ROADS AND ROAD USE

Road use is currently free of charge on the vast majority of roads in Canada. However, the cost of roads is certainly not zero. Governments in Canada spent almost $29 billion on roads in 2010/11 (see Table 3), far more than they spent on transit and all other transportation system elements combined (see Figure 1).[33]

There is a widespread view that motorists pay fully for roads through fuel taxes. It is a mistaken view; road spending is not covered by fuel taxes. Even adding revenues from permit, licence and other fees collected by all levels of government, the total revenue from road users amounts to only $15.5 billion per year across Canada. More than $13 billion per year – nearly half – of the annual spending on roads is subsidized by other revenue sources.[36]

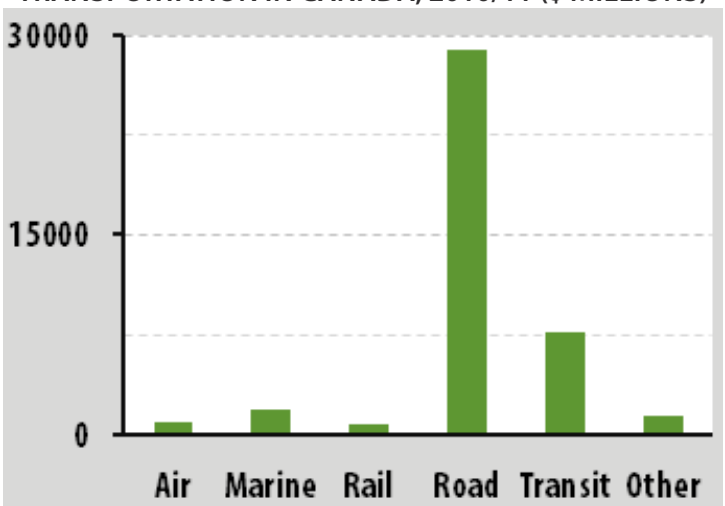
In addition, fuel taxes and road-related user fees and charges cover none of the social costs of road use: air pollution, greenhouse gas emissions, noise, delay from traffic congestion, and vehicle collisions. These costs are high – estimated at more than $27 billion per year in one study.[37] A more recent study puts the annual cost of collisions alone at $63 billion.[38]

The benefits of using automobiles on roads are mainly private, in other words they are internal to motorists: convenience and faster access to destinations, depending on the situation.[39] The costs are both private (internal) and social (externalized).[40]

TABLE 3: ALLOCATION OF GOVERNMENT SPENDING ON ROADS IN CANADA, 2010/11[34]

FEDERAL	$2.48 billion
PROVINCIAL/TERRITORIAL	$14.69 billion
LOCAL	$11.89 billion
TOTAL	**$28.96 billion**

FIGURE 1: GOVERNMENT SPENDING ON TRANSPORTATION IN CANADA, 2010/11 ($ MILLIONS)



Source: Transport Canada[35]

PARKING

As with roads, parking is often provided to users free of charge, particularly in suburban areas. Indeed, from a shopper's perspective, free parking is a significant and sometimes determinative factor in choosing a shopping destination.

As with roads, "free" parking does have real costs. These include the costs of preparing, maintaining and repairing the parking spaces, and the opportunity costs of the land devoted to parking and not used for other purposes.[41] The cost of providing a parking space in downtown Toronto is $35,000 and up,[42] consistent with costs in other large North American cities.[43]

Whether free parking is provided by businesses or municipalities, the costs are paid by many. Businesses have to pay for their free parking spaces, and they are only able to pass along a portion of the costs to others. Customers of businesses who provide free parking pay higher prices for goods and services, while employees pay through reduced wages. Taxpayers pay through higher property taxes to cover costs of providing municipal free parking.

Residents with onsite parking – whether they are house owners or apartment renters – pay for driveway and garage/carport construction and upkeep, and the lost opportunity to use the space for other purposes (the opportunity cost). When suburban shopping malls, business parks and industrial parks provide free or subsidized parking, they encourage higher levels of motoring (60% higher for employer-provided parking).[44]

The bottom line on "free" parking is that it's not free. It's actually a wealth transfer to parking users that is paid by everyone. The scale of the cost of "free" parking is enormous; based on a US study, the cost in Canada would be in the tens of billions of dollars per year.[45]

CLIMATE CHANGE

The transportation sector is Canada's largest source of greenhouse gas (GHG) emissions,[46] and 69% of transport-sector emissions are from road-based motor vehicles. From 1990 to 2010, GHG emissions from transport, caused primarily by energy used for personal transportation, rose 33%, or 49 megatonnes. Overall, the transport category in 2010 contributed 195 megatonnes of GHG emissions and accounted for 47% of Canada's emissions growth from 1990 to 2010.[47]

The problem is not automobiles per se; it is the excessive use of automobiles. And sprawl increases automobile use. Statistical analysis suggests that climate change emissions from motor vehicle transport are closely correlated to sprawl.[48] Greater automobile dependency and travel results in greater energy consumption and GHG emissions for low-density areas (see Figure 2).

For its residents, sprawl locks in a higher future level of driving. Sprawling areas are generally automobile-dependent, and residents end up needing more cars and driving further distances:

- Research for National Resources Canada shows that vehicle kilometres travelled can be approximately three times higher per household in suburban areas than in communities close to the city centre.[49]
- Census data show that automobile dependence increases significantly further from the city centre. In Calgary, "more than half of those living within five kilometres of their workplace walk, bike or take transit. At 10–14 kilometres, that percentage drops to less than a quarter."[50]

Climate change is already having significant financial impacts, most notably through extreme weather events. Hurricane Sandy in October 2012 was estimated to have cost the United States more than $60 billion and Canada more than $100 million in insured costs alone.[51]

While no particular storm, flood or drought can be attributed to climate change (just as no particular case of lung cancer can be attributed to smoking), it is clear that climate change is "loading the dice", i.e. increasing the likelihood of extreme weather events.[52] It is also clear that the number and cost of such events is on the rise (see Figures 3 and 4).

In coming years, it is estimated that climate change will cost Canada into the tens of billions of dollars every year.[53] The global costs of climate inaction could be very high, at 20% or more of global GDP, or higher.[54] Needless to say, considering Canada's economic reliance on trade, that kind of decline in global GDP would have profound effects on Canada's economy.[55]

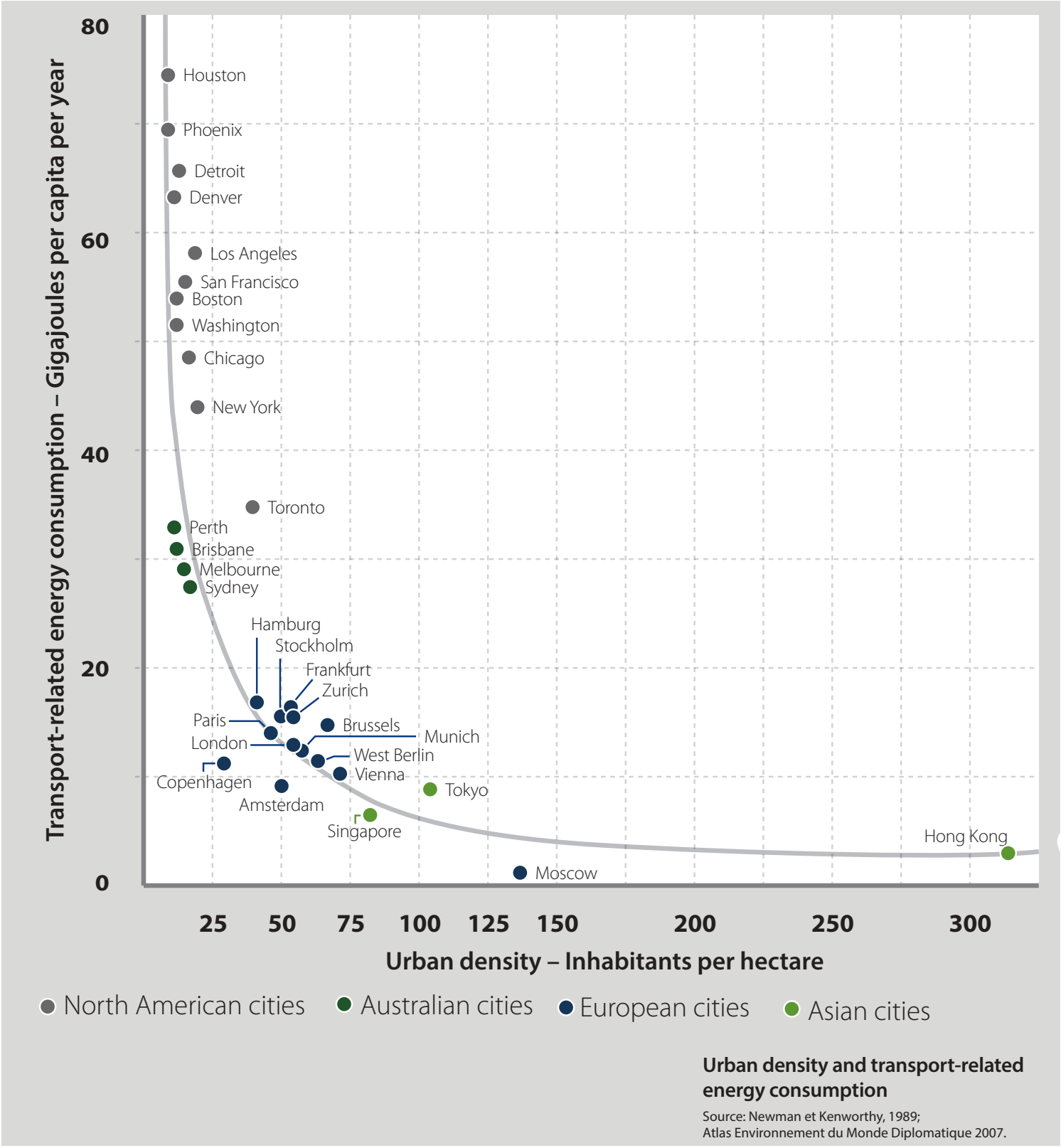
SMOG

Smog is created by certain air pollutants – sometimes termed "criteria air contaminants," or CACs – many of which also cause acid rain. Regulatory emission controls on automobiles and other emission sources have reduced the ambient concentration of some CACs over recent decades. However, total emissions remain a serious health problem. In Ontario alone, smog emissions have been estimated to kill more than 9,500 people per year[56] – almost twice as many as die from infectious disease.[57]

Motor vehicles are an important source of CAC emissions. In Toronto, air pollution from traffic has been estimated to kill more than a quarter of those killed by air pollution overall (440 out of a total of 1,700) and to cost $2.2 billion per year.[58] Motor vehicles are more CAC-intensive than transit.[59]

As noted in the climate change section above, sprawl is associated with greater transportation-related fossil fuel combustion, which results in greater emissions. The higher levels of automobile use necessitated by sprawl boost morbidity and mortality, along with their financial and economic costs.

FIGURE 2: URBAN DENSITY AND ENERGY USE

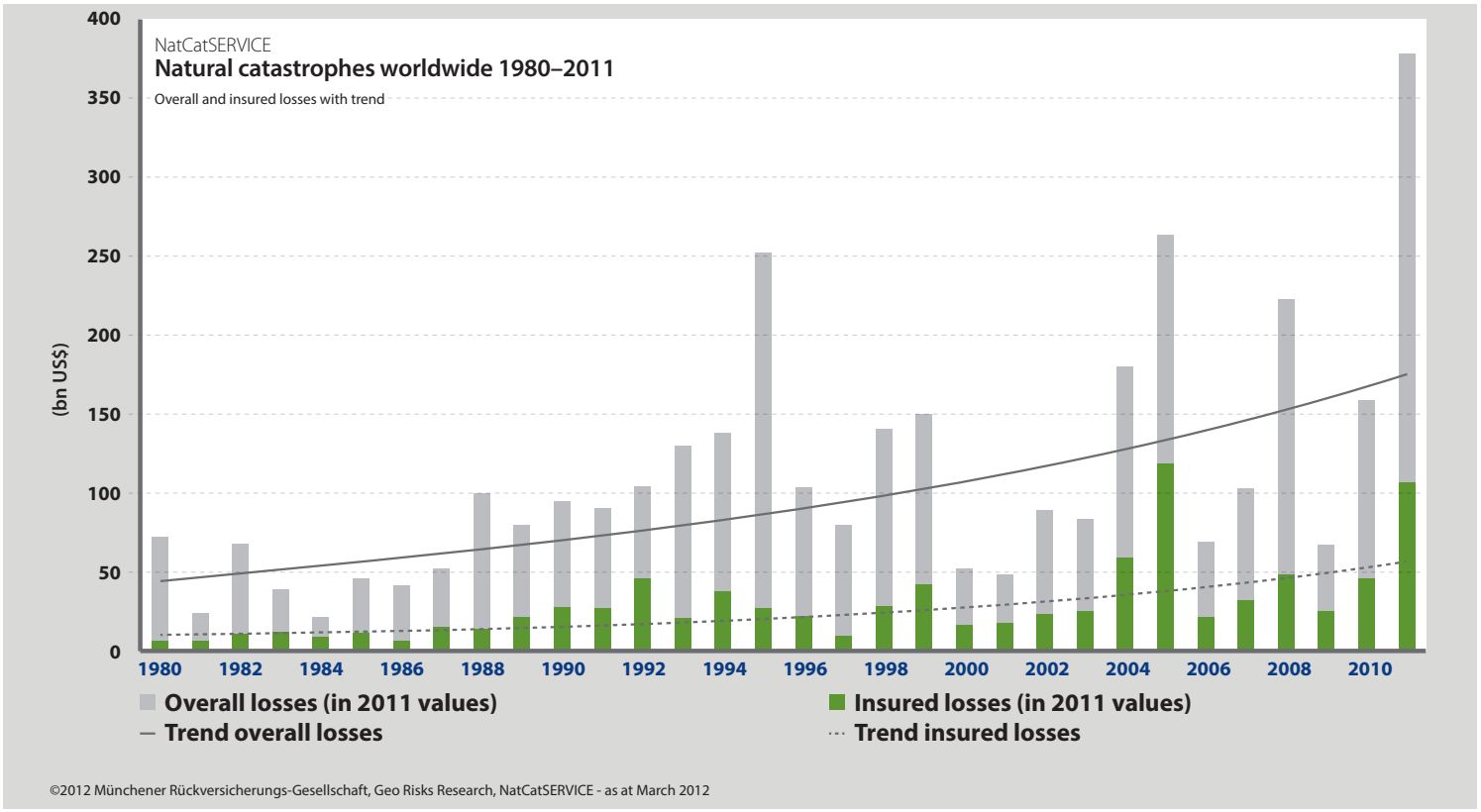


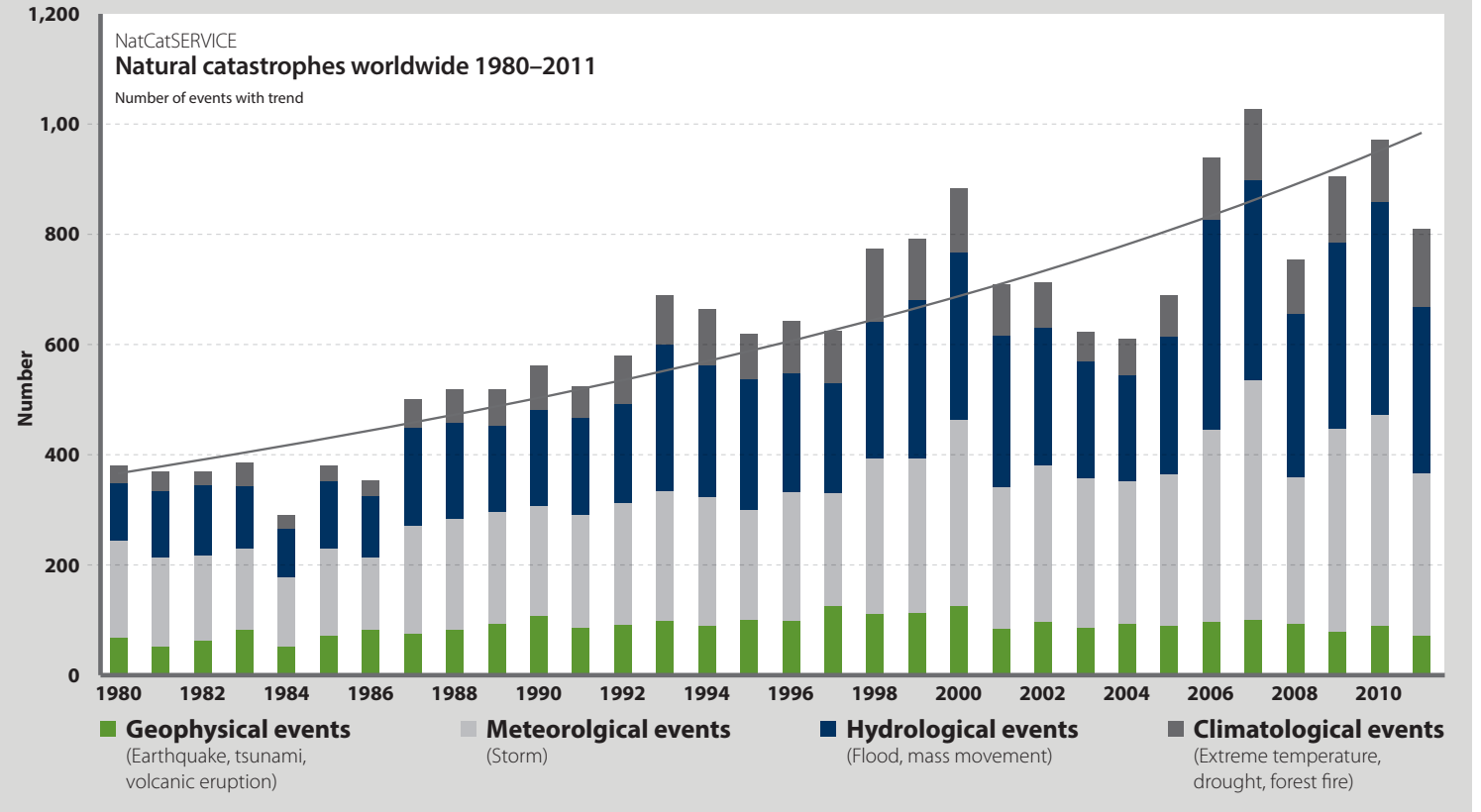
Urban density and transport-related energy consumption

Source: Newman et Kenworthy, 1989;
Atlas Environnement du Monde Diplomatique 2007.

Source: Emmanuelle Bournay, UNEP/GRID-Arendal[60]

FIGURES 3 AND 4: TREND IN WEATHER CATASTROPHES AND COSTS[61]





PERSONAL HOUSEHOLD COSTS

Although house prices in sprawling areas tend to be lower than in central areas, the cost of transportation tends to be higher: as noted above, residents of sprawling areas are more dependent on car travel and tend to own more cars and drive further distances.

The personal costs of car ownership are high. In Canada, the average car costs its owner approximately $10,000 per year,[62] which translates to roughly $830 per month. Reducing the number of cars in a household by one would yield savings enough to enable ownership of a much more valuable home.

Considering another major household cost, retirement, the annual cost of owning an extra car for 35 years could buy more than $570,000 of RRSPs[63] – more than the vast majority of Canadians in their 50s have saved for retirement.[64]

The question of affordable housing takes on an entirely new meaning when considering the automobile dependency created by suburban sprawl. In a sense, homebuyers are being sold on the low sticker price for houses, while the high costs of the needed car ownership are brushed aside. Housing in sprawling areas is only "affordable" because the costs are being transferred to the homeowner's transportation bill.

As the housing + transportation indices show, there is more to home affordability than the sticker price. Walkability of the neighbourhood, proximity to shops and services, and availability of high-quality transit are important determinants of true affordability. A cheap house at the edge of town that requires automobile transportation is not as affordable as it looks.

Some argue that the solution is greater "financial literacy" for homebuyers. If homebuyers would just learn how to do the research and crunch the numbers, the argument goes, they could make better financial decisions, including the decision to locate in a neighbourhood that truly reduces their costs.

The reality is that many people are simply too busy with work, families and other commitments to dig up non-transparent costs and perform the needed financial analysis for home buying, car buying, retirement planning, energy efficiency investments and the many other long-term financial decisions they face.

In order for real people to make the best decisions, they require relevant information. Housing + transportation affordability indices are an attempt to start developing that information. Ultimately, relevant information needs to be supplied to homebuyers when they are making decisions about whether to buy the house. It is very unlikely that all vendors of suburban housing will voluntarily perform the calculations and tell prospective buyers about the additional costs required in order to use their products. If markets don't provide such information, governments will need to step in.

AN IMPROVED MEASURE OF AFFORDABILITY: HOUSING + TRANSPORTATION INDEX

Researchers are beginning to cast light on the combined costs of home ownership and transportation. For example, the Center for Neighbourhood Technology has developed the Housing + Transportation Index, based on 337 US metropolitan regions. The index demonstrates that homeowners can save thousands of dollars per year in transportation costs by locating in compact, rather than dispersed, communities. Aggregated across an entire municipality, it can add up to hundreds of millions or even billions of dollars of savings per year.[65]

"Families who pursue a 'drive 'til you qualify' approach to home ownership in an effort to reduce expenses often pay more in higher transportation costs than they save on housing, thereby placing more, not less, stress on their budgets."

– A. MOTLUCK [66]

Research for Canada Mortgage and Housing Corporation (CMHC) on a housing + transportation index showed that in Calgary, being able to eliminate one car per household would put many more homes within financial reach of the potential buyer – depending on income level, up to 18 times as many homes.[67]

Even if the housing + transportation costs are eventually displayed prominently on housing product information, it is far from clear that buyers will be able to make the "rational" decision that ideal economic actors would make. Behavioural economics has provided important insights about real-world decision-making, including the tendency to heavily discount future costs and benefits.[68] Simply put, many people tend to make decisions based on immediate costs and benefits, and they downplay future costs. Thus, there may need to be policy interventions that extend beyond the provision of information and that effectively reduce the risk of homebuyers overextending on transportation costs (just as CMHC now intervenes to reduce the risk of overextension on home mortgage payments).

The hidden household transportation costs of sprawl become even more important in light of potential energy cost increases. Although fuel prices are below their 2007 peak, in 2013 they are still historically high despite a major

global recession followed by a prolonged economic slowdown. Oil prices could well climb in the future: demand in developing countries continues, while the current boost to OECD unconventional production appears set to last little more than a decade.[69] As jurisdictions around the world continue to respond to climate change by expanding carbon pricing and regulation, the cost of fuel is likely to rise even further.

Higher fuel prices would have a disproportionate financial impact on suburban homeowners. If enough of those homeowners find themselves unable to afford their transportation costs, the value of suburban and exurban homes could tumble. This is what happened in the US housing bubble collapse; house values in areas requiring lengthy commutes fell more rapidly than those in central, compact neighbourhoods.[70] And when home values go down, many owners find themselves holding more debt than assets.[71]

HEALTH IMPACTS

The health costs of smog from vehicle emissions, and injury and death from traffic collisions, are discussed above. However, there are other health impacts of sprawl.

The research is still relatively new, but the literature has already identified linkages between sprawl and a large number of chronic diseases and risk factors.[72] For example, University of Toronto researchers found that populations in less walkable neighbourhoods develop higher levels of diabetes; among new immigrants, the rate is 50% higher in the least walkable areas compared to the most walkable.[73] Another study states that there are "public health consequences of urban sprawl… [I]ncreasingly sedentary lifestyles now contribute to greater levels of obesity, diabetes and other associated chronic diseases."[74] Furthermore, there are mental health impacts, ranging from loss of sense of community and social capital, to driver stress and road rage.[75]

What about the risk of injury from violence? Even in American cities (where the risk of death due to violent crime is far higher than in Canadian cities), when considering crime and car crashes together, suburbs and particularly exurbs have a higher overall risk of violent death. This is due to the higher incidence of collisions in comparison to crime.[76] A study of the largest 101 metropolitan areas of the US determined that the degree of urban sprawl is directly related to traffic fatalities and pedestrian fatalities.[77] In Canada, although death rates from motor vehicle collisions are declining in response to consumer safety requirements, motor vehicle collisions still kill more than 2,000 Canadians a year.[78] Although the media and the federal government have made a political priority out of violent crime, the real health priority is automobile collisions, which kill four times as many Canadians as die from homicide.[79]

ECOSYSTEM SERVICES

The natural areas surrounding municipalities provide a range of ecosystem services that have value to residents, businesses and municipal governments. These services include water filtration, storage and runoff control, fresh air, erosion control, pollination, recreation and aesthetic enjoyment.

These ecosystem services don't appear on financial statements, but they are real, and economists have quantified them. For example, the total value of ecosystem services provided by Toronto's greenbelt has been estimated at $2.6 billion annually.[80]

The City of New York has purchased land and conservation easements in the Catskill/Delaware watershed in order to protect its drinking water supplies, avoiding $6 billion to $10 billion in water filtration plant capital costs and more than $300 million per year in operations.[81]

Where municipalities do not protect their surrounding environment, sprawl can literally pave over agricultural and natural spaces, displacing, damaging and even eliminating some of these services.