

An aerial photograph of a city, likely New York City, with a dense grid of skyscrapers. Overlaid on the image is a digital network of glowing blue and orange lines and nodes, suggesting a smart city or data network. The text is overlaid on this image.

TIM CAMPBELL

BEYOND SMART CITIES

HOW CITIES NETWORK, LEARN, AND INNOVATE

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Beyond Smart Cities

The promise of competitiveness and economic growth in so-called smart cities is widely advertised in Europe and the US. The promise is focused on global talent and knowledge economies and not on learning and innovation. But really to achieve smart cities—that is, to create the conditions of continuous learning and innovation—this book argues that there is a need to understand what is below the surface and to examine the mechanisms which affect the way cities learn and then connect together. This book draws on quantitative and qualitative data with concrete case studies to show how networks already operating in cities are used to foster and strengthen connections in order to achieve breakthroughs in learning and innovation. Going beyond smart cities means understanding how cities construct, convert and manipulate relationships that grow in urban environments. Cities discussed in this book—Amman, Barcelona, Bilbao, Charlotte, Curitiba, Juárez, Portland, Seattle and Turin—illuminate a blind spot in the literature. Each of these cities has achieved important transformations, and learning has played a key role, one that has been largely ignored in academic circles and practice concerning competitiveness and innovation.

Tim Campbell has worked for more than 35 years in urban development with experience in scores of countries and hundreds of cities in Latin America, South and East Asia, Eastern Europe, and Africa. His areas of expertise include strategic urban planning, city development strategies, decentralization, urban policy, and social and poverty impact of urban development. He is chairman of the Urban Age Institute, which fosters leadership and innovation between and among cities in areas of strategic urban planning, urban policy and management, sustainable environmental planning, and poverty reduction. Campbell retired from the World Bank in December 2005 after more than 17 years working in various capacities in the urban sector. Before joining the Bank, he worked for over 13 years as a private consultant and university professor. His consulting clients included private sector firms, governments, and international organizations. He taught at Stanford University and the University of California at Berkeley. He has also lived in rural and small town Costa Rica for two years as a Peace Corps volunteer.

Praise for this book

"This is a strikingly original piece of work that is unlike previous efforts to understand city development. Although there is a long history of the study of networks of influence in sociology, most recently by Manuel Castells, it has never been connected to city innovation and learning in the way that Campbell does here."

Michael Teitz, Emeritus Professor, University of California, Berkeley

"Perfectly timed for this moment in history, when more of mankind is urban than rural, this incisive book shows that profound urban transformations now underway in cities are being led by innovators—formal and informal leaders—who are harnessing the power of shared learnings to convert information and knowledge into innovation, both in policy and in practice. Campbell offers a practical approach to understanding urbanization through a distinctive lens."

Wim Elfrink, Executive Vice President and Chief Globalization Officer, Cisco

"At last someone has unravelled the complexity of urban networks that lead to learning and help drive a city's creativity and innovation. These are issues that so far nobody has addressed in this comprehensive way. Only a person with Tim Campbell's immense global experience could have achieved this."

Charles Landry, author of *The Creative City*

"A 'flaneur' of the modern global city, Campbell perceives new features, like 'clouds of trust,' in the collective learning of cities. His unexpected findings will compel cities and city associations to rethink their strategies about learning and global city networks."

Josep Roig, Secretary General, United Cities and Local Governments

Beyond Smart Cities

How Cities Network, Learn and Innovate

Tim Campbell



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Contents

<i>List of figures and tables</i>	<i>vii</i>
<i>Foreword</i> <i>Dr Joan Clos</i>	<i>ix</i>
<i>Foreword</i> <i>Wim Elfrink</i>	<i>xi</i>
<i>Preface and acknowledgments</i>	<i>xiii</i>
Part I The changing place of cities in the urban age	1
1 Overview	3
2 The slow emergence of learning cities in an urbanizing world	17
3 Cities as collective learners: what do we know?	40
Part II Framing a view	53
4 A gamut of learning types	55
5 Light on a shadow economy: city learning in 53 cities	75
Part III Crucibles of learning: proactive learner-reformers	99
6 Informal learners—Turin, Portland and Charlotte	101
7 Technical learning: Curitiba and city think tanks	124
8 Corporate styles: Bilbao, Seattle and others	147
9 Clouds of trust in style	162
Part IV Secrets of a knowing and accelerating change	181
10 Taking stock: why some cities learn and others do not	183

11 Turning the learning world upside down—pathways forward in policy and research	202
<i>Appendix 1</i>	221
<i>Appendix 2</i>	224
<i>Appendix 3</i>	226
<i>Appendix 4</i>	227
<i>Appendix 5</i>	228
<i>Index</i>	229

List of figures and tables

Figures

Figure 1.1	Schematic diagram of the machinery of city learning	11
Figure 3.1	Nonaka's ba	44
Figure 5.1	Global perspective of city visits	83
Figure 5.2	Global perspective with peripheral clusters	84
Figure 5.3	North–South pattern of city-to-city visits	86
Figure 5.4	Asia-centric pattern of visits	88
Figure 5.5	Euro-centric pattern of visits	89
Figure 6.1	Interviewees and trusted relationships in Turin	111
Figure 6.2	Cloud of trust in Portland	119
Figure 6.3	Cloud of trust in Charlotte	121
Figure 8.1	Tampere's network of actors	158
Figure 9.1	Graphic representation of informal networks	166
Figure 9.2	Reciprocal ties of trust in city clouds	168
Figure 9.3	Schematic map of city-to-city exchanges	174
Figure 11.1	Hypothetical sequence of events for city learning and exchange	215
Figure A5.1	IPPUC organization chart	228

Tables

Table 2.1	Urban population size and growth by region	22
Table 2.2	Number of cities of various population sizes: 1995–2025	28
Table 4.1	Typology of city learning	56

Table 5.1	Number of study tours and exchanges	79
Table 5.2	Seventeen proactive cities, innovation, and institutional practices	81
Table 5.3	Direction of visitor flows	85
Table 5.4	Reformers by North or South	87
Table 5.5	City visitors and hosts by population size	87
Table 5.6	Time spent in city learning	90
Table 5.7	Substantive areas of learning	91
Table 5.8	Management areas of learning	92
Table 5.9	Impact of learning events	93
Table 6.1	Sources, by sector	109
Table 6.2	Frequencies of persons named	110
Table 6.3	Age distribution	112
Table 7.1	Comparing think tanks	143
Table 8.1	Network exchange	155
Table 9.1	Coherence measures	165
Table 9.2	Cohesiveness measures in three city clouds	169
Table 9.3	City-to-city exchanges: typical features	172
Table 10.1	Conceptual map of learners and reformers	186
Table 10.2	Institutional attributes	187
Table 10.3	Learning types and orders of learning	200
Table 11.1	Sample tools for orders of learning	205
Table A 1.1	Summary features of learning types	221

Foreword

Dr Joan Clos

United Nations Under Secretary and Executive Director, UN-HABITAT

By now the world is well aware that the planet has become urbanized. Policy makers are not always so cognizant that this long-running historical process is unfolding unevenly. Africa is the fastest urbanizing continent on the globe, and poverty is shifting to cities. At the same time, cities everywhere share needs in the core areas of urban development.

One of the natural consequences of an urbanized planet is the rise of interactions among cities as they grow. Only 50 years ago, most cities in the developing world were the weak and dependent creatures of subnational governments or mere agents of central authorities. Even then, cities were often blamed for failures to correct glaring problems that for the most part were not of their own making. Today, cities are beginning to see, and many of them to act upon, the latent potential they hold as vehicles for change.

This urban transition over half a century has been accompanied by a largely unseen but open process of learning at two levels. Individual cities have engaged in collective learning by key leaders in public, private and civic realms. Importantly also, cities are engaging increasingly in an exchange of ideas and best practice. Indications are that investment in city learning and exchange has been growing rapidly over the past two decades. Knowledge exchange can help the 4000 cities and towns around the globe to overcome past deficits.

In 2001, UN-Habitat published some of the first documents calling attention to horizontal assistance as a vehicle to advance urban development. Today, UN-Habitat is sharpening its focus on key areas that affect all cities: planning; urban institutions, and governance; and economics, job creation, and finance. New attention is given to issues such as urban mobility and energy supply as key elements of the prosperity of cities. Harnessing the spontaneous exchanges taking place between cities can serve both the normative objectives of UN-Habitat and the operational needs of its most important stakeholders.

Tim Campbell's exploration into "learning cities" deepens our understanding about how the learning process works. His key observation is that although several kinds of learning systems can be observed, the process of learning may be as important as the product in contributing to sustainable outcomes. Outside knowledge is only part of the solution. The critical limits are often internal. He suggests that the policy environment—local, national, and international—can help facilitate, even accelerate, learning, and enhance the richness of a city's collective thinking.

Foreword

Wim Elfrink

Executive Vice President and Chief Globalization Officer, Cisco

Over the past several decades, leading members of the corporate sector, academic community, governments and organized civil society have been turning their attention to solving long-standing urban problems with the new tools of advanced technology. It is ironic in a way that the signature features of cities—density and high levels of interaction—have become the target for innovation by the very technologies that grew out of urban settings in the first place. Today we are crossing the threshold to put internet-based tools to work in cities. This signifies a new urban age, one that makes much greater use of technology—networks, sensors, and the analytics—to tie cities together. Now and in the future, practically any object at both the personal and the household level—objects that will soon number in the trillions—will have an accessible address over the internet.

Cisco's Smart+Connected Communities initiative has taken a leading role, utilizing the network as the service delivery platform to transform physical communities to connected communities. This approach helps community leaders in the public and private sector redefine the way public information and services are delivered. Through smart and seamless connections, individuals, communities, and cities can realize significant pay-offs: working arrangements without a commute; transit without the burden of large carbon footprints; health care virtually from the home or a public location; the operation of public facilities optimized; and economic development. For all of this to work well and at scale, the city itself—its leaders, both public and private—must understand and agree on pathways forward.

Tim Campbell's book invites us to look deeper into the fabric that makes cities work in a seamless manner. This book reminds us of several principles that are important to making cities more livable, economically, socially and

environmentally sustainable, and congenial. One is that technological devices are merely tools that can make our lives better only if they are put in the hands of users who understand and can make the most of them. The great sociologist Peter Marris observed that matches and firearms were taken up quickly by many groups because the receiving societies understood that new technologies could advance their purposes. In the complexities of cities, identifying a city's purpose and learning about new options takes on an entirely new order of effort, one that must engage a wide spectrum of formal and informal leaders in the city. Campbell points out that the tissue of trust between and among groups is a magic ingredient in achieving a coherence of effort.

A second feature of this book, one that Cisco understands and supports, is the sharing of learnings from one place to the next about how to make things work. Campbell documents for the first time the active trade in ideas that is taking place among cities around the globe. Part of the inter-connectedness of the new urban age is that cities by the thousands all around the globe are increasingly exchanging ideas between and among themselves. Indeed, Cisco, like many other corporate players, is forming partnerships with the many actors in the urban arena, seeking to facilitate the exchange of good ideas, the hastening of implementation and the continued innovation that must follow.

The Cisco Smart+Connected Communities initiative brings together a broad portfolio of partnerships, products, services, and solutions to address this significant emerging opportunity that the network offers as medium of exchange. It will change the way cities, towns, and villages are designed, built, managed, and renewed to achieve economic, social, and environmental sustainability. *Beyond Smart Cities* helps us balance the equation in our quest for progress. The book opens a new window to learning and shows us how cities take into account both the technological and the human elements needed to solve urban problems.

Preface and acknowledgments

Over five decades working in urban development, first as a consultant from Berkeley and later at the World Bank in Washington, I grew increasingly cognizant of a fatal flaw in the approach taken by development institutions towards cities. While Bank lending was both welcome and productive support for infrastructure that is so critical to urban and national development, managing local public choice and investment decisions are equally critical, yet far less diligently pursued in lending. Generalizing broadly, and perhaps unfairly for some agencies, development institutions have not met their responsibilities on the software and management side of urban development. Capacity building takes time; it is tortuous and fraught with headwinds and reversals, like frequent regime change at the local level and capricious policy shifts nationally.

I observed this somewhat schizophrenic approach to development over many years. The hardware of infrastructure moved ahead at a reasonable pace while the software of urban management was left all too often to the whims of fate after World Bank missions had departed the country.

With the waves of decentralization in the 1980s and 1990s, a subtle but now unmistakable change became visible. Nations and cities remained far apart in terms of priorities and policy coordination. But cities began to recognize the many similarities that bound them together, and this common ground became the agora for learning and exchange. Cities of a certain size anywhere on the globe began to realize that often they had more in common with each other than with smaller cities in their own country.

It is hard to say exactly when an inflection point appeared in the history of city-to-city exchange, but the 1976 UN-Habitat Conference in Vancouver is a convenient reference point. This book explores learning in cities that began to take off sometime afterward; certainly horizontal exchange was running much

more heavily by the 1996 UN-Habitat Conference in Istanbul. The potential of this phenomenon is still only beginning to be recognized in policy and academic circles.

The book is written for the practitioner, policy maker and scholar. Although I believe the material poses some intriguing questions that need further research, I hope that elected city leaders, members of civil society, and corporate citizens alike will find both resonance with and stimulation from the ideas expressed here.

Of course, ideas about learning in organizations go back a long way, and I am cognizant of the duty to acknowledge all that have come before me. I will occasionally redefine terms or concepts developed by thinkers who have trodden this path before, including the many practitioners of sister and twinning cities: Janice Perlman and her MegaCities, who saw the transfer of knowledge as an important policy and developmental tool long ago; Jochen Eigen and his colleagues at UN-Habitat; Josep Roig at Metropolis; Bill Stafford at Trade Department Alliance; Tim Honey at Sister Cities International; and many more. I hope they have been done no injustice by the licenses I take in the chapters ahead.

Acknowledgments are also due to many who have helped me shape and improve the chapters contained here. Gordon Feller has been unfailingly supportive and imaginative; Mozart Vitor and Maria Teresa Serra provided ideas and insight from the very earliest drafts. I am indebted also to the German Marshal Fund and especially to the city coordinators—Brian Collier in Charlotte, Mike Wetter in Portland, and Elisa Rosso and Judith Trincherio in Turin.

Gratitude also goes to Michael Teitz for urging me to move ahead; K. C. Sivaramakrishnan and Prod Laquian, Neal Peirce, Paul van Lindert and Marike Bontenbal for reading early versions and providing valuable comment; David Leipziger for helping to manage data and providing excellent draft material; Yang Yu for help with graphics; and Nicki Dennis at Earthscan for helpful advice all along the way. Thanks too to the staff of the Library of Congress where I spent uncountable and pleasurable afternoons doing research.

Finally, special thanks to the family—wife Linda, who unfailingly provided fresh perspective and new insight, and daughter Alana, who helped me work through logical arguments and provided statistical expertise. Thanks also to Kathryn and Eric, for being understanding and supportive over the many months of production.

Tim Campbell
Chevy Chase, MD, USA
August 2011

Part I

The changing place of cities in the urban age



1 Overview

"Why did you spend US\$25,000 apiece on those two 28-year-olds to come here to visit Shanghai?" I asked the Vice President of Boeing about the youngsters on the study tour from Seattle. The VP didn't bat an eye. "It's the best training money can buy. They get to know their customers, the Chinese, and we get to know ourselves, the Seattleites. When we get back to Seattle, we can pick up a phone to call the city or county or Microsoft, and the person on the line is someone we have a relationship with."

Do cities learn?

The vignette about Seattleites in Shanghai contains an important kernel of truth about urban development. It suggests that learning takes place in the heads of people who care about and take action to affect the cities where they live. This is the essence of city learning. The central concept to be explored extensively in this book is unlike organizational learning where new knowledge is captured, recorded and shared in line with mission goals and often a corporate bottom line. The nature of city learning is more closely akin to collective learning, but, as recognized in the substantial bodies of literature built up over the post-war period in both organizational and collective learning, cities are places that are more open, more loosely organized, and more riven with cross-currents of social, economic and political interests than most firms, knowledge-intensive organizations and even associations with broadly shared goals.

And yet, the most successful of cities, the innovators, reformers and survivors in the competitive race for talent and economic power, exhibit a pattern of deliberate and systematic acquisition of knowledge. Good practices in successful cities offer short-cuts. Cape Town and Buenos Aires drew on the waterfront renewal experience of Baltimore and London. Da Nang took lessons from Japan in conversion and regulation of urban land. Regional centers in Rajasthan in the north of India are following lessons of infrastructure expansion and business readiness that peer cities developed in central and southern India. Amman, Jordan is studying the many experiments in decentralized governance from other parts of the world, even outside the Middle East. These examples arise from direct city exchange.

We shall see that the most active of learning cities also develop mechanisms to store, spread and verify newly acquired ideas and apply them to solve local problems. How do they get into these circumstances? Are all learning cities successful and all successful cities learners? This book explores these and other questions that are now arising as cities emerge in this century more prominent in global trade and national standing.

We cannot go very far either without asking, what is learning? In its simplest form, learning is acquiring new knowledge. This book makes the point that cities learn as part of their governance function, but often learning is informal or technical and sometimes even off the governance radar screen altogether. Learning and knowledge acquisition come about almost as a by-product of running a city. Yet learning is qualitatively different from urban governance.

Learning can be straightforwardly linear and mystifyingly complex. In one recent configuration, MacFarlane's idea of "assemblages," groups of like-minded individuals, like slum dweller advocates, share an ethos that is bundled up in one city and transferred elsewhere by dedicated slum advocates working in other cities (MacFarlane, 2010). Practitioners internalize the ethos and apply it to their own city. Janice Perlman's core idea of mega-cities represents another point on a spectrum of learning where knowledgeable practitioners share and develop ideas of best practice (Perlman, 1987). These are both useful and important kinds of learning, but not the kind explored in this book.

The learning of cities is also to be distinguished from the emerging consensus about cities and urbanization that we receive from such influential thinkers as Geddes, Mumford, Castells, Hall and Glaeser. Our focus is how cities learn, as collective units, not on what is received wisdom about cities and policies that are then synthesized and adopted by a wider community of scholars and practitioners.

Learning cities depend upon clusters of people in close exchange of ideas. This is one of the mechanisms that produced the *Triumph of the City* (2011) so eloquently articulated by Edward Glaeser. But while Glaeser highlights the chains of innovative entrepreneurs embedded in cities, *Beyond Smart Cities* focuses on

collective learning across public, private and civic networks that function as public goods. Because they provide the context for these networks, cities are the fulcrum upon which policies can help to leverage learning to achieve innovation and change. But most cities have been lethargic about the machinery of learning, merely providing a passive matrix in which exchanges take place. Cities could play a more proactive and productive role in encouraging and expanding networks, filling in key gaps, identifying weak spots, and most of all mobilizing new membership from the ranks of young talent, both native and global.

This book sees city learning as a collective process, which always starts with discovery by individuals. The critical distinction is that individuals begin to learn together. The collective process involves subjective exchanges of values and perceptions, leading to validation and eventual adoption of new ideas by wider groups, such as NGOs, neighborhoods, business communities, public officials, and many more. In contrast to MacFarlane's packaged ethos, learning cities create a common understanding rooted in widely shared values. Thus learning takes place on several levels. On one level is the superficial acquisition of new ideas by a businessman, a city official, a neighborhood activist, picked up by observing the way something works in a city. At another level, learning involves the willing sharing of values that get internalized on the basis of trust. Later in the book, the idea of a milieu of trust will be used to describe environments where this learning takes place.

We shall see also that transmission of ideas, and the values behind them, occurs close to or nearly simultaneously with innovation. The acceptance of the idea itself in learning is a form of innovation. When this is accomplished at city level—in the way taxation is applied, or commercial interests are incorporated into development plans, or a parking meter system is adopted, or neighborhood preferences are heard—breakthroughs are made in policy or in the innovative application of a practice or technology.

Smart cities and learning

The popular literature and current trends in Europe and the US about global talent and knowledge economies advertise the promise of competitiveness and economic growth in so-called smart cities. Yet some smart cities succeed better than others; some cities low down on the IQ list achieve great things. Building up a knowledge economy of highly educated talent, high-tech industries and pervasive electronic connections are only the trappings of smartness and cannot guarantee the outcomes that policy makers hope to achieve. Though global talent and seamless connections are important, they can also amount only to the dressing of a pauper in prince's clothing.

To achieve the real promise of smart cities—that is, to create the conditions of continuous learning and innovation that has led cities like Seattle, Barcelona, Bilbao and Curitiba to keep pace with economic change—cities need something more. This book aims to understand what is below the surface in these places, to examine the mechanisms which are effective in the way open institutions like cities learn, to identify different levels (I will call them “orders”) of learning, and to explore ways to connect knowledge communities together to accelerate change.

Learning far and near

In a recent presentation about New York’s PlaNYC, Mayor Bloomberg stated that his team

drew on the experiences of Berlin for our renewable energy and green-roof policies; from Hong Kong, Shanghai and Delhi for our transit improvements; from Copenhagen for our pedestrian and cycling upgrades; from Bogota for our plans for Bus Rapid Transit; and from Los Angeles and Chicago for our plan to plant one million trees.

(United Cities and Local Governments, 2010: 1)

New York is not alone. Seattle has been visiting other cities every year since 1993 to benchmark, build relationships, and capture best practice. Seattle’s Trade Development Alliance, born out of the Chamber of Commerce, is a dedicated agency to keep Seattle at the cutting edge. But the real secret of Seattle’s learning is not just finding new ideas. The productive secret, as the Boeing executive recounted, is forming relationships that are conducive to collective learning.

Though Seattle is a recognized leader in learning, hundreds of cities around the world are now engaged in the learning process. Large cities everywhere stand astride the most critical arenas in this century. On a global plane, cities are a platform where the fortunes of nations are decided in a globally competitive environment. More and more, the products of city economies are tradeable, meaning that back-office services like hospital accounts in Manchester or design coding for Texas Instruments are handled on the other side of the globe.

These examples represent shifts in the locus of production and a sharp increase everywhere in the stakes for cities to win a race for investments and global talent. These shifts also mean that cities know they must understand their competitors and outperform them in order to move ahead. The exchange of knowledge between cities is part of this understanding and is now taking off in leaps and bounds. Cities can get new knowledge in dozens of ways. Some of the most important are commercial, internal development and exchange with other cities.

Buy it

Some cities, like Bogota, San Salvador and Amman, have turned to a commercial source of knowledge that is developed from international practice, complemented with local data, adapted to local circumstances and packaged for city customers, often the chamber of commerce or more specialized business group. The Monitor Group, McKinsey, Bearing Point, and many other consulting firms offer these services. The analytical work is useful and often of high quality. Some firms aim to be inclusive in the process, taking pains to expose clients to the assumptions and analytical exercise. But often the process is divorced from the day-to-day business of the intended beneficiaries. Key players who must understand and implement the many parts of a typical plan are not involved in working through the strategy.

Worse still, many parts of what must become a functioning whole—that is, the core leadership of a city—are not engaged in working through the discovery. Regulatory bodies, issue-oriented neighborhood groups, local investors and businesses and public officials all have to be a part of uncovering new truth. The Monitor product for Bogota included high-quality data and useful analysis, but ended up with many familiar recommendations in support of clusters in such well-known and already established industries as floristry, electronics, health care and tourism. The knowledge packaging includes recommendations which are also predictable, such as relaxing the regulatory process, streamlining decision making, setting up dedicated agencies to cut transaction costs and urging a marketing of the city brand. And while these may be analytically correct, they cannot themselves produce a magic sauce that results in a wholesale transformation. Without involvement of key stakeholders in the discovery, the creation, the deep and sometimes intensely personal exchange of values, analytics and recommendations often remain only artifacts, having objective truth but not personal conviction.

Invent it at home

Many cities have found ways to innovate by applying already known, locally found or invented techniques to improve an existing process, say taxation or licensing for businesses, or delivery of a new service, like web-based transactions in public business. Curitiba is perhaps one of the early leaders in local invention. A bus rapid transit system was built up on the basis of a social convention about controlling the automobile in the city. A local institutional genius was born in Curitiba. The main elements of the bus system were conceived in Curitiba's

planning institute. From the beginning, decades before other cities caught on, while most cities were still stuck on underground metros, the planners in Curitiba aimed to run their system like a surface metro on tires.

Local planners in Curitiba, many with experience in Europe and other international cities, contributed their sometimes exotic knowledge to innovative applications, including the layout of rights of way, dedicated lanes, building densities along the bus routes, revenue sharing of operators, and a host of other clever ideas that make Curitiba a working laboratory of innovation. The learning underlying these innovations was derived from local experts applying knowledge gained from work and travel abroad, and the climate that helped incubate new ideas and nurture them to fruition is a critical part of Curitiba's success.

"Foreign exchange"

Seattle has created a process of learning that ventures out to other cities in an organized exploration of best practice and benchmarking for lessons that can be brought back home. The study missions of Seattle are elaborate, highly organized, dedicated visits organized on a yearly basis by the Trade Development Alliance, a dependency of the Greater Seattle Chamber of Commerce. The study missions engage up to 100 business and civic leaders in the greater Seattle area. Their objectives are many, but one key overarching objective made explicit in the ethos of Seattle is to build relationships internally. As participants visit peer cities, they broaden their understanding of the position of Seattle vis-à-vis the visited city, its region and state, and indeed, increasingly, the entire global context of urban economies.

Participants on the missions include the top leadership figures of the city and county along with utilities, ports, universities, private firms, and NGOs. Not all of the delegates are senior officials, as indicated by the high-level Boeing executive whose vignette opens this chapter.

The heart of the learning experience takes place during the many opportunities where participants are together; in plenary sessions, in working groups, at meals, on the bus, when delegates sit for the post-action meeting on the last day, and even after they have returned home. During these gatherings, they question and digest what they have seen and heard and exchange perceptions and opinions with each other. They are able to gain perspective and insight on their own issues back home.

Above all, the interactive learning style of Seattle's study missions creates a personal bond of shared experiences. Participants often spoke long afterwards, back in Seattle, of the benefits of having participated in a mission. Back home,

when placing a phone call to a government agency or business, the advantage of having had this shared experience and knowing the face of the “person on the other end of the call” greatly facilitated understanding and the speed of doing business (Trade Development Alliance, 2001).

The rise of city learning

At a global level, cities are forming a thick and growing web-work of ties that constitutes an underground economy of knowledge. A survey conducted in preparation for this book shows that city-to-city exchanges—i.e., technical visits of professional practitioners seeking new knowledge and best practice—reach thousands, perhaps tens of thousands, of visits each year across the globe.

In both global and local arenas, proactive cities are developing a dynamic of internal leadership that involves acquiring outside knowledge, building an internal capacity to learn, and exchanging ideas about policies and practices in order to validate present performance, benchmark against others, and shape long-term strategic change.

It is not surprising that cities should be entering a global hunt for knowledge. It can be (and has been) argued that the very *raison d’être* of cities is that they facilitate exchange of all kinds. More to the point, in a globalized economy where knowledge plays an increasing role, cities are the crucibles where linkages are made. In turn, linkages are the channels of learning, and learning is a key not only to good practice, but also to creating wealth and reducing poverty among the poorest.

The intermediate position of cities puts them between their citizens and the outside world, mother nation-states and other cities around the globe. In the coming decades, cities will become increasingly important players in the implementation of policy, dissemination of knowledge, and creation of wealth. But while cities have long been seen as central to innovation, they have not been plumbed for their knowledge-exchange properties until now.

City learning: blind spot in urban innovation and governance

In-depth studies developed for this volume document recurrent patterns in making modern transformations. Dozens of cities discussed in this book—from Barcelona, Spain to San Fernando, Philippines—illuminate a blind spot in conventional approaches to urban development as well as in the bulk of scholarly

literature. Each of the cities scrutinized in this book has sought best practice abroad and most have achieved important transformations based in part on what they have learned from others.

Bilbao launched its pursuit of the Guggenheim Museum only 10 years after city leaders had pondered lessons from other cities around the world about industrial restructuring. Key leaders in Lima, Peru, long embattled over the role of private developers, saw in London the magic of private sector contributions—it wasn't the money; it was the incentives to partner in public goods. The secret: the public sector structures a framework for mutually beneficial returns for both public and private players. That lesson broke a logjam in Lima's deliberations over large pieces of infrastructure needed in the city's metropolitan development. Though these new configurations didn't come easily to Bilbao or Lima, the key insights came in a collective learning process. In these and many other cases, learning has played a key role, one that has been largely ignored in academic settings, policy circles and by professional practitioners concerned with competitiveness and innovation.

Indeed, few cities have given serious and systematic thought to both *what* and *how* they learn. A dozen different approaches to urban development, from regime theory to economic geography, cover pieces of this story. But no one approach has viewed the modern metropolis as a learning entity, active in acquiring and processing new knowledge as a part of its governance mechanism. Not only do cities not pay much attention to learning, their leading agencies often do not bother to measure their own progress, to evaluate the effectiveness of visits and other forms of learning, to ask whether knowledge or technology transfer is meeting city objectives, and to explore whether and how city leadership and innovation can be improved to meet the many challenges facing the city.

Research for this book over the past five years has developed quantitative data to address these questions. The findings reveal new patterns about learning and innovation. For one thing, learning cities tend to be innovative places and vice versa. They devote more time and resources to acquiring new knowledge and validating it for application at home. Second, they exhibit patterns in the way they learn, in acquisition of new knowledge from "external" sources as well as in internal processing and adaptation of knowledge to local circumstances. Cities that are serious about learning invent civic processes that facilitate the conversion of tacit to explicit knowledge. Successful cities like Seattle create opportunities for internal bonding; for instance, by involving civic and business leadership in a continuing program of study tours. In doing so, Seattle achieves internal bonding—as with those young professionals from Boeing—as it harvests a rich crop of data and best practice.

Patterns are also found in how cities internalize new knowledge. My research uncovers signature styles of trust and collaboration that characterize a city,

particularly in the shape and features of internal networks. These attributes are critical to converting knowledge to innovations and are important for understanding how to accelerate learning and make knowledge more useful.

Clouds of trust in the machinery of learning

This book shows that the vital factors for smart cities are informal leadership networks that I call “clouds of trust.” These are ties of trusted links between and among key actors in the community. Elected leaders come and go, but business, civic and youth leaders who are incorporated into ongoing “thinking” about the city represent an important form of social capital, not just because they bridge gaps in connectedness or reinforce social norms, as Burt and others suggest (Burt, 2001). They also provide a platform for learning and sustain the threads of continuity in a place over time.

Qualitative and quantitative data gathered during five years of research from cities around the world illustrate the mechanisms and the policies that enable cities to be smart, i.e., to create dense “clouds of trust” to exchange knowledge, to store it for wider and longer term use, and to convert learning to innovation. Clouds of trust pervade the machinery of learning (see Figure 1.1).

Later chapters will explore each of four elements that compose the learning city. *Trusting milieu* refers to the “ba” atmosphere of which clouds of trust are emblematic. *Institutional process* refers to documentation, deliberation, and discussion of knowledge which is gathered by internal and external mechanisms. *Agency* refers to a central office or responsible unit for managing and recording knowledge. *Knowledge gathering* is the activity of harvesting ideas from internal and external sources for adaptation as innovations in the city. Networks of confidence have a direct or indirect impact in each element.

We shall see, for example, that Portland and Turin, two of numerous in-depth cases explored in later chapters, show intriguing variation in key features of trust

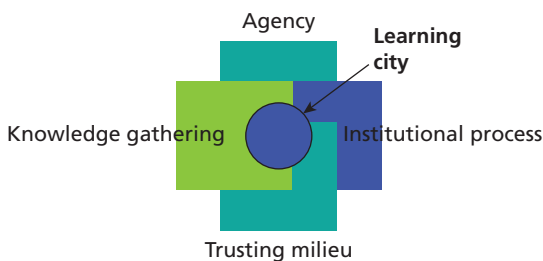


Figure 1.1 Schematic diagram of the machinery of city learning