as key to achieve a long term strategic asset management focus for agencies responsible for services dependent on infrastructure.

The State of South Australia has already put in place legislation requiring long term financial plans founded on sound infrastructure asset management plans. New South Wales has foreshadowed legislation and other states are considering this direction. The approach to date has been to be not overly prescriptive; the intention is to encourage a management approach, not a compliance mindset. The growing support for legislating sustainable management of infrastructure is considered an indication of the maturity of the environment for asset management in Australia.

A significant effort in 2008 is developing *Australian Infrastructure Financial Management Guidelines*. It is seen as a companion to the *International Infrastructure Management Manual*. This involves accounting, engineering and valuation and audit professionals led by the IPWEA as project manager. IPWEA is also largely underwriting the project to 'make it happen'. It is possible for IPWEA as a national professional organization to widely consult in the

development of the *Guidelines* but then resolve different views among the various state and other approaches. It can then publish *Guidelines* which have initial wide support, and like the *IIMM*, have the potential to become the default national (and possibly international) benchmark.

Infrastructure Financial Management Guidelines will adopt a common set of definitions for terms and consistent guidance for valuation of assets, financial reporting, condition assessment, and sustainable and long term financial planning. As stated in the report of the Financial Sustainability Review Board, “Poor financial governance and associated inadequacies in service provision and funding policy frameworks invariably leads to inadequate control on growth in operating expenses, a neglect of essential capital spending, revenue raising that is inflexible and inequitable, and a low level of understanding within the community of the real costs of current infrastructure and service commitments. The expertise and understanding among elected members as well as senior officers regarding financial governance needs significant upgrading. A cash accounting mindset and short-term (one-year) planning horizon still overwhelmingly prevail.”⁴⁹

Observations

1. Australia’s IPWEA has been successful by focusing on asset management for local government.
2. Australian states have documented the need for sustainable management of infrastructure. This has reinforced all necessary aspects—technical, financial, and political—required to sustainably manage community assets. Each study highlights that infrastructure is the foundation of a community’s financial sustainability, and that local governments are “asset rich and revenue poor.” A long term financial plan based on sound asset management planning is seen as part of the solution.
3. Asset management’s adoption by Australian local governments has varied considerably. Progress has been handicapped by a lack of adequate guidance and a need for greater standardization in approaches and systems. IPWEA has stepped in to provide a simplified approach to implementing asset management using NAMS.PLUS subscription-based workshops, templates and e-guidelines aimed at producing asset management plans as an input to long term financial plans within a state’s local governments. This approach is now deployed across all 6 states with some 190 councils now on the program.
4. The Australian asset management journey lays out many of the essential components needed to sustainably manage a community’s infrastructure. The chronological steps that Australia followed are⁵⁰:

⁴⁹ *Rising to the Challenge Towards Financially Sustainable Local Government in South Australia*, Financial Sustainability Review Board, 2005

⁵⁰ *Presentation by Chris Champion, IPWEA CEO, Pacific North West Asset Management User Group, August 2008*

- Accounting standards (moving from cash to accrual)
- Asset registers and valuations
- Adopting a national framework (the International Infrastructure management Manual)
- Awareness and understanding (a realization of the need for practical tools and guidelines to assist implementation)
- Financial sustainability studies (driven at a state level and successful in obtaining Elected Official and senior management commitment and political will)
- Technical capacity (development of industry skills in asset management, availability of practitioner developed tools and guidelines)
- Finance professionals buy-in (acknowledging the need to move from annual budgeting to long term financial plans; the need for information sourced from sound asset management plans; the need for guidelines for accounting for infrastructure)
- Legislation (10 year financial plans founded on 20 year asset management plans; not overly prescriptive to encourage a management not a compliance approach)
- Levels of Service (linking cost and budgets to levels of service)
- Continuous improvement (sustainable management of infrastructure is a journey of continuous improvement).

A-2.2 CANADA

“There is an unwritten rule of international collaboration in order to achieve sustainable infrastructure management.”

Konrad Siu, Director
City of Edmonton Office of Transportation and Infrastructure

Background

National, Provincial, Municipal Structure

Canada is a federation with three levels of government: the federal government, ten provincial and three territorial governments, and about 4,000 local governments. The federal government makes national laws for immigration, unemployment insurance, trade and commerce, national defense, native affairs and criminal law. Provincial governments are empowered to control regional and local affairs including education, health, social services, property rights, administration of justice, municipal public works and municipal institutions. Some responsibilities are shared between the federal and provincial governments, such as immigration, agriculture and pensions. The responsibilities of municipal governments in Canada are set out in legislation in each province but generally comprise police and fire protection, roads and transit, water and sewers, solid waste, recreation and culture and planning.⁵¹

Infrastructure ownership and funding sources

The combined value of Canada's highways and roads, bridges and overpasses, water supply systems, wastewater treatment facilities and sanitary and storm sewers was \$286.2 billion in 2007. This represents 80% of all infrastructure owned by federal, provincial and municipal governments. Highways and roads, the largest component of the five public assets, were worth \$170.1 billion, representing 59% of the total.

The responsibility of managing Canada's community physical infrastructure falls primarily to provinces, territories and municipalities. This reflects a shift of responsibilities for managing Canada's infrastructure from the federal and provincial levels to municipalities.⁵² In 2002, the federal government controlled 7%, provinces 41%, and municipalities 52% of Canada's national capital infrastructure.⁵³ In 2000, municipal infrastructure included transportation and transit (52%), water and wastewater (30%), and recreation, public buildings, solid waste management (15%). Most Canadian water supply systems are owned and maintained by local governments.⁵⁴

⁵¹ *Building Prosperity from the Ground Up: Restoring Municipal Fiscal Balance*, Federation of Canadian Municipalities, 2006

⁵² *Ibid.*

⁵³ *Danger Ahead: The Coming Collapse of Canada's Municipal Infrastructure*, Federation of Canadian Municipalities, 2007.

⁵⁴ *Ibid.*

The federal government is not a primary player in Canadian asset management, providing much less funding than the United States for transportation infrastructure. Federal revenues are distributed 52% to federal government, 42% to provincial and 8% to municipalities. Provinces and territories control the purview of municipal service delivery and in some cases must approve use of specific funding types.

Historic Timeline Leading to Asset Management

- 1980s and 1990s Canada experiences two short but severe recessions and two lengthy periods of growth
- 1997 “Accounting for Results” report aims to enhance government decision-making and accountability and to improve organizational performance by providing more complete information on the costs of programs and activities
- 2000 Federal government creates Infrastructure Canada Program
- 2001-07 InfraGuide, a partnership between the Federation of Canadian Municipalities, the National Research Council and Infrastructure Canada, documents case studies, best practice reports (Decision Making and Investment Planning, Environmental Protocols, Integrated Infrastructure, Potable Water, Storm and Wastewater, Roads and Sidewalks, Transit) and e-learning tools (Managing Infrastructure, Developing a Water Distribution System Renewal Plan, An Integrated Approach to Assessment and Evaluation of Municipal Road, Sewer and Water Networks) for sustainable municipal infrastructure
- 2002 Department of Infrastructure Canada created
- 2003 “Civil Infrastructure Systems Technology Road Map (TRM) 2003-2013. Ten-year objectives include: knowledge management, to implement processes to ensure knowledge sharing and dissemination, education, training and outreach.
- 2003 Transport Canada’s “Straight Ahead – A Vision for Transportation in Canada” identifies strategic national transportation investments to “ensure competitive communities, manage climate change and encourage innovation.”
- 2004 National Round Table for Sustainable Infrastructure (NRTSI) created, a national forum for stakeholders for “capacity building, management best practices and innovation, to develop and inform policy makers on a broad strategic framework for sustainable infrastructure applicable to municipal, provincial and national governments,” initially focused on municipal public works—water and sewer, roads and bridges.
- 2006 PS 3150 requires local governments to report tangible capital assets beginning with their 2009 financial statements
- 2006-07 Federation of Canadian Municipalities produces detailed reports⁵⁵ documenting shift of infrastructure and service responsibility from federal to municipal level, and inequity in funding allocations among federal, provincial and municipal levels.
- 2007 Federal government announces US\$28.7 billion Infrastructure Plan, “Building Canada” provides provincial, territorial and municipal infrastructure funding between 2007 and 2014 based on “projects of national importance, accountability, and innovative funding.” Includes allocation based on adoption of asset management.
- 2007 Canadian Network of Asset Managers initiated “by municipalities for municipalities”
- Nov. 2008 (target date) A 5-year project adopted by National Round Table for Sustainable Infrastructure (NRTSI) and National Research Council (NRC) to develop national “state, performance and management” framework . Two phase project will develop performance-based condition assessment tools leading to a performance-based infrastructure management system. Critical federal, provincial and municipal infrastructure investments will be identified and funded in phase two based on asset (technical) and service (non-technical) performance measures adopted by Infrastructure Canada.

⁵⁵ *Building Prosperity from the Ground Up: Restoring Municipal Fiscal Balance*, Federation of Canadian Municipalities, 2006; *Danger Ahead: The Coming Collapse of Canada’s Municipal Infrastructure*, Federation of Canadian Municipalities, 2007

Jan. 2009 (target date) The Public Sector Accounting Board (PSAB) Statement of Recommended Practice (PSAB 3150) adopts principles for government reporting of tangible asset value, physical condition and remaining average life expectancy to evaluate the effect of government's policies on assets and the capacity of that government to address the future funding requirements. Terms are defined for assessing condition and valuing assets.

Current Directions and Drivers

The Need

The world wide downturns in the 1980s and 1990s led to Canadian policies in the late 1990s encouraging more coordinated capital planning as a part of the government's business plan. Similar to New Zealand, the drive to become more efficient and downsize the public sector led some provinces to privatize maintenance and capital renewal activities, including planning, design, construction supervision and maintenance operations. Canadian cities and provinces found themselves with two roles of stewardship: owner and manager of public assets. A process was needed to manage contracts and identify greatest need so that funds could be efficiently allocated. While efforts to develop asset management processes in some provinces resulted in credible estimates of needs, procedures for calculating the condition and value of public assets differed across provinces making comparisons of need difficult.

Cities rely largely on property taxes and in some cases must obtain provincial authority to impose new revenues options. Social services and community expectations grow within cities as the majority of Canada's growth is occurring within urban areas; 79 percent of Canadians live in cities over 10,000 population.⁵⁶ Rural parts of Canada are finding the long distances and greater cost responsibility per capita for infrastructure maintenance and renewal leading to a general decline in the ability to meet infrastructure needs.

As with other countries, there has been a general increase in the age of Canada's five critical public infrastructure assets (highways and roads, bridges and overpasses, water supply systems, wastewater treatment facilities and sanitary and storm sewers).⁵⁷ Canada's roads had passed just over half of their useful life of 28 years in 2007. Wastewater treatment facilities average useful life has passed 63% of their average useful life (28.2 years) nationally, the highest ratio among the five critical public infrastructure assets. Most water supply systems are owned and maintained by local governments. By 2007, Canada's water supply systems had reached 40% of their useful live (which is 36.8 years on average).

Up to 80% of Canadian highway and road expenditures are spent on new construction and 20% for rehabilitation. In the 1990s, more than 90% of sewer

⁵⁶ *Building Prosperity from the Ground Up: Restoring Municipal Fiscal Balance*, Federation of Canadian Municipalities, 2006

⁵⁷ *Age of Public Infrastructure: A Provincial Perspective*, Statistics Canada, 2008

investments were for new infrastructure although in recent years this is shifting toward rehabilitation and renewal.⁵⁸

The federal government perceives a lack of a standardized approach to calculate renewal needs. In some cases, inconsistent or no municipal asset inventories or condition assessments led provinces to take asset management responsibilities back from municipalities; Quebec reassumed management of bridges in the province based on this concern. Infrastructure Canada is using federal gas tax funds, and Ontario and Alberta provincial gas tax funds to support improved asset management.

Recent studies by the Federation of Canadian Municipalities call for addressing a fiscal imbalance between levels of government.⁵⁹ FCM cites the impact of new provincial and federal regulations on municipalities, the transfer of assets to the municipal level and the greater risks and liabilities in cities and rural areas as demand for services increase.⁶⁰

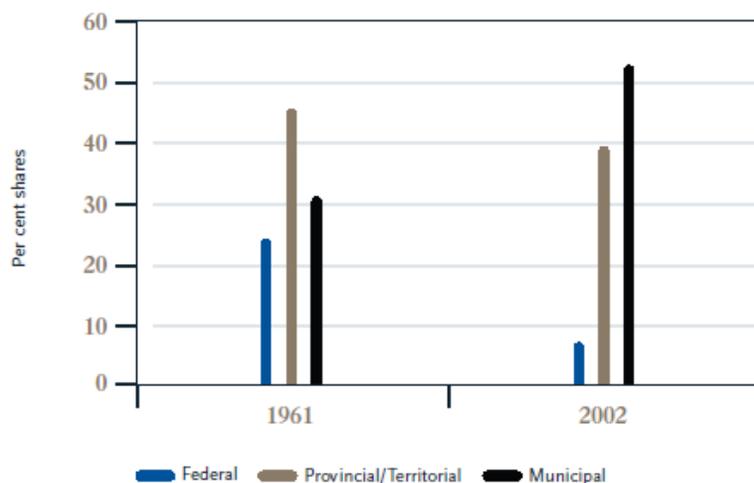


FIGURE A-2.2.1 Canadian Public Stock Ownership

Accounting Standard

In 2006, Canada’s Public Sector Accounting Board (PSAB) adopted a new financial reporting requirement, PS3150. By January 2009, the local level of Canadian government must integrate the inventory, value and amortization of tangible capital assets over their useful lives in their annual financial reporting. Similar to the U.S.’s GASB 34, capital assets are to be recorded at historical cost. The intent is to improve transparency and accountability of public sector financial management by providing a link between financial management and budgeting. The desire is to improve the stewardship of publicly owned capital

⁵⁸ *Ibid.*

⁵⁹ *Danger Ahead: The Coming Collapse of Canada’s Municipal Infrastructure*, Federation of Canadian Municipalities, 2007.

⁶⁰ *Ibid.*

assets by informing decision making and providing greater accountability. Better information should help determine future funding requirements and establish user fees and tax rates to meet them.

Municipal leaders have highlighted that this accounting requirement alone will not provide adequate information to manage the lifecycle of public physical assets. Information, such as replacement cost, is necessary to determine the “infrastructure gap” or funds needed to maintain and renew assets over their useful life.

Federal gas taxes and some province’s use of gas tax funds are being used to create incentives to develop this information as a part of a broader implementation of asset management practices. For example, Ontario allows asset management as an eligible expense under this program for municipalities. Under Canada-Ontario Municipal Rural Infrastructure Fund (COMRIF), federal and Ontario governments have dedicated up to 1% of COMRIF funding for asset management. Ontario has developed PSAB implementation manuals. Alberta’s Finance Officers Association has developed manuals on:

- Asset classification
- Amortization methods and useful life
- Capitalization thresholds
- Resources required
- Developing an implementation plan and budget
- Networks, components and segmentation

British Columbia is initiating a Local Government Asset Management Working Group composed of a multi-stakeholders group including engineering, planning, financial, government officers, and academia. The purpose of the group is to develop processes, information system tools and techniques which assist the province and governments within it to develop asset information, management plans and long term financial reports. There is consideration of using Australian IPWEA’s model of rolling out consistent guidelines, templates and training province-wide using NAMS.PLUS e-guidelines, templates and workshops. A demonstration of NAMS.PLUS took place in August 2008 in Vancouver, British Columbia.

In 2007, Infrastructure Canada announced a Building Canada program which is aimed at allocating US\$28.7 billion from 2007-2014 to address national infrastructure needs. Approximately US\$15.3 billion is allocated to municipalities and US\$2.0 billion to provinces over 7 years; the remaining US\$11.5 billion is allocated to program funding for gateways and borders, public-private partnerships and “Building Canada Fund.”⁶¹ Established in 2002, Infrastructure Canada, provides infrastructure funding and policy direction.

⁶¹ <http://www.buildingcanada-chantierscanada.gc.ca/plandocs/index-fig01-eng.html>

Implementing Community of Asset Management Practice

Three initiatives have addressed Canada's infrastructure needs through a network of asset management stakeholders.

First, the *National Guide to Sustainable Municipal Infrastructure: Innovations and Best Practices* (known as *InfraGuide*) operated from 2001 to 2007 and developed a series of best asset management practices and case studies. *InfraGuide* is self-described as a "Network of Excellence, a system of shared knowledge, shared responsibility and shared benefits."⁶² *InfraGuide* was founded by the Canadian Public Works Association, and jointly supported by the Federation of Canadian Municipalities, the National Research Council and Infrastructure Canada to improve municipalities' use of sustainable infrastructure management practices. This initiative was largely funded by the federal government.

Volunteer technical committees and working groups—with the assistance of consultants and other stakeholders—researched and published guidelines for many best asset management practices, (Decision Making and Investment Planning, Environmental Protocols, Integrated Infrastructure, Potable Water, Storm and Wastewater, Roads and Sidewalks, Transit) and e-learning tools (Managing Infrastructure, Developing a Water Distribution System Renewal Plan, An Integrated Approach to Assessment and Evaluation of Municipal Road, Sewer and Water Networks) for sustainable municipal infrastructure. Ten case studies and fact sheets present examples and issues related to implementing best practice in municipal settings.

InfraGuide was considered of value by public works and municipal contributors for peer networking and documentation of best practice. These resources were also of value internationally to those seeking asset management examples and guides on asset management. In spite of this support by practitioners, federal funding for *InfraGuide* was discontinued in 2007.

In 2003, a second initiative, the National Round Table for Sustainable Infrastructure (NRTSI) was recommended in a report called the *Civil Infrastructure Systems Technology Road Map (TRM) 2003–2013*. The TRM was the product of a series of meetings between the Canadian Council of Professional Engineers, the Canadian Public Works Association, the National Research Council and the Canadian Society of Civil Engineers. It presents a ten-year action plan to develop new technologies and management practices that ensure sustainable communities.⁶³ Recommended actions include:

- create a National Round Table for Sustainable Infrastructure (NRTSI) with federal, provincial municipal, first nation and industry representatives aimed at developing a national action plan;

⁶² <http://www.sustainablecommunities.fcm.ca/infraguide>

⁶³ *Civil Infrastructure Systems Technology Road Map 2003–2013*, Canada's Society for Civil Engineering, Council of Professional Engineers, Public Works Association and the National Research Council, 2003.

- include cost effective and life cycle considerations in project funding consideration;
- create Centers of Excellence for infrastructure;
- introduce maintenance and rehabilitation into education curricula;
- and to involve financial, engineering and public and private consultancies as stakeholders implementing the TRM.

Measurement of success was to occur “within five years.”

As proposed, the NRTSI is described as:

...the only group in Canada that can mobilize the participation, contribution and engagement of multi-sector, multi-discipline stakeholders in this rigorous process that is supported by a strong science (engineering, economic, social) base. Having served over the last two years as the forum for stakeholders to discuss, identify and initiate work in priority areas to improve Canada’s critical infrastructure, the NRTSI is uniquely positioned to ensure relevance and buy-in for the results of this project—key ingredients to success.

The NRTSI governance structure and mandate were drafted in 2004 by a working group composed of the Canadian Council of Professional Engineers, Federation of Canadian Municipalities, the Conference Board of Canada, the Canadian Construction Association, the Canadian Public Works Association and Infrastructure Canada. Initial efforts were to focus on municipal infrastructure (water, sewer, roads and bridges). The inaugural meeting of the NRTSI occurred in 2005. US\$.9 million dollars per year for five years was requested from Infrastructure Canada to establish the NRTSI with a launch in 2006. Stakeholders were expected to provide another US\$.9 million in in-kind research contributions. After year three of this arrangement, NRTSI was to transition to a shared funding approach among stakeholders. Stakeholders were also expected to finance travel and participation.⁶⁴ It would act as an “independent, multi-stakeholder, non-partisan, not-for-profit advisory body providing counsel to the infrastructure community. “ A 31-member advisory council comprised of stakeholders from all levels of government, urban planners, banking and insurance, engineering, architecture, construction, educators and private industry would be supported by issue or project working groups using a consensus model of decision making. A permanent staff would support these efforts. Staff would organize meetings of the Advisory Council and committees, carry out administration, conduct or contract research, and report on activity and financial status.

NRTSI priorities are:

- Information, outreach and knowledge management—particularly around the issues of innovation and financing
- Education and skills
- National asset management

⁶⁴ Appendix A: Governance and Financing Options for the NRTSI, NRTSI, May 2006

- Small communities
- Sustainable development opportunities
- NRTSI institutional structure

The request for NRTSI funding was never acted on by Infrastructure Canada.

However, the Canadian Public Works Association was asked to form the National Asset Management Working Group (NAMWG) to develop a strategy and program for implementing the asset management recommendations of the TRM. Since 2006 this group has aligned with the NRTSI. The National Asset Management Working Group's priority is developing a national asset management framework (see Future Directions, below).

A third initiative evolved following cancellation of InfraGuide. The Canadian Network of Asset Managers (CNAM) initiated in 2007 provides a peer network for municipalities focused on the practical implementation of asset management. Their motto is "by municipalities for municipalities." Annual three-day conferences or "working sessions" held in 2007 and 2008 were sponsored by consultancies and professional associations serving municipal asset managers in Canada. A third conference is planned for May 2009. Presentations from leading Australian asset management consultants and Canadian educators, municipal asset managers and consultants are available on a CNAM website. Presentations incorporate operational asset management techniques including maintenance management, managing and planning for infrastructure condition and functionality, and developing capital and operating budgets for specific service areas; policy and strategy development, risk-based capital decision making and business planning; and long-term, sustainable management techniques such as life cycle cost analysis, asset management planning and economic forecasting.

Future Directions

A national framework for the assessment of the state, performance and management of Canada's critical infrastructure (roads, bridges, transit, water and wastewater systems) is under development.⁶⁵ A collaborative project between the National Round Table for Sustainable Infrastructure (NRTSI) and the National Research Council, this two-phase project is to select indicators and relevant technical (asset) and non-technical (service) measures using available information. Phase 1, initiated in February 2008 and completed in December 2008, will select indicators and measures, adopt a national framework and a five-year implementation plan. Phase 2 will assess Canadian infrastructure need, identify projects that improve performance and develop performance-based assessment tools over five years. Projects to develop performance-based condition assessment tools leading to a performance-based infrastructure management system will be led by the National Research Council. The

⁶⁵ "Framework for the Assessment of the State, Performance and Management of Canada's CPI," presentation of NRTSI/NRC Project, February 2008.

objectives of this effort are to provide objective and validated metrics to decision makers, owner and operators of public infrastructure at all levels of government with all regions of Canada using common assessments to ensure senior levels of government can evaluate the impacts of funding on infrastructure performance. The National Research Council describes performance as the risk (the likelihood and consequence) of network (not project) failure given the lifecycle of network assets.

British Columbia's Ministry of Community Development is supporting creation of a Local Government Asset Management Working Group. A provincial-level of the NAMWG, this multi-sector stakeholder network is to recognize minimum elements of asset management practice and an accountability framework indicating the benefits and costs of implementing asset management for the public, elected officials, and technical and professional staff.

Obstacles

- Efforts within Canada to identify best practice, set policy and priority to addressing infrastructure needs have been hampered by a lack of a national asset management strategy and buy in by all levels of government. The 2003 *TRM* suggests that there is “a very diverse and fractured community dealing with (Canadian) infrastructure with little or no dialogue among the sectors of the community.”
- Removal of federal funding for InfraGuide was perceived as a blow to implementing best asset management practice in Canada. InfraGuide working groups and committees were seen as an active network of municipal asset managers and practitioners involved in the research and documentation which led to InfraGuide products. The current lack of a national forum for sustainable infrastructure management practices as a “go-to place” promoting networking and collaboration is cited by the NRTSI working group as a gap in promoting a greater understanding of sustainable infrastructure management.
- The National Research Council viewed InfaGuide as non-technical and a collection of existing practice. There was a desire by Infrastructure Canada to develop a more consistent, risk-based way to identify greatest infrastructure needs across provinces for allocation of federal revenues. The perceived lack of a standardized approach for identifying the critical needs of infrastructure led to cancellation of InfraGuide funding. This lack of a repeatable process and loss of federal funding can be seen as obstacles or the impetus for current activities to adopt a national asset management framework, terms and performance indicators.

Success Factors

- Support by all levels of government—some providing financial resources and other staffing and human capital—academia, and consultancies produced InfraGuide best practice guides and case studies. This network of leading practitioners' collaboration created a sense of accomplishment;

- this body of work is still used as a reference by agencies seeking best asset management practices and examples.
- Federal funding was a key to the participation and production of InfraGuide.
 - A willingness to share information and the multi-year view of building incrementally on the experience and successes of participants' experience was needed to produce InfraGuide best practice guides through a collaborative process of work groups and committees. Extrapolating from the specific to generic implementation strategies required extensive consideration of the principles of asset management practice and the implications of the building blocks required to put long term investment tools, knowledge and practice in place.
 - Collaboration with international asset managers and exchange of information and experience is a hallmark of Canada's efforts to advance asset management excellence.
 - Long term involvement by champions of asset management is responsible for previous and current initiatives to advance Canada's asset management excellence. These champions come from public works, municipal and provincial levels of government.

Observations

1. Support by all levels of government—some providing financial resources and other staffing and human capital—academia, and consultancies produced InfraGuide. This network of leading practitioners' collaboration created a sense of accomplishment.
2. While all levels of government have been involved, Canada's asset management efforts have come primarily from the grassroots or municipal level of government. InfraGuide, the Canadian Municipal Network of Asset Managers and British Columbia's current efforts to create a Local Government Asset Management Working Group reflect this.
3. Canadian efforts to implement asset management have used a multi-discipline approach. This recognizes the need to break down "silos" in the workplace and the multi-discipline nature of asset management. This model recognizes the need to eliminate duplication of effort and improve the quality of approach, method and software without dictating what these are.
4. As with other countries, a January 2009 compliance date for the new accounting standard (PSAB 3150) is driving Canadian local authorities to report on asset inventory, condition and valuation.
5. A two-phase project is underway in Canada which will outline a national framework by November 2008. This effort aims to develop objective and valid metrics across all of Canada for assessing the impacts of funding on infrastructure performance.

A-2.3 NEW ZEALAND

“...until (we) published educational materials and began teaching regions how to do asset management, New Zealand was just spinning their wheels.”

New Zealand representative at Michigan AM Conference⁶⁶

Background

Government Structure⁶⁷

There are two tiers of government in New Zealand, national and local. A unicameral parliamentary system, parliament's members are elected every three years and are headed by the Prime Minister who, along with other Cabinet members, can make administrative or regulatory changes without public input or legislative approval.

The region is the top tier of local government in New Zealand. There are 16 regions of New Zealand. Twelve are governed by an elected regional council, while four are governed by territorial authorities, the second tier of local government. There are 73 territorial authorities. Regional Council areas are based on drainage basins, whereas territorial authorities are based on an area with sufficient ratepayers and community of interest.

Infrastructure ownership and funding sources

Most water and road assets and services are provided by local government. Transit New Zealand (Transit) is the Crown Entity responsible for state highways, the strategic roads and motorways that are about 12% (10,894 km) of all New Zealand's roads, but account for about half of the 22 billion vehicle miles traveled annually.⁶⁸

Regional councils are responsible for the administration of many environmental and public transport matters, while the territorial authorities that administer local roads and reserves, sewerage, building consents, the land use and subdivision aspects of resource management, and other local matters. Property rates (land taxes) are used to fund both regional and territorial government activities. There is often a high degree of co-operation between regional and territorial councils as they have complementary roles.

⁶⁶ *U.S. Domestic Scan Program Best Practices in Transportation Asset Management Scan Report*, Federal Highways Administration, Association of State Highways and Transportation Officials, and National Cooperative Highway Research Program, July 2007

⁶⁷ <http://www.gao.gov/archive/2000/ai00057.pdf>

⁶⁸ Transit New Zealand website, July 2008

Historic Timeline Leading to Asset Management

Mid-980s to the early 1990s,

- The New Zealand economy experienced a prolonged period of very slow growth.
- 1984 New Zealand, adopted accrual accounting and budgeting as one component of sweeping reforms to restore its economy after several years of serious economic difficulties. As part of these reforms, New Zealand changed its reporting from cash to accrual and comprehensively and fundamentally restructured the role of the national government in the economy and radically changed the accountability relationship between the government and departmental executives in which all departments and agencies and ministers must agree on the desired outcomes and the contributing outputs to achieve those outcomes.
- 1986 State-Owned Enterprises Act organizes departments with commercial activities into separate commercial entities and required them to adopt business practices, implement new accounting systems, and compete with private sector entities where applicable. SOEs are put on a commercial basis and forced to compete with private sector entities
- 1988 State Sector Act reforms accountability and performance in the core public service and replaces the permanent tenure system for heads of government departments with a contract system.
- 1989 The Public Finance Act furthered the move towards a new financial management system and enhances link between budget and performance at the departmental level by shifting to output-based appropriations for the delivery of services over which departments had control. Departments' measurement basis for budgeting, reporting, and performance assessment shifts from cash to an accrual basis. Specifically, each department 1) defines its broad classes of outputs (the basis for accrual-based appropriations), 2) develops an accrual-based system capable of monthly and annual reporting, 3) develop a cost allocation system to allocate all input costs, including depreciation and overhead, to outputs, and 4) develop a system of cash management.
- 1991 Resource Management Act requires sustainable management of physical and national resources, stressing focus on non-asset (demand management) solutions as alternatives are assessed, and costs and benefits identified for the best option.
- 1993 Office of the Auditor-General of New Zealand reports on the weak financial condition of local authorities due to lack of knowledge about condition of major assets, and the absence of strategic planning for service requirements in the medium to long-term. A local government task force recommended adoption of a nationwide asset software package.
- 1994 Fiscal Responsibility Act (FRA) expands accrual-based framework to cover all government accounts so that programs are budgeted on an accrual basis. FRA extends accountability framework from management of executives to the rest of the government programs. The FRA requires that government first articulate fiscal strategy before budget submission, and then report subsequently on its performance.
- 1995 National Asset Management Steering (NAMS) Group formed. NAMS is a consortium of national and local government associations and consultants that advances asset management best practice and knowledge in local governments. Members include INGENIUM, the Association of Local Government Engineering; SOLGM –Society of Local Government Managers; Local Government New Zealand; Office of the Auditor-General; New Zealand Water and Wastes Association; New Zealand Recreation Association; Association of Local Government Information Managers, Local Authority Property Association.

- 1996 Local Government Amendment Act (No. 3) requires local government authorities to prepare and adopt a long-term (10-year minimum) financial strategy every three years and loss of service (depreciation) funded annually.
- 1997 Road Information Steering Group (RIMS) is formed. RIMS is a joint venture between territorial local authorities, Transit New Zealand, and Land Transport New Zealand. Its primary purpose is to integrate, lead and facilitate the development and promotion of computerized AM information systems. RIMS developed dTIMS, a pavement management and optimization system.
- 1997-98 Local authorities fund the development and presentation of 30 national AM training workshops , organized by NAMS Group, to raise awareness of AM and develop skills to prepare AM plans, develop AM techniques for service level reviews, customer consultation, risk management, optimized decision-making, valuation/depreciation, maintenance planning. Additional workshops helped define AM improvement and service management/risk management, a video presentation on stewardship for elected leaders.
- 2000-02 NAMS Group continues training and best practice manual production including International Infrastructure Management Manual, Valuation and Depreciation Guidelines, Contract Management, Creating Customer Value from Community Assets, and Optimized Decision Making.
- 2002 New Local Government Act (LGA) imposes requirement for communities to be consulted on “significant” service level changes, and local authorities’ role as promoting the sustainable social, economic, environmental and cultural well-being of their communities. Sustainable development became a requirement.
- 2004 Land Transportation Management Act, national legislation emphasizing role for transportation in moving people and goods, and link between national goals and transportation system performance. Asset management is seen as part of the management structure that will achieve sustainability.
- 2006 Water Information System Group (WIMS) Group, a fourth committee of INGENIUM, is formed in response to a requirement from the New Zealand local authorities water sector for a more consistent approach to information collection and management across the country. WIMS is similar to the RIMS Committee for road data management.
- 2008 NAMS Group initiates Advanced Asset Management Forum, presenting best AM practice and case studies.

Drivers for Asset Management

The Need

In 1970s, the New Zealand cash system did not account for future liabilities arising from present commitments. The government continued borrowing in low interest rate, strong-currency markets, without appropriate consideration and accounting for the risk involved in currency changes. From the mid-980s to the early 1990s, the New Zealand economy experienced a prolonged period of very slow growth.

Legislation

Beginning in the 1980s, after several years of struggling economically, New Zealand adopted a series of reforms that led to increased accountability in the public sector. Creation of State Owned Enterprises (SOE) created an awareness of the management efficiency that resulted from moving to accrual accounting and performance-based budgeting and financial reporting. There was a shift to

“outcomes” based on strategy in management of the public’s assets. The local governance structure was simplified legislatively. In 2002, local governments were required to consult with stakeholders about changes in service levels prior to making “significant” service changes. Key elements required by the Local Government Act 2002 Schedule 10 include:

1. Identify the activity within the group of activities
2. Identify the rationale for delivery of the group of activities
3. Outline any significant negative effects
4. How demand for services will be managed
5. How service levels will be managed
6. What additional asset capacity will be required
7. How the provision of additional asset capacity will be undertaken
8. What the estimated costs of the additional asset capacity will be and the broad division of those costs
9. How the costs of providing the additional asset capacity will be met

Accounting standards: Cash to Accrual

By 1992, the improvement in the performance of state owned enterprises (SOE) was seen as an indication that management efficiencies could be achieved by moving departments to accrual accounting and budgeting as well. There was a desire to tie budgeting to performance and accountability in a coherent management framework. New Zealand governments moved to defining strategies, which ministers translated into performance requirements (outputs) of the chief executives of departments. This reformed system led to government purchasing departmental outputs at an agreed upon price. Thus, output pricing became crucial. To properly determine the output price, the government needed to account for all output costs, not simply the cash flows in any given year. This accounting method moved from a cash or short term process to a longer term, or accrual accounting process, thus making accounting method an integral part of the management framework, not an end unto itself.

Sustainability as the Key

New Zealand’s roles as provider of services, and contract manager for service provision created the impetus to take a longer range view of management decisions. Output-based budgeting and accrual-based measurement in both financial reporting and budgeting provides the information and incentives needed for these two roles. This created a shift to managing existing as well as new assets in a financially sustainable manner. The future liabilities of decisions are considered along with the cost of service and maintenance of existing and new assets to ensure the sustainability of services long term.

Drivers for Creation of NAMS

1. In 1993, the Office of the Auditor-General of New Zealand reported that the financial condition of local authorities was weak, given the lack of knowledge about the condition of major assets, and the absence of strategic planning for

- service requirements in the medium to long-term. A local government task force recommended adoption of a nationwide asset software package.
2. In 1994, the Fiscal Responsibility Act (FRA) expanded the use of the accrual-based framework to cover all government accounts so that programs were budgeted on an accrual basis. This extended the accountability framework from management of executives to the rest of the government programs. The FRA required that government first articulate fiscal strategy before budget submission, and then report subsequently on its performance.
 3. In 1995, INGENIUM formed the National Asset Management Steering (NAMS) Committee as one of its four committees. The NAMS Committee, (and its NAMS Group, which develops and sells best asset management practice manuals), transfers knowledge and techniques related to best practice through meetings, seminars and an INGENIUM's annual conference. The NAMS Committee was re-constituted under a company structure in 2004. NAMS Group Ltd has charitable status, and is 100% owned by INGENIUM. NAMS Ltd is the operational arm and is 100% owned by NAMS Group Ltd. The purpose of moving to the company structure was to bring commercial rigor to the NAMS operation, and to protect the INGENIUM membership from legal liability.

Implementing New Zealand Asset Management Community of Practice

New Zealand has several communities of asset management practice. The Road Controlling Authorities Forum (RCAF) is a group of representatives from the territorial local authorities, Department of Conservation, Land Transport New Zealand, and Local Government New Zealand (LGNZ), led by Transit New Zealand. The purpose of the RCA is to exchange information and provide updates on working groups, legislation, standards and guidelines, highway and procurement strategies and other issues relevant to road controlling authorities and the other member organizations.⁶⁹

A second organization, INGENIUM, is the brand name for the Association of Local Government Engineering New Zealand Incorporated. INGENIUM is the organization that represents professionals who manage, maintain and operate public infrastructure in New Zealand. Public infrastructure includes roads & bridges, water supplies, sewers, storm water systems, river control, land drainage, airports and harbor facilities. Sponsoring members of INGENIM include:

- The Association of Local Government Engineering in New Zealand (INGENIUM)
- Society of Local Government Managers New Zealand (SOLGM)
- Local Government New Zealand (LGNZ)
- Office of the Auditor General New Zealand
- New Zealand Water and Waste Association (NZWWA)
- New Zealand Recreation Association (NZRA)

⁶⁹ www.rcaforum.org.nz

- Association of Local Government Information Managers (ALGIM)
- Local Authority Property Association (LAPA)

INGENIUM Mission & Objectives

INGENIUM's mission addresses both a combined role in engineering and asset management; objectives recognize the importance of the international community of practitioners. INGENIUM is the umbrella organization for local government engineering and asset management best practice in New Zealand.

The INGENIUM mission is:

To foster the awareness, expert provision and management of community services through the disciplines of engineering and asset management.

Objectives are to:

1. Uphold and improve the status of engineering and management of public assets in New Zealand.
2. Promote and encourage appropriate engineering and asset management standards for all public assets.
3. To be the principal advisory engineering body to Local Government New Zealand.
4. Foster the exchange and dissemination of information among:
 - Members
 - Engineers, asset managers and others working with public assets
 - Local government elected members
 - Associations and organizations with similar objectives within New Zealand and overseas.
5. Encourage, sponsor and promote research into all aspects of public asset engineering and management.
6. Provide benefits for members, including opportunities for education, networking and personal development.
7. Take any other action which in the opinion of the Board will be to the benefit of members or to local government or public asset engineering and management generally.

Administration and accounting services for the NAMS and WIMS Group are provided by INGENIUM. Management of the NAMS operation is carried out by a part-time CEO. Direct expenses (e.g. travel) for NAMS Group members is an overhead of the NAMS Group operation. Initially, INGENIUM funded the startup of the NAMS Group until it had its own income. Its revenue sources are sales of manuals and seminar profits. NAMS has operated at a loss for the past few years. Recent restructuring to a company structure is aimed at remedying this situation.

INGENIUM has five geographic branches which generally meet every three months. Activities focus on training and education, and exchanges of information and ideas.

The branches report to a national board which is elected by INGENIUM members. The national board includes a president, a vice-president, the five branch chairpersons and six other members elected at large. A Chief Executive provides the board with administrative support. The board is made up of industry practitioners who lead and advise on matters relevant to public asset engineering and management.

INGENIUM's focus is on technology transfer specific to public infrastructure asset management and engineering. Members participate in branch meetings, seminars and our annual conference. Asset management-related committees and companies of INGENIUM are:

- National Asset Management Steering Group (NAMS Group Ltd.)
- Infrastructure Decision Support Holdings Ltd (IDS Support Ltd.)
- Road Information Management Steering Group (RIMS Committee)
- Water Information Management Steering Group (WIMS Committee)
- Hansen User Group (HUG Committee)

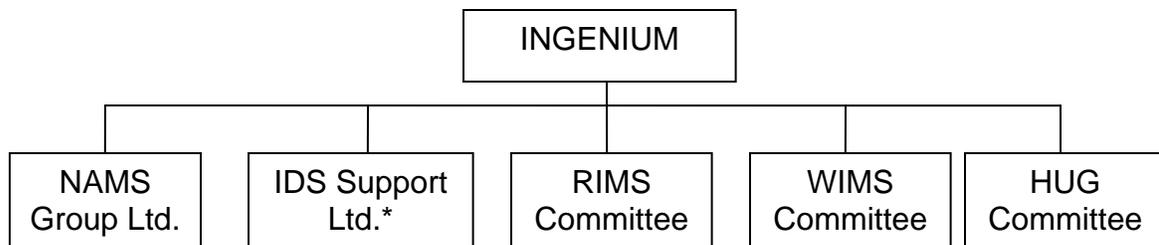


FIGURE A-2.3.1 INEENIUM Asset Management Structure

Started in 1995, the National Asset Management Steering (NAMS) Committee has developed asset management best practice manuals within New Zealand. The committee controls the NAMS Group, a non-profit industry organization, which promotes asset management through the development of best practice guidelines and training. Manuals include the *International Infrastructure Management Manual*, *Optimized Decision Making Guidelines*, *Depreciation and Valuation Guidelines*, *Developing Levels of Service and Performance Management Guidelines*, *Property Asset Management Guidelines*⁷⁰.

The newest committee of INGENIUM is the Water Information Management Steering Group (WIMS Committee). WIMS was formed following a requirement from the water sector within New Zealand territorial local authorities for a more

⁷⁰ IDS Ltd. Is owned by INGENIUM and started trading April 1, 2008. It was formed to manage the dTIMS software product, previously under the RIMS Committee control. dTIMS is a Canadian infrastructure deterioration modeling product of Deightons. IDS Holdings Ltd. purchases bulk licenses and resells them to New Zealand organizations (mainly local councils). IDS Holdings Ltd. also adding value to the product by further developing the software for use in New Zealand. IDS Holdings Ltd. is owned by INGENIUM.

consistent approach to information collection and management across the country. The RIMS group successfully provided consistent approaches to information management and provided a model for the WIMS group.

WIMS addresses their desire to not duplicate other national efforts, but leverage off other industry and public works sector best practices. Adherence to stakeholder consultation based on levels of service and long term management of assets are clearly incorporated in this group's purpose. Stated objectives are:

1. To encourage the use and availability of best practice asset management information systems in N.Z. that:
 - a. deliver accurate, timely and relevant information to enable the optimal targeting of investment in water infrastructure
 - b. meet asset management information needs
 - c. prove that agreed service levels are being achieved
2. To focus on the development of strategic level, best practice models, providing advice to territorial local authorities on the options available to them in selecting the most cost effective, least risk system solutions that best meet their business needs
3. To focus on the application of the NAMS guidelines in the water sector
4. To pursue, consider and where appropriate facilitate the acquisition of specific systems or templates in the interests of achieving nationally cost effective solutions that advance objective 1., above
5. To avoid duplication and to seek cooperative development with others where value can be added
6. To promote information sharing within the industry
7. To deliver training that promotes the objectives of the group and up skills the industry

The practical steps involved in developing asset management information required to guide decisions is reflected in the initial listing of WIMS Committee activities:

- Develop a national database for pipe performance, per capita consumption, asset deterioration models, and New Zealand specific pressure versus leakage relationships
- Guidelines for Level of Service reporting
- Best practice guidelines for asset management components such as:
 - Data collection & data management requirements, and
 - Renewal & replacement forecasting methodologies
- Resourcing within Councils for asset management,
- A project around dTIMS (as 80% of Councils have this software),
- User survey
- Software evaluation guide
- Business process mapping and methodologies
- Data requirements to feed into documents or projects such as WASA, long term community consultation plan (LTCCP), PHOMPS
- Website, with an inventory of useful asset management tools

Budget

INGENIUM's Fiscal Year 2005-06 budget was US\$213,000. Expenses are distributed primarily for staffing and operations (70%), communications (9%), membership (6%), "strategic alliances" (6%), industry (4%), and awards (5%). Income depends on a mix of subscriptions by members (39%), seminar/workshops (20%), administrative fees (19%), an annual conference (15%), and corporate-sponsorship (5%).

The INGENIUM Fiscal Year 2008-09 budget includes annual conference income and expenditures. Income sources for the US\$820,000 budget include: 14% from member subscriptions, 19% from various INGENIUM companies and committees administration recoveries, 29% from seminars, 35% from INGENIUM's annual conference, with "other" making up the remaining 3%.

The NAMS Group Fiscal Year 2006-07 budget was US\$491,000. Asset management manual production and support represents slightly over half (51%) of expenses, while the remainder supports operating (43%) expenses. Income comes from sales of best asset management practice manuals (64%), asset management seminars (29%), and projects (3%).

Communication Strategy

INGENIUM issues a newsletter (INGENIUM@Work) every two months. E-mail and a web site provide ongoing communication between the board, branches and membership. Each branch meets every three months. A conference is held annually. As new committees are created (e.g., WIMS) or initiatives occur, communication of these occurs through members of INGENIUM, such as the Local Government New Zealand.

Definition of Asset Management

The NAMS Group defines asset management as:

The combination of management, financial, economic, engineering and other practices applied to physical assets with the objective of providing the required level of service in the most cost-effective manner.

The source of this asset management definition and its practices are documented in the *International Infrastructure Management Manual, 2006*.

NAMS provides a series of one day courses covering asset and activity (non-asset services) management. Courses are aimed at local government staff, consultants and contractors working in asset management. Introductory and specialist subjects for non-asset based activity managers, support staff and elected officials. In 2008, 24 one-day workshops include:

- Introduction to Asset Management (3)
- Writing Asset Management Plans (3)
- Levels of Service (5)

- Asset Management for Property (2)
- Asset Management for Parks (2)
- Asset Management for Non-asset Managers (2)
- Optimized Decision Making and Risk Management (2)
- Asset Valuation and Financial Forecasting (2)
- Information Systems and Data Management (3)

Observations

1. New Zealand is recognized as a world leader in implementing comprehensive asset management tied to corporate level reporting, public consultation on levels of service, complete asset inventories and a structured approach to funding asset maintenance, renewal and acquisition.
2. In general, large cities and regional authorities have had the human capacity and funding for their asset management practice.
3. Leadership by national government established requirements for developing asset management plans, funding of workshops to raise awareness of the importance and benefits of good asset management, with a common road information system used across all levels of government which enables consistent analysis of asset condition and valuation.
4. As reported by a local government asset management consultant,⁷¹ small New Zealand authorities struggle with insufficient capacity to meet the expectations of the community and requirements of legislation. Early progress has stopped or slipped in some authorities as priorities, resources and staffing change. Many authorities focus on minimum compliance sufficient to pass audits. Consultant-led efforts result many times in little buy in and cultural shift needed to ensure long term changes in decision making.
5. Leading authorities frequently are a result of an individual champion with reduced long term success when this individual leaves.
6. Chief executive support, dedicated asset management positions and commitments to the elements of good practice—on-going training, data maintenance and integrated internal and stakeholder communication—can be seen in leading local authorities in New Zealand.
7. While training and case study comparisons alone are not sufficient to ensure an asset management culture and implementation, the NAMS Group represents an excellent example of a cross-asset, multi-sector network of public and private sector practitioners responsible for documenting existing, recognized best practice. The established committee structure, business structure, and its flexibility in updating best practice based on participants' experience have brought New Zealand its current recognition in the world. NAMS Group provides local authorities the opportunity to be recognized as leaders in asset management, network with others as research, tools and techniques are made available and tend to help authorities just starting out embed asset management practice more quickly.

⁷¹ Ross Waugh, Waugh Infrastructure Management Limited

A-2.4 UNITED KINGDOM

”Asset management is not just about engineering, or finding the right technical solution at the best price. It’s about ensuring the asset provides the service that the public want from it. Good asset management starts with knowing what assets you have, what condition they are in and what you want to use them for. This funding will help local authorities to gather and use the data they need to ensure they get the best from the infrastructure they manage.”

Rosie Winterton, U.K. Minister of State for Transport
July 16, 2008

Background

Transportation demand in the United Kingdom (U.K.) is primarily local and is concentrated in urban areas.⁷² With the exception of Central London, the road network provides the backbone for freight and passenger travel. The Eddington Transport Study (2006) found that, similar to the United States, urban “agglomerations” are becoming growth centers in the U.K. Good transportation policies and investments that support economic benefits need to reflect dynamic economic and social changes.

While the U.K.’s basic transportation infrastructure is built, how the network supports growth, capacity, reliability and connectivity need to be assessed. Outcomes-based strategies, benefit to cost analysis justifying new projects, and full costing of services are recommended as strategies to improve the efficient utilization of transportation network capacity. The Eddington Study calls for national government to evaluate how to give regional (sub-national) bodies the power or financial incentive to implement transportation solutions across modes, flexibly allocate funding to highest “value for money” solutions; and support greater accountability and capacity.

National and Local Authority Structure

The United Kingdom is composed of England, Scotland, Wales and Northern Ireland. There are two main levels of government—the central government and local authorities. The U.K. has 73 towns and cities with a population of more than 100,000.⁷³ There are 32 local authorities in Scotland.

Infrastructure ownership and funding sources

The U.K.’s central government has direct or indirect control over most government revenues and spending, while local authorities are primarily responsible for service delivery in education, housing, and social services. Local authority fixed assets are worth nearly US\$426 billion which makes them the second most costly resource after staff for local authorities to manage.⁷⁴ Scottish

⁷² *The Eddington Transport Study*, Department of Transport, 2006

⁷³ *Ibid.*, 2006

⁷⁴ www.local.communities.gov.uk/finance/stats/natstats.htm

local authorities control land, property, plant and equipment with a 2008 estimated historical value of US\$42 billion.⁷⁵ Management of these public assets is second only to employee expenses in Scotland local government budgets.

Historic Development of Asset Management

- 1982 Code for Fiscal Stability requires increased transparency and accountability by presenting a fiscal strategy and reporting requirements.
- 1996-97 County Surveyors Society (CSS) raises neglect of highway network and declining investment as issues with national government leading to increased highway maintenance funding to local authorities through the Local Transport Plan process.
- 1999 Local Government Act imposes Best Value Duty, defined as “consistently delivering the best possible services to the community through effective procurement and partnerships, taking into account whole life costing, innovation and continual improvement.”
- 1999 England requires property asset managers to develop asset management plans and capital strategies; guidelines issued. In Wales and Scotland, property asset management recognized as key to improved service delivery and efficiency.
- 2001 U.K. Roads Liaison Group (UKRLG) established to advise on road engineering and maintenance best practice, policy and initiatives for national, local engineers and professional bodies
- 2003 Local Government Act, Part 1 (England and Wales) and Local Government Act in Scotland, Part 7 (Scotland) imposes a duty on local authorities to determine and review the maximum amount which they can afford to allocate to capital expenditure; required to implement the Prudential Code for Capital Finance in Local Authorities that relate to “affordability, sustainability and prudence,” specifies asset management as appropriate method to determine Code compliance.
- 2004 CSS produces *Framework for Highway Asset Management*, defines comprehensive asset management
- 2005 RLG Code of Practices: *Well Lit Highways, Well Maintained Highways, Management of Highway Structures* incorporating asset management planning, risk management.
- 2005 RLG *Guidance Document for Highway Infrastructure Valuation*. Helps authorities link planned maintenance to financial requirements needed to achieve performance standard. Allows comparison of planned maintenance costs to changes in network condition by year. Facilitates authorities “taking asset management across all assets” for first time
- 2005 RLG *Maintaining a Vital Asset* summarizes common recommendations from Codes of Practice; defines elements of good asset management aimed at elected members and senior managers
- 6/2008 CIPA *Local Authority Transport Infrastructure Assets: Review of Accounting, Management and Finance Mechanisms*. Concludes: 1) Local authorities information (inventory and cost) are not good quality, 2) documents minimum of 5% reduction in life cycle cost when maintaining roads prudently (Value for Money validation); 3) recommends move to current value accounting for infrastructure assets (and concludes historic cost basis does not support “effective long term management of assets”)
- 7/2008 Minister of State for Transport announces Department for Transport US\$42 million over 2 years 2009-10 to assist England’s local authorities developing AM capacity
- 4/2009 Duty to Involve statutory requirement for local government to inform, consult and involve local people in their functions and activities. Enforces current move to rebalance the central-local relationship; better enable local partners to work together; and give communities a say based on simplified performance framework

Definition of Asset Management

In 2004, the U.K. County Surveyor’s Society defines asset management as:
 “A strategic approach that identifies the optimal allocation of resources for the management, operation, preservation and enhancement of the highway infrastructure to meet the needs of current and future customers.

⁷⁵ http://www.audit-scotland.gov.uk/docs/fwd/pb_asset_management_councils.pdf . Note: Historical cost undervalues assets.

As stated by the Scotland central government, asset management is:

“The full life cycle management of assets in order to maximize their advantage. It covers site acquisition and disposal, the replacement and remodeling of buildings, roads and bridges to include extensions and improvements, plus the management and maintenance of such capital infrastructure assets.”

In an explanatory advisory to Scottish local authorities:

“Although practices may vary, the underlying principles of good asset management remain the same, and it is important that they are commonly identified and clearly understood by those working in the public sector in Scotland.”⁷⁶

Current Directions and Drivers

Accounting Standards

Legislation forced a change in accounting practices. The “Code for Fiscal Stability” (1982) required government to increase transparency in fiscal policy and accountability by presenting a fiscal strategy and certain reporting requirements. The Code provides a general framework requiring that fiscal and debt management policy be guided by five key principles: transparency, stability, responsibility, fairness, and efficiency. The incumbent government is given wide discretion in developing its specific strategy.

The Need

In 1997 the U.K.’s public services and institutions were judged not fit for purpose due to decades of underinvestment.⁷⁷ This led to central and local government’s significant investment and strong national direction to enforce Best Value and efficiency in the public sector. Central government is working with cities and regions to develop powers and resources that support regions and local authorities. Strategies and service delivery are being examined that reduce governmental overlap and improve co-ordination between national, pan-regional, regional, sub-regional and local agencies, both in terms of strategy and delivery. Central government, in collaboration with local government, set out a number of prerequisites for driving service transformation. Themes include:

- business process improvement and flexible working
- collaboration between public bodies
- use of technology, including information sharing
- procurement
- competition
- asset management
- stable finance
- challenge

⁷⁶ *Framework for Highway Asset Management*, County Surveyors Society, 2004

⁷⁷ *Strong and Prosperous Communities: The Local Government White Paper*, Department of Communities and Local Government, 2006

- support

Ways to link statutorily mandated long range plans with transportation asset management plans are currently being assessed.⁷⁸

Resource Accounting and Budgeting (RAB):

The RAB framework implemented in 1993 shifted government to accrual-based measurement and imposed performance measurement by linking inputs to outputs.

All local authorities were required by 2006 to prepare the explicit valuation of all assets held and an evaluation of the level of depreciation to arrive at a current value. National agencies, such as the Highways Agency, preceded local agencies in producing accounts in this format (2002).

Water Utility Price Regulation

The U.K. water industry implemented asset management as a requirement of price regulation. Asset management is now closely integrated with financial and key business management processes. Network Rail has only recently begun implementing asset management.⁷⁹

Local Government Act in England and Wales and Local Government in Scotland Act 2003

Five provisions in the 2003 Act are directly relevant to the issue of asset management by local authorities. The purpose of the 2003 Act was to provide a legislative framework for “Best Value,” to improve accountability for the use of public assets and funds, and encourage local authorities’ procurement practices while encouraging innovation. Best Value is defined as continuous improvement, looking for a balance between quality and cost in procurement and use of assets, and sustainable development over long term management of assets.

In Scotland, local authorities are required by the 2004 *Prudential Code for Finance in Local Authorities* to fund capital renewal in capital budgets. The Code aims to be consistent with and support local asset management planning and “proper option appraisal.” This long term focus and pressure on budget resources moved Scotland to use asset management planning as a tool to understand and target asset renewals.

This move to Best Value, sustainable development and budgeting for capital renewal are considered the primary drivers for embedding asset management practice at the local authority level in Scotland.

⁷⁸ *Review of Transport Asset Management Plans for the Department of Transport*, Atkins Global, 2008

⁷⁹ *Local Authority Transport Infrastructure Assets: Review of Accounting, Management and Finance Mechanisms*, Chartered Institute of Public Finance Accountancy, 2008

Building a Better Scotland 2004

The Scottish Government has targeted improvements in asset management as part of its “Efficient Government” agenda and modernization agenda in which councils have been directed by central government to achieve 2% efficiency per year. Asset management is identified as one of five initiatives in “Building a Better Scotland” expected to significantly contribute toward improving efficiency in the public sector. Flexibility is given as to how this is to be achieved.

Asset Management Guidelines

The Chartered Institute of Public Finance and Accountancy (CIPFA) local governments’ directors of finance published a general framework for asset management and capital planning guidelines in 2006 to assist Scottish compliance with the statutory requirement to provide “Best Value” and sustainable development. Guidelines:

- Ensure that management arrangements secure continuous improvement
- Balance quality and cost in relation to the procurement and use of assets
- Ensure asset management decisions contribute to sustainable development.

Asset management planning is meant to:

- Demonstrate Best Value
- Assist in identifying efficiency
- Be integral to a performance management framework⁸⁰

Councils are required to have a 3-5 year strategy with a vision, baseline and action plan that indicates how a community will achieve its vision and assets to be acquired (capital plan). Capital plans of councils are to be “affordable, prudent and sustainable.” An asset management strategy is seen as an integral part of service and business planning which describes 1) the current condition of the assets; 2) the overall use of the asset; 3) occupancy costs; 4) service and organizational constraints; and 5) capital investment decisions. These “good practice arrangements” are endorsed by Chartered Professional Accountants and the Royal Institute of Chartered Surveyors (RICS) and designed to develop a corporate approach with elected officials and chief council officer commitment.

Evaluation of Asset Management Practice

In January 2008, an in-depth assessment of U.K. local authorities leading transportation asset management implementation, and a broader survey of 100 local authorities’ asset management practice found that while guidance exists, it is not well understood.⁸¹ There is confusion about what an asset plan should include, whether the plan is for the management of all transportation assets or simply highways, the timeline needed to produce an asset plan, and where

⁸⁰ *Capital Planning and Option Appraisal – A Best Practice Guide for Councils*, CIPFA Local Government Directors of Finance, 2006

⁸¹ *Review of Transport Asset Management Plans for the Department of Transport*, Atkins Global, 2008

available asset management advice can be found. Even though many local authorities understand benefits of adopting an asset management approach, a lack of resources limits the ability to implement the long term changes needed to realize benefits. Documenting “value for money” in use of resources is therefore difficult as investment strategies frequently do not tie maintenance and renewal to long term capital programs.

In June 2008, CIPFA reviewed local governments’ accounting, management and financing mechanisms for funding transportation infrastructure assets.⁸² This included consultation with local governments throughout the U.K. Conclusions were that effective asset management is at a “very early stage of development in most local councils.” Elements of asset plans existed in the audited councils, but information on asset use was inadequate, there was a lack of a corporate approach when setting service levels, and councils used separate asset registers. The review concludes that: 1) Local authorities information (inventory and cost) are not good quality, 2) a minimum of 5% reduction in life cycle cost can be achieved when maintaining roads prudently (Value for Money validation); 3) a move to current value accounting for infrastructure assets is needed (concludes historic cost basis does not support “effective long term management of assets”).

Local authorities consulted desire more rapid progress implementing comprehensive asset management. Given the findings and consultation responses, CIPA recommends changing to current value accounting about infrastructure assets be reported by 2011 (dry run) with full adoption by 2012.

In 2008, Audit Scotland initiated a study to assess whether councils’ have good asset management practices, manage their assets to provide a high level of service and whether councils achieve “value for money” given new legislation and asset management guidelines. The study will also examine how councils work with other bodies to ensure efficient and effective use of their assets. The written agreement between Scottish central and local governments requires a 2% efficiency savings per year. Asset management and collaboration between local authorities are expected to contribute to this as part of the Efficient Government Agenda. Meetings with local authorities will ascertain:

- Are organizations working toward collaboration?
- What are the steps to start?
- Identifying good examples of strategic collaboration?
- What are the barriers to collaboration?

Recommendations are due in spring 2009 and will be coordinated with the Audit Commission and the Wales Audit Office who are also conducting studies on strategic asset management.

⁸² *Local Authority Transport Infrastructure Assets: Review of Accounting, Management and Finance Mechanisms*, Chartered Institute of Public Finance Accountancy, 2008

Implementing Communities of Asset Management Practice

Several U.K. initiatives are underway to improve and clarify asset management guidance and address the gaps in local authorities' asset management practice.

Minister of Transport Incentive Grants

A July 2008 letter from the Minister of State for the Department of Transport made US\$45 million available to England's local authorities. Two-thirds will be awarded to authorities to develop asset management capability with regard to their highway-related assets (including highways, sidewalks, bridges, street lighting, signage and other assets). One-third will reward authorities' innovative use of data supporting investment and maintenance decisions on the highway, including their willingness to "act as a regional champion, working with the region, to disseminate improvements in highway maintenance achieved through better use of data". Criteria for this portion of funding are: clarity in the strategic aims addressed by the action; value for money of the action; the handling of change; assessment of the benefits accrued from the action; evidence of on-going work to sustain the benefits accrued.⁸³

Road Liaison Group Asset Management Subcommittee

The Road Liaison Group, author of the U.K.'s road management code of practice, established an asset management working group in 2008 that is charged with simplifying asset management guidance for local authorities. Guidance will develop clear and meaningful definitions for service levels for all parts of road infrastructure, life cycle planning, risk management and innovative data collection techniques, and computer tools that help calculate depreciated replacement costs.⁸⁴

SCOTS

The Society of Chief Officers of Transportation in Scotland (SCOTS) sets common national standards and practices for the local authorities. SCOTS' Steering Group consists of eight representative local authorities directing project resources. Two projects highlight SCOTS approach to embedding asset management in Scottish local authorities.

The Scottish Road Maintenance Condition Survey (SRMCS), now in its second 4-year contract, involves all 32 Scottish councils. Machine road condition is collected for all Council road networks. The survey provides a wealth of condition data for these roads and provides the performance indicator for statutory compliance.

The SCOTS Roads Asset Management Project was initiated in 2006. After failing to obtain national funding, and based on the road condition survey project's success, SCOTS decided to self-fund the National Asset Management

⁸³ "Application for Funding Transport Asset Management," Department for Transport, July 18, 2008

⁸⁴ "2008-2011 Business Plan," UK Roads Group, Asset Management Sub-Group, July 14, 2008

Framework for Roads Project. The project's desired outcome is that "efficient, sustainable and advanced road asset management (will be) practiced in all Scottish Local Authorities." By February 2009, each authority is to participate in workshops which will develop proficiency in five asset management practice areas: people, processes, data, systems and finance. These consultant-led workshops in 2008 cover all aspects of asset management practices and planning. A common framework for an asset management plan is to be delivered by the consultant in February 2009 based on these workshops. Scottish local authorities will then develop individual Road Asset Management Plans (RAMPs) with completion scheduled for February 2012.

One leading Scottish authority has subscribed to Australia's NAMS.PLUS suite of asset management e-guidelines, templates and four workshops. NAMS.PLUS will be used to accelerate production of their council's asset management plan and long term financial plan.⁸⁵

CIPFA and Local Government Asset Management Network

In 2000, the Institute of Public Finance and local government property associations formed an asset management network. Its purpose is to disseminate best practice information and support for local authorities developing asset management practices. The network meets in regional locations three times a year with 500 practitioners attending each event. Approximately 300 local authorities are members.

Institute of Asset Management (IAM)

The Institute of Asset Management (IAM) is a cross-asset community of asset management practice. IAM has existed in some form since 1995. It sponsors events, collaboration projects, networking opportunities and membership services to individuals and corporate members in the U.K. and overseas. While there are no membership restrictions, IAM primarily represents a network of asset management practitioners representing water, wastewater and electric utilities and related consultancies. Leeds University is also a member.

The IAM is a legal entity with a Board of Management acting as the company directors. The IAM president is the managing director of the legal entity. The IAM is governed by a council elected to represent various membership categories. The council is chaired by the president. Most of the work is carried out by committees, some of which have delegated authority. The IAM council typically meets four times a year. It reviews and approves committee proposals and activities. The council also:

- considers and approves strategy and objectives
- reviews and comments on budgets and business plans
- receives reports from and ensures Board accountability
- initiates work themes and projects and establishes formal sections, committees or appropriate groupings for particular purposes.

⁸⁵ Perth-Kinross local asset manager communication, September 2008

The IAM secretary, a voluntary and elected position, is responsible for developing the IAM budget, managing and procuring office services, managing the board agenda and follows through on action items of the board, facilitates internal and external IAM communication, including their website. Office and event support is provided by service contract. Offices and related costs are provided at a discount rate to IAM by a corporate member (patron).

As stated in their 2007 annual report, the IAM's purpose is to:

1. Advance for the public benefit the science and practice of asset management
2. Promote and recognize high standards of practice and professional competence
3. Generate widespread awareness and understanding of the discipline.⁸⁶

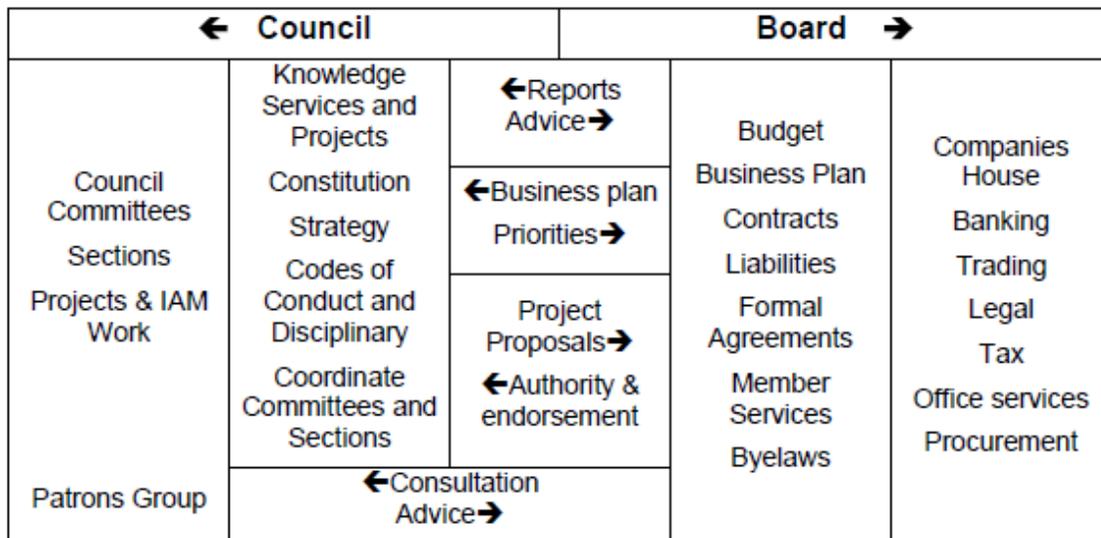


FIGURE A-2.4.1 Relationship of IAM Council and Board

The lack of association with the Institute of Civil Engineers (ICE) and other professional road associations is cited as a limiting factor in IAM's influence in the transport sector.⁸⁷

Obstacles to Success

- A Department of Transport 2008 survey of 100 local authorities ranked the reasons preventing improved use of valuation:
 - incomplete data inventories
 - developing depreciation/impairment models
 - time and resource constraints
 - insufficient data for developing accurate unit rates for valuation

⁸⁶ http://www.iam-uk.org/Downloads/IAM_Handbook.pdf

⁸⁷ Communication with Transport for London manager, October 2008

- The main reasons for the delay in implementing transportation asset management plans (not mandated) include:
 - lack of resources
 - unclear requirements
 - organizational issues
- Authorities “urgently” desire guidance for implementing asset management development (not simply accounting rule compliance) to accelerate its adoption at the local level.
- Competing initiatives and issues take precedence in local authorities. Adding asset management to existing national groups’ work is seen as diluting current initiatives making it difficult to achieve them. Separate, focused work groups tasked with asset management are now being used at the national level and within local authority associations.
- Skills and knowledge required to implement asset management practices have to be acquired either through training or bringing in external expertise.
- Staff resistance to changes in ideas, practices and methods
- The need for cost element definitions that led to greater consistency on cost elements including valuation of land
- Complying with asset management-based accounting requires a slower time frame
- Asset management is most frequently led by the team responsible for road maintenance. In many cases there is little interaction with this team and the one responsible for long range planning. This weak link to strategic objectives is seen as a stumbling block to showing “value for money” using asset management.

Success Factors

- Release of resources to augment inspection regimes led to early adoption of asset management by some local authorities.
- Leading local authorities cite the drive to implement Best Value and the need to achieve more with existing funding as the driver for their early adoption of asset management.
- The vast majority of authorities successful in asset management work in regional groups, supporting each other and offering opportunities to share examples of best practice and move asset management forward. 92% of local authorities participate in regional groups working on elements of U.K. TAMPs. 50% of local authorities work with other authorities to produce an AMP template. Metro authorities often work with neighboring authorities to produce templates. 51% of local authorities would like some additional guidance, either written or in workshops and training sessions. Only 7% of LGA would like AMPs to be mandatory.
- Talking to “those who have come before” is the greatest benefit to encourage an organization starting out.
- Elected leader understanding and involvement in asset plan development was vital to support of asset management.

- Scotland's initiatives are possible due to the relatively small size of the country and previous local government structure. Up to 1996, roads were the responsibility of 12 regional authorities making contact and joint decision making easier.⁸⁸
- Senior management and elected member understanding and involvement – from presentations to support for implementing asset management—have been the most important factor. Organizing a group tasked with asset management has provided the on-going momentum to see results achieved.
- Training operational staff and showing them “what’s in it” for them, and how it can help them to do their jobs.
- Availability of tools required to carry out the new practices need to be in place as early as possible in order to carry out the new practices.
- SCOTS ‘ is leading two projects (managing the contract that collects road condition data for council networks, and AM Committee that is coordinating national workshops to develop a national asset management framework for road asset management).
- Relying on peer collaboration to develop improved way of doing business builds long term culture change. This strong culture is then focused on improving council performance.
- Being given the time to develop the necessary processes that ensure successful change.
- Focusing on one process and implementing it as a successful demonstration of asset management’s more generalized benefits.
- Asset management is seen as a common sense process for investment decisions. The ability to value assets and document maintenance needs based on inventory, condition and unit costs increases confidence in decisions and investment strategies.

Observations

1. Progress implementing asset management varies considerably between U.K. local authorities. In most cases asset management is still not fully integrated into business processes.
2. Asset management in the U.K. water industry precedes the transport arena and was a requirement of price regulation. Network rail has only recently introduced asset management.
3. Local authorities cite insufficient local resources as the chief reason for the slow progress and recent slippage in the development of transportation asset management plans.
4. Local councils have received most benefit from talking to “those who have gone before” notably the Australian and New Zealand asset management associations and managers, and see most value from “hands on” assistance, both short term interactive presentations and longer term exchange programs.
5. Local councils have advanced beyond struggling with internal obstacles to asset management adoption. Recommendations reflect the benefits of

⁸⁸ Perth-Kinross local asset manager communication, September 2008

- communities who are beyond the initial stages of basic understanding, commitment and collaboration; concerns reflect the needs of more advanced asset management practitioners.
6. Longer term benefit would come from developing academic or professional qualifications in asset management.
 7. Improvements are needed in data collection, management and analysis. Developing customer-based levels of service and introduction of long term financial planning are also needed in local councils.
 8. Collaborative development of the TAMP can provide an excellent framework for integrating neighboring authorities' decisions while maximizing use of available AM skills in a region. TAMP development engages a wide range of management and staff. This helps build a supportive culture where people and systems work together to provide a shared view of management information.

APPENDIX B: PROJECT REVIEW COMMITTEE

Project Sponsor

Steve Gaj, Leader, System Management and Monitoring Team
U.S. Federal Highways Administration Office of Asset Management

Review Committee

Steve Allbee, Strategic Project Initiatives, U.S. Environmental Protection Agency (EPA)

Chris Champion, CEO, Institute of Public Works Engineers Australia (IPWEA) and National Asset Management Steering Group Australia (NAMS.AU)

Lacy Love, Director, Office of Asset Management, North Carolina Department of Transportation

Sue McNeil, Professor, University of Delaware, and Chair, Transportation Research Board Subcommittee on Asset Management (TRB ABC40)

Project Manager

Patricia Bugas-Schramm, President, PBS Consulting

APPENDIX C: DEFINITIONS OF ASSET MANAGEMENT

American Public Works Association

A comprehensive and structured approach to the long-term management of assets as tools for the efficient and effective delivery of community benefits.

ASSHTO

A strategic and systematic process of operating, maintaining, upgrading, and expanding physical assets effectively throughout their lifecycle. It focuses on business and engineering practices for resource allocation and utilization, with the objective of better decision making based upon quality information and well defined objectives.

Austrroads⁸⁹

Road asset management is a structured approach to the delivery of community benefits through the management of road networks.

FHWA

Transportation asset management is a systematic process of operating, maintaining, and upgrading infrastructure cost-effectively. It combines engineering and mathematical analyses with sound business practice and economic theory.

Highways Subcommittee on Maintenance Definition (2005)

Asset management is a strategic and systematic process of maintaining, upgrading, and operating physical assets effectively throughout its life cycle. It focuses on business and engineering practices for resource allocation and utilization with the objective of better decision making based upon quality information and well defined objectives.

Michigan

An ongoing process of maintaining, upgrading, and operating physical assets cost-effectively, based on a continuous physical inventory and condition assessment. (Act 499, 2002)

NAMS-NZ and NAMS.AU⁹⁰ (2006)

The combination of management, financial, economic, engineering and other practices applied over the full life cycle of physical assets to provide the required level of service for present and future customers in the most cost-effective manner (for present and future customers).

⁸⁹ An association of Australian and New Zealand road and traffic authorities that provides important leadership in asset management for member institutions.

⁹⁰ From *International Infrastructure Management Manual*, NAMS-NZ/AU, 2006

National Asset Management Work Group, Canada⁹¹

An integrated approach involving planning, engineering and finance to effectively manage existing and new municipal infrastructure in a sustainable manner to maximize benefits, reduce risk and provide satisfactory levels of service to the community user in an environmentally and ecologically responsible manner.

NEWEA Asset Management Committee

A discipline that should be practiced at all levels of an organization for the purpose of safely and efficiently providing the level of service expected by customers while minimizing risk, controlling costs, and satisfying requirements of all stakeholders over the entire life cycle of the infrastructure being managed.

New Mexico Environmental Finance Center (NMEFC)

Maintaining a desired level of service (what you want your assets to provide) at the lowest life-cycle cost (best appropriate cost not no cost.)

Scotland Central Government

The full life cycle management of assets in order to maximize their advantage. It covers site acquisition and disposal, the replacement and remodeling of buildings, roads and bridges to include extensions and improvements, plus the management and maintenance of such capital infrastructure assets."⁹²

U.K. County Surveyors Society

A strategic approach that identifies the optimal allocation of resources for the management, operation, preservation and enhancement of the highway infrastructure to meet the needs of current and future customers. (Framework for Highway Asset Management, 2004)

Water Services Association of Australia (2008)

The combination of management, financial, economic, engineering and other practices applied to physical assets with the objective of providing the required level of service in the most cost-effective manner.

⁹¹ Allied with but precedes creation of National Round Table on Sustainable Infrastructure of Canada.

⁹² <http://www.scotland.gov.uk/Resource/Doc/35596/0028836.pdf>

APPENDIX D: ORGANIZATIONS CONTACTED

Australia

Chris Champion, CEO, Institute of Public Works Engineers (IPWEA) & National Asset Management Strategy Group, Australia (NAMS.AU)

Canada

Theresa Cloake, Infrastructure Policy Advisor, Office of Infrastructure and Funding Strategy Finance and Treasury, City of Edmonton

Lynn Daigle, National Research Council

Konrad L. Siu, Director, Office of Infrastructure and Funding Strategy Finance and Treasury, City of Edmonton

Wally Wells, Wells Infrastructure Group for Local Government Asset Management Working Group, and British Columbia Ministry of Community Development

New Zealand

Ross Vincent, CEO, Ingenium for National Asset Management Strategy Group-New Zealand (NAMS.NZ)

U.K.

Les Hawker, Transport for London for Roads Liaison Group, Asset Management Board
Norman Ballantine, Asset Management Officer, Perth and Kinross Council for Society of Chief Officers of Transportation in Scotland (SCOTS) Asset Management Committee

U.S.

Patrick Bauer, Assistant Div. Admin., Federal Highway Admin., Ohio Division

Barry Buchanan, Board President, Pacific Northwest Asset Managers User Group (AMUG)

John Fortin, New England Water Environment Association (NEWEA)

Heather Himmelberger, Dir., New Mexico Environmental Finance Center (NMEFC)

Laura Hansen, Asset Management Integration Coordinator, Oregon DOT

Karen Homolac, Program Specialist, Oregon Economic and Community Development Department

Terry McNinch, Director, Michigan Local Technical Assistance Program (LTAP)

John Oshel, County Road Program Manager, Association of Oregon Counties

Carmine Palumbo, Transportation Dir., Southeast Michigan Council of Govts.

Satvinder Sandhu, U.S. Federal Highway Administration Oregon Division

Ethan Seltzer, Director, School of Urban and Regional Planning, Portland State University, Portland, Oregon

Steve Warren, Director of Planning, Kent County, Michigan Road Commission

Mark Wills, Asset Management Integration Section Manager, Oregon DOT

Paul Wirfs, Engineering and Asset Management Unit Mgr., Oregon DOT

APPENDIX E: SURVEY QUESTIONNAIRE⁹³

Background

The U.S. National Cooperative Highway Program (NCHRP) sponsored a Transportation Asset Management Scan in 2005. The purpose of the scan was to “investigate asset management experience, techniques, and processes in the world,” and to share this with U.S. federal, state and local transportation agencies as they seek ways to improve the organizational culture, policies, tools and methods used to target infrastructure investment decisions. A key observation of the scan team was that world leaders in asset management actively create and support a community of asset management practitioners.

One of the recommendations of the scan team was to:

[Explore] joining with other efforts, agencies and resources to embed asset management into existing efforts on an ongoing basis. Create a National Asset Management Steering Committee (NAMS) in the United States. Such an effort provides a platform to distribute information, provide training, and document best practices on transportation asset management nationally and abroad. Develop an easy-to-understand toolbox for asset management that can be applied at different levels of government. The tools should look beyond transportation to best practices in other industries.

Purpose

The purpose of this project is to identify ways to support or improve existing efforts to communicate and transfer knowledge of sustainable infrastructure management practices, tools and techniques in the U.S. Existing efforts will be identified (including those outside the United States and beyond transportation communities of practice), and alternatives evaluated. Recommendations for implementation are to be made by December 2008, prior to U.S. Congress transportation funding reauthorization in spring 2009.

Objectives

1. Document national and international asset management peer networks.
2. Identify factors which influenced or challenged success – content, membership, funding, and structure.
3. Identify alternatives for implementation in the U.S.
4. Recommend best approach and funding for U.S. implementation prior to Congressional discussions of transportation funding reauthorization spring 2009.

⁹³ Questions differed when interviewing countries or agencies involved in supporting creation of asset management practitioners.

Asset Management Defined

Many definitions of asset management exist. For purposes of this report, the following definition, adopted by the American Association of State Highway Transportation Officials (AASHTO) in 2006, will be used.

Asset management is a strategic and systematic process of operating, maintaining, upgrading, and expanding physical assets effectively throughout their lifecycle. It focuses on business and engineering practices for resource allocation and utilization, with the objective of better decision making based upon quality information and well defined objectives.

Communities of Practice Defined

A community of practice is a self selected group with a common interest seeking to improve their understanding based on sharing their experiences and the expertise of others. More developed groups committed to expanding the training, knowledge and practice of an interest, in this case, asset management, may move to a more formal work team with assigned roles and tasks that are aimed at achieving agreed goals. Regardless of their evolution, it is acknowledged that these communities of practice nurture new knowledge, stimulate various innovation, and most importantly share existing tacit or “unstructured” knowledge of individuals with common interests within and across organizations. They tend to attract leaders, risk takers and innovators in their field. By creating and supporting communities of practice, documenting or managing this knowledge is possible. Benefits of communities of practice are promoting education and the sharing of best practices. Competitive advantage and increased organization effectiveness led to greater innovation, better customer experiences, consistent good practices, and accessible knowledge for organizations physically separated. By encouraging information exchange between peers, organizations can benefit; organizational walls can be broken down and employees involved with design and problem-solving functions can accomplish tasks more quickly and efficiently.⁹⁴ Communities of practice have become associated with knowledge management, learning organizations and continuous improvement.⁹⁵ These are all aspects of an organization that has successfully embedded asset management into its business practice.

⁹⁴ “Transportation Asset Management Today: Communities of Practice in the Transportation Industry,” *Transportation Research Record: Journal of the Transportation Research Board*, No. 1885, TRB, National Research Council, Washington, D.C. 2004, pp. 88-95.

⁹⁵ *The Fifth Discipline: The Art and Practice of the Learning Organization*, Peter Senge, 1990.

Survey Questions

1. Interviewee Information

- Name & Position:
- Organization:
- Address:
- Phone/Cell/E-mail

If not a Community of Practice, go to question 10.

2. Organization Background:

- Organization's name, purpose, infrastructure focus (if any)
- Membership (public, private)
- Mission (**copy**)
- History of development
- Drivers for creation
- Funding sources

3. Communication Strategy

- Content of forums (**copy** of agendas)
- Frequency
- Method of communication (newsletters, Internet, face-to-face meetings, seminars, conferences, ad hoc meetings)

4. Organizational Resources/Secretariat

- Program/organization resources (event coordinator, permanent staff)
- Organizational structure (**copy**)
- Assigned roles & responsibilities (**copy**)
- Business plan? (**copy**)

5. Definition of Asset Management definition, resources

- What definition of asset management is used? (**copy**)
- What is the source of this definition?
- What asset management resources are used (**list**) or have you developed (**copies**)
- Examples of tools, techniques presented (**copies of presentations/workshop agendas**)

6. Accountability

- What are the desired outcomes?
- How is success measured?
- Are there defined critical results areas and strategies and performance indicators to reach them?
- What are the reporting mechanism to membership/financial supporters/government/industry/professional associations?
- Do you produce annual reports? (**copy**)

7. **Lessons Learned**

- Are there gaps in the current versus desired performance of your organization? If so, what are the reasons for the gap?
- What's worked (success factors/strengths)
- What do you want to change (reasons hasn't worked/pitfalls/weaknesses)
- What's been the number one obstacle to success, and how was it overcome?
- What's the number one reason for success to date?
- What emerging trends do you see as opportunities?
- What emerging trends are threats to success?

8. **Recommendations for U.S. Success**

- From your perspective, what processes are critical for the success of a community of asset management practice in the U.S.?
- What missing links or reasons for any process variations do you perceive between countries/regions/states/cities/infrastructure communities?
- What strategies for improvements within the U.S. could you suggest?
- In your experience, are formal associations (with professional associations, industry groups, government departments, local technical assistance programs, educational institutions) necessary to U.S. success? If so, which would you recommend, if not, why not?

9. **Others to Contact or Other Resources to Research?**

10. **(Skip if Questions 1-9 answered.) What efforts are you aware of to embed consistent and comparable asset management practices (education and training, information dissemination, technology evaluation, research and development) in your country?**

- Who is involved? (levels of government: federal, state, local, regional, infrastructure-water, waste water, transportation, other)
- Where did this effort come from? (legal, overlap of physical system responsibility, environmental/legal mandate, financial, institutional, informational need)
- Why now? (legislation, audit requirement, public demand, financial opportunity, local leadership/champion)
- How does it work? (method of communication: face to face meetings, newsletter, internet website, conferences); organizational structure: (if formal, structure, bylaws, charter, roles & responsibilities); financial support (sources, annual budget, permanent staff, professional in-kind support)
- Success stories? (Examples of case studies, or projects (legislative advocacy, events, collaborative partnerships resulting from efforts)
- Obstacles to success?
- Recommendations to U.S. efforts to create asset management communities of asset management practice?
- Others to contact/sources to research?