

**Technology Road Map – Town Hall Meeting
Vancouver, BC - January 30, 2003**

Flip Chart Notes

General Issues

1. Dissemination of TRM to Federal, Provincial/Territorial and Municipal involvement.
2. Include other stakeholders (ex. finance, insurance) in the CIS-TRM project.
3. Bring infrastructure to the public eye and promote the value of infrastructure (ex. "the story of infrastructure") in an appealing and interesting manner to the general public.
4. Civil infrastructures are in many ways the healthcare system of "communities".
5. Historical patterns of funding (ex. % spent on repairs versus new versus maintenance).

Discussion A: CIS Short/Medium Term Technology Development Needs

- Qualified deterioration curves:
 - "General/Generic" for better decisions. At the same time, make them applicable to small systems.
- Standardized repositories of data about "What's There?"
- Virtual tour of infrastructure
- Standardized methods of economic analysis of projects
 - Expert system model available to "any user"
 - Consensus on input values
 - multi-objective criteria
 - data
 - "integration" of types of infrastructure
 - move from "project" to program planning
- Integration of Capital Operation Budgets (process issue), Life Cycle Costs (LCC) and maintenance planning.
 - Challenge is to incorporate "other" costs.

- Move toward more "self-contained" "local" systems.
- Life expectancy maintenance:
 - ex. Impacts of increased maintenance dollars on life expectancy
 - Generate improvement curves; share information with "TRUST".
- Monitoring (ex. Quality of water in distribution systems) and what to monitor.
- Dedicated research & development (R&D) with more emphasis on dissemination.
- "Non-man" entry technologies
ex. "sewer system without manholes"
ex. robotics, remote control, etc.
- Executive management systems
- Standard definitions & terminology
- Activity based costing: process, understanding issue and integration of finance with engineering. Ex. Sustainability model for infrastructure
- Tools for consumers to understand the cost of usage.
- Web-based system for information about infrastructure
- Qualified labour: training, more partnerships, more applicable research, and value engineering (include certifications).
- Liability is becoming a major concern. Reduce liability through implementing quality management systems and/or standards.
- Increase fundamental understanding of material.
- Information/data that feeds policy papers.
- Adaptation of technologies from other sectors.
- Continue development of CALIBRATED NETWORK models assessment
 - to support decision makers
 - to address issues of reliability
- Barriers to implementations:

- legacy of past decisions
 - trying to adapt new approaches to stay ahead of wave
- Quantify "sustainable" level of infrastructure:
 - "How infrastructure is actually needed"
 - Demand management
- For LCC - What are the "real" user cost/value?
- Influence of "externalities" on infrastructure.
- Lack of redundancies in "critical" components.
- Link optimum level of maintenance?
 - Enforce preventative procedures?
 - Enforce reactive procedures?
- Infrastructure management and funding: What are the "Carrots + Sticks"?
- All participants included in the delivery of good systems.
- "Ruggedness" (robustness) of technology.
- Dealing with "variables" (change).
- "Do not fear failure".

Discussion B: CIS Technology Challenges to Meet Needs

➤ **Uniform/Standardized methods of economic analysis** **Refer to Discussion A (Item #4)**

- Define objectives and the perspective
- Performance measures:
 - define
 - quantify
 - comparisons & trade-offs
 - social and/or economical benefits, ex. BC cost benefit assessment manual
 - process to determine "value" of measures
 - "skeleton tool" that can be customized
 - relatively simplistic and transparent(See AB Infrastructure - data collection)
- Data collection (private and/or centralized)
- "Cannot afford not to do"
- Various levels of sophistication based on available data (Top down approach)
- Include "sensitivity" of model (bounds, subjectivity)
- Output: define the best return on investment (ROI)
- Needs: inventory, function, interrelations
- Information on funding mechanisms
- Question: Full cost accounting or not? (ex. Training)

➤ **Infrastructure Management and Funding** **[Carrots & Sticks]** **Refer to Discussion A (Item #29)**

- Demand management tools
- Life cycle management benefits (ex. New Zealand)
- Technologies to measure (and then manage) demand
- User-pay technologies (measure use of service & costing it)
- Focus on "standardized" technologies
- Encourage "innovations"
- Cost saving information (comparisons of: technologies, service lives, etc.)
- Liability (use as a "toof")
- Vulnerability
- Can we learn from others?

➔ **Deterioration curves; improvement curves**
Refer to Discussion A (Items # 1 & 7)

- Deterioration models for materials & structures
- Data overtime – consistent
- Analysis geared to different levels of decision making
- risk/decision models
- inexpensive, reliable (calibrated)
- in-place technologies (ex. Liner for sewers)
- costing the technologies
- NDT/condition rating
- continuing monitoring (sensors that are inexpensive)
- "common language"
- common procedures
- costing models, investment models
- "Field" performance data for rehabilitation technologies
- system reliability
- low tolerance for failure: steps needed to "share risk":
 - How to measure risk aversion
 - Demonstration projects
 - Define the "value" of risk

➔ **LCC - Real Costs/Value**
Refer to Discussion A (Item #24)

- What are costs?
- Define costs (include discount rates)
- Challenge: measure life of assets
 - costs over life of asset
 - measure database
- Influenced by "level of service"
- Educate public that infrastructure has a life cycle
- National Action Plan Information:
 - New "sustainable" funding ("rate structures") models
 - watch for "burden" on municipality
 - alternative service delivery mechanisms (evaluations)
 - Planning Tools - integrated, adopted infrastructure asset management
 - inventory
 - processes for ROI
 - * "Recognize"/reflect instead of include
 - Strengthen institutions:
 - Education, training

- Communications
- Corporate structures
- Knowledge
- Governance
- Corporate structures
- Interactions (ex. Between partnerships)
- Need "stakeholders" (ex. Lobby) group
- To continue moving we must plan forward