

**Review & Analysis:  
Infrastructure Investment Tools & Methods  
in Relation to Northern and Rural Communities in Canada**

**Final Report**

**March 5, 2004**

**Prepared for:**

**Rural Secretariat  
Agriculture and Agri-Food Canada**

**Prepared by:**

**ECONEX**

**Consulting**

*Research Team:*

Ken Perlich  
Robert Greenwood  
Derek Brewin



Government  
of Canada

Gouvernement  
du Canada

**Canada**

## **Review & Analysis: Infrastructure Investment Tools & Methods in Relation to Northern and Rural Communities in Canada**

March 2004

Prepared by Econex Consulting

Prepared for the Rural Secretariat, Agriculture and Agri-Food Canada

*This information is provided free of charge to the public. It may be reused provided that it is accurately reproduced and the source is credited. Persons using this information agree to save harmless Her Majesty in right of Canada and all her representatives against any claim resulting from its use.*

*Any policy views, whether explicitly stated, inferred or interpreted from the contents of this publication should not be represented as reflecting the views of the Rural Secretariat, Agriculture and Agri-Food Canada or the Government of Canada.*

© Her Majesty the Queen in Right of Canada, 2004

To obtain additional copies, please contact:  
Rural Research and Analysis Unit  
Rural Secretariat, Agriculture and Agri-Food Canada  
1341 Baseline Road, Tower 7, 6th floor,  
Ottawa, Ontario K1A 0C5  
Fax: 1-800-884-9899  
E-mail: [rs@agr.gc.ca](mailto:rs@agr.gc.ca)

ISBN 0-662-40648-6, N° de catalogue A114-17/2005E-HTML  
Agriculture and Agri-Food Canada Publication Number 10042/E

Également offert en français sous le titre :  
*Revue et analyse : Outils et méthodes d'investissement en infrastructure pour les collectivités septentrionales et rurales du Canada*  
Agriculture et Agroalimentaire Canada N° de publication 10043/F

# Table of Contents

<b>TABLE OF CONTENTS .....</b>	<b>2</b>
<b>EXECUTIVE SUMMARY .....</b>	<b>3</b>
<b>1. OVERVIEW .....</b>	<b>5</b>
<b>2. COMMUNITY CHALLENGES &amp; OPPORTUNITIES .....</b>	<b>5</b>
<b>3. PURPOSE OF THE STUDY .....</b>	<b>6</b>
<b>4. RESEARCH APPROACH.....</b>	<b>6</b>
4.1 INTRODUCTION.....	6
4.2 LITERATURE REVIEW OF METHODS & A SEARCH FOR TOOLS.....	7
4.3 ASSESSMENT OF TOOLS.....	8
4.4 DETAILED ANALYSIS OF SHORT LIST .....	8
4.5 USER-BASED ANALYSIS OF SHORT LIST .....	9
<b>5. RESULTS .....</b>	<b>9</b>
5.1 SUMMARY .....	9
5.2 DETAILED ANALYSIS .....	10
5.2.1 <i>Categorization</i> .....	10
5.2.2 <i>Selected tools</i> .....	11
5.2.3 <i>Description &amp; Analysis of Short-Listed Tools by Investment Stage</i> .....	13
<b>6. CONCLUSIONS .....</b>	<b>34</b>
6.1 LOW-HANGING FRUIT & GAPS .....	34
6.2 GENERAL OBSERVATIONS .....	35
<b>APPENDIX A .....</b>	<b>A-1</b>
<b>APPENDIX B .....</b>	<b>B-1</b>
<b>APPENDIX C .....</b>	<b>C-1</b>

# Executive Summary

Given limited human and financial resources, rural and remote municipalities must make sound decisions regarding infrastructure investment. Sound decision-making can lead to substantial cost savings and improved service provision.

The objective of this study is to identify tools that can improve decision-making with regard to infrastructure investments in rural and remote communities. Once the search for infrastructure investment tools was complete, an analysis of the most promising tools was undertaken. The search and the analysis that followed had a purpose that was two-fold: 1) to find the most promising tools for use by rural and remote communities and 2) to detail gaps and opportunities that may be addressed by Federal and Provincial governments.

The search process found more than 200 tools. They are outlined in Appendix B (colour coded by investment stage). These tools cut across infrastructure types and community needs. More than 50 of the most promising tools were short-listed using a rating system that identified ease of implementation and impact on communities. This ranking was done twice (once by the research team and once by an independent panel of community developers and planners – The Ground-Truthers). Once the ranking process was complete, the Federal-Provincial Steering Committee reviewed the list of selected tools. After some discussion, and noting that further information on some of the tools would be difficult to acquire, further analysis was completed on a number of tools and groups of tools outlined in section 5.2.3 of this report.

## *Results*

Three comprehensive tools that provide assessment, planning, and implementation of infrastructure investments were found, they include The National Infrastructure Guide, Alberta's MIMS and Ontario's REDDI program.

A wide range of reference materials was available from various sources. While these instruments offer sound advice, most lacked focussed efforts to provide usable infrastructure investment tools to communities.

There is a wealth of easily implemented planning tools. The most important of these appears to be the regional planning structures.

Many implementation tools were found. However, given the range of uses and the number of tools identified it was difficult to assess each of these tools specifically. There appear to be some gaps (performance evaluation tools are lacking).

## *Conclusions*

For the most part, there is a wide range of infrastructure investment tools that are for use by communities in rural and remote areas.

The greatest need appears to be a requirement to inform communities of the tools that are available to them. If a community does not realize that a particular tool exists, it is of little use.

Another need is the requirement for further training of community leaders and administrators in the use of such tools. In order to be implemented, most tools require a minimal amount of expertise in terms of technical understanding or financial ability. This is the case regardless of the degree to which communities used outside expertise to assess, plan and implement infrastructure investments. A concerted effort to develop human capital in rural and remote areas would be beneficial.

While there are only a limited number of tools that are directed toward aboriginal and extremely remote communities, the tools that do exist can apply or be reworked to assist these areas. Remote communities face significant financial limitations concerning infrastructure assessment, planning and implementation. Aboriginal communities have additional requirements regarding cultural norms and specific societal needs.

# 1. Overview

The effort to prioritize, evaluate and implement infrastructure improvements in a community can be arduous, especially in rural and northern locations. Limited resources are often unable to meet the unlimited requests for physical and social infrastructure, while jurisdictional overlaps and gaps may intensify the frustration. For this reason it is essential to identify and assess various tools and methods that can assist community decision-makers in their efforts to prioritize, evaluate and implement the most appropriate infrastructure investments in a community.

This study identified and assessed over 200 tools and methods that could be used in rural infrastructure investment planning and implementation. The entire grid of tools was presented to a group of users and community development professionals in a Ground-Truthing Session (See Appendix A). This group was asked to identify “low hanging fruit”: tools that were easy to implement and/or that would have a high impact. Once a short list of tools was established the Federal-Provincial Steering Committee was asked to determine which tools should be assessed further. Roughly 50 tools were selected for further analysis. Criteria used to assess these tools included potential benefits and costs, as well as the “fit” with requirements for rural and remote communities.

What became apparent as the research progressed was that there are many easily available, high impact tools for rural communities to use in planning and implementing various infrastructure investments. However, it is often the case that community planners and authorities are not able to implement these tools. This is generally the result of a lack of information about the actual tools or limited understanding and training regarding the tools’ implementation. It is clear that the current resources dedicated to develop the new infrastructure investment tools is sufficient, though greater emphasis could be placed on ensuring communities are aware of these tools, their benefits and costs. In addition, greater emphasis on training and advice regarding the actual use of these tools would be beneficial.

Below we offer a more thorough description of our research and its findings.

## 2. Community Challenges & Opportunities

Every community has an inherent commitment to provide residents with opportunities to live, learn, work and play. Part of this commitment is met through infrastructure investments in healthcare, transportation, sewer / water, communication, education, economic development and recreation.

Given limited revenue availability, increasing capital costs and seemingly insatiable needs by residents, communities are steadily strained to provide adequate services. To alleviate this problem community leaders need tools that will allow them to provide the most necessary services in a cost efficient manner.

These limitations are particularly acute when viewed from the perspective of remote communities, jurisdictions with extremely low population densities and aboriginal communities. Remote communities have little capability to partner with neighbouring towns and villages to ensure adequate service to residents. Areas with extremely low population densities often lack the tax revenue to provide adequate levels of service and limited potential to agglomerate services given the critical mass required for infrastructure investments in areas like healthcare and education. Aboriginal communities have particular cultural needs and norms that may require extra efforts in planning and implementation of infrastructure investments.

Regardless, all communities must take stock of their assets, both physical and social. All communities must prioritize the needs of their residents. All communities must establish a plan that will meet those needs in an efficient and effective way. All communities must ensure adequate financing, sufficient human resources, and cost-effective procurement once the plan to invest in a particular piece of infrastructure is put into action. Finally, all communities must monitor the viability and performance of the infrastructure item once it has been built.

Tools exist to assist communities in these efforts. Our objective is to identify such tools and assess their applicability to rural areas.

### **3. Purpose of the Study**

To identify and assess the tools that are available to help rural and northern communities with physical and social infrastructure investments. Such infrastructure investments can enable growth, facilitate change and empower communities.

## **4. Research Approach**

### **4.1 Introduction**

Given a relatively short time frame, the research team along with a Federal-Provincial Steering Committee agreed that electronic searches of the Internet and scientific publications would give us a wide net to find possible tools in a short time. Personal contacts were also made as potential tools were identified. As the research team and staff identified tools they assessed each tool's primary use and attempted to assess its effectiveness by checking for various factors that are listed in detail below.

Once this list of tools was compiled the research team reviewed all of the tools and attempted to identify the most easily implemented tools and those that offered the highest positive impact. A short list was then presented to a group of Ground-Truthers (tool users and rural planners) for further feedback. Next, the designers/providers of each of

the tools in the short list were contacted for any information on evaluation of their tools and for a list of representative users. The feedback from these tool providers and their users, along with the information gathered during the Ground-Truthing Session and the grid creation process, were summarized. The information gleaned from these sources was used to develop our final conclusions and recommendations.

## **4.2 Literature Review of Methods & A Search for Tools**

The main objective of this part of the study was to identify methods, tools and information originating or implemented in various jurisdictions, including: Canada; United States; Australia; New Zealand; United Kingdom; and other member countries of the EU. In order to identify as many titles as possible from these jurisdictions, three different sources were employed: Internet sources, scientific journals and personal communication (by phone or e-mail).

Once identified, each title was catalogued according to the following information:

1. Name/Type of Tool
2. Description of the Tool
3. Title / Name of Policy / Program /Publication
4. Author / Contact Person
5. Date
6. Country / Region
7. Stage of Investment (Reference, Planning or Implementation)
8. Type of Infrastructure (Transportation, Utility, Social)
9. Purpose
  - a. Prioritization
  - b. Needs assessment
  - c. Financial models
  - d. Benefit/Cost analysis
  - e. Social impact
  - f. Other
10. Availability
11. Accessibility
12. Current Uses / Success Stories
13. Restrictions on Use
14. Advantages
15. Disadvantages
16. Barriers
17. Community
18. Capacity Required
19. Applicability to Rural Canada
20. Location (Metro, Rural, Remote)
21. Aboriginal Context
22. Value of Info / Tool
23. Web Source



Items 1 through 6 can be considered solely categorization elements. Items 7 to 9 provide more explanation of each tool/method and attempts to categorize them more consistently. Items 7 through 22 allow some assessment of each tool that assists in creating the short list of tools/methods that will be more fully examined in the assessment section of this study.

### **4.3 Assessment of Tools**

Under the direction of the Federal/Provincial/Territorial Steering Committee and the members of the Ground-Truthing session, the most promising tools were identified. Each of these tools was analyzed to assess their usefulness in assisting rural and northern communities in prioritizing, evaluating and implementing infrastructure investments.

The following questions were used to assess each tool:

- How useful is each tool for rural and northern communities? Differentiate among metro-adjacent rural communities, non-metro-adjacent and remote communities?
- How accessible is the tool? For example, does it require that communities have high-speed Internet access, or large sums of money?
- Is the tool useful and appropriate for First Nations communities?
- What level of capacity is required to use the tool?
- What are the advantages, disadvantages and barriers of each tool for rural and northern communities?
- Does the tool apply to single communities only, or is it useful for regions and communities working together?
- Is the tool applicable to all provinces and territories or only to some? What are the differences across provinces and territories?

### **4.4 Detailed Analysis of Short List**

In this step a short list of the most promising tools was chosen by the research team, in concert with the Steering Committee, for further assessment. These chosen tools were evaluated on the basis that they could be used in a Canadian setting to assist rural and northern communities in strategic planning, needs assessment, project viability, financing efforts and project evaluation with regard to rural infrastructure investment efforts.

All of the tools in the grid were subjected to a thorough review. A ranking analysis was conducted by each researcher, by the research team in concert, and by the participants of the Ground-Truthing Session (See Appendix A). Emphasis was placed on the following aspects of each tool:

- Current Success Stories
- Implementation and operational costs: direct and indirect
- Net benefits that accrue, and to whom
- Applicability to the Canadian Experience.
  - Assistance provided to Canadian communities

- Community capacity required
- Promotion of inter-community / inter-jurisdictional co-operation
- Potential for aboriginal participation
- Inclusion of smaller more remote communities

Note: These criteria can be considered normative; they were used by the research team to inform the steering committee as to each tool's:

- Ease of implementation
- Impact on communities.

These last two criteria were used to evaluate “low hanging fruit” that scored well for ease of implementation and impact. See Appendix A for the graphs showing the relative scores of each short-listed tool (includes that research team evaluation and the Ground-Truthers' evaluation).

## **4.5 User-Based Analysis of Short List**

To improve our assessment of the tools in the short list the remaining project time was budgeted to work through the tools in order to collect more information. Short listed tools were fleshed out and our evaluation confirmed, in consultation with:

- Company, developer, provider of tool
- One or more users of tool at community level
- Any independent evaluations, assessments of tool

# **5. Results**

## **5.1 Summary**

The final Grid is made up of 203 tools, categorized by type of infrastructure (see Appendix B). Applicable tools were found in Canada, the United States, Australia, New Zealand and Europe. Most of the tools were applicable to more than one type of infrastructure. There were 92 transportation related tools, and 85 utility related tools. Only 10 of the utility tools were not also transportation tools. There were 58 tools that were used on all types of infrastructure, 100 that address social needs like hospitals and schools, 88 tools that dealt with technology infrastructure like web access and 99 that dealt with other types of infrastructure.

Because of the repetition of tools across types of infrastructure we also looked at the way the tool was used as a key categorization. Tools were listed according to their use for planning and implementation and then within these two general categories, according to more specific uses. 22 of the tools were comprehensive in nature covering all stages of infrastructure development. 36 tools were considered reference guides that supported

various stages of investment but were not specific. 45 tools were designed for planning purposes and 100 tools facilitated infrastructure implementation.

It became apparent that a great many of the tools were planning tools that cut across types of infrastructure. It can be safely said that there are few gaps in planning tools. Even among remote and aboriginal communities, the few tools specific to these communities that we found were focused on gathering local input and information to make more comprehensive plans. There was also a wealth of reference materials that informed all stages of infrastructure investment. There were also very comprehensive infrastructure guides, like the National Guide to Sustainable Municipal Infrastructure, which offered tools to help communities plan, implement, monitor and evaluate their infrastructure investments. The National Guide even contained practical experience from people on the ground using these tools.

Most of the tools we found were described in detail directly on the World Wide Web. These tools are easily available and usually affordable in that sense. However, they often required significant investment in monitoring systems or other investments to be properly used. It was also clear that by far the biggest cost to implementing virtually all of the tools was expected to be the training of staff in tool use. Even when costly products like SASKBIZ are offered to rural communities for free, their use is hindered by lack of training at the community level.

## **5.2 Detailed Analysis**

### **5.2.1 Categorization**

#### **000 Across All Stages**

#### **100 Reference Materials**

110 Best Practices /Research Inventory / Portals

#### **200 Planning**

210 Regional Local Planning Process

220 Regional Planning Structures

230 GIS for Regional Planning

#### **300 Implementation**

310 Indicators / Development / Project Selection

320 Financial Tools

330 Training / education

340 Procurement Tools

350 Asset Management / Asset Mapping / Life Cycle Analysis

360 GIS for Engineering / Infrastructure

## **5.2.2 Selected tools**

The Detailed Grid (see Appendix C) includes 52 tools, categorized by investment stage.

### **000 Across All Stages**

- 001 National Guide
  - a) Formal Planning Tools
  - b) Strategic Planning
  - c) Information Management
  - d) Weighting And Ranking Priorization Models
  - e) Business Case Approaches To Priorization
- 002 REDDI
  - a) Project Implementation – Putting Plans into Action
  - b) Tracking Progress
- 003 MIMS
  - a) MIMS Self-Assessment
  - b) MIMS RFP Template
  - c) MIMS Spatial Recommendation
  - d) MIMS Data Gathering Cost Tool
  - e) MIMS Data Dictionary
  - f) MIMS Specifications
  - g) MIMS Application

### **100 Reference Materials**

- 110 Best Practices / Research Inventory / Portals
  - 111 InfraGuide CD (Reference material for the National Guide)
  - 112 Infrastructure Investment and Economic Growth – research paper
  - 113 Infrastructure Management – planning guide
  - 114 Publication Storehouse – [www.civicinfo.bc.ca](http://www.civicinfo.bc.ca)

### **200 Planning**

- 210 Regional / Local Planning Process
  - 211 Community Self Assessment
  - 212 Social Accounting Matrix (SAM)
  - 213 Village Appraisals for Windows Software Package
  - 214 Village Appraisals
  - 215 Aboriginal Community Management Plan Development
- 220 Regional Planning Structures
  - 221 Empowerment Zone & Enterprize Community (EZEC) Program
  - 222 CFDC's, REDA's, REDB's
- 230 GIS (Regional / Local Planning)
  - 231 Geographic Information Systems (GIS)
  - 232 SASKBIZ
  - 233 CommunityViz

**300 Implementation**

## 310 Indicators / Development / Project Selection

- 311 Federation of Canadian Municipalities (FCM's) Quality of Life reporting system
- 312 CMHC/Environment Canada's Sustainable Community Indicators Program (SCIP)
- 313 Inventory of National Rural Health Research
- 314 Social Benchmarking and Indicators
- 315 Benchmarking Local Government Services in Canadian Municipalities
- 316 Community Inventory
- 317 Local Agenda 21 Planning Guide
- 318 Aboriginal Infrastructure Program

## 320 Financial Tools

- 321 ACFA Debt Limit Worksheet
- 322 ACFA Loan Calculator
- 323 ACFA Borrowing Manual
- 324 Municipal Financing of Infrastructure
- 325 Infrastructure Costing Model
- 326 The Maintenance of Infrastructure and its Financing and Cost Recovery (See also #354)
- 327 P3 Guide – Industry Canada
- 328 Capital Budgeting

## 330 Training and Education

- 331 Service Excellence Programs/Training

## 340 Procurement Tools

- 341 Contracting Templates and Procurement Guides

## 350 Asset Mgmt / Asset Mapping /Life Cycle

- 351 Assets Map
- 352 Infrastructure Valuation and Depreciation Guidelines
- 353 Asset Management Planning
- 354 The Maintenance of Infrastructure and its Financing and Cost Recovery (See also #326)
- 355 Sustainable Building Assessment Tool

## 360 GIS (Engineering / Infrastructure)

- 361 Geographic Information Systems (GIS)

### **5.2.3 Description & Analysis of Short-Listed Tools by Investment Stage**

In this section, each tool is described briefly and an analysis is detailed. The analysis includes success stories, costs (direct, indirect, and community capacity required) benefits, and applicability to Canadian communities (especially smaller, remote, and aboriginal communities). The analysis also includes each tool's potential impact and ease of implementation according to the Ground-Truthers' evaluation.

The following descriptions and analyses are taken primarily from the websites that were searched. Given time constraints and contact limitations, telephone interviews were conducted for only a few of the tools noted below. These include the National Guide to Sustainable Infrastructure (001), the Municipal Infrastructure Management System (003) and SaskBiz (230).

Verification and further investigation of the remaining tools was completed through e-mail query, and should not be considered extensive or complete. Tool users were contacted in a cursory manner; third-person information was often used, as most direct users were unavailable. No independent performance evaluations of the short-listed tools were reviewed, since none were found. Notwithstanding these caveats, the text below gives a brief summary of the tools and the benefits that may accrue from their use, as well as an indication of the requirements that communities would need to implement them.

#### **001 National Guide to Sustainable Municipal Infrastructure**

##### **–Description**

The National Guide is a comprehensive tool that contains best practices regarding several areas of infrastructure development including municipal roads and sidewalks, potable water, storm and wastewater management, decision-making and investment planning, environmental protocols and transit. Currently 30 best practices have been published under the program and more topics are being considered. Content was created through consultation with stakeholders from Canadian municipalities. The National Research Council (NRC) and the Federation of Canadian Municipalities (FCM) provide funding for this program. Its official title is “Coordinating Infrastructure Works: A Best Practice By The National Guide To Sustainable Municipal Infrastructure”.

##### **–Analysis**

- **Current Success Stories**
  - There is no question that the content of the guide is of the highest quality, however, designers of the guide understand that the greatest obstacle to success is uptake and use of the information contained in the guide by communities and infrastructure practitioners across Canada.
  - To date, the guide has been most often used in urban centers, and those communities in close proximity to urban agglomerations.

- Implementation and operational costs: direct and indirect
  - FCM and NRC have covered the direct costs of developing the guide.
  - These direct costs have been defrayed by volunteer efforts to establish the guide. Professional infrastructure practitioners, community researchers and municipal officials share their information and best practices in the guide. As well, users of the guide are invited to share their expertise and experiences.
  - There is a commitment of time required by community officials to study the guide and understand its best practices.
  - Note that infrastructure professionals are available to assist communities in implementing the best practices in communities across Canada.
- Net benefits that accrue, and to whom
  - Given that infrastructure investments are long-term in nature, mistakes can be costly. For this reason the guide's approach is to allow users to learn from the experience of others. In doing so, the guide provides best practices that may allow community leaders to avoid costly mistakes and reduce any unwarranted costs to the taxpayers in a community.
  - Proper planning can produce dividends, both monetarily and in terms of resident satisfaction with service provision within a community.
  - The guide also allows community leaders to verify the recommendations of hired experts and practitioners, and leads decision-makers toward the simpler, more inexpensive solutions to infrastructure problems.
- Applicability to the Canadian Experience.
  - The guide uses Canadian expertise to develop best practices for the Canadian experience.
- Community capacity required
  - There is a need for users of the guide to be knowledgeable regarding the particular type of infrastructure being managed. This may be in-house expertise or take the form of hired consultants and engineers.
  - Limited computer skills would be an asset since the guide is available in web-based and CD-based versions. However, it is also available in hard copy.
  - A pilot project is being developed that would allow potential partner organizations to use the content of the guide to develop curriculaum for training efforts across Canada. This project may include teaching materials, sample exercises and an e-learning component that could allow for distance education and certification of community infrastructure practitioners.
  - The guide's staff understands that the training needs are twofold: an immediate need to educate and inform current practitioners of best practices in the field ("tailgate" sessions); and a more long-term approach that would allow use of the materials to teach planners and engineers in university programs (McGill University already uses the material).

- Promotion of inter-community / inter-jurisdictional co-operation
  - The guide does not specifically call for co-operation among communities. However, it is very unlikely that the guide would dismiss such efforts, especially if benefits are readily available from such co-operation.
  - The guide promotes networking between and among infrastructure experts and practitioners across Canada. This allows interested individuals to understand that all Canadian communities have similar problems regarding infrastructure provision, and allows those individuals to work toward common solutions.
- Potential for aboriginal participation
  - While there are no specific aspects of the guide relating to aboriginal communities, aboriginal communities would benefit from its use.
- Inclusion of smaller, more remote communities
  - The guide relates to all communities, there is no specific element of this tool regarding remote communities. However, some limited understanding of specific infrastructure is presumed to be present in the community.

## **002 REDDI (Project Implementation / Tracking Aspects)**

### –Description

The Rural Economic Development Data and Intelligence (REDDI) program provides five separate tools to assist in infrastructure decision-making and region development: 1) Socio-economic insight, 2) Analyze your economy, 3) Set strategies. 4) Implement projects, and 5) Track progress. However, only two aspects of this comprehensive tool have been selected for more detailed analysis, they are: Project Implementation and Tracking. The project implementation component allows communities to build business plans regarding their infrastructure investments. The tracking tool allows for performance measurement of each investment. This program is exclusively administered in Ontario, although its uses as an infrastructure investment tool could be applied across Canada.

### –Analysis

- Current Success Stories
  - None found.
- Implementation and operational costs: direct and indirect
  - Because the REDDI website and its contents are funded by the Government of Ontario, this tool can be used by communities at no cost.
  - The Province will provide Economic Development staff to assist in planning and monitoring efforts (for Ontario communities).
  - The Province will also provide some training (for Ontario communities).
  - There is a commitment of time and effort required by communities that use this tool.



- Net benefits that accrue, and to whom
  - Improved planning and tracking can produce dividends, both monetary and in terms of resident satisfaction with service provision, within a community.
- Applicability to the Canadian Experience.
  - REDDI is focused on helping rural communities in Ontario. However, the contents can be applied to rural and urban communities across Canada.
- Community capacity required
  - There is a need for users of this tool to be knowledgeable regarding the particular type of infrastructure being planned or monitored.
  - While extremely user-friendly, there is some need for limited computer skills since REDDI is available through the Internet.
  - While a high-speed Internet would be advantageous, saving time with regard to this tool, these benefits can be considered minimal and such an investment would not be necessary.
- Promotion of inter-community / inter-jurisdictional co-operation
  - This tool does not specifically call for co-operation among communities. However, the Government of Ontario would likely be amenable to assist in instances where additional benefits can be attained and limited disruption will occur from co-operation between municipalities.
- Potential for aboriginal participation
  - While there are no specific aspects of this tool relating to aboriginal communities, aboriginal communities would benefit from its use.
- Inclusion of smaller, more remote communities
  - The tool relates to all rural communities in Ontario, there is no specific element of this tool regarding remote communities.

### **003 Municipal Infrastructure Management System – Alberta**

#### **–Description**

Municipal Infrastructure Management System (MIMS) is a web-based tool designed to assist communities in collecting and evaluating data that will inform infrastructure investment decisions. It is made up of seven separate tools: 1) MIMS Self-Assessment, which allows a community to review its current resources and identify gaps in its data gathering capabilities. 2) MIMS RFP Template, a document that can serve as a guide in hiring consultants to collect the required data. 3) MIMS Spatial Recognition outlines best practices regarding data collection and maintenance. 4) MIMS Data Gathering Cost Tool allows communities to estimate the costs of data collection, depending on population base and data requirements. 5) MIMS Data Dictionary, which can assist communities in identifying core data requirements, intended for development of inventory and management systems. 6) MIMS Specifications outlines a set of guidelines with the purpose of establishing common data gathering standards. 7) MIMS Application, which stores all of a community's infrastructure data in a central location; it has reporting and graphical capabilities, which provide

information about your municipality's inventory, condition, functional adequacy and lifecycle status.

–Analysis

- Current Success Stories
  - At least 59 users of the MMS tool set, 49 Alberta municipalities and 10 engineering firms.
  - The City of Fort Saskatchewan uses MIMS in conjunction with GIS and other asset management tools.
  - The Oldman River Intermunicipal Services Agency (ORISA), is a shared planning resource that serves 18 communities and municipalities in southern Alberta. ORISA, and its member communities are working with MIMS staff to align land use information with MIMS databases and maps. This will allow an integrated planning effort, land use and infrastructure, for most of rural southern Alberta.
  - The town of Legal, Alberta is a community situated one hour north of Edmonton. It is an example of a small community (population is rough 1,000 people) that has implemented the MIMS tool set.
- Implementation and operational costs: direct and indirect
  - There is currently no direct cost to municipalities within Alberta for acquiring the MIMS tool set. However, MIMS is looking to becoming a self-funding entity, thus there are plans to charge back some or all of the organization's operating costs to communities that use the service.
  - The Government of Alberta has covered the cost of development in partnership with municipal associations, and the support of the Consulting Engineers of Alberta.
  - Municipalities are likely to already have the computer hardware required to run the tool set.
  - There are costs of collecting data and maintaining the database. In addition, municipalities are required to sign a licensing agreement in order to employ the MIMS software.
- Net benefits that accrue, and to whom
  - Four questions can be answered using the MIMS tool set:
    - What infrastructure do I own?
    - What is the condition of my infrastructure?
    - Where is my infrastructure ... in relation to other important information including land parcels, etc.
    - How much money can I expect data collection and data entry to cost?
  - Answers to these questions can assist municipalities in understanding the data requirements needed to make informed decisions regarding infrastructure investments

- As a result, the MIMS tool set can assist municipalities in meeting the service needs of a community with the appropriate infrastructure investment. This is done by better informing planning activities and ensuring the implementation of the most cost-effective investment strategies.
- As well, given the attrition and the possibility of employee turn-over, the specific information of each piece of infrastructure may be better stored in a database, rather than in the mind of the local engineer or administrator.
- Applicability to the Canadian Experience.
  - MIMS is focused on helping communities in Alberta. However, the contents can be applied to communities across Canada.
- Community capacity required
  - MIMS is designed for communities with population of at least 400 people. The tools are designed for small to medium-sized communities. For the most part, the interface with existing software packages is relatively straight-forward.
  - Administrative and engineering staff with database and data collection experience would be beneficial. As well, high-speed Internet would be beneficial, but is not necessary
  - Although additional expertise is often required to assist in database building and proper data collection procedures, for example, closed-circuit cameras can be used to inspect water lines, but outside expertise would likely be needed to interpret the images.
  - An existing infrastructure inventory would be a head-start for communities.
  - Six types of training sessions are available from MIMS staff. They range from a simple overview to a full course on the functioning of GIS. The time required is between a half-day and one-and-a-half days. Training is moving from in-community sessions to regional sessions, usually held in Edmonton or Calgary.
- Promotion of inter-community / inter-jurisdictional co-operation
  - This tool does not specifically call for co-operation among communities. However, the Government of Alberta would be amenable to assist in instances where additional benefits can be attained and limited disruption will occur from co-operation between municipalities.
  - Note the ORISA example above.
- Potential for aboriginal participation
  - While there are no specific aspects of MIMS relating to aboriginal communities, aboriginal communities would benefit from its use.
- Inclusion of smaller, more remote communities
  - MIMS is focused on serving the needs of all communities in Alberta; as a result there is no specific element of this tool regarding remote communities.

## 110 Best Practices / Research Inventories & Searchable Web Portals

### –Description

This category is a combination of several of the best reference materials found in the search for infrastructure investment tools. The list in Appendix C consists of two journal articles and one searchable web portal:

“Investing in Rural Infrastructure” – a paper that examines the relationship between infrastructure investment and economic growth.

“Local Tools for Smart Growth” – a paper that outlines best practices regarding needs assessment, infrastructure costing, taxation and project funding, as well as public consultation procedures. A number of case studies are cited in the paper. The paper also contains sections on strategic planning and transportation.

[www.civicinfo.bc.ca](http://www.civicinfo.bc.ca) – a searchable website that allows individuals and communities to obtain information regarding the prioritization, evaluation and implementation of various infrastructure investments. While there are a number of other searchable websites listed in the general grid (Appendix B), this particular website was deemed to be a representative example of this type of tool.

### –Analysis

- Current Success Stories
  - No specific success stories are noted here.
- Implementation and operational costs: direct and indirect
  - Given that these resources are already in the public domain, no direct cost is applied to communities that use these tools.
  - However, there is an extensive time commitment involved in search out and reviewing the documents / search engines outlined in this category.
  - There is one drawback that exists: such enormous volumes of information are easily accessible, which may lead to information overload.
- Net benefits that accrue, and to whom
  - The benefit from this type of resource is the increased human capital that can be gleaned from this type of tool.
  - Greater dissemination of best practices will encourage more informed choices in infrastructure investment at the community level.
- Applicability to the Canadian Experience.
  - Reference material and search engines contained in this category originate from various locations around the world. Each has particular resonance to the Canadian experience.
- Community capacity required
  - Some reference materials will require technical training to understand, although the greatest requirement is a willingness to learn.
  - Use of search engines will require computer literacy and a web connection.

- Promotion of inter-community / inter-jurisdictional co-operation
  - Not applicable.
- Potential for aboriginal participation
  - While we have found no specific aspects of these resources relating to aboriginal communities, they may exist in some searchable form. Note that aboriginal communities would still benefit the use of these resources.
- Inclusion of smaller, more remote communities
  - These resources can be used in any community.

## **210 Regional / Local Planning Process [planning / capacity]**

### –Description

This category contains several different types of tools that can assist in the planning process, and allow communities to determine their current infrastructure situation, with particular emphasis on identifying gaps and critical maintenance requirements. The four tools that have been chosen for further assessment are:

- Community Self-Assessment
- Social Accounting Matrix
- Village Appraisals (for Windows and non-computer use)
- Aboriginal Community Management Plan Development

### –Analysis

- Current Success Stories
  - Because these tools are most often used for overall development planning, no success stories that pertain specifically to infrastructure planning were found.
  - While these four tools were chosen, there are many tools that outline a planning procedure and a tremendous amount of know-how in this area, in Canada and around the world.
- Implementation and operational costs: direct and indirect
  - These tools require a substantial commitment of time and money on the part of the community that undertake them. The actual expenditure will depend on the data requirements and the extent of the survey being proposed. It is very likely that communities would hire professional help in developing surveys and plans.
  - Not only are there significant direct expenditures, there is also a requirement that residents give of their time and effort to complete surveys and offer input into consultation processes.
- Net benefits that accrue, and to whom
  - Identifying your community's current situation regarding infrastructure or development, and establishing real goals and action plans are activities that will pay dividends. Residents will better understand where their community is headed and why.

- Applicability to the Canadian Experience.
  - While some of these tools are from Europe, most are straight forward planning tools, applicable in any country.
- Community capacity required
  - Money, time, commitment to the process are all needed, this may not be available in some communities
  - If communities decide to go it alone (without professional assistance), a great deal of community expertise will be required regarding the process and the particular infrastructure types.
- Promotion of inter-community / inter-jurisdictional co-operation
  - While not overtly stated as an aspect of any of the tools noted above, given the resources required and the regional nature of some infrastructure investments, this type of co-operation may be wanted and needed.
- Potential for aboriginal participation
  - While Aboriginal Community Management Plan Development is titled as an aboriginal assistance program, the instructions provided appeared to apply to any community.
- Inclusion of smaller, more remote communities
  - These resources can be used in any community.

## 220 Regional Planning Structures

### –Description

This category contains examples of regional planning authorities. While the search used many of these organizations as sources, it was not until the compilation of search material that these organizations were categorized as a type of tool. Just a few examples of these organizations include REDA's in Saskatchewan, REDB's in Newfoundland and CFDC's across Canada. Of course, this list omits many of the general and sector-specific regional planning authorities that are apparent in each province in Canada and in most sub-national jurisdictions in developed countries.

### –Analysis

- Current Success Stories
  - While regional development planning structures have been noted as successful examples, there are many infrastructure specific success stories. These include hospital boards, education boards, transportation planning boards, land-use planning initiatives, as well as gas-line, potable water and other utility co-operatives.
- Implementation and operational costs: direct and indirect
  - These tools are often supported by provincial or federal dollars.
  - They do require a substantial commitment of time and money on the part of the communities involved.

- The actual expenditure will depend on the infrastructure being planned and the number of communities involved.
- It is very likely that communities or groups of communities would hire professional help in developing surveys and plans.
- Not only are there significant direct expenditures, there is also a requirement that each community may be asked to forego some powers that may have previously been the purview of the individual community.
- Residents and community leaders must give of their time and effort to ensure that such structures are established and sustained.
- Net benefits that accrue, and to whom
  - Often communities are unable to afford adequate levels of infrastructure. If communities work together service levels may be expanded by spreading out the fixed costs of the infrastructure investment.
- Applicability to the Canadian Experience.
  - These structures exist in most parts of Canada.
- Community capacity required
  - A willingness to work with neighbouring communities.
  - Some form of technical expertise is usually required.
- Promotion of inter-community / inter-jurisdictional co-operation
  - This is the essence of these structures.
- Potential for aboriginal participation
  - While such structures are not specifically designed for aboriginal communities, they are applicable in such instances. They may also foster co-operation between aboriginal and non-aboriginal communities.
- Inclusion of smaller, more remote communities
  - These structures can be used in any community. However, more remote communities may need to partner with federal or provincial government to establish such structures.

## **230 GIS for regional / local planning**

### **–Description**

This category includes Geographical Information Systems (GIS) that can assist communities in identifying needs and planning potential infrastructure investments. Three separate GIS tools that are detailed here are: Arcview software, SaskBiz, and CommunityViz.

Arcview is one particular software maker that designs GIS applications for use in community planning efforts, including infrastructure planning. CommunityViz, aligned with ESRI Canada, this software assists communities in making better land use decisions. SaskBiz allows site selection for potential businesses in Saskatchewan. It can also be used to compare physical and social infrastructure across communities or administrative regions. Planners may use this information to gain an understanding of the existing infrastructure in a community or set of communities. The following analysis focuses primarily on the SaskBiz tool:

## –Analysis

- Current Success Stories
  - The main focus of SaskBiz is to promote Saskatchewan locations to potential investors. The tool provides quality information to would-be investors so that sound decisions can be made regarding investment in, and operation of, new businesses.
  - SaskBiz also enables local and regional planners to identify the strengths located in their community and those attributes that might be found in neighbouring locations. This can lead to better planning in regard to economic and community development, as well as infrastructure investment.
  - SaskBiz provides up to 40 separate statistical indicators regarding: governance, demographics, economic base, financial data, labour criteria, amenities and utilities, on most locations in the province. In addition, there are text descriptions covering geography, history, economic base, community attractions and other themes are included for hundreds of communities and administrative areas. However, most northern communities have not provided any text information. In the coming months SaskBiz staff are intending to make a concerted effort to assist northern communities in uploading text descriptions of their community or area. There are also GIS capabilities that allow users to search for, and view, information in a map form.
  - Training and support services can be obtained through SaskBiz staff. The staff will provide website-user orientation (usually a 2-hour session) and support to information providers (those that provide the information for up-loading on the website).
- Implementation and operational costs: direct and indirect
  - Federal grants, provincial funding and private sector contributions to establish SaskaBiz have totaled between \$800,000 and \$1 million.
  - The SaskBiz tool is provided free-of-charge to municipalities in Saskatchewan. Communities can find information that is needed in community development and infrastructure planning at no charge. The data is presented in tabular and map form. This type of information may require some interpretation, thus staff or outside expertise may be required.
  - SaskBiz staff does the uploading of data, text and maps, but communities must provide the text information. This may also require some staffing commitment on the part of the community or administrative area.
  - Once an understanding of the current situation is achieved, the planning process itself may also require further commitments of staff and resources.
  - Note: CommunityViz is commercial, user-pay software.
- Net benefits that accrue, and to whom
  - Generally, GIS tools provide a visual understanding of the current and future state of infrastructure in a community.
  - As an example, the “SmartMap” included in the SaskBiz tool can show several levels of data concerning various statistical themes.



- Maps, tables & charts (outputs) facilitate presentation, education, and consultation.
- Applicability to the Canadian Experience.
  - GIS tools are available across Canada, though are more readily available in communities with greater population density. SaskBiz covers communities across Saskatchewan, though there is an effort to enhance the participation of northern communities.
- Community capacity required
  - Human capital: computer literacy, understanding of the software, in-house or hired technical capabilities.
  - Depending on the type of GIS software, significant dollars may need to be expended. This is especially the case if commercial software is employed.
- Promotion of inter-community / inter-jurisdictional co-operation
  - SaskBiz allows communities to work together in understanding the current state of affairs in a given geographical area. Reeves and mayors of a particular region can see the amenities available to their combined residents. For example, one community may have a swimming pool, while another has a skating rink. Community leaders may decide to share recreational facilities rather than invest in new recreational infrastructure; this would lead to a more efficient and effective outcome for both communities.
- Potential for aboriginal participation
  - While such tools are not specifically designed for aboriginal communities, they are applicable in aboriginal communities.
  - As mentioned above, there are plans to assist northern communities to become more fully involved in the SaskBiz process in the coming months.
- Inclusion of smaller, more remote communities
  - These structures can be used in any community with adequate funding.

### **311 FCM's Quality of Life Reporting System**

#### **–Description**

This tool allows communities to assess the effectiveness of their social and physical infrastructure. It includes eight criteria: community affordability, quality of employment, quality of housing, community health, community safety, community stress, community participation, and population resources. While currently applied in urban municipalities, this tool could be used in rural areas.

#### **–Analysis**

- Current Success Stories
  - The Federation of Canadian Municipalities (FCM) currently conducts a “quality of life” report for cities in Canada. The report is well received and FCM is considering requests to expand the report to rural communities.

- Implementation and operational costs: direct and indirect
  - Time and effort to fill out the survey.
  - Development dollars may be required to establish the rural version of this tool.
- Net benefits that accrue, and to whom
  - The tool provides a snapshot of issues facing Canadian communities. It allows communities to direct dollars to areas of greatest need.
  - The tool provides context for informed infrastructure decisions balancing social, environmental and economic concerns.
  - As mentioned, the tool is currently offered in select urban municipalities, but the effort may be extended to rural areas.
- Applicability to the Canadian Experience.
  - Yes, though this is currently an urban tool.
- Community capacity required
  - Minimal.
- Promotion of inter-community / inter-jurisdictional co-operation
  - Completed surveys may show that there is some overlap or gap in infrastructure provision in a particular region. Communities may band together to address these needs.
- Potential for aboriginal participation
  - The rural version of the survey would need to address issues that are important to aboriginal communities. To the degree that this can be accomplished, it will become an important needs assessment tool for aboriginal communities.
- Inclusion of smaller, more remote communities
  - Design of the rural survey would also need to take into account issues facing remote communities in Canada.

### **317 Local Agenda 21**

#### –Description

This is an assessment and participatory planning tool that focuses on ecological sustainability of cities and towns. It is a global effort that was established by the UN Conference on Environment and Development in 1991. Currently, the world headquarters of this UN initiative are located in Toronto, Canada. There are regional offices around the globe.

#### –Analysis

- Current Success Stories
  - There are various incarnations of this environmental sustainability tool in a number of regions of the globe. While it is focused on developing nations, there are some communities in the US and the EU that use this tool for environmental planning.

- Implementation and operational costs: direct and indirect
  - The time and effort to collect and assess data, and plan for environmental sustainability regarding potential infrastructure investments.
  - Development costs are borne by the UN; however, there are several publications and tools that are available on a user-pay basis.
- Net benefits that accrue, and to whom
  - Gives communities a framework with which to establish local environmental plans.
- Applicability to the Canadian Experience.
  - Yes. However, the tool has been focused on environmental sustainability in developing nations. As well, it is particularly suited to urban centers rather than rural and remote areas.
- Community capacity required
  - Minimal.
- Promotion of inter-community / inter-jurisdictional co-operation
  - The environmental aspects from this tool could be folded into a regional planning effort.
- Potential for aboriginal participation
  - Because this tool is global, this tool is likely not to overlook the cultural sensitivities that aboriginal communities may have regarding the environment.
- Inclusion of smaller, more remote communities
  - Not designed for this specific purpose, but it would be applicable.

### **323 Borrowing Manual**

#### **–Description**

This tool assists communities in understanding the funding requirements of various infrastructure investments. It includes a loan calculator (determines borrowing costs of a particular loan amount) and a debt limit worksheet (determines maximum amount of debt that a community can service).

#### **–Analysis**

- Current Success Stories
  - Alberta municipalities use this tool to determine borrowing costs and debt capacity.
- Implementation and operational costs: direct and indirect
  - Minimal time and effort.
  - Data entry is very simple, and the tool completes the calculations.
- Net benefits that accrue, and to whom
  - This tool allows communities to accurately measure the amount of debt they will need to carry for one or more infrastructure investments.
  - It also details the overall ability of a community to carry debt.
- Applicability to the Canadian Experience.
  - Yes.

- Community capacity required
  - Some financial understanding would be helpful.
- Promotion of inter-community / inter-jurisdictional co-operation
  - Only in situations where two or more communities decide to finance a shared infrastructure item.
- Potential for aboriginal participation
  - Not specifically designed for aboriginal communities, though it is applicable to those situations.
- Inclusion of smaller, more remote communities
  - Not designed for that purpose, but applicable nonetheless.

### **326 Maintenance of Infrastructure & Financing**

#### **–Description**

This tool outlines planning, programming, budgeting, and management of infrastructure maintenance, as well as efforts to finance such maintenance. The tool is focused on cities in developing countries, but could be reworked to apply to rural settings in Canada.

#### **–Analysis**

- Current Success Stories
  - None found.
- Implementation and operational costs: direct and indirect
  - It is very likely that planning or technical professionals would be hired to undertake the planning and establishment of this type of infrastructure maintenance program in rural and remote communities.
- Net benefits that accrue, and to whom
  - Residents can be assured that existing infrastructure is being maintained and that a plan is in place to oversee maintenance costs and schedules of potential infrastructure investments into the future.
- Applicability to the Canadian Experience.
  - Yes, though the tool has previously only been used in urban settings in developing nations.
- Community capacity required
  - Some technical and financial expertise would be beneficial.
  - An understanding of particular pieces of infrastructure is needed.
- Promotion of inter-community / inter-jurisdictional co-operation
  - To the extent that infrastructure items are shared, like transportation and other linear infrastructure, inter-community co-operation may apply.
- Potential for aboriginal participation
  - Not specifically designed for aboriginal communities.
- Inclusion of smaller, more remote communities
  - Not specifically designed for remote communities.

### 327 Industry Canada's Guide Book for P3's

#### –Description

This tool outlines the efforts that must be undertaken to establish an effective P3 borrowing plan. It includes information on several topics: Team and project development, choosing a P3 model, developing an implementation plan, selecting a partner, as well as negotiation and legal issues. This publication was released by Industry Canada in 2001. The information in this publication has been reprinted numerous times by provincial and private organization during the intervening period.

#### –Analysis

- Current Success Stories
  - The town of Maple Ridge, B.C. has used this tool as a basis to write their own guide. While specific examples of communities using the tool were not identified, the availability of the information would suggest that communities have used this approach.
- Implementation and operational costs: direct and indirect
  - Significant costs accrue in each stage of the process to find a suitable P3 partner.
  - It is very likely that professional assistance would be required to undertake the efforts laid out in this guide.
- Net benefits that accrue, and to whom
  - This tool provides a step-by-step process for implementing P3 partnerships. This type of funding can alleviate current-year budget pressures, but this benefit may come at the cost of some local autonomy.
- Applicability to the Canadian Experience.
  - Yes.
- Community capacity required
  - A substantial degree of financial and expertise is necessary.
- Promotion of inter-community / inter-jurisdictional co-operation
  - Where extremely large investments, that may cover more than one municipality, are needed, a P3 solution could be proposed on a regional basis.
- Potential for aboriginal participation
  - Federal funding of infrastructure on reserves may render this tool not applicable.
- Inclusion of smaller, more remote communities
  - Most P3 partners are looking for positive returns and easily monitored investments. Remoteness may be a discouraging feature to potential investors.

### 330 Training & Education

#### –Description

Tools in this category provide human resource improvements, from both an infrastructure and general skills perspective. The tool found under this category is the Service Excellence Training Programs provided in Manitoba. Because this is a community-development training tool, a more general approach to the topic was used in the analysis outlined below:

#### –Analysis

- Current Success Stories
  - The Ground-Truthers suggested that there is a gap in the efforts to provide usable training and education tools to rural and remote communities.
  - There is also a tendency for communities to overlook this aspect of infrastructure provision. Given the fiscal constraints that face communities and the costs associated with training and education it is not surprising that communities may forego such expenses in lieu of other expenditures that may provide more concrete results.
- Implementation and operational costs: direct and indirect
  - Substantial costs can be expended on training and education.
  - Direct costs include enrollment and registration fees, as well as the cost of transportation to attend such courses,
  - Total costs may vary depending on the amount and specificity of the training.
  - Training must be provided to staff, as well as community leaders and decision makers
- Net benefits that accrue, and to whom
  - A more informed staff and executive will allow communities to develop and implement infrastructure plans using in-house resources. This can limit expenditures on outside expertise.
  - Given a critical mass of skills, staff member may be “hired-out” to surrounding communities to defray the costs of training and education.
- Applicability to the Canadian Experience.
  - Yes.
- Community capacity required
  - This is an effort to improve community capacity. However, it does require a significant budgetary and time commitment.
  - Community leaders must be committed to ongoing training and education into the future, a one-time training exercise will not suffice.
- Promotion of inter-community / inter-jurisdictional co-operation
  - As mentioned above, if a community’s staff members are particularly well trained they can be outsourced to neighboring communities.
  - Co-operative efforts may allow training courses to be conducted on a regional basis, rather than having remote communities send staff to urban centers for educational purposes.

- Co-operative efforts to send several staff members from a number of communities can defray the costs associated with training and education. However, each individual and community will have differing human resource goals.
- Potential for aboriginal participation
  - No training and education tools were found that specifically relate to the needs of aboriginal communities.
- Inclusion of smaller, more remote communities
  - Smaller communities may not have the capability to afford proper training for staff members.

### **340 Procurement Tools**

#### **–Description**

Tools in this category allow community leaders and municipal administrators to improve purchasing capabilities. The tool examined under this category is the Canadian Construction Association's (CCA) collection of contracting templates and procurement guides.

#### **–Analysis**

- Current Success Stories
  - Ground-Truthers suggested that this is an important gap in the efforts to provide usable tools to communities.
  - Currently, smaller communities do not use standardized contracts or practices when tendering and procuring construction or maintenance services. Efforts to inform all communities concerning proper procurement procedures are available, but often go unused, especially in smaller communities.
- Implementation and operational costs: direct and indirect
  - The tool is provided free of charge by the CCA to communities in Canada.
  - There is a small commitment of time and effort that is required to use this tool.
- Net benefits that accrue, and to whom
  - Costs savings are readily available from improved tendering and procurement procedures. As well, use of this tool may result in a greater degree of on-time delivery and increased quality regarding infrastructure construction and maintenance.
- Applicability to the Canadian Experience.
  - Yes.
- Community capacity required
  - Some understanding of contracting, negotiating and a degree of financial expertise is needed.
- Promotion of inter-community / inter-jurisdictional co-operation
  - Two or more communities may work together to put forth a tendering process on similar pieces of infrastructure. In such a situation it would be

- helpful for those communities to use the CCA guidelines as a basis on which to establish this type of co-operative effort.
- Potential for aboriginal participation
    - Aboriginal communities would benefit significantly from adoption of this tool. Currently very few use standardized procedures. The CCA has taken steps to allow for cultural differences in their tendering and contracting templates.
  - Inclusion of smaller, more remote communities
    - Small and remote communities can benefit from use of this tool. These communities are likely to receive a greater number of tenders using the CCA guidelines, resulting in more competitive bids.

### **350 Asset Mgmt / Asset Mapping / Life cycle**

#### **–Description**

This category applies to various tools that allow communities to monitor and manage particular infrastructure items that may be approaching the time when repair or replacement might be necessary. The following tools have considerable potential for adoption under this category:

- Strengthening Rural Communities:Tool #6 – Asset Maps (Australia)
- New Zealand Infrastructure Valuation and Depreciation Guidelines
- Asset Management Planning – (UK)
- The Maintenance of Infrastructure and its Financing and Cost Recovery – Tools to Support Participatory Urban Decision Making (UNCHS)
- Sustainable Building Assessment Tool – (South Africa)

#### **–Analysis**

- Current Success Stories
  - It is clear that a well-monitored piece of infrastructure is likely to be better maintained, and there is a greater potential for such items to provide greater benefit to the community in which they exist. Infrastructure that is poorly maintained or fully depreciated can result in extra costs and significant service impositions. It is in the interest of a community to ensure its existing infrastructure is checked regularly, is well maintained and is replaced on a reasonable schedule. As well, when planning new infrastructure, the efforts required to maintain and eventually replace the infrastructure must be considered.
- Implementation and operational costs: direct and indirect
  - These tools generally require a high degree of technical proficiency. This may include GIS, financial modeling or planning expertise. As such, it is likely that communities would need to hire an outside professional to undertake some of the efforts involved.
  - Most are publicly available, and Internet accessible, so that direct costs of acquisition are minimal.



- Net benefits that accrue, and to whom
  - Greater capability to monitor, manage and reassess infrastructure items and plans allow community leaders to keep abreast of changes in the infrastructure situation of their community. As a result, cost savings and improved service provision is likely to accrue to the residents.
- Applicability to the Canadian Experience.
  - Yes.
- Community capacity required
  - A substantial degree of financial and technical expertise may be necessary to employ these tools in an effective manner.
- Promotion of inter-community / inter-jurisdictional co-operation
  - Because these tools focus on a particular piece of infrastructure, it is likely that inter-community co-operation would be minimal. Only when shared infrastructure is being assessed or monitored would such co-operation be involved.
- Potential for aboriginal participation
  - While not designed to apply specifically to aboriginal communities, aboriginal communities can benefit from their use.
- Inclusion of smaller, more remote communities
  - Smaller communities may not be able to afford to implement these types of tools.

### **360 GIS for engineering / infrastructure**

#### –Description

This category includes Geographical Information Systems (GIS) that can be used on a daily basis by engineers and employees to work on particular infrastructure projects. The tool identified under this category is Arcview, though other commercial software systems are available.

#### –Analysis

- Current Success Stories
  - This type of tool is currently used with great success in numerous larger municipalities in Canada. It is used to enumerate, monitor, and assess various types of infrastructure. It can also layer infrastructure so that each piece of a community's infrastructure can be tracked. For instance, transportation, utilities, recreational facilities, hospitals, and schools can be delineated one map. The map can include various data ranging from utilization rates to maintenance schedules. Maps can be produced that are simple or complex, geographically specific or wide-angle representations.
- Implementation and operational costs: direct and indirect
  - Expenses can be substantial. Requirements include: hardware, software, staff and training.
  - Collection of data may also be arduous, depending on the complexity of the system and data required.

- Professional assistance may be required.
- Net benefits that accrue, and to whom
  - Improved operation of infrastructure can result in significant cost savings to the community.
  - Service levels may also improve from implementation of this type of tool.
- Applicability to the Canadian Experience.
  - Yes.
- Community capacity required
  - Some technical understanding of GIS systems is required.
  - When greater complexity is required, dedicated staff may be warranted.
  - A substantial degree of expertise in infrastructure operation is also necessary.
  - GIS training can be obtained through post-secondary institutions, though familiarity with particular software can be gained through short courses provided by the software developer or a third party.
- Promotion of inter-community / inter-jurisdictional co-operation
  - GIS tools are meant to foster inter-community co-operation, however they may assist communities in aligning operations of various modes of transportation, gas-lines, electrical lines and other linear infrastructure.
- Potential for aboriginal participation
  - While GIS tools are not specifically designed for aboriginal communities, they are applicable in such instances.
- Inclusion of smaller, more remote communities
  - Affordability is an issue.

## 6. Conclusions

### 6.1 Low-Hanging Fruit & Gaps

The three tools contained in the “0000” categorization (the National Guide, REDDI components and the MIMS program) can be considered low-hanging fruit. All of these tools are currently being implemented by Canadian communities, and are thus deemed to be low cost. They offer a wide range of utilities and are considered user-friendly.

Actions that may improve the efficacy of these tools include:

- 1) Greater awareness of the tools themselves.
- 2) Improvement in overall computing skills of staff and, to a lesser degree, community leaders through increased training and education.
- 3) Emphasis on short-course regarding the particular software employed by or encompassing the tool.
- 4) Additional resources dedicated to providing direction to community leaders so that they may better understanding all of the aspects of each tool. This is likely to entail short courses and one-on-one sessions, rather than a broad-based educational effort.
- 5) Enhanced understanding of technical features of the specific infrastructure pieces.

The reference materials portal (1000) categorization contains several useful publications. While easily accessible for most communities, they offer less significant benefits than most tools. This is because they are informational tools rather than utilities that are ready for implementation. As for the searchable web sites, there appears to be greater benefits here, though only to the extent that community authorities and administrators can find and use the information that they require. Information overload is a concern with this type of tool.

In order to gain the most from these tools, a community will need to dedicate the following:

- 1) A commitment to improving the skill base of its staff and community leaders.
- 2) Time and a limited amount of resources to study and understand the reference materials.
- 3) Staff time and computer capabilities (hardware, software, internet access) to allow searchable portals to be used to the fullest in an effort to identify best practices relating to infrastructure investments.

There were many tools identified under the planning category (2000). Of note are the significant benefits that can result from the planning classification that concerns regional planning structures. These regional structures allow for co-operation among municipal governments and between levels of government. While the analysis focuses on regional economic development structures, the greatest benefit may result from implementing

more sector-based structures (eg. Regional Transportation Authorities, Regional Healthcare Authorities, and Regional Education Authorities).

To use these types of tools to their greatest potential, communities must:

- 1) Fully commit to a planning process as it relates to infrastructure investment.
- 2) Provide staff with adequate resources to develop such a plan. This may include time, money, computer equipment, and Internet capabilities. In addition, education of staff members in the area of planning best practices and computer training would be needed.
- 3) Further commit to work with other communities in order to establish regional planning efforts to assess needs, implement actions and evaluate performance of infrastructure investments on a co-operative basis.

While a wide-range of tools was found in the implementation (3000) categorization, there appears to be several gaps. Based on the Ground-Truthing Session, the procurement guide, the borrowing manual and some of the life-cycle management tools appear to be the most useful implementation tools for rural and remote communities. While a wide range of benchmarking tools and indicators were identified and assessed, performance evaluation tools seem lacking.

Community leaders looking to implement these tools need to:

- 1) View infrastructure investments as a long-term commitment rather than a one-time expenditure.
- 2) Understand that staff and executive training are long-term investments not just expenditures.
- 3) Expand staff training to foster technical, computer and financial expertise.
- 4) Commit to fiscal responsibility and performance evaluation as the normal course of business.

## **6.2 General Observations**

- Additional revenues (improved tax-fields, federal and provincial grants and other forms of income) are needed to ensure that rural and remote communities have wherewithal to undergo the substantial changes required to improve their planning, assessment, implementation and performance evaluation of new and existing infrastructure investments.
- None of the tools identified contained barriers to aboriginal communities and remote municipalities. However, there were only a few tools that were specifically designed for aboriginal communities and remote communities.
- Tools are only beneficial when utilized properly. Throughout this project researchers were told that:
  - Often tools that are made available are under-utilized, even those that are relatively simple to employ. Community administrators and authorities

must be better informed of such tools and a concerted effort to educate potential users of the benefits of existing tools is needed.

- When tools are more complex, local authorities and administrators may require assistance to implement their use. There is a need for advisory services so that communities can achieve the greatest benefit from new and existing tools.
- A very important requirement for communities to make better use of existing tools is for the provision of greater training and advisory support services.

## APPENDIX A

**Ground-Truthing Session  
Regina, Saskatchewan  
January 19, 2004****MEETING NOTES**INTRODUCTIONS:*Ground-Truthers:*

- \*1) **Craig Pollett**, Executive Director, Newfoundland and Labrador Federation of Municipalities  
ph: 709-753-6820  
e-mail: [cpollett@nlfm.nf.ca](mailto:cpollett@nlfm.nf.ca)
- 2) **Bob Grodzik**, Manitoba Govt, working in Winnipeg Regional Government  
ph: 204-945-5720  
e-mail: [bgrodzik@gov.mb.ca](mailto:bgrodzik@gov.mb.ca)
- 3) **Manley McLachlan**, Executive Director, Saskatchewan Construction Association  
ph: 306-525-0171  
e-mail: [manleym@scaonline.ca](mailto:manleym@scaonline.ca)
- 4) **Dennis Belliveau**, IRAP Officer, Construction Industry, National Research Council  
ph: 306-525-0171, Ext 14  
e-mail: [dennis.belliveau@irap.nrc.ca](mailto:dennis.belliveau@irap.nrc.ca)
- 5) **Bland Brown**, working with municipalities around the province re: the Guide.  
Formerly, City Manager for Regina  
ph: 306-949-9536  
e-mail: [bland@sasktel.net](mailto:bland@sasktel.net)
- 6) **Bill Spring**, Saskatchewan Industry & Resources (Our Host)  
ph: 306-787-2225  
e-mail: [bspring@ir.gov.sk.ca](mailto:bspring@ir.gov.sk.ca)

\*Mr. Pollett could not attend as a business matter arose at the last minute. He will be sending a review of the Grid in the coming days.

*Research Team:*

Ken Perlich, Rob Greenwood & Derek Brewin

REVIEW:

Ken reviewed the project, its methods and procedures, as well as work to date.

ROUGH RANKING:

- 1) National Guide to Sustainable Municipal Infrastructure (27)
- 2) GIS for engineering / infrastructure (27)
- 3) Municipal Infrastructure Mgmt System – Alberta (26)
- 4) Indicators [eg. FCM-Quality of Life Reporting System] (24)
- 5) Best Practices / Research Inventories / Portals (24)
- 6) Asset Mgmt / Asset Mapping / Life cycle (22)
- 7) Regional / Local Planning Process [planning / capacity grouping] (20)
- 8) CMHC Borrowing Guide (20)
- 9) Local Agenda 21 (19)
- 10) Project Implementation / Tracking [REDDI] (19)
- 11) Regional Planning Structures [REDA's, CFDC's, REDB's] (18)
- 12) Costing Model (18)
- 13) Health Impact Assessment Tool (18)
- 14) Toolkit for Telecomms (17)
- 15) CMHC Guide Book for P3's (17)
- 16) Maintenance of Infra. & Financing (17)
- 17) GIS for regional / local planning (16)

Bracketed numbers at the right signify the research team's overall ranking or the tool (out of a total score of 30).

SWOT:

## 1) National Guide

- This Tool contains decision-making and technical components
  - Decision making aspects are useful for all municipalities and all infrastructure types
  - Technical aspects vary by type of infrastructure:
    - - i. Water
      - ii. Sewer
      - iii. Pavement
- and size of municipalities.
- However, smaller communities are more likely to use consultants ... this makes adoption of such tools easier.

Impact = 8

Ease of use = 6 (or better depending on capacity of municipality and use of consultants)

## 2) GIS for Engineering / Infrastructure

- Utility mapping is a good opportunity, but as a planning tool ... not so much.
- Weaknesses: lack of data and skilled practitioners.
- If data and design are in place, becomes a more powerful tool.
- Not the best for remote municipalities.
- We have a technology that outstrips the skill level of local operators.
- Is there enough commitment to get GIS out to communities in a form that can be used -- needs to be more than just usable.
- Manley's story: ... "But the dogs won't eat it."
- Start with people => process => technology, do not start with technology.

Impact: 8 if used

Ease: 3 (hard to get people to use at the local level) -- as low 1



### 3) MIMS

- Nobody is expert on this item at the GT Session.
- May be a data tool only.
- Address issues with current users
- Saskatchewan may have some of these pieces (check it out)
- Research Team should ask current users (eg. Municipalities) if they are satisfied with the tool.
  - i. Benefits that accrue from use
  - ii. Why do they like (dislike) the tool
  - iii. Size and location of municipality
  - iv. Scope of use: data only?

Impact: No Rating

Ease: No rating

### 4) Indicators

- Maybe no application to rural
- Quality of Life – noise, smell, all others are issues that count on every decision by a municipality (including infrastructure decisions)
- Something about baby-boomers spending on flooring
- Quality of life indicators can be important to decision-making at a political level.
- Important measure of more than just physical infrastructure
- Quality of life is one aspect of overall indicators
  - i. Quality of life indicator will not stand on its own (need others)

Impact: 4 to 7 on overall indicators

Ease: ? - depends on indicators established

### 5) Best Practices Portals / References

- Bland hands out the “Infraguide” CD
- Impact and ease depends on the user-friendliness
- Reliability of the source (i.e., quality info)
- At the community level, it is hard to get people with time and expertise to interpret the information found in these sources.
- How do we hold eyes to screen, or get eyes to screen
- Key: network; person to talk to

Impact: 5

Ease: 5

## 6) Asset Management et al

- Huge impact, but tough to implement.
- May be related to MIMS in scope.
- Aboriginal infrastructure is pretty new (much of it has been built very recently) ... therefore window of opportunity.
- Blends with GIS.

Impact: 8

Ease: 3

## 7) Regional / Local Planning Process

- Some ability to plan in communities is necessary.
- Tough for small communities to perform this type of planning.
- Critical to all the other tools, but how do you manage this type of tool?
- A political challenge.
- How to avoid top-down control? Especially when funding is from above.
- Grassroots: most important aspect.

Impact: 7

Ease: 6

## 8) CMHC Borrowing Manual

- This item should be grouped into a package of financial tools, including:
  - i. The borrowing manual
  - ii. P3's (see CCDC)

## 11) Regional Planning Structures

- Collaboration is tough, needs to happen.
- Who's putting the money in?
- Could cause a skewed impact across the region.
- Too much current turf protection right now.

Impact: 7

Ease: 4 -- Political and political barriers to overcome

NEW ITEMS:*\*Training and education*

For local administrators and operators and counselors, on municipal government an infrastructure

Relates to ease of impact

Impact: 9.5

Ease: 8 (just time and money)

*\*Procurement (CCDC as an example)*

Impact: 6/7 maximize dollars spent

Ease: 8

*\*Other: Project implementation -- lots of need*GAPS:

Aboriginal population is growing at a faster rate than the total population of Canada (especially in rural and remote areas) ... why are there no specific infrastructure decision-making tools for aboriginal communities?

When asked whether any of the above tools were inappropriate for use in aboriginal community, the ground-truthers did not see any barriers to such use. However, they did note that aboriginal communities had specific social and cultural needs that may be overlooked by traditional decision-making tools. (eg. Aboriginal employment may be as critical a factor in an infrastructure investment decision as the overall cost or the rate of return.)

THE CHALK BOARD:

Bob: implementation and evaluation tools are limited in the Grid.

Manley: Remote/Aboriginal  
Most of the tools here are irrelevant ...need to understand culture and environment; huge cultural and social differences in aboriginal communities:

- Funding sources differ
- No taxes

Denis: Remote doesn't mean no road links; can have remote road links.

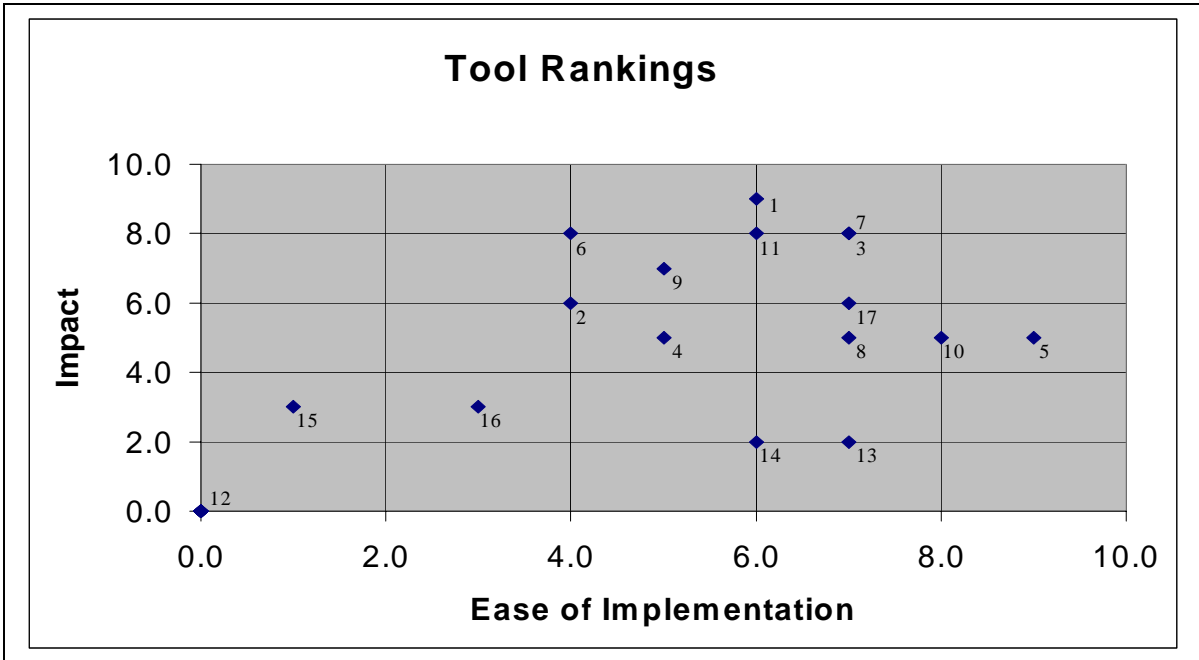
Bob: Investment in physical infrastructure has social impacts

Manley: Procurement  
Interpretation Guides / Standard contracts are available through the Canadian Construction Documents Committee (CCDC). Generally rural and remote communities have very limited knowledge of the procurement and contracting aspects of infrastructure investment.

Bland: Assessment of need by communities for each tool.

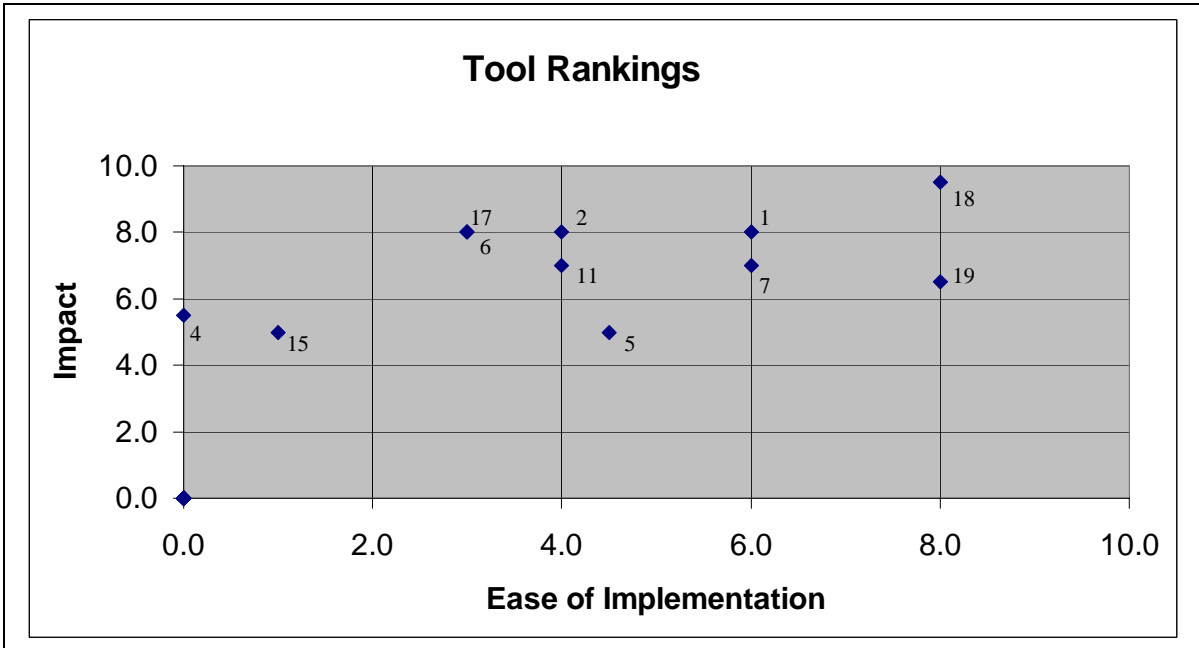
Denis: Where is "use of consultant" as a tool? [fits under ease of implementation]

**Research Team’s Preliminary Rating**



#12 – Insufficient information given.

**Ground-Truthers’ Rating**



#3 – More information is needed to make an appropriate assessment.

#4 – Ease of implementation depends on indicators used.

#8 – Combine this tool with other financial tools (with #15) and reassess.

#9 – Omitted. #10 – Omitted. #12 – Omitted. #13 – Omitted. #14 – Omitted. #16 – Omitted.

## RECOMMENDATIONS:

The Research Team recommends that the following tools be selected for further research:

- |     |  |                |
|-----|--|----------------|
| 1)  | National Guide to Sustainable Municipal Infrastructure           | ✓              |
| 2)  | GIS for engineering / infrastructure                             | ✓              |
| 3)  | Municipal Infrastructure Mgmt System – Alberta                   | ✓              |
| 4)  | Indicators [eg. FCM-Quality of Life Reporting System]            | ✓              |
| 5)  | Best Practices / Research Inventories / Portals                  | ✓              |
| 6)  | Asset Mgmt / Asset Mapping / Life cycle                          | ✓              |
| 7)  | Regional / Local Planning Process [planning / capacity grouping] | ✓              |
| 8)  | CMHC Borrowing Guide   | COMBINE w/ #15 |
| 9)  | Local Agenda 21  | ✓              |
| 10) | Project Implementation / Tracking [REDDI]                        | ✓              |
| 11) | Regional Planning Structures [REDA's, CFDC's, REDB's]            | ✓              |
| 12) | Costing Model  | OMIT           |
| 13) | Health Impact Assessment Tool                                    | OMIT           |
| 14) | Toolkit for Telecomms  | OMIT           |
| 15) | CMHC Guide Book for P3's   | COMBINE w/ #8  |
| 16) | Maintenance of Infra. & Financing                                | ✓              |
| 17) | GIS for regional / local planning                                | ✓              |
| 18) | Training & Education Tools (GT Session)                          | ✓              |
| 19) | Procurement Tools [CCDC standards] (GT Session)                  | ✓              |