The price of sprawl in Ontario, Canada

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Introduction

Urban sprawl is a type of development characterized by relatively low population density and relatively high land utilization. Sprawl is less associated with, but equally responsible for, broader environmental degradation as well as societal dislocation. Dwellers in sprawling communities typically face long commute times on the way to work and back, affecting both individual leisure and family quality-time opportunities. The private automobile is the primary mode of commuting in sprawled communities since low population densities make the relative cost of public transit very high on a per capita basis. Municipal transit authorities respond to high transit per capita costs, low ridership, and the corresponding low fare box revenues by limiting transit service by time of day and geographic area and thus further making the automobile an even more preferred means of transportation for individuals in these communities. Further, recent studies indicate that the sprawl form promotes an unhealthy lifestyle as a result of inadequate exercise for residential dwellers. People who live in suburban sprawling communities tend to walk much less and less often than those in higher density urban centers.

The list of issues related to urban sprawl is extensive.

- For example (fig. 1), Ontario Ministry of the Environment documentation indicates that transportation accounts for the majority of smog related pollutants in Ontario cities, such as nitrogen oxide. Private automobiles and trucks are the most significant contributors of these pollutants.
- In addition, city budgets are constantly challenged by the need to provide, maintain and rebuild community roads at the expense of other services. The result is an increasing cost of living in these sprawling communities. For example, insurance companies pass on to consumers the ever increasing costs of auto insurance that is characteristic of areas of high traffic congestion and the consequent high accident rates from sprawling towns and cities.
- Finally, and not least of all, urban sprawl is a huge consumer of land, depriving that land from other non-urban uses, such as farming or natural habitat. A recent study by Statistics Canada highlights the degree to which prime agricultural land has been converted into houses, institutional buildings, factories and roads. *The Rural and Small Town Canada Analysis Bulletin* (vol. 6, no.1, Jan. 2005) highlights how, by 2001, about half of Canada's urbanized land was located on dependable agricultural land (all land in Classes 1, 2 and 3)[1] and that over the 1951 to 2001 period, the supply of agricultural land declined by 4 percent while the demand for cultivated land increased by 20 percent.[2] Towns and cities occupied over 11 percent of Ontario's Class 1 agricultural land by 2001.

More than 56 percent of Class 1 agricultural land in Canada is concentrated in Ontario. Of that, the proportion which is now covered by urbanization has virtually doubled from 1971 to 2001 (to 11 percent). This indicates that Ontario's urban planning systems, which involve a complex set of safeguards with provincial oversight and local/regional official plans and formal planning

Fig. 1: Ontario in Canada.

processes, have failed to protect agricultural land against urban sprawl.

In the course of their 1996 to 2000 State of the Lakes Ecosystem Conferences (SOLEC), the Canadian and US governments noted that land use is the biggest environmental problem facing the Great Lakes Ecosystem and that the urban sprawl land form is the primary component of this problem. The rates of sprawl in Ontario and US Great Lakes basin states were virtually indistinguishable. An interesting side observation of the SOLEC research was that urban sprawl occurred even in communities where the rate of population growth was very low or even negative (de-population). For example, Cuyahoga County in Ohio, USA, had declining population rates in the study period but still encountered urban sprawl at rates not dissimilar from that in Ontario. Clearly, population growth is not the sole or even the major driver of urban sprawl.

If population is not the key driver behind urban sprawl, then some other factor, such as economics, must be the driving factor. Since inner city land is typically more expensive to purchase and build on than open farm fields, one can conclude that economics plays a key role in this sprawl phenomenon. Quite simply, developers can make greater profits from building on these lower cost greenfields, than they can by re-development on higher priced land within existing cities. Of course, there are costs associated with the provision of new services and infrastructure for green field development, but these are often subsidized to a greater or lesser extent. It is the thesis of this paper that the economics associated with greater profitability of greenfield developments is a primary driver for continued urban sprawl.

Consequently, this paper examines economic solutions to what is essentially an economic problem – an imbalance in the market place for development land for new housing and industry. It is not that an economic solution might necessarily provide the entire answer to the problems identified above, or even the best answer to the ongoing problem of unabated sprawling urban development. However, economic incentives/disincentives for development that make communities more efficient would be a practical companion to better urban planning and greenbelt controls.

The natural city

Cities are the work of humans and not a part of nature, as we typically refer to that term. However, cities which are more liveable, efficient and environmentally supportive deserve to be called natural cities – if any do. The development of cities is guided by the controls that manage its growth, its overall urban form and its balance. By-laws typically serve to limit the activities of individuals within the city, while zoning restricts and guides where people may work, shop, sleep, drive and park and how the places in which they do these things must look and feel. Finally, subsidies, such as the funding of new development infrastructure and taxes and fees, both influence the final urban form.

The history of urban planning in Ontario is blighted by the fact that the very instruments intended to ensure rational development have hastened urban demise in the form of sprawl. Whether it be greenbelt (Parkway Belt) multi-level municipal official plans, the Provincial policy statement or policies of the Ontario Municipal Board, these planning instruments have failed to provide sustainable and liveable communities in spite of the prominence, expense and effort that have been placed on this very goal. In fact, the creation of city boundaries and official plans, which were intended to diminish inefficient urban sprawl, may have served to promote it.

As noted above, it is the thesis of this paper that imperfect land markets are a major distortion that have led to and continue to encourage urban sprawl. Some of this distortion is related to the differences in prices and preferences between long and short term markets for land. The ultimate responsibility lies with municipalities and the Province of Ontario which lack the will or ability to constrain the expansion of urban boundaries and thus hold the line on urban sprawl. This becomes a political issue in the end as municipal councils lack the tools by which they can simply say no to new sprawl.

Given the reality of politics, there is a need for new economic instruments in the municipal tool kit. The research coming out of the SOLEC process indicated that, despite Ontario's rigorous planning process, there was little difference in the degree to which urban sprawl has dominated development on both sides of the border. Thus, economic instruments could play a vital role for US as well as Canadian urban communities.

A natural city should be for humans what a natural forest is for wildlife. If the characteristics of successful ecological communities include diversity, complexity, efficiency and redundancy, then these should be present in the natural city. However, these characteristics are rarely present in typical urban sprawl communities. The thesis of this paper is that if economics is to blame for sprawl, then economic instruments could help to fix the problem.

Economic instruments

The term "economic instruments," as used in public policy, includes a wide range of tools that are available to governments for implementation to motivate human behavior and to pay the bills. Some instruments, such as property taxes, are not typically discretionary in application but are applied broadly to raise money to pay government bills. Other economic instruments, however, may be intended to promote changes to societal behavior. All of these economic tools can be assumed to result in some kind of effect in human behavior, whether intended or not. However, the incidence of any economic instrument and the relative elasticity of demand and supply for the services being taxed are important factors in determining the overall effect of any instrument.

Much as taxes and charges lead to changes in behavior, subsidies provide incentives for sustainable or unsustainable development. Subsidies may be direct or indirect and implicit. In some cases, they may not necessarily be seen as subsidies. For example, funding municipal infrastructure for a new development out of municipal general revenue is an implicit subsidy to the development, yet does not typically appear as a cash transfer to the developer as it likely would be spent directly by the Council on the project. This funding makes the development less expensive for the developer and encourages the project to proceed, since the result should improve demand and profitability for the developer.

The following two economic instruments are proposed for consideration to disincent urban sprawl type developments:

- a new tax to rebalance the huge economic advantage that exists for developers holding relatively inexpensive farm or natural lands, once that land is approved for development; and,
- a second instrument which would involve a sophisticated regulated land trading scheme, by which greenfield developments would proceed with their project, contingent on more efficient inner city development being undertaken.

The objective of these instruments is to increase the degree of density of Ontario's urban communities with the expectation that this will lead to economies of scale in the use of municipal resources and improved overall efficiency.

The sprawl tax

There is a significant price difference between downtown land and farm or natural greenfield land. In part, this is attributable

to the value that has been added to inner city land which has been fitted with sewers, roads and other infrastructure. However, the opportunity costs associated with agricultural and natural lands, as compared to residential/industrially developed lands, is the most significant part of the equation.

The economic return per hectare of agricultural land is considerably lower than what one would expect from developed lands. In most cases, there are no markets where transaction values can be established for the services provided by natural lands and, where there are usage charges, these values are typically poor proxies for what one is willing to pay (contingent value) for use of the natural resource. Speculators and developers purchase farms in the outskirts of urban boundaries and wait until the opportunity avails itself to convert this land into the urban form.

Urban sprawl is profitable, largely because the cost of land is so much less for new suburban development than it is for downtown in-fill or redevelopment projects. The Ontario Real Estate Association publishes real estate listings for land throughout Ontario. Industrial land prices ranged from CAD10,000 (approx. US$8,500) to CAD50,000 (approx. US$45,000) per hectare in smaller communities and ten times that amount in larger communities. This illustrates the potential profitability of building in rural and suburban locations as opposed to downtown locations.

However, it is the comparisons between the per hectare values of development land in cities like Toronto and agricultural land in rural, nearby communities like Milton that illustrate the magnitude of the profitability of urban sprawl. For example, an unserviced parcel of land that had been designated rural residential with future development potential was listed at CAD75,000 (approx. US$60,000) for 24.6 acres (approx. 12 hectares) while inner city development land was listed for CAD2.9 million (approx. US$ 2.4 million) for approximately half an acre (approx. quarter of a hectare).

The goal of the Sprawl Tax is to influence and re-balance the market for development land such that agricultural land being used for development bears a value closer to that of inner city lands. Raising the price of agricultural (or natural) lands to urban development price levels is justified, since these lands will no longer be used for farming or their original natural uses. This sprawl tax will provide a strong incentive for inner city and possibly, brownfield development.

The Sprawl Tax would need to be set so as to equalize the land cost differential between prices for agricultural land and the value of residential/urban use in inner city urban development. The fee would be collected from prospective greenfield developers, as a condition of development, based on the difference between average inner city prices and the likely greenfield price. Revenue collected could be earmarked and dedicated for specific uses such as to:

- redevelop brownfields;
- upgrade inner urban areas;
- contribute to urban infrastructure renewal; and,
- retrofit/green the city.

An example might be useful at this point. A developer applies for a new sprawl development on 100 hectares greenfield agricultural which is valued at US$10,000 per hectare (for its next best farm use, or based upon the recent purchase price). The equivalent land requirement for an inner city development would be US$1 million per hectare (ha). Allowance could be made for servicing the greenfield property and other infrastructure requirements which would bring the greenfield land costs closer to US$100,000 per ha. Building an equivalent number of residences in the inner city might require less land as a more compact urban form would be more appropriate for an inner city development, perhaps as little as 50 percent less in this hypothetical example.

The development land values are then: 100 ha @ $100,000 = $10 million for the greenfield urban sprawl development. Alternatively the equivalent number of residences could be developed in the inner city with 50 ha @ $1 million = $50 million. In this case, the difference in net land costs ($40 million) would be subject to the sprawl tax, which might be set at anywhere from 50 to 100 percent of the difference. Thus, in excess of $20 million would be available from that sprawl development for other purposes as suggested above, should the developer decide to proceed with the development.

If the development were based on 500 residential units and the land costs were fully passed on to the final purchasers, each house would cost $40,000 more than was the initial planned sale price in this example. The result would be to influence the demand for new sprawl development, since these residences are $40,000 more. This provides an additional incentive for inner city development and away from urban sprawl. As noted above, the sprawl tax revenues could be provided to cities to assist with low cost, inner city high density housing, urban transit system support, brownfield re-development and urban renewal or other worthy causes.

Sprawl offset trading

Rather than applying a tax or subsidy, there are a number of regulatory instruments, including the model provided by the highly successful British Columbia Agricultural Land Reserve, which has been of assistance in curtailing urban sprawl in that Province.[3] Alternatively, another option is the economic regulatory instrument inherent in offset trading.

Offset trading, typically applied to manage air emissions, is a process whereby regulated organizations which reduce their emissions beyond required limits may convert their surplus emission reductions into emissions credits or offsets. These offsets may be sold to other regulated organizations which are unable or unwilling to meet their emissions limits. Providing each regulated organization's emissions limits are met by undertaking emission reduction actions or by purchasing and retiring emissions offsets, the regulation will achieve its intended purpose. Since those organizations with high emission costs may purchase from those who can exceed their reductions at a lower cost, offset trading ensures that emissions limits are met in the most economically efficient way.

The following example applies the principles of offset trading to reducing urban sprawl (low density suburban development), given that reducing urban sprawl is an objective. This concept assumes that higher density residency developments (housing units per hectare) occur in the inner city and the outskirts are characterized by relatively lower density development. In order for this concept to work, a regulation would be required to restrict all new development to achieve a desirable level of high residential density (houses per ha). All new development would need to meet that density target or be required to purchase sprawl offsets sufficient to meet the density limits.

For example, let us assume that the density target was set at 100 residential units per hectare. A greenfield developer coming in with a plan for 5 units per ha would have to obtain another 95 units per ha to offset the low density impact of the development. This might motivate the developer to redesign the original development plan or to cancel it. Alternatively, the greenfield developer could purchase the necessary offsets from someone else who has developed with densities greater than 100.

Sprawl offsets would be valued in a market among buyers and sellers with a price contingent on available supplies of offsets and the demand for these. However, if an offset were valued at US$10,000, this regulatory program would increase the price of the development in the original design by another $950,000 per

ha. The developer in this example might want to reconsider the sprawl proposal, might increase density or might seek alternate development opportunities.

High density urban sprawl occurs when greenfield developments in outskirt locations are desiged to accommodate high residential rates of occupancy. In many ways, it could be argued that high density sprawl is worse than low density sprawl since the transportation and other issues associated with sprawl are magnified as the population is increased. Unless measures are taken to ensure adequate transportation and other amenities, it might be preferable to restrict this kind of high density sprawl entirely, particularly if a sprawl offset trading program is being considered.

A sprawl offset trading scheme, although complicated, is attractive and indeed could be very effective at re-balancing the distortions between the use of agricultural and agriculturally priced land with that of the inner city. To that end, this mechanism makes clear the signal for higher density (more efficient) developments and more efficient development as opposed to the continued exploitation of farm and natural lands. The key to making this tool successful lies in setting an appropriate density target and in ensuring that it serves the goal of increasing both inner and total city densities to make the delivery of mass transit and other urban amenities more cost effective.

Unlike a tax, a regulated offset program might be less susceptible to manipulation or political influence, since it would function automatically once the density rate had been set. Unlike taxes or subsidies, this tool would be independent of municipal budgetary decisions and all developers would have both clear signals and know the full costs facing them, should they decide to invest in greenfield developments.

Conclusion

Existing urban planning systems, such as that which is in practice in Ontario, were developed, in large part, to protect against continued "urban sprawl" and its impacts. History has shown that these planning systems by themselves have failed to stop urban sprawl and have, in fact, proved no better in this regard than practices in jurisdictions without such complex programs. The problems of urban sprawl are well known and include higher costs for residents, environmental degradation and social dislocation.

There is a need to find and implement new mechanisms to complement urban planning and to harvest the potential of market-based economic incentives for more sustainable and natural urban development. The fundamental causes for urban sprawl are economic, related to the imbalance in the marketplace for land valued for farming (or natural uses) and for urban development. Thus, in the absence of strict regulatory land-use controls which limit the use of farm land for urban purposes, economic instruments can play a vital role in market correction.

Two models, one that adds a positive tax to land converted from farm use to urban sprawl and one that promotes inner city development by requiring the purchase of sprawl offsets, have been proposed in this paper. Although there may be other economic instruments which might also assist in re-balancing the market place for development land, these two merit further consideration.

Notes

1. There are seven classes used to rate land capability. Class 1 lands have the highest and Class 7 lands the lowest capability to support land use activities of each sector (see also Note 3).
2. "The (British Columbia) Agricultural Land Reserve (ALR) is a provincial zone in which agriculture is recognized as the priority use. Farming is encouraged and non-agricultural uses are controlled. The ALR covers approximately 4.7 million hectares. It includes private and public lands that may be farmed, forested or vacant land. Some ALR blocks cover thousands of hectares while others are small pockets of only a few hectares. In total, the ALR comprises those lands within BC that have the potential for agricultural production. The Agricultural Land Reserve takes precedence over, but does not replace other legislation and bylaws that may apply to the land. Local and regional governments, as well as other provincial agencies, are expected to plan in accordance with the provincial policy of preserving agricultural land. The *Agricultural Land Commission Act* sets the legislative framework for the establishment and administration of the agricultural land preservation program." (*Source*: http://www.alc.gov.bc.ca/alr/alr_main.htm).
3. The Canada Land Inventory comprises four sectors - agriculture, forestry, recreation, and wildlife. For each of these sectors there are seven classes used to rate land capability. Class 1 lands have the highest and Class 7 lands the lowest capability to support land use activities of each sector. "The Government of Canada developed the Canada Land Inventory (CLI) under the auspices of the Department of Regional and Economic Expansion (1963-1971) and the Department of the Environment (renamed Environment Canada), (1971-1994). The program was officially discontinued in 1994. The process to transfer the data and intellectual property to the National Archives of Canada started in 1995. Since 1995 several Canadian federal departments have been instrumental in extracting the data from the old tapes to modern formats and media, including: National Archives of Canada, Agriculture and Agri-Food Canada, Statistics Canada, and Natural Resources Canada." (*Source*: http://geogratis.cgdi.gc.ca/CLI/right.html).

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