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SmarterCities Santiago
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"Building a Smarter Planet: City by City"

Chart: Title slide

Welcome to Santiago and to the SmarterCities forum.

I want to thank you all for joining us… for investing your time and making the trip to be here. It says a lot about you, your cities and the companies and institutions you represent.

I also want to offer a special thank you to the Institute for Urban and Territorial Studies of the Catholic University of Chile for helping us convene what promises to be an exciting and important conversation about the future of our cities.

Chart: SmarterCities Santiago '10

Today, we are joined by <u>more than 100 leaders</u> – governors and mayors … national, city and regional officials… CEOs… and urban experts from academia – from all parts of Chile, as well as many others from North America and Europe.

We were initially expecting a much smaller group, about half, but the response was overwhelming. I think that's indicative of the importance of the future of our cities all around the world.

And clearly – as we just heard from Fernando Echeverría – Santiago is representative of the new urban future… both its opportunities and its challenges… that faces our planet.

In the early part of the twentieth century, Santiago had 500,000 inhabitants. Today it has more than 5 million – or more than one-third of the nation's total population.

This population growth has also translated into making Santiago the financial and commercial center of the country. The metropolitan region generates 45 percent of GDP and nearly 50 percent of total household income in Chile.

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These facts and figures represent bigger trends. Sparked by the 2008 economic crisis, the world is undergoing a fundamental shift. And all countries, markets and institutions face a set of choices about how they react to that.

Since IBM's first SmarterCities forum last June in Berlin, we have held or planned more than 200 smarter cities forums around the world, attracting approximately 20,000 leaders. The way we have designed our SmarterCities forums is based on showcasing the new tools, new models and new leadership requirements that are reshaping the urban ecosystem for the 21st century.

This is not an IBM sales pitch. It's not about our hardware, software and services – but about the local leaders who are creating smarter solutions in cities around South America and the world.

Our SmarterCities forums have underscored the passion and momentum that exists in support of urban transformation – and the energy that is building to *make these ideas a reality*.

We're using what we learned at previous forums to shape the agenda and format for today's discussion.

We will hear from some of Chile's most forward-thinking leaders – governors, mayors, business executives and community leaders – on how they are transforming critical systems in their cities. And we've designed the agenda to give you the opportunity to hear directly from them, and to participate in peer-to-peer discussion.

That's why the most important part of this forum is the breakout sessions this afternoon… where we can roll up our sleeves, share insights, and take some deep, system-by-system dives into building *the roadmap toward a smarter city*.

In building this exciting future, collaboration is key. And judging by the crowd we've gathered today, it is clear that you are excited to get started.   So let's get going.

Chart: A Planet of Smarter Cities

It's not an exaggeration to say that humanity's story over the past 5,000 years – in other words, what we call "history" – has been the story of how our planet has become urbanized. And as you know so well, the pace of this 5,000-year-long story is now accelerating.

Consider this: If humans had been able to go into orbit around the Earth 100 years ago, they could have seen the light from 16 concentrations of a million or more people. Rio de Janeiro would have been one of them.

Today, as the crews of space shuttles orbit our planet, they can see the lights of *450 shining cities of a million-plus*. These cities are the economic, governmental, cultural and technological power plants of an urbanizing world.

In fact, in 2007, we crossed a major threshold. For the first time ever, more than half of us were city dwellers. By 2050, that number will rise to 70 percent. We are adding the equivalent of seven New York Cities to the planet... *every year.*

We should be proud of this unprecedented urbanization. It is an emblem of our economic and societal progress – especially here in Chile and in other Latin American markets. Eight of the world's 100 fastest-growing large cities are in Brazil, and six are in Mexico.

But it is also a huge strain on the planet's infrastructure. And no one feels that more urgently than you and your peers around the world.

Chart: The Reality of Global Integration

That urgency has increased over the past decade, and I believe we can identify its source. The start of the 21st century has constituted a *series of wake-up calls* on a single subject: the reality of global integration.

  ➢ In the last few years, our eyes have been opened to global climate change, and to the environmental and geopolitical issues surrounding energy.
  ➢ We have been made aware of the vulnerabilities of global supply chains for food and medicine.
  ➢ We entered the new century with the shock to our sense of security delivered by the attacks on 9/11
  ➢ And much of the world is still recovering from a global financial crisis.

These collective realizations have reminded us that we are all now connected – economically, technically and socially.

But we're also learning that *being connected is not enough*.

Chart: Something Meaningful is Happening

Yes, the world continues to get "flatter." And yes, it is getting smaller and more interconnected. But something is happening that holds even greater potential – and it arrives not a moment too soon.

In a word, our planet is becoming ***smarter***.

This isn't just a metaphor – but, then, you know that. You are here because you understand that new *intelligence is being infused into the way the world literally works* – the systems and processes that enable physical goods to be developed, manufactured, bought and sold… services to be delivered… everything from people and money to oil, water and electrons to move… and billions of people to work and live.

Chart: Infusion of Intelligence into the Way the World Works

First, our world is becoming *instrumented*:

The transistor, invented 60 years ago, is the basic building block of the digital age. Today, there are nearly *a billion transistors per human*, each one costing one ten-millionth of a cent. Think about that. We are producing more transistors every year, and at a lower cost, than grains of rice.

There are 4 billion mobile phone subscribers, and 30 billion Radio Frequency Identification tags produced globally.

Because of their increasing sophistication and low cost, these chips, sensors and devices give us, for the first time ever, real-time instrumentation of a wide range of the world's systems – natural and man-made… business and societal.

Second, our world is becoming *interconnected*:

Very soon there will be 2 billion people on the Internet. But that's just the beginning. In an instrumented world, systems and objects can now "speak" to one another, too.

Computational power is being put into things we wouldn't recognize as computers. Indeed, almost anything – any person, any object, any process or any service, for any organization, large or small – can become digitally aware and networked.

Think about the prospect of *a trillion connected and instrumented things* – cars, appliances, cameras, roadways, pipelines… even pharmaceuticals and livestock.

And then think about the amount of information produced by the interaction of all those things. It will be unprecedented.

Third, all things are becoming *intelligent*:

New computing models can handle the proliferation of end-user devices, sensors and actuators and connect them with powerful back-end systems. Combined with advanced analytics, such supercomputers – and new computing models like "clouds" – can *turn mountains of data into intelligence*.

And that intelligence can be translated into action, making our systems, processes and infrastructures more efficient, more productive and responsive – in a word, smarter.

Chart: The City: A System of Systems

All of this comes together in the city. Consider some of the key systems that are essential to the functioning of a city today:

 ➢ Consider transportation. A number of estimates suggest that in both developed and in developing cities, traffic congestion costs between 1 and 3 percent of GDP.

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That's big – and it's only going to increase. In the cities of emerging markets, car ownership rates are skyrocketing. Here in Chile car use has grown by 42 percent since 2001, adding almost one million more vehicles on the streets. Think of the strain on transport infrastructures.

➢ There are similar issues for <u>energy, utilities and water.</u> Cities generate the vast bulk of the world's CO_2 emissions, and they account for 60 percent of all water allocated for domestic human use. As urbanization levels increase, how do city leaders ensure continuing water and energy supplies – while also promoting environmental sustainability?

➢ Cities also face significant <u>healthcare</u> challenges. With growing populations, the fiscal sustainability of urban health systems will be pushed to the limit. Yet some cities are achieving significantly lower costs than others for similar levels of care. How are they doing that?

➢ Consider <u>education</u>. In developed countries, costs of education rose 42 percent between 1995 and 2004, according to an OECD study. Those costs are much lower in most developing countries – but they won't be for long. Public funding for primary education is already inadequate to meet demand. According to UNESCO, developing countries' average spending on education amounts to less than 6 percent of gross national income. It's only going to rise.

➢ Ensuring <u>public safety</u> is crucial to cities' quality of life – and to attracting work, investment and talent. And the good news is, this no longer appears to be a losing battle. New York and other cities are using advanced data analysis to achieve historic reductions in crime.

➢ Finally, smarter <u>government services</u> are crucial for both citizens and businesses. It is estimated that a 25 percent reduction in administrative costs – for instance, cutting the time spent filling out forms – could yield savings of up to 1.5 percent of GDP.

Further, the challenges your cities face – educating your young… keeping your citizens safe and healthy… attracting and facilitating commerce… enabling the smooth flow of planes, trains, cars and pedestrians – are only being compounded by <u>the global economic downturn.</u>

That's the bad news. The good news is that new models are emerging… and this presents leaders everywhere – in business, in government, across civil society – with a choice. How will we react? <u>What will we do?</u>

First, we need actually to *see* what is happening in the world. For example, as heartening as the rescue of Chile's miners was, the real story of Chile and other parts of Latin America is the extraordinary, historic trajectory of economic growth and global integration. According to the World Bank, the region is expected to grow on average 5.4 percent. <u>Yes, the world is still undergoing economic struggles – but they are not evenly distributed.</u>

As I keep saying to my colleagues and our leaders in the United States and in Western Europe, we need to heed the lesson of the world's emerging markets and *invest* in the future. At a moment like this, it would be terribly short-sighted to hunker down. You have to do more than <u>repair</u> what is broken… you have to <u>prepare</u> for what is coming.

If you are a business leader, <u>you can't just cut costs and trim operations</u>. You need to look ahead and position yourself for the major growth opportunities ahead. If you are a government leader, <u>you can't just tax and regulate</u>. You have to plan for the future.

Even if you are the leader of a <u>non-governmental organization</u>… or within a local community… you, too, have to think about the implications for society and daily life of this very new global commons on which we all now live and work.

And it would be <u>a grave error</u> for the nations of the world to react to the downturn by adopting protectionist trade policies. That would be to race toward the past, not toward an interconnected, intelligent future, and it would be <u>especially devastating to cities</u>, which are the primary hubs of global commerce.

This isn't about political systems or ideologies. It's about understanding the historic moment in which the planet now finds itself, and about investing in – and actually building – its future.

Chart: Forward-thinking Leaders Are Paving the Way

It's clear that forward-thinking leaders are acting on the opportunities:

➢ <u>Around energy</u>: The island-nation of Malta is building the world's first national smart grid, which will also monitor the country's water systems. And later today we will hear from ENDESA who is considered the leading electricity provider in Spain and the number one private electricity company in Latin America. The company supports 10 million+ customers using nuclear, fossil fuel, hydroelectric and renewable power. It recently launched a SmartCity initiative in Malaga, Spain, with the help of other partners to encourage energy conservation and a shift to renewable energy. Through this project ENDESA will apply real-time monitoring and smart meters to achieve an estimated 20 percent reduction in overall energy use.

➢ <u>In finance</u>: Banco Itaú in Brazil uses a real-time view of information to uncover new insights and take immediate and corrective actions to reduce risk and detect noncompliance. In Colombia, Bancolombia responded to stricter governmental reporting requirements on fraud prevention by integrating and centralizing data from across its lines of business, while capturing data from 700 branches and 2,300 ATMs in six countries. It was able to analyze over 1.3 million transactions per day – uncovering 40 percent more suspicious transactions and generating productivity savings of nearly 80 percent.

➢ In healthcare: Here in Chile, Integramédica is improving the delivery of healthcare through the creation of intelligent medical records. By centralizing patient information and making it accessible in real time to medical practitioners, this healthcare provider has reduced administrative workloads for medical staff and freed up time for patient care. It has also been able to decrease the risk of clinical and administrative mistakes, avoid conflicting therapies and identify cross symptoms.

➢ In transportation: Cities around the world are investing in smarter transportation. A smart card system has enabled Singapore Land Transport Authority to develop optimal routes and schedules, reducing congestion and increasing the appeal of public transit – while cutting fare leakage by 80 percent and doubling the LTA's performance capacity to 20 million fare transactions per day.

➢ In our schools: The University of Chile's Center for Mathematical Modeling is opening up new research frontiers by applying highly complex computations to areas of strategic importance to Chile's manufacturing competitiveness – mining, water and the dispersion of air pollutants. Connecting multiple data sets and research variables, the Center cut down analysis and computation time from two weeks to two hours, and it is aiming to create a collaborative network with other research facilities.

This list goes on – smarter oil exploration in Brazil, smarter government services in Peru, smarter food exportation in Argentina.

Chart: The New Leadership Requirements

The key, as it has been throughout history, is not technology per se… but leadership.

Let me offer four practical thoughts to spark your thinking for the day's discussions… thoughts about the management and leadership challenge of building smarter cities.

First, we must have standards. Of course, the importance of standards is widely understood – not just technology standards, but new, global rules of the road for trade policy, intellectual property and more.

But look at the city as it really is – as a complex system of systems. To make them all work together, *the interfaces matter*, compatibility matters. Just because you throw things together… that doesn't make it a system. To build a true system, you need much more than hand-offs.

We need standardized interfaces between the transportation system and the energy system... between the education system and the healthcare system... and among water, traffic, commerce, public safety and government services.

To be sure, there are limits to the standardization possible in any system. And that's especially true when it comes to systems where the key components are _human beings_. But if we're going to build truly smart cities… we will need a greater level of interface standardization than we have had heretofore.

Second, as organizations, as municipalities… and as societies… we must encourage greater openness and innovation, not hinder it.

This is especially important for cities, which are the world's primary hubs of innovation. IBM's Institute for Business Value recently completed a fascinating study that explores how essential cities are to new economic growth and societal progress – in particular, as crucibles for human expertise and creativity.

Indeed, unleashing the human imagination may be _the true design point_ for the cities of the future. And there are many ways we can do that – from open collaboration… to skills development… to improving our cities' quality of life.

Third, with the promise of smarter cities come some important policy implications.

Cameras – in London… in Chicago… in the Incheon Free Economic Zone in Korea – help alert police and other first responders to emergencies far faster and more precisely than ever before. That saves lives.

But some citizens have expressed discomfort. Who has all this data? What will they do with it? Do I trust them?

Similarly with regard to security. Companies and governments are excited about the competitive, economic and environmental advantages of smart infrastructure – smart grids, smart rail, smart sewers and smart buildings. But does that mean that our essential infrastructure is only as secure and reliable as a website?

These are serious issues. And they will require serious consideration across all the stakeholders of society. We need to build more than technological and business systems. _We must build societal constituency._

And that leads me to my last point – which was also my first: We will have to become far more collaborative.

This is not just the familiar formula of "public and private sector cooperation." It's multi-directional, multi-stakeholder, truly global. Think about it – none of the systems I've mentioned is the responsibility of any one entity or decision maker. They all involve business, government, communities, non-governmental organizations… all of civil society.

This will require new approaches. For instance, IBM and the municipality of Peñalolen have joined together to conduct a technology assessment to identify challenges and to optimize the use of energy supplies and improve the flow of public and private transport, carbon emissions, waste management and the coordination of public safety services.

Finally, this imperative for collaboration will also call for new kinds of leaders.

Our traditional idea of a leader is someone with <u>superhuman vision and will</u>… someone who sees the future, points to the horizon and charges ahead – either compelling or inspiring others to follow. But given the complex reality of a global system of systems, this model <u>no longer seems appropriate</u>.

Much more, we will have to <u>lead by listening</u> – by attending to what these multi-faceted ecosystems are telling us. We need to *influence, not dictate*. A reality as dynamic and complex as this must be approached with humility, and <u>with an intent to serve</u>, rather than to dominate. And we will need management systems that are architected for inclusion, collaboration and transparency.

Chart: Building a Smarter Planet

The urbanization of Planet Earth is one of those developments – arguably, the signal one – that is big enough to "see from space." And <u>all those bright city lights</u> mark the most promising opportunities for shaping <u>how our world works</u> and how we live.

I, for one, am optimistic that we will succeed.

Most importantly, the key precondition for real change now exists: *People want it.* From board rooms, to cabinet rooms, to kitchen tables around the world, there is a hunger for fundamentally new approaches.

However, this moment will not last forever. And in hindsight, when the circumstances that cry out for change are gone, when things have returned to "normal" – don't we always wish we had been <u>bolder, more ambitious, gone faster, gone further</u>?

A <u>period of discontinuity</u> is, for those with courage and vision, a period of opportunity. Remember, over the next couple of years, <u>there will be winners, and there will be losers</u>. Some companies, some industries… and some cities… <u>will shine more brightly</u> than others. And the new leaders who emerge on this global stage will win not by surviving the storm, but by <u>changing the game</u>.

One thing is clear: The world will continue to become smaller, flatter… and smarter. We are moving into the age of the globally integrated and intelligent economy and society. And that is a future of enormous promise – if we seize it.

The time to act is now. The place to act is in our cities. And the way to act is together.

Thank you very much.