



Innovation and the Urban Sustainability Agenda

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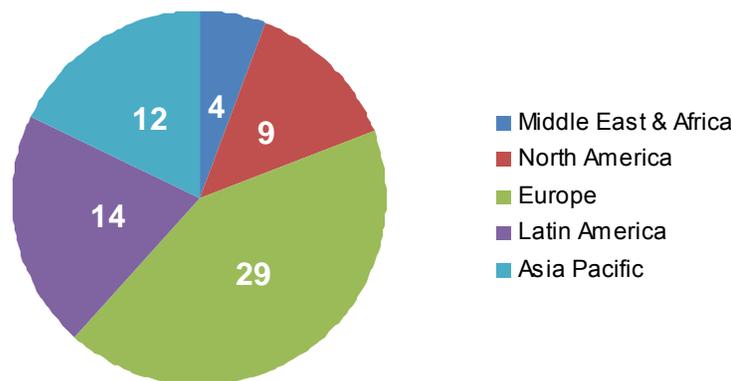
Innovation and the Urban Sustainability Agenda

Introduction

In March 2009, Cisco and Metropolis, a global association of 106 member cities, agreed to collaborate on a number of projects under the aegis of the Metropolis Partnership for Urban Innovation (PUI) commission.¹ This commission is one of seven areas of focus within the Metropolis Strategic Plan, 2009-2011.² One of the actions agreed in the Cisco-Metropolis Memorandum of Understanding signed in March 2009 was to undertake research—with the participation of the wider Metropolis community—to inform a forward-looking perspective on sustainable cities and a vision for the long-term evolution of urban environments.

From August to October 2009, Cisco's Internet Business Solutions Group (IBSG), the strategic consulting arm of the company, in partnership with Metropolis, undertook a survey of municipalities around the world to explore plans, priorities, and challenges of city leaders as they pertain to sustainability. Key questions the study addressed included: How are cities tackling the issue of sustainability? How does urban innovation work to support sustainability objectives? What role does information and communications technology (ICT) play in driving improved sustainability outcomes?

Figure 1. Respondent Geography (N=68)



Cisco IBSG, Metropolis, 2009

Sixty-eight officials from 27 nations³ participated in the study (see Figure 1), affording a global, multidisciplinary “pulse check” of sustainability issues confronting cities. Participating officials represented both political and administrative leadership (particularly city planners),

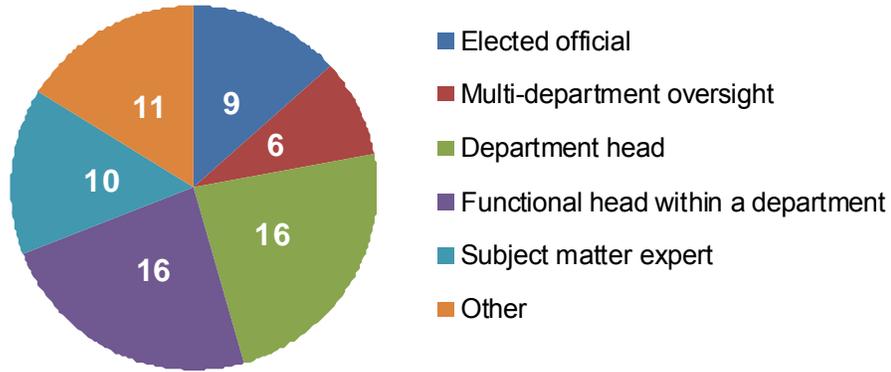
¹ <http://www.metropolis.org/metropolis/node/1264>

² <http://www.metropolis.org/metropolis/en/node/19>

³ Countries represented included Argentina, Australia, Bosnia and Herzegovina, Brazil, Cambodia, Canada, Chad, France, Germany, India, Indonesia, Iran, Ireland, Japan, the Netherlands, Nicaragua, Panama, Portugal, Serbia, South Africa, South Korea, Spain, Sri Lanka, Sudan, Turkey, the United Kingdom, and the United States.

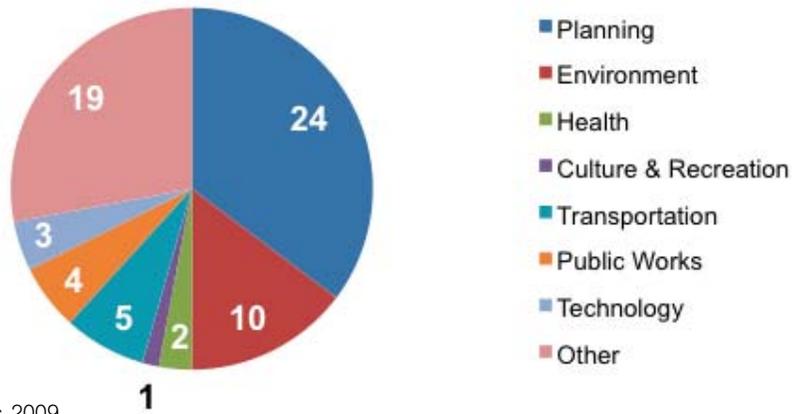
business and technology decision makers, as well as domain experts on a diverse range of sustainability-oriented topics (see Figures 2 and 3).

Figure 2. Respondent Role (N=68)



Cisco IBSG, Metropolis, 2009

Figure 3. Respondent Department (N=68)



Cisco IBSG, Metropolis, 2009

The study uncovered several important themes that should inform the work of the PUI commission in coming years:

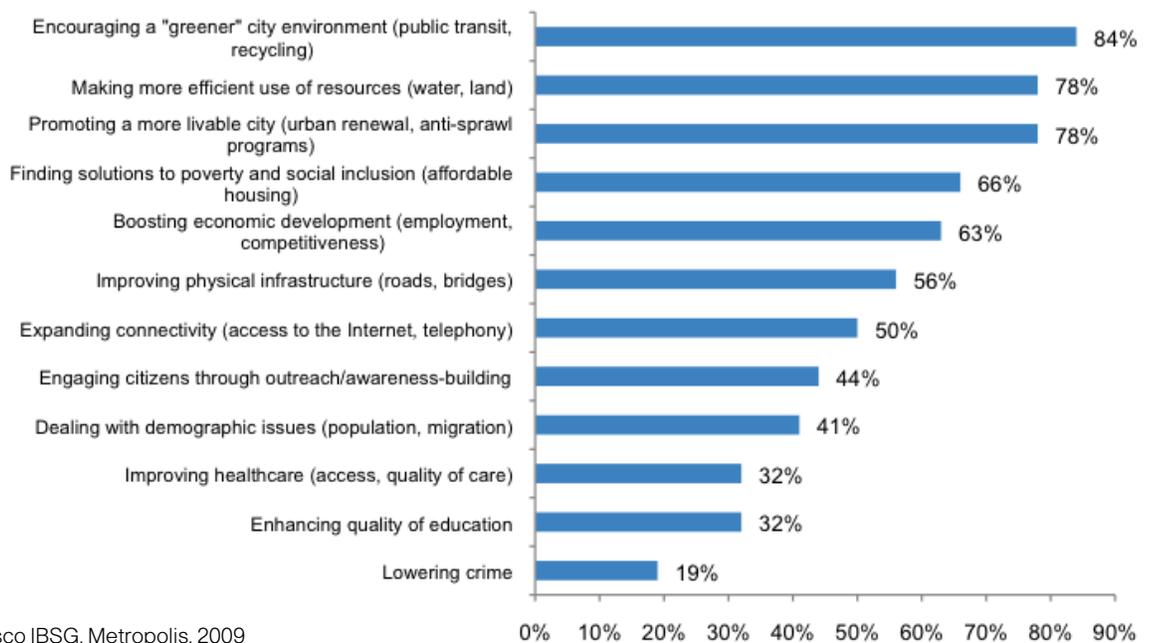
1. For cities, sustainability is first and foremost about the environment, but economic development and social inclusion also are crucial priorities of the wider urban sustainability agenda.
2. “Livability” is the watchword in municipalities’ sustainability efforts, with a clear focus on climate change mitigation.
3. Local governments are actively driving the push for more sustainable cities, marshalling resources to address the problem, orchestrating the input of the private sector and community groups, and leading by example in urban innovation initiatives, even in the face of obvious funding challenges.
4. ICT is recognized as a vital contributor to urban innovation—and, therefore, to sustainability—in cities.

The Urban Sustainability Agenda

One of the key areas of investigation for the study was how cities define “sustainability,” particularly because the term is so fraught with controversy and confusion, both in the media and among city leaders. Although it is often seen as a kind of shorthand for “environmental responsibility,” further precision in terms of its constituent elements is warranted.

Respondents to the Cisco-Metropolis survey confirmed they view sustainability as a multi-faceted issue for cities (see Figure 4). While environmental and “green” concerns were cited by respondents as core to how they conceive of sustainability, interestingly, in line with the emerging view that sustainability can also be contemplated via an accounting of “triple bottom-line” effects (that is, environmental, economic, and social), respondents also pointed to fighting poverty (66 percent), supporting economic development (63 percent), and expanding Internet connectivity (50 percent) as important aspects.

Figure 4. Definition of Sustainability (N=68)

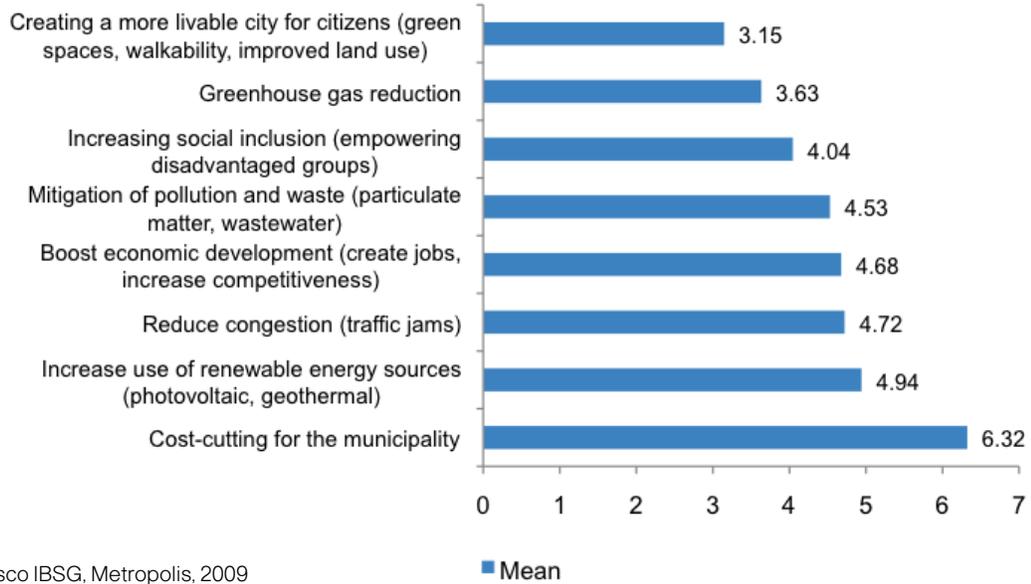


Cisco IBSG, Metropolis, 2009

Q: We are interested in how your city leadership defines "sustainability." The following are challenges many cities face. Which of these challenges does your city leadership view as falling under the theme of sustainability? (Respondents selected all that apply.)

In terms of the key drivers of municipal sustainability efforts, respondents cited 1) improving the livability of cities (walkability, urban renewal, anti-sprawl programs) and 2) greenhouse gas reduction as top priorities (see Figure 5). This suggests that improved sustainability is conceived as both an overarching policy goal (greater livability and quality of life) as well as a concrete target for cities, particularly in addressing the issue of climate change.

Figure 5. Sustainability Drivers (N=68)

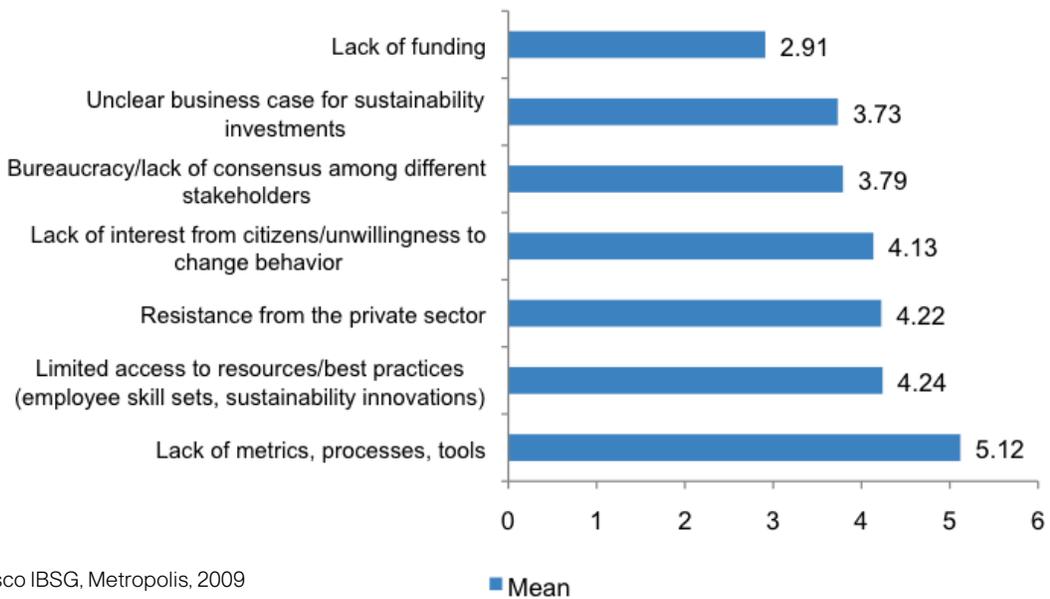


Cisco IBSG, Metropolis, 2009

Q: What are the top drivers of your city's sustainability agenda? Please rank the following eight factors, where "1" represents the most important and "8" represents the least. Important. (Respondents performed a forced ranking of the factors.)

By a considerable margin, cities consider lack of funding to be the predominant obstacle they face in terms of sustainability-oriented efforts (see Figure 6). Bureaucracy and a lack of consensus among relevant stakeholders were cited as the second most significant inhibitor.

Figure 6. Sustainability Inhibitors (N=67)

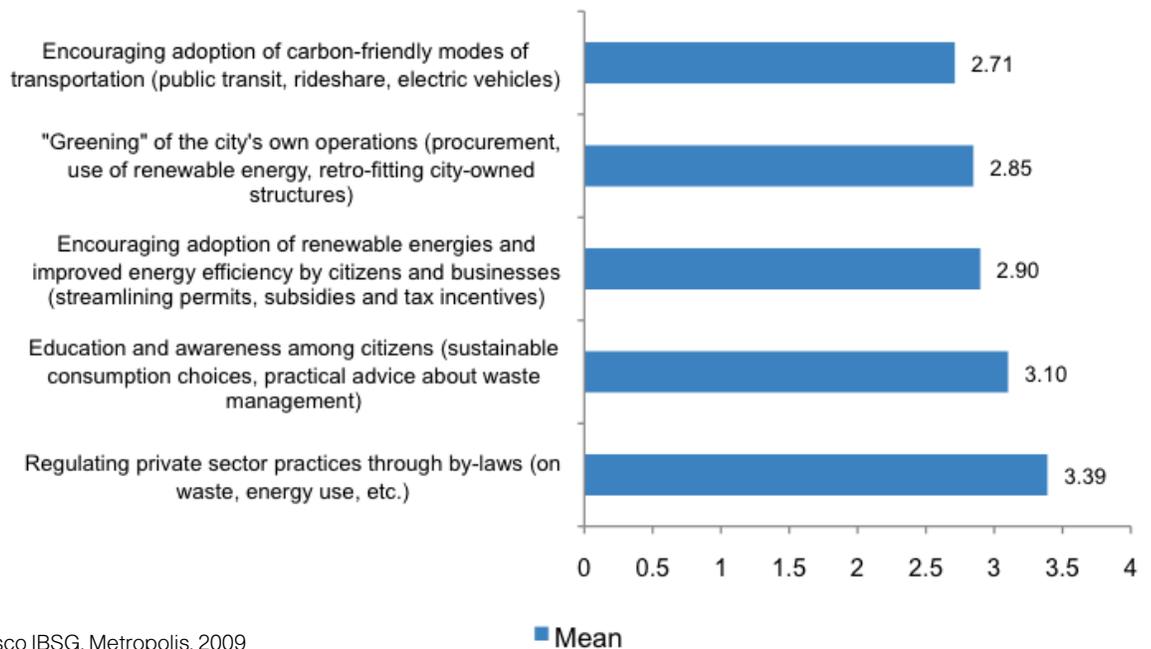


Cisco IBSG, Metropolis, 2009

Q: What are the top obstacles your city faces in its sustainability efforts? Please rank the following eight factors, where "1" represents the most important and "7" represents the least important. (Respondents performed a forced ranking of the factors.)

When asked where they were concentrating resources in terms of time and money to foster a more sustainable city, respondents listed the promotion of public transit options and the “greening” of the city’s own operations (procurement, use of renewable energies, retrofitting of existing government structures) as principal areas of investment (see Figure 7). Cities appear prepared to advance more responsible consumption options for consumers and businesses, while acknowledging the direct impact of the city itself (its administration, infrastructure, and operations) on urban sustainability.

Figure 7. Sustainability Priorities (N=59)

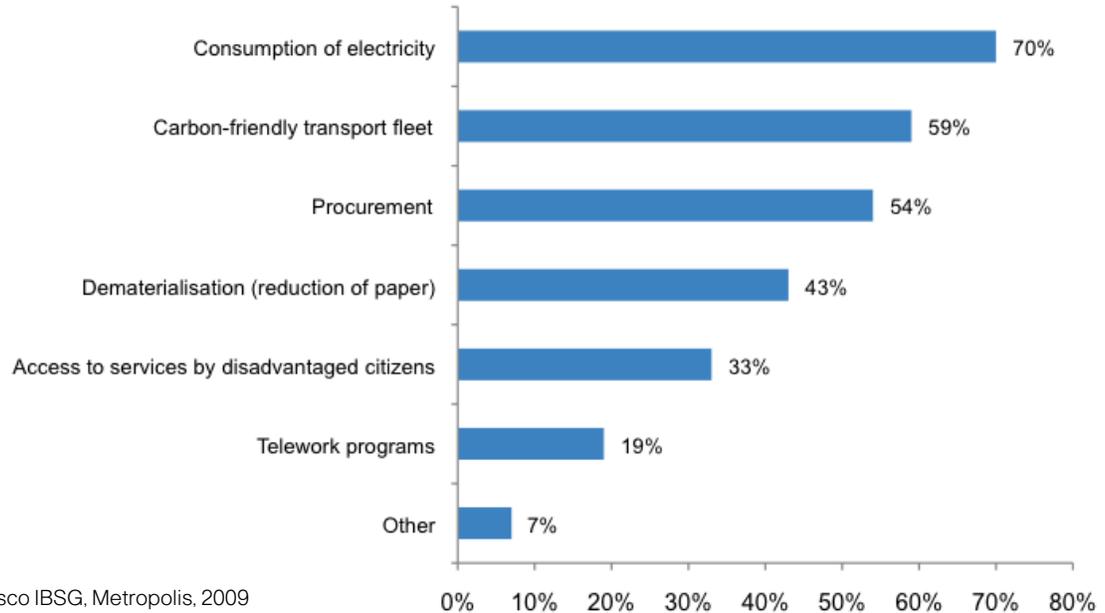


Cisco IBSG, Metropolis, 2009

Q: In which areas is your city devoting the most resources in terms of promoting greater sustainability? Please rank the following eight factors, where "1" represents the most important and "5" represents the least. (Respondents performed a forced ranking of the factors.)

Respondents cited a wide range of focus areas in terms of the green agenda within their own governments (see Figure 8). Across the board, cities are emphasizing reduced consumption of energy to decrease carbon emissions (lowering use of electricity generally, mitigating greenhouse gases through the use of more carbon-friendly technology in powering and managing public transit assets). In line with the view that sustainability can also encompass issues like social inclusion, fully one-third of respondents pointed to improved access to services by disadvantaged members of the community as a major focus. Just 19 percent of respondents, however, are investing in telework programs to reduce employee travel, suggesting a potential area of opportunity and a theme for further investigation with Metropolis members.

Figure 8. Sustainability Focus Areas for City Operations (N=54)

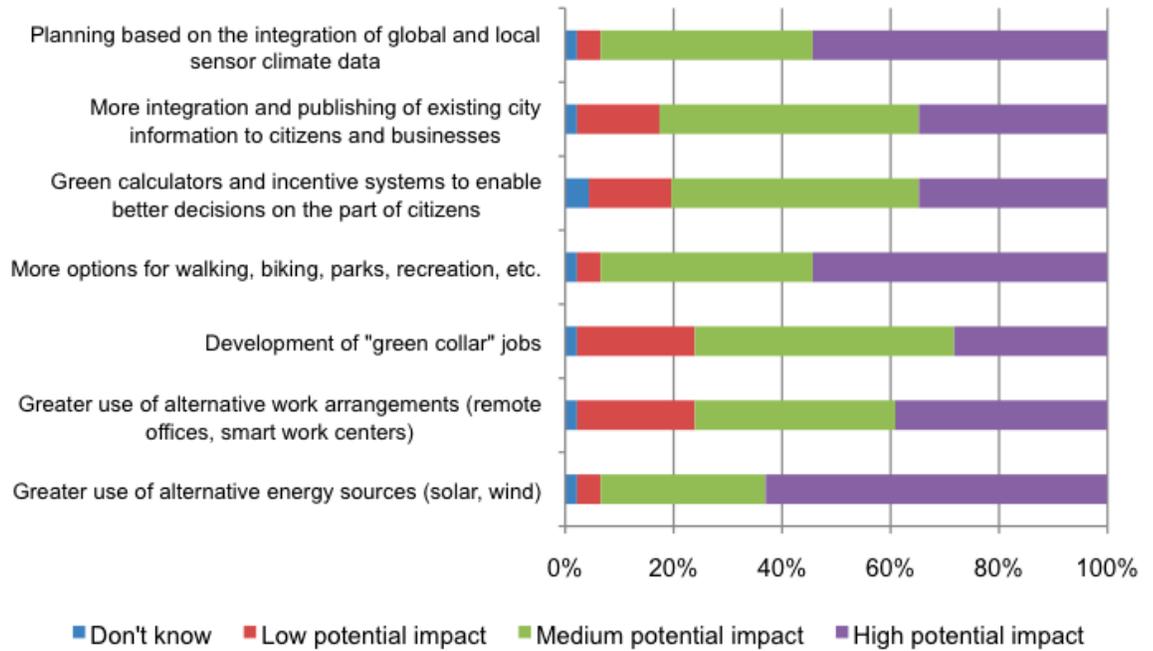


Cisco IBSG, Metropolis, 2009

Q: Which of the following are focus areas in your city's efforts to be more sustainable in its own operations? (Respondents selected all that apply.)

When asked about the potential of different sustainability-focused initiatives, respondents indicated alternative energy sources, more than any other one area, had “high potential impact” for improving sustainability (see Figure 9). In keeping with the finding that cities have placed considerable emphasis on enhancing the livability of the urban environment, increasing the availability of options for walking, biking, and access to green spaces was also seen as being of significant potential benefit. Of note, a large number of respondents (37 percent) considered the use of sensor data for more intelligent planning to be an opportunity with “high potential impact.”

Figure 9. Potential of Sustainability Initiatives (N=46)

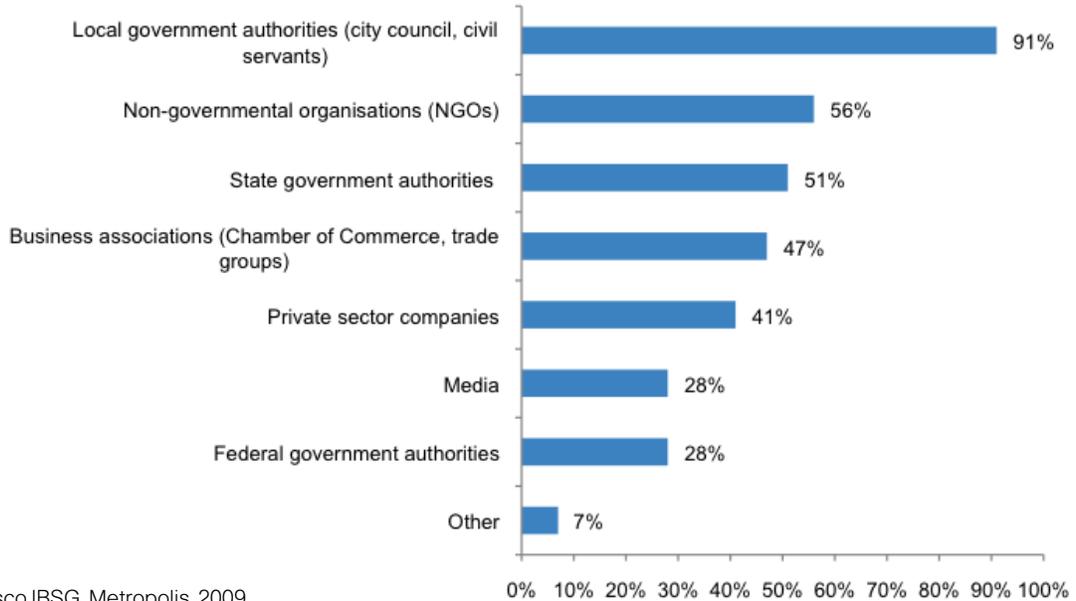


Cisco IBSG, Metropolis, 2009

Q: How would you rate the potential of the following initiatives over the next five years in terms of contributing to the improved sustainability of cities?

Sustainability strategies are being conceived and implemented primarily by local governments. Eighty-nine percent of respondents listed local government as a principal driver of the sustainability agenda, with non-governmental organizations (56 percent), state governments (51 percent), and business associations/trade bodies (47 percent) viewed as secondary influencers on policy and programs (see Figure 10).

Figure 10. Sustainability Stakeholders (N=68)

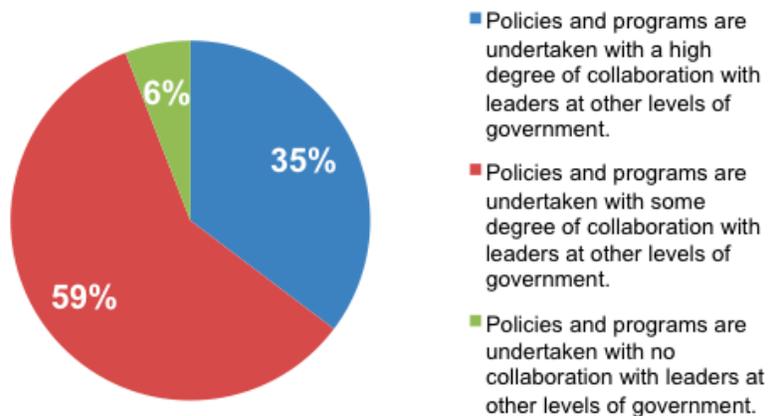


Cisco IBSG, Metropolis, 2009

Q: Who are the stakeholders driving your city's sustainability agenda? (Respondents selected all that apply)

It is perhaps surprising to note that only roughly one-half of cities consider state/provincial government authorities to be key players in driving sustainability plans, and only 28 percent of respondents consider federal government agencies as critical stakeholders. When asked about the level of collaboration between cities and state and national authorities, a strong majority (59 percent) pointed to at least some degree of collaboration on the design and implementation of sustainability-focused programs, with more than one-third indicating tight partnership with other levels of government, and just 6 percent indicating no substantive collaboration (see Figure 11).

Figure 11. Collaboration on Sustainability Among Levels of Government (N=51)

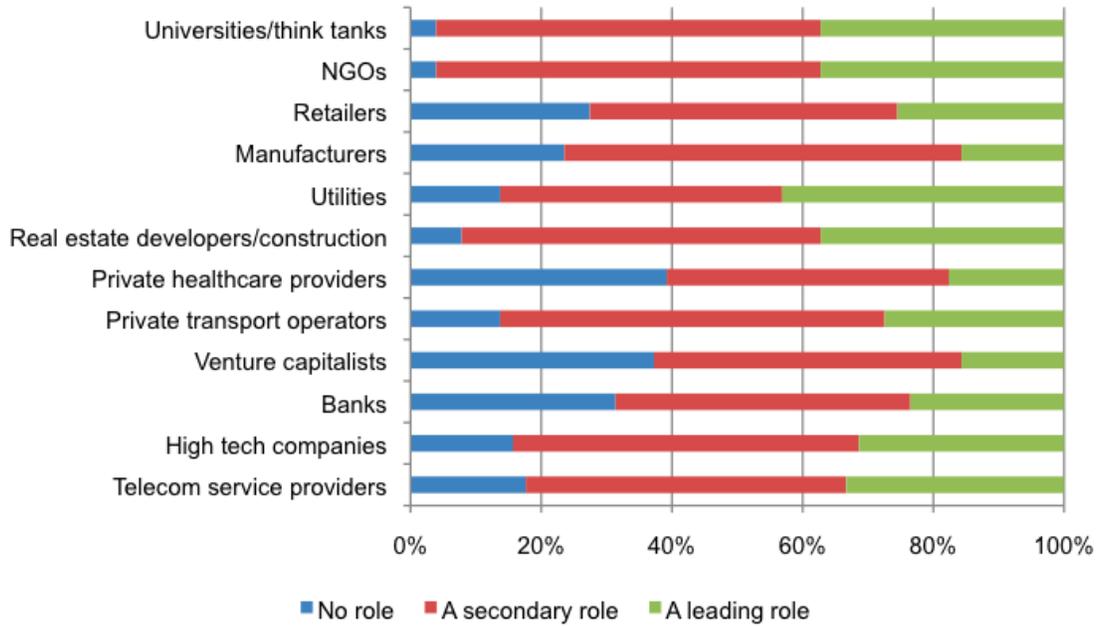


Cisco IBSG, Metropolis, 2009

Q: To what extent are sustainability policies and programs undertaken in partnership with officials at state/provincial or national levels?

The private sector also provides important inputs to the urban sustainability agenda. Utilities, real estate developers, telecommunications service providers, universities, and NGOs were cited as the top actors in pursuing sustainability issues with the city (see Figure 12). Ninety percent of respondents also indicated that citizen input is considered by the city sustainability plans, with 49 percent calling citizen involvement “integral” to the process (see Figure 13).

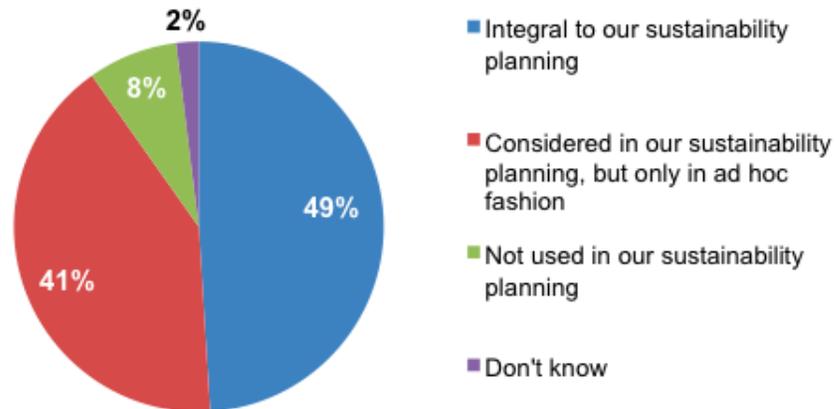
Figure 12. Impact of the Private Sector on Sustainability Planning (N=51)



Cisco IBSG, Metropolis, 2009

Q: What role do the following types of private sector organizations have in your city's sustainability strategies to date?

Figure 13. Impact of Citizen Inputs on Sustainability Planning (N=51)



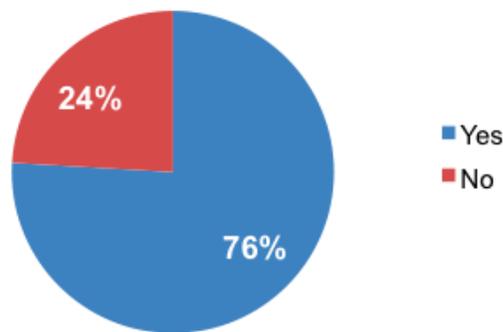
Cisco IBSG, Metropolis, 2009

Q: What role does the input of individual citizens play in your city's sustainability planning?

Governance of Urban Sustainability Initiatives

Survey findings suggest sustainability is fast becoming a priority for city leaders and that they are taking steps to tackle the challenge head-on. A sizable majority of cities (76 percent) have now implemented an official strategic plan for sustainability (see Figure 14). Typically, these plans spell out general principles (and, in some cases, specific goals) for the municipality and policies to support them. The fact that such a large proportion of cities have developed a strategic plan, against which external stakeholders and citizens can gauge progress and areas of inertia, is instructive and underlines a growing awareness of the issue's import on the part of both political and administrative leaders.

Figure 14. Use of a Strategic Plan for Sustainability (N=54)

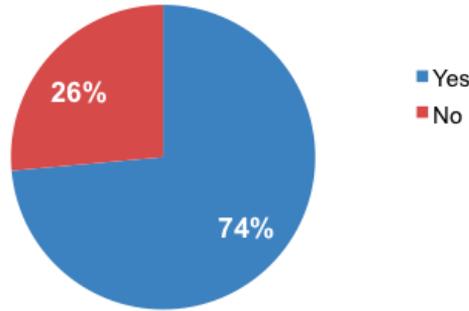


Cisco IBSG, Metropolis, 2009

Q: Does your city have a documented "strategic plan" for sustainability that encompasses all relevant city departments?

Although primarily driven by local governments, sustainability programs clearly involve coordination of multiple constituencies, including the private sector. Some 74 percent of cities' sustainability strategies involve some level of official public-private partnership (see Figure 15); 69 percent of respondents believe relevant public-private partnerships will increase in frequency and significance in the coming years (see Figure 16). These findings illustrate the importance of the city *as an orchestrator*, bridging multiple constituencies, navigating divergent political ambitions, converging bureaucratic and administrative agendas at various levels of government, and facilitating citizen participation to provide a coherent approach to sustainability as a distinctly local issue.

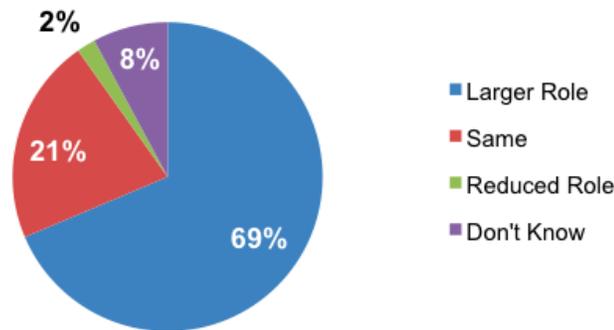
Figure 15. Public-Private Partnerships (N=53)



Cisco IBSG, Metropolis, 2009

Q: Does your city have any current public-private partnerships as part of its sustainability strategy?

Figure 16. Future of Public-Private Partnerships (N=51)



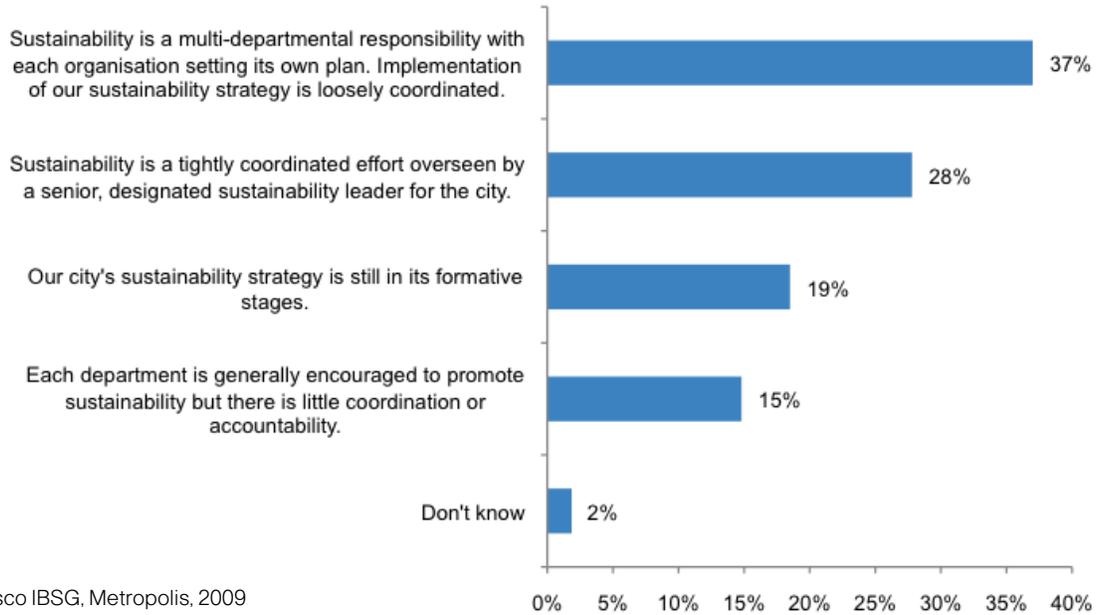
Cisco IBSG, Metropolis, 2009

Q: Over the next five years, how do you expect the role of public-private partnerships will change in terms of your city's sustainability strategies?

More than two-thirds of cities have at least a “loosely coordinated” strategy for sustainability across departments (see Figure 17). Although a plurality of respondents cited sustainability as a distributed responsibility, with each department setting out its own execution plan to comply with city-level guidelines or policies, more than one-quarter of cities have appointed a kind of sustainability “czar,” charged with overseeing the implementation of sustainability strategies and having responsibility to coordinate sustainability efforts across multiple organizations.

Interestingly, only 19 percent of respondents indicated their city had no identifiable strategy for sustainability or that it was not yet codified, and just 15 percent of respondents indicated that their city’s approach lacked coordination and accountability. Respondents noted that pollution levels, greenhouse gas emissions, and the prevalence of green spaces were key metrics by which progress is assessed (see Figure 18), although both social issues (poverty levels) and economic concerns (unemployment rate) also scored high as relevant yardsticks.

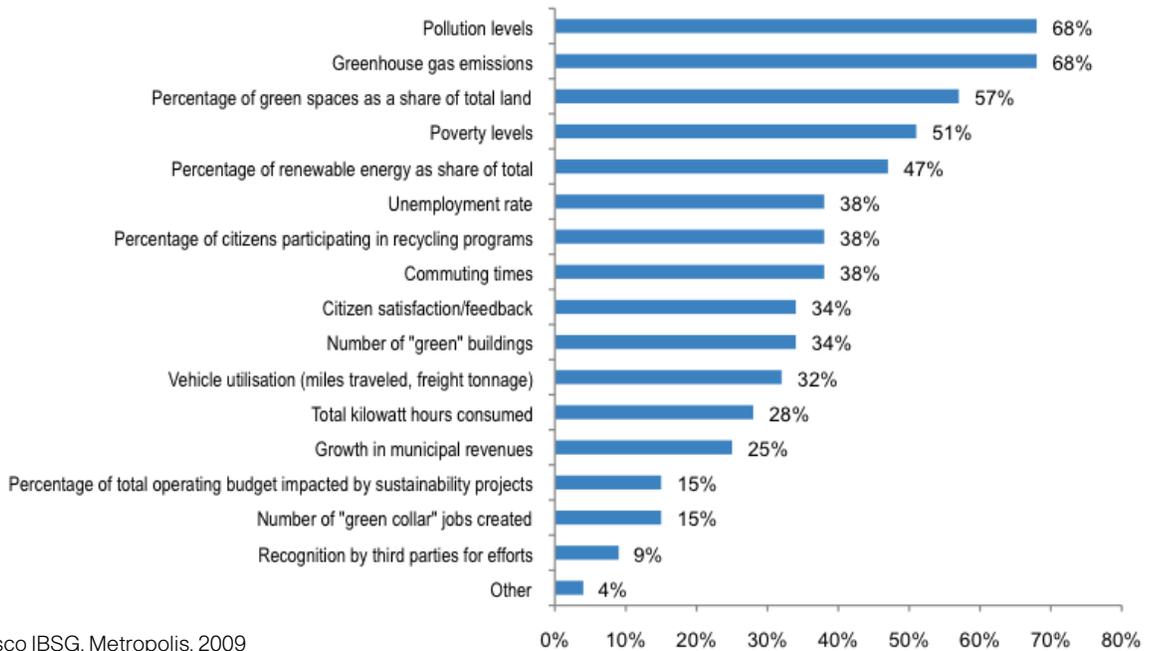
Figure 17. Sustainability Governance Model (N=54)



Cisco IBSG, Metropolis, 2009

Q: Which of the following statements best describes the governance model for your city's sustainability strategy?

Figure 18. Measures of Progress Against Sustainability Goals (N=53)



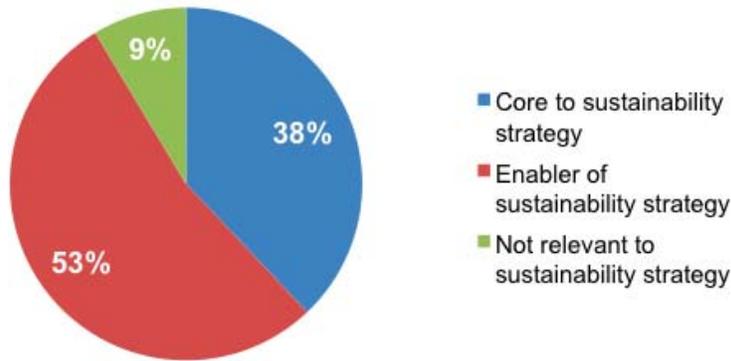
Cisco IBSG, Metropolis, 2009

Q: How does your city assess progress against its sustainability goals? (Respondents selected all that apply)

The Role of ICT

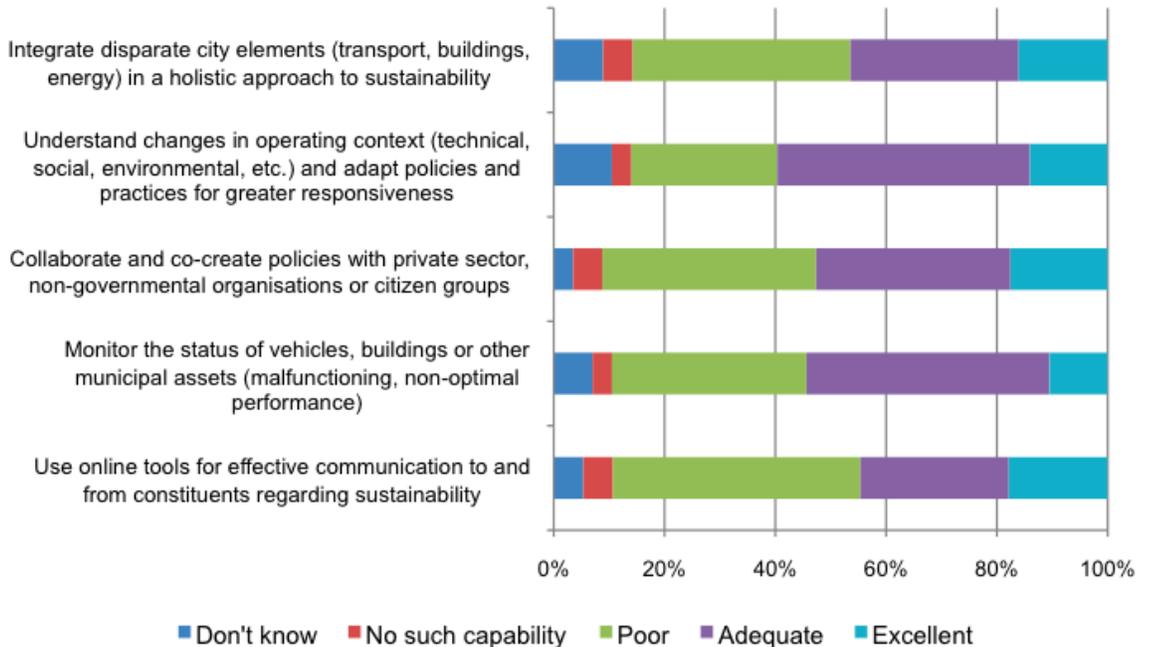
A major thrust of the Cisco-Metropolis research was to test the perception of municipal leaders regarding the role of ICT in fostering greater sustainability within cities. A majority of respondents view ICT as an enabler of sustainability efforts, with some 38 percent considering it core, and just 9 percent judging it not relevant (see Figure 19). While ICT is viewed by most respondents as playing either an enabling or central role in sustainability, most perceive their own city's current capabilities with respect to ICT to be a continued challenge (see Figure 20).

Figure 19. Relevance of ICT to Urban Sustainability (N=58)



Cisco IBSG, Metropolis, 2009

Figure 20. ICT Capabilities (N=57)

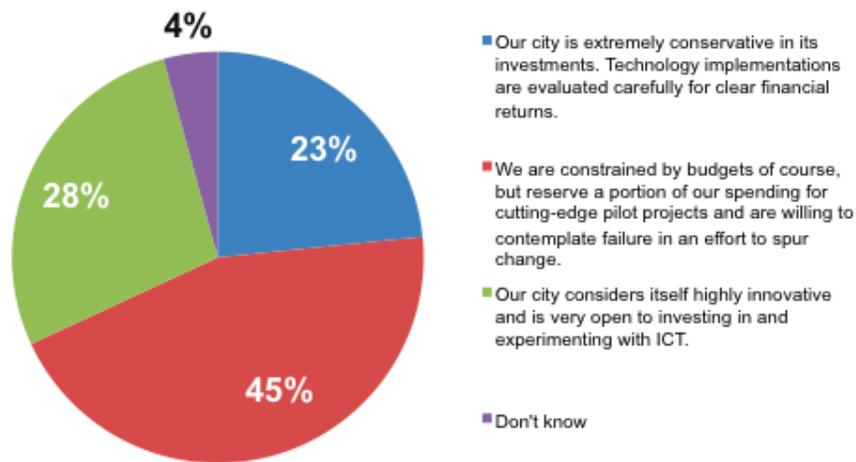


Cisco IBSG, Metropolis, 2009

Q: When it comes to using ICT for sustainability programs and policies, how would you rate your city's capabilities in the following areas?

Another key element of this research was to assess how urban innovation occurs, how cities use ICT, and what role technology plays in sustainability. Contrary to the perception in some quarters that city governments are laggards in the use of ICT, or are indeed even hostile to the change technology can represent, less than one-quarter of respondents characterized their city's attitude toward ICT as "extremely conservative," with 45 percent indicating their city devotes a portion of its budget for cutting-edge projects, and a further 28 percent considering their city "highly innovative" in its use of ICT (see Figure 21). Respondents also made clear that cities must themselves build momentum toward more sustainable urban environments, with fully half affirming cities must take "a leading role in driving innovation" (see Figure 22).

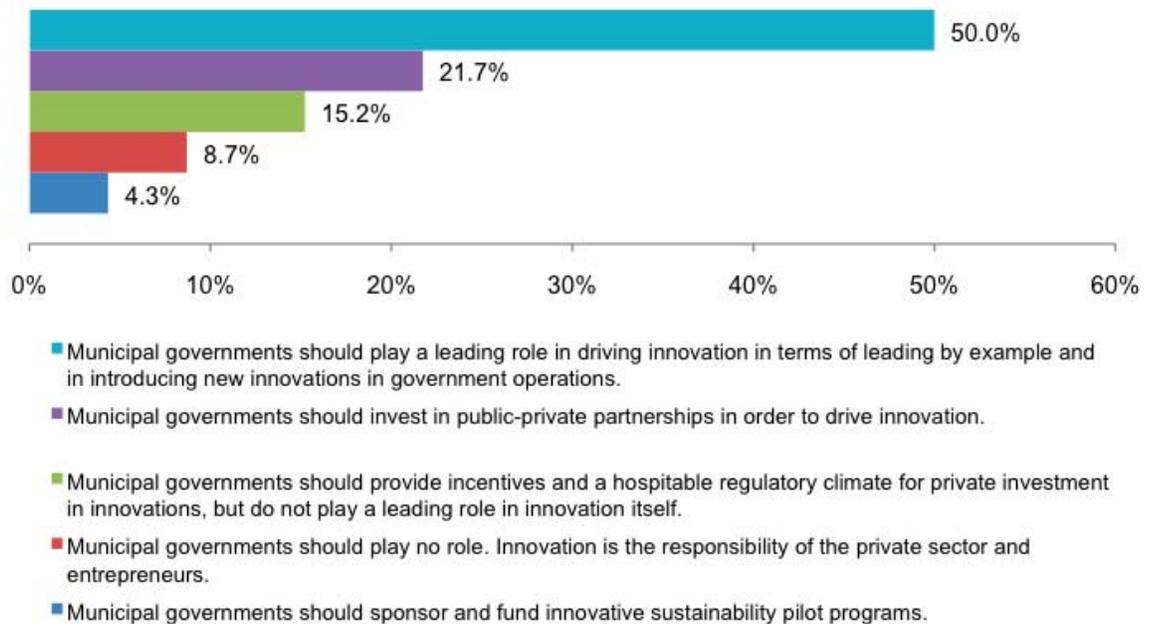
Figure 21. Approach to ICT and Innovation (N=47)



Cisco IBSG, Metropolis, 2009

Q: Which statement below best characterizes the way your city approaches technology innovations and investments in general? (Respondents could select only one option.)

Figure 22. Role of Cities in Urban Innovation (N=46)



Cisco IBSG, Metropolis, 2009

Q: Which of the following statements best characterizes how your city views its role in driving innovation as it pertains to sustainability? (Respondents could select only one option.)

Conclusion

This “pulse check” survey has identified a number of trends that can inform the Metropolis community of cities in terms of policymaking and planning. This study provides a platform for discussion and a point-of-departure benchmark for the Partnership for Urban Innovation commission in its engagements and progress through 2011.

In the context of this study, the definition of sustainability was found to go beyond “environmental responsibility,” spanning the domains of economic development and social inclusion. This is also reflected in the priority accorded to notions of “livability” for citizens.

The biggest obstacles to sustainability programs—lack of funding and bureaucracy—underscore the need for new models of flexible, modular services and support mechanisms from a broad range of community participants to enable access to financing and innovation. Indeed, the concentration of current priorities around areas such as public transit and the city’s own infrastructure is understandable. It does, however, limit the scope and impact of efforts to enable sustainability: research⁴ has demonstrated that the greenhouse gas mitigation potential associated with the city’s own carbon footprint is small when compared with the opportunity posed by deeper engagement on the part of individuals and businesses in addressing sustainability.

The perceived potential in integrating sensor data for improved planning is an encouragement to a number of relevant initiatives seeking to provide decision spaces to

⁴ “Governing Climate Change Post-2012: The Role of Global Cities,” Tyndall Centre for Climate Change Research, 2008.

inform citizens' and policymakers' actions based on new information flows. Cisco's Planetary Skin⁵ program, a partnership with the U.S. National Aeronautics and Space Administration (NASA), as well as the Urban EcoMap project,⁶ with the cities of Amsterdam and San Francisco, are illustrative examples of how far-flung sensor data can be captured and analyzed for more effective resource planning, land use, and citizen engagement.

Local governments are plainly taking the lead in working toward more sustainable cities, although in most cases, with at least some collaboration with officials at other levels of government. Within the private sector, there is a growing need to involve thought leaders—including the academic community and NGOs—as well as the providers of services to citizens and businesses, including utilities, telecommunications companies, and, increasingly, real estate developers. The survey also identified a positive disposition toward the incorporation of individual citizens' input. Essential measures of progress around sustainability were found to be greenhouse gas emissions and pollution levels. ICT is seen as very relevant to most cities' sustainability plans, while capabilities to *exploit* ICT are, for the most part, rated just poor to adequate.

This study has revealed real-world constraints, but also an openness to and appetite for innovation to address the sustainability imperative. The Cisco-Metropolis partnership and the ongoing work of both organizations will seek new ways to engage the international community of cities to share knowledge and best practices, and to identify new pathways to facilitate this needed innovation.

⁵ <http://www.planetaryskin.org/>

⁶ <http://www.urbanecomap.org/>

Appendix: Urban Innovation Programs

Partnership for Urban Innovation

The Metropolis PUI commission seeks to enable and accelerate innovation, and share knowledge across the global community of cities. The basic objectives of the commission are:

1. To help governments and their external partners improve how they lead, manage, and implement innovation in cities
2. To support the network of cities and its partners to disseminate and replicate cities' most outstanding innovations around the world

Within this program, the association focuses on four key thematic issues:

- A new type of urbanism
- Environmental sustainability and climate change
- Social integration, local economic development, and cultural diversity
- Mobility and new technologies

There are two vehicles through which this is being developed: (1) training and (2) innovation centers.

1. The Metropolis Institute runs field trips, provides technical assistance, and is developing a training curriculum with Cisco and other PUI partners.
2. Centers for innovation partnerships: A second and central feature of the organizational arrangements of the PUI is a core cluster of innovation centers. Leading cities, firms, and institutions are selected on the basis of expressed commitment to manage the development and implementation of specific innovations related to the PUI commission's efforts.

Connected Urban Development

Connected Urban Development (CUD)⁷ is a five-year program developed through Cisco's participation in the Clinton Global Initiative. The CUD approach is to change how cities deliver services to citizens, how work patterns can change, how traffic flow is managed, how public transportation operates, and how real estate resources are used and managed.

CUD was launched in partnership with the cities of San Francisco, Amsterdam, and Seoul in 2006. In 2008, four new cities joined the program: Birmingham, Hamburg, Lisbon, and Madrid. Cisco and other partners, such as the Massachusetts Institute of Technology (MIT) Mobile Experience Lab,⁸ work together to provide thought leadership and develop programs in support of each city's strategic planning process.

By using network connectivity for communication, collaboration, and urban planning, CUD is helping cities improve efficiencies in the areas of mobility, work, buildings, energy, and socioeconomics. CUD aims to reduce global carbon emissions while simultaneously promoting economic development by fundamentally changing the way cities operate and use natural resources. CUD is an example of a successful public-private partnership

⁷ <http://www.connectedurbandevlopment.org>

⁸ <http://mobile.mit.edu/>

between Cisco and cities around the world that demonstrates how ICT can increase efficiencies and reduce carbon emissions in urban environments. In the next phase of the program's evolution, the CUD Alliance⁹ — under the governance and secretariat of The Climate Group¹⁰ — aims to bring together cities, business partners, and NGOs in a global industry platform approach for ICT in the sustainable city.

Smart+Connected Communities

Cisco's Smart+Connected Communities initiative¹¹ helps transform physical communities to "connected communities" and achieve economic, social, and environmental sustainability. Cisco works with customers, from idea to execution, using vertical solutions built on the network as an open integrated platform, a broad ecosystem of partners, and innovative business models to change how communities are designed, built, managed, and renewed.

Smart+Connected Communities provide "Community+Connect" experience for constituents (residents and businesses) as well as a "Community+Exchange" for those who manage the community. We understand how important it is for governments and their private sector partners to ensure a thriving, safe community where constituents are free to live, work, learn, and play.

Further to all these programs, the Metropolis and Cisco publication, *Climate Change: Cities in Action*,¹² captures the leading initiatives being implemented today by a wide range of global cities, in a broad set of areas.

⁹ http://newsroom.cisco.com/dlls/2009/prod_092409b.html

¹⁰ www.theclimategroup.org

¹¹ http://www.cisco.com/web/strategy/smart_connected_communities.html

¹² <http://www.connectedurbandedevelopment.org/publications/external#cities-in-action-for-climate-change>



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