BIG DATA
& CONNECTED CITIES
Acknowledgments

We would like to acknowledge the following for their advice, guidance, and support: Barry Fougere, President, Sunapee Advisors and Former CEO, BigBelly Solar; Leo Hermacinski, CEO, dSide Technologies; Patrick Larkin, Director, The Innovation Institute at the Massachusetts Technology Collaborative; Marilyn Matz, Co-Founder and CEO, Paradigm4; Steven O’Leary, Managing Director, Aeris Partners; David Power, President, Power Strategy; Susan Windham-Bannister, Ph.D., President and CEO, the Massachusetts Life Sciences Center; Bob Zurek, Senior Vice President of Product, Epsilon.

About the Mass Technology Leadership Council

With more than 550 member companies, the Mass Technology Leadership Council (MassTLC) is the region’s leading technology association and the premier network for tech executives, entrepreneurs, investors and policy leaders. MassTLC’s mission is to accelerate innovation by connecting people from across the technology landscape, providing access to industry-leading content and ideas, and offering a platform for member companies to collectively advance their interests. For more information on MassTLC visit www.masstlc.org
# Table of Contents

<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>PREFACE</td>
</tr>
<tr>
<td>04</td>
<td>INTRODUCTION</td>
</tr>
<tr>
<td>05</td>
<td>THE DELPHI PROCESS</td>
</tr>
<tr>
<td>06</td>
<td>THE VISION OF THE CONNECTED CITY</td>
</tr>
<tr>
<td>07</td>
<td>A CONNECTED CITY VISION FOR BOSTON</td>
</tr>
<tr>
<td>09</td>
<td>DEVELOPING ALIGNMENT</td>
</tr>
<tr>
<td>11</td>
<td>HOW CAN BOSTON ADVANCE THE CONNECTED CITY VISION?</td>
</tr>
<tr>
<td>15</td>
<td>HOW DO WE MOVE FORWARD?</td>
</tr>
<tr>
<td>18</td>
<td>CONCLUSION &amp; NEXT STEPS</td>
</tr>
</tbody>
</table>
Preface

This big data and connected cities report is part of the Mass Technology Leadership Council’s (MassTLC) work in support of Massachusetts Governor Deval Patrick’s ongoing initiatives to identify and exploit key economic and leadership opportunities for the Commonwealth.

We engaged in this initiative to foster greater collaboration between sectors; to spotlight and enhance the leadership capacity of our region; to attract talent, investment, and new business; and to position our region at the forefront of the big data revolution. We have employed a Delphi methodology to gather the leading minds within key industries, to lend their expertise to help identify both short and long-term opportunities.

Our work builds upon our 2012 report, *Big Data and Analytics: A Major Market Opportunity for Massachusetts*, and subsequent big data Delphi roundtable report, finding, among other themes, that leadership opportunities exist for Massachusetts to capitalize on its strengths and focus on actionable business insights.

With this, we set out in 2013 to “bump” and connect the region’s big data thought leaders with those in other key strength areas, including urban infrastructure, healthcare and life sciences. We leveraged our four-decade legacy of data and technology leadership to explore some of the most vexing challenges and opportunities of our times.

Our Delphi process involved four steps: (1) interview thought leaders representing both big data and each of the target industries, (2) survey participants to identify areas of consensus, as well as differences of opinion, (3) provide survey findings back to the Delphi participants, and (4) explore the opportunities, barriers, and possible public/private interventions, through an interactive roundtable.
Introduction

On June 27, 2013, MassTLC convened a group of 19 thought leaders from industry, academia, state and local government who came together through an innovative forecasting process to explore opportunities and interventions around the topic of connected cities is the subject of this report. Looking ahead, MassTLC will collaborate with relevant state, academic, and industry partners to advance the recommendations set forth in this report.

From the connected cities roundtable, various themes emerged with the City of Boston and the Commonwealth of Massachusetts setting the standard for openness and partnering, we should:

1. Leverage the connected city (and Commonwealth) opportunity to create a substantial growth engine for the local economy, spawning a robust set of commercial, research and collaboration opportunities.

2. Assemble an ongoing group comprised of public sector planning and IT staff, technology companies and academic institutions to further develop a vision, set priorities, align resources, and create a continuity of focus.

3. Engage the “creative class” of the City’s youth and technology community around the ideation and vision setting process. Create contests, hackathons and other mechanisms to engage the creative class.

4. Target connected city opportunities across the full spectrum of city services and infrastructure including: transportation, energy/environment, public safety, education, healthcare, and other areas, including making participation in the democratic process substantially more transparent and participatory.

5. Create an abundance of opportunities for new and existing companies to address the connected city vision, resulting in a leading global connected city innovation cluster: “Build your connected city business here”.

The Delphi Process

With fast-moving technologies, the question most often is, “Where is this all going?” When something like big data, or even the Internet comes along, it’s almost too difficult to think about all the possibilities. Imagine you could have any data in the world, and almost in near real time. What problem would you solve with it? MassTLC gathered the preeminent experts within the connected cities realm to help identify how to make Boston a leading connected city.

To begin the process of imagining Boston as a connected city, we used the Delphi forecasting technique. The Delphi process is often utilized in the absence of historical data or data from which you can extrapolate information. The Delphi process brings together the preeminent thought leaders in a particular field to consider a problem, form consensus through discussion, and identify actionable outcomes. As the experts discuss the issues at hand, they can advance new ideas and start to shape where things are going. Mass TLC did this in 2012 on big data as an emerging industry in Massachusetts. One of the insights that became clear during that process is that the value of big data is very much defined by its application in key verticals.

By gathering this group of renowned technology, academic, and government leaders, MassTLC set out to build consensus around what Boston, as a connected city, could look like and how a new vision could be achieved.

The Delphi Panel

Jennifer Tour Chayes
Microsoft

Tom Hopcroft
MassTLC

Mark Norman*
Zipcar

Bill Oates*
City of Boston

Ory Zik
Energy Points Inc.

Nathan Philips
Boston University

Elizabeth Bruce
MIT

Martin Fleming
IBM

Greg Bialecki
Commonwealth of MA

Barry Fougere
Formerly BigBelly Solar

Erin Rae Hoffer
Autodesk

Dave Power
Power Strategy

Ralph Menzano
Oracle

Peter Torrellas*
Siemens

Bob Zurek
Epsilon

Quentin Palfrey*
MassDOT

Tim Healy
EnerNOC

* denotes that individual is no longer with the organization cited at print time. See Appendix A for Panel Member bios.
The Vision of the Connected City

The connected city is an evolving concept that harnesses and exploits a very broad set of information flows to:

- Dramatically improve the quality of existing city services (e.g., more timely, more effective, more targeted, etc.)
- Enable new and better services
- Provide existing services at lower cost
- Provide greater transparency of government services, enabling a more informed citizenry and inclusive form of government

The potential of the Connected City is almost unlimited and will touch all aspects of city services and infrastructure, transportation, public safety, education, healthcare, energy, water, sewer & waste management, etc.

If we knew the location of every bus, train, car and bike in real-time, as well as current traffic and congestion information, could we improve traffic routing and reduce congestion? Could we better target investments and resources toward public transportation, removing more vehicles from the road? This is not fantasy; there are cities making real progress on such data harvesting and application piloting today.

If we knew the profiles of every building within the city boundaries – age, materials, equipment, occupancy profile, etc.– could we better target efficiency improvements to dramatically reduce energy consumption? Could we identify correlations to type of tenant and provide better tools and incentives for reducing energy use?

In his last year, former Boston Mayor Thomas Menino filed an ordinance to mandate the reporting and discussion of building energy performance for all large and medium sized buildings, paving the way for new innovations utilizing of this data set, which in turn creates a big data opportunity to properly exploit this information.

Much of the technology infrastructure is already in place to make this aspiration a reality. We are already a world-leading destination for higher education. We have the critical mass of thinkers and doers in the many colleges and companies in our city to make the connected city a reality. We have the technology and big data leadership and significant collaboration opportunities among the private sector, the public sector, and academia.

How do we best link these resources, engage across the private and public sectors, partner with our leading academic institutions, and take other steps to move decisively? What does the vision look like? How do we engage, align and motivate the different constituents?

With this as our background, let’s begin to examine a collective vision for the connected city of Boston.
A Connected City Vision for Boston

**Mark Norman:** We see an inflection point with a lot of great technologies coming to cars, coming to cities, coming to cross-data manipulations that we think will commercialize and democratize some of these benefits to enable simple and responsible urban living. These new technologies will make moving around cities seamless, easy, inexpensive, and efficient.

**Nathan Phillips:** I think that humans are at the center of the connected cities. We refer to one of our projects as urban metabolism, in which we are looking at the city of Boston as if it were an organism or an ecosystem, and carbon dioxide as our currency of metabolic function. We manage a network of towers, in collaboration with Harvard, on the top of the Prudential Building, on top of BU, and on top of UMass Boston, that measure real time carbon footprints. We’re doing these real time carbon footprints, but are also striving to connect them with the on-the-ground data to explore and enhance sustainability.

**Quentin Palfrey:** These actions can be reinforcing. If we can deal effectively with congestion, we will go a long way to dealing with carbon impact. I think that one of the best ways to improve the sustainability of this city would be to make a mode shift and optimize the way that people get from place to place.

**Dave Power:** I want to talk about the goals of connected city, because there is a major alignment challenge to this whole topic. Through this meeting, we can create a collective vision—a mosaic of what we think a Connected City is—short-term and long-term.

In the pre-meeting survey, I asked you to think about what we are trying to achieve in making Boston a connected city by examining it as a business professional. (Complete survey results can be found throughout the report). You ranked what makes the vision of a connected city most appealing to you, in order of most important to least important, as follows:

1. More business opportunities
2. Increased attraction and retention of companies, investors, and talent: If Boston is a great city, people will want to work and live here.
3. Improved quality of life for citizens
4. Better government services
5. A better place to work

What is our common goal in making Boston a connected city? It is always helpful to focus on one goal in order to achieve it. You may have to keep coming back to that goal again and again to remind yourself of what you’re trying to accomplish, but defining the goal is extremely important.

**Tim Healy:** The goal should be to make Boston the most appealing city in order to attract and retain talent; “talent” essentially translates to all the people that live and work here. That is a simple overarching goal that most people can get behind. Everything else is a subcomponent of that. If you have a very appealing city, you should have a thriving economy, lower crime rates, services that people want, and businesses and government agencies that are ready...
to provide some of those services. So if you focus on making Boston a place to attract and retain the best companies, and the best people to work and live within the city, I think you have what you’re looking for.

**Martin Fleming:** One interesting dimension of the pre-meeting survey is that the number one response was around job creation and business success, which is as important to political leaders as it is to the business community. I would focus on attracting and retaining talented and skilled people to come and live and work in the city, and develop the skills and the talent of the residents that we have.

There are a lot of big data implementations that can help distinguish one city from another and improve the quality of life, which leads to the attraction of talent, and ultimately successful economic outcomes. But we are in a global competition with cities all around the world to attract that talent.

**Jennifer Tour Chayes:** One of the things that Boston and Cambridge has going for it is that much of the greatest talent in the world passes through these cities while getting an education. We have to keep more of them here.

One of the ways to do that is to offer opportunities in data science. If the City of Boston is well coordinated with the businesses and the universities, that can be really compelling. For example, we could discuss having a citywide data platform in the cloud. Every city is trying to do that.

If we decided that our goal is to have Boston be the first major city that has a great data platform that can be accessed by startups and companies, and yet protect privacy, and we can show that it delivers value to the citizens of Boston, we will help in the talent acquisition because people will stay here to build on that platform.

**Bob Zurek:** One area to consider is how to prepare the Connected City of Boston for the future generation. The future consumers—kids that are 10, 12, 15—have a certain level of expectation on how they live and communicate in the city. They expect, of course, to find a Hubway bike because they have grown up with it. They expect to find the Zipcar around the corner. Somehow, we need to think about that next generation of professionals who are in grammar school and high school now, who will come out and say, “Boston is so cool. You can do X, Y, Z, and stay connected, not just with your friends, but with the city.”

**Power:** So when we say quality of life, great place to work, that idea should not just be for us as we see it today, but for the generations to come. And those generations need to be part of the design process. If there’s a customer experience design, a key customer is the 20-something.

**Zurek:** We also have to think about the way we communicate to this audience. When we talk to them, let’s make sure we’re talking to them through Facebook, Twitter, and Instagram—through all the forms of media that they’re used to receiving information.

**Ory Zik:** Another huge talent and creation attraction is environmental performance. I think that the young generation is expecting it. In cities like Beijing you cannot even breathe today, so a huge value-add of a connected city is to be able to understand environmental performance and optimize it.
Developing Alignment

For Boston to emerge as a leading connected city, there are many issues we need to address. First, we must establish a shared vision where public and private sectors are aligned. Then, we must set up a manageable set of goals that are accessible and involve all the parties who have a vested interest in seeing Boston as a connected city. What should we be thinking about in establishing goal alignment and moving forward?

**Bill Oates:** City governments normally do not do a good job of taking unsolicited ideas. We were so proscribed with our procurement processes that we needed a place to be able to take some risks and do some things differently. So, we created the Mayor’s Office of New Urban Mechanics with some team members from IT and from the Mayor’s office to serve as an open door, and we’ve made some progress.

We have so much more to do, but I’m glad we have this open door, because you are the companies Boston’s city government wants to partner with in order to solve some of these problems. Boston is the perfect size. We’re big enough with 620,000 citizens. We are globally recognized as a big city, but we’re not that big. We have a city government that’s organized in a way that we can get things done. And we have a great ecosystem of higher education and business that can work together.

**Greg Bialecki:** The important part of the connected cities idea is that we have to convince people that Boston must continue to grow if it is going to be a competitive city in a competitive world.

The notion of a connected city could help us do is create a vision of how we could grow—how we could add more businesses, talent, and investors and get more VC investment — and do that in a way that is not detrimental to the very high quality of life and the character of our communities in Boston. The connected city helps us imagine a future with a lot of growth that still is sustainable and maintainable.

As a citizen, rank what makes the vision of a connected city most appealing.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Increased government services</td>
<td>5.3</td>
</tr>
<tr>
<td>2</td>
<td>Reduced cost of delivering government services</td>
<td>4.0</td>
</tr>
<tr>
<td>3</td>
<td>Increased business opportunities/jobs</td>
<td>3.8</td>
</tr>
<tr>
<td>4</td>
<td>Increased attraction/retention of companies, investors, talent</td>
<td>3.4</td>
</tr>
<tr>
<td>5</td>
<td>Improved government services offerings</td>
<td>3.0</td>
</tr>
<tr>
<td>6</td>
<td>Improved quality of life for citizens</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Boston is the perfect size. We’re big enough with 620,000 citizens. We are globally recognized as a big city. We have a city government that’s organized in a way that we can get things done. And we have a great ecosystem of higher education and business that can work together.
Chayes: The New York City Office of Economic Development did studies about why Silicon Alley had died in 2000, whereas Silicon Valley had taken off, and Kendall Square had survived. What NYC cited as their number one problem relative to their competition was the lack of people advanced engineering degrees. Boston is number one in the country with people earning advanced engineering degrees, and New York is number 22.

Mayor Bloomberg asked the important question: “What will it take to make New York number one?” The answer was the Applied Science Initiative. Cornell Tech, a new graduate engineering school in NYC, will produce 2,800 graduates at its peak. The Center for Urban Science and Progress (CUSP) at New York University is another institution that is granting engineering degrees. CUSP will have 50 new faculty and 500 graduate students over the next few years. The Columbia Institute for Data Science and Engineering is hiring 75 new faculty. All of this educational action was in response to RFPs driven by the Bloomberg administration, with a focus both on producing much greater numbers of technical talent and engaging them on working with the City of New York on connected city challenges.

If we are starting out as number one, why don’t we go from our strength, from what makes Boston a unique place, and then try to build on our trump card?

Power: Boston has fierce competition for retaining talent—Bloomberg has created laser focus around a vision and can find the money to get those advanced degrees. It’s much easier to mobilize resources across multiple sectors when you have a common goal.

Fleming: At the risk of going back to New York for another example, they have a regional planning association that has been around for, I don’t know, 50 or 60 years. They get on these issues and get on these projects, and they stay on them for year-after-year-after-year. They’ve become a bit of an adjunct, almost, to the city government. But they have a durability and sustainability through a number of different administrations, and over a long period of time.
How Can Boston Advance the Connected City Vision?

To get to next steps, the City of Boston must have commitment to open data and focused engagement with the private sector and universities. We want Boston to be the easiest city to acquire and leverage data on city services and infrastructure. We also want to make it easy for both citizens and visitors to “plug in” anywhere by creating a unique “Boston API” that allows for easy accessibility. We would like Boston to be the model and the leader of all global cities in possessing a highly desirable citizen–user experience across all major city service areas and we’d like to do that by drawing citizens into the process of establishing goals, with a specific focus on young people.

**Power:** I would like to put together a mosaic of the elements of a connected city. If we shot into the future five to ten years from now, what would the Connected City of Boston look like?

**Erin Rae Hoffer:** I want to see a set of performance objectives that would include environmental, as well as innovation and economic objectives and how they would translate to an individual. What is the citizen–user experience that we are envisioning?

**Elizabeth Bruce:** Amazon uses algorithms to determine what you bought and suggest other things you might like to buy based on those original purchases. I would like to take that into Boston and use it to make recommendations for visiting sites within the city. “We know you like this musician, this kind of restaurant—based on that, here are some recommendations. When you’re in Boston go to this restaurant or this museum because we know you like X.”

**Oates:** We have an open data platform in Boston; we push out stuff and make it available. I would concur with you that the platform and the data itself may not be very
 usable. We try to put stuff out there that is valuable for researchers or developers and can be used to build something. We should kick that in the rear end and say, “How do we do it differently? How do we focus it around specific objectives?” We have a data platform, but there has to be a way to gather and store the data so it means more to the scientists who want to be able to access and do things with it.

Bruce: At CSAIL, we are collecting transportation data by working with the city government to get a year’s worth of taxi data, MBTA ridership data, and Hubway data. We are working with the Boston Globe to get events data, weather data, anything that might impact transportation in the city of Boston. But it’s been an incredible amount of work and we still don’t have all the information we need.

Oates: A year ago we went through an exercise and the issue was pretty simple: It was vehicle miles traveled in the city. So we are doing bike share, we’re changing parking rules, we want to see what kind of impact any of that stuff has on the actual vehicle miles traveled because we’re curious and interested about transportation and the impact on the environment.

Chayes: Beijing is giving Microsoft its taxi data. We are able to do unbelievable things with that data.

Oates: There is an opportunity to take something like that and use our collective public and private resources to do this in a way that is going to make a difference,” as opposed to, “Okay, check it off, we’ve got a data platform.”

Barry Fougere: It could make sense as a motivator to set an audacious goal, such as you can get from anywhere to anywhere within the city of Boston within 20 or 30 minutes. How would we get there? Maybe that will not be achievable for 30 or 40 years, but it could be something to strive for.

Chayes: We need to have a big goal. We also need the platform and the opportunities, which no other city is providing to let people work with. Let them put sensors all over the place. We have to worry about privacy, certainly, but CUSP, which is part of NYU Poly now, is covering a whole block in Brooklyn with sensors, and they are going to let people study the outcome of those sensors for energy and all kinds of things. They’re going to see when people turn their lights on and off, really micro stuff, and that is very attractive.

I would want the most innovative data scientists and social scientists to say, “Wow! It’s so easy to deal with the City of Boston. It’s more manageable. They have a shared data platform. I can see everything here.”

Power: New York has a big vision and they are encouraging people to stay there and develop new business.

Hoffer: What is the Boston application programming interface (API)? When we think in terms of software, we think about creating a product, creating an API, and then publicizing it. I am trying to envision a Boston API project that would bring a group like this together, plus the technologists; then you could throw in a lot of cool technology that is now available in a kind of a sandbox where we can really invent and move forward.
Zik: If we would like to attract talented people who have just graduated from area colleges, how about making Boston the city where dreams come true for these young entrepreneurs? People would like to invest in cool ideas, and there are a lot of cool ideas. The connection between them is a big data problem.

Palfrey: We could articulate a very specific goal, such as putting the data together so that a user in Boston will know all transportation options in real time, such as when the next train is coming, where the taxi cab is available, what the nearest Zipcar location is, or where the nearest Hubway bicycle options are. How much is it going to cost if you take the subway? How much is it going to cost if you drive through the toll?

I could imagine mashing up this data, and over a relatively short period, having an app that could access all of that data and output it to drive certain behavior. It would be a push mechanism, where folks here could come together and make whatever data we have available, mash it up, figure out a user-friendly app, and move along towards a vision. I think that’s a really valuable thing to do, and maybe we can articulate something fairly ambitious but actionable like that.

However, I also want to make sure that we leave room open for happy accidents. So I want to make sure that we’re intentional about the way that we think about these things, but also that we empower people to figure stuff out that we didn’t even aim for.

Power: So, we need to encourage experimentation, incubators, seed money, and that sort of thing.

Norman: Boston would benefit from creating a challenge for its data community, a city hackathon to use some of Boston’s big data to solve a citywide problem.

Ralph Menzano: Tourism is also up in the air for competition. There’s a competition that is starting to be generated around tourism, things like loyalty to a city. They don’t only want you as a tourist once, but as a repeat tourist. The city of Dublin, for example, has created
a tourism relationship management system. So there’s something about tourism that says a city is great.

**Peter Torrellas:** If we want to fill out the vision, maybe we can crowd source the idea of answering these questions and use that iterative and agile process that we’ve learned through the data sciences. Maybe we can set as a goal and part of the vision for the connected city to have a participatory relationship with the creative class to help solve those problems and create a platform where that can happen.

**Hoffer:** I just wanted to add that I would like to see connectedness also as being, “I have a value I can provide to you. I can do lots of little projects.” If I want to come to a city where I can interact with people and do my work in this sort of post-corporate way, can Boston support it?

**Bruce:** We have a lot of students in Boston and I’m thinking about ways to get students more engaged. Maybe there’s a way to leverage all these really smart minds, by developing a program like City Year or Code for America that can help students learn about big data in a real world environment. We could call it “City Data.” We can set up a living lab, create an environment, and they can get their hands on data and start to use it, like developing algorithms that would improve traffic in the city.

**Philips:** The students in Boston are already self-organizing on certain topics. On the climate change issue, for example, Tufts, Brandeis, Harvard, MIT, BU, and Northeastern are all sitting together, working together, and networking. I suggest that we look at what they’re already doing on their own and supercharge it.

**Chayes:** Then, as Ory pointed out, find some funding for the best ideas that come out of these groups. Develop more challenges and have some funding so that when they set up shop, they do it in Boston or in Kendall Square, so that there’s a barrier to them moving to someplace else. Once they are here, they will attract others. It is a virtuous cycle in that way.

What do you see as the biggest barriers in achieving the vision of a connected city?

- Funding: 100%
- Lack of inter-agency collaboration/communication: 55%
- Privacy issues: 44%
- Data availability: 44%
- Public & Private Sector alignment on objectives: 44%
- Lack of clear vision/strategy: 44%
- Political support: 33%
- Long, complex sales cycle: 11%
- Technology availability: 0%
How Do We Move Forward?

**Power:** Let’s transition to the topic of recognizing that we don’t have the full and final vision of the connected city yet. It is difficult to develop that vision, and it will evolve. We should engage the student community on ideas of what it should look like. Industry, government and academic leadership is in this room. The resources and institutions that are going to drive the process are represented in this room.

**Torrellas:** Yes, but let’s make sure to ask the students directly what would make them stay and get them engaged. We have to craft the policies and solutions and create the business opportunities to manifest the intentions that are behind them. We have a lot of problems to solve and a lot of smart kids. Back in the days when I was a smart kid, I wanted to solve bigger problems, and I would have gone anywhere where I thought I could solve a cool problem.

**Bruce:** Do you think the idea of New York being the number one data city is coming from publicity and marketing or do you think it’s real?

**Chayes:** Some of the hype is being caused by publicity and marketing, but the reality is that the institutions are being created with money behind them and the mandate to pull in this data. I see MIT and CSAIL sitting here today and I can’t help but think that your organizations could do some of these things so much more easily and quickly than Cornell Tech, which is just getting formed and currently has three faculty members. We can be the facilitators of this vision because a lot of creativity can happen around it. And I especially like your idea of crowd sourcing for the creative class.

**Power:** In the connected city we’re looking for a better social life, a better ability to move across the city in terms of transportation, sustainability, and growth. What are the barriers to going forward from where we are today to achieving what we’re looking for in the connected city?

**Fougere:** With the application area being a city, by definition that means collaboration between technologists who want to create and sell things, and agencies that are actually going to deploy and procure them.

**Power:** And what’s the challenge?

**Fougere:** The challenge is to start with is an alignment issue. Is there full awareness on the customer side about what the supplier side can offer? Is there full awareness on the supplier side about all the complexities of dealing with the customer side? Basically, is there a shared view of how we can help each other – and of what each side’s motivators and constraints are - regardless of whether it’s transportation, sustainability, energy, or whatever the problem? It probably starts with that.

**Power:** So you’re saying that whatever it is we are going to do here, it is going to involve the public sector spending money on some infrastructure to have it. And whatever that is, they’re not articulating it, and maybe we’re not helping them, and therefore, private companies don’t really know what to build and sell.
Fougere: Companies need a real and credible “pull” signal so they are not wasting time pushing on a rope, and so it’s kind of “help me help you”. We need to come together around alignment of goals and motivations.

Norman: The key is to create that vision and roadmap that allows us to break down and work across the silos, to provide the stepping stones to get to the government agencies, the technology companies, and to the students in the hackathons.

Oates: My feeling when I first got into public sector was that you had the supplier community on one side and you had the city/public sector folks on the other side, and you had a bridge between them. What I found happening is that there was always a gap there, which meant having to convince the supplier that they have to come farther along across that bridge because they don’t have the skill set on the public sector side.

The solution architecting, and other kinds of things that need to be the final steps to make the connection, can be really tough. I used to think about it from a vendor perspective: “Why would anyone want to sell to the public sector?” It was just so long, hard, and fragmented. I don’t think that’s a big issue in Boston.

The financing is another challenge. How do we think through what the investment is? Even though we do all those things, we do it in small pieces. We need to do it bigger.

Bruce: What are your limits to doing it bigger? Is it financial?

Oates: No, I don’t think it’s financial. I think it’s that bridge between the city/public sector and the supplier community. It is articulating the value proposition that is very specific for the residents of Boston, to really show what we are talking about and what the benefits are going to be.

Power: The taxpayers are the end, users and the voters, and in the end they are in charge.
Oates: If we could articulate that, then the financing and the support—political, financial—will come.

Bialecki: I think the most fundamental issue is that when we think about the power of big data and being a more connected city for Boston, we need to think and talk and act differently. Boston is already a pleasant place to live and visit. We like bicycling along the Charles and so forth. But as Jennifer and Peter pointed out, that’s not the primary way you get young talent. It has to be the most exciting place to be. Of all the things we have discussed today, that’s a very different fundamental shift.

In terms of picking a goal, we have to be the place where people who want to solve a problem are saying, “My God, you have got to go to Boston because they’re thinking about that problem 10 times better than anywhere else.”

Menzano: I always thought it was helpful to go out and find examples of what I wanted to be or what project I wanted to do. So what projects do we want? Do we want to model ourselves after Berlin or Singapore? What are the models out there?

Oates: It would also be helpful to share more widely what we’re working on already. We can work collectively to form the vision on where we want to be, identify gaps or opportunities and then set priorities. There’s a great opportunity to take some of the learnings here and have them put into initiatives, some of which are going to be city related, but most of which I think are going to really be public/private opportunities.

Power: People in this room could generate some buzz around a powerful vision of a connected city that gets people to pay attention. Because of the diversity of organizations and businesses represented here today, there are a number of potential audiences we could reach if we wanted to get people to say, “Hey, that connected city initiative is pretty exciting.”
**Power:** We are at the end of our time together. I heard a number of action items during our conversation today that will help to further our commitment toward making Boston a model connected city:

1. Confirm the immediate and long-term goals of Boston as a connected city. This includes gaining the ongoing engagement and commitment of today’s participants.

2. Working with City officials to inventory and baseline where the City of Boston is today in terms of the connected city and obtain commitment from the administration to make the connected city vision for Boston a reality.

3. Mobilize students at universities around Boston with a challenge, a data hack-a-thon, or a nerd center.

4. Gather a subset of today’s group to do further work to define the connected city vision and get alignment on what we’re trying to achieve for Boston. It’s a substantial opportunity for a new Administration, but could take Boston to a unique vision of what it wants to be. It could be very big.

5. Define the responsibilities for directing and managing the process of migrating Boston towards becoming the leading Connected City.

The connected city is an exciting and compelling application of big data to a unique set of challenges that affect not only our professional, but also our personal lives. There was great energy in the room among the Delphi participants, great ideas for engagement with the commercial, academic and government entities within the Boston area, and great enthusiasm for tapping into the student and creative communities to help drive forward toward making “Connected Boston” the best city in which to live work and dream. MassTLC looks forward to its ongoing role in making that vision a reality.
Appendix A – Delphi Participants

* denotes that individual is no longer with the organization cited at print time.

Co-Chairs:

**Dave Power (and Moderator), President, Power Strategy:** Dave Power, President of Power Strategy, has guided growth companies as an operating executive. Dave was CEO of Novera Software, a pioneer in web application integration that was acquired by Mercator Software. Prior to Novera, he was Senior Vice President of Marketing and Corporate Development at RSA Security (now a division of EMC) where he helped transition the company from security token vendor to enterprise security leader. At Sun Microsystems, Dave was Vice President and General Manager of SunSelect, a software business providing PC-Unix integration solutions.

As a Partner at Fidelity Ventures, Dave was an investor and board member in enterprise software, digital marketing, mobile and healthcare IT companies including: Black Duck Software, EnterpriseDB, Ping Identity, Polyserve (acquired by HP), RedBrick Health, Castlight Health, and Vibes Media. He was also a board member of Ximian (acquired by Novell) and Curam Software. Prior to Fidelity Ventures, Dave was a Venture Partner at Charles River Ventures where he led the firm’s business development efforts with CIO’s and provided operating advice to portfolio companies.

Earlier in his career, Dave was a Partner at Temple, Barker & Sloane (acquired by Mercer Management, now Oliver Wyman). There he co-founded the firm’s technology industry practice, advising Apple Computer, Lotus Development and other technology leaders. Prior to his business career, Dave was an environmental engineer with Camp, Dresser & McKee.

Dave earned BSCE and MS degrees in Environmental Engineering from Tufts University, and an MBA from Stanford Business School where he was an Arjay Miller Scholar. He serves as a Trustee at the Perkins School for the Blind where he chairs the online education committee. Dave is a Certified Gazelles International Coach and teaches “Strategic Management” and “Innovation” at the Harvard Extension School.

**Barry Fougere, President, Sunapee Advisors former Chief Executive Officer, BigBelly Solar:** Barry Fougere, Chief Executive Officer of BroadStar Wind, is responsible for the overall strategic direction and management of the company. Barry is an experienced company builder who brings over 20 years of senior operating and advisory experience, and a strong personal commitment to energy & environmental sustainability.

Previously, Barry was the CEO of BigBelly Solar, an innovative leader in waste & recycling systems. Earlier in his career, Barry was CEO of Colubris Networks, an enterprise wireless company that is now HP’s $100M+ enterprise mobility division. He has also held Partner level roles in the professional and business services industries, with leading global firms such as A.T.Kearney and Heidrick & Struggles. He began his career designing jet engines at Pratt & Whitney Aircraft.

Barry is an active board member with several technology and educational institutions, serving as an overseer of the Museum of Science, an overseer of the Massachusetts Technology Leadership Council, and an advisory board member with the
National Center for Technological Literacy. He has also been a serial mentor for business planning and entrepreneurial programs, such as the MIT Clean Energy Prize and MIT Founders’ Skills Accelerator. Barry is the President of a woodlands preservation group and a member of several other organizations committed to the preservation of nature and open space.

Barry received a MBA (Kellogg) and MSEM (McCormick) from Northwestern University, a MSME from Rensselaer Polytechnic Institute and a BSME with high distinction from Worcester Polytechnic Institute.

Panelists:

Greg Bialecki, Secretary for Housing and Economic Development, Commonwealth of Massachusetts: Mr. Gregory P. Bialecki is the Secretary for Massachusetts Executive Office of Housing and Economic Development. He oversees the commonwealth's business development, housing and community development, and consumer affairs & business regulations under secretariats. As Governor Patrick’s chief housing and economic development advisor and cabinet member, Mr. Bialecki has oversight of 14 state agencies. Prior to that, he served as the Undersecretary of Business Development. Mr. Bialecki also leads the Governor’s Development Cabinet, which improves coordination across several Cabinet Secretariats involved in high level initiatives geared towards strengthening the Commonwealth’s economic position. He has been the architect of the Patrick-Murray Administration’s Growth Districts Initiative, oversaw the implementation of the Massachusetts Opportunity Relocation and Expansion (MORE) Jobs capital program, and created an “Industry of the Month” series to strengthen relationships with key economic drivers in the state. Mr. Bialecki also served as the Commonwealth’s first Permitting Ombudsman in which he executed the Chapter 43D Expedited Permitting Program and chaired the Interagency Permitting Board. Before joining the Patrick-Murray Administration, Mr. Bialecki enjoyed a 20 year career as a real estate development and environmental lawyer at the law firms of Hill & Barlow and DLA Piper Rudnick, where his work focused on the major urban redevelopment projects in the Greater Boston area. He also worked extensively with public agencies, non-profit organizations, and private landowners on land conservation and open space protection matters throughout the Commonwealth. Mr. Bialecki serves as the Chairman of Mass Ventures. He also serves as the Chairman and Director of Massachusetts Development Finance Agency. Mr. Bialecki is a graduate of Harvard College and Harvard Law School.

Elizabeth Bruce, Executive Director, Big Data Initiative at CSAIL, Director of Industry Partnerships, CSAIL, MIT: Elizabeth Bruce joined MIT CSAIL in May 2008 as Director of Industry Partnerships. She is responsible for developing industry-university collaborations to help bridge the gap between research and commercialization. She recently co-led the launch of bigdata@CSAIL, a major new industry-sponsored initiative focusing on next generation big data technologies. Elizabeth works with faculty to launch new research initiatives at CSAIL covering topics in big data, mobile, multicore and cloud computing, health, AI, robotics, and security. Elizabeth helped found the CSAIL Industry Affiliates Program (IAP) in 2008 and is responsible for leading the CSAIL-IAP team and growing the program to 40+ member companies. Prior to CSAIL, Elizabeth
held leadership roles at the MIT Microphotonics Center, where she led an industry-academic Technology Roadmapping project, and at the MIT Center for Biomedical Innovation, where she led the launch of a new Biomanufacturing program.

Elizabeth has held strategic management and consulting positions in industry, including at Analog Devices Inc in the corporate strategic projects group, and at Aberdeen Group where she built the Optical Communications practice. Trained as an engineer, Elizabeth holds a Masters degree from MIT in Ocean Engineering and a BS in Electrical Engineering from the University of Washington.

Jennifer Tour Chayes, Distinguished Scientist and Managing Director, Microsoft Research New England: Jennifer Tour Chayes has been Managing Director, New Lab of Microsoft Corporation since February 2008. Ms. Chayes Co-Founded Microsoft Research in 1997 and serves as its Co-Leader of Theory Group. She has directed research groups at the Microsoft in the fields of mathematics, theoretical computer science, and cryptography. She is an expert in the emerging field at the interface of mathematics, physics, and theoretical computer science. She is also Affiliate Professor of Mathematics and Physics at the University of Washington, and was for many years Professor of Mathematics at UCLA. She served as Vice-President of the American Mathematical Society. She is co-inventor of more than 20 patents and the co-author of nearly 100 scientific papers. She serves as Chairperson of the Mathematics Section of the AAAS. She serves as Trustee of Mathematical Sciences Research Institute. She serves on numerous institute boards, advisory committees and editorial boards, including the boards of the Banff International Research Station, the Fields Institute, the Center for Discrete Mathematics and Computer Science, the International Union of Pure and Applied Physics, and the National Academy of Sciences Communications Advisory Committee. She served twice as Member of the Institute for Advanced Study in Princeton. She is the recipient of an NSF Postdoctoral Fellowship, a Sloan Fellowship, and the UCLA Distinguished Teaching Award. Ms. Chayes holds a PhD in mathematical physics from Princeton and had postdoctoral positions in mathematics and physics at Harvard and Cornell.

Chayes is well known for her work on phase transitions, in particular for laying the foundation for the study of phase transitions in problems in discrete mathematics and theoretical computer science; this study is now giving rise to some of the fastest known algorithms for fundamental problems in combinatorial optimization. She is also one of the world’s experts in the modeling and analysis of random, dynamically growing graphs, which are used to model the Internet, the World Wide Web and a host of other technological and social networks. Among Chayes’ contributions to Microsoft technologies are the development of methods to analyze the structure and behavior of various networks, the design of auction algorithms, and the design and analysis of various business models for the online world.

Chayes lives with her husband, Christian Borgs, who also happens to be her principal scientific collaborator. In her spare time, she enjoys overworking.

Martin Fleming, Chief Economist and Vice President, Business Performance Services, IBM: In leading the Business Performance Services team, Martin leads an analytics center of competency focused on improving IBM’s business performance and achieving IBM’s 2015 financial goals. The Business Performance Services team creates new data
sources, applies advanced analytic techniques, deploys new business processes, and drives resource reallocation to achieve increased revenue growth and improved organizational leverage.

As IBM’s Chief Economist, Martin provides regular insight and analysis on relevant economic issues to IBM’s senior leadership team. Additional responsibilities include providing regular global economic forecasts; publishing economic flash reports to a broad cross-section of IBM managers; promoting a consistent IBM global economic outlook for internal decision making; and engaging with select IBM clients to provide a view of the global economic outlook.

Previously, within IBM Corporate Strategy, Martin led IBM’s Smarter Planet strategy development and execution with a focus on energy, climate change, transportation, water and Smarter Cities. Martin has also led IBM’s Emerging Business Opportunity program and IBM’s Global Sales and Distribution’s strategy and planning activities.

Prior to joining IBM, Martin was a Principal Consultant and the technology practice leader at Abt Associates, Cambridge Massachusetts. He was also Vice President, Strategy for Reed-Elsevier, Inc., the Anglo-Dutch information company. Martin began his professional career at the System Dynamics Group, Alfred P. Sloan School of Management, Massachusetts Institute of Technology.

Martin is a member of the New York Association of Business Economists, the National Economists Club and the American Economics Association. Martin has served as a member of the Board of Directors of the National Association of Business Economists April 10, 2011 (NABE), chaired the NABE Statistics Committee and the Julius Shiskin Awards Committee. Martin also served as President and held various offices of the Boston Association of Business Economists.

His work has been published in a number of professional journals, such as the Journal of Economic and Social Measurement, Business Economics and American Demographics as well as other general interest publications such as the New York Times and the Wall Street Journal. Martin has testified to various US Congressional committees, including the Joint Economic Committee.

Tim Healy, Chief Executive Officer, Chairman, and Co-Founder, EnerNOC: Tim co-founded EnerNOC in 2001 and serves as its Chairman and CEO. In 2007, he led EnerNOC’s initial public offering, which was named IPO of the Year by the Association for Corporate Growth Boston and Mass High Tech magazine, and received the Ernst & Young Entrepreneur of the Year Award in New England. More recently, EnerNOC was recognized with a 2012 Platts Global Energy Award for Industry Leadership, and Tim Healy was honored as CEO of the Year by the Massachusetts Technology Leadership Council. Today, EnerNOC is one of the world’s largest full-service energy management providers with over 700 employees and operations in the United States, Canada, the United Kingdom, Australia and New Zealand.

Prior to EnerNOC, Tim worked in the Energy Technology Laboratory for Northern Power Systems, Inc., and held positions with Merrill Lynch, International Fuel Cells (now UTC Fuel Cells), and the venture capital firm Commonwealth Capital Ventures. Tim also co-founded Student Advantage, a Boston-based affinity marketing company that went public in 1999.

Tim currently sits on the Board of Directors of the Advanced Energy Economy (AEE), the Massachusetts High Technology Council, and the New England Clean Energy Council, and serves on TechNet’s Executive Committee and the Board of Trustees for the New England Aquarium. Tim is an
advisory to several area startups and coaches youth soccer.

Tim graduated from Dartmouth College with a Bachelor of Arts in Government and Economics, and received his Master of Business Administration from the Tuck School of Business at Dartmouth.

Erin Rae Hoffer, Industry Strategy & Thought Leadership Marketing, Autodesk: As Senior Industry Programs Manager with Autodesk, a leading provider of software for architecture and engineering, Erin Rae Hoffer fosters the adoption of innovative approaches to design and practice. An architect with twenty-five years of experience in technology and computer-aided design, Erin is a co-chair of the Boston Society of Architect’s Building Systems Committee, a member of the AIA’s National Committee on Codes and Standards, chair of the Massachusetts Technology Leadership Council’s Energy Cluster, and an advisory member of the National Institute of Building Standards new Council on Finance, Insurance and Real Estate (CFIRE).

Prior to joining Autodesk, Erin served as Executive Vice-President with the Boston Architectural College and was on the board of directors of the Boston Society of Architects as Commissioner of Technology. She led technology and services organizations for Harvard, MIT, and Tufts University. She is a LEED Accredited Professional, a member of the AIA and CSI and past member of the Urban Land Institute. Erin received a Master in Architecture from UCLA, and a Master in Business Administration from MIT’s Sloan School of Management. She is registered to practice architecture in California and is a Ph.D. candidate in Northeastern University’s program of Law and Public Policy, completing a dissertation on the impact of green building policy on real estate investment decision-making.

Tom Hopcroft, President and CEO, Mass Technology Leadership Council: Tom Hopcroft is President & CEO of the Mass Technology Leadership Council, Inc. (MassTLC), a business association that addresses the critical leadership issues of innovative technology and technology-enabled companies. Drawing on the rich legacies of the Massachusetts Network Communications Council, the Massachusetts Software Council, and the New England Business and Technology Association, Inc., MassTLC accelerates innovation by connecting people from across the technology landscape, providing access to industry-leading content, and offering a collaborative platform for driving ideas and people forward.

A Massachusetts attorney and former adjunct professor at Northeastern University’s College of Business Administration, Mr. Hopcroft formerly led and founded the New England Business and Technology Association (NEBATA) which merged with the Mass Software Council in 2005. After the merger he led the Council’s cluster development activities, growing the cluster portfolio from three to ten active groups. Prior to founding NEBATA, Hopcroft served on the American Bar Association’s Information Security Committee, where he contributed to the drafting and editing of the ABA’s Digital Signature Guidelines: Legal Infrastructure for Certification Authorities and Secure Electronic Commerce, published in 1996. He also participated in the International Chamber of Commerce’s ETERMS Repository project, an international repository for incorporating terms by reference into EDI messages.

Ralph Menzano, Industry Director Transportation, Oracle: Ralph Menzano is Industry Director, Transportation for Oracle. At Oracle,
Mr. Menzano’s role is to develop and implement the company’s national strategy in addressing the transportation vertical, which encompasses airports, seaports, highway authorities, and transit agencies.

Formerly, he was chief information officer (CIO) for the Southeastern Pennsylvania Transportation Authority (SEPTA) in Philadelphia—a $1.7 billion, 10,000-employee, 750,000-passenger-per-day agency. His responsibilities included directing information technology and network strategies enterprise-wide.

He has held senior information technology (IT) positions at JP Morgan Chase Bank, General Motors and Saint Gobain. Mr. Menzano started his career as the U.S. Navy’s first IT Auditor. He is also an Adjunct Professor for the Fels Institute (Program for Masters Degrees in Government Administration) at the University of Pennsylvania and is a Certified Systems Professional.

A board member for LaSalle University and Villanova University, he has been featured in articles in publications such as CIO Magazine and has authored an e-book entitled “Making IT Happen.” He is a frequent speaker for the American Public Transportation Association (APTA) and many other groups.

Mr. Menzano earned a bachelor’s and master’s degrees at Villanova University.

*Mark Norman, President, Zipcar: When it comes to putting the “Zip” in Zipcar, no one has more drive than Mark. With more than 20 years experience leading businesses in transportation, technology and consumer services, he doesn’t need GPS to move a company in the right direction. Mark has been in the car sharing industry since 2006 when he took the wheel at Flexcar, a Seattle-based car sharing company. He became president of Zipcar in 2007, when Zipcar acquired Flexcar, creating the world’s largest car sharing network. During his tenure at Zipcar, he has managed the company’s growth in 20 major metropolitan areas, and on more than 300 college campuses in the United States, Canada, the United Kingdom, Spain and Austria.

Mark and the Zipcar team are focused on expanding Zipcar’s leadership position in technology innovation, sustainability, and member service while continuing to revolutionize personal mobility. Powered by the global network of Avis Budget Group, Mark is driving Zipcar’s growth across geographies, technologies and service models.

Mark’s career has been defined by leveraging operational best practices to ensure customer satisfaction and revenue growth. His ability to streamline complex operations with a focus on what matters most – our members – helps Zipcar continue to expand its global operations with the same entrepreneurial and member-centric approach that has made Zipcar successful thus far.

Mark has significant executive experience in both early stage and global businesses, including roles as CEO of Flexcar; Chairman, President and CEO of DaimlerChrysler, Canada and Managing Director of Summit Systems, a technology distribution startup. While in the auto industry, he was responsible for teams numbering in the thousands and several billion in revenue. He has spoken at leading conferences and events, including, Meeting of the Minds, Cleantech Forum, Advertising Age and many others.

Mark holds an undergraduate degree in Economics from Rice University as well as a Masters in Business Administration from Harvard Business School.

*Bill Oates, Chief Information Officer, City of Boston: Bill Oates is the Chief Information Officer for the City of Boston, Massachusetts. Oates was named Boston’s first Cabinet
level CIO by Mayor Thomas M. Menino in June of 2006. As CIO, Oates is charged with spearheading the City’s technology initiatives and is responsible for the delivery of IT services in support of the various city functions.

Under Bill’s leadership, the City of Boston has been recognized as a leader in leveraging technology to improve citizen engagement and access to services. In 2011, Oates was recognized as one of the “Top 25 Public Sector Innovators” by Government Technology Magazine and named the New England CIO Innovation Award winner by Mass High Tech. In 2012, Bill was inducted into the CIO Hall of Fame by IDG’s CIO Magazine and was also recognized as a finalist for the MIT Sloan CIO Award for Innovation.

Prior to joining the City, Oates served as the Senior Vice President & Chief Information Officer for Starwood Hotels & Resorts Worldwide, Inc. Based in White Plains, NY, Starwood is one of the leading hotel and leisure companies in the world. Named CIO in June, 2000, Bill was responsible for delivery of the Company’s global information technology services.

A graduate of Boston College, Oates is also an attorney and member of the Massachusetts Bar. He received his JD from Suffolk University Law School in Boston and was awarded his LL.M in Global Technology Law in 2005. In 1996, Oates was inducted into the hospitality industry’s “Technology Hall of Fame” for his vision in applying technology to the business.

Mr. Oates is based at Boston’s City Hall. A native of the Boston area, Bill is married with two children.

*NQuentin Palfrey, Senior Counsel to the Secretary for Policy & Operations at the Massachusetts Department of Transportation. In that capacity, he works on a wide variety of transportation policy issues to advance the Patrick Administration’s Way Forward plan for 21st century transportation in the Commonwealth.

Prior to coming to MassDOT, Palfrey served as Senior Advisor for Jobs & Competitiveness in the White House Office of Science & Technology Policy, where he led a number of policy issues relating to intellectual property, innovation, technology, the Internet, and global development. Palfrey previously served as the U.S. Department of Commerce’s Deputy General Counsel for Strategic Initiatives, overseeing initiatives relating to innovation, intellectual property, trade, and international development. Palfrey joined the Commerce Department from the Massachusetts Attorney General’s office, where he served as the Chief of the Health Care Division. Prior to joining the Attorney General’s office in 2005, Palfrey was a litigation associate at the law firm Cravath, Swaine & Moore LLP in New York. He graduated from Harvard Law School cum laude in 2002 and from Harvard College magna cum laude in 1996. After graduating from law school, he served as a law clerk for the late Judge Max Rosenn on the U.S. Court of Appeals for the Third Circuit.

Nathan Phillips, Faculty Fellow, Professor, Earth and Environment, Boston University: Nathan Phillips is Professor of Earth and Environment at Boston University. His research focuses on physiological mechanisms that regulate water, carbon, and energy exchanges between plants/ecosystems and the environment, especially in the context of environmental change. More recently, this research has been translated to studies of the ecology “in cities”, and the ecology “of cities”, in an interdisciplinary research program called “Urban Metabolism” supported
by the National Science Foundation and Boston University’s Sustainable Neighborhood Laboratory.

*Peter Torrellas, CTO, Infrastructure and Cities, Siemens: Peter Torrellas, Chief Technology Officer in Siemens Infrastructure & Cities sector, has over 18 years of experience in infrastructure development and innovation. Peter began his passion for making our infrastructure smarter with Siemens by successfully designing and delivering over $500M in technology for New York City’s transportation infrastructure. Peter is considered a visionary thought leader in systems and software architecture and the implementation of new technologies for public infrastructure and was recently hosted by the United Nations, the World Bank Group, the United Sates Conference of Mayors, the Transportation Research Board and many others to discuss the role of technology in urban infrastructure. Peter has been quoted by BBC News, CNN Money, Metro Magazine, and others. His current portfolio covers Road and City Mobility, Passenger and Freight Rail Automation, Airport Services, and Logistics and the integration of Mobility with the Energy grid, Building Technologies, and Public Safety.

Ory Zik, Founder & CEO, Energy Points: Prior to founding Energy Points Inc., Dr. Zik was the founding CEO of HelioFocus where he currently serves on the board of directors. The company develops solar thermal augmentation for conventional power plants and is now growing internationally. Prior to HelioFocus he was the founding CEO of QuantomiX Inc., a microscopy company based on his invention, which he led from inception in 2001 to commercialization. QuantomiX was the first to visualize cells and tissues in their native wet state with an electron microscope. In 1992, he spent a year as the curator of Israel’s National Museum of Science and in 1993, while a Ph.D. student, he founded Greenpeace Israel.

Dr. Zik holds B.Sc. (cum laude) in Physics and Mathematics from Tel Aviv University as well as M.Sc. (cum laude) and Ph.D. in Physics from the Weizmann Institute of Science, where he received the Feinberg physics award and the national Amos De Shalit physics prize. He holds worldwide patents and has extensive experience in founding startups based on university innovations (Weizmann Institute, Stanford, Harvard, Boston University, Purdue). Currently, Dr. Zik is an MIT research affiliate. He is also active in education, coaching first-time entrepreneurs, and environmental protection.

Bob Zurek, Senior VP of Products, Epsilon: Mr. Zurek is responsible for the strategic direction of Epsilon’s products as well as product marketing and product-specific client operations. The client operations teams will work closely with Epsilon’s industry vertical teams to provide specific product recommendations that help to better serve Epsilon’s vast global client base.

Mr. Zurek has over twenty five years of proven professional software development, technology research and strategy, development and product management expertise along with a strong operational background. He has a proven track record in corporate and business development. Prior to Epsilon, Zurek was Vice President of Technical Product Strategy – BI/Analytics at Endeca (acquired by Oracle). He also served as Vice President of Products and CTO at both Infobright and EnterpriseDB as well as Ascential Software (acquired by IBM). Mr. Zurek has been a speaker and guest lecturer at a number of public conferences as well as institutions including Harvard University, MIT, Brigham Young University and Salem State.