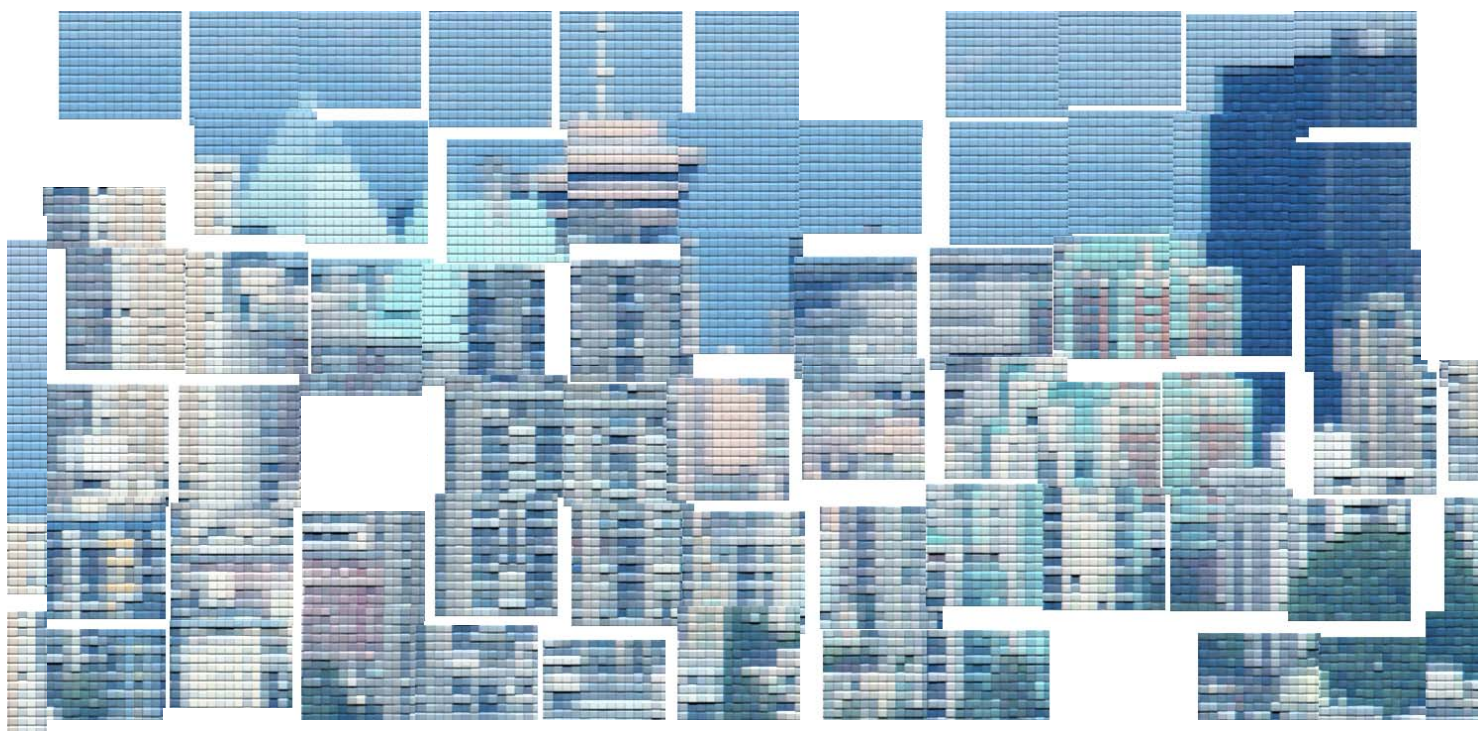**Sustainable Cities**

city-to-city learning

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Edited by: Natalie Ethier

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Over 50% of the world's population lives in cities, and although covering only 3% of the world's land mass, they consume 75% of the world's resources and emit a corresponding proportion of greenhouse gas emissions.

Infrastructure Canada

This paper provides an overview of how cities learn in the Sustainable Cities: PLUS Network. It has been compiled through participant observation and a survey of members of the Network. The structure of the report provides an overview of the Network, a literature review of organizational learning, and then outlines some of the key characteristics of learning organizations, with a particular focus on local government and the role of networks in helping to generate, disseminate and store knowledge. Barriers to learning are also explored. The survey results are presented and analyzed and further observations made based on the experience of the International Centre for Sustainable Cities and PLUS Network members. The implications for the Network are identified as are areas in need of further research.

Contents

Striving to create "...organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to see the whole together"
(Senge 1990)

The research for "City to City Learning" was undertaken to examine questions around how cities learn about urban sustainability in order to identify ways to accelerate the transfer of knowledge. The research focused on cities within the Network and was supported by Infrastructure Canada and The Canadian Chair in Sustainable Communities at Royal Roads University.

The Sustainable Cities: PLUS Network

The Sustainable Cities: PLUS Network is a network of over 40 cities and regions from around the world that share their learning and best practices about integrated long-term planning and sustainability demonstration projects. PLUS is an acronym for Partners for Long-term Urban Sustainability. The Network was founded by the International Centre for Sustainable Cities (ICSC) in 2004, with the goal to catalyze action on urban sustainability in cities around the world by accelerating the transfer of learning, knowledge and research from city to city.

PLUS Network members commit to building on their existing planning processes through the use of a long-term lens. While each city's approach is different, the process typically includes developing 50 to 100-year visions, with 30-year strategies, and 5-year implementation plans. The city or region also identifies an immediate demonstration project that shows how they are progressing toward their long-term goals. Members participate in regular peer exchanges, biennial conferences, training events and facilitated web dialogues, giving them opportunities to share their work and learn from one another's experiences. It is expected that over a number of years the collaborative experience will result in more resilient cities better able to respond to economic, ecological and social shocks and stresses.

Since the launch of the network in 2004, ICSC has served as the secretariat, and Dr. Nola-Kate Seymoar, President and CEO, has served as the principle participatory action researcher, reflecting back to the network the emerging lessons observed by herself, ICSC staff and PLUS Network members. Her observations have been shared with network participants, discussed at peer workshops, training events and conferences. The PLUS Network's generic planning cycle resulted from this process and is an example of the Network's participatory action research.

In the fall of 2008, a questionnaire was used at the Durban 2008 PLUS Network biennial conference to obtain initial information about how member cities learn. The data gathered provided momentum for ICSC to engage graduate students to undertake further research to gain a broader perspective on the issue. A second and more focused survey was conducted in May 2009. This paper provides an overview of the literature and the results of the second survey. It focuses first on cities as learning organizations and then on networks as vehicles for the transfer of knowledge. The results are consistent with those from the pilot survey. This paper is just one step towards understanding how cities learn in general, and how to facilitate their learning and stimulate further research about urban sustainability, in particular.

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[1]The Sustainable Cities Planning Cycle can be downloaded from the Sustainable Cities: PLUS Network website at
http://sustainablecities.net/docman-resources/cat_view/110-resources/98-urban-sustainability-planning-a-implementation

18 of the respondents identified their location. The following 11 Canadian cities and regions were represented: Iqaluit, Ottawa, National Capital Commission, Vernon, Whistler, Calgary, Cochrane, Regina, Niagara Region, and Canmore. This represents 59% of the Canadian members surveyed and 56% of the Canadian PLUS Network members. Responses included large, medium, and small, remote and aboriginal communities. Thus it can be viewed as a representative sample of the Canadian members of the Network. Of 12 international cities surveyed, responses were received from seven cities: Chihuahua and Colima (2 cities from Mexico), Adelaide (Australia), Durban (South Africa), Montpelier and Olympia (2 cities from the USA) and Curitiba (Brazil). This represents 58% of the international cities surveyed and 32% of the total number of international cities in the Network and is also representative of all sizes of cities.

City / Town / Region	Population	City / Town / Region	Population
Adelaide, Australia	1,158,259	*Montreal, Canada	3,635,570
Badulla, Sri Lanka	780,000	Moratuwa, Sri Lanka	177,190
Bucharest, Romania	1,945,000	National Capital Commission, Canada	N/A
Calgary, Canada	1,043,000	Niagara Region, Canada	430,000
Canmore, Canada	12, 040	Nuwara Eliya, Sri Lanka	703,610
Chattanooga, USA	496,700	Okanagan Indian Band, Canada	1,800
Chihuahua, Mexico	3,241,444	Olympia, USA	42,520
Cochrane, Canada	13,760	Ottawa, Canada	812,000
Colima, Mexico	568,000	Port Alberni, Canada	17,550
Curitiba, Brazil	1,828,092	Porto Alegre, Brazil	1,430,220
Dakar, Senegal	2,564,900	Portland, USA	2,159,720
Dar es Salaam, Tanzania	2,809,000	Regina, Canada	205,000
Durban, South Africa	3,470,000	Saint John, Canada	75,000
Edmonton, Canada	1,040,000	San Fernando, Philippines	114,850
Gatineau, Canada	242,125	San Jose, Costa Rica	1,611,700
Halifax, Canada	372,680	Salvador, Brazil	2,948,800
Iqaluit, Canada	6,200	Suncheon, South Korea	270,270
Matale, Sri Lanka	37,000	Toronto, Canada	5,500,000
Matamoros, Mexico	422,750	Ulaanbaatar, Mongolia	1,067,475
Matara, Sri Lanka	761,400	Vernon, Canada	35,950
Metro Vancouver, Canada	2,250,000	Whistler, Canada	9,900
Montpelier, USA	8,100		

OVERVIEW OF INSTITUTIONAL LEARNING

Much of the existing literature about institutional learning comes from private corporations, which have different leadership and financial structures and policies than local authorities. ICSC saw this as an opportunity to draw on its experience with the PLUS Network members to relate the general theory of organizational learning to public institutions and local government. ICSC has observed that successful cities are continuously learning in order to adapt to external and internal demands, stressors, and daily challenges, and to capitalize on opportunities, enhance trade and local economies, increase technical know-how, and identify and adopt best practices. When cities join the PLUS Network they are joining a "peer learning network"; thus it has been assumed that they themselves are interested in becoming a learning organization and also that the Network will operate as a learning organization.

Organizational Learning Theory

Organizational learning occurs when an "organization itself both learns and facilitates learning" (Wallace 1997). While it might be suggested that the public sector does not face the same survival pressures of private corporations, the experience of ICSC, as well as recent research by Richard Florida (2005), Tim Campbell (2008), and Neil Bradford (2003), indicate that cities do in fact face similar financial and political pressures, including direct competition by other cities. Therefore, the general theories of organizational learning are applicable to cities.

Louise Kloot (1997) identifies four basic theories around organizational learning: (1) knowledge acquisition, (2) information dissemination, (3) information interpretation, and (4) organizational memory.

Organizational learning theory includes the key concept of single and double loop learning: Single-loop learning such as Peter Senge's adaptive learning "is the detection and correction of errors that does not require changing values that govern the existing theory-in-use and organizational defensive routines" (Argyris 2004). Single-loop learning is product-driven learning whose only aim is to produce the desired outcome and does not address the underlying causes that created the initial problem (Ibid). Typical technical training programs would be examples of single-loop learning.

Double-loop learning, such as Senge's generative learning, is learning that treats both the symptom(s) and the underlying cause(s) by evaluating the outcome of the solution by way of a feedback loop (Argyis 2004). Double-loop learning is essentially the flexibility to unlearn unsuitable reactions, routines, and solutions based on new information (Burstrom von Malmborg 2002). In the PLUS Network, for example, double-loop learning is considered necessary for approaching complex problems such as climate change, which requires adaptive management .

Learning Technologies or Disciplines

According to Senge (1990) and David Garvin (1993)[2], a learning organization has several component technologies or disciplines:

- Systems thinking
- Personal mastery
- Mental models
- Building shared vision
- Team learning
- Skill at systemic problem solving
- Experimentation
- Learning from past experience
- Transfer of knowledge

McGill and Slocum (1993) promote active organizational 'unlearning', which requires an openness to new experiences, responsible risk-taking, and a willingness to take ownership of mistakes and learn from them.

Various theorists identify the use of past experience as a guiding principle for making decisions (Argyris 2004), and Burstrom von Malmborg (2002) and Levinthal (1993) state that creativity is a necessary prerequisite for true learning.

All of this learning theory can be organized into three categories: normative learning theory, developmental learning theory and capability learning theory (DiBella and Nevis 1998). The chart on the next page compares the three branches of organizational learning theory in terms of their main characteristics. The general approach of the Sustainable Cities: PLUS Network is perhaps most closely aligned with developmental learning theory, although specific activities fall into the other two categories.

[2] The last four points are drawn from David Garvin (1993)

Figure 2 – Single and Double Loop Learning

Source: cognitivedesignsolutions.com

branches of organizational learning			
FEATURES	NORMATIVE LEARNING THEORY	DEVELOPMENTAL LEARNING THEORY	CAPABILITY LEARNING THEORY
time / orientation	future	longitudinal	present
source of learning	strategic action	evolution, adaptation	existence
learning style	unique, prescribed	adapted to stage of organizational development	multiple, relative
relationship between learning + corporate culture	dependence	parallel in evolution	embedded
management focal point	learning disabilities	organizational history	current capabilities

(DiBella, Anthony and Edwin Nevis 1998)

Organizations continuously go through lifecycles of learning that build upon each other to strengthen the viability and resilience of the organization (DiBella and Nevis 1998). This process is primarily organic, but it is the responsibility of leaders, managers and administrators to ensure that each cycle results in lessons learned in order to drive the future of the organization. Thus, management is a key player in ensuring there is maximum utilization of knowledge.

Types of Organizational Learning

There are three major types of organizational learning: (1) Technical, (2) Corporate/ Formal, and (3) Informal (Campbell 2009).

Technical or 'know-how' learning allows organizations to learn how to utilize current technologies and best-practices instead of relying on outdated technology. Workshops and short management training seminars focused on specific issues such as district energy, sustainable tourism or land-use and transportation are examples of technical learning that is a component of the activities of the PLUS Network.

Corporate/Formal learning is within the purview of normative learning theory and often relies on management systems for enabling and enhancing organizational learning. Management systems may provide a practical way for continuous learning to be built into the very structure of an organization, as envisioned by the normative organizational learning theorists. Management systems have the additional positive attribute of having already been widely accepted and exist in many municipalities in a variety of forms. Cities in the Network are using a variety of management systems and decision making support tools. For example, Saint John, New Brunswick, has been using a system based on the Governments of Canada Strategic Reference Model (GSRM)[3]; several cities are using a decision making system based on The Natural Step, an organization dedicated to education, advisory work and research in sustainable development; and Olympia, Washington (USA) developed a Sustainable Action Map (SAM)[4] that others have adopted.

Informal learning at the municipal level is exemplified by cities in the PLUS Network engaging in one-time study tours of 'mentor cities' (Blanco and Campbell 2006) or participating in conferences of organizations, such as ICLEI-Local Governments for Sustainability, United Cities and Local Governments (or their local equivalent such as the Federation of Canadian Municipalities), Metropolis or CityNet.

Network-Driven Learning

Networks represent "a web of connection among equals, not held together by force, obligation, material incentive, or social contracts, but by shared values and the understanding that some tasks can be accomplished together that can never be accomplished separately" (Meadows et al. 2004).

In order to better understand the role of the Sustainable Cities: PLUS Network, this report focuses on network-driven learning. There is ample evidence to show that networks do indeed facilitate learning and that they can be invaluable tools for the creation and dissemination of knowledge (Campbell 2009). How do city-to-city networks facilitate learning and can they be of particular use in enabling learning around sustainability?

As illustrated in Figure 4 (next page), there are two models of networks: expert and distributed.

Specialized or expert networks concentrate knowledge and contribute to the refinement of best practices and innovations in particular fields or on specific topics. For example, the Natural Step Canada (TNS) has launched an expert network of municipalities and organizations that share learning on The Natural Step approach and framework, thereby contributing to the integration of and experimentation with one specialized technique as it is applied across disciplines, sectors and stakeholders.

The Sustainable Cities: PLUS Network is an example of a distributed network. One of its earliest activities was to research and publish information about the different tools and frameworks for long-term integrated planning being used by member cities (Seymoar 2004). ICSC, in a novel approach, has signed affiliation agreements with several networks to disseminate knowledge more widely[5], thereby enhancing its outreach and depth of knowledge and research dissemination for learning.

Both kinds of networks are designed to accelerate the generation and transfer of knowledge.

[3] Governments of Canada Strategic Reference Model - http://www.tbs-sct.gc.ca/btep-pto/documents/2004/overview-sommaire/overview-sommaire08-eng.asp

[4] Sustainable Action Map - http://www.ci.olympia.wa.us/?sc_itemid={E4972563-C03D-4172-83D4-CB284A32E96F}

[5] TNS, International Mayors Communication Centre (China), ICLEI and the Canadian Urban Institute.

International Pool of Expertise
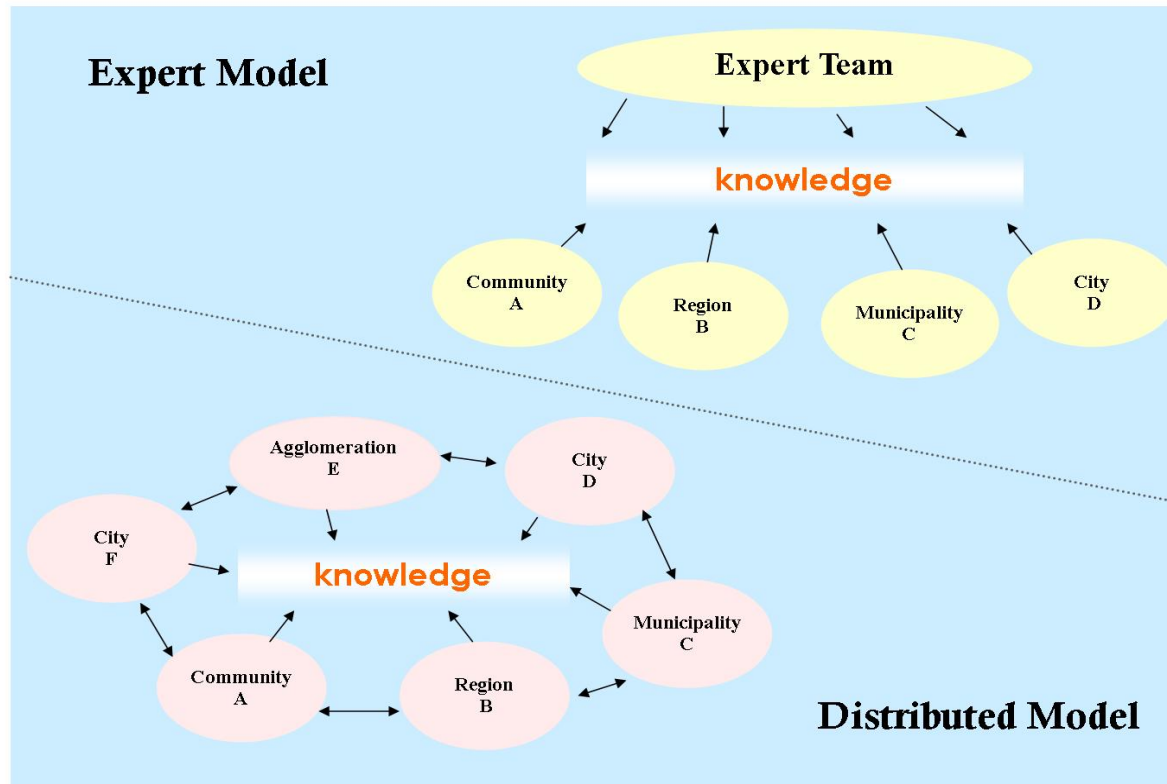
Networks can enable learning, specifically learning around sustainability, in five ways: (1) by lowering the costs associated with knowledge acquisition, (2) by acting as an organization's memory, (3) by nurturing organizational flexibility, (4) by bridging solitudes, silos and stovepipes and (5) by making knowledge communal instead of a tool of control.

Networks greatly lower the costs associated with the acquisition of knowledge by acting as a reservoir of information, general expertise, technical know-how, and potential contacts of experts or colleagues who are facing the same challenges. A sustainability network, for example, can fulfill the role of a specialized 'Sustainability Team' that a small municipality may not normally be able to afford. The City of Cochrane, for example, recently hosted a Long-term Integrated Planning Bootcamp that brought together participants[6] from various cities and towns in Alberta as well as representatives from several consulting agencies, who spent three days addressing the city's draft Integrated Community Sustainability Plan (ICSP). At the end of the Bootcamp, Mayor Truper McBride remarked that they had received "the best advice possible from a group of experts from across the country who paid to attend the Bootcamp!"

One of the most valuable roles a network can play is serving as both a warehouse and clearing house for information. Networks often focus on the collection and dissemination of information, and thus may also be able to mentor new Network members and reinforce the organizational memory of members. In addition, they can serve as a safe learning ground for practitioners and decision-makers to receive peer support and critiques of their work.

The weakest point in the learning process is often the creation of organizational memory. Organizational memory is, "the means by which knowledge from the past is brought to bear on present organizational activities" (Argote 2005). Without a formal process by which employee knowledge becomes institutional knowledge, knowledge is lost when an employee leaves the organization (Ibid). Municipalities, like other knowledge-based service delivery organizations, are especially vulnerable to the loss of knowledge due to electoral and staff turnover. In knowledge-based organizations people are warehouses of knowledge with different specializations and abilities, and therefore are not readily interchangeable or easily replaceable. A successful organization seeks to both retain people and institutionalize their knowledge. In both Britain and Canada, the long tradition of a professional public administration that serves regardless of the political party or group in power is an attempt to maintain this organizational memory and learning. In local authorities, mayors and members of council are key actors whose learning also needs to be institutionalized. This leads inevitably to a certain creative tension between the needs and desires of the public sector to remember and retain the old ways and the desire through democratic elections to chart a new political direction.

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[6] Calgary, Edmonton, Town of Peace River , Strathcona County , Town of Olds , Town of Sylvan Lake Canmore, (among others), as well as representatives from different consulting agencies 02 Planning & Design, AECOM Canada , Jacques Whitford , Stantec and WorldViews Consulting, among others)

The ancient maxim that knowledge is power, recapitulated by philosophers from Francis Bacon to Michel Foucault, describes how knowledge is often used in the workplace. Shauna Sylvester (2009), from Canada's World, has reported a shift from "knowledge equals power" to "power equals sharing knowledge" [7]. If an organization wants to dissuade employees from hoarding information as a way of protecting their influence, the presence of a network can aid in this goal by making knowledge communal property. The existence of a network can encourage the employees of an organization to view information as something to be disseminated. This is especially important for municipalities seeking to overcome traditional management hierarchies (or silos) and achieve greater horizontality and employee empowerment.

Of course, the existence of a network itself will not prevent knowledge from being used as a tool of control within the workplace. The person assigned to maintain contact with the network is an informational gatekeeper and as such has tremendous power directly connected with the information they receive (Keiner and Arley 2007). Thus it is important that networks develop multiple points of contact within every member organization in order to minimize the risk or reduce the extent to which power can be used for personal gain within an organization. An effort to maximize accessibility might tap into some of the synergistic benefits created by a horizontal network of a volunteer 'community of practice', such as was done with the development of the InfraGuide[8] and Water Bucket[9] in Canada.

A network can also help prevent management systems from becoming rigid structures of control that prevent facilitating learning. Over-emphasis on protocol results in employees learning how to act in certain situations, as opposed to understanding the reasons behind what that action is meant to achieve (Burstrom von Malmborg 2002). In some circles, the use of Results Based Management, for example is evolving into a rigid management system, preventing innovation and adaptive management. This problem has also been noted in the LEED process for certifying green buildings. By constantly supplying new information through distributed networks, and generating new knowledge collectively, there is a greater likelihood that processes will develop within a municipality to assimilate new information and utilize it, nurturing and rewarding flexibility. Thus alternative approaches – developmental evaluation and outcome mapping for example may be tested and tried by others.

It is of paramount importance that the information disseminated by networks is in a form that is directly usable by the municipality. Metaphorically, each piece of information must be another piece of the puzzle being built, and not a piece from another puzzle. By designing educational as well as research components within their projects, networks can ensure that learning is part of the service that they provide. Positive experiences can result in network-wide adoption of learning processes, as was the case in the development of the Sustainable Cities Planning Cycle.

[7] Sylvester, Shauna. Canada's World: Presentation to Women Thought Leaders Forum, June 26 2009, unpublished.

[8] www.gmf.fcm.ca/infraguide

[9] www.waterbucket.ca

Sharing information about the Hann Bel Air composting project in Dakar, Senegal

From Organizational Learning to Learning Cities

Organization Learning Concepts Relevant to Cities

- In order to be a learning organization, municipalities have to seek out, interpret, utilize and remember new information.

- Networks can aid cities in all steps of this process, by providing information in a way that can be easily utilized and stored by the receiving city.

- The structure of networks, expert or diversified, is crucial to their receptivity and seeking out of new information

- All cities learn both proactively and reactively.

- Most cities that are current models of organizational learning began their journey of self-education when confronted with crisis (Blanco and Campbell 2006). However, crisis is not necessary for learning to occur. Cities in the PLUS Network for example report being inspired by others or a larger cause.

- Management and leadership are keys in creating a learning institution, but the focus must encompass the whole organization – from elected officials to front-line staff.

- Learning is an ongoing process natural to all organizations. In order to capitalize on learning, an organization must recognize its existence, without passing judgment on types or topics of learning (Ibid). There are multiple entry-points for learning.

- It is important for an organization to recognize that learning is a process that goes through developmental stages.

- Organizations are not machines requiring a technologically engineered solution; when evaluating organizational learning, it is essential to consider the people within the organization who create its culture and values.

Barriers to Learning

- Local government bureaucracies may have 'learning disabilities' arising from such challenges as restricted budgets, arbitrary approval processes, lack of internal formal systems, lack of time allocated for sharing information and no institutionalized manner to store information or to train new employees about historical cases or files.

- Solitudes, silos and stovepipes in government bureaucracies prevent the sharing of information and learning in critical ways.

- A problem that has not reached full crisis proportions may not engender action or learning. In order to be a catalyst for change, a crisis needs to be seen as both manageable and the responsibility of the municipality. Learning theory outlines the importance of taking ownership for problems and the mistakes that may be made trying to correct the course of action. This is particularly important to note in the face of complex, long-term issues such as climate change.

- Often outcomes of informal methods of learning are not tracked or measured by the cities or organizations involved. Without processes for translating the knowledge gained by the individuals on the journey, there is little possibility for there to be measurable effects upon the municipality in question. Baldersheim et al. (2002) explored study tours and explained their importance for initial, exploratory searches for information in regards to a problem(s), identifying "the pull, push, and facilitating factors" (Senge 1990).

Adelaide's solar power initiatives: left, Solar Mallee trees at nighttime; right, "Tindo", the word's first solar electric bus

Summary and Analysis: "How Cities Learn" Survey

Description of survey methodology

In order to gain more information about how cities in the Sustainable Cities: PLUS Network learn, a survey (in English) was sent to 29 of the 40 member cities in May 2009 [10]. The survey was based on the results of a pilot survey conducted at the PLUS Network Biennial Conference in Durban in 2008, and focused on "How cities learn about urban sustainability and how the PLUS Network is contributing to the learning process" [11]. 17 of 18 Canadian cities [12] and 12 of 22 international cities were surveyed. A total of 67 people were sent questionnaires, including 53 city staff, two mayors, and 12 academics or consultants to the network. 25 responses were received (38% response rate).

Geographic and size representation

10 Canadian cities (59% of those surveyed) were represented in the survey responses; Iqaluit, Ottawa, National Capital Commission, Vernon, Whistler, Calgary, Cochrane, Regina, Niagara Region, and Canmore. Responses included large, medium, and small, remote and aboriginal communities and are representative of Canadian cities and communities. Of 12 international cities surveyed, responses were received from 7 cities (58% of those surveyed): Chihuahua and Colima (Mexico), Adelaide (Australia), Durban (South Africa), Montpelier and Olympia (USA) and Curitiba (Brazil) and are also representative of cities in the Network. It is important to note that the Sustainable Cities: PLUS Network is focused on medium and small cities (up to 6 million in population) and does not at present include metropolitan regions of over 6 million people.

Issues of interest identified by respondents

Respondents identified several topics of learning interest including: long-term sustainability, transportation, climate change adaptation/mitigation, land use planning, solid waste management, water quality, youth engagement, aging cities, food security, and economic development. Secondary issues included: creative cities, air quality issues, energy efficiency and governance.

Motivation to learn

In response to questions about what motivates cities to embark on learning about urban sustainability, the two most common answers included: being guided by a future vision and the desire to be a leader on urban sustainability issues. The importance of a vision to the potential success of a city has been documented by Canadian researcher Neil Bradford (2003). These responses seem to contradict the organizational literature, which suggested that organizations are primarily motivated to learn when faced with a crisis. It would appear people in the PLUS Network cities are motivated as well by aspirational and competitive goals. Other sources of motivation that might reflect crisis issues included the desire to save money or to access funding, climate change and future uncertainty and the opportunity to continue connecting with like-minded people (a social goal). Responsibility to address new challenges and the opportunity to implement different strategies appeared to be strong motivators as well.

Approach to problem solving

The vast majority of respondents answered that when faced with a problem, they consulted their peer group: colleagues in another city (80%); colleagues in their department (68%); colleagues in different departments in their own city (68%) and colleagues in other organizations (48%), while 72% of respondents consulted "best practices" websites. 40% of all respondents consulted professional associations. 36% reported consulting mentors, and, about 30% turned to private sector consultants or government resources. 28% consulted academic institutions, 16% friends and family.

Once a problem has been identified respondents indicated their first, second and third step in learning more about it. Speaking with colleagues and independent research were the most frequently listed responses.

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[10] The survey was conducted in English and language barriers made it difficult to expect a response from the Sri Lankan, Mongolian, Romanian, Costa Rican and Brazilian cities.

[11] When respondents indicated that the survey was too long, an abridged version of the survey was also distributed in the last week of May which focused only on "How Cities Learn". 2 of the 25 respondents answered the abridged version.

[12] Toronto was not included as there was no current contact for the network at the time of the survey

ICLEI Oceania Delegates from Australia and New Zealand get a tour of the 2010 Olympic Village Development in Vancouver, June 2009

Sources of information or knowledge

The majority of respondents answered that they looked at between 4-8 sources of information before making a decision. Women were more likely than men to consult websites of other cities (90% versus 33%), and networks/ associations (73% versus 44%), whereas men were more likely to consult journals / magazines (56% versus 18%). Some of the sources of information are explored further below.

One respondent's comments about his extensive personal network echoed those of many others who look first to colleagues for ideas and information. He talked about his network of friends in the urban planning field, former colleagues and people he had met through work and conferences including those who are knowledgeable in areas of transportation, housing, social and environmental issues, and are interconnected with other people in the field who have additional knowledge and experiences to share.

The Internet is an important and accessible source of information, with 72% of all respondents indicating they consider it a valuable resource. Respondents try to research cities that are similar in size or addressing similar issues; often this information is relayed through word of mouth or at conferences. Experience with implementation is important to cities, as they are not looking for theory but strategies for taking action. The Internet is particularly important for providing case studies.

Some websites that were listed by several respondents include: The PLUS Network, Smart Growth, The Natural Step, Cities PLUS, Imagine Calgary and Whistler2020.

Academic institutions were not listed as a priority source of information for cities, (only 28% of respondents said they consulted with academic institutions). It appears that if a city does look to academic sources, local universities are chosen first.

Professional associations were not a priority source of information for respondents; (only 40% identified this as a source of information).

Conferences are a great way to hear who is doing what and meet the people involved. The ability to ask detailed questions is invaluable.

Conferences serve to provide information on different themes, best practices, sources of funding, and implementation challenges. 92% of respondents stated that conferences are a good way to learn about sustainability.

Respondents indicated that conferences are useful when they provide case studies and research on "cutting edge" innovations. Although some cities said that they don't usually hear about new trends, conferences were seen as good for seeding ideas, providing lessons learned, expanding professional networks and sharing. Face-to-face and personal interactions were cited by several respondents. One respondent pointed out how conferences are also reaffirming for those delegates who get to teach others about their experience. The only concern raised is that conferences are often expensive and can have a significant environmental impact.

While many respondents included local and regional conferences, it appears that most municipalities are willing to travel internationally to attend conferences.

Top conferences listed by respondents include:

- PLUS Network Biennial Conference
- Canadian Institute of Planners National Conference
- Federation of Canadian Municipalities Sustainability Conference
- Fraser Basin Council Sate of the Basin Conference

We're trying to change the world, one block at a time, one city at a time. We need to shift to a new paradigm in city planning - people have been talking about the problems for years, but no real action has occurred. Cities evolve gradually over time; they do not suddenly reinvent themselves overnight in the face of real adversity. If not now, when? If not us, who?

-Sustainable Cities : PLUS Network survey respondent

Notes from an Environmental Youth Alliance (EYA) asset-mapping exercise

Sharing, learning and disseminating knowledge

100% of the female respondents and 56% of the males believed that learning could be accelerated in their city, but the "how" seemed more complicated. Some male respondents said that this was not necessary as they were already comfortably on the learning path or that there did not seem to be enough time to formalize learning. Respondents noted that in the first place, there needs to be a desire for more learning. Strategies for enhancing learning included exposing more staff and councillors to what is possible, presumably by attending conferences and hearing the accomplishments of other cities. Collaboration and interaction across departments was cited, which can be done at interdepartmental meetings and workshops. Crisis was mentioned as an important motivator for faster learning and seems to propel the "learning by doing" strategy. Other strategies included helping employees to develop personal training plans, in agreement with their supervisor and updated yearly during performance evaluation. The Knowledge Management Strategy was cited as an important driver for learning. A respondent stressed the importance of bringing "Thinkers" (as opposed to "content experts") together to examine issues, emphasizing the need for holistic and integrated thinking on sustainability challenges. Many of the ideas pointed out by survey respondents reflect the theories of organizational learning (i.e. the need for systematic problem solving, experimentation, learning from past mistakes or past mistakes of others, transfer of learning, responsible risk taking and ownership of problems and mistakes).

In light of the research on organizational memory, the survey asked individuals to indicate how they share information throughout their organization. Presumably this is important, since many of them are attending conferences on behalf of their city. Many respondents share information within the organization informally, primarily through email or word of mouth. Team or department head meetings, council meetings and the intranet or city websites are other ways to effectively disseminate information. Reports to council seem to be an important way for people to share information and for others to learn from other departments.

Information sharing outside of organizations seems to occur regularly. Nearly all respondents indicated that they distribute information to other cities, usually on a "by request" basis. Requests for information about project or program progress occur over email, at workshops or public speaking events. One respondent mentioned blogs as a useful tool where other people can read about projects or interact directly for more information.

As most information sharing focuses on a specific project or issue, this is usually done informally through email or by circulating printed material. Reports or highlights from conferences are filed and some cities create opportunities for doing Power Point presentations with colleagues. Brown Bag lunches with project managers, lectures from visiting consultants, and team meetings are also ways to informally share information and are not considered to be structured learning environments.

The size of a city seems to be a determining factor in whether and how information is shared formally; for example, two cities mention that because they are small and have minimal municipal staff, information sharing happens easily as the "links are very short". Formal or institutional learning is tracked or archived in shared electronic space (for benchmarking or reference material) or in an organizational library. One city indicated that they have recently started using a Knowledge Management System (with a Documentation Management System) but despite having this system, information sharing continues to be a challenge.

Although most respondents felt learning could be accelerated in their city, the question of "how" seemed more complicated. They noted the need for a desire for more learning. Strategies for enhancing learning included exposing more staff and councillors to what is possible, presumably by attending conferences and hearing the accomplishments of other cities. Collaboration and interaction across departments is cited, which can be done at interdepartmental meetings and workshops. Crisis is mentioned as an important motivator for faster learning and seems to propel the "learning by doing" strategy. Other strategies included helping employees to develop personal training plans, in agreement with their supervisor and updated yearly during performance evaluation. The Knowledge Management Strategy is an important driver for learning. A respondent stressed the importance of bringing "Thinkers" (as opposed to "content experts") together to examine issues, emphasizing the need for holistic and integrated thinking on sustainability challenges. Many of the ideas pointed out by survey respondents reflect the theories of organizational learning (i.e. the need for systematic problem solving, experimentation, learning from mistakes, transfer learning, responsible risk taking, and ownership of problems and mistakes).

Left, delegates at Mexico's First Urban Forum on mobility and transportation, February 2009. Right, a poster advertising the event.

Barriers to learning and strategies to overcome them

96% of respondents recognized that there were significant barriers to learning. **The most commonly sited barriers include: time, funding, lack of human resources, daily pressures, resistance from others, lack of commitment from city council, laziness and complacency, helplessness, lack of clarity around purpose or vision, and lack of passion among colleagues.** In line with the research, silos and bureaucracies were stated as inhibitors to effective collaboration and action. Since learning is a process, some respondents said that it is hard to motivate people who are "results-oriented" as learning does not fit with their perspective.

For example, respondents commented:

It's a vicious cycle because more learning would at least potentially reduce the workload, but you need that initial injection of energy, which takes leadership and commitment.

It's hard to get people into the mode of shifting expenditures from wasteful to sustainable practices. They tend to focus on the money needed to implement these new sustainable initiatives rather than the money that will be saved in the long-run.

It seems that unless learning is formally structured, and in the absence of a crisis, the inertia of other priorities leads individuals and organizations on the course of business as usual. Reflecting on the theory of organizational learning, the barriers presented by the respondents are related to daily pressures and differing personalities within an organization, not the lack of organizational structure for learning.

Most respondents indicated that it was rare for them to not find answers to their questions with all of the resources available. When necessary, a member of the executive or city council will be engaged, but usually an individual must persevere independently until they find answers. However the effort to do constant research may reinforce the status quo, inhibit innovation and openness to new ideas, support path dependence, technological 'lock-in' and past unsustainable decisions.

The survey also inquired about strategies used to overcome the most commonly identified barriers. The most popular answer from respondents was recognition and serving as a leader, continuing to work with persistence, and dedication and independent action (often by doing overtime or unpaid work). The other popular strategy is to have dedicated staff attend to specific issues, and indentify people to mobilize and motivate fellow colleagues to do more; engaging the 'willing and able' in collaborative and action orientated projects and programs seems to drive action. Ensuring that an organization's mission and vision are clear to the whole organization allows staff to identify with the "brand". Demonstrating solutions to problems and accompanying actions can be motivational. One respondent said that they use a "Create-a-crisis" strategy. Another respondent noted that the economic downturn this year has helped the municipal staff slow the pace slightly. However, some respondents did identify that learning and training needs to be a corporate priority.

Consistent with organization theory, responses also cited the inspirational value of informal learning settings, such as conferences and opportunities to exchange face-to-face with peers and colleagues, along with providing staff with diverse contacts and resources as a way to advance learning quickly and efficiently.

Through this survey it has become apparent that by enhancing friendly exchange among professionals, peer networks can become primary sources for advice related to urban sustainability. This goes beyond just communicating about the sustainability imperative, where developing trusting relationships with colleagues allows people to openly discuss issues in order to gain better understanding.

Diverse networks are crucial to a city's ability to innovate. Further, it is important to identify champions in an organization who will drive a learning organization/city forward due to their own motivations and by taking advantage of structures, networks and resources that are already in place.

COMPETITION AMONG FRIENDS

In the Summer of 2007, the City of Olympia and the City of Montpelier adopted a joint resolution kicking off a Sustainable Capital City Challenge. The objective of the challenge is for the two communities to support each other in becoming the most sustainable capital Cities in the nation. The two cities will share ideas, report on progress and celebrate milestones together and challenge their communities to work together to build a sustainable future.

Right; Michael Mucha, Olympia Director of Public Works, and Gwen Hallsmith, Montpelier Planning Director, March 2008.

15

Contribution of the Sustainable Cities : PLUS Network

The second section of the survey asked respondents about the contribution of the PLUS Network to their learning about urban sustainability. The PLUS Network uses peer exchanges, bootcamps, (intensive training events that apply a number of different frameworks and tools to a case example provided by the host community), biennial conferences, web dialogues, newsletters, websites, and internships to facilitate information exchange. The survey inquired about most of these programs to better understand their contribution to learning cities.

PLUS Network Activities

Respondents were asked to rate the activities and resources of the PLUS Network in terms of their contribution to learning. The highest rated resource was the peer exchanges, which, as described by one respondent, are an "excellent source of information [for] sharing / learning". Bootcamps ranked second, followed by the biennial conferences and phone consultations. Other activities: youth internships, introductory missions, the newsletter and web dialogues were rated as providing an "average source of information sharing / learning".

The survey results highlighted the key role of peer exchanges and confirmed feedback from the evaluations that are filled out at the end of each of these events. 100% of the respondents who have attended a peer exchange answered that it had contributed greatly or had reaffirmed their ideas and that they had learned something new at the event. Peer exchanges were described as "*by far, the best tool for sharing information and learning".* Peer exchanges provide a greater pool of ideas for resolving problems and help to build long term relationships, which work better than conferences where there is often only a "one-off" exchange.

When asked to compare PLUS Network peer exchanges to other workshops or events in terms of their ability to help in the learning process, the majority agreed that the value of PLUS Network exchanges "*exceeds other workshops*". Of the respondents that had not attended PLUS Network exchanges, several noted that other colleagues had attended and provided positive feedback.

The PLUS Network website has been undergoing many changes to meet the needs of Network members and the public at large. Most respondents who had accessed the website said they found the resources on it useful. Resources that were mentioned included papers by Nola Kate Seymoar, Bliss Brown and frameworks/methodologies (EarthCAT). When asked to rate the website, about half of the people rated it as "*excellent, valuable material*". Positive commentary about the website mentioned easy navigation, good design and access to diverse topics and relevant information.

The Network also uses web dialogues to share ideas about urban sustainability. This is particularly important to reduce travel time, costs and green house gas emissions. Feedback on this type of learning has been positive particularly by those who have participated since Ann Dale of Royal Roads University has facilitated the dialogues. Comments have highlighted the openness of the panelists and the value of the perspectives from other cities.

Role of the PLUS Network

A series of questions was asked about the role of the PLUS Network in contributing to learning on specific issues. The Network was viewed as a "strong or medium" contributor to learning by nearly two-thirds of those respondents engaged in long-term integrated planning, by nearly half of those engaged in demonstration projects, by about a quarter of those using sustainability indicators, by over a quarter of those involved in youth engagement, and by a quarter of those dealing with women's equality issues.

Respondents were also asked about the major strengths of the PLUS Network. The majority said that it helped to enhance their professional network (increase the number of people they can turn to for advice); other strengths included: exposing members to emerging issues and possible solutions, and accessing diverse experiences. Technical information/solutions and long-term planning strategy development and implementation were also mentioned as strengths of the Network.

The survey also asked for major weaknesses of the PLUS Network. Half of the respondents noted insufficient funding as a major weakness. Other concerns included: not enough expertise about specific issues, lack of translated resources (Spanish language resources in particular), indecisiveness around operational or administrative issues related to events (this is tied to funding), and not enough "on the ground support" (more of a think tank). One respondent noted the difficulty of comparative information between cities, for example, between Canadian cities on the path to community sustainability and other cities. Some respondents noted that either they did not see any weaknesses or the problems lay with their own organization's lack of funding, ability to participate, or not asking enough of the organization to truly benefit.

Finally the survey asked respondents to independently outline how the PLUS Network was helping their city with its learning process on urban sustainability issues. Answers included:

- Invitation of experts like Larry Beasley (Vancouver) and Ken Cameron (Vancouver), to fortify concepts of mobility and densification with local authorities and stakeholders.

- Hosting Brian Riera (Langara College) in 2007, a professional consultant in urban planning, to contribute to the elaboration of Chihuahua's Transportation and Mobility Plan.

- Through visits by PLUS Network staff to speak at the local Urban Forum and participating in meetings with local authorities and social leaders, where they promote the benefits and challenges of long-term vision planning and urban sustainability.

- Through direct conversations with PLUS Network staff.

- Facilitation of thought provoking discussions via engagement of experts to explore different ways to develop long term plans. Funding that enables flexibility to learn from demonstration projects.

- Strengthening leadership – particularly amongst mayors and city councilors. Assisting with the provision of sustainability information and helping to generate interest with community leaders.

- Fostering opportunities to work in conjunction with First Nations

- Securing funding and managing youth-led community projects, such as asset mapping projects.

- Connecting to international cities.

- Placing urban sustainability at the centre of the governance agenda.

Concluding remarks from the respondents addressed the need to obtain funding to support all members of the PLUS Network, including members in high-income countries like Canada, the USA and Australia, to enable participation in peer exchanges. Respondents also reinforced the need for constant communication to ensure continued information sharing and learning opportunities.

"There is no endeavour more noble than the attempt to achieve a collective dream. When a city accepts as a mandate its quality of life; when it respects the people who live in it; when it respects the environment; when it prepares for future generations, the people share the responsibility for that mandate, and this shared cause is the only way to achieve that collective dream."

- Jaime Lerner, former Mayor of Curitiba, Brazil

An image from Imagine Durban's marketing campaign

Conclusions

This research project was extremely useful in providing the PLUS Network members with an important moment to reflect on the learning process as it applies to their city and to the PLUS Network itself. In light of the relative absence of research about how public institutions learn, it suggests that this is a rich area for future research and one that the PLUS Network could continue to facilitate.

The general conclusions about how cities learn that can be drawn from this sample and questionnaire include:

- When faced with problems, over three-quarters of the respondents turn to their peer group - colleagues they know in other cities.

- Conferences and learning events are one of the best sources of new ideas.

- The Internet is a common source of information, particularly for case studies and best practices.

- The least likely sources of information or guidance to be used are academic institutions, professional organizations, journals or mentors.

- Most cities do not have conscious learning processes established or institutionalized.

- Learning does not occur evenly throughout an organization – those people who participate in conferences or peer exchanges get greater exposure to innovative ideas but they are not usually able to ensure a systematic transfer of that knowledge. Often these people are leaders and are motivated to attend conferences in order to keep furthering their personal and professional learning.

- Knowledge storage or corporate memory is not formally organized or captured by the vast majority of the cities in the survey

- Some of the best ways to learn are by: experimentation (doing), attending conferences and events that provide opportunities for direct face-to-face sharing, presenting at conferences, attending City Council meetings, and presenting at team/department meetings.

- Learning from other cities, particularly those of a similar size, is important and through networks or professional colleagues many cities reach out to other cities for information.

- Although there is competition between cities to achieve social, economic and environmental prosperity, sharing occurs extensively in informal and formal channels (often by request) and through networks, so that people become exposed to new ideas and become more collaborative with peers from other cities.

- Barriers to learning are largely related to time, funding, lack of human resources, heavy workloads; and daily pressures.

- While sustainability may be common parlance, there is significant complacency within and across departments. It requires dedicated staff and self motivation to keep the vision clear and tangible.

- Leadership on sustainability is a large motivator for learning and doing. Being guided by a vision and strong leadership makes the process smoother.

"Cities are like acupuncture points – interventions in cities can improve the health of the whole planet." - Dr. Nola-Kate Seymoar

The survey was particularly relevant to the PLUS Network in helping the organization to progress on its own continual learning path.

The survey demonstrated that:

- Travel funding for participants is a crucial issue for cities in Canada, the USA, and Australia, not just for cities in low-income countries.

- There is a need for the PLUS Network to continue facilitating the exchange of information among cities, and different programs and activities are highly valued by its members.

- Staff at the PLUS Network needs to maintain regular contact with cities in order to ensure that cities feel engaged, and to document and transfer learning on a regular basis.

- Members appreciate the tools and resources that are available, but in order to make the sharing and learning more accessible, translation into other languages is necessary.

- Peer exchanges and biennial conferences are the most useful learning opportunities within the PLUS Network, however other activities, such as web dialogues, newsletters and the website are also helpful.

- The open, flexible, positive attitude of staff members is important in creating a safe space for sharing and learning.
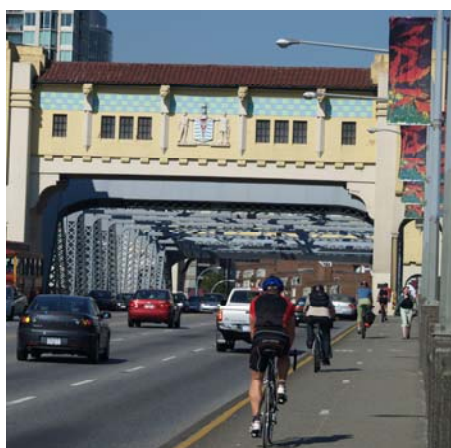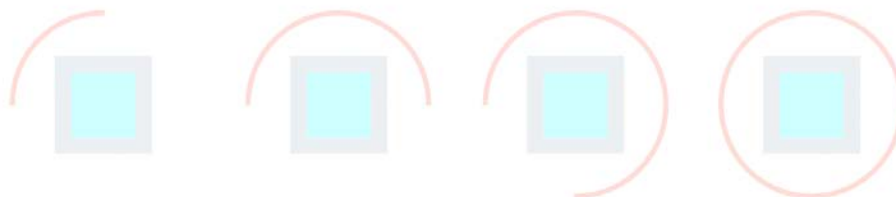
Other Observations from the PLUS Network about City-to-City Learning

PLUS Network members are gradually implementing long-term planning processes in order to enhance the sustainability of their operations, and their cities as a whole. The PLUS Network staff and other PLUS Network members use participatory observation methodology when they visit these cities to get updates on the progress of their projects and programs. This peer reflection methodology allows for greater sharing about processes that are underway and facilitates open lines of communication (observation, commentary/analysis) and trouble shooting. In addition, rich data is obtained, particularly on process implementation. By having members from all over the world, representing cities of different sizes and at different stages in their processes, participants in the Network are able to recognize and learn from one another's common issues.

In its 15-year history of serving cities, and five years of PLUS Network operations, ICSC has made many observations about how cities learn and transfer knowledge from city to city. The ideas that have been formulated over this time within ICSC are in line with the literature and responses from the survey reported earlier.

Below are some of the highlights about how cities learn, based on the observations of ICSC, and the implications of those observations for the PLUS Network.

- **Learning is an interactive process.** As a city tackles a sustainability problem it typically learns by hearing about another city's solution, then discussing or seeing it (on a study tour or the internet) and testing its own version of the solution. If it is a learning organization it will document its lessons and share those with others. The PLUS Network can facilitate this process of reciprocal learning.

- **Cities learn by doing.** Policy and planning initiatives are relevant in so much as they impact the lives or physical environment of residents. They must be seen to be believed relevant. The implication of this for the PLUS Network is that in addition to the focus on long-term integrated planning the expectation that members undertake short term practical demonstration projects that show how they are moving towards long-term sustainability is fundamental to success.

- **The exploitation of knowledge and learning by adults is accomplished through peer networks, which serves to enhance process implementation.** The PLUS Network strives to be a community of practice that encourages innovation.

- **Cities copy other cities.** There is widespread evidence in the Network of ideas and whole programs being transferred from one city to another. For example, "Imagine Calgary" led to "Imagine Durban" and other participatory visioning processes in Saint John, Iqaluit, and Regina and has inspired similar process that will be undertaken in Olympia, Ottawa/Gatineau and the National Capital Region. Peer exchanges allow cities to showcase their planning and demonstration projects so others can copy the strategies and ideas. Copying ideas is a celebration of a success and cities are proud to share their accomplishments and guide others through the processes.

- **Large cities adapt innovations from medium-sized cities and medium from smaller ones.** The Vice Mayor of London, England, for example reported that "they had learned everything from Portland Oregon". When Calgary was looking at how to integrate its systems it looked to Okotoks, Alberta – an innovative and smaller community. In smaller cities, it is possible to see the interconnections more clearly. The implication for the PLUS Network is to foster a wide range of participants in the Network – from small, remote and aboriginal communities and towns, to metropolitan areas and regions of up to 6 million people.

- **There is value in diversity that encourages multi-dimensional and international learning.** Low-income (developing country) cities, medium-income (newly industrializing or transition economies) cities and high-income (developed country) cities learn different things from different examples. Dar es Salaam reported that it was able to learn more from Durban than from Canadian cities, because Durban had recently been dealing with similar problems. Thus it is important to have a diverse network including cities from all three income groups.

- **Successful cities follow a number of paths, suggesting that there are many ways to move toward sustainability** – thus the network uses a distributed network rather than expert network model.

- **The Canadian Federal Government has embedded long-term integrated planning into the gas tax agreements with the provinces and this has stimulated an active integrated planning industry and a desire on the part of cities to share their experiences with consultants and frameworks.** Bringing this expertise into the international PLUS Network is a strong and unique Canadian contribution.

- **Canada has a distinct advantage in the international cities market.** Canadian cities are very livable, successfully incorporating immigrants and multiculturalism, while successfully accommodating population growth, without incurring the overwhelming stresses of other cities in the world that are experiencing very rapid growth. Ultimately, the Network is envisioned to have a third of the city members from Canada, a third from low-income countries, and a third from middle and high-income countries.

- **Learning is often lost – sometimes elections or other interventions result in experienced and committed champions being defeated at the polls or officials being transferred or replaced.** The necessity to maintain learning and advance rather than retreat means two things – multi-sectoral teams at the local level must be built to transcend electoral and other changes, and the Network must be a repository of learning, with concepts that are easily understood and accessible.

- **Dissemination of learning from city to city occurs through personal contacts, often made at conferences or on study tours.** The depth of learning on well conducted study tours is enhanced by the depth of personal relationships that develop allowing for broader initiatives upon returning home. The Network's biennial conferences and peer exchanges are the essence of its success.

- **Best practices and technological advances are not disseminated widely or quickly enough.** The advances being made by ICSC, its partners, and many other international organizations are not finding their way to the decision-making tables quickly enough to have an impact on climate change, poverty reduction and the quality of life on earth. Networks may accelerate the transfer of ideas, knowledge, research and technologies, and further research is needed to identify how that process can be improved.

The survey results demonstrate that local administrators learn mainly from their peer group. Networks emerge as a key strategy for speeding the exploitation of knowledge and learning, both formally and informally, in and between local governments. They can bridge issues of scale and implementation gaps, as well as critical divides between professionals, sectors, levels of government, and even between nations, as the PLUS Network demonstrates. A distributed network is central to the adoption of novel ideas and more sustainable practices. More research remains to be done on the nature, density and centrality of networks to sharing information, knowledge diffusion and their capacity for bridging between researchers, practitioners and local decision-makers to become "knowledge collaboratives" central to decision-makers and policy development.

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