

Urban Planning for a Changing **and** **Challenging Future**

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1. Introduction

This brief explores the likelihood of climate change, and a major shift in the costs and accessibility of energy causing major impacts on society, lifestyles, and the urban plan. The present paradigms of planning will have to change substantially in order to provide a practical, liveable and feasible urban environment. A major focus of this is to preserve whatever remaining greenspace there exists to enable such cities to continue to prosper. Other important factors are public transit, and multi-faceted neighbourhoods.

2. Energy Forecast

The current situation of falling oil prices and plentiful reserves is a short term aberration. Many experts have raised the issue of Peak Oil, which is the point at which the reserves and production of oil reach their peak, and begin to decline. Some dispute such a scenario, but it is quite logical that nothing is infinite, and that there must eventually be a limit encountered. This is not to say that on a certain foreseeable date oil will no longer be available. Instead its supply will slowly decrease, causing shortages, and it will probably undergo continuous price increases. This will be aggravated by the increasing competition for fuels from the third world. The scarcity will be further exacerbated by increased cost of production, and the probable imposition of carbon taxes. Within a decade or two, we could experience gas prices over \$12 a litre. Alternate sustainable energy sources such as wind, solar, and wave are not intensive enough, and will probably not exceed 20% of the requirements. Coal and nuclear are similarly not adequate solutions. Hydro electric power, with which Québec is blessed, will not be exempt unfortunately. I suspect that with a superpower neighbour to the south who will be in panic and crisis, the days of cheap electricity for us will have passed, and world prices will dominate. Therefore, it is reasonable to think that energy costs will skyrocket and its accessibility and affordability will be an important factor and limitation for the majority of the population.

3. Effects of Limited Energy

The developed (and most of the rest of the) world relies on cheap and available oil. This is an extremely unusual situation, never before encountered in the history of the planet. It is only in the past couple of hundred years that we have been able to extract and harness oil and gas, which took hundreds of thousands of years to develop underground. Before oil, almost everything was done by human or animal labour. So we are very fortunate to live in a relatively small time window in history when we can enjoy the benefits of these prehistoric deposits (actually an energy bank account). But what happens when the account runs dry? Does the human race declare bankruptcy?

However the effects will not be sudden, but gradual. For oil, the downstream products are fuels, for transport, manufacture, and heating; and petrochemical products. As the costs and availability are impacted, some displacements to alternate energy sources may take place (such as electric vehicles), but their costs will similarly increase due to electricity production challenges. The majority of the population will not have much choice, and will be faced with serious decisions and impacts. This will range broadly across all facets of daily living. Some affected elements would be the cost of food (production- water, fertilizers, pesticides, harvesting; and transport), commuting to

work or school, home heating and air conditioning, and manufactured goods (production, raw materials, transport). As the impacts on these factors increase in significance, there will be serious consequences in financial, health, and employment terms, to name just a few.

4. A Peek into the Future

We are not often given the opportunity to glimpse the future, but there are a few snapshots from the USA that may give us a hint of what may happen. Let us first take the case of southern California. A few years ago, gas prices passed the \$4.50 a gallon mark. The consequences of this relatively minor (in terms of what we will pay in a few years) increase was fairly sobering. Thousands of people who drive to work, and have no alternate means of transport, could literally not afford the gas since in some cases it cost more than they earn after taxes. So people had to decide between employment and residence. Either they became unemployed, or had to move closer to work. This was one of the elements of the California housing crisis. Overnight the housing prices collapsed in the suburbs, as everyone wanted to sell and there were no buyers. Homes were foreclosed and towns had their tax base destroyed. These communities were not sustainable.

Climate change has also badly affected southern California, especially the Imperial Valley, the source of much of our vegetables and fruits. We can expect further escalation of prices and decreased availability of California produce in the future.

Another example is Youngstown, Ohio. As the long term unemployment rate increased, the home foreclosure rate skyrocketed. (There were some other factors such as the sub-prime mortgages, but they were in the first wave of foreclosures. The second and more important wave was due to long term unemployment and health care costs causing the middle class to deplete their savings and becoming unable to pay the mortgage through no fault of their own.) This has led to the incredible situation of cities closing, abandoning, and condemning entire blocks and neighbourhoods. This was followed by demolition of houses, shutting the sewer, water, and electricity, and digging up the roads! Such a scenario has never been seen before whereby a government demolishes its own neighbourhoods without any civil war or enemy factor at play.

A final example is Detroit, Michigan and suburbs. Due to multiple factors, the neighbourhoods just imploded. Similar abandonment and condemning of sectors occurred. Since food distribution and availability was a problem (retailers had fled), the citizens, with the cities' approval, established urban farms. This led to numerous problems, and industrial scale farming had to be curtailed. Some of it was due to lack of infrastructure such as water supply, and drainage, the use of chemicals, and inefficiency due to small plots, never mind the zoning regulations.

These examples highlight the importance of urban planning for a changing and challenging future.

5. Key Factors in Planning

It is important to note that many of the problems we will face are not the responsibility of the municipal level of government, such as financial policies, energy policies, and many environmental issues, to name a few. However municipal planning may be able to mitigate some of the negative effects of the future challenges, even if it is not possible to eliminate them entirely. Furthermore, it

is the cities in many jurisdictions that are leading the way. The elements in planning that need significant focus are described below.

5.1 Greenspace

One important area that *is* in the municipal domain is greenspace. The value of greenspace is hard to measure. It provides a natural area for recreation, relaxation, and an escape from the concrete jungle. But beyond that, it provides services to the environment such as cleaning the air, providing oxygen, enabling biodiversity to various extents (depending on location, size, composition), heat dissipation, flood control, and many others. Economists have not yet figured out how to accurately calculate the value of these services in dollar terms, but it is significant and cannot be ignored. Under the scenario of large increases in oil price and shortages, travel to distant vacation spots, whether it be the Caribbean or even the Laurentians, will become unaffordable if not inaccessible for most people. Local greenspace will have to fill this recreational and health need as citizens become restricted to their cities and towns. It has been shown in numerous studies that access to greenspace is an important element in mental health and child development. Urban greenspace will become the only natural environment experience of most citizens. To deny this experience is a serious risk for society. These spaces must be distributed throughout the urban regions for ease of access. Unfortunately, there is very little potential remaining in Montreal, namely, Meadowbrook, Falaise St. Jacques, Angell Woods, la Promenade Bellerive, to name a few. It is important to note that rehabilitation and conversion of brown spaces into green is much more costly than conservation of existing green space.

As climate change causes increased temperatures and precipitation, greenspace is again important. Summertime extreme heat is a health hazard. Citizens need relief from high temperatures, but if air conditioning is not available due to costs and energy shortages, they could go to an urban forest. I have measured the temperature difference on hot days between the street and the Bois Franc forest, and it is about 10C, not counting the humidity levels (which would increase the humidex difference). So besides providing shelter from the heat, greenspaces can contribute to cooling the urban environment. Flooding caused by precipitation is also reduced, as greenspace, especially forests, soak up the rain instead of channelling it down the street to the drains. Greenspace will also provide educational opportunities, where people can reconnect with nature, and become creative in adaptation to the new challenges.

Agricultural lands are another element, and will become invaluable once transportation costs and climate change prevent food from being delivered thousands of kilometres from their markets. Food will have to be grown in the proximity of cities in order to be affordable. The Montreal region has very fertile farmland, and this must be maintained and preserved if our citizens are to be fed in the future.

5.2 Transportation Systems

The number of automobiles is constantly growing, causing major congestion, pollution, wasted time and fuel. We are approaching the limits of what the roads can carry. Also, with fuel becoming very expensive in the future, private automobiles will no longer be generally practical. Thus the focus on highways and roads will have to shift to mass transit systems. The best way to move people around the city is, and will be by bus, train and metro (and bicycle, weather permitting). However these are most efficient in densely populated areas. They are more expensive and difficult to support in suburban or other areas with large single family housing lots. Due to the long implementation time for such large scale transport systems, it is essential that this shift in focus begin now, before the

crisis hits. Building more highways will be a wasted investment in the past, not the future. It would stand out as a monument to short term and delusional thinking. We risk following the southern California example.

5.3 Housing

The single family house on a 1000 sq metre lot (or even less) is not really sustainable due to several factors. As mentioned above, transport is one issue. But there are many more, such as maintenance and carrying costs. As energy costs rise, heating, lighting, and air conditioning become major expenses. The failing economy that will accompany such a situation will force more and more families to relocate to cheaper housing with mass transit access, as they will not be able to afford the large house. This in turn will affect house prices, and the tax base. The often heard principle that housing construction and “development” expands and improves the tax base will be finally disproved to be the liability it really is. Today’s castles will become a financial problem for the owner, bank, and municipality. As seen in the USA, it can result in abandoned neighbourhoods that are unliveable, and condemned, causing additional expense for the city. Therefore it is important that high energy efficient, TOD (transit oriented development) and higher density construction replace the single family one. Furthermore, such construction should be allowed only on already developed land (redevelopment or renovation of factory space) or land such as parking lots, and not on existing or de facto greenspace. Families moving into high density from low density areas will especially need greenspace. It is important to note that greenspace does not require the large infrastructure investment as a housing development does, and furthermore, does not represent the potential liability of a housing development in case of trouble (e.g financial, or environmental crisis).

5.4 Zoning

To be truly sustainable, a neighbourhood should ideally have within it as much as possible of the elements needed for its survival and to help it thrive. While practically speaking it is not possible to deploy some elements such as power generation, food production, and water production in many cases, it might be possible to maximize the extent to which some are locally available.. In terms of construction, energy efficient buildings with solar power can help reduce the power requirements. Efficient use of water can reduce the amount of water required to be supplied and waste treated and disposed. The multi-faceted neighbourhood has residential, office, retail, service, entertainment, recreational and industrial elements, providing for the supply and employment needs of the population, This reduces the transport factor, and the need to travel beyond the neighbourhood, reducing the need for automobiles and regional transit. Greenspace completes the picture, allowing for a healthy environment whereby citizens can access much of what they want and need by walking (getting exercise at the same time).

This is a radical change from the current practice of zoning which tends to be single use zoned, either residential, industrial, or retail. This forces people to travel between the zones, causing pollution, incurring expense and time, and is inefficient. Of course there are challenges in mixing industrial and residential components, but if the industries are environmentally compliant, with some creativity there should not be a major problem with integration.

6. Conclusions

The challenges we face are in some ways unprecedented. However in history, when cities or empires met environmental (and related economic) limits, they imploded and disappeared. We will need wise planning, **implementation** and much luck in order to avoid such negative consequences. We can no longer afford short term approaches to planning based on illusory profits or worse, with a laissez-faire attitude to market forces. Governments must take the responsibility and act in the name of all its citizenry, to plan for the long term benefit of all. More natural environments and greenspace will help cities to cope with the difficult changes on the horizon. Extensive mass transit will play a major role in the competitiveness, and very survivability of cities. Continued reliance on the automobile will lead to massive congestion and wasted resources in the short term and total paralysis in the long term when fuel becomes unaffordable. We can already see some examples of this around us today. Finally, agricultural land must be preserved in order to have a local base of food production when long distance transport of food becomes impractical.

We are **not** at a crossroads today. We have probably already passed beyond the stage where decisions could have avoided major impacts to our lives. The impacts are coming. It is now a question of limiting the impacts, to provide for a still liveable environment in the city. There is very little greenspace remaining in Montreal, and most of the conservation opportunity is lost. Whatever still remains **must** be preserved. History will be the judge.