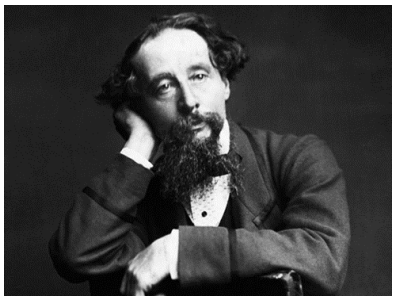
"Cities in a Time of Technological Change"

Keynote Address at the
National League of Cities – Congress of Cities & Exposition
Seattle, Washington
Brad Smith, EVP and General Counsel, Microsoft
November 14. 2013

Thank you. First of all, on behalf of Microsoft I want to say welcome to the Puget Sound. I want you to know that I chose this photograph for a very specific reason. I want all of you to be able to go home and say that you saw Seattle in the sunshine. (Laughter.) Actually, if truth be told, it looked this way the entire summer, both days. (Laughter.)

Certainly, we appreciate the important role that all of you are playing, and the vital role that cities are playing across the country. And I want to talk about the opportunities and the challenges for cities in a time of rapid technological change.



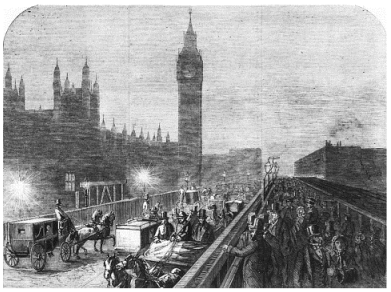
Of course, this isn't entirely new. If we go back in time, this fellow had some important words of wisdom. That's Charles Dickens.

It was the best of times.

It was the worst of times.

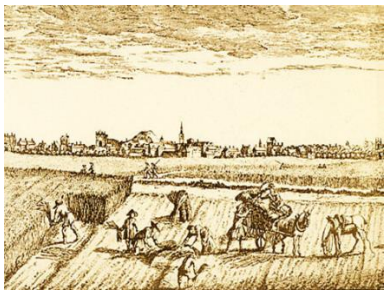
And in 1859 he penned the famous words, "It was the best of times, it was the worst of times."

It was in a book, of course, entitled "A Tale of Two Cities." In many ways, it was a tale of many cities.



It certainly was a tale of his own city, which was London. London in 1859 had experienced rapid growth. In the preceding three decades the population had tripled to over 3 million. It had attracted immigrants from Ireland and refugees from Germany and Spain and France. It was a vibrant city, it was a challenged city, all at the same time.

In fact, in 1859, London had become what in many ways almost every city has been ever since: a magnet for people. And, of course, the reason cities have become magnets for people are manifold.



In part, it's because of what happened outside of cities. In this drawing of a farm in the 1800s, if you look carefully, you'll see the harvest being brought in by 14 people and two horses.

Of course, if you fast forward to today, you'll see a far larger field with one person and one machine.

And, of course, that just begins to tell the story of what's happened outside of cities. I think this picture says it best. Look at all the cows, look at all the machines, and look at the one man in the barn.

Take it from somebody who grew up in Northeastern Wisconsin: There is a reason that cows outnumber the people in certain parts of many states. It's because so much human labor on farms has been replaced by machines.

And, of course, this has sparked a century and a half of migration. Where have all the people gone? You know where they've gone. They've gone to the city.

This decade, the United Nations estimates that for the first time in human history across the planet there are more people living in cities than are living in rural areas. In the United States, currently 82 percent of our population live in cities.

Of course, as you well know, we have our own challenges in urban areas. After all, the reason people left the farm to come to the city was to look for work.

When they first arrived, they found that manufacturing in cities was mostly done by people.

A century ago, an automobile assembly line had a car and a number of people working on it.

And yet increasingly, this is the image of an automobile assembly line.

Now, there are, of course, still lots of images and jobs that we associate almost uniquely with cities, such as this. If you're looking at a large group of taxis, you must be in a city.

There are more taxi drivers than ever before.

But that's the present. If you want to see the future, all you had to do was turn on your television recently and take a glimpse of this commercial from Audi.

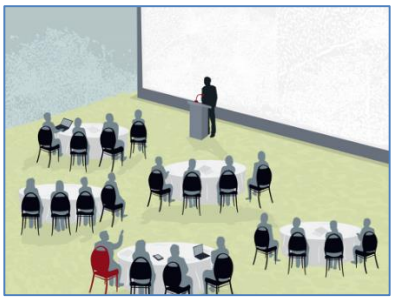
(Video segment.)

(Laughter.)

The reality is clear: There will come a time in every city when there are more taxis and there may be no taxi drivers. That is what the future looks like.

What do all the people do?

We go to meetings. (Laughter.) Increasingly, that's what has happened to those of us who live and work in cities.



And as you know, sometimes we go to big meetings.

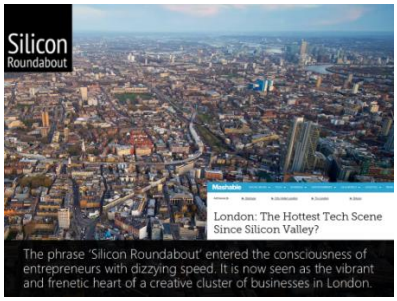
And sometimes we go to really, really big meetings like the one in this room!

But why do we go to so many meetings? It's because that's where creativity happens. That's where sophisticated governmental and business processes are managed. It's where people come together to invent and to collaborate.

And with this comes lots of opportunity and also challenges.

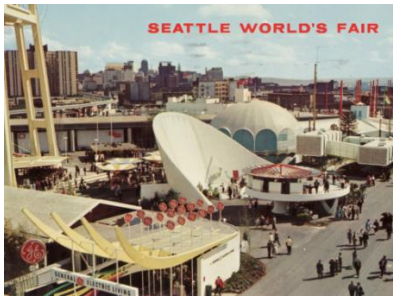
Certainly, the opportunity is increasingly clear. It's captured in what we're seeing in the industry in which I work, an industry that basically grew up in the suburbs, but more and more you see this kind of headline: Twitter is establishing its headquarters in San Francisco.

New York is now called "Silicon Alley."



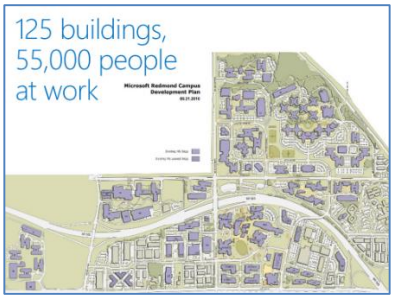
And it's not confined to the United States. You can go back to the home of Charles Dickens where they now refer to London as the Silicon Roundabout. (Laughter.) When I lived in London – I lived there for four years – they said a roundabout was an invention made to cause a small country to seem bigger. (Laughter.) But now they refer to it as a place where tech companies come together and people live and work.

All of this causes us to ask, what is the future of the city? Certainly at Microsoft, and certainly in Seattle I'd say this is a great place to ask this question.



It was 50 years ago that people were coming to Seattle to the World's Fair to see the iconic Space Needle.

Certainly, for us, we live and work across Lake Washington. We happen to work at the largest research and development center in the world. We have some of the challenges of cities; we have some of the attributes of cities. I would be the first to say that managing our little city is not nearly as difficult as is managing a real city, but there are more attributes that we have in common than you might first think.



We have a lot of buildings, 125 buildings where 55,000 people come to work every day.

We actually have the fifth largest bus service in the state of Washington. We offer 22 bus routes so our employees can ride to and from work free of charge, doing work and using the Internet the entire time, by the way. (Laughter.)

We have many restaurants. We run them ourselves. We serve over a million slices of pizza to our employees every year.

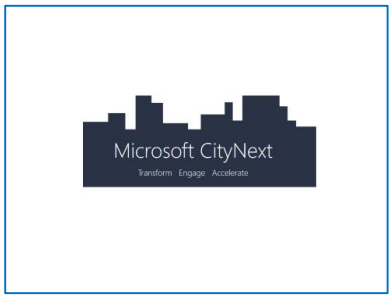
We have a parks and recreation department. We have soccer fields, we have baseball diamonds, and we have basketball courts.

We have 150,000 computers, three times the number of people, you would probably note.

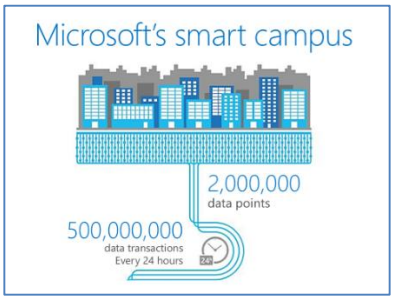
And we, in fact, have as much diversity in some respects as you might in your hometown. A third of our employees across the Lake have come to us from 157 countries. They speak over 50 languages. We're responsible for many of their human services, including providing immigration services to 27,000 employees and their dependents.

We're self-insured, so we manage the delivery of health care, through other providers, to 150,000 employees and their beneficiaries through an $800 million health care program each year, through a website that actually does work, too. (Laughter, applause.) I mean, if it doesn't work at Microsoft, then all hope is gone. (Laughter.)

But it gives us the opportunity to experience at least some of the things that you experience, because more than anything else, we need to create in our little city the kind of atmosphere, the community, the creativity that increasingly one looks to find in cities across the country.



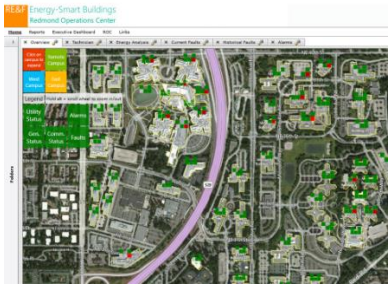
And that's what we focus on doing as well. It has caused us to launch a program that we call Microsoft CityNext. It gives us an opportunity to connect our city with cities around the world. We love to learn about what's going on in cities, because we take it home and we apply it on our own campus. And then we take what we're doing and we share it with other cities around the world, always thinking about how you make technology at least a piece of the solution that will make cities better.



Of course, one of the things that we have to focus on is electricity. We have an electrical grid with 2 million different data points. It's been there for years. It has all kinds of different pieces of infrastructure. It processes half a billion data transactions every 24 hours.

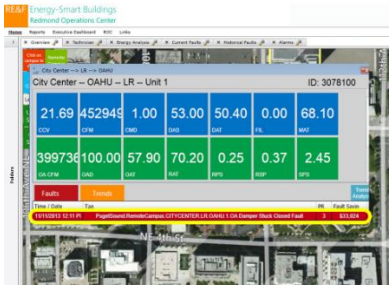
We asked ourselves, how can we make that better without replacing all of the wires? We realized we had the data; we just had to put the data to use.

So we went to work and we basically created a new electronic infrastructure using our Windows Azure technology, working with a partner, to manage our own electrical grid.



What we found when we did that is we could do things that we never dreamed were possible before.

We could look at every building, we could zoom in and see the buildings, we could find faults in the electrical grid immediately, and we could call them up, as you can see here, and then we could immediately recognize what they were.



In this case there was a damper on an air conditioner on the top of a building that was not working properly. And we use software to estimate the annual cost was to our electrical bill from that fault. In this case, as you can see, that fault was costing us about $33,000 a year.

A lot of these faults we found we could fix electronically. We now fix 48 percent of our faults in under 60 seconds. And the others we use people to go fix. And we can use work orders and get people to go out and do what needs to be done and do it right away.

We focus not only on making our electrical system cheaper. We have figured out a way to cut in the first two years our total electrical consumption by 10 percent. And we'll recover our investment in the first 18 months.

And more than making things cheaper, we're also making them safer. Because what's the other thing that every city has everywhere?

It’s the humble but all important fire extinguisher.

It turns out that in our little Microsoft city we have 8,500 of these. And before we took new steps and connected them, we had people go inspect each and every one every month to see if the pressure was properly working.

We don't do that anymore. We plug the extinguisher into the grid so that if the pressure falls, we know immediately, and then people go do what needs to be done. They fix the fire extinguishers that are broken, but they don't actually spend their time looking at the ones that are fixed.

And with these sensors that you see next to it, if somebody does something silly like put a file cabinet in front of a fire extinguisher where no one would then see it if there were a fire, we know immediately that that has happened as well.

And we're working now to extend this to the city of Seattle. We have a new public-private partnership with Seattle City Light, with private businesses, with the city. We're working first with about 2 million square feet of buildings. Part of this goal is to work between now and the year 2030 to reduce electrical consumption by 50 percent. (Applause.)

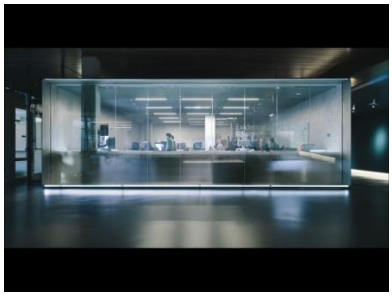
I think what's really exciting as well is to see what we can learn from cities around the world. That's one of the fun things about working at Microsoft: We get to see what cities in other countries are doing.

In this case, it's the city of Santander, Spain. We're working with them, and they are deploying 10,000 sensors on parking spaces, traffic lights, and elsewhere.

One of my favorites is that every waste bin, or garbage can, is getting a sensor. So no longer will the garbage trucks go and empty every garbage can. They will simply go around and empty the garbage cans that need to be emptied. And they're doing this in an interoperable way so they can then use this technology as they bid out their future waste management contracts to competitive and potentially multiple bidders.

That's part of what happens in cities. Of course, another thing that you have to do, we actually have to do as well: fight crime. You might say, "Microsoft, you fight crime? What the heck is that about?"

Well, this is an exciting day, because this morning we launched the new opening of our Cybercrime Center. It's something that I get to look over, since it's in my department. It's for something we've had for about a decade, a Digital Crimes Unit.

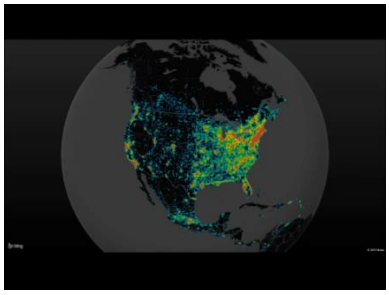


Today, we opened the new headquarters and it does a lot of things to fight crime on the Internet.

One of the ravages of the Internet right now is something you probably haven't heard about. It's called botnets. What are botnets? They're basically server computers that are command and control computers that criminals place in the network infrastructure, and then they send phishing attacks, e-mails out across the Internet, in the hopes that unsuspecting people -- sometimes they're kids, sometimes they're the elderly and sometimes they're the people in your offices -- will open. And when they open, they copy malware onto your computer.

And what your computer then does is it phones home to that command and control server every day and gets instructions. And typically the instructions are to send lots of spam out to other people. If your computer is running slow, it sometimes is the reason.

Well, it turns out that this has become a bigger phenomenon, and we decided to do something to fight against it. So we started innovating with our legal teams and our engineering teams, working with law enforcement, including the FBI.



(Video starts.) Earlier this year, we took down on the 5th of June a botnet that was codenamed Citadel. And this botnet actually took over 5 million PCs around the world that had been responsible for half a billion dollars of fraudulent financial transactions. But by replacing the command and control computers with new servers with the help of the FBI, instead of having computers phone home and getting instructions about how to send spam, we sent instructions to the users about how to clean up their PC.

And we were able with this data using off the shelf Microsoft technology tools to then track where the computers were that had this malware on it, and we could work with cities and others to encourage people to clean up their PCs.

In fact, 40 percent of the PCs worldwide were cleaned up in the first seven weeks. We're now up to 57 percent of the PCs being cleaned up. And if this follows the pattern of other botnets on which we've worked, we'll get up to over 99.5 percent of these PCs being fixed. So it's how we use technology and big data to fight crime in a very specific way.

And, of course, not surprisingly, we're now taking these kinds of tools to other cities around the world.

Recently in Bangkok we were able to partner with them. They had a lot of information that they were not able to work with quickly, including records of foreign criminals coming into the country. We've been able to work with them, and they've been able to reduce the time of some of their investigations from two years on average to 15 days. It shows what the power of information, together with software and services, can really do.

Of course, if you ask me, if you listened to our last speaker with whom I couldn't agree more, if there's one single best way to use technology, it's to use technology to invest in people.

And there's probably no better use of technology than education. There's probably no greater need in cities, given the advance of machines, than to help people skill up so that they can do great things.

I often remark upon the fact that the birth of American public education really owes itself to a city, Boston; to a particular individual, Horace Mann; and to a specific year, 1835. That was the year he decided he was going to leave the Massachusetts State Legislature and instead become the first secretary of the Massachusetts Board of Education.

He set in motion waves of educational innovation that continue to this day, waves from which we at Microsoft benefit, not just from our own employees being so well-educated, but because we're actually a big educator ourselves. We educate 8.4 million students a year -- some people are out working, some people are in college, some people are in high school -- on technology. We issue 1.4 million certifications every year on Microsoft technology. Microsoft is actually the single largest certifier of skills in the United States.

So, of course, we're thinking all the time about how the heck we can use technology to make education better, how can we address the new needs that we see.

And this is an interesting week. It's a week that started on Monday, of course, but this Monday was Veteran's Day.

For me this Veteran's Day was symbolized by this fellow who spent Monday on the Microsoft campus. His name is Adam Citterbart. He's a staff sergeant in the Green Berets. He held off a group of adversaries in Afghanistan for 11 hours, keeping a radio operating and in a firefight, a combination that basically saved his entire unit. Now he's back here near Seattle in what's called Joint Base Lewis-McChord, and like so many other veterans he's about to leave the service.

And, of course, what do our veterans need so often to leave the service and reenter the private sector? They need some additional education.

So we started a new program with the military called the Microsoft Software and Systems Academy. We have a first group of 24 people. We're paying for them, while they're still in the service, to get 16 weeks of training, nine hours a day, four days a week, advanced technology training, and we've promised every veteran -- (Applause.) We've promised every one of them an interview at Microsoft, and we're going to expand this form Washington State to California to Texas to a number of other states as well.

It certainly reflects one part of our educational challenge, helping people develop more skills, and in many instances more technology or engineering or scientific or mathematical skills.

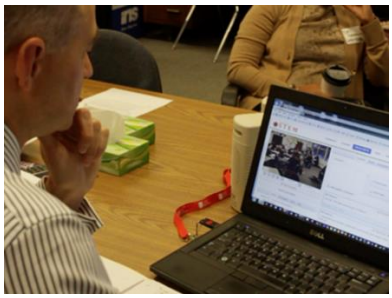
But, of course, that's only half of the challenge. The other half is how can we put technology to use to make *all* kinds of education better.

Here in Washington State we're one of the founders of a group called Washington STEM. We're working with teachers to help them become better teachers.

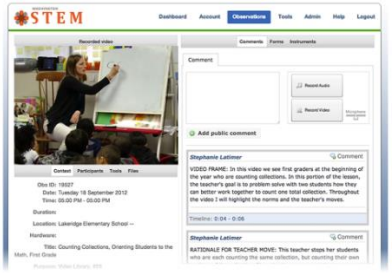
One of the things that Bill Gates is working on is one of what I think is the great ironies in American life. If you think about teachers, they provide more feedback and evaluations -- quizzes, tests -- to people they work with, their students, than almost anybody else in any other walk of life. And yet they receive almost no feedback themselves, because they work by themselves with their students.

So in this classroom Washington STEM has started with an experiment, and it’s now spreading to other classrooms. We're looking at the fact that here in Washington State $300 million is spent every year on teacher training, but most of the time teachers say they're not able to really take what they learned back and apply it directly in the classroom.

In this case we have some training that takes place in the classroom itself, because not only is there a teacher and not only are there students in this classroom, but over in the corner there's a camera, basically a web cam. If you look really closely you'll see that on the teacher's lapel there's a little microphone, and in the ear there's a little Bluetooth ear bud.



In addition to this camera there's a direct Internet connection with this coach who happens to work with the University of Washington College of Education.



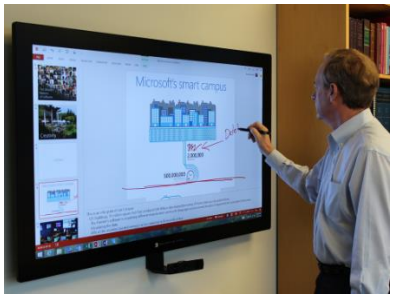
So he's able to work with the teacher and give the teacher feedback in real time, and they're able to archive the video so that the teacher can go back and look at it later.

In one of the first elementary schools where this technology has been put to use, the passage rates on the 5th grade state math test in only two years has risen from 20 percent to 56 percent. (Applause.)

Clearly, it shows if you can help teachers become better teachers, you can help students become more successful students.

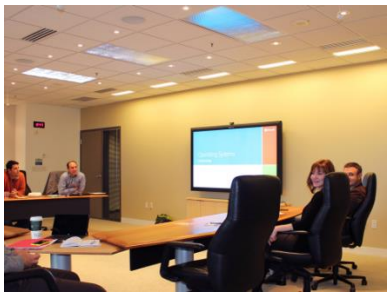
And the last thing that I'm particularly excited about relates back to that little thing we all do, going to meetings. We need to make technology a tool that can help us have better meetings.

So increasingly we're thinking not only about the computer in your pocket called your phone or on your desk, but a computer on the wall.

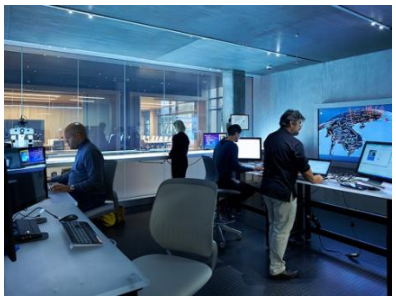


This happens to be a computer that's on my wall in my office. It runs Windows. It has a stylus. That's what I was using just three hours ago, editing the PowerPoint slide. As you can see, when you go to Microsoft you don't wear a suit. You only put it on when you come meet you all. (Laughter.)

But we've found that this transforms meetings. People can look at things together. They can work on them together.



We've re-architected our boardroom so that we can combine advanced videoconferencing with other advanced materials and the ability for people to work in more collaborative ways.



And we're redesigning across our campus the workspaces, including here at the Cybercrime Center.

I can certainly tell you as somebody who's been connected to this industry for about 25 years, who's worked at Microsoft for two decades, that I have gotten more excited and made more advances in my personal productivity in the last 18 months than probably any other time in the last 11 or 12 years.

So I think there are exciting opportunities for all of us to look forward to.

Ultimately, I actually think that Charles Dickens was just as right if we're talking about today as he was in 1859.

It *still* is the best of times.

It *still* is the worst of times.

It still is the best of times, it still is the worst of times, and cities are at the frontline for both phenomena.

Many in our industry like to talk about how technology is the solution to all problems. I'm an enthusiast, as you can tell.

Technology creates new challenges.

But I'll also be the first to recognize that technology creates challenges as well. We have to think about the challenges and we have to work together to solve them.

Technology is a tool.

And I won't stand up and tell you that technology is the solution, but I will say technology is a tool. And when we can put a powerful tool in the right hands, then one thing becomes clear:

People are the solution.

People are the solution, and that is where you come in.

Thank you very much. (Applause.)

END