***City of the Future***

***How leading cities are solving***

***problems to create a new urban***

***vision for the 21st century***



**Windsor Arms**

**March 11, 2014**

**Agenda**

|  |  |  |
| --- | --- | --- |
|  | **Topic 1** | **Topic 2** |
| **08:00 – 08:45 Breakfast** |  |  |
| **08:45 – 10:15 Session 1** | **The challenges and trends** | **The mobile city** |
| **10:15 – 10:30 Break** |  |  |
| **10:30 – 12:00 Session 2** | **The well-planned city** | **The self-sufficient city** |
| **12:00 – 1:15 Lunch** |  |  |
| **1:15 – 2:45 Session 3** | **The inclusive city** | **The resilient city** |
| **2:45 – 3:00 Break** |  |  |
| **3:00 – 4:30 Session 4** | **The smart city** | **The crowd-sourced city** |

**Session 1, Topic 1: the Challenges and Trends**

**What is the context within which cities will function in the 21st century?**

* There are several broad political, economic, social and environmental trends that will affect cities in the 21st century and to which they will have to adapt.
* By far the most important is **climate change**. The environmentalist, James Lovelock, formulator of the “Gaia hypothesis”, predicted in 2008 that London will be partly underwater by 2040. Many scientists now consider this prediction to be conservative. Every city will be affected by climate change, whether in the form of floods, droughts, heat, ice storms, damaging winds or other phenomena. Think Hurricanes Sandy, Katrina and Haiyan, the Toronto ice storm, the recent UK floods and the California drought.
* **Technology** is another big disruptor, but in this case potentially positive. The “internet of things”, “big data”, social networks and other technologies open up previously unimaginable opportunities for cities to become “smart”. For example, cities could have sensors everywhere measuring how water and electricity are used, what transportation patterns are, what city services are in demand at what times, and more.
* **Globalization** has linked almost every larger city into a network of constant economic interaction, both digital and physical. Trade between cities is expanding exponentially. While in a macro sense this has been positive, it has created a rapid increase in **inequality** as globalization has spawned elites who are taking over central cities and gentrifying older core neighbourhoods, while pushing out poorer and even middle class people. More serious is the trend towards “gated cities” within cities, which buy their own services and insulate themselves from the rest of the city. The social sustainability of cities is becoming an issue. In Toronto a recent report “The Three Cities Within Toronto” highlights this issue. <http://www.urbancentre.utoronto.ca/pdfs/curp/tnrn/Three-Cities-Within-Toronto-2010-Final.pdf> Cities will have to respond with policies if pluralistic cities are to be retained.
* **Population growth and migration** are huge phenomena that will affect every city. In the case of many developing world cities, particularly in Africa and Asia, this means massive unplanned growth. In the case of the rich world, there will be large numbers of immigrants, legal and illegal. Dealing with population flows will be a significant city challenge in coming years. Housing, infrastructure and social stability will all be strained.
* U**nemployment** is a challenge that will test many if not all cities. The shifting and reshaping global economy is creating many losers in the developed world, while in the developing world, population growth cannot be accommodated with sufficient jobs. In some of these cities, unemployment rates are over 25%, while in some parts of the rich world it could reach similar levels. How will cities cope with large numbers of unemployed people in their midst? Can we just forget about them? Give them the minimum possible social assistance? Is this sustainable?
* **Health risks** are becoming a serious urban issue as Toronto discovered in the SARS crisis of 2003. Global pandemics can shut a city down and make it unable to function. In a globalized age, when people are constantly moving between cities and continents, this risk is always there.
* Finally, **security** has to be a concern as cities are the target terrorism. 9/11, 7/7 in London, poison gas in the Tokyo subway, the Boston Marathon bombing are all reminders of cities’ vulnerabilities in an age of radicalization and rage. Can cities do anything about this? Do we become a hyper-surveillance society or just pick up the pieces each time? Is there some middle ground?

***Can and should cities plan for these challenges or should they just adapt as the impacts occur?***

**What are the implications of these broad trends?**

* **Economic model**. The city of the future cannot rely on single industries or traditional economic engines. The city needs to be constantly assessing its competitive advantages and building the underlying conditions for economic success, including liveability, excellent air, rail, road links and public transportation, leading educational institutions, competitive costs and more.
* **Urban mobility** is one of the biggest requirements arising out of the unplanned sprawl of modern cities. Transportation is the key to giving people employment opportunities and to reducing social exclusion and social instability. The most current thinking is about multi-modal mobility, perfectly integrated.
* **Housing** is equally or more important. Homelessness and inadequate housing is an issue, in different ways, in developed and developing world countries. Again, without decent housing and related services, people are unable to function effectively. Housing is increasingly about land use, density and cost-effectiveness.
* **Readiness and resilience** is becoming a new paradigm for cities in our unpredictable age, whether this is a natural disaster, terrorism or disease. This means excellent emergency services as well as an ability to communicate with the population and move to alternative modes of operation immediately.
* **Social capital** - cohesion and levels of trust, a key underpinning of resilience, economic development and liveability. With large-scale immigration, it is critical to integrating people and having them be effective quickly.
* **Energy** is the key enabler of our society. The city of the future will have a dramatically different energy solution to todays – renewable and decentralized.
* **Short-termism vs. planning**

***Which of these themes resonates most for you? Where would you start in building a city that is likely to meet the challenges of the future?***

**Session 1, Topic 2: The Mobile City**

**How do we move people effectively and efficiently in huge cities?**

* There is no single answer to the future of urban mobility. It will vary by size of city, stage of development, wealth, culture and just how quickly preventing further global warming becomes a critical priority.
* That being said, there are certain “drivers” that are shaping the future of urban transportation:
	+ **Congestion.** This is getting worse everywhere, and is affecting both productivity and quality of life
	+ **Rising price of energy.** Oil will go up in price and while natural gas has possibilities, its energy density is too low for most car transport. Alternative energy will eventually come on but will be expensive for the foreseeable future.
	+ **Changing nature of work.** In the developed world, people will tend to have multiple jobs and contracts, and work from home much more.
	+ **Global warming**. This is almost certain to become a higher priority, possibly a compelling one.
	+ **Technology**: Various technologies will have a huge influence on transportation, including video-conferencing, smart phones, Skype, driverless cars, “big data”, traffic management systems and more.
	+ **Social change**: People in the developed world do not necessarily want what their parents wanted. They want different kinds of experiences, with more flexibility and freedom.
	+ **Demographic change**: There will be more old people everywhere. Population in most developed world cities will stabilize and may even decline in some cases. In the developing world, city populations will continue to expand, although there will be many “newer” cities as the biggest existing cities become over-crowded.
* Based on these drivers, as well as existing already discernable trends, one can make certain predictions:
	+ People will travel less where possible, through the use of technologies to communicate.
	+ People will want to walk much more and cities will plan to enable this.
	+ Car use will be dramatically reduced. Private car ownership will be a luxury and will plummet. Cars will be a service, not an asset. Car sharing will become ubiquitous, almost like existing bike-sharing programs. What cars there are will be electrically powered. Most cars, if not all, will be driverless.
	+ Road tolls and heavy parking fees will become common as cities seek to discourage car use. Access to roads will also be physically controlled.
	+ Cities will become more densely populated through land use policies tied to transportation plans. This will make public transportation more viable.
	+ Public transportation will become ubiquitous, with fully networked systems to take people from close to their homes to anywhere in the city. The use of cars, bike, bus, LRT and subway will be integrated through multi-modal transit hubs
	+ People will plan their trips more and use technology to tell transport planners when they will travel. This will be used to plan transportation services dynamically, adjusting hour-by-hour and on a daily, weekly and monthly basis. Unplanned trips will cost more. Travellers will be provided with the optimal transportation service for their trip.
	+ All urban transportation, including roads, will be under a single authority, with a single budget, and with integrated fare payment systems.

***Can we make an adjustment to this urban transportation vision? What will it take?***

**Session 2: Topic 1: The Well-Planned City**

**Is it possible to plan a city or is planning a relic of the 20th century?**

* Jane Jacobs’ vision was a city of neighbourhoods, densely populated, with “eyes on the street”. People living as much as possible in walkable, multi-purpose neighbourhoods, with work, play and housing all together.
* This is in some ways the essence of an unplanned city. Planning got a bad name by advocating separation of uses, huge apartment buildings without community, and transportation based on highways between where people live and work.
* A new planning paradigm is emerging:
	+ “Human scale development”, lower rise, tied tightly into the city
	+ High rises tied to transit and shopping. No need to drive
	+ Multi-functional neighbourhoods
	+ Very densely packed living, but with lots of public spaces
	+ A reduced city footprint
	+ Repurposing existing buildings as the economy changes
	+ Paris is more densely populated than New York, London or Mumbai, but is seen as an ideal place to live
* The key issues are:
	+ Have enough places to live
	+ Move people efficiently
	+ Reduce social exclusion
	+ Have access to adequate energy but use as little as possible
	+ Have access to adequate water
	+ Have clean air with low emissions
	+ Have ubiquitous access to high-speed band-width
	+ Be resilient. Know how to handle disasters
* There are two types of city planning:
	+ “Tactical” planning that attempts to ensure that the city evolves in its capacity to meet the needs of its current and future residents. This would include planning infrastructure development and service capacity to meet known and predicted needs.
	+ “Strategic” planning that shapes the city’s future. This would include deciding where the city will be developed and in what way, including planning transportation infrastructure that will shape development rather than the other way round. Copenhagen has done this brilliantly.
* The problem is that most cities are reacting tactically, not planning strategically. Toronto is a prime example. We stopped planning transportation 30 years ago other than expanding the 400 series deeper into farmland. However, we got our urban core right.
* Most cities are effectively planned by the development industry, in collaboration with governments bought off with development fees or worse.
* What is needed is strong strategic leadership with a vision and an ability to bring all stakeholders on board.
* Long-term decisions need to be strategic, bringing in all affected departments and disciplines. You cannot make transit decisions in isolation. The TTC and even Metrolinx should be an input into the big transit decisions, not the sole players.
* An open, consultative but time-limited process is needed. Sell the vision first, and then get input on the details. The New York City Highline is an example.
* Detailed, centrally developed plans are not likely to work. Rather, develop vision and principles at the centre, with public input, create the right incentives, and let the private sector and other players act.
* Barbara Hall’s decision in Toronto to eliminate zoning restrictions is an example.

***Could Toronto become a planned rather than a reactive city?***

**Session 2, Topic 2: The Self-Sufficient City**

**Should a city strive for self-sufficiency? Can we make necessary adjustments?**

* The core short-term needs of a city are food, water, and energy. In the longer-term, city needs a wide range of manufactured goods.
* Most cities are more or less self-sufficient in their water supply through natural water sources, reservoirs and existing infrastructure. Food and manufactured goods are another matter. They are reliant on complex global production and distribution networks. Energy is dependent on relatively local generation, but vulnerable transmission and distribution grids.
* The reasons for greater self-sufficiency are reduced vulnerability to disruption; reduced environmental impact; and greater local economic activity.

**How real is urban agriculture?**

* Urban agriculture can reflect varying levels of economic and social development. In the global north it often takes the form of a social movement for sustainable communities, where organic growers, ‘foodies’ and ‘locavores’ form social networks founded on a shared ethos of nature and community holism. These networks can evolve when receiving formal institutional support, becoming integrated into local town planning as a movement for sustainable urban development.
* In the developing south, food security, nutrition and income generation are key motivations for the practice. In either case, more direct access to fresh vegetables, fruits, and meat products through urban agriculture can improve [food security](http://en.wikipedia.org/wiki/Food_security) and [food safety](http://en.wikipedia.org/wiki/Food_safety).
* Alterrus systems of Vancouver has developed a hydroponic apparatus, which can grow over 60 different types of plant hydroponically. A 6,000 square foot installation on the top floor of a parkade in Vancouver, British Columbia, can produce thousands of pounds of fresh produce annually and the installation is sold out, experiencing demand at many times its capacity.
* Unfortunately, on January 21, 2014, the company announced its bankruptcy. It cited “problems with production and a mechanical failure”.
* However, on January 28, 2014 BrightFarms, which builds and operates hydroponic greenhouses farms in urban areas, announced it raised $4.9 million in Series B financing. “We are trying to change the produce supply chain in this country (United States),” says Brightfarms CEO Paul Lightfoot. “In five years, we will have greenhouses covering the Midwest and East Coast corridors, displacing a number of long-distance produce items that used to be sourced from the West Coast.” <http://brightfarms.com/s/>
* Benefits of urban agriculture:
	+ Productive use of unused space
	+ Availability of healthy food
	+ Less use of pesticides as food can be grown in controlled environments
	+ Less soil erosion as food will be grown hydroponically or acquaponically
	+ Reduced food spoilage
	+ Lower distribution costs
	+ Employment opportunities
* Obstacles to large-scale urban agriculture:
	+ Economic availability of space
	+ The energy required for artificial lighting. Needs cheap renewable energy
	+ Soil contaminants, particularly lead
	+ Access to reliable and safe water
	+ Higher temperatures in cities
* An emerging sustainable model of urban agriculture is rooftop farming. Gotham Greens in New York City is an example of this. <http://gothamgreens.com> It does not need artificial light in the same way as vertical or underground farming does.

***Should society invest in sustainable urban farming?***

**Will cities of the future be energy self-sufficient?**

* The present energy model is mainly centralized generation with long-distance transmission and local distribution. This provides the economies of scale that make energy affordable.
* However, as we experienced with the ice storm, this model makes us vulnerable to transmission and distribution issues, not to mention possible generation problems
* A new vision for the future is a far more decentralized model, with individual homes or neighbourhoods generating their own electricity through small-scale solar, wind and geothermal.
* There would still be a grid, with everyone connected, but this would be to share surpluses with each other rather than transmitting from a central power plant.
* Another possibility is mini nuclear reactors, providing energy for a neighbourhood. These would be les costly and more quickly built. Obviously, safety concerns would have to be dealt with.
* The other key urban energy strategy is conservation – cutting energy usage by changing lifestyles, making more efficient use of energy and using smart information technology.
* Better building technologies will yield huge results:
* The “smart grid” will replace the existing “dumb” grid. It will measure energy utilization continuously by location, by type of use and reach into every home to regulate energy consumption - Shutting off appliances when appropriate, heating and cooling only when needed.
* People will travel less, using “Telepresence” for business meetings, with multi-user facilities around the city to conduct meetings with people in other parts of the world.
* “Smart pricing” will further aid conservation. People will pay more by time of day, in a far more refined way than at present.
* To put it in perspective, in the U.S. alone a 1% gain in energy efficiency translates into a $200 billion return over 15 years.
* Perhaps most importantly, raise energy prices by at least a factor of two over 10 years, perhaps even more.

***Can we make the necessary personal adjustments to achieve greater energy self-sufficiency in our cities?***

**Decentralized manufacturing**

* This is perhaps the easiest adjustment. 3-D printing will enable personal and neighbourhood manufacturing of many products.

**Session 3: Topic 1: The Inclusive City**

**Are we doomed to living in segregated cities, with the rich in gated communities and the poor on the outside, except as service workers?**

* Unfortunately, this is the vision that is emerging today. Whether in developing world cities, from Rio to Johannesburg to Istanbul, or even in New York, London and Toronto.
* In the developing world almost every large city is facing a growing social exclusion problem. An elite class has developed largely as a result of globalization. These are the entrepreneurs who control trade, finance and key resources. They live lives completely removed from the rest.
* This phenomenon is playing out more subtly in cities like Toronto, but is nevertheless real. See David Hulchanski’s “Three Cities” report. The number of middle class neighbourhoods is shrinking. Rich neighbourhoods have increased slightly, while poorer neighbourhoods have increased markedly and have moved to the periphery.
* The levers of social inclusion are:
	+ Accessible and affordable mobility
	+ Accessible and affordable education
	+ Employment opportunities
	+ Public spaces accessible and usable by anyone
* In many cities, none of the above is present. Quite the opposite.
* We face two possible future scenarios:
	+ Gated cities for the rich, including where they live, work and play. Think Sandton in Johannesburg, Santa Fe Mexico City, Orange County or Silicon Valley. The majority will live in huge “barrios”, commuting long distances to get to low-paid service jobs in the rich city, making a living in the informal economy, or possibly working in a global manufacturing plant for minimum wage. The rich city will have its own well-maintained infrastructure, while infrastructure in the rest of the city will be non-existent or decaying. Public services, including education, for the majority will be rudimentary. The rich will buy all their services, including healthcare and education, in the private market. A big employment opportunity will be in private security.
	+ The alternative scenario is a city, with rich, poor and a large middle class, living in close proximity. There is well-maintained infrastructure for all and solid public services, including a great library system. Public healthcare and education are universal and good quality. The employment base is diverse, with lost of locally-owned enterprises. Most European and Canadian cities still look like this. This is the vision of Bill De Blasio in New York City. It has been done in the developing world, in places such as Curitiba, Brazil
* Recently, cities such as Philadelphia have actively resisted the impacts of gentrification

***Can we resist the trend towards social segregation in our cities? Will we pay the wages ad taxes to retain a socially inclusive society?***

**Session 3, Topic 2: The Resilient City**

**Why is resilience important?**

* According to the Rockefeller Foundation 100 Resilient Cities Project, resilience “is about making people, communities and systems better prepared  to withstand catastrophic events – both natural and manmade – and able to bounce back more  quickly and emerge stronger from these shocks and stresses”.
* Climate change is the obvious big issue
* Threats from terrorism are another
* Our vulnerability to our overly complex society, over-reliance on technology and excessive inter-dependence.
* What happens if we suffer a climate disaster in a major city, a major energy meltdown, a global pandemic or……?
* We live in a “just-in-time”, zero inventory, zero redundancy society. Can we function for a week or a month with our core systems not functioning?
* Resilience is the “idea du jour” in city thinking, but is it real?
* Key principles of resilience are:
	+ Spare capacity, which ensures that there is a back up or alternative available when a vital component of a system fails.
	+ Flexibility, the ability to change, evolve, and adapt in the face of disaster.
	+ Limited or “safe” failure, which prevents failures from rippling across systems.
	+ Rapid rebound, the capacity to re-establish function and avoid long-term disruptions.
	+ Constant learning, with robust feedback loops that sense and allows new solutions as conditions change.
* It requires steps such as:
	+ Retreat from development along shorelines and floodplains.
	+ Build more capacity than we need in energy, water, food supply and having some separation of capacity – think small and decentralized
	+ Have citizens ready to adapt to unpredictable situations
	+ Build “social capital” so that levels of trust in society are high
	+ Have more bus rapid transit rather than subways
* Resilience has a trade off. It means not seeking peak efficiency, but allowing some room for the unpredictable. In other words, it costs money.
* The view is that the successful city of the future will be resilient to various threats.

***How important is resilience? How resilient is Toronto? Where should our resilience efforts be placed?***

**Session 4, Topic 1: The Smart City**

**Is the “smart city” the solution to the issues facing cities?**

* A “smart city” is a city that uses information technology embedded in the fabric of the cities activities, to make better decisions about the development of infrastructure and the delivery of services.
* The term “smart city” is to some extent a marketing concept being pushed by companies such as IBM and Cisco to sell their products and services. However, the use of digital technology to better target and deliver services is real
* *“The transformation to Smart Cities requires an ecosystem that brings both existing and new partners together to unlock the tremendous value that emerges from connecting people, processes, data and things” –* CiscoSystems
* Examples of the use of “smart technology” include:
	+ Mapping cell phone locations dynamically to get a picture of road and pedestrian traffic patterns
	+ Using websites to enable citizens to report issues and share ideas on city improvement
	+ Placing sensors on all city infrastructure to measure usage and wear and tear, including likely breakdowns
	+ Being able to digitally map the location of every city bus, LRT, streetcar and subway car to provide citizens with real-time information on best public transit options
	+ Being able to have sensors in every road to track vehicle usage and identify upcoming traffic problems
	+ Having cameras everywhere monitoring activity to prevent and solve crimes
	+ Using drones to identify problems such as fire hazards, potential mosquito breeding sites and criminal activity
	+ Using data on usage of city services, such as libraries, day care and community centre programs to plan services a week, month, year and decade ahead
	+ Using data on energy utilization by household, by appliance, to identify communities and families that should obtain information on energy conservation
	+ Sensors that tell whether a parking spot is used or vacant, and sent to an app that drivers in the area can access
	+ The use of “Ushahidi” technology for citizens to report infrastructure problems, traffic problems and public safety problems

***Does this sound really useful or is it an unrealistic utopian vision and/or one driven by technology companies trying to sell their stuff?***

**Session 4, Topic 2: The “Crowdsourced” City**

* Crowdsourcing is a term to describe the development of ideas and solutions through the “wisdom of the crowd”; that is, letting the community at large identify what should be done. The underlying principle is that the combined intelligence and ideas of a large group of people will be superior to that of a small group at the top, no matter how brilliant.
* In thinking about cities, the idea is that no technological structure such as proposed by IBM, Cisco or Siemens can factor in the dynamic and unpredictable organic development of cities.
* Think of how rapidly new neighbourhoods become “hot” through a process that cannot be understood through scientific, rational mechanisms.
* Some think that the development of the city cannot be based on “autonomous” systems that essentially take decisions making away from people.
* The alternative vision is that city development will be driven more by social media – large numbers of networked people sharing their opinions and ideas outside the formal city management processes. The City management will be a facilitator rather than the driver.
* In fact, the two ideas: the “smart city” and the “crowdsourced city” could work in tandem to produce a powerful capability for better city management in the 21st century.

***Will Facebook and Twitter play an important role in city development? Would this be compatible with the hyper-technocratic “smart city” vision?***