

Spiking the Line

A Megaregional Growth Plan for the Windsor/Quebec Corridor

by

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I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

In a truly global context, the contemporary urban landscape is changing dramatically. The megaregion has emerged as the primary scale of economic development and the home of the world's wealth, innovation and progress. Increasingly expensive and scarce land, as well as the protection and preservation of farmlands and habitats, are driving up density. A renewed emphasis on environmental sustainability means not just greener building treatments and improved fuel efficiencies, but a need to redirect infrastructural investments in far more efficient ways.

If, as the Regional Plan Association asserts, megaregions have replaced metropolitan regions and cities as the geographic units of the global economy, they must be planned, structured and supplied to maximize their potential as such. This thesis proposes a regional plan for the Windsor/Quebec corridor that attempts to satisfy any qualitative aspirations of the current "Places to Grow" plan for the Greater Golden Horseshoe while strategically repositioning growth in the region to be more globally competitive and sustainable.

This proposal utilizes two very specific existing elements in expanded roles; the 400 series highways as an infrastructural distribution network, and the regional shopping mall as a strategic site for discreet, distributed urban cores. Together, these two elements form a conceptual city at the megaregional scale; a concentrated, sprawl-free, efficient and sustainable form of city-making that also integrates seamlessly into the existing urban morphology.

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In memory of Zella Clark

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Image source: SkyTran - The Future of Travel <http://www.skytran.net/> Accessed 30-October 2009.
- 104 5.8 An image showing a sustainable future city. Popular Science, 2009.
Image source: SkyTran - The Future of Travel <http://www.skytran.net/> Accessed 30-October 2009.

- 105 5.9 The highway as the primary conduit of regional urbanism. RVTR, "The Post-Carbon Highway", 2009.
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- 120 5.24 Perspective image of STC, projecting development on unused lands and secondary parking lots. Shadows represent fall equinox conditions, mid-afternoon of September 21st.
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Image source: Adam Clark, 2009.
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Image source: Adam Clark, 2009.
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- 121 5.28 Model perspective and plan view of STC, adding development at two strategically selected parking lot sites. Total capacity; 13,500.
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Image source: Adam Clark, 2009.
- 122 5.30 Perspective image of STC, projecting development of 15,000.
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- 124 5.36 Perspective image of STC, projecting development of 20,000.
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- 125 5.38 Model perspective and plan view of STC, identifying all sections of chain retail for redevelopment.
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Image source: Adam Clark, 2009.

- 129 5.50 Model perspective and plan view of STC, identifying all three department store anchors for redevelopment.
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- 129 5.51 Model perspective and plan view of STC, identifying all three department store anchors for redevelopment.
Image source: Adam Clark, 2009.
- 129 5.52 Model perspective and plan view of STC, adding development at each anchor, removing concourse.
Image source: Adam Clark, 2009.
- 129 5.53 Model perspective and plan view of STC, adding development at each anchor, removing concourse.
Image source: Adam Clark, 2009.

This thesis establishes a framework for a megaregional growth plan serving the Windsor/Quebec corridor; an unbroken, linearly distributed urban form that joins large populations of Ontario and Quebec via the regional highway system. This plan is presented as an alternative to the Ontario Ministry of Public Infrastructure Renewal's "Places to Grow", which identifies the Greater Golden Horseshoe as the footprint for future growth. Places to Grow directs that growth in a number of traditional ways; densifying downtowns, developing arterial corridors and brownfield sites, and building suburban neighbourhoods.

Here, the emergent properties of two pervasive urban elements are explored as the new carriers for both regional infrastructural systems and development density; the 400-series highways and the regional shopping mall, respectively.

Section one, "*The Megaregion*", identifies the corridor's regional and global context, juxtaposed against that of the Greater Golden Horseshoe. It presents an argument for re-establishing the growth plan as 'the line' rather than 'the horseshoe' in an effort to better connect the region, prevent sprawl, and establish a more economically sustainable method for delivering infrastructural connectivity.

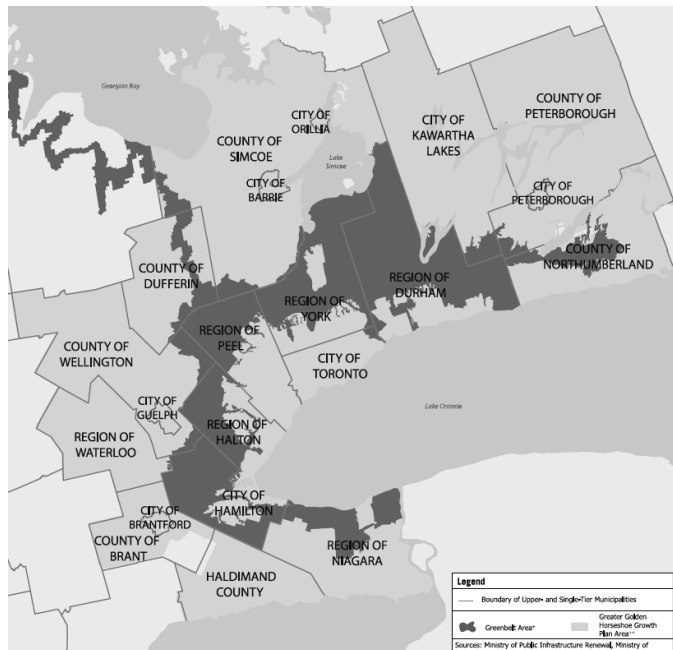
Section two, "*The Infrastructure*", focuses on the 400-series highway backbone as a potential amalgamating force for the region's infrastructural systems. It explores the existing network of multi-modal transit systems in the region, the declining stature of Canada's information networks and the difficulty in delivering high-order connectivity to a sprawling region. Section two also begins to reposition the highway backbone from a underperforming, underfunded, uni-modal system of highways to the baseline for all highest order infrastructural systems in the region; this includes both public and private transit, renewable energy systems and new information networks.

Section three and section four explore "*The Regional Mall*" as both an architectural and planning phenomenon as well as a cultural one, establishing the mall as both a strategic carrier for future development and a significant attractor of social and cultural activity. It unpacks shopping mall development as a specific form of urbanism that is both typologically and culturally valuable to future, on-site development, one that promotes adaptability and cultural evolution in the form of the regional centre.

Section five, *“The Windsor/Quebec Corridor”*, outlines a number of different intensification strategies for both the highway backbone and the regional mall, resulting in a framework for future regional development that is specifically tailored to the region’s strengths. It builds upon the 400-series highway network, diversifying regional transit and shipping at multiple scales, speeds and bandwidths. Section five also presents Scarborough Town Centre as a precedent for regional centre development and considers a number of economic potentialities to project future, on-site intensification strategies.



fig. 1.1 (above) The Greater Golden Horseshoe and the 401/403 regional highway backbone. fig. 1.2 (below) A closer view of the GGH showing county/city lines and extents. Ontario Ministry of Public Infrastructure Renewal, 2006.



“The current sprawling development patterns in the GGH are adversely affecting Ontario’s competitive potential, hurting the economy and damaging our health, environment and quality of life. People are traveling longer distances to work and spending more time commuting. More automobiles are on the roads. Pollution is increasing. Gridlock is worsening. Goods are not getting to their destinations on time. Valuable agricultural lands and greenspaces are being paved over. People are driving more and walking less. Obesity levels are up. Continuing current development patterns would only exacerbate these problems.” - Places to Grow, A Guide to the Growth Plan¹.

The Growth Plan And The Greater Golden Horseshoe

Introduction

The government of Ontario’s Growth Plan for the Greater Golden Horseshoe predicts that the population of the region will grow by 3.7 million (from 2001) by the year 2031², making it the fastest growing region in Canada and the third fastest in North America^{3,4}.

Prepared under the Places to Grow act of 2005, the growth plan is designed to work within the existing planning framework to manage growth policy for the region⁵, addressing *“transportation, infrastructure, planning, land-use planning, urban form, housing, natural heritage and resource protection in the interest of promoting economic prosperity⁶.”* However, as the plan itself explicitly states, that existing framework has led to a number of undesirable outcomes. While it may be possible to correct-- to a degree-- for issues such as sprawl or congestion within the developmental, planning and political climates of the region as they currently exist, this is unlikely. There is a much greater potential for success in reworking the growth plan to better take advantage of specific regional strengths-- the streamlined highway infrastructure, the relatively linear distribution of settlement areas from Windsor to Quebec City, the region’s proximity to and participation in large and highly competitive meagaregional economies-- while eliminating rather than mitigating harmful and poorly directed growth; specifically suburban sprawl. A new plan must not just rework existing policy; it must also reconsider the boundaries and definitions of the region itself and how it operates within its larger context, providing smartly targeted growth sites and connective tissue capable of repositioning the region’s future growth while remaining compatible with existing local urban structures.

Success in this context refers to quality of life, economic prosperity and social, economic and environmental sustainability. It means not just the mitigation but elimination of sprawl, drastic improvements to inefficient and overburdened transportation and information networks, and a greater inter-regional competitiveness in a globalized economy.

“Just as metropolitan regions grew from cities to become the geographic units of the 20th century global economy, megaregions- agglomerations of metropolitan regions with integrated labour markets, infrastructure, and land use systems- are rapidly taking their place.” America 2050: A Prospectus⁷.

Context

According to the Regional Plan Association’s 2006 report ‘America 2050’, a megaregion is defined as an “*extended network of metropolitan regions linked by environmental systems, transportation networks, economics and culture*”⁸. Generally these megaregions are centred on the largest regional economic driver and form essentially by accident; as one metropolitan area grows into another, their infrastructural systems and urban fabric become linked, and eventually intertwined⁹.

Globally, there are an estimated 20 to 25 megaregions¹⁰ that are concentrating wealth, talent and innovation from all over the world. Megaregions are growing rapidly while less-connected areas often stagnate¹, causing growth at the national level to be uneven. This in turn results in an economic disparity between megaregional and non-megaregional areas of the same country. As this gap widens, residents of megaregions from different parts of the world are finding themselves increasingly connected to each other, and increasingly less connected to their geographical neighbours¹². Likewise, megaregions are becoming increasingly competitive with each other for business, investment, and talent¹³, assets which are all mobile enough in a globalized climate to simply relocate to wherever is most advantageous. A megaregional economy is one in which each competing megaregion must be world-class by definition if it hopes to achieve a sustainable prosperity.

America 2050 identifies eleven megaregions within the continental United States alone¹⁴, however, only a handful of these truly have a global presence and two- identified as the Northeast and Great Lakes megaregions- clearly separate themselves from the rest.

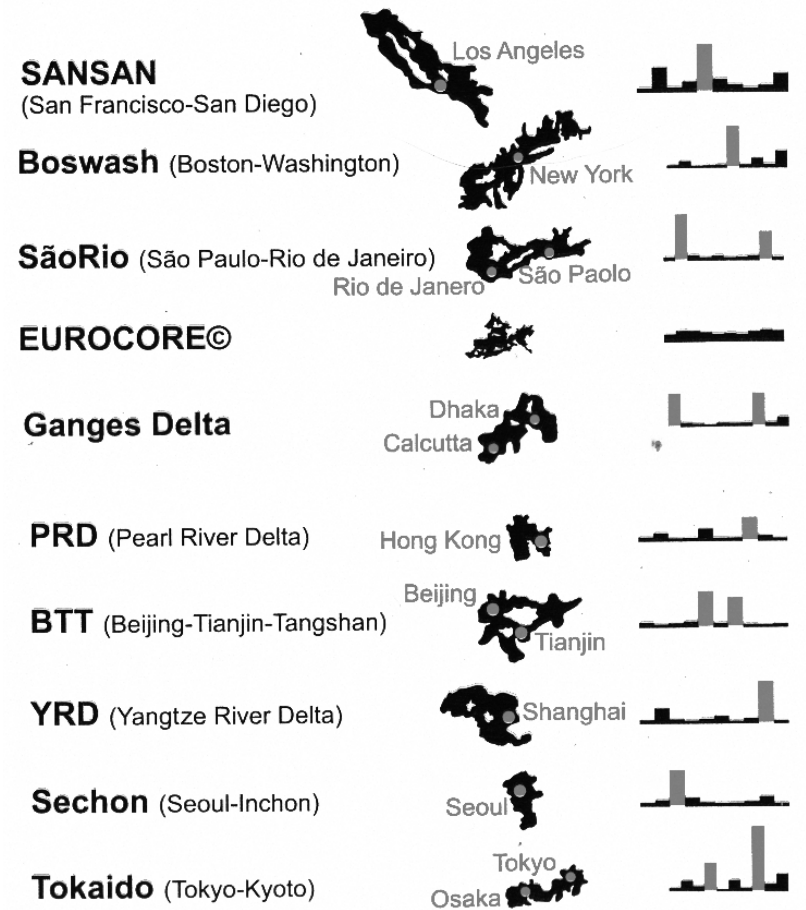


fig 1.3 (above) The ten most populous global megaregions and their centres. AMO, Content, 2004.

A Tale of Two Megaregions

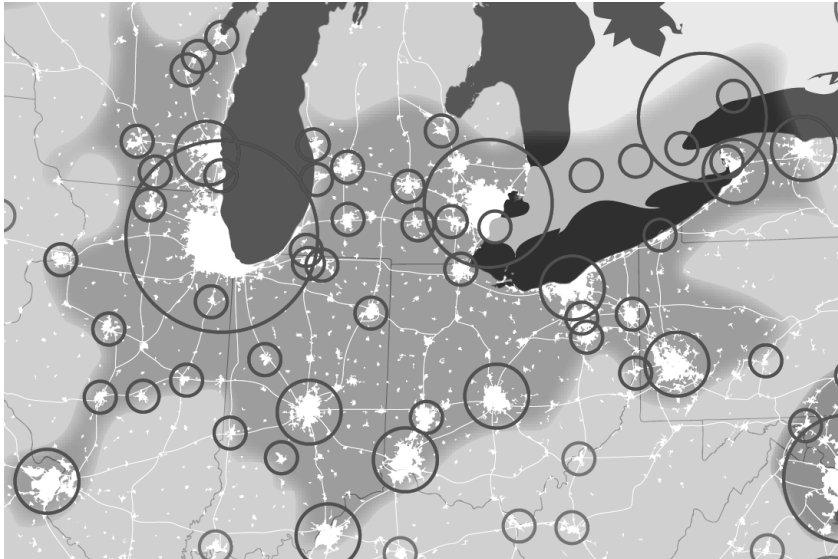
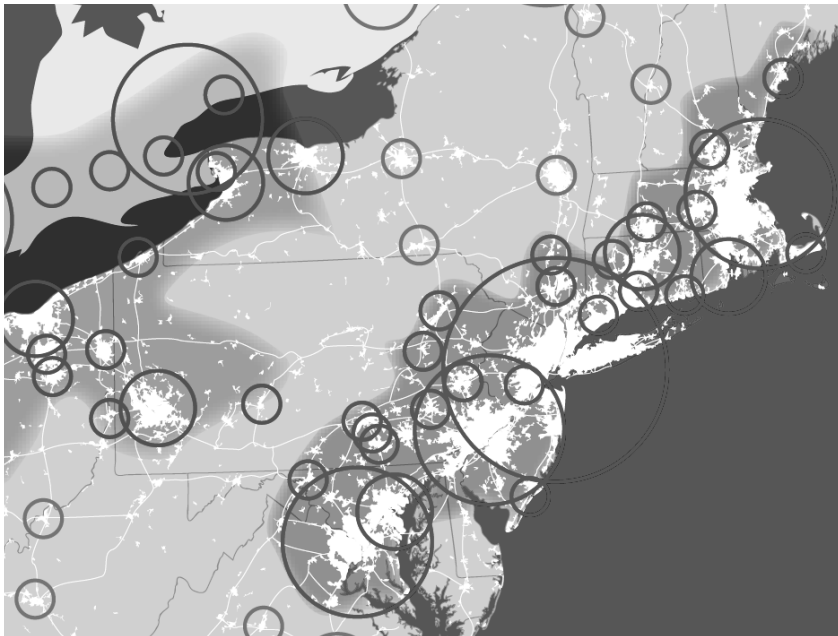


fig 1.4 (above) *The Great Lakes megaregion*, and fig 1.5 (below) *The Northeast megaregion*. The darker tone indicates the region's extents while the circles represent metropolitan area populations of 150,000 to 1 million, 1 to 3 million, 3 to 6 million and 6 million plus, from smallest to largest. *Regional Plan Association, America 2050: A Prospectus*, 2006.



The Northeast megaregion and the Great Lakes megaregion are a fascinating juxtaposition; very different despite being so nearby to one another; but still approximately equal. They are by a large margin the biggest of the North American megaregions; the Northeast megaregion accounted for a 2005 GDP of nearly 2.6 trillion dollars, while the Great Lakes megaregion accumulated nearly 2.1 trillion^{15,16}.

The Northeast megaregion had a 2000 population of just under 50 million, while the Great Lakes megaregion fell slightly shy of 54 million people^{17,18}. In the United States, both regions are forecast to grow 17% by the year 2025¹⁹.

Despite having similar sized economies, populations and projected growth rates, the Northeast megaregion has a footprint of just 62,000 square miles, less than a third of the Great Lakes megaregion's 205,000 square miles²⁰. Accordingly, the Northeast region had a 2000 population density of 800 people per square mile, more than triple that of the Great Lakes²¹.

The Northeast megaregion holds tightly to the eastern seaboard of the United States, a corridor of major coastal cities, while the Great Lakes megaregion scatters its urban nodal points around the loosely-networked rust belt and the watershed of its namesake. The former is a recently troubled global financial and cultural beacon, but one which produces 20 percent of the nation's GDP with 18 percent of the population densely packed into only 2 percent of the American landmass²². The latter, a waning industrial powerhouse that is growing despite a shrinking manufacturing sector thanks to its natural resources and 'a strong research and cultural tradition tied to its leading public universities'²³. The Northeast megaregion's international presence is felt almost entirely through its epicentre of New York City, while the Great Lakes megaregion has a dual-core, with Chicago on the American side and Toronto on the Canadian side.

Both regions are extending toward Montreal, with proposed high speed rail lines linking the city to the Northeast region via Boston and highways that directly link the city to both Toronto and New York. Presently however, the Northeast megaregion is exclusively American while the Great Lakes megaregion contains all of southwestern Ontario, resulting in enormous quantities of trade between the two nations.

While the Northeast megaregion contains many dissimilar focal cities, (the characteristic differences between Boston, New York, and Washington are pronounced) the national network of infrastructure tying the region together is essentially uniform. In the Great Lakes megaregion however, there are significant differences between Canadian and American systems. On the American side, the infrastructural network resembles a more industrial focused, less exhaustively connected version of the Northeast megaregion's. On the Canadian side however, the highway infrastructure in particular is reduced to what is essentially a single line; the 401. This is a situation, specific to southwestern Ontario, in which a networked, fully developed first-world infrastructure is simplified to the degree that it can still potentially be used as a stem for testing new ideas of organization and distribution within its emerging megaregional context. Traditionally, by the time an area has developed to the point where it can be considered a part of a megaregion, it has also developed past the point where its future growth can be re-contextualized and diverted according to a new set of more appropriate and more competitive guiding principles²⁴.

This makes the Ontario portion of the Great Lakes megaregion uniquely suited to infrastructural and urban growth proposals that look to both maintain and enhance existing networks while re-routing new development in a manner that will position the region as one of the most sustainable and competitive in the world.

As megaregions continue to grow and sprawl, they will become increasingly complex and unmanageable²⁵. Much like cities, metropolises and regions before them, megaregions will eventually become too big to manage and will outgrow any sort of adherence to their founding principles. When this happens, planners and urbanists will once again be forced to reconsider how to grow after the fact and the same obstacles will need to be dealt with at larger, more complex and harder to correct scales.

The Ontario portion of the Great Lakes megaregion is an opportunity to re-think growth strategies as more than the continued swelling of existing megaregions. Rather than splitting growth into the continued densification of urban cores and the filling of greenfield spaces between them, a new, specifically directed development strategy can be superimposed onto existing systems. This new, megaregional framework can re-adjust the historical urban fabric without disruptive interventions while at the same time developing a new, densely-woven, hyperthreaded²⁶ network of cores and connective tissue.



fig 1.6 (above) High speed rail network proposed as part of the American economic stimulus. U.S. Department of Transportation, 2005.

fig 1.7 (below) An image of Toronto; the epicentre of the Ontario side of the Great Lakes megaregion. Urban, transit and information networks. Google Earth, 2009.





fig 1.8 (above) A map of municipal jurisdiction in eastern Ontario and fig 1.9 (below) A map of municipal jurisdiction in southwestern Ontario. Ministry of Municipal Affairs and Housing, 2006.



“... a new urban scale has emerged that presents a framework for responding to large scale, cross-border challenges.” - America 2050²⁷.

Megaregional Growth Planning

Traditionally in North America, a growth plan is formulated at the national or regional level, such as America 2050 or Places To Grow²⁸. It is then delegated to cities, municipalities, counties and townships for implementation. More than anything else, this is a result of the existing structure of governmental hierarchy; a publicly funded growth plan has to originate from an existing level of government. Places to Grow, for example, aims to provide a comprehensive plan for the entire region “while still giving individual municipalities the flexibility they need to meet their own priorities²⁹.”

This becomes an issue when the “new competitive units in the global economy”³⁰ megaregions- are rarely confined within the invisible lines of county, city, state/province or even national jurisdiction. These levels of government, as well as municipal boundaries and planning methodologies, were all determined irrespective of the megaregion, and it is unwise to expect that a retrofit to accommodate this new scale will be successful, particularly in a globally competitive environment.

Downloading planning initiatives and responsibilities from one tier of government to the next leads to a number of individual interpretations during the implementation phase; interpretations that are often motivated by maximizing available funding from higher levels of government, causing competition between municipalities under the same plan.

Places to Grow exacerbates this problem by promoting the concept of *complete communities*³¹, encouraging further competition between municipalities to attract residents, businesses and cultural and entertainment venues. Each municipality is to develop into a community capable of complete autonomy from others; this means hundreds of individual public infrastructures inefficiently vying for the same funding while providing the same approximate services across many scales of inhabitation. This is not conducive to a region or megaregion that operates efficiently or sustainably. In a globalized economy, completeness cannot be measured at the municipal level. There are greater scales at work through which smaller pieces must contribute harmoniously; a more cohesive vision must operate specifically at the megaregional level, balancing local needs within the region’s global context.

The simple reality of the situation is that the megaregion is anomalous of traditional planning structures. The Great Lakes megaregion, for example, crosses one international border, contains parts of several states, two provinces³², dozens of mid-sized cities, several metropolises, and hundreds of counties.

Planning for a growing megaregion at what ends up being the municipal level is a risky proposition that assumes but does not promote inter-municipal cooperation. Rather than neglect even the most trivial of boundaries, Places to Grow accepts the limitations of the Greater Golden Horseshoe's historical planning framework, crafting a regional agenda for future growth that is completely at the mercy of localized climates and obsolete methodologies.

The obvious solution; megaregional planning strategies specifically designed to work at that scale. A plan that can accommodate new regional growth at sustainable densities in a coherent and intelligent manner. A plan that is sophisticated enough to operate independently of traditional hierarchies without damaging the infrastructural systems or quality of life in established areas; causing minimal disruption to existing cities without allowing the historical urban fabric to dilute future progress.



fig 1.10 (above) The Great Lakes watershed. Great Lakes Information Network, 2009. fig 1.11 (below) A map of the Great Lakes megalopolis. Visible is the continuous, linear form of the Windsor/Quebec corridor. Constantinos A. Doxiados, *The Developing Urban Detroit Area*, 1966.

The Regional Boundary

The first question that arises is whether or not the current boundary for the region is the most appropriate. As presently defined, the Greater Golden Horseshoe (as shown in figures 1.1, 1.2 and 1.12) wraps itself around lake Ontario from the region of Niagara to the county of Northumberland with the city of Toronto at its centre. A vast majority of the region is made up of farm lands; 9 of the 14 county/municipal zones are almost entirely rural, often containing no more than one mid-sized city. It is hard to argue that Haldimand County shares many similarities with the City of Toronto, for example, and while homogeneity is hardly a prerequisite of regional boundary making, it is unlikely such disparate areas can share a regional plan without having to defer substantially to the municipalities involved by the time that plan reaches implementation, whether this is an intended consequence or not.

The GGH divides itself into inner and outer rings by the Greenbelt Zone, a strip of protected rural land that arcs through the entire Horseshoe separating the Greater Toronto Area from



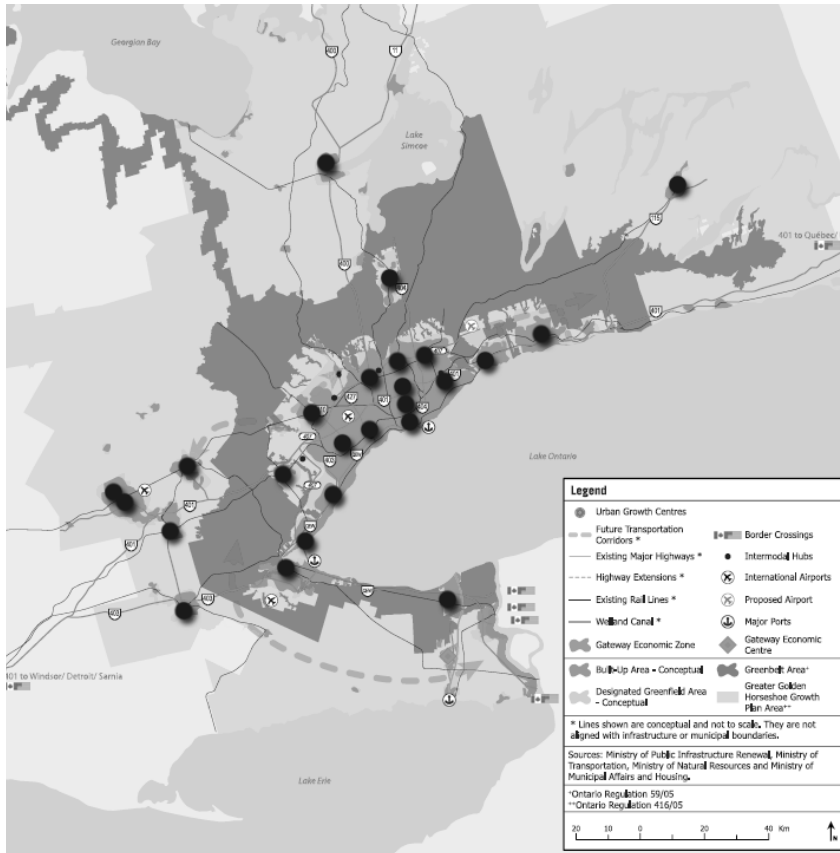


fig 1.12 (above) The GGH including major transit, urban Growth Centres (black dots), the Greenbelt and other major infrastructures. Ontario Ministry of Public Infrastructure Renewal, 2006. fig 1.13 (below) The GGH's 25 urban growth centres with density targets (people and jobs per hectare). Ontario Ministry of Public Infrastructure Renewal, 2006.

400

- Downtown Toronto
- Etobicoke Centre
- North York Centre
- Scarborough Centre
- Yonge-Eglinton Centre

200

- Downtown Brampton
- Downtown Burlington
- Downtown Hamilton
- Downtown Kitchener
- Uptown Waterloo
- Markham Centre
- Downtown Milton
- Mississauga City Centre
- Newmarket Centre
- Midtown Oakville
- Downtown Oshawa
- Downtown Pickering
- Richmond Hill/Langstaff Gateway
- Vaughan Corporate Centre

150

- Downtown Barrie
- Downtown Brampton
- Downtown Cambridge
- Downtown Guelph
- Downtown Peterborough
- Downtown St. Catharines

the rest of the region. This helps create two very distinct zones; a sprawling but densifying inner metropolis sandwiched between lake Ontario and the Greenbelt, and a comparatively empty and expansive stretch of rural land outside the Greenbelt, held loosely by relatively arbitrary county lines.

The GGH connects to the United States via Niagara Falls but is otherwise surrounded by rural lands. Mid-size and larger industrial towns to the southwest- Woodstock, Ingersol, London, Chatham, and Windsor- are not included, though they are connected via the 401 highway, the extremities of which also connect across the border to Detroit as well as northeast through the major cities of Montreal, Quebec City, and (via the 416) Ottawa. The GGH, for the most part, is simply an extension of the Greater Toronto Area in all directions; the result of which is the continued sprawl of an already sprawling city more than a true economic megaregion.

Conceptually, if county and municipal lines can be ignored when drafting a new regional boundary, it becomes clear that the GGH as currently delineated is not particularly advantageous. It promotes sprawl by radiating itself outward from downtown Toronto, which also operates as the one and only truly cosmopolitan centre in the region. This causes a concentration of economic and cultural activity for residents of the entire Horseshoe, who must commute en masse, overloading high order transit at peak hours. This reality clashes with the 'complete communities' initiative, the aim of which is to disperse activity to multiple, independent city centres. However, even Places to Grow itself characterizes downtown Toronto as 'a celebrated centre of influence for commerce, culture and innovation' that is 'at the heart' of the Greater Toronto Area metropolis³³. This apparent confusion over whether the region is centralized, de-centralized or multi-centred is understandable; in reality, as it has developed over time, it is all three. The issue here is that Places to Grow ultimately chooses not to narrow its focus for future growth, doing little to reverse what are proving to be harmful long-term planning practices.

Targeting Intensification

Starting in 2015, Places to Grow calls for a minimum of 40% of all residential development to be within the *built-up area*³⁴, with individual municipalities required to develop intensification strategies within the *built boundary*³⁵. The *built boundary* is the limit 'of the developed urban area as defined by the Ministry of Energy and Infrastructure'³⁶, in consultation with the affected municipalities^{37,38}. While the plan establishes intensification targets for municipalities, the Minister of Energy and Infrastructure may permit an alternative minimum to

municipalities located in the *outer ring*³⁹ to 'ensure the intensification target is appropriate given the size, location and capacity of built-up areas⁴⁰.' There is a strong foundational idea here; placing a specific percentage of all growth within a particular boundary is a smart way to add density and mitigate sprawl. Ignoring for a moment whether 40% is an appropriate percentage, the problem here is simply that the parameters are not firmly in place. The built boundary can be expanded and the density targets can be reduced. This may not occur, and if it does, density targets may be exceeded elsewhere. However it is impossible to know for certain, which undermines the value of the plan itself.

Fortunately, that 40% of growth is semi-specifically directed. Within the *built-up area*, as delineated by the *built boundary*, exist three types of *intensification areas*; *urban growth centres*, *brownfield/greyfield sites*, and *intensification corridors*⁴¹.

There are 25 *urban growth centres*, consisting for the most part of the downtowns of large and mid-sized cities⁴². These centres are categorized according to density targets of 400, 200, and 150 people and jobs per hectare⁴³, and are listed accordingly in *fig 1.13*. In this way, a certain percentage of growth is spoken for as cities meet the targets for their downtowns.

However, adding smart density to an historic downtown is challenging for several reasons; land ownership and zoning by-laws are more complex, there are a greater number of special interest groups, and most areas are already built-up and established, rendering major infrastructural enhancements impossible. This is particularly true for the adding of lanes or alternative transit options to overloaded downtown streets, many of which have actually seen lane reductions, added street parking and a narrowing of lanes in recent years through localized streetscaping initiatives. Note that in figures 1.14 - 1.16 (which are images provided by Places to Grow) as the architectural density of the street more than doubles, the number of lanes and the amount of traffic occupying them remains constant. These images are simply not accurate.

Brownfield/greyfield sites are 'undeveloped or previously developed properties that may be contaminated. They are usually, but not exclusively, former industrial or commercial properties that may be underutilized, derelict or vacant⁴⁴', while *intensification corridors* are 'intensification areas along major roads, arterials or higher order transit corridors that have the potential to provide a focus for higher density mixed-use development consistent with planned transit service levels⁴⁵.'



fig 1.14 (above) Visualization for density target for 2031 of 150 people and jobs per hectare and fig 1.15 (below) Density target of 200 people and jobs per hectare. Ontario Ministry of Public Infrastructure Renewal, 2006.



fig 1.16 (below) Density target of 400 people and jobs per hectare.



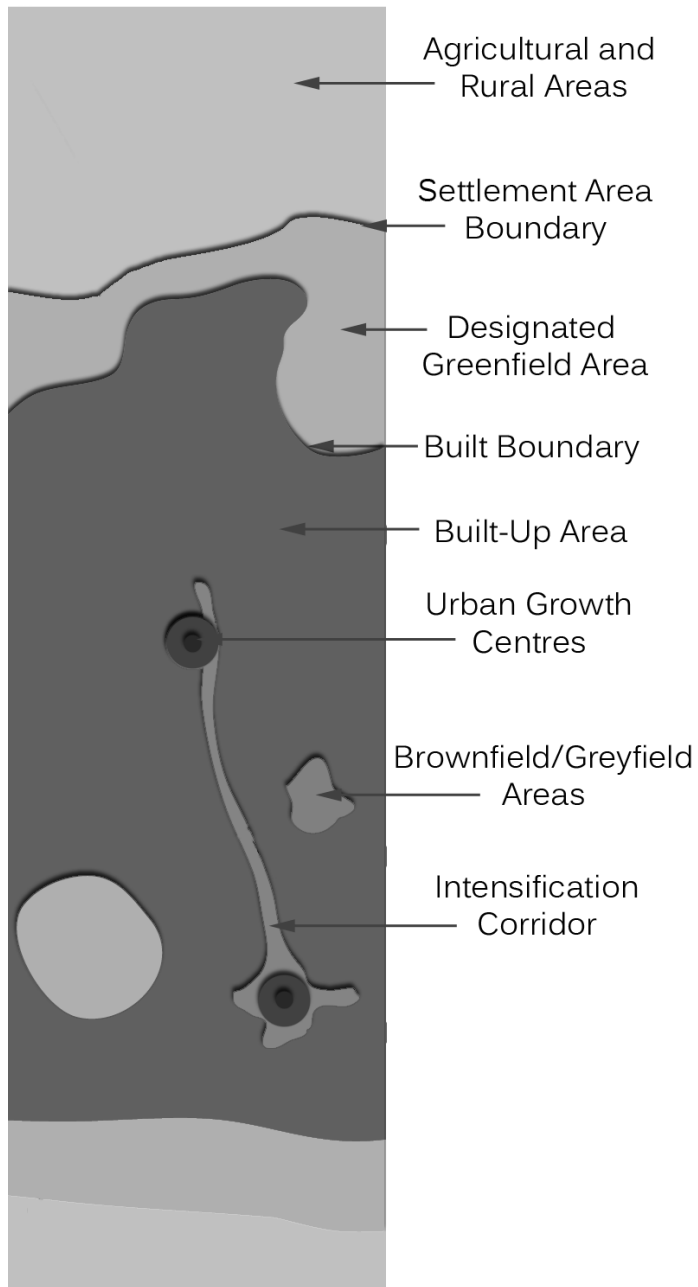


fig 1.17 (above) A diagram illustrating the different classifications for development areas contained within Places to Grow. Ontario Ministry of Public Infrastructure Renewal, 2006.

These types of sites hold more promise. Arterials certainly offer the greatest regional connectivity (outside of direct occupation of the 401, that is⁴⁶) and are therefore the most infrastructurally efficient places to concentrate growth. Also, the linear distribution of growth along an arterial corridor makes best use of transit systems by being neither centralized (adding to congestion) nor de-centralized (adding to sprawl). However, arterial development places an even greater dependence on an existing road network that is already handling the majority of commuter traffic between highway, downtown and suburban zones.

Brownfields, on the other hand, assuming they are mostly vacant or disused industrial and commercial lands with little traffic, have more capacity to handle growth volumetrically, but are less connected overall to the local public infrastructure, though they may be very well connected regionally⁴⁷.

Of course, these are not strictly discreet elements; a brownfield may exist on an arterial that passes through a downtown, for example. Therefore it will be important to be more specific about which areas outlined for development have the most potential for success, both infrastructurally and typologically.

These three types of intensification areas potentially cover only a small fraction of the *built-up area* that has been selected to contain 40% of the region's post-2015 growth, but should account for a large percentage of that growth as other parts of the built-up area are presumably already occupied and/or otherwise poorly equipped to handle additional density (suburban residential, neighbourhood retail and industrial lands for example).

What is perhaps the most interesting and potentially distressing part of the growth plan, however, is not that 40% of growth is required to take place within the *built boundary*, but rather that 60% is not.

This represents 2.2 million people (against 1.5 million people) potentially settling in *designated greenfield areas*, which are defined as an 'area within a settlement area that is not built-up area⁴⁸.' Accordingly, *settlement areas* are defined as 'urban areas and rural settlement areas within municipalities (such as cities, towns, villages and hamlets) where development is concentrated and which have a mix of land uses, and lands have been designated in an official plan for development over the long term planning horizon⁴⁹.'

Elsewhere, designated greenfield areas are defined more simply as 'the area between the built boundary and the settlement area boundary that has been approved for development,

but not yet built⁵⁰. Therefore, these are areas consisting of fields and other open lands devoid of existing infrastructure.

These areas are to have a minimum density of 50 people and jobs per hectare, measured over the entire designated greenfield area of each municipality⁵¹. It is also possible to expand the settlement boundaries within a municipality if certain criteria are met⁵². Even if the minimum density were 50 people per hectare and the jobs were additional density on top of that, an influx of 2.2 million people would require an additional 440 km² of currently undeveloped land. That's over 7 times the size of Manhattan island⁵³, or roughly 1.5 times the size of Mississauga, of low-density, suburban neighbourhoods.

While the growth plan seems to delineate fairly clearly that which exists within the *built boundary*, it is considerably more difficult to get a firm idea of exactly what will ultimately be included within the *settlement area*. Designated greenfield areas are likewise more difficult to pinpoint within this context, and the plan seems to consciously avoid associating the potential 60% of all growth figure with this section of the plan. In fact, despite a number of qualifications, it appears that the only definite limitations to settlement area boundary expansions are that it must meet the requirements of the Greenbelt, Niagara Escarpment and Oak Ridges Moraine Conservation Plans, and that it must not compromise specialty crops^{54,55}.

Places to Grow is a growth plan tailored to handle 40% of the region's expected growth through 2031, while allowing the remaining 60% to sprawl essentially unabated. In a region growing as quickly as the GGH, this is not an acceptable long term strategy. Hundreds of additional square kilometers of suburban development is neither infrastructurally, economically nor environmentally sustainable, and when coupled with the added strain caused by increasing density to established areas, the problems facing the region today are likely to still exist in 2031, only at an even larger and more unmanageable scale.

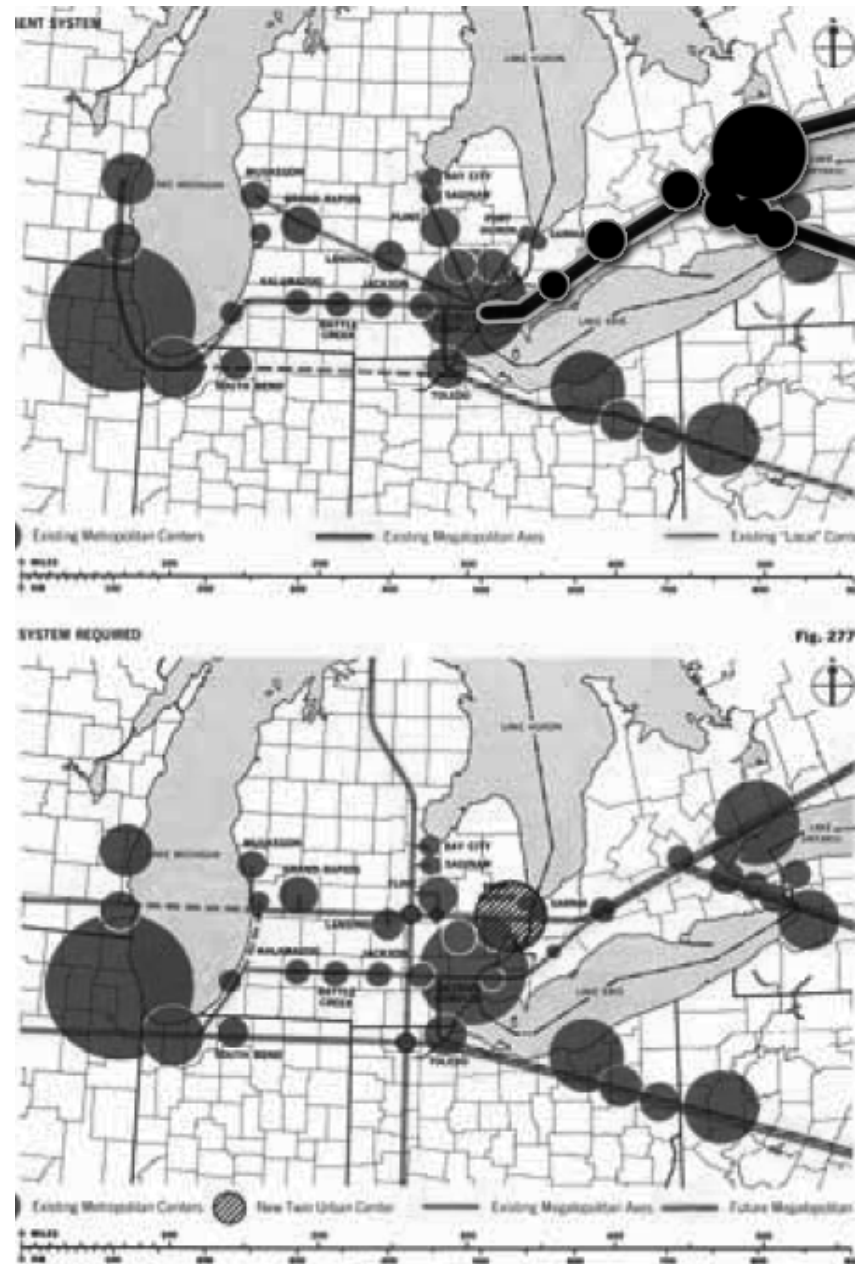


fig 1.18 (above) Diagrams of the new physical structure of the emerging Great Lakes megalopolis. Distributed, connected urban nodes along a networked infrastructural backbone. Constantinos A. Doxiados, *The Developing Urban Detroit Area*, 1966.

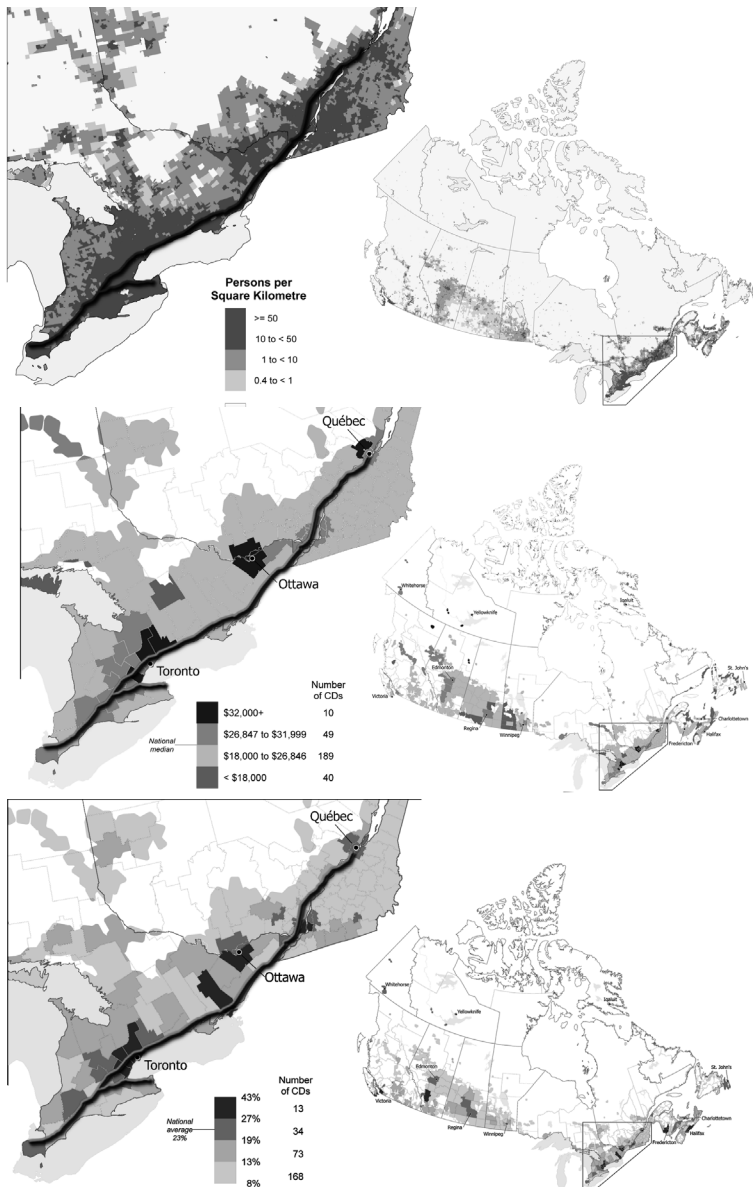


fig 1.19 (top) Population density of the Windsor/Quebec corridor. Adapted from Statistics Canada, Population and Dwelling Count Highlight Tables, 2006 Census.

fig 1.20 (middle) Median 2000 earnings. Statistics Canada, Profile of Income of Individuals, 2001 Census.

fig 1.21 (bottom) Percentage of population aged 25-64 with a university degree. Statistics Canada. Education in Canada, 2001 Census.

By most measures, the Windsor/Quebec corridor is Canada's only foothold within the network of global economic megaregions; there is little question as to the overwhelming importance of the region to the Canadian economy. Toronto and Montreal are the nation's two largest metropolitan areas⁵⁶. 4 of the top 7 and 10 of the top 16 metropolitan areas in Canada are located along the corridor⁵⁷. As a region it is among Canada's densest, wealthiest, most diverse and best educated.

The 2001 population of the Greater Golden Horseshoe was 7.8 million⁵⁸ at a time when the population of Canada was 30,007,094⁵⁹; that's 26% of the country's entire population without even including other connected parts of southern Ontario, eastern Ontario and southeastern Quebec.

The corridor extending from Windsor to Quebec City is Canada's largest concentration of population and capital. Ontario's total 2006 population of 12.7 million- almost entirely concentrated within this corridor- accounts for nearly 40% of all Canadians⁶⁰. Add in the 7.5 million residents of Quebec⁶¹- the majority of whom are also on the corridor- and that percentage rises to over 67%. Adding only the populations of metropolitan regions along the corridor of over 100,000 people nets a total of 14.2 million; almost half the national population⁶².

Also, in 2006, half of all Canadian immigrants settled in Ontario, a number that rises to nearly 70% when Quebec is included⁶³. Nearly all immigrants move to built-up regions, meaning most of that 70% came to live along this same backbone. In Ontario, 28.3% of the population is foreign-born; the highest rate in the country and far above the national average of 19.8%⁶⁴.

Interestingly, by 2030- one year before the end of Places to Grow- it is estimated that in Canada, deaths will begin to outnumber births⁶⁵. This will bring an end to the era of growth by natural increase; an era in Canadian history that began when Canada did. After this time, future growth will come only from what is called a 'migratory increase', or immigration.

By 2056, Canada could be running a natural increase deficit of over 100,000 people per year⁶⁶, which even at the 2007 per capita GDP of \$38,200, would represent an equivalent monetary deficit of nearly 4 billion dollars. Equally worrisome are the projections that by 2056, the migratory increase may not even cover the natural decrease⁶⁷, meaning a gross population loss; a depression.

A natural increase, of course, means more people are being born than dying. A migratory increase generally means an importation of people directly into the work force. These two things, when combined, allow for sustainable growth where the majority of people are of working age, producing a large enough tax base to properly fund their children's education and care for their elderly. Too few births and too few immigrants makes for an aging population inconducive to economic or cultural growth.

The end of the present regional growth plan projections also marks the end of Canada's ability to naturally increase the population. At that time, the region must be positioned to attract talented and creative immigrants from around the world to ensure continued prosperity via economic growth. As such, the Windsor/Quebec corridor must be a truly globally competitive market by this time, offering high GDP, exceptional infrastructure, transit, health care, air quality, cultural and entertainment amenity, employment, overall quality of life, and other factors that separate it from other megaregions looking to attract the same individuals and investments. Otherwise the region, and Canada as a whole, may begin to find itself in decline.

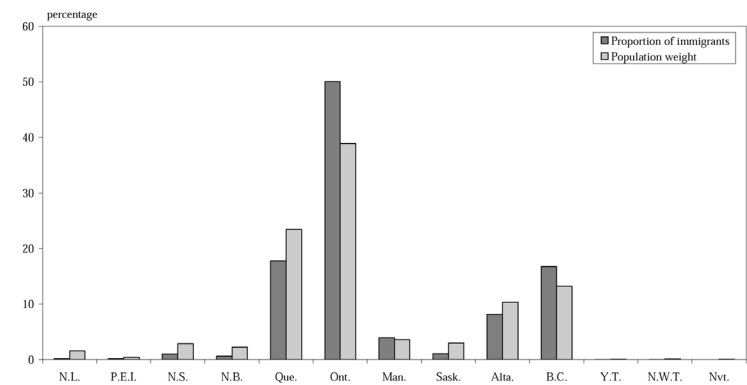
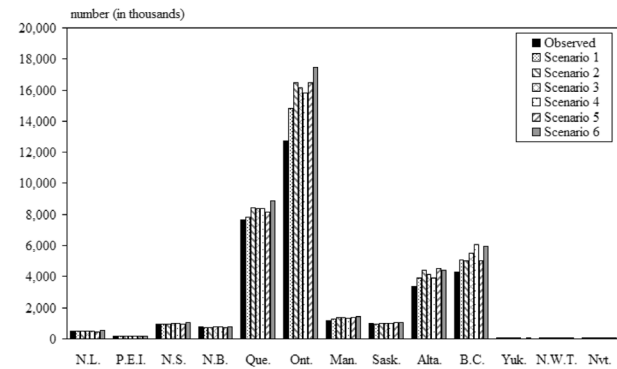
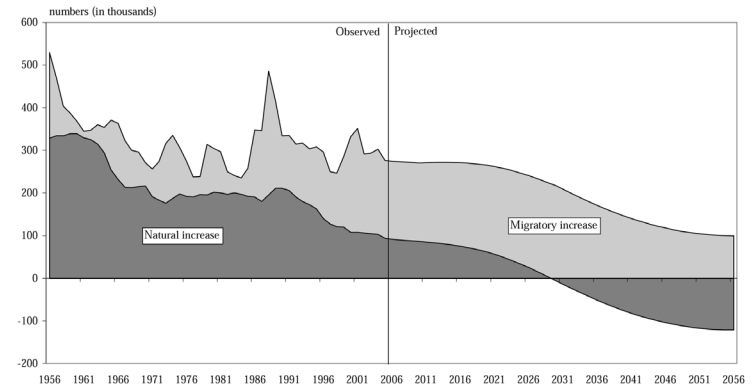


fig 1.22 (top) Canada's declining population growth, natural and migratory.
 fig 1.23 (middle) Population by province according to various projections.
 fig 1.24 (bottom) Distribution of immigrants in 2006.
 Ministry of Industry, 2008.



fig 1.25 (above) A map of southwestern Ontario's road infrastructure. Natural Resources Canada, 2001.

"Traffic, gridlock and congestion on our roads and highways were threatening our economic prosperity and quality of life. There were no strategies for better ways to move either people or goods. Capital investments and maintenance for provincial highways idled behind what was needed, while clogged and inefficient international gateways were costing the provincial economy more than \$5 billion a year. In the GTA, gridlock continued to worsen with commute times likely to increase by as much as 45 per cent by 2031. Approximately 70 per cent of GTA highways were almost at total capacity during rush hours. The regional transportation system was disjointed and dysfunctional. There was no plan to deal with the transportation needs of an additional 3.7 million people expected to settle in the Greater Golden Horseshoe within the next 25 years." - ReNew Ontario⁶⁸.

The Infrastructural Deficit

It can be very difficult to get a clear picture of the health of infrastructural systems. Many figures are inconclusive; for example, it is clear that per capita municipal public spending on infrastructure has been declining within the GGH, but this could be due to the privatization of some operations, or a growing population allowing for a shared cost of some projects over a greater number of people, or simply that more large-scale infrastructural projects are already in place and fewer are needed⁶⁹.

In 1996, a Federation of Canadian Municipalities (FCM) and McGill University study of city officials estimated a national per capita deficit of \$1,484, an increase of \$400 per capita from a similar 1985 study (adjusted for inflation)⁷⁰. The average age of engineering structures, such as streets and highways, has increased from 14.1 years in the early 1970's to 17.5 years in 2004⁷¹. Also, per capita expenditure on infrastructure increased just over 3% from 1988 through 2003, while municipal revenues grew by more than 16% during the same time period⁷². All of this points to a significant under investment in public infrastructure at all levels of government.

Places to Grow itself offers that *'tens of billions of dollars beyond current levels of investment will be required before the situation is back in balance'*⁷³. A 2003 Statistics Canada report on public infrastructure in Canada suggests that *'economic growth has pressed the capacity of Canada's public capital infrastructure, because public capital investment has not kept pace with the growing economy'*⁷⁴. As Canada has grown, its infrastructure has simply not seen enough investment to keep pace.

Statistics Canada also estimates the value of Canada's public infrastructure at \$157 billion, while several studies have estimated a public infrastructure under-investment of between \$60 and \$125 billion⁷⁵. A deficit of \$125 billion would represent a per capita shortage of over \$3700 (it should be noted that the broader umbrella of 'public infrastructure' includes hospitals, schools, and other public buildings in addition to transportation, utilities, etc.).

Clearly, there is a consensus that there does exist a significant infrastructural deficit in Canada, and nowhere is this more critical an issue than the GGH, as trade accounts for over half of Ontario's GDP, 90% of which is shipped to and from the United States⁷⁶. Over \$1.2 trillion worth of goods is transported along the 401 highway annually⁷⁷, and congestion and delays cost the province in excess of \$5 billion per year in lost GDP⁷⁸. For being such a key economic driver, the failure to adequately maintain, upgrade and expand the 401 is inexcusable. As a major commuter route, there are also significant losses of productivity and quality of life caused by delays and congestion which cannot be measured.

Suburban Sprawl

In the GGH, suburban sprawl is a significant contributing factor to this deficit. According to Places to Grow, 'attractive and efficient public transit is difficult to introduce into sprawling communities, and this limits our ability to respond effectively to growing traffic and congestion issues'⁷⁹. Likewise, the plan states that 'new infrastructure is being built to service lower-density areas, while existing infrastructure in the older parts of our communities remains underutilized'⁸⁰.

It is surprising that the plan characterizes existing infrastructural systems as 'underutilized', particularly when recognizing that congestion and gridlock problems are significant. If underutilized in this context really means under-funded and under-maintained- as a direct result of the capital sunk into providing sprawling suburban tracts with new roads and utilities- then perhaps this claim makes more sense.

In this way there appears to be a fairly straightforward correlation contributing to the GGH's infrastructural deficit; suburban sprawl necessitates substantial and very inefficient infrastructural investment to provide for outlying areas. This in turn limits the available funds that can be invested in existing systems in higher density areas where traffic is significantly more congested. Therefore, the roads in established areas are older, in poorer repair and of a lower capacity than they should be, which then causes an increase in delays, congestion and accidents.

Conversely, suburban transit infrastructure is underutilized by default; individual local streets serve too few residents to ever approach capacity. Even during rush hour, there is rarely a buildup of traffic on local streets, as commuters are dispersed as they are removed from higher order transit. The sporadic patterning of the suburban roadscape allows for only

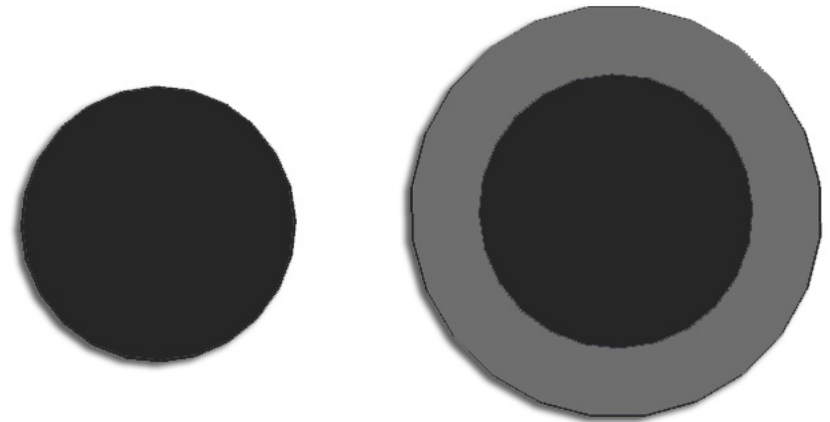


fig 1.26 (above) Increasing the radius of the settlement area by only 1/3 would more than double the total area that needs to be serviced.

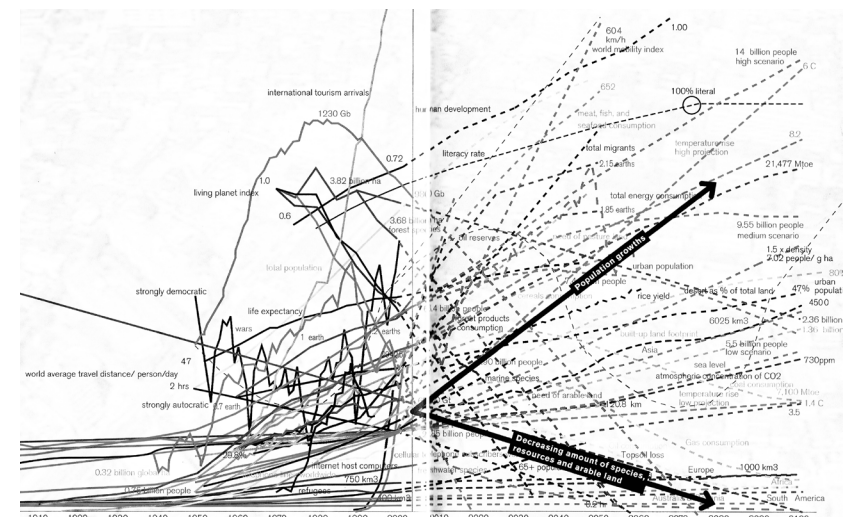
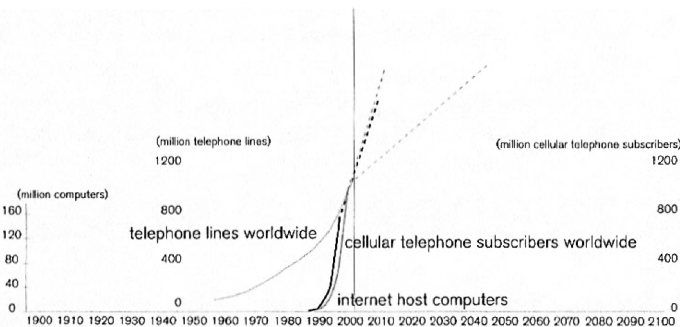
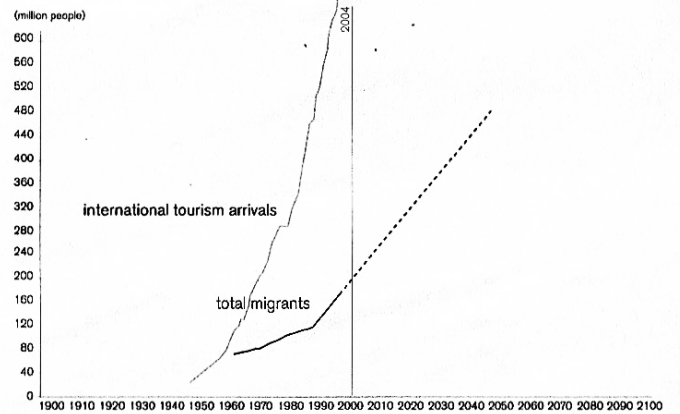
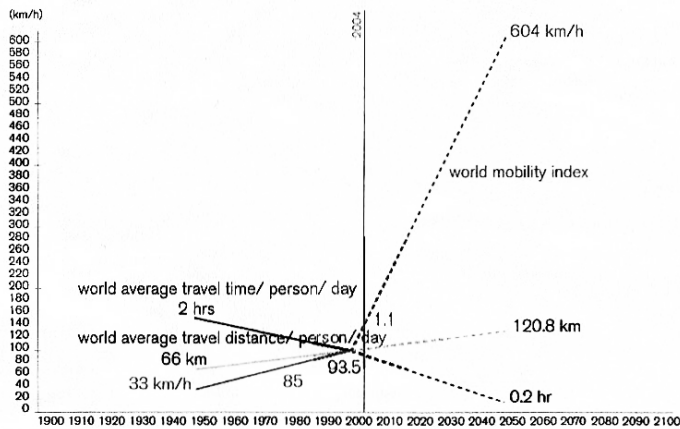


fig 1.27 (above) A graph overlaying several global trends including population growth, energy consumption, literacy, mobility, food production and consumption, etc. MVRDV, KM3: Excursions on Capacity, 2005.



circuitous connectivity; it is a slow, vast and exhaustive door-to-door network that is dumb and inefficient.

As such, the infrastructural systems of the GGH seem to be trending negatively in two directions. One, by accommodating sprawl, the simple act of providing even minimal new systems to an expanding settlement area is increasingly expensive and increasingly less efficient. Two, the escalating costs of providing for new suburbs shrinks the capacity for improvements to existing networks, which are also growing, leading to poorer and less reliable service.

The suburban roads being built in the region at the moment are the same roads that will be barely used in the future, while the highways and arterials that will carry even greater loads are allowed to fill to capacity and decay. Further, if a road 'at capacity' is experiencing delays or even reduced speeds, (as the 401 does, daily) this is unacceptable. The goal must not be a transit system that collapses under its own weight in some areas while going nearly untouched in others, but rather one that is scalable to meet daily fluctuations in traffic while also growing in step with the region as a whole. This cannot be accomplished under the current growth plan, or any plan that allows for continued sprawl and the daily mass importation and exportation of commuter traffic.

"Years of neglect and poor planning have allowed Ontario's public infrastructure to decline, and damaged the delivery of critical public services. Waiting lists in hospitals, rundown schools, and congestion and gridlock on our roads are all visible signs of this neglect. The cost of correcting past under-investment and of building the public facilities we need to accommodate future growth may exceed \$100 billion. Renewed and sustained action is needed now to tackle Ontario's public infrastructure challenge. Given the magnitude of the challenge, Ontario needs both a better way to manage growth and a better way to finance and manage investments in public infrastructure."- Building A Better Tomorrow⁸¹.

fig 1.28 (top) World mobility index.

fig. 1.29 (middle) Migrants and tourists.

fig 1.30 (bottom) Communication and information technology.

MVRDV, KM3: Excursions on Capacity, 2005.

“At the beginning of the third millennium, the world is denser than ever before. It is inhabited by more and more people who consume more, who want to live with more space and more comfort, who can afford to do that, and who can move around more. Such a world seeks space, almost desperately, for extra production, water, energy production, oxygen, ecological compensation, safety, and buffers owing to the increased possibilities for disasters. Everyone wants space.” - KM3 : *Excursions on Capacities*⁸².

The Infrastructural Surplus

The third millennium is an age of global acceleration. The U.S. Census Bureau estimates the global population, as of July 01, 2009, at 6,768,167,712⁸³. World population grew from 3 billion in 1959 to 6 billion in 1999, doubling in only 40 years⁸⁴. While growth is expected to slow, projections anticipate passing the 9 billion mark by 2043⁸⁵.

Canada has an estimated 2009 population of 33,487,208, ranking it the 36th most populous country in the world⁸⁶. According to the 2006 census, the combined population of Ontario and Quebec- the vast majority of which is within reach of the 401 highway corridor- is 19,706,413⁸⁷. If this corridor were a country, it would rank 58th, ahead of the Netherlands, Chile, and many others⁸⁸.

Although urban areas are becoming more dense⁸⁹, a rapidly growing worldwide population still takes up increasingly more space, while consuming more food and energy; both of which have a theoretical limit of production that is rapidly being approached⁹⁰. At the moment, this is not a particularly pressing issue for Canada, which has both agricultural and energy surpluses⁹¹.

At the same time, with only 0.5% of the world’s population, Canada is responsible for nearly 2% of global CO₂ production⁹². The continued exploitation of the Albertan oil sands is likely to make Canada an even bigger player in the global energy business and an even greater polluter. Global energy consumption will continue to escalate as reserves drop, prices will rise, CO₂ emissions will worsen, and there will be a global energy crisis. Canada’s role in this will be substantial, as are its opportunities to begin to right the course toward more sustainable energy production for the future.

If Canada were to take its non-renewable energy revenues and invest them in a major, national (or rather, megaregional) renewable energy initiative, it could maintain its economic position as an energy exporting nation long after its fossil fuel reserves dry up. This could be particularly successful in a region such as the GGH, where a large percentage of Canada’s population resides adjacent to a massive American population of over 100 million people⁹³.

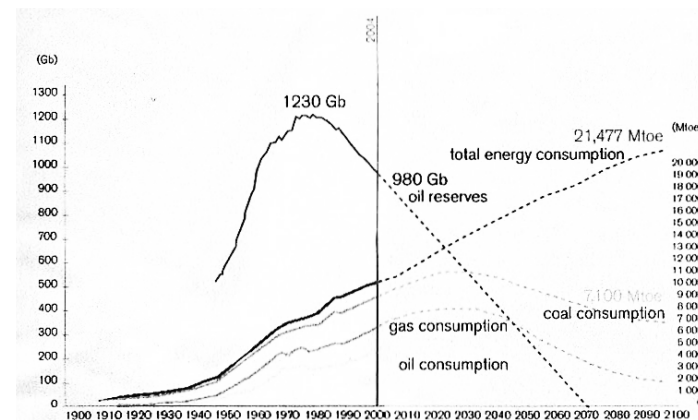


fig 1.31 (above) Total energy consumption, fossil fuel energy consumption, oil supply. MVRDV, KM3: *Excursions on Capacity*, 2005.

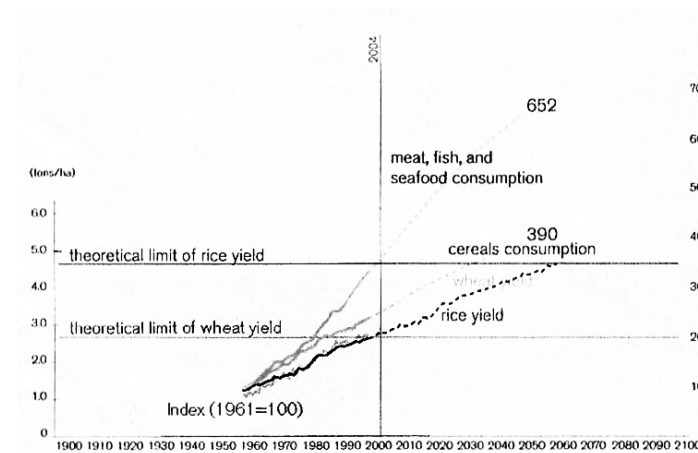


fig 1.32 (above) Food consumption/yield. MVRDV, KM3: *Excursions on Capacity*, 2005.

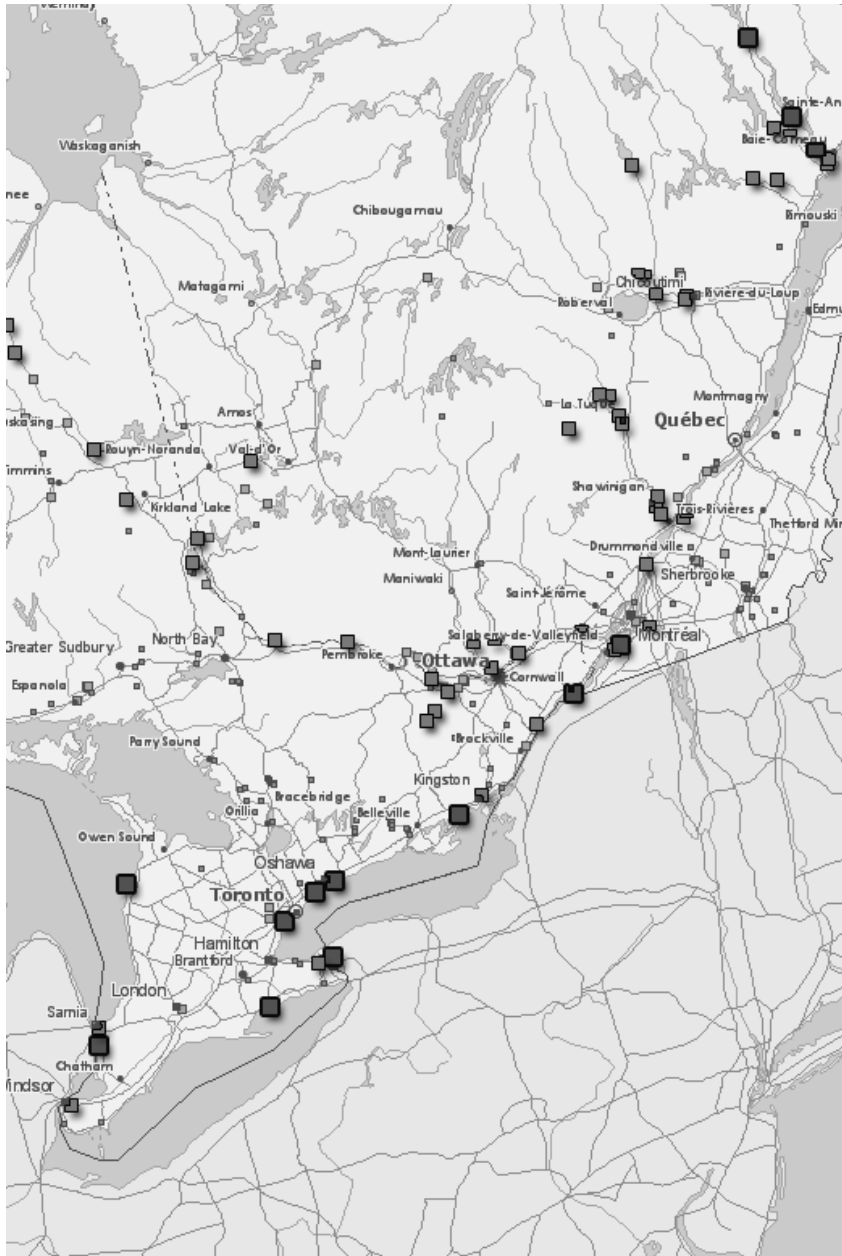


fig 1.33 (above) A map of regional electricity generating stations. Natural Resources Canada, 1997.

Similarly, Canada has an opportunity to increase its global agriculture presence, keep pace with its own growing population, and even promote a greater dependence on local food production. Even within Places to Grow, significant areas of arable land are being built upon. While Canada contains approximately 167 million acres of agricultural land, it is a limited resource⁹⁴. As other parts of the world become wealthier, with better diets consisting of more animal protein, global agricultural systems will be stretched even thinner⁹⁵. Compounding the issue is the rising demand for ethanol, the production of which displaces other crops and ultimately lowers the available food supply⁹⁶.

However, better farming practices and technology have increased yields, with crop production up essentially across the board⁹⁷. New, high-yield, sustainable farming technologies are emerging, and while genetically modified foods are controversial, they are already present in many places and hold the potential to greatly increase global food supplies.

There are substantial farmlands surrounding the GGH and all along the 401 corridor⁹⁸; 25% of Canada's agricultural produce is from the area⁹⁹. Many hundreds of square kilometers of this land will be converted into suburban neighbourhoods in the coming years. But if it were possible to not extend settlement areas onto agricultural lands whatsoever- preserving every acre of farmland in the region- while at the same time seeing yield increases as technologies and methods allow farming to intensify, the GGH could potentially see more of its agricultural needs met locally, even as the population grows. If, as with the earlier energy example, there is a surplus produced, that surplus has an immediate adjacency to a huge American population outfitted with a major shipping infrastructure.

Another regional advantage is that the Great Lakes contain 1/5th of the world's surface fresh water¹⁰⁰. Canada, Ontario, and the GGH therefore all enjoy surpluses in energy, agriculture and fresh water supply. These advantages can either be smartly pressed by a new, sustainable regional growth plan, or existing margins can be diminished by poor systems management and the strain of suburban sprawl. Professor John Beddington, the United Kingdom's Chief Scientific Advisor, predicts that by 2030 there will be a 'perfect storm' for global food, energy and fresh water demand¹⁰¹. At a conference in London, Beddington suggested that demand for food and energy will increase by 50%, with demand for fresh water increasing 30% as the global population grows past 8.3 billion¹⁰². Places to Grow extends through 2031; when/if Beddington's perfect storm hits, will Canada, and more specifically the GGH, have improved its global profile in these three critical areas? Or is unsustainable growth going to eat away at these advantages over time?

Both Canada and the GGH appear to be well positioned to cope with a global crisis of the magnitude Beddington suggests. But there is a clear opportunity for even greater, cleaner and more profitable food, water and energy surpluses at a time when prices are likely to rise dramatically throughout the world. Canada and the GGH will then be positioned to not only reap the benefits of these investments, but also help shoulder the burden of increased global demand in a sustainable, conscientious and competitive manner.

None of this can be accomplished without significant changes to the growth plan that immediately begin the transition to an unremitting program of sustainability through system-wide efficiencies that can only be achieved with a strategic and unwavering commitment to true densification.

This is true for several reasons. Growth is an essential part of the equation. Economic growth is not only important to the long term health of the region¹⁰³, but a growing tax base, accommodated in a drastically more efficient manner, is the only way to avoid the crippling deficits needed to fund the capital cost of implementing the new systems that will alleviate the *existing* infrastructural deficit. Once these systems are in place, the continued efficiency of a highly dense and growing region is what will then allow for the potential production of surpluses, and if successful-- timed to coincide with the end of the Growth Plan in 2031-- would place both Canada and the GGH in a position of great strength within global markets.

Drafting A New Regional Boundary

The growth plan calls for 40% of future growth to take place within built up regions, many of which have significant existing infrastructural problems with regards to congestion and capacity. The other 60% of growth will be directed to Designated Greenfield Areas, which have been demonstrated to require significant resources only to achieve an inefficient result. All of this is happening in a de-centralized region with a boundary that is not particularly advantageous economically and practically demands continued centrifugal sprawl.

Clearly, this strategy is problematic. While the growth plan does appear positioned to mitigate sprawl, it is still perpetuating the planning behaviours that established the infrastructural deficit in the first place. That is, expanding suburban neighbourhoods while at the same time overloading existing systems.

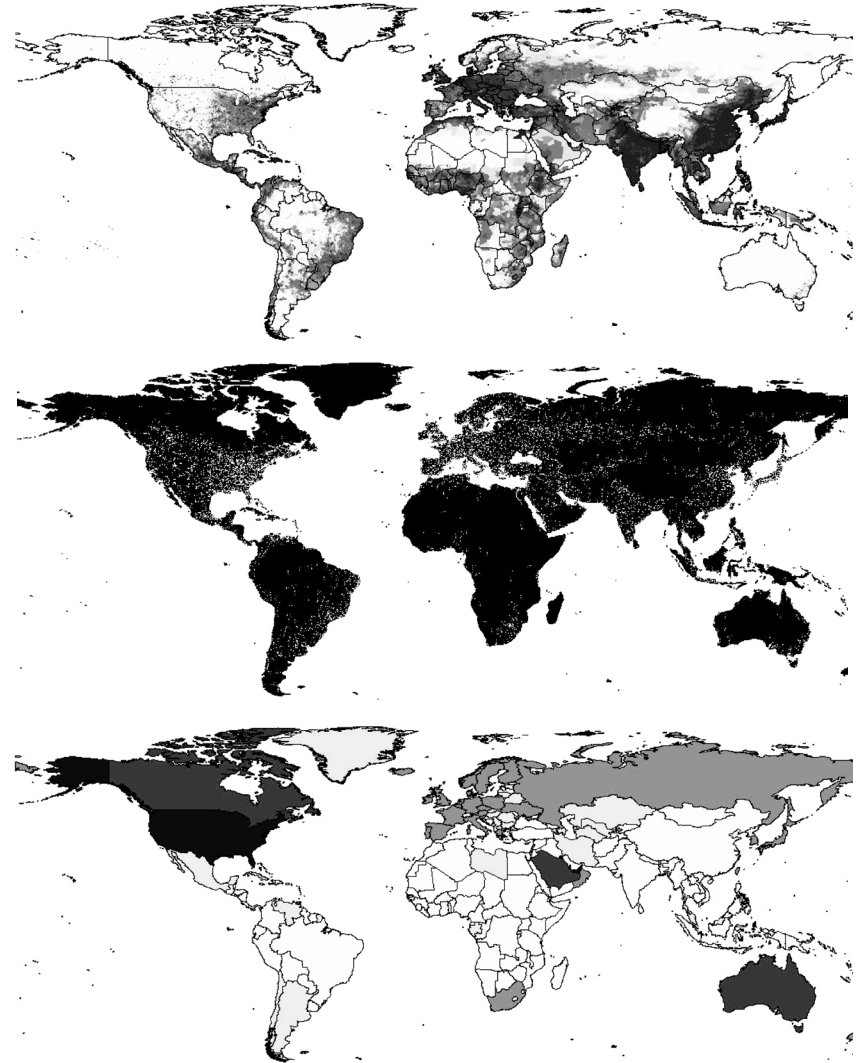


fig 1.34 Map of global population density. As the population grows, densifying but also expanding onto agricultural lands, less farmland will be available to feed more people. That farmland will be located farther away from population centres, requiring more shipping, increasing costs and emissions. Earthtrends.wri.org, 2007.

fig. 1.35 Map of global light patterns. As more areas industrialize around the world, more, cleaner, cheaper power will need to be produced as oil reserves dwindle. Earthtrends.wri.org, 2007.

fig 1.36 Map of global CO₂ emissions. Canada is a major global polluter and an exporter of fossil fuels to other polluting nations. Earthtrends.wri.org, 2007.



If the goal is to be truly relentless about a development strategy for the region-- one that promotes true infrastructural, economic and environmental sustainability as a starting point-- suburban and historical downtown development can no longer be pursued, let alone made focal points for growth. The Greater Golden Horseshoe as presently delineated can no longer be the site for a growth plan in a megaregional global context.

A logical first step would be to narrow and extend the region along the axis of the 401/403 highways, holding development to within a specified linear zone. Doing so stretches the GGH into the Windsor/Quebec corridor, an unbroken high-speed line that is highly connected. This corridor holds the potential to halt sprawl, revolutionize infrastructural efficiency, and direct growth to highly specific and strategic sites at a new level of density.

If a redefined regional boundary holds development tightly to the Windsor/Quebec corridor, an enormous infrastructural burden is lifted. There will be no more need for exhaustive but sparsely populated networks of new roads and sewers. New important public infrastructures-- police, hospitals, fire, schools, etc.-- will no longer need to be so sparsely spaced, underfunded and ineffective.

A corridor that acts not only as a transportation backbone but an infrastructural one-- transit, power, information, water, etc. all condensed to one incredibly bandwidth intensive line-- is an efficient solution to the region's infrastructural network going forward. It falls into neither trap of overloading existing urban infrastructures nor permitting unsustainable sprawl, instead placing an enormous amount of pressure on a single, key artery; the 401. If the 401 is left untouched, this is a potentially disastrous solution. However, if properly invested in, the Windsor/Quebec corridor has the potential to thrive as a truly sustainable example of high-tech, linearly distributed urbanism.



"What counts is a city's trajectory of development rather than its form. If a city simply grows radially outward from its centre, as usually happens, pressure increases on the centre until the organism collapses. "Surgery" on the "heart," like feeding new "arteries" as highways into the core, will only speed up its death... a city should grow in one direction.

"Buildings are but "shells" for movement patterns that reach out far beyond them. Whereas buildings house function, networks are pure function, function without shell. If modern architects are serious in their commitment to function, they will have to reduce their fixation on shells and become responsible for networks." - Mark Wigley, Network Fever¹⁰⁴.

fig 1.37 (top) A map of southwestern Ontario with the Greater Golden Horseshoe highlighted. Ontario Ministry of Public Infrastructure Renewal, 2006.

fig 1.37 (above) The Windsor/Quebec Corridor.

Sources:

1. *A Guide to the Growth Plan* (2006, 4).
 2. *Places to Grow* (2006, 12).
 3. *A Guide to the Growth Plan* (2006, 4).
 4. The Greater Golden Horseshoe (GGH) is a region of Ontario, Canada centred around the sprawling metropolitan urban fabric composed of the Greater Toronto Area and Hamilton, the epicentre of which is the city of Toronto. It is a collection of counties, regions and cities wrapped around the western edge of Lake Ontario, connected by the 400 series highways and divided by the Greenbelt Area*. This results in a rather loose affiliation of some fairly disparate areas; from the exhaustively rural Haldimand county to the tri-cities of Waterloo region to the cosmopolitan centre of Toronto. It also presents some curious omissions; Oxford, Middlesex and Essex counties, for example, would seem to present more growth opportunity than Northumberland or Peterborough counties, among others. This is a somewhat curious collection from which to form a growth plan.
- *The Greenbelt area, in accordance with Ontario Regulation 59/05 is a designated area that includes the Oak Ridges Moraine area and the Niagara Escarpment Plan area, and is also inclusive of the 2005 "Plan of the Boundary of the Protected Countryside". Greenbelt Act, 2005. http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_050059_e.htm Accessed 01 July 2009.
5. *Places to Grow* (2006, 7).
 6. *Places to Grow* (2006, 6).
 7. *America2050 Prospectus* (2006, 4).
 8. *America2050 Prospectus* (2006, 4).
 9. Boston-New York-Philadelphia-Baltimore-Washington, a nearly unbroken urban corridor that is known as "Boswash" was the first megaregion to be identified as such, by Jean Gottmann in the 1950's. Other global megaregions that have emerged since are identified in fig. 1.13. Content (2004, 95).
 10. *Florida* (2007, XIV).
 11. *America 2050 predicts that by mid-century, over 70% of the nation's economic and population growth will take place within its megaregions.* *America 2050 Prospectus* (2006, 4).
 12. *Florida* (2007, XXV).
 13. *Richard Florida identifies this talent as the Creative Class, and puts their number at 150 million.* *Florida* (2007, XXV).
 14. *America2050 Infrastructure* (2006, 11).
 15. *America2050 Infrastructure* (2006, 11).
 16. The next closest region, called the Southern California region, came in at less than half of that with just over 1 trillion in GDP (however, combine Southern California and Northern California into what AMO identifies as "SANSAN" and that number improves to approximately 1.6 trillion. On the other hand, AMO doesn't differentiate between the Great Lakes and Northeast megaregions either, which would make for a combined 4.7 trillion). *America2050 Infrastructure* (2006, 11).
 17. *America2050 Infrastructure* (2006, 11).
 18. Note that either of these figures is significantly higher than the entire population of Canada, and when combined, account for more than triple Canada's population within a landmass that would easily fit inside just Ontario, including the space between the two megaregions.
 19. *America2050 Infrastructure* (2006, 11).
 20. *ibid.*
 21. *ibid.*
 22. *America 2050 Prospectus* (2006, 11).

23. *ibid.*

24. Or, as is the case with many of the Asian 'Special Economic Zones', the existing urban form at the time of its re-designation is essentially considered inconsequential and wholesale redevelopments can take place. Only in the Ontario section of the Great Lakes Megaregions does there exist a fully developed, urbanized region that remains infrastructurally abstract enough to test new megaregional planning principles without having to displace any existing inhabitants.
25. Eventually, the Northeast and Great Lakes megaregions will merge to form one great ultra-region (or whatever you want to call it, but it will likely be among the world's two or three wealthiest, largest and most powerful), and after a time there may form a global economic singularity consisting of western Europe, the entire eastern portion of North America, the entire western portion of North America and the Pacific Rim.
26. Hyperthreading is "A high-performance (computing) architecture that simulates some degree of overlap in executing two or more independent sets of instructions. <http://www.answers.com/topic/hyper-threading>
27. *America2050 Infrastructure* (2006, 10).
28. There have been a number of national infrastructure initiatives in the United States dating back to the early 19th century. *America 2050 Infrastructure* (2006, 6).
29. *A Guide to the Growth Plan* (2006, 4).
30. *America2050 Prospectus* (2006, 4).
31. *Places to Grow* defines 'complete communities' as follows: "Complete communities meet people's needs for daily living throughout an entire lifetime by providing convenient access to an appropriate mix of jobs, local services, a full range of housing, and community infrastructure including affordable housing, schools, recreation and open space for their residents. Convenient access to public transportation and options for safe, non-motorized travel is also provided. *Places to Grow* (2006, 41).
32. Quebec is not normally considered to be a part of the Great Lakes Megaregion, however, as part of the Windsor/Quebec corridor, both Montreal and Quebec City are integral parts of the region as defined later in this thesis.
33. *Places to Grow* (2006, 9).
34. *Places to Grow* (2006, 14).
35. *Quick Reference Guide for the GGH* (2008, 1)
36. *Quick Reference Guide for the GGH* (2008, 1)
37. *Places to Grow* (2006, 15).
38. The *Growth Plan* actually identifies the Minister of Public Infrastructure Renewal as the body responsible for the built boundary, however, since the growth plan has been published, the Ministry of Public Infrastructure Renewal has been merged with the Ministry of Energy to form the Ministry of Energy and Infrastructure. The current Minister of Energy and Infrastructure is George Smitherman, formerly the Minister of Health.
39. The 'outer ring' is defined as 'the geographic area consisting of the cities of Barrie, Brantford, Guelph, Kawartha Lakes, Orillia and Peterborough; the counties of Brant, Dufferin, Haldimand, Northumberland, Peterborough, Simcoe, and Wellington; and the regions of Niagara and Waterloo.' *Places to Grow* (2006, 45). This is basically a designation for any community on the far side of the Greenbelt Area.
40. *Places to Grow* (2006, 15).
41. *Quick Reference Guide for the GGH* (2008, 1).
42. *ibid.*
43. *A Guide to the Growth Plan* (2006, 11).
44. *Places to Grow* (2006, 41), (Provincial Policy Statement, 2005).
45. *Places to Grow* (2006, 43).

46. Thun (2009, 202) In the essay "The Post-Carbon Highway", RVTR suggests occupation of highway interchanges along the 401.
47. Old industrial and commercial buildings, particularly those not downtown (as many of those have already been redeveloped) are often adjacent to regional highway and rail lines.
48. Places to Grow (2006, 41).
49. Places to Grow (2006, 46).
50. Quick Reference Guide for the GGH (2008, 1).
51. This does not include protected areas such as wetlands or wildlife habitats, meaning density will not need to be higher in developed areas to compensate. Places to Grow (2006, 19).
52. Places to Grow (2006, 20).
53. Manhattan Info- History, Office of Manhattan Borough (2006, http://www.mbpo.org/free_details.asp?id=75)
54. Places to Grow (2006, 20).
55. Specialty crops are crops such as peaches, cherries, plums, grapes, other fruit crops, vegetable crops, greenhouse crops, and crops from agriculturally developed organic soil lands . Places to Grow (2006, 47).
56. http://en.wikipedia.org/wiki/List_of_the_100_largest_metropolitan_areas_in_Canada
57. *ibid.*
58. Places to Grow (2006, 12).
59. Statistics Canada, 2001 Census. <http://www12.statcan.ca/english/census01/products/standard/pop-dwell/Table-PR.cfm>
60. Canadian Demographics at a Glance (2008, 41).
61. Statistics Canada, 2006 Census. <http://www12.statcan.ca/english/census06/data/>
62. http://en.wikipedia.org/wiki/List_of_the_100_largest_metropolitan_areas_in_Canada
63. Canadian Demographics at a Glance (2008, 44).
64. Keep in mind that it is Ontario's size that is significantly propping up the national average in the first place; the actual discrepancy between Ontario's foreign born population and the rest of the country's is larger than it appears. Canadian Demographics at a Glance (2008, 45).
65. Canadian Demographics at a Glance (2008, 5).
66. *ibid.*
67. *ibid.*
68. ReNew Ontario Progress Report (2007, 10).
69. Mintz (2004, 3).
70. Mintz (2004, 1).
71. Mintz (2004, 2).
72. Mintz (2004, 2).
73. Places to Grow (2006, 8).
74. Harchaoui, et al. (2003, 1).
75. City of Ottawa LRFP (2006, 5).
76. Places to Grow (2006, 7).
77. Thun (2009, 172)
78. Places to Grow (2006, 7).
79. Places to Grow (2006, 8).
80. *ibid.*
81. Building A Better Tomorrow (2004, 8).
82. MVRDV (2005, 18).
83. U.S. Census Bureau (2009, <http://www.census.gov/ipc/www/popclockworld.html>).
84. U.S. Census Bureau (2009, <http://www.census.gov/ipc/www/idb/worldpopgraph.php>).
85. *ibid.*
86. U.S Census Bureau (2009, <http://www.census.gov/ipc/www/idb/ranks.php>).
87. Statistics Canada (2008, <http://www12.statcan.gc.ca/census-recensement/2006/dp-pd/hlt/97-550/Index.cfm?TPL=P1C&Page=RETR&LANG=Eng&T=101>)
88. U.S Census Bureau (2009, <http://www.census.gov/ipc/www/idb/ranks.php>).
89. MVRDV (2005, 27).
90. *ibid.*
91. Canada had a 2005 total agricultural surplus of \$5,241,754: Statistics Canada (2009, <http://www.statcan.gc.ca/pub/96-325-x/2007000/t/6000066-eng.htm>).
- Canada is also a net energy exporter, with 1997 energy imports of 59,098,000 metric tons of oil equivalent against exports of 180,771,000 (with a total 2000 energy production of 374,864,000): *Canada - Energy and Resources - Country Profile* (<http://earthtrends.wri.org/text/energy-resources/country-profile-33.html>) Likewise, as of 2004, Canada had the world's second largest oil reserves at 178.9 billion barrels, 97.5% of which is contained in the Alberta oil sands: *Canadian Energy Exports* (<http://www.itintl.com/canadian-energy-exports.html>).
92. *Canadian Energy Exports* (<http://www.itintl.com/canadian-energy-exports.html>).
93. *America 2050 estimates the population of the American Great Lakes megaregion at 53,768,125 and the Northeast megaregion at 49,563,296 (2000 data), America 2050: An Infrastructure Vision for 21st Century America* (2008, 11).
94. *Statistics Canada Agriculture Overview* (2008, http://www41.statcan.ca/2008/0920/ceb0920_000_e.htm).
95. *ibid.*
96. *ibid.*
97. *Statistics Canada - Production of Principle Field Crops* (2008, <http://www.statcan.gc.ca/daily-quotidien/081002/dq081002a-eng.htm>)
98. Ontario, as of 2006, had nearly 4 million pigs, 2 million cows, 44 million chickens, and 9 million acres of croplands. *Ontario Farm Data, Census of Agriculture, 2006.* <http://www.omafra.gov.on.ca/english/stats/census/summary.htm> Accessed 14- November 2009.
99. Shnier (2009, 38).
100. *Great Lakes Information Network* (2009, <http://www.great-lakes.net/lakes/>)
101. *BBC News : Global Crisis to Strike by 2030* (2009, http://news.bbc.co.uk/2/hi/uk_news/7951838.stm).
102. *ibid.*
103. *A Guide to the Growth Plan* (2006, 3).
104. Wigley (2001, 88).

"My suggestion is that you stop thinking about the city and the suburbs and the exurbs and the rural areas as separate entities and you really consider them as united ecosystems." - Michael McDonough¹

The Windsor/Quebec Corridor

The Line

The Windsor/Quebec corridor and its associated metropolitan areas are clearly the key drivers of the Canadian economy. This corridor runs over 1000 kilometers, with concentrations of development in southwestern Ontario, particularly the Greater Golden Horseshoe, and the Montreal/Laval metropolitan area. Its population is held together in such a tightly linear fashion by the 820 kilometers of the 401 freeway². This delineative, iconographic stretch of road is North America's busiest highway, with peak daily traffic loads nearing half a million vehicles³. It transports over \$1.2 trillion worth of goods each year⁴, \$900 million of which crosses the U.S./Canada border daily⁵. It connects a majority of the Canadian population, including 16 metropolitan areas with populations of 100,000 or more⁶. There are 30 public universities located along the corridor⁷, and as seen previously in figures 1.19-1.21, there is a direct correlation between proximity to the 401 and population density, high wages, and post-secondary education.

The line is an infrastructural and urban phenomenon that is unlike the more thoroughly connected American Interstate system; one that has deeply effected the lifestyle of the public and one which has shaped the industrial and urban morphology that surround it⁸. It is a network that is long, fast, typologically refined and highly connective. And yet, it is underfunded, under performing and underutilized by the very region that depends so heavily on it. The line should be viewed not just as a highway, but as an infrastructural backbone and a framework from which to launch future growth.



fig 2.1 (above) A simplified map of the Windsor/Quebec City corridor with the 401 and 403 highways.

fig 2.2 (below) The highway network around the Greater Toronto Area.



The 401

Work began on the 401 in 1936 to replace the existing, overloaded highway 2⁹. It stopped with the outbreak of World War II in 1939¹⁰, which was fortuitous for the Ontario Department of Highways for a number of reasons. The layoff gave the DHO time to conduct several studies, including a survey of 375,000 drivers which helped determine the highway's route¹¹. The DHO was also able to assess the Queen Elizabeth Way, which had been converted to a dual-lane highway modeled on the German Autobahn, and improve on its deficiencies¹². Finally, numerous technological advances made during the war were available for the design and construction phases of the 401, making it significantly more advanced than it would otherwise have been¹³.

The survey of motorists was particularly interesting in that it resulted in a 'desire line'¹⁴ that averaged itself away from the downtowns of specific municipalities, bypassing most built-up areas while establishing a route that was the most connective for the greatest number of people in the region. Rather than connect one city to another, encircling each metropolitan area before moving on, the 401 tangentially skirts the edge of its connected municipalities, downloading motorists onto lower-order transit to reach the various downtowns. This is especially significant in Toronto, as the 401 was built far enough away from the city core that it has had room to expand through its most critical stretch. Where possible, a 300 foot right-of-way was left to allow for expansion, a provision which has allowed the 401 to grow as the region has, eliminating the need for other major highways to be built in other locations^{15,16}. By being wide, relatively straight¹⁷ and bypassing downtowns, the 401 was designed for speed, safety and convenience.

The 401 aided and accelerated post-war decentralization as it allowed the industrial and manufacturing sectors a cheap and easily accessible shipping infrastructure away from expensive and congested downtowns. It also made possible the vast suburban sprawl that currently characterizes the region, as dispersed motorists could still conveniently commute to the downtown. As much as the 401 accommodated urban de-centralization, it has had something of the opposite effect at the regional level; it has clustered development at this larger scale as people, business and industry have needed to remain close to it.

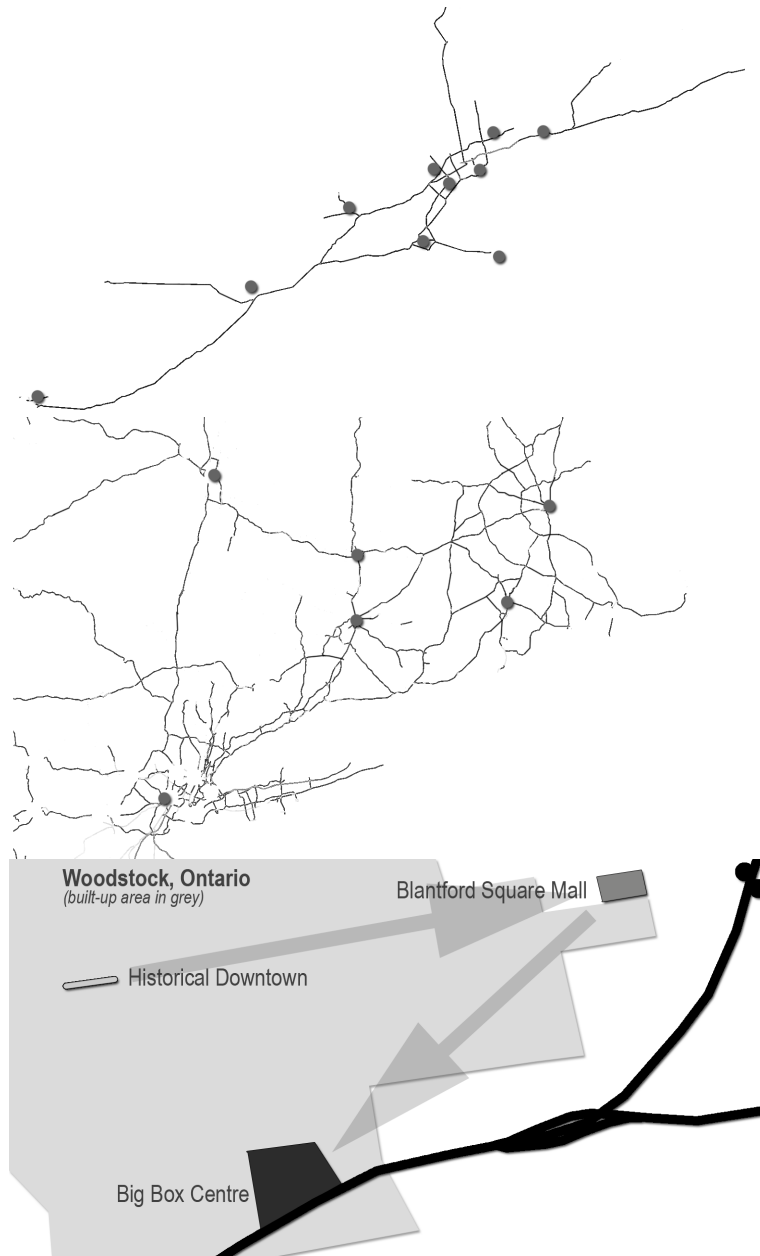
In a more evenly distributed web of higher order transit as exists in the American interstate system, the potential for megaregional sprawl is nearly limitless. This can be seen to a lesser degree in the Greater Toronto Area, where the highway network expands¹⁸, giving way to the Greater Golden Horseshoe's vast suburban landscapes of Mississauga, Brampton, Vaughan, Richmond Hill, Markham, Pickering, and others.



fig 2.3 (above) The Canadian highway system. Natural Resources Canada, 2001.



fig 2.4 (above) The American interstate highway system plan. National System of Interstate and Defense Highways, 1955.



In contrast to the 401's existence as an almost autonomous regional backbone, the American interstate highway system forms a more traditional network of nodes and connective tissue, directly linking large metropolitan areas to one another as shown in *fig 2.4* and *fig 2.6*. There is a gravitational pull from major city centres that densifies the highway network as it approaches the downtown, sometimes causing that network to orbit the city and its surrounding neighbourhoods, as clearly seen in the case of Boston in the upper right of *fig 2.6*.

Rather than being pulled toward its various centres, however, the 401 exerts an opposite force, hovering between downtowns while pulling urban and suburban development toward it. It purposefully negotiates the space between nodes and as such never gives itself over to local urban infrastructures; it is truly a regionally scaled phenomenon. This effect is particularly evident in industrial and retail development, with the progression of retail development over the past half-century particularly easy to track.

A specific example of this is Woodstock, a city of approximately 35,000 people located southwest of Toronto, where the 403 splits from the 401. Woodstock was one of the sites where work first began on the 401 in 1936¹⁹, and saw its downtown retail struggle after the opening of Blantford Square, a small regional mall located at the east end of the city less than a kilometer away from the 401. Over time, Blantford Square began to struggle and was eventually abandoned and torn down as Woodstock's retail centre shifted again to a big box development south of the downtown with an immediate adjacency to the 401²⁰.

This kind of migration toward the 401 is common, and while the highway infrastructure does scatter somewhat as it crosses the Ontario/Quebec border into Montreal, the corridor remains linear and relatively consistent throughout its entire length, widening where growth dictates an increased capacity and narrowing to a minimum of 4 lanes through its long rural stretches.

The promise held by the 401 is remarkable, but in reality the situation is far from ideal. Congestion and delays are a daily occurrence, primarily due to the convergence of a sprawling commuter base. Accidents caused by bad weather and inexperienced and distracted drivers cause further delays and can be fatal. There is constant wear on the 401 from its astronomically high usage, and yearly maintenance and improvement projects cause lane closures, further congestion, and more delays.

*fig 2.5 (top) The highway structure of the Windsor/Quebec corridor.
fig 2.6 (middle) The highway structure of the Northeast megaregion.
fig 2.7 (bottom) A diagram of the retail migration over time of Woodstock, Ontario.*

The 401 is particularly susceptible to the above because it is so heavily relied upon and no adequate secondary network exists, but also because it is a uni-modal system. Efficiency is lost whenever a lane is closed or road conditions are poor, because there is no alternative way to move traffic along the network. Drivers who are unfit or unqualified to safely operate their vehicle on the 401 do so anyway as there is no real alternative. The 401, while conceptually brilliant, is also prone to and especially hindered by human/user error.

The Multi-Modal Network

Places to Grow calls for a ‘multi-modal’ transit system for the Greater Golden Horseshoe, defined as “the availability or use of more than one form of transportation, such as automobiles, walking, cycling, buses, rapid transit, rail (such as commuter and freight), trucks, air and marine”²¹. The growth plan prioritizes public transit for “infrastructure planning and major transportation investments”²² that will shape growth at higher, transit-supportive densities while improving “linkages from nearby neighbourhoods to urban growth centres, major transit station areas and other intensification areas”²³.

The region, and the Greater Toronto Area specifically, is already extensively multi-modal; it just isn’t effectively or efficiently planned and operated. Toronto has multiple subway lines linking the city, there are the regional GO trains connecting the suburbs, and there are Via passenger rail lines connecting historical downtowns. There are regional, national and international airports; there are city, regional and inter-regional buses. There are provincial highways, regional highways, arterial roads, surface roads, expressways, collectors and local streets, occasionally with bicycle lanes. There are street cars and other local transit options in downtown Toronto, and a multitude of shipping and freight infrastructures that extend the network well beyond public transportation.

The region is clearly not lacking for options. The real problem is that these systems are generally semi-independent of one another, connecting discreet pieces of the region with no overall vision for successful multi-modal operation. Because of a combination of sprawl and high personal vehicle ownership²⁴ no public transit option on its own is nearly extensive enough to be relied on by most users, and the current distribution of modes makes multi-modal use too inconvenient, cumbersome and costly. Only in downtown Toronto and Montreal can public transit reasonably be expected to satisfy the needs of residents. Elsewhere, private vehicle ownership is nearly mandatory, and once that investment is made, there is little reason to use public transit, even in situations where it might otherwise make sense to do so.

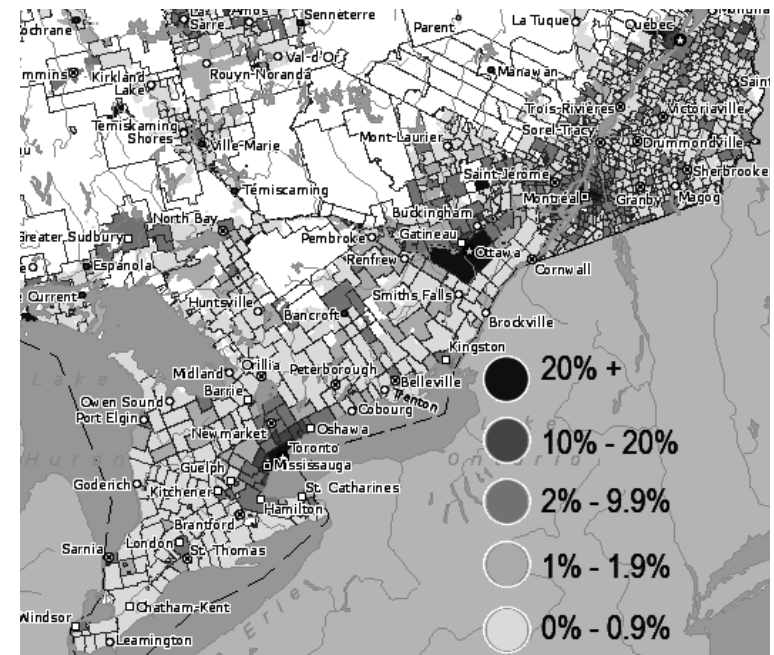


fig 2.8 (above) A map showing the percentage of people who take public transit to work. Only in downtown Toronto, Ottawa and Montreal is ridership above 20%, with nearly all other areas falling below 10%. Statistics Canada, 2006 Census.

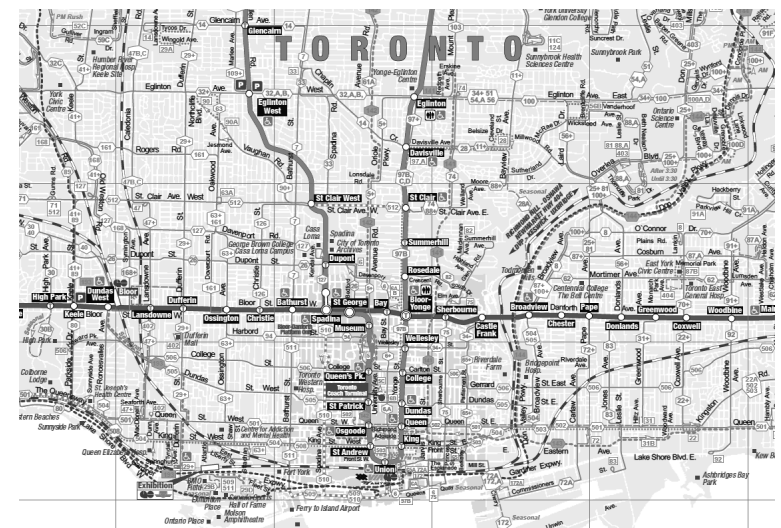


fig 2.9 (above) Toronto’s multi-modal transit system. TTC System Map, 2009.

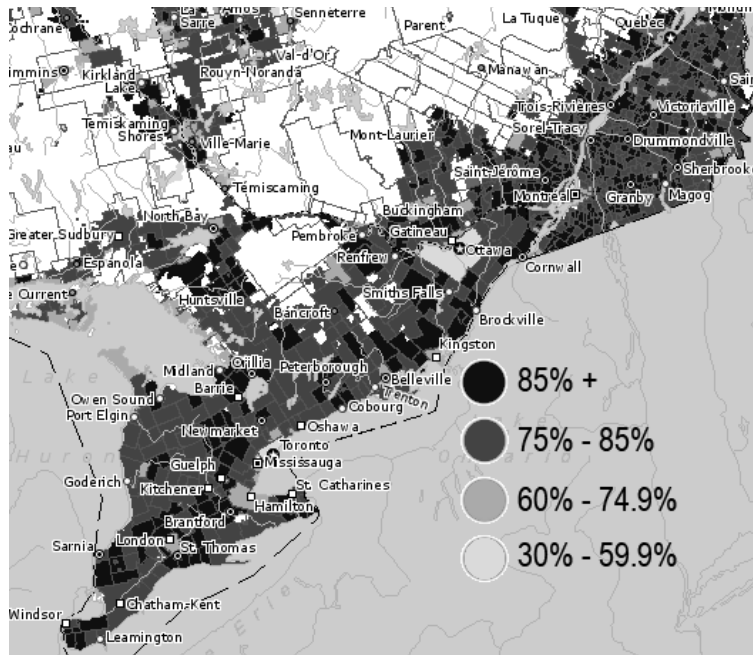


fig 2.10 (above) A map showing the percentage of people who drive to work, not including passengers or carpools (driver only). Once again, only in the major downtowns is this percentage below even 60%. Statistics Canada, 2006 Census.

New transit infrastructure seems to be largely reactionary; modes are patched in after development has already begun. The fact that new LRT lines are just now being implemented to connect many suburban neighbourhoods, and more importantly, Pearson International Airport, is a testament to this²⁵. While these lines are welcome and the City of Toronto claims that by 2021 there will be 120 km of service with over 175 million annual riders²⁶, the system is incredibly slow, averaging only 22 km/h²⁷. This means that a trip from the airport to downtown Toronto will still average more than an hour, even under the best conditions²⁸. A typical daily commute is likely to take longer by LRT than by car unless both the departure point and destination are located on the same line, despite the LRT having its own right-of-way²⁹.

A truly effective multi-modal transit network needs to have one goal; to be faster, safer, cheaper and more convenient than private vehicle ownership. Nowhere in the GGH or the Windsor/Quebec corridor is this the case, with the possible exceptions of downtown Toronto and Montreal. In a region as dependent on the car as this³⁰, weaning a substantial percentage of the public onto a subsistence-level reliance on public transit cannot be accomplished unless that public transit is legitimately superior. While the current plan may be to compliment private vehicle use with a public option, this is self-defeating to a degree. As the automotive industry continues to struggle, fuel prices continue to rise and greenhouse gases continue to proliferate, there must be a public transit infrastructure that is a capable substitute for the car.

“Let’s say your departure point is downtown Brampton. You either walk to the downtown transit terminal, or, if you live far enough away from the station, you might take one or two buses to get to that station.

“Let’s say your destination is somewhere around the Scarborough Town Centre, near Markham Rd. and the 401. So you start your journey at the GO platform, and catch a bus there, because the train only services the Georgetown-Union line in one direction (Eastbound in the morning, Westbound at night.)

“You catch a GO bus. If you are lucky enough to catch the express, it will take about 45 minutes to get to York Mills, if you have to take a local GO bus, it takes over an hour, give or take, especially in peak traffic.

“You have to get off that bus at York Mills, and catch another GO bus to Scarborough Town Centre. You get off there, and let’s say you have to get over to Markham Rd. You’d hop on a TTC bus (paying for a new fare,) and ride that for about 20 minutes, through congested arterials until you get to your destination. When everything is said and done, you would have paid for three different transit fares, spent about \$13, and it would have taken you upwards of 2.5 hours of travel time.” - Aaron de Boer, Sr. Planning Tech, The Corp. of the City of Brampton³¹

Bandwidth

The GGH's transit network is multi-modal, but not truly multi-purpose. Each line is specifically useful and connective, but the network as a whole is severely lacking in bandwidth. Bandwidth is a computing term that simply means transmission capacity³², and can be applied in a number of ways when looking at infrastructural systems. It refers not only to the overall speed at which content travels, but also the tolerance within the system to circumvent congestion, delays and outages via redundancies and multiple modes of transmission.

The GGH's network is slow. While the proposed LRT is set to average 22 km/h as it travels along surface roads with its own right-of-way, the existing Toronto subway system only manages to average 30 km/h despite being completely autonomous³³. Passenger rail is hampered by having to slow down immensely as it passes through historic downtowns, and most other modes operate on the same roads as private vehicular traffic; it is therefore not capable of being faster than one's car.

The network is also poorly connected. This is not a fault of the transit lines themselves, but rather an issue of suburban sprawl. It is impossible for public transit to exhaustively connect low density neighbourhoods. Therefore, as long as sprawl continues in the GGH (with 2.2 million new suburban residents in the region by 2031) the existing network cannot be nearly as connective, and therefore nearly as convenient, as the private automobile.

This is a problem that extends beyond the question of transit. As seen in *fig. 1.33*, power generating stations are also scattered throughout the province, with over 29,000 kilometers of high-voltage transmission lines in Ontario³⁴. Electricity is often shipped over great distances, resulting in what is known as 'line loss'³⁵. Line loss is caused by resistance in the transmission lines, which heat up and consume power as electricity passes through them. The further electricity needs to be shipped, the more efficiency is lost in this way, and those losses are costs that are passed down to the consumer³⁶.

A similar problem exists with Canada's information networks, which, despite being among the world's best less than a decade ago, have failed to keep up with other countries³⁷. A 2008 report measuring broadband penetration, speed and reliability ranked Canada 28th out of the 42 nations studied³⁸. Canadian internet speeds are several times slower than top ranking countries such as Japan and Korea, and fall below the international average³⁹. Likewise, Canada's internet is among the world's most expensive, and its providers impose bandwidth limits, a practice which can cripple online business growth⁴⁰.

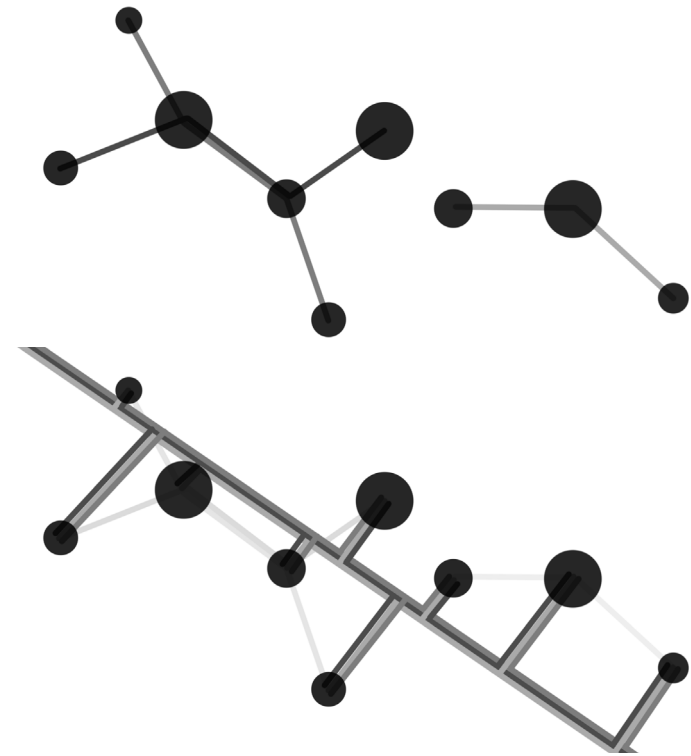


fig 2.11 (above) A diagram representing two multi-modal transit systems; one with poor bandwidth and sporadic connectivity (existing GTA transit) the other showing the high bandwidth and greater speeds of a connected backbone (a multi-modal 401).

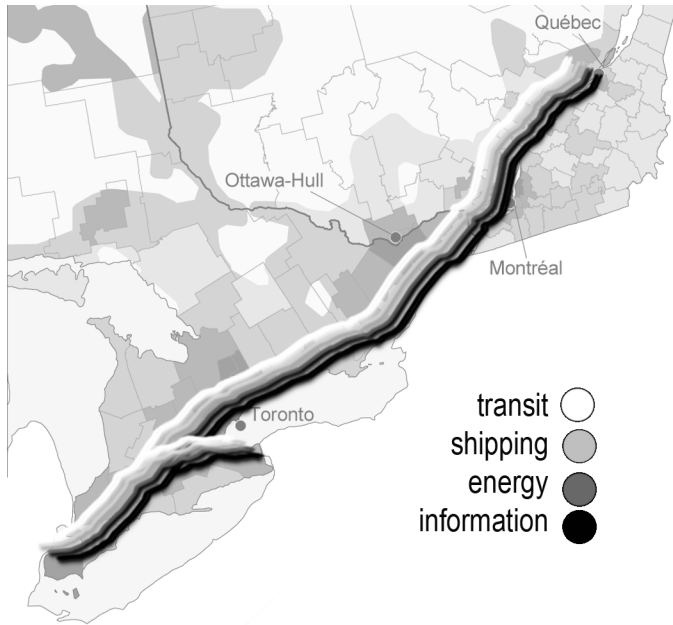
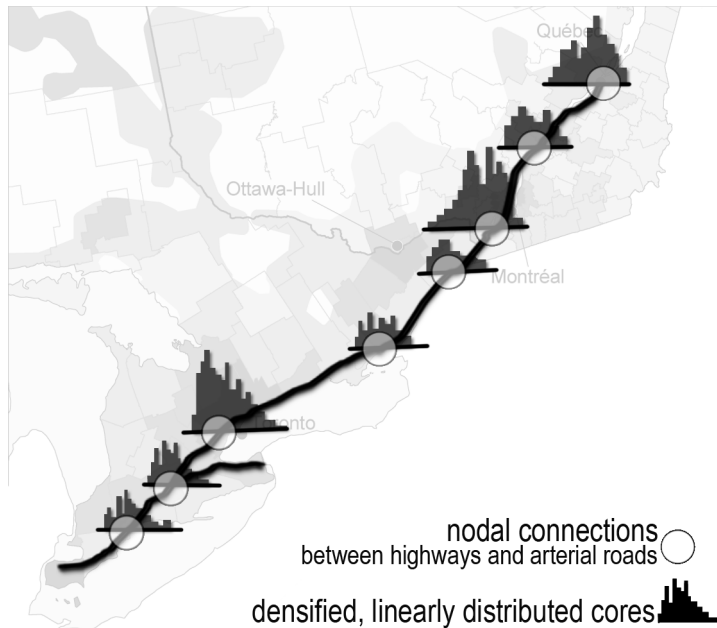


fig 2.12 (above) A diagram of the 401 as a multi-modal backbone, layering infrastructural systems in a linearly distributed manner.

fig 2.13 (below) A diagram of a potential strategy for 'last mile urbanism'; locating dense urban centres directly on the backbone network, linearly distributed.



The economic importance of globally competitive broadband networks cannot be overstated. Beginning July 2010, every person in Finland will have the guaranteed legal right to a 1 megabit broadband connection, with a goal of a 100 megabit connection for all by 2015⁴¹. Australia, which has performed dismally in such studies in the past, announced in April 2009 a \$30 billion dollar national broadband initiative⁴². The Australian stimulus is the largest infrastructure project in the country's history, and is expected to play a critical role in reviving the national economy⁴³. In contrast, of Canada's \$43.6 billion stimulus, only \$225 million will be invested in broadband⁴⁴. This is less than 1% of the Australian commitment for a country with 12.2 million more inhabitants⁴⁵. Canada's decreasing stature in such an increasingly important infrastructure is unacceptable. The failure to properly invest in information networks is short sighted and uncompetitive, as other regions race to be the fastest in the world.

These three critical infrastructures- transit, energy and information- all suffer from a similar problem in the Windsor/Quebec corridor; they cannot efficiently and affordably serve a continually sprawling population. These networks lose their speed due to low bandwidths at their various points of delivery. A new approach is needed.

"Doxiadis never tired of insisting that the real dimension of cities is not space, but time. What counts is a city's trajectory of development, rather than its form. If a city grows radially outward from its center, as usually happens, pressure increases on the center until the organism collapses. "Surgery" on its "heart," like feeding new "arteries" as highways into the core, will only speed up its death. Doxiadis's prescription, as worked out in most of his projects since the mid-fifties, is that a city should grow in one direction." - Mark Wigley, Network Fever⁴⁶

Last Mile Urbanism

To communication companies, one of the last remaining infrastructural hurdles is known as 'the last mile', which is the final leg of delivering service from the provider to the consumer⁴⁷. While it is relatively inexpensive to upgrade a network backbone, those costs escalate geometrically as the network begins to fan out to reach each individual user. The last mile is this separation between the backbone architecture and the final delivery point, and the losses that occur in between. In the case of Internet Service Providers, investment in an upgraded backbone could multiply many times the potential bandwidth, speed and reliability of the network, but these gains can not be passed down to the consumer as it is prohibitively expensive to deliver such upgrades door-to-door.

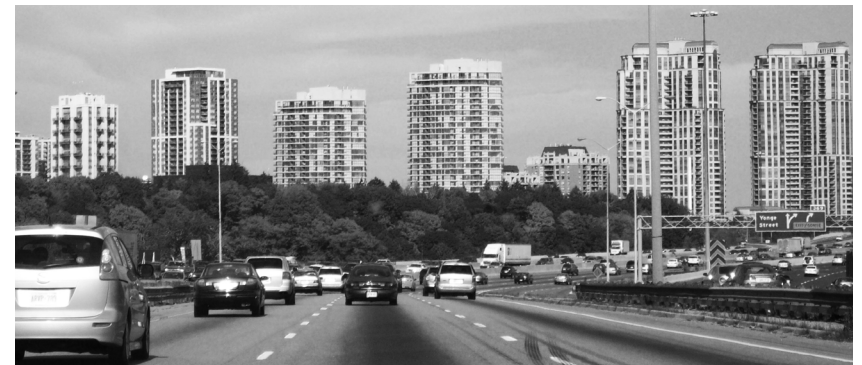
This is the biggest problem facing the Windsor/Quebec corridor's infrastructural networks; efficiency lost to sprawl. Just as the highest available broadband speeds cannot be piped everywhere, high speed road and transit networks cannot be delivered to each individual residence and utilities cannot be delivered without substantial losses.

The solution to this problem, of course, is density. Japan is ranked first in broadband speed and penetration, partially because its urban areas are so dense⁴⁸. There is a critical mass that can be reached whereupon the cost of delivering the fastest and most efficient network is offset by the revenue from a newly connected, dense consumer base.

As it applies to transit, the last mile can be looked at from two vantage points. First there is the question of public transit in a de-centralized region. The more connective bus and LRT lines are, the more stops they make, the slower they become. In a low bandwidth multi-modal system such as the one currently serving the GGH, the problem persists; having to transfer and wait for a train/bus to arrive results in huge efficiency losses at inter-modal connection points.

Public transit loses efficiency quickly in comparison to private vehicles, which are able to deliver the user from departure to arrival points without any inherent intermediary delays. However, the personal automobile is not as 'last mile' compatible as it appears to be. While the user does not share the same vessel as others traveling to other destinations, he or she does share the same road network with fellow commuters. Therefore a delay for one person translates into a delay for everyone utilizing the same section of road.

Likewise, speeds are not consistent throughout the road network. While the highway may have multiple lanes moving without stops at speeds in excess of 100 km/h, to reach a destination point the driver must exit the highway and download onto an arterial road. That arterial road may be moving at an average speed of 70 km/h, with multiple stop lights where perpendicular arterials cross. Then, in many cases, the driver must download again onto a local street, which may move at 50 km/h in one lane, stopping frequently and navigating over poorly maintained surfaces. Lane closures, congestion or construction at any of these intervals can result in significant delays. Even allowing for ideal conditions, the loss of speed is analogous to that experienced by information networks; the last mile remains a slow, inefficient bottle-neck that is crippling infrastructure in the region.



*fig 2.14 (top) An overloaded 401 highway downloads to...
fig 2.15 (middle) an overloaded arterial corridor (seen here as a line of high rises cutting across the 401) downloads to...
fig 2.16 (bottom) a sprawling and inefficient suburban community.
Ontario Growth Secretariat, Ministry of Energy and Infrastructure.*

If the Windsor/Quebec corridor is to realize its potential, new systems must be put in place that affordably and sustainably overcome the last mile. This will require new development to confine itself to highly dense nodes with a relative adjacency to the highest order backbone network; in this case the 401 and its connected highways. These nodes must be strategically placed within the existing and future urban fabrics, accommodating to density, highly connected and culturally relevant.

Ideally, these centres will be centrally located within large urban and suburban populations, connecting directly to local transit. In this way, the existing public transit infrastructure will effectively 'plug-in' to a new, higher order transit system, helping alleviate dependence on the car through much higher speed, megaregional connectivity.

Each centre will require substantial buildable lands, developed at a density that will prevent continued growth from sprawling out of range of the central delivery point. They will be linearly distributed along the corridor in a pattern consistent with Places to Grow's expectations of growth and will therefore not force inhabitation against the tide of market forces.

If this is to be a megaregional initiative that operates consistently and effectively, these nodes must be located on relatively easy to acquire real estate held by as few individual owners as possible, and of the same typological conditions to allow for a thematic and structured (though still varied) implementation.

Satisfying all of the above conditions and presenting a strategically assembled selection of connected properties within a single, repeated typology is the regional shopping mall. Combining this type with the 400 series highway network results in the framework for a new megaregional plan, one which integrates old and new. Following is a proposal for how this plan will develop a new infrastructural identity that is sustainable, high bandwidth, and delivered intact over the last mile.

Sources:

1. *Massive Change* (2004, 38),
2. As well as highway 20 once over the Quebec border. <http://www.roadsscholar.on.ca/lateststory.html>
3. The most highly trafficked area is between Keele St. and Islington Ave. <http://www.roadsscholar.on.ca/lateststory.html>
4. Thun (2009, 172).
5. Thun (2009, 169).
6. http://en.wikipedia.org/wiki/List_of_the_100_largest_metropolitan_areas_in_Canada
7. http://en.wikipedia.org/wiki/List_of_universities_in_Canada#Ontario
8. <http://www.roadsscholar.on.ca/lateststory.html>
9. *ibid.*
10. *ibid.*
11. *ibid.*
12. *ibid.*
13. *ibid.*
14. *ibid.*
15. *ibid.*
16. With the recent exception of the 407 toll highway, which was built to alleviate some of the congestion on the 401 as it passes through the Greater Toronto Area.
17. Gentle curves were actually built into the design to prevent driver boredom and fatigue. <http://www.roadsscholar.on.ca/lateststory.html>
18. The 403, 407, 404, 400, 410 and 427 are all major carriers in the GTA
19. <http://www.roadsscholar.on.ca/lateststory.html>
20. Not surprisingly, Wal-Mart played a critical role in this, as it was the sole anchor of Blantford Square, making it both impossible for downtown department stores to exist and then later impossible for the mall to remain open as it pulled out and moved to a location at Norwich Ave. and the 401.
21. *Places to Grow* (2006, 44).
22. *Places to Grow* (2006, 25).
23. *ibid.*
24. "In the period from October 1994 to September 1996, 88 percent of the 11.3 million Canadian households had at least one person with a driver's licence and 81 percent of the households used at least one vehicle for personal reasons. The total fleet was estimated at 14.2 million private vehicles for an average of 1.3 vehicles per household, including the households that did not own a vehicle (18.5 percent)." Natural Resources Canada: http://oee.nrcan.gc.ca/publications/infosource/pub/energy_use/NAPVUS/NAP-VUSch3.cfm?attr=8
25. Eglinton Crosstown LRT, http://www.toronto.ca/involved/projects/eglinton_crosstown_lrt/pdf/2009-09-02_display_panels.pdf
26. 175 million riders is roughly equivalent to the annual peak traffic loads of the 401 (daily peak of 400,000 x 365 = approx. 150 million) Eglinton Crosstown LRT, http://www.toronto.ca/involved/projects/eglinton_crosstown_lrt/pdf/2009-09-02_display_panels.pdf
27. *ibid.*
28. The City of Toronto estimates a 48 minute commute from Pearson to Yonge/Eglinton station, which is centrally located within the GTA. From there, various existing and proposed lines of public transit connect to the various neighbourhoods. Eglinton Crosstown LRT, http://www.toronto.ca/involved/projects/eglinton_crosstown_lrt/pdf/2009-09-02_display_panels.pdf
29. Eglinton Crosstown LRT, http://www.toronto.ca/involved/projects/eglinton_crosstown_lrt/pdf/2009-09-02_display_panels.pdf
30. A region whose manufacturing sector was essentially built around the automotive industry.
31. Interview, 17-April 2009.
32. Bandwidth definition: <http://dictionary.reference.com/browse/bandwidth>
33. Eglinton Crosstown LRT, http://www.toronto.ca/involved/projects/eglinton_crosstown_lrt/pdf/2009-09-02_display_panels.pdf
34. A Guide to Electricity Charges in Ontario's Competitive Marketplace: http://www.ieso.ca/imoweb/pubs/media/Electricity_Charges.pdf
35. Ministry of Energy and Infrastructure: http://www.mei.gov.on.ca/wsd6.korax.net/en/energy/electricity/?page=electricity-faqs#question_9
36. A Guide to Electricity Charges in Ontario's Competitive Marketplace: http://www.ieso.ca/imoweb/pubs/media/Electricity_Charges.pdf
37. Canada's Broadband Networks Not Ready For Future: Report: <http://www.cbc.ca/technology/story/2008/09/15/tech-broadband.html>
38. The report conducted speed tests to determine benchmarks for both a country's ability to meet current needs as well as the estimated needs for three years into the future. 22 countries met the present-day benchmark, Canada did not: <http://www.cbc.ca/technology/story/2008/09/15/tech-broadband.html>
39. Canada's Global Edge In Broadband Dwindling: <http://www.cbc.ca/technology/story/2008/05/20/tech-broadband.html>
40. Typical monthly bandwidth restrictions are 60gb per month in Canada. Comcast, an American ISP, has considered implementing a cap of 250gb per month, which is still 4 times what is offered in Canada. Canada's Global Edge In Broadband Dwindling: <http://www.cbc.ca/technology/story/2008/05/20/tech-broadband.html>
41. 1mb Broadband Access Becomes Legal Right: http://yle.fi/utiset/news/2009/10/1mb_broadband_access_becomes_legal_right_1080940.html?origin=rss
42. Australia's National Broadband Initiative: <http://www.govtech.com/dc/638235>
43. *ibid.*
44. *ibid.*
45. The Australian population is estimated at 21 million, with the Canadian population estimated at 33.2 million: www.cia.gov
46. Wigley (2001, 88).
47. http://en.wikipedia.org/wiki/Last_mile
48. Canada's Broadband Networks Not Ready For Future: Report: <http://www.cbc.ca/technology/story/2008/09/15/tech-broadband.html>

Minutes From Town

People attending conventions and other visitors to Detroit can easily and quickly reach Northland Center via the John Lodge Expressway. Northland is actually only a matter of minutes from Detroit's Civic Center and the city's business section.

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IN THE
CITY OF SOUTHFIELD
MICHIGAN
ADJACENT TO NORTHWEST DETROIT

fig 3.1 (above) An advert for Northland Shopping Centre, Victor Gruen's first fully realized indoor shopping centre, in suburban Detroit. Victor Gruen Associates, 1954.

"As a planning concept, the regional shopping centre is a formula of the new order to come within our entire urban pattern, and in this term I include not what we usually refer to as cities but the entire sprawling fabric of suburbs and metropolitan towns. As a planning concept...it is the forerunner of the nuclear or cluster, or as some people call it, the cellular approach to regional planning." - Alex Wall'

Historical Context And Planning

Historical Context

As Victor Gruen writes in his textbook/anthology Shopping Towns U.S.A., "the shopping centre is one of the few new building types created in our time²." The act of shopping itself, in various forms, goes back in time indefinitely, but Gruen thankfully provides an abbreviated historical context for the suburban shopping centre as follows:

"The advent of the Industrial Revolution radically changed the organization and character of cities. Thousands of factories were built in the midst of towns and cities. The city grew into a crazy quilt of packed humanity. The industrial slum became the new pattern of the city.

"Life in the city soon became intolerable and those who could afford it led the march into the suburbs. The exodus increased its tempo with the advent of interurban, elevated and subway trains and became a rout with the emergence of the automobile.

"The automobile was the means by which the last vestige of community coherence was destroyed. So long as suburban dwellers traveled in vehicles that ran on tracks, new communities had a central point- the railway stop- to build around. As the cities stretched out along the tentacles of railroad lines, shops, churches, and community buildings sprang up around the railroad station; the size of residential areas was automatically controlled by the walking distance from the station.

"When the automobile emerged as a means of private mass transportation, the final urban explosion took place. Automobiles, free of steel rails or overhead wires, could move at will in every direction. They provided complete freedom of movement to the individual driver and made him independent of public transportation.

"As the spreading continued with increasing speed, distances between places of residence and the central city grew by leaps and bounds.

"Throughout the United States, the growth was so fast and frenzied that purely practical matters; [basic infrastructure] lagged years behind; but any serious attempt at adequate planning of properly situated schools, shopping facilities, community centres and churches was nonexistent.

"Stores, which followed their customers into the suburbs, were no longer provided with obvious predetermined locations such as near railway stations. For the customer no longer emerged at defined points; he and his automobile were everywhere.

"Under these circumstances the best bet seemed to be store locations on highways over which shoppers would have to travel on their way back and forth to the city. As the number of highway stores increased, more people stopped their cars along the curb and parking space became available only for a cash premium- a new type of hitching post, the parking meter, had made its appearance. Because the shortage and cost of curb parking tended to slow down sales, merchants arranged for off-street car storage areas, at first behind and later on in front of their stores.

"Business grew and so did automobile traffic. Consequently, serious traffic congestion appeared on the highways, so serious that drivers began to avoid them by using alternate routes. When those roads inevitably attracted new stores and new congestion, super highways and freeways were constructed at tremendous cost in order to promote an easy flow of traffic.

"As customers were siphoned off from the roads along which merchants had settled, partly by neighbourhood deterioration, partly by the use of new freeways, a wild scramble for new locations started. Merchandising outlets were built in freshly created suburban areas still farther removed. Here, within a few years, merchants encountered a repetition of the undesirable conditions from which they had tried to escape. The need for farsighted, comprehensive planning finally became urgently apparent.

"Planning is needed not only to bring order, stability, and meaning to chaotic suburbia; it is necessary in order to establish a strong logical framework within which individual merchandising enterprises can flourish and provide crystallization points for suburbia's community life.

"The basic need of the suburban shopper is for a conveniently accessible, amply stocked shopping area with plentiful and free parking ... Good planning, however, will create additional attractions for shoppers by meeting other needs which are inherent in the psychological climate particular to suburbia. By affording opportunities for social life and recreation in a protected pedestrian environment, by incorporating civic and educational facilities, shopping centres can fill an existing void. They can provide the needed place and opportunity for participation in modern community life that the ancient Greek Agora, the Medieval Market Place and our own Town Squares provided in the past.

"If the shopping center becomes a place that not only provides suburbanites with their physical living requirements, but simultaneously serves their civic, cultural and social community needs, it will make a most significant contribution to the enrichment of our lives³."

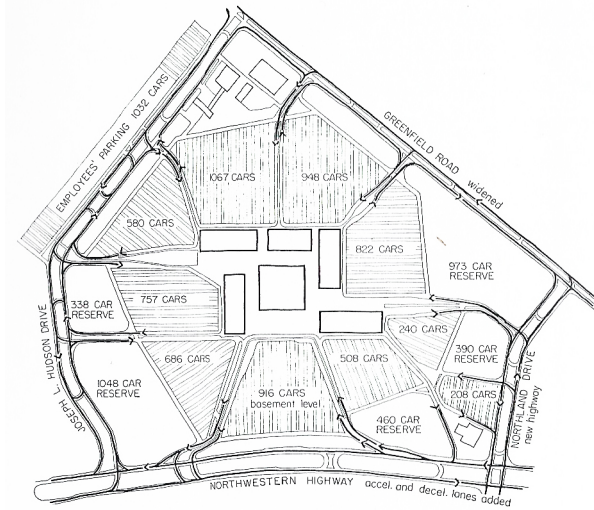


fig 3.2 (above) Site plan for Northland Shopping Centre, a 'pinwheel' design clustering buildings around public spaces. Victor Gruen Associates, 1954.

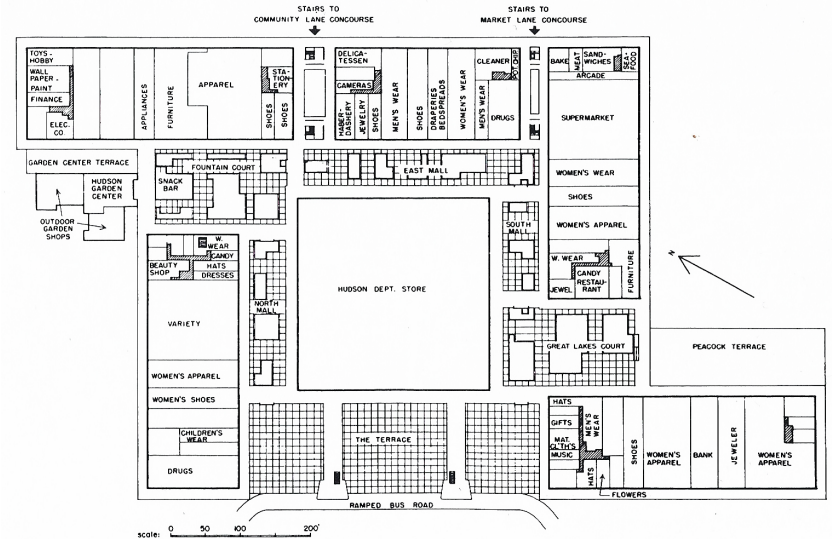
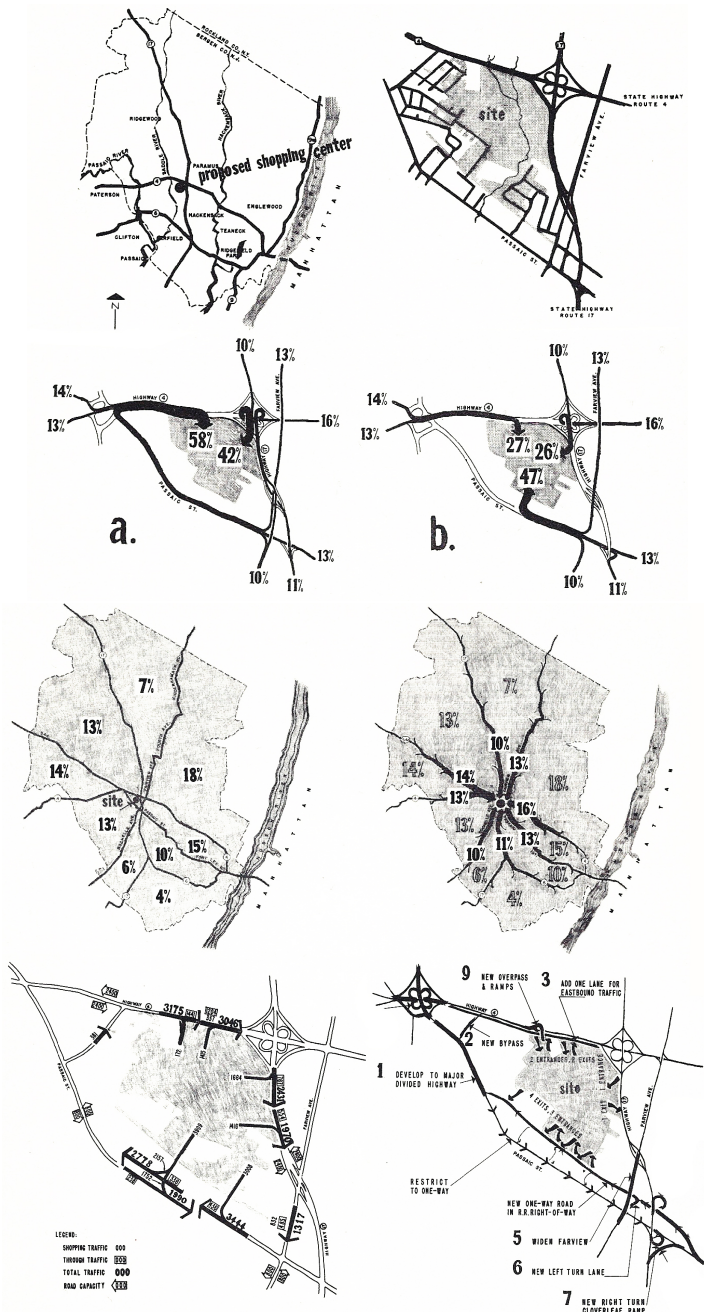


fig 3.3 (above) This type of 'cluster planning' would be a hallmark of Gruen's urban ambitions. Northland Shopping Centre, Victor Gruen Associates, 1954.



Most of these historical factors are well understood by architects and planners, though the shopping centre is often seen as a contributor to suburban sprawl rather than the re-centering force envisioned by Gruen. After all, regional malls are sited on huge swaths of land covered in surface parking and were specifically designed to cater to the automobile. Having been around for just over 50 years⁴, the shopping centre has been widely criticized by architects and urbanists⁵, and while many have attempted to design the occasional centre, very few have ever made a career of it⁶. It is possible however that the typology has been a victim of its own youth and the prejudice of critics who did little to involve themselves in the practical conditions of post-war development at the time. In fact, architect Alex Wall notes the lack of attention from architects and planners during the critical early days of interstate highways and suburban expansion, writing;

“Architecture and planning are devoted to creating the built environment, yet in the past fifty years, architects have confined themselves to creating signature buildings, and planners have rebuilt downtowns or renewed historic city centres that fewer and fewer people have wanted to, or could afford to, live and work in. Where were architecture and planning when suburbia was first built out? And where was planning when interstate highways pushed through residential neighbourhoods, and when the needs of new suburbs, aging downtowns, and regional landscapes conflicted with one another and required reconciliation?”

Wall credits Gruen with being the architect/planner most engaged in these trends at the time, and it is telling that by the end of his career, Gruen had involved himself in the design of traffic, transportation and urban systems, as well as city masterplanning⁸. Fig 3.4 shows a series of studies done to analyze traffic and road patterns at Garden State Plaza Shopping Centre in New Jersey, demonstrating the emphasis mall development places on identifying and developing important infrastructural systems. The bottom right image suggests ‘recommended highway improvements necessary to correct conditions where existing road capacity is lower than combined expected traffic load,⁹ which is indicative of the mall’s transformative capabilities.

Gruen’s mall was always part of a new regional urbanism, even in its embryonic stages. Assuming that the regional mall today is more advanced but not yet fully mature as a typology, it is important to observe it from as many perspectives as possible in order to properly contextualize and understand it before projecting its future.

fig 3.4 (above) Maps from the traffic analysis report by Victor Gruen Associates for Garden State Plaza Shopping Centre, Paramus, New Jersey.

"Take 100 acres of ideally shaped flat land. Surround same by 500,000 consumers who have no access whatever to any other shopping facilities. Prepare the land and cover the central portion with 1,000,000 square feet of buildings. Fill with first-rate merchandisers who will sell superior wares at alluringly low prices. Trim the whole on the outside with 10,000 parking spaces and be sure to make same accessible over first-rate under-used highways from all directions. Finish up by decorating with some potted plants, miscellaneous flower beds, a little sculpture, and serve sizzling hot to the consumer." Victor Gruen¹⁰.

The Gruen Formula

The regional shopping centre is a typology that adheres to a very specific formula, originally developed by Victor Gruen along with economist Larry Smith. This formula, culled from years of experience that was, at the time, unique to Gruen's firm, is collected in the publication "Shopping Towns U.S.A."

Essentially a textbook on the economics and planning of shopping centres, Shopping Towns lays out the basic framework within which nearly all subsequent mall developments in North America have operated. This formula has been refined and expanded in the last half-century; shopping malls have grown much larger and more dense, the nature of their surrounding neighbourhoods has changed, and the retail and economic climates of North America have shifted significantly.

What has remained relatively constant, however, are the basic planning and development principles of regional mall design. Malls owe much of their success to their careful adherence to the economic formula posited by Gruen and Smith, and have always been designed with profitability as the primary concern.

The first section of Shopping Towns U.S.A. looks at developmental prerequisites; of which site selection is particularly important. Regional mall sites were chosen almost exclusively according to economic considerations; attracting the most people with the most money from as far away as possible in the least amount of time.

It is no coincidence that Shopping Towns was co-authored by an economist. An indoor mall has no need for aesthetically pleasing site conditions; patronage is far more dependent on trade area, population distribution, visibility from and adjacency to the highway, and driving time¹¹. In fact, according to Shopping Towns, an economist is the professional most suited to determining the mall's site; not the developer, architect or engineer¹².

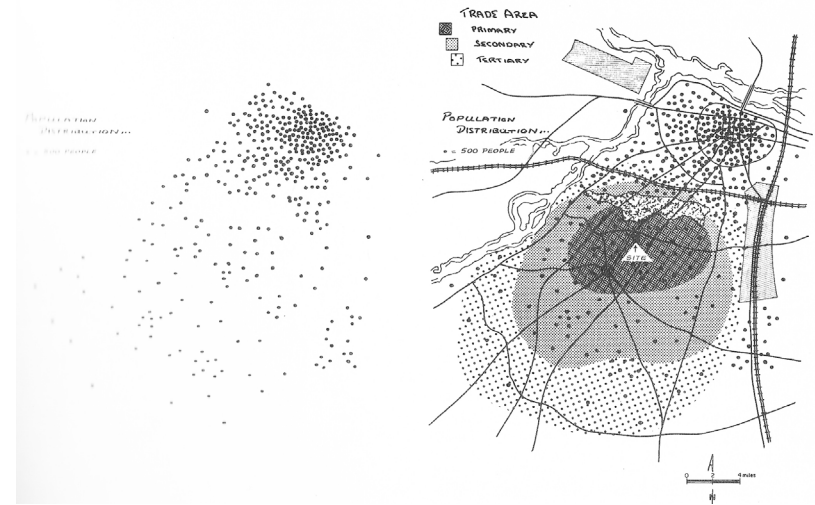


fig 3.5 (above) A theoretical mapping of a potential shopping centre location, its associated trade areas and the surrounding population distribution. Victor Gruen Associates, 1960.

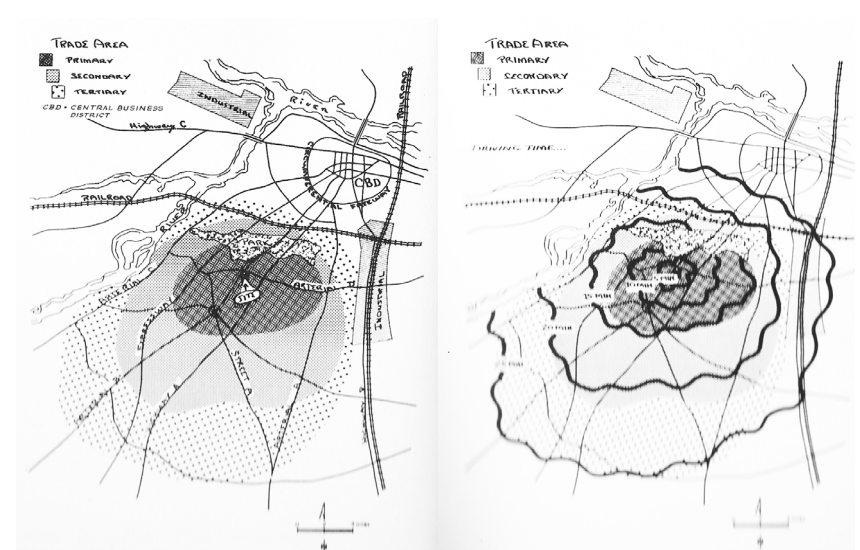
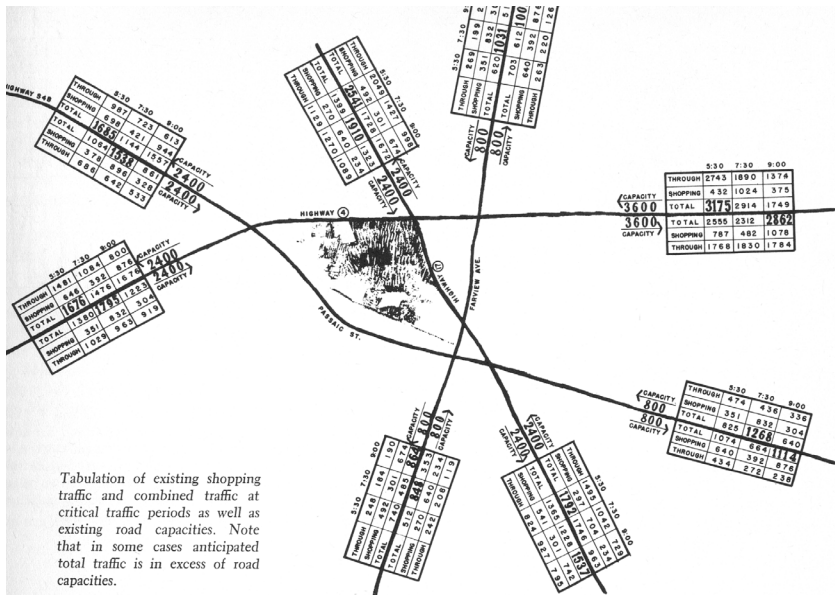


fig 3.6 (above) Adding factors such as barriers to accessibility, driving time distances for the theoretical location and fig 3.7 (opposite) tabulation of existing traffic, critical traffic periods and road capacity. Victor Gruen Associates, 1960.



- 1) The site must be located in the general area established as most desirable by the economic survey.
- 2) It must be owned or controlled by the developer, or its acquisition must be feasible.
- 3) The cost of the land must be in keeping with the overall economic considerations.
- 4) Existing zoning must permit usage of the site for shopping centre purposes, or there must be a reasonable likelihood that rezoning can be achieved.
- 5) There must be enough land to allow construction of facilities that will meet the sales potential.
- 6) The shape of the site must be such that advantageous planning is feasible.
- 7) The land must be in one piece, free of intervening roadways, rights-of-way, easements, or major waterways, etc. that would force development in separated portions.
- 8) Physical characteristics of the land must permit advantageous planning and reasonably economical construction.
- 9) The surrounding road pattern and the accessibility of the land must allow the full utilization of the business potential of the projected centre.
- 10) The possibility of achieving visibility of the shopping centre structure from major thoroughfares must be present.
- 11) Surrounding land uses should be compatible with the operation, free of competitive developments; and should, if possible, offer contributing and enhancing characteristics.¹⁷

The aim of site selection was to maximize sales potential using the following criteria; population, income, purchasing power, competitive facilities, accessibility, etc¹³. Mall sites, therefore, are very carefully selected to be central to a large populations, adjacent to major transit infrastructure, and distributed in exact proportion to the size, density, wealth and spacing of the suburban neighbourhoods in which they are located. In this way they are ideally suited to serve as centres for regional densification based on their sites alone; as a part a megaregional infrastructure they are invaluable in amalgamating a complete spectrum of economic, social and urban conditions into a single typology, distributed at high speeds along high-order transit networks.

Regional shopping centres are also planned not only according to existing populations; they look to past growth, trends, available land and population shifts to predict future growth¹⁴. Mall developments locate themselves centrally not only to existing populations at the time they are built, they also take a much longer view with regard to where and how the local population is growing. This leads to regional malls that are actually more legitimate centres than many historic downtowns, from which growth has often progressed eccentrically due to natural or infrastructural limitations and opportunities that were not originally taken into account. Where historic city centres are generally located according to early industrial criteria-- proximity to water and rail shipping infrastructures, for example-- the regional mall places itself ideally within emerging megaregional populations and contemporary transit, distributed evenly and in step with surrounding demographics.

Their locations are also proportionally spaced to limit one mall from competing directly with another. This is partly the result of so few owners controlling such a large percentage of malls, and partly because malls simply aren't being built anymore, let alone in competing markets¹⁵.

The regional mall is tailor-made to re-centralize megaregional growth without disrupting the nature of the existing urban fabric or causing a major upheaval of social infrastructure. Linking together all of the available regional mall sites via the 400 series highway system results in a comprehensively connected network that is already smartly positioned to handle growth.

The idea that linear cities could follow the highway network is certainly not a new one. Ludwig Hilbersheimer's 1949 book *The New Regional Pattern* suggested using the highway system as a dispersal strategy for Cold War-era decentralization¹⁶. This idea came to be known as the 'strip city', a potentially endless urban form, enabled by technology and realized at the

expense of local identity or a collective civic culture¹⁸. Gruen fought this notion¹⁹ and instead sought to limit expansion and create distinction via the 'cluster city'²⁰. Cluster planning is an idea stemming from Gruen's early development of the regional mall, where tenant store blocks were designed in a cluster pattern around a department store²¹.

In "Modern Architecture", Gruen wrote:

"The answer seems to me to lie in the creation of human activity nuclei or clusters, based on the scale of acceptable walking distance within each unit. Each cluster will be separated from the next by neutral areas of varying width, which may be devoted to agriculture or recreational purposes. Constellations of clusters will form communities, constellations of communities towns, and a galaxy of towns a metropolitan area around a compact and vigorous, cultural, social, administrative and economic centre, the metropolitan core. Between these nuclei within the neutral areas, there will be ample space for the traffic carriers of the future."²²

Though Gruen saw this as a strategy for all growth-- a strategy which has clearly not come to be-- it is potentially an even more elegant approach now, as it reconciles in some ways existing sprawl with the immediate need to concentrate future development. Gruen, and other mall architects since, have been (consciously or not) implementing the framework for Cluster City to take form. While there may need to be adjustment to the particulars-- the scale of each cluster should be based on the reach of the infrastructural 'last mile' rather than walking distance and what exists between nuclei will likely remain the providence of the municipality-- there is an infrastructural framework already in place and with surrounding neighbourhoods now maturing, a new regional plan needs only to redirect development to these nodal mall sites to create a dense, sustainable and efficient new megaregional backbone.

Capacity

There are 100 regional shopping malls within the Windsor/Quebec corridor²³. Of these, 46 are located inside the boundaries of the Greater Golden Horseshoe and 29 are in the Greater Montreal Region. Combined, these 100 mall sites account for a total of just over 25 square kilometers, which is 40% of the land mass of Manhattan island.

If these sites were held to their boundaries and developed at the density of Dhaka, the world's densest city²⁴, the corridor could accommodate 1.14 million people. This would be just over 30% of the GGH's projected growth from 2001-2031. It is difficult to project potential densities in this way however; because the mall sites are discreet and surrounded

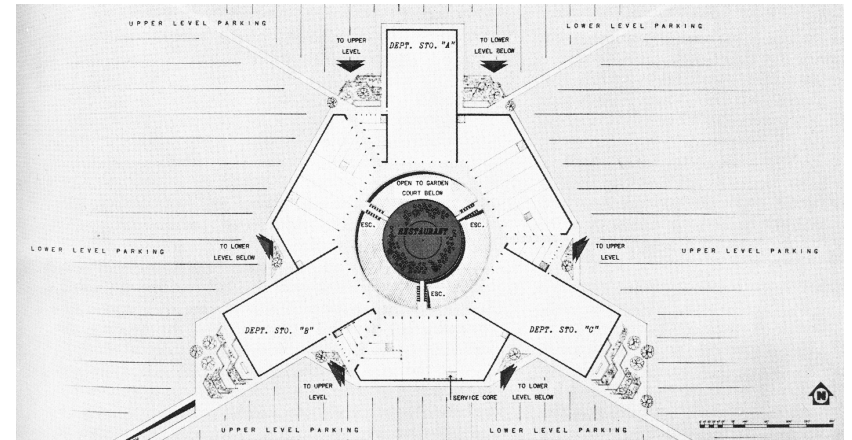


fig 3.8 (above) Mt. Prospect Centre, Victor Gruen Associates. Shopping centre as urban sub-centre.

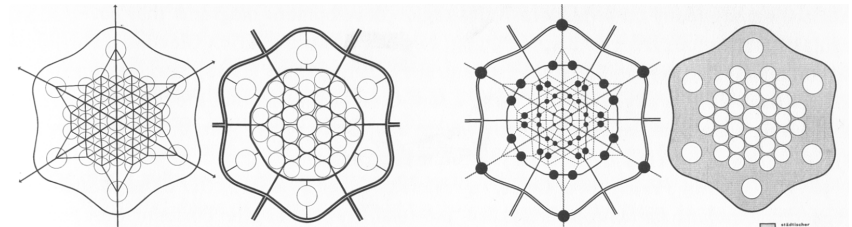


fig 3.9 (above) The cellular metropolis. Victor Gruen, "The Heart of Our Cities", 1964.

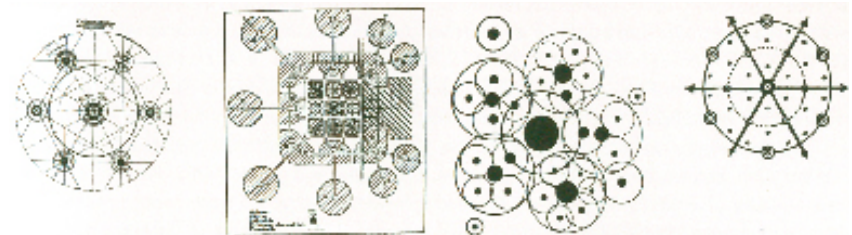


fig 3.10 (above) Various cellular growth precedents; Ebenezer Howard (1908), Raymond Unwin (1922), Gaston Bardet (1940), Robert Cristaller (1930).

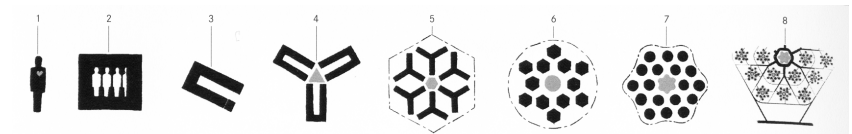
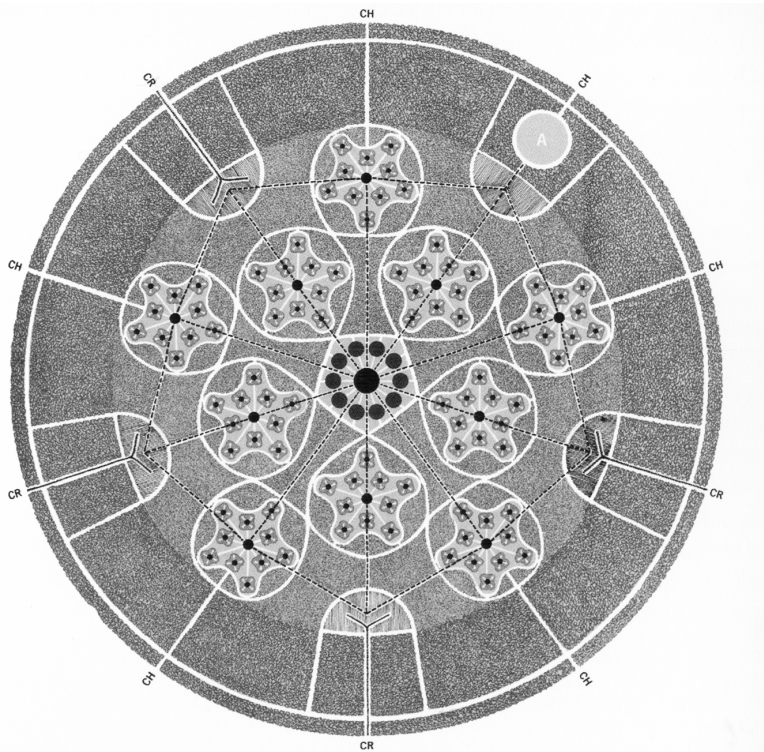


fig 3.11 (above) Victor Gruen's modular cluster planning at various scales, from the individual to the megaregion.



fig 3.12 (above) An aerial photograph of Dhaka, Bangladesh. The world's most dense city. Google Earth, 2009.

fig 3.13 (below) Victor Gruen's diagram for *The Cellular Metropolis of Tomorrow*. Three planning principles are inherent: transition between public and private transit, a pattern of built and unbuilt space, and a rhythm of high and low density development.



by urban, suburban and rural areas of much lower densities, it is not accurate to compare them to traditional cities. However, as a general point of comparison, Dhaka will be used to illustrate the corridor's potential capacities. While these mall sites, combined, form a 'city' of considerable size, they are separate entities distributed throughout a varying megaregion. Because of this, when directing growth to these sites the result should neither be seen as a new city nor as a series of new centres for existing cities, but rather a hybrid of the two. Therefore, a development density that meets or exceeds that of the world's densest existing cities is not nearly as unreasonable as it may at first appear.

Assuming that the GGH is projected to grow by another 2.6 million people between 2010 and 2031²⁵, and that a certain percentage of that figure will be redirected to regional mall sites, the following potential projections can be made under the conditions that a) suburban sprawl must be eliminated altogether and b) there is an undetermined amount of available land adjacent to mall sites with the capacity to handle an unknown percentage of growth in addition to that contained within the mall site proper.

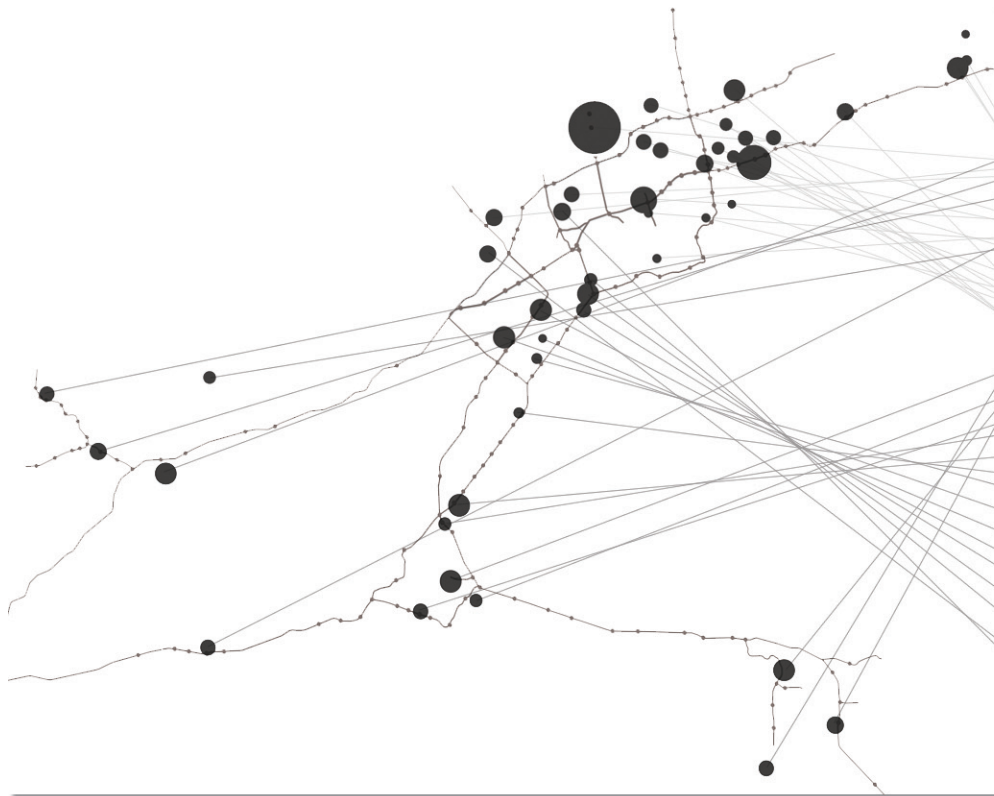
If 100% of the GGH's growth is redirected to mall sites, with no adjacent or peripheral sites used, the average density across all 100 sites would be 104,000 people per square kilometer; more than double that of Dhaka. While this would tightly contain growth, allowing densities to be much lower outside of mall site boundaries, it is unrealistic to expect development in the region to be so compressed.

If 60% of that growth is targeted for mall sites-- the same percentage currently slated for suburban development-- the resulting 1.6 million inhabitants would be distributed at a density of 64,000 people per square kilometer, which is still 40% higher than Dhaka.

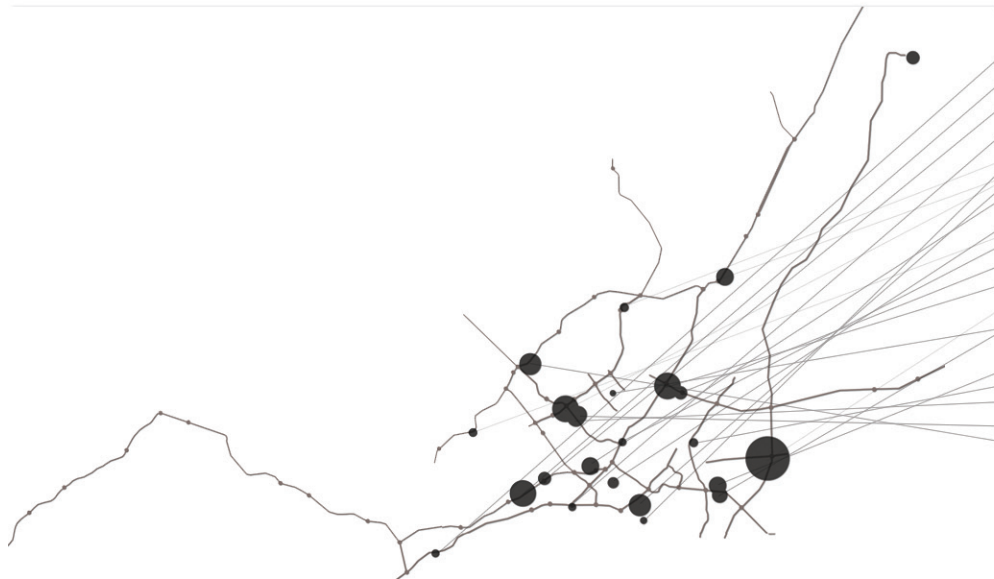
However, the problem with accounting for only the expected suburban growth is that equally infrastructurally unsound developments in historical downtowns will continue, exacerbating a particular set of problems as discussed earlier.

Borrowing from the rationale of Places to Grow, if 40% of all growth is contained within mall sites while 60% is located on adjacent sites, along the transit corridor, and on other potential strategic sites, the on-site density average is reduced to 40,000 people per square kilometer, which is now slightly less than that of Dhaka. This percentage also represents a round figure of 1 million people.

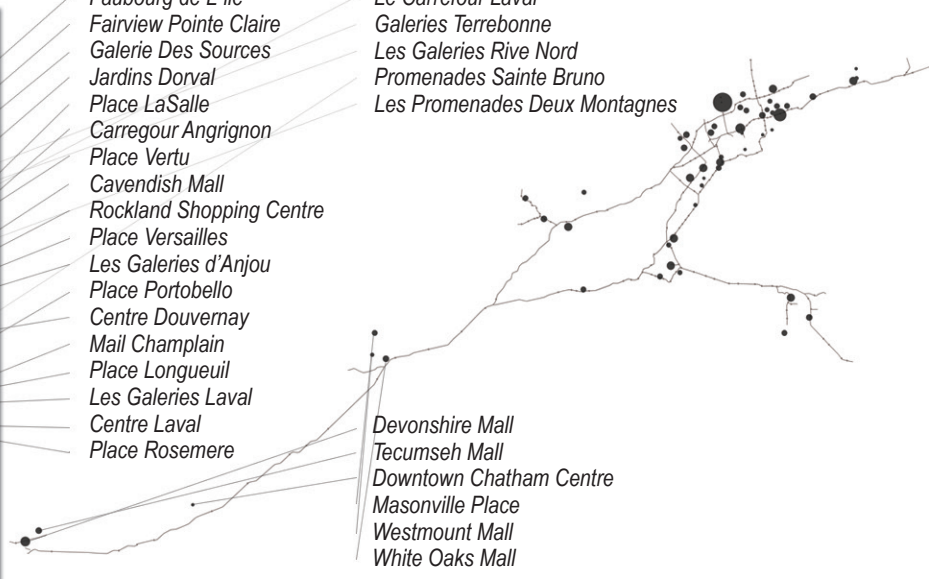
fig 3.14 (top left) The regional malls of the Greater Golden Horseshoe.
 fig 3.15 (bottom left) The regional malls of the Montreal/Dorval region.
 fig 3.16 (below, opposite) The regional malls of the Windsor/Quebec corridor.



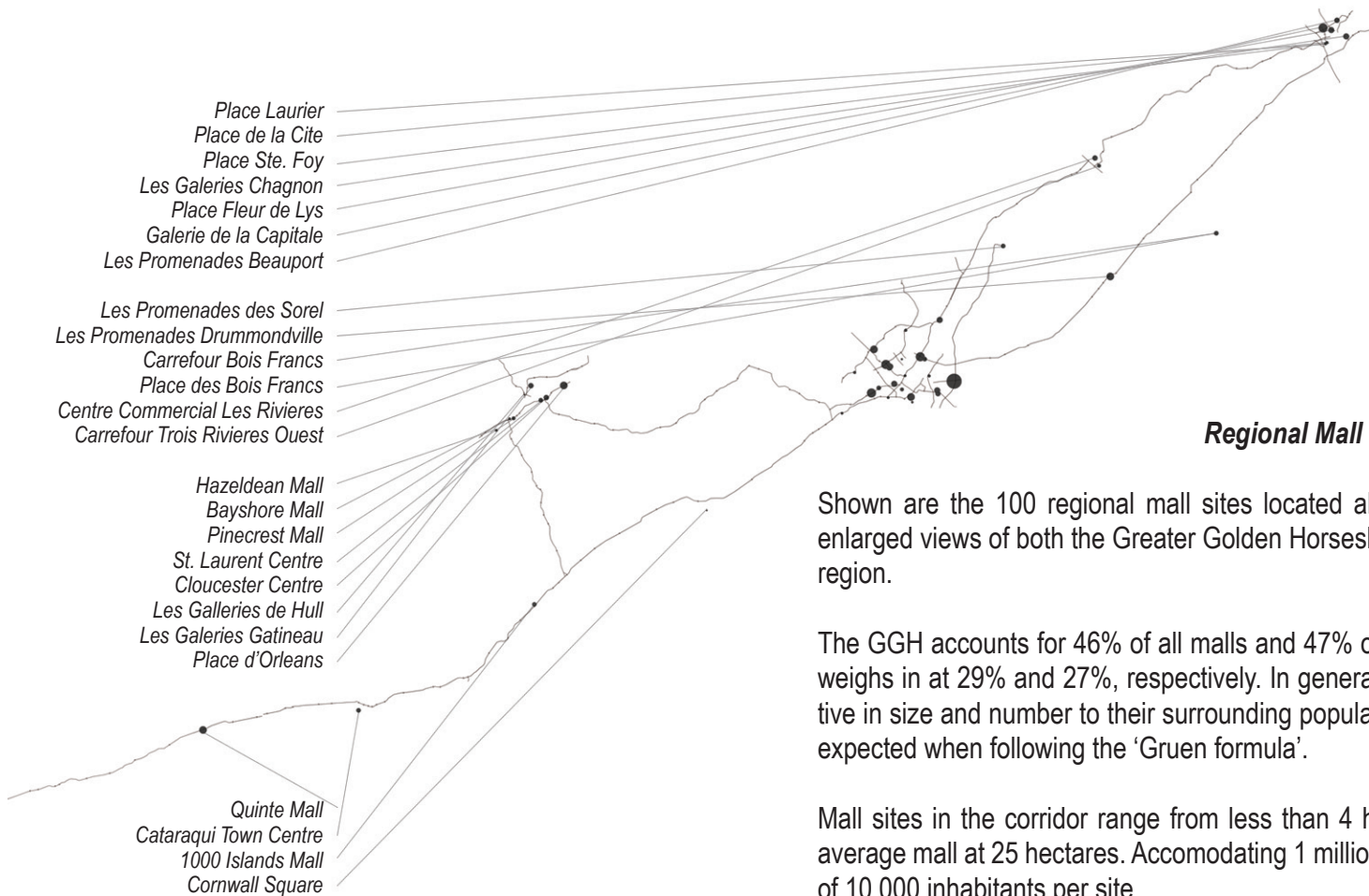
- Cambridge Centre
- Fairview Park Mall
- Conestoga Mall
- Lynden Park Mall
- Stone Road Mall
- Seaway Mall
- Niagara Square
- Niagara Pen Centre
- Centre Mall
- Eastgate Mall
- Limeridge Mall
- Mapleview Centre
- Burlington Mall
- Oakville Place
- Sheridan Centre
- Erin Mills Town Centre
- Westdale Mall
- Square One
- Dixie Outlet Mall
- Sherway Gardens
- Cloverdale
- Shoppers World Brampton
- Woodbine Centre
- Bramalea City Centre
- Shoppers World Albion
- Vaughan Mills
- Dufferin Mall
- Yorkdale Mall
- Lawrence Square
- Centrepoint Mall
- Hillcrest Mall
- The Promenade Shopping Centre
- East York Town Centre
- Fairview Mall
- Eglinton Square
- Bridlewood
- Agincourt Mall
- Woodside Square
- Scarborough Town Centre
- Pacific Mall
- Malvern Town Centre
- Markville Shopping Centre
- Pickering Town Centre
- Oshawa Shopping Centre
- Midtown Mall
- Five Points Mall



- Faubourg de L'île
- Fairview Pointe Claire
- Galerie Des Sources
- Jardins Dorval
- Place LaSalle
- Carregour Angrignon
- Place Vertu
- Cavendish Mall
- Rockland Shopping Centre
- Place Versailles
- Les Galeries d'Anjou
- Place Portobello
- Centre Douvernay
- Mail Champlain
- Place Longueuil
- Les Galeries Laval
- Centre Laval
- Place Rosemere
- Le Carrefour Laval
- Galeries Terrebonne
- Les Galeries Rive Nord
- Promenades Sainte Bruno
- Les Promenades Deux Montagnes



- Devonshire Mall
- Tecumseh Mall
- Downtown Chatham Centre
- Masonville Place
- Westmount Mall
- White Oaks Mall



Regional Mall Sites in the Windsor/Quebec Corridor

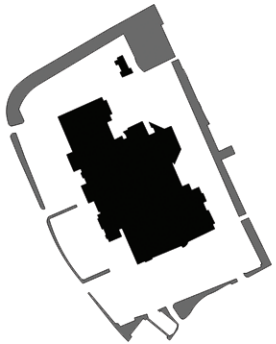
Shown are the 100 regional mall sites located along the Windsor/Quebec corridor, with enlarged views of both the Greater Golden Horseshoe and the Montreal/Laval metropolitan region.

The GGH accounts for 46% of all malls and 47% of the total mall site area. Montreal/Laval weighs in at 29% and 27%, respectively. In general, regional malls in the corridor are relative in size and number to their surrounding populations and densities, exactly as would be expected when following the 'Gruen formula'.

Mall sites in the corridor range from less than 4 hectares to nearly 90 hectares, with the average mall at 25 hectares. Accommodating 1 million in new growth would mean an average of 10,000 inhabitants per site.

Assuming an even distribution of growth among sites, the smallest²⁶ site (Cornwall Square, at 4.2 ha) would house 4200 new residents by 2031, while the largest site (Vaughan Mills, at 87.8 ha) would see a growth of 87,800. Certainly, some sites may be better equipped to develop at greater densities than others; these figures are simply meant to be illustrative of the corridor's overall capacity.

On the following pages are graphical representations of each mall's site²⁷, followed by a table listing a number of vital statistics such as site area, surrounding features, distance to the nearest expressway, and owner/developer.



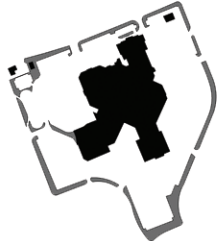
Devonshire Mall, Windsor



Tecumseh Mall, Windsor



Chatham Centre, Chatham



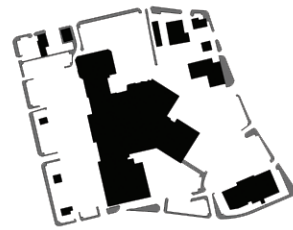
Masonville Place, London



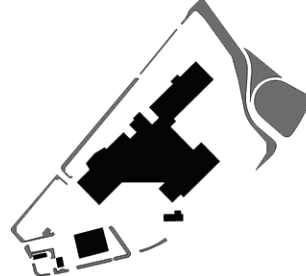
Westmount Mall, London



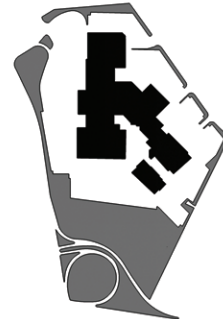
White Oaks Mall, London



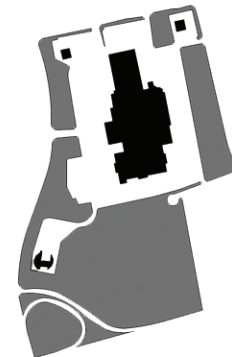
Cambridge Centre, Cambridge



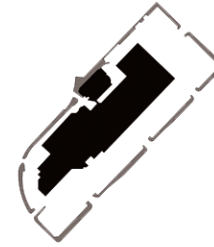
Fairview Park Mall, Kitchener



Conestoga Mall, Waterloo



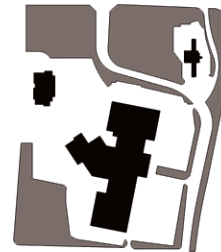
Lynden Park Mall, Brantford



Stone Road Mall, Guelph



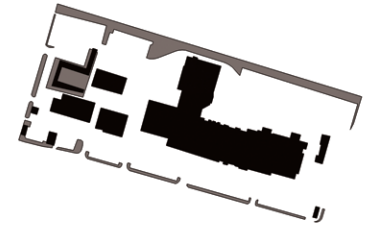
Seaway Mall, Welland



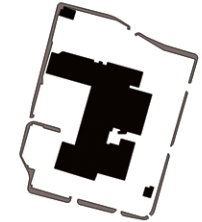
Niagara Square, Niagara Falls



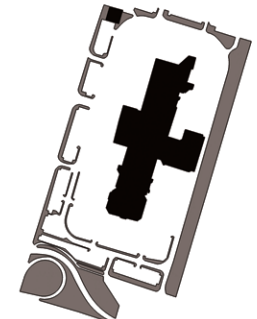
Niagara Pen Centre, St. Catharines



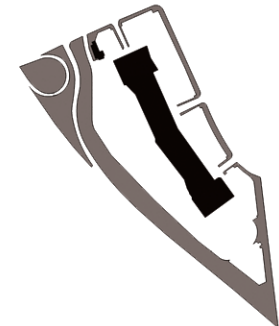
Centre Mall, Hamilton



Eastgate Mall, Hamilton



Limeridge Mall, Hamilton

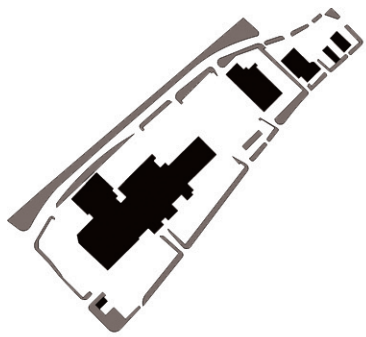


Mapelview Centre, Burlington

Mall Name	Location	Site Area	Surrounding Features	Distance to Expy	Owner/Operator
<u>Southwestern Ontario</u>					
Devonshire Mall	Windsor	37.7 ha	Michigan tunnel	0.0 km	Ivanhoe Cambridge
Tecumseh Mall	Windsor	20.3 ha	Chrysler ass'y plant	2.3 km via pkwy	Ivanhoe Cambridge
Downtown Chatham Centre	Chatham	4.8 ha	Downtown	7.0 km via rail	Ivanhoe Cambridge
Masonville Place	London	20.7 ha	Western University	14.0 km via surface roads	Cadillac Fairview
Westmount Mall	London	15.0 ha	Thames river valley	5.4 km via surface roads	Bentall Capital
White Oaks Mall	London	25.3 ha	Agricultural land	1.1 km via arterial	Redcliff Realty
Blantford Square Mall	Woodstock	n/a	Demolished/Toyota Plant	n/a	n/a
		123.8 ha			
<u>Greater Golden Horseshoe</u>					
Cambridge Centre	Cambridge	27.1 ha	Grand Valley cons. area	5.0 km via rail	Morguard
Fairview Park Mall	Kitchener	26.3 ha	Grand Valley cons. area	0.0 km	Cadillac Fairview
Conestoga Mall	Waterloo	28.5 ha	Waterloo University	0.0 km	Ivanhoe Cambridge
Lynden Park Mall	Brantford	36.1 ha	Agricultural land	0.4 km via pkwy	Ivanhoe Cambridge
Stone Road Mall	Guelph	15.0 ha	Guelph University	0.3 km via surface roads	Oxford Properties
Seaway Mall	Welland	23.8 ha	Welland Canal	4.3 km via surface roads	Doral
Niagara Square	Niagara Falls	32.5 ha	Agricultural land/USA	0.0 km	Rio Can
Niagara Pen Centre	St. Catharines	28.1 ha	Niagara Falls/USA	0.0 km	20 Vic Management
Hamilton City Centre	Hamilton	n/a	Downtown Hamilton	n/a	n/a
Centre Mall	Hamilton	29.8 ha	Port/Manufacturing	2.9 km via rail	Recliff Realty
Eastgate Mall	Hamilton	18.4 ha	Suburbs/Stoney creek	1.2 km via surface roads	Redcliff Realty
Limeridge Mall	Hamilton	30.1 ha	Suburbs	0.0 km	Cadillac Fairview
Mapleview Centre	Burlington	23.8 ha	Suburbs	0.0 km	Ivanhoe Cambridge

fig 3.17 (opposite, far left) The regional malls of Soutwestern Ontario, from Windsor to London.

fig 3.18 (opposite) The regional malls of the Greater Golden Horseshoe.



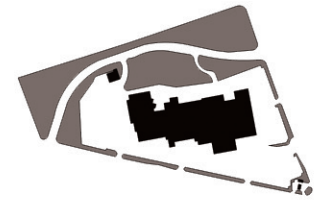
Burlington Mall, Burlington



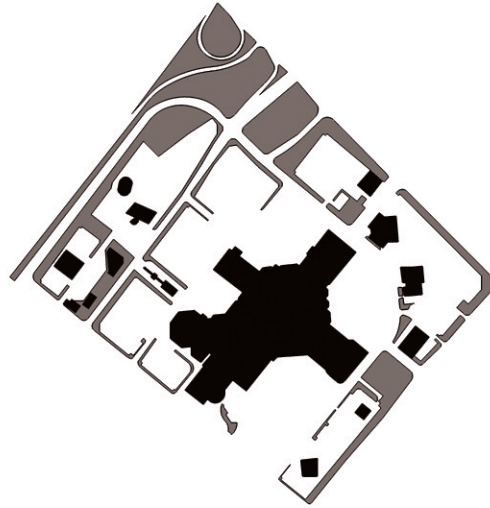
Westdale Mall, Mississauga



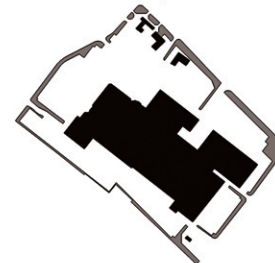
Cloverdale Mall, Etobicoke



Shoppers World Albion, Rexdale



Square One Mall, Mississauga



Shoppers World Brampton, Brampton



Vaughan Mills, Vaughan



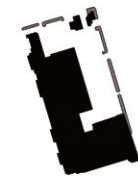
Oakville Place, Oakville



Dixie Outlet Mall, Mississauga



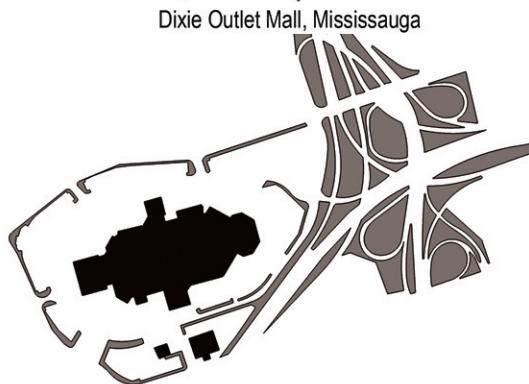
Woodbine Centre, Malton



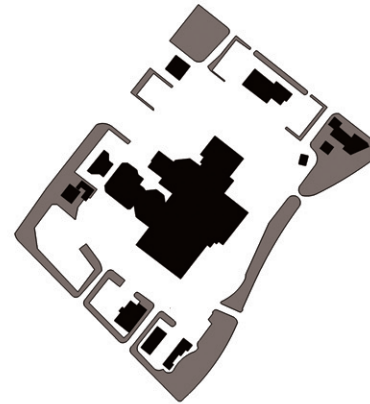
Dufferin Mall, Toronto



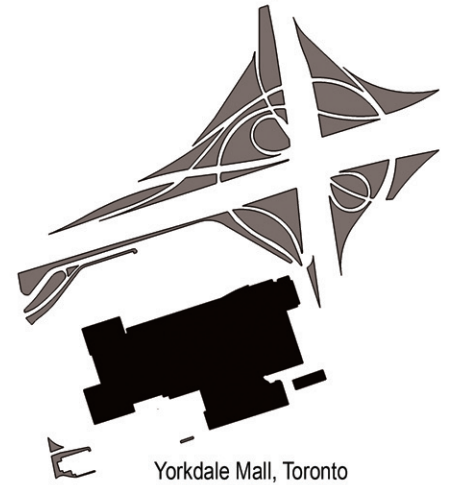
Sheridan Centre, Mississauga



Sherway Gardens, Etobicoke



Bramalea City Centre, Brampton



Yorkdale Mall, Toronto



Erin Mills Town Centre, Mississauga

Mall Name	Location	Site Area	Surrounding Features	Distance to Expy	Owner/Operator
<u>Greater Golden Horseshoe (con't)</u>					
Burlington Mall	Burlington	28.6 ha	Suburbs/GO station	0.7 km via arterial	Ivanhoe Cambridge
Oakville Place	Oakville	14.8 ha	Glen Abbey golf club	0.0 km	Ivanhoe Cambridge
Sheridan Centre	Mississauga	14.1 ha	Suburbs	0.5 km via pkwy	Bentall Capital
Erin Mills Town Centre	Mississauga	36.1 ha	Suburbs/Credit river	1.0 km via pkwy	Cadillac Fairview
Westdale Mall	Mississauga	6.4 ha	Credit river	4.7 km via surface roads	Paula Dale Ltd.
Square One	Mississauga	67.3 ha	Suburbs	0.0 km	Cadillac Fairview
Dixie Outlet Mall	Mississauga	21.2 ha	Lake/golf	0.0 km	Ivanhoe Cambridge
Sherway Gardens	Etobicoke	50.5 ha	Etobicoke creek/Suburbs	0.0 km	Cadillac Fairview
Cloverdale	Etobicoke	17.5 ha	Kipling station/Suburbs	0.0 km	Bentall Capital
Shoppers World Brampton	Brampton	23.9 ha	Downtown/golf	1.9 km via arterial	RioCan
Centennial Mall	Brampton	n/a	Suburbs	n/a	Davpart Inc.
Woodbine Centre	Malton	22.1 ha	Pearson airport/racetrack	1.4 km via arterial	Darton Property
Bramalea City Centre	Brampton	47.4 ha	High-rise res/Suburbs	1.3 km via arterial	Morguard
Shoppers World Albion	Rexdale	33.2 ha	Humber river/Suburbs	3.3 km via arterial	Morguard
Vaughan Mills	Vaughan	87.8 ha	Canada's Wonderland	0.0 km	Ivanhoe Cambridge
Dufferin Mall	Toronto	8.8 ha	Suburbs/High park	2.4 km via surface roads	Oxford Properties
Yorkdale Mall	Toronto	42.1 ha	Downsview park/TTC	0.0 km	Oxford Properties

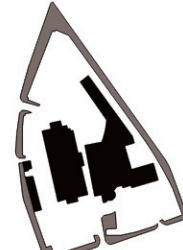
fig 3.19 (opposite) The regional malls of the Greater Golden Horseshoe.



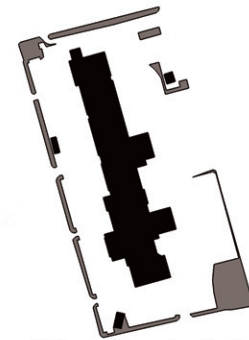
Lawrence Square, Toronto



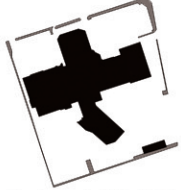
Eglinton Square, Don Mills



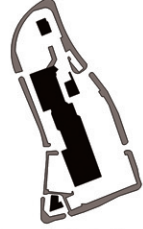
Pacific Mall, Markham



Oshawa Shopping Centre, Oshawa



Centrepoint Mall, Thornhill



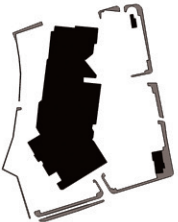
Bridlewood Mall, Scarborough



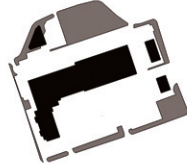
Malvern Town Centre, Malvern



Midtown Mall, Oshawa



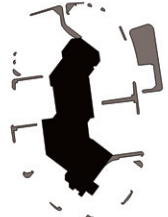
Hillcrest Mall, Richmond Hill



Agincourt Mall, Scarborough



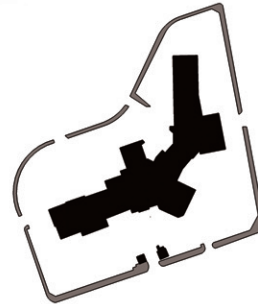
Five Points Mall, Oshawa



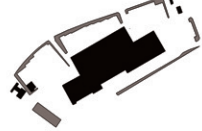
The Promenade Shopping Centre, Thornhill



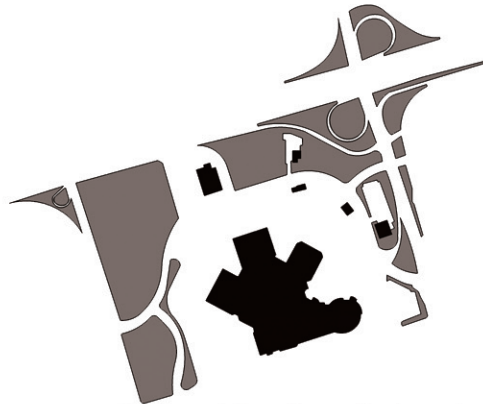
Woodside Square, Scarborough



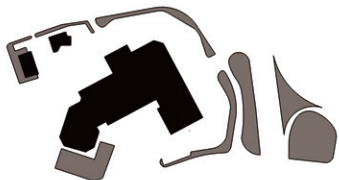
Markville Shopping Centre, Markham



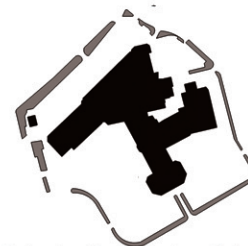
East York Town Centre, East York



Scarborough Town Centre, Scarborough



Fairview Mall, Don Mills



Pickering Town Centre, Pickering

Mall Name	Location	Site Area	Surrounding Features	Distance to Expy	Owner/Operator
<u>Greater Golden Horseshoe (con't)</u>					
Lawrence Square	Toronto	12.9 ha	TTC	0.0 km	RioCan
Centrepont Mall	Thornhill	15.0 ha	Suburbs	4.5 km via Yonge st.	Morguard
Hillcrest Mall	Richmond Hill	18.9 ha	Suburbs	1.9 km via Yonge st.	Cadillac Fairview
The Promenade Shopping Centre	Thornhill	23.9 ha	Suburbs	2.1 km via surface roads	Cadillac Fairview
Toronto Eaton Centre	Toronto	n/a	Downtown Toronto	n/a	Cadillac Fairview
East York Town Centre	East York	9.3 ha	Don Valley park	0.8 km via surface roads	Morguard
Fairview Mall	Don Mills	24.2 ha	Subway	0.0 km	Cadillac Fairview
Eglinton Square	Don Mills	9.7 ha	Suburbs	2.2 km via arterial	Oxford Properties
Bridlewood	Scarborough	21.3 ha	Suburbs	2.0 km via arterial	Darton Property
Agincourt Mall	Scarborough	13.5 ha	Suburbs	0.8 km via arterial	Darton Property
Woodside Square	Scarborough	11.0 ha	Agincourt rail yard	3.1 km via arterial	Redcliff Realty
Scarborough Town Centre	Scarborough	51.4 ha	Subway/RT	0.0 km	Oxford Properties
Pacific Mall	Markham	17.6 ha	Suburbs	2.2 km via arterial	unknown
Malvern Town Centre	Malvern	14.8 ha	Agincourt rail yard	1.4 km via surface roads	Davpart Inc.
Markville Shopping Centre	Markham	29.9 ha	river valley	1.2 km via arterial	Cadillac Fairview
Pickering Town Centre	Pickering	24.0 ha	Suburbs	0.0 km	20 Vic
Oshawa Shopping Centre	Oshawa	32.6 ha	General Motors plant	1.0 km via surface roads	Ivanhoe Cambridge
Midtown Mall	Oshawa	5.4 ha	Downtown Oshawa	3.0 km via surface roads	RioCan
Five Points Mall	Oshawa	20.0 ha	Agricultural land	5.4 km via surface roads	RioCan
Landsdowne Mall	Peterborough	n/a	Downtown Peterborough	n/a	20 Vic
		1168.1 ha			

fig 3.20 (opposite) The regional malls of the Greater Golden Horseshoe.



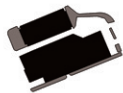
Quinte Mall, Belleville



Cataract Town Centre, Kingston



1000 Islands Mall, Brockville



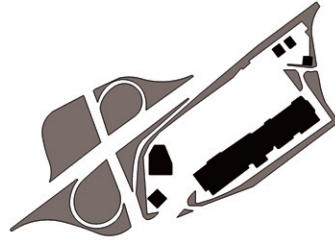
Cornwall Square, Cornwall



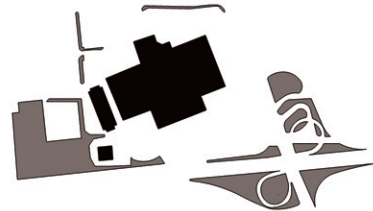
Hazeldean Mall, Kanata



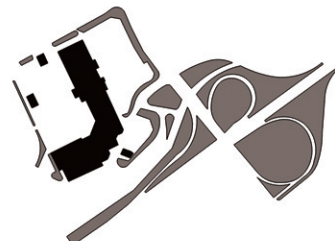
Bayshore Mall, Ottawa



Pinecrest Mall, Ottawa



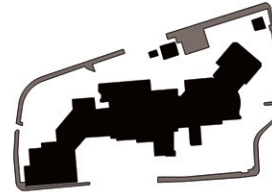
St. Laurent Centre, Ottawa



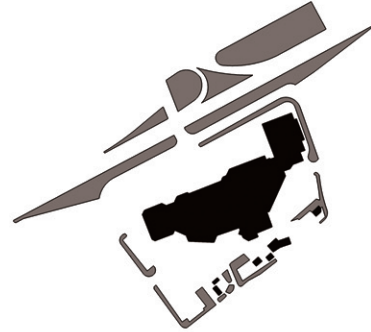
Gloucester Centre, Ottawa



Les Galeries de Hull, Hull



Les Galeries Gatineau, Gatineau

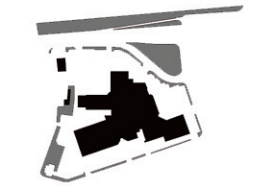


Place d'Orleans, Orleans

Mall Name	Location	Site Area	Surrounding Features	Distance to Expy	Owner/Operator
<u>Eastern Ontario</u>					
Quinte Mall	Belleville	37.2 ha	Agricultural land	0.0 km	Ivanhoe Cambridge
Cataraqui Town Centre	Kingston	11.4 ha	Suburbs	3.0 km via surface roads	Cadillac Fairview
1000 Islands Mall	Brockville	13.9 ha	Agricultural land	0.0	Arcturus
Cornwall Square	Cornwall	4.2 ha	Civic/Downtown/Rec	4.5 km via surface roads	Redcliff
		—————			
		66.7 ha			
<u>Ottawa/Hull</u>					
Hazeldean Mall	Kanata	8.9 ha	Green space	1.9 km via arterial	Bentall Capital
Bayshore Mall	Ottawa	20.3 ha	Lake Deschenes	0.0 km	Ivanhoe Cambridge
Pinecrest Mall	Ottawa	33.9 ha	Suburbs	0.0 km	unknown
St. Laurent Centre	Ottawa	25.2 ha	Can. supreme court	0.0 km	Morguard
Cloucester Centre	Ottawa	20.3 ha	CSIS HQ/Cons Area	0.0 km	unknown
Les Galeries de Hull	Hull	5.5 ha	Casinos	0.0 km	Ivanhoe Cambridge
Les Galeries Gatineau	Gatineau	24.6 ha	Suburbs	0.8 via highway	unknown
Place d'Orleans	Orleans	27.4 ha	Suburbs	0.0 km	Oxford Properties
Herongate Mall	Ottawa	n/a	Suburbs	n/a	unknown
Rideau Centre	Ottawa	n/a	Downtown	n/a	unknown
		—————			
		166.1 ha			

fig 3.21 (opposite, far left) The regional malls of eastern Ontario, from Belleville to Cornwall.

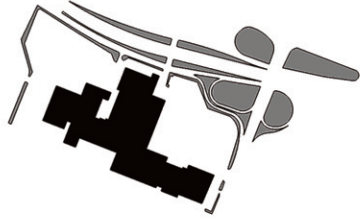
fig 3.22 (opposite) The regional malls of Ottawa/Hull



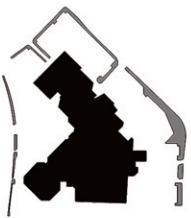
Faubourg de L'île, Pincourt



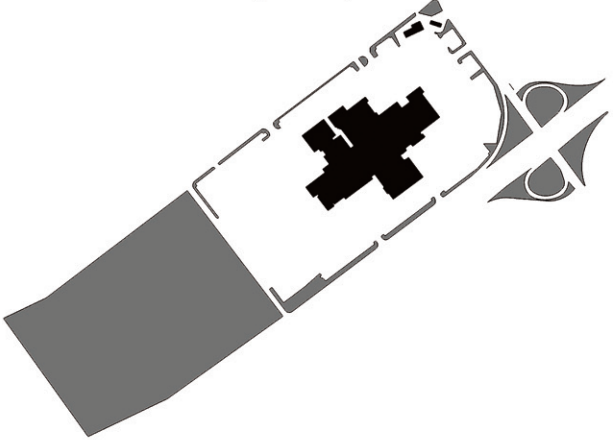
Place LaSalle, LaSalle



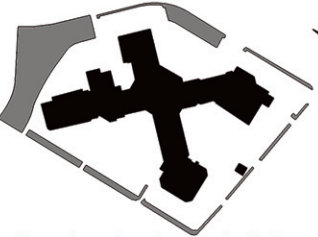
Place Versailles, Anjou



Mail Champlain, Greenfield Park



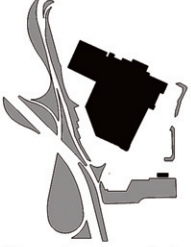
Fairview Pointe Claire, Kirkland



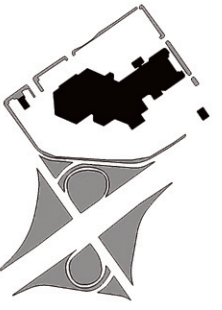
Cerrefour Angrignon, LaSalle



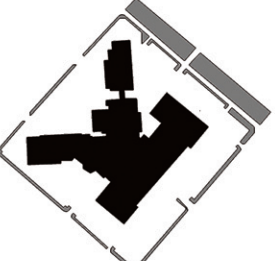
Les Galeries d'Anjou, Anjou



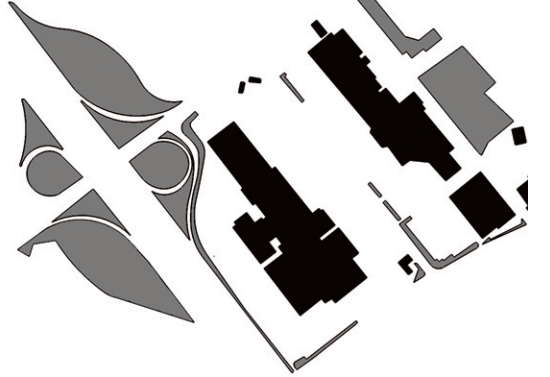
Place Longueuil, Longueuil



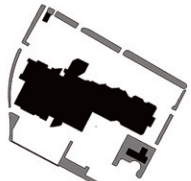
Galeries des Sources, Dollard-des-Ormeaux



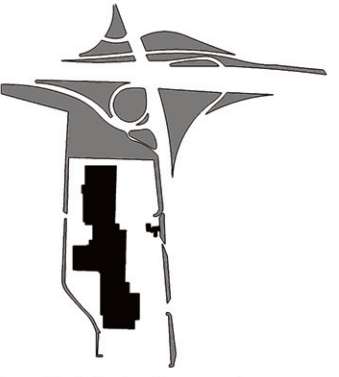
Place Vertu, Ste. Laurent



Centre Laval, Laval Les Galeries Laval, Laval



Cavendish Mall, Cote-Sainte Luc



Place Portobello, Brossard



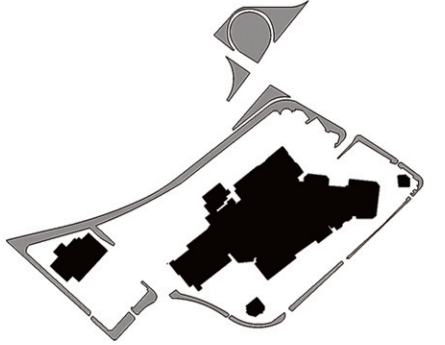
Les Jardins Dorval, Dorval



Rockland Shopping Centre, Montreal



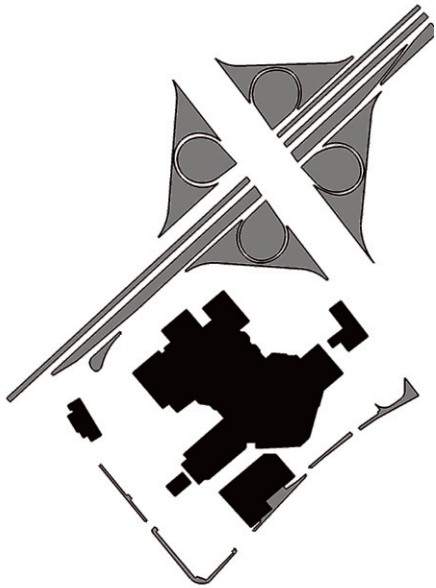
Centre Douvemay, Laval



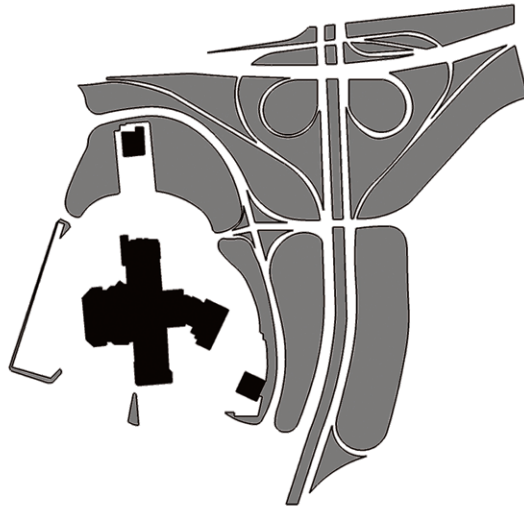
Place Rosemere, Sainte-Therese

Mall Name	Location	Site Area	Surrounding Features	Distance to Expy	Owner/Operator
<u>Greater Montreal Region</u>					
Faubourg de L'île	Pincourt	12.1 ha	Lake	0.0 km	Dgem
Fairview Pointe Claire	Kirkland	61.8 ha	Suburbs	0.0 km	Cadillac Fairview
Galerie Des Sources	Dollard-des-Ormeaux	19.7 ha	Airport	0.0 km	Cogir
Les Jardins Dorval	Dorval	12.5 ha	Airport	0.0 km	Edgecombe
Place LaSalle	LaSalle	11.4 ha	Suburbs	3.8 km via surface roads	unknown
Carregour Angrignon	La Salle	31.8 ha	Park land/Suburbs	0.6 via arterial	Westcliff
Place Vortu	Ste-Laurent	25.2 ha	Suburbs	0.7 via arterial	Ivanhoe Cambridge
Cavendish Mall	Cote-Sainte Luc	15.1 ha	Rail yard	2.4 via rail	unknown
Rockland Shopping Centre	Montreal	13.9 ha	Suburbs	0.0 km	Ivanhoe Cambridge
Place Versailles	Anjou	22.2 ha	Suburbs	0.0 km	unknown
Les Galeries d'Anjou	Anjou	57.0 ha	Suburbs	0.0 km	Cadillac Fairview
Place Portobello	Brossard	21.1 ha	Suburbs	0.0 km	Cogir
Centre Douvernay	Laval	6.7 ha	Suburbs	1.1 km via arterial	Edgecombe
Mail Champlain	Greenfield Park	19.5 ha	Suburbs	0.5 km via arterial	Ivanhoe Cambridge
Place Longueuil	Longueuil	15.8 ha	Six Flags	0.0 km	Cogir
Les Galeries Laval	Laval	24.5 ha	Major Commercial	0.0 km	Marton
Centre Laval	Laval	34.2 ha	Major Commercial	0.0 km	Homburg
Place Rosemere	Sainte-Therese	36.5 ha	Former GM Site	0.0 km	Morguard

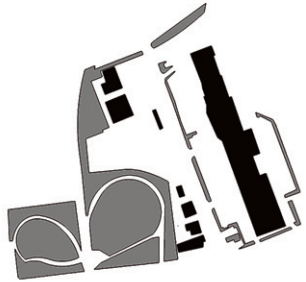
fig 3.23 (opposite) The regional malls of the greater Montreal region.



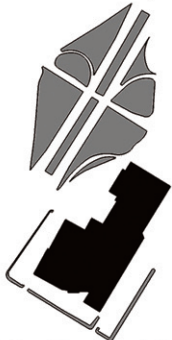
Le Carrefour Laval, Laval



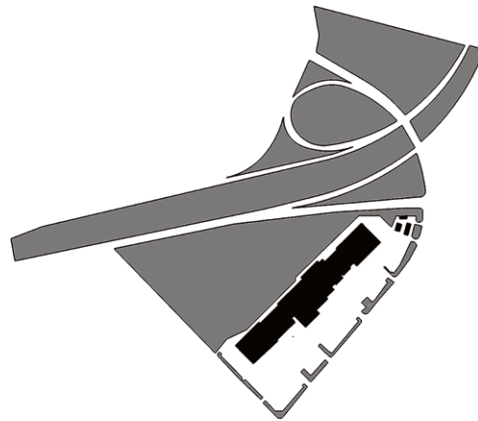
Promenades Sainte Bruno, Sainte-Hubert



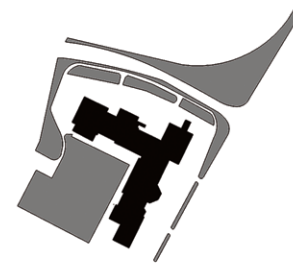
Les Galeries Terrebonne, Terrebonne



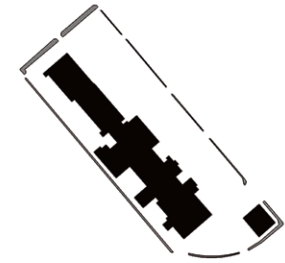
Les Galeries Rive Nord, Repentigny



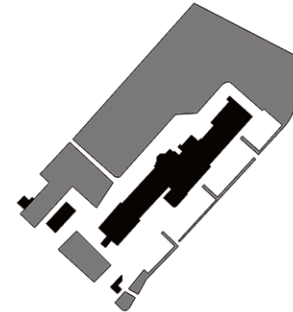
Les Promenades Deux Montagnes, Deux Montagnes



Les Promenades des Sorel, Sorel



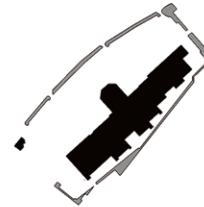
Centre Commercial Les Rivières, Trois Rivières



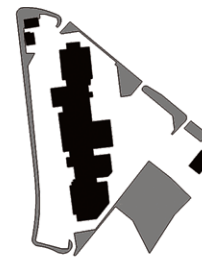
Les Promenades Drummondville, Drummondville



Le Carrefour Trois Rivières Ouest, Trois Rivières



Carrefour Bois Francs, Victoriaville

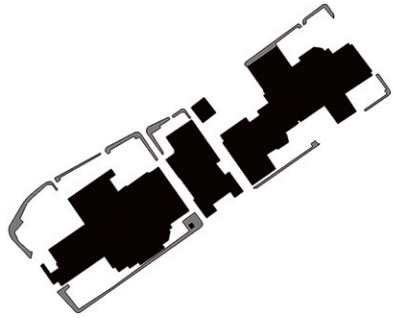


Le Grande Place de Bois Francs, Victoriaville

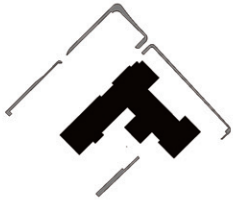
<i>Mall Name</i>	<i>Location</i>	<i>Site Area</i>	<i>Surrounding Features</i>	<i>Distance to Expy</i>	<i>Owner/Operator</i>
<u>Greater Montreal Region (con't)</u>					
<i>Le Carrefour Laval</i>	<i>Laval</i>	<i>62.7 ha</i>	<i>Major Commercial</i>	<i>0.0 km</i>	<i>Cadillac Fairview</i>
<i>Galeries Terrebonne</i>	<i>Terrebonne</i>	<i>20.9 ha</i>	<i>River</i>	<i>0.0 km</i>	<i>Westcliff</i>
<i>Les Galeries Rive Nord</i>	<i>Repentigny</i>	<i>22.6 ha</i>	<i>Suburbs</i>	<i>0.0 km</i>	<i>Ivanhoe Cambridge</i>
<i>Promenades Sainte Bruno</i>	<i>Sainte-Hubert</i>	<i>86.3 ha</i>	<i>Agricultural land</i>	<i>0.0 km</i>	<i>Cadillac Fairview</i>
<i>Les Promenades Deux Montagnes</i>	<i>Deux Montagnes</i>	<i>45.8 ha</i>	<i>Agricultural land</i>	<i>0.0 km</i>	<i>unknown</i>
		<hr/> <i>679.3 ha</i>			
<u>Eastern Quebec</u>					
<i>Les Promenades des Sorel</i>	<i>Sorel</i>	<i>23.1 ha</i>	<i>Agricultural land</i>	<i>0.0 km</i>	<i>Westcliff</i>
<i>Les Promenades Drummondville</i>	<i>Drummondville</i>	<i>30.2 ha</i>	<i>Agricultural land</i>	<i>0.0 km</i>	<i>Westcliff</i>
<i>Carrefour Bois Francs</i>	<i>Victoriaville</i>	<i>13.3 ha</i>	<i>Agricultural land</i>	<i>28.5 km via surface roads</i>	<i>unknown</i>
<i>La Grande Place des Bois Francs</i>	<i>Victoriaville</i>	<i>21.3 ha</i>	<i>Agricultural land</i>	<i>29.1 km via surface roads</i>	<i>Cogir</i>
<i>Centre Commercial Les Rivières</i>	<i>Trois Rivières</i>	<i>19.9 ha</i>	<i>Residential</i>	<i>2.9 km via surface roads</i>	<i>Ivanhoe Cambridge</i>
<i>Le Carrefour Trois Rivières Ouest</i>	<i>Trois Rivières</i>	<i>16.5 ha</i>	<i>River</i>	<i>0.9 km via surface roads</i>	<i>Cogir</i>
		<hr/> <i>124.3 ha</i>			

fig 3.24 (opposite, far left) The regional malls of the greater Montreal region.

fig. 3.25 (opposite) The regional malls of eastern Quebec, from Sorel to Trois Rivières.



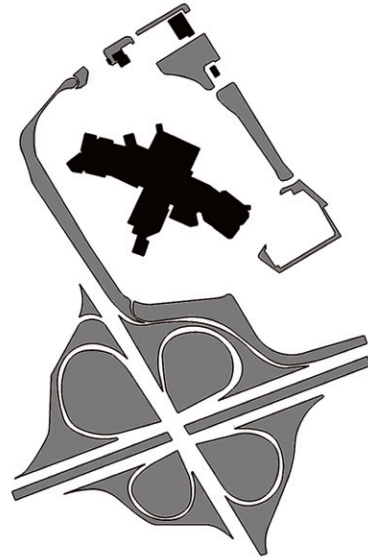
Place Laurier, Quebec City
Place de la Cite, Quebec City
Place Ste. Foy, Quebec City



Les Galeries Chagnon, Levis



Place Fleur de Lys, Quebec City



Galerie de la Capitale, Quebec City



Les Promenades Beauport, Quebec City

Mall Name	Location	Site Area	Surrounding Features	Distance to Expy	Owner/Operator
		<u>Quebec City</u>			
<i>Place Laurier</i>	Quebec City	13.4 ha	Laval University	0.0 km	Ivanhoe Cambridge
<i>Place de la Cite</i>	Quebec City	3.2 ha	Laval University	0.0 km	Cominar
<i>Place Ste. Foy</i>	Quebec City	13.0 ha	Laval Universtiy	0.0 km	Ivanhoe Cambridge
<i>Les Galeries Chagnon</i>	Levis	15.7 ha	Golf/Suburbs	1.0 km via surface roads	Westcliff
<i>Place Fleur de Lys</i>	Quebec City	34.8 ha	Suburbs	0.0 km	Oxford Properties
<i>Galerie de la Capitale</i>	Quebec City	64.2 ha	green space	0.0 km	Redcliff Realty
<i>Les Promenades Beauport</i>	Quebec City	36.1 ha	Agricultural land	0.0 km	Cominar
		<hr/> 180.4 ha			

fig. 3.26 (opposite) The regional malls of Quebec City.

"Ideas flow more freely, are honed more sharply, and can be put into practice more quickly when large numbers of innovators, implementers, and financial backers are in constant contact with one another, both in and out of the office. Creative people cluster not simply because they like to be around one another or they prefer cosmopolitan centers with lots of amenities, though both those things count. They and their companies also cluster because of the powerful productivity advantages, economies of scale, and knowledge spillovers such density brings." - Richard Florida.²⁸

Demographic Mapping

Though of the same typology and located along the same infrastructural backbone, the regional malls of the Windsor/Quebec corridor vary according to a number of criteria; site size and surrounding context, proximity to the expressway, economic and social status of the surrounding local and regional markets and the maturity of nearby neighbourhoods all factor into the size of a mall, the type and format of its outlets and its role in local and regional transit infrastructures. There are also a number of demographic conditions to consider when determining a site's fitness for development. Much as Gruen developed a formula for locating and operating successful shopping centres, megaregional nodes at mall sites must also examine external factors.

Some, such as population density, centrality, dwelling value and median income have value that can be directly translated from shopping centre to urban centre. Others, like percentage of foreign born and education metrics apply more directly to planning for a megaregion that will need to attract highly-skilled immigrants in order to continue to grow sustainably.

At the macro scale the Windsor/Quebec corridor must compete with other global megaregions; it therefore makes sense to be aware of similar factors within the region in order to smartly direct development in the most globally advantageous way. Within the otherwise linear corridor exist clusters of demographic conditions at various concentrations. The exact nature of these clusters-- as well as areas where there are no clusters-- must be understood in order to create complimentary communities that attract a diverse mix of uses and levels of inhabitation.

Seven categories are identified on pages 62 and 63 and applied to each mall site in order to form a series of maps showing demographic differentiations at the regional scale. These maps begin to shape the framework for the distribution of growth within a new megaregional plan.

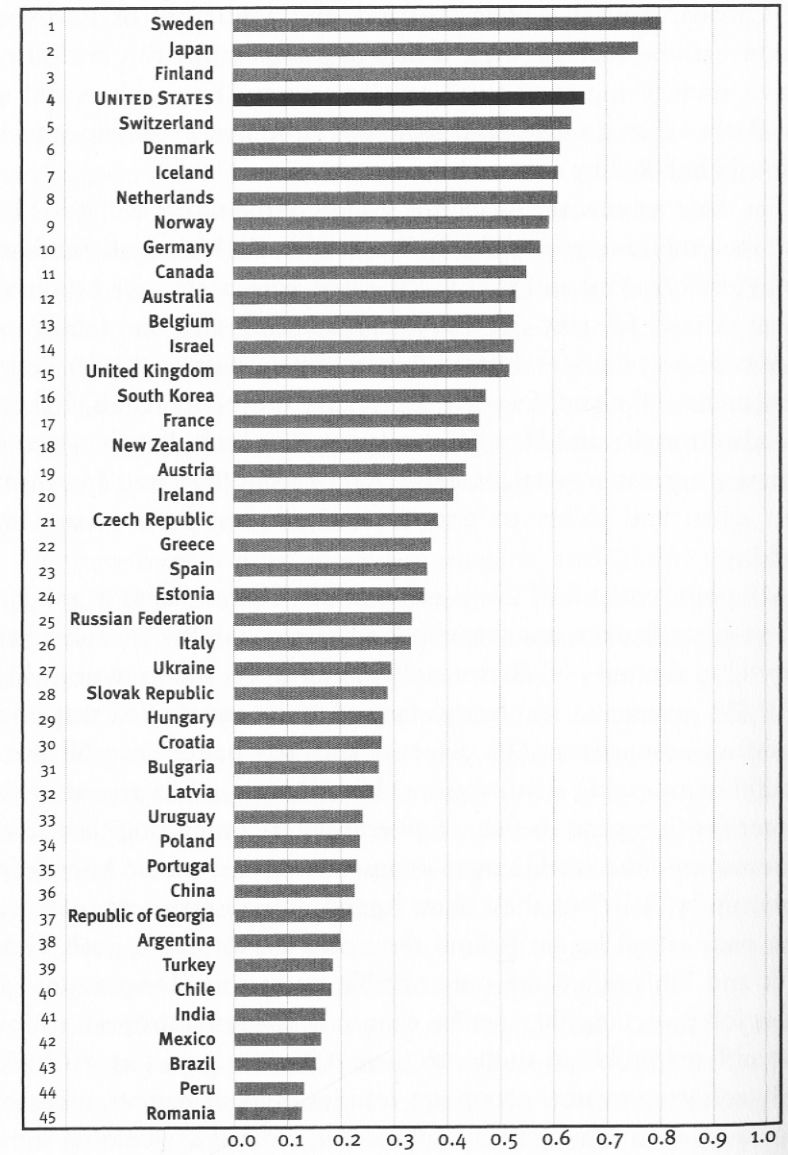


fig. 3.27 (above) The "Global Creativity Index", a composite of national competitiveness based on economic factors such as Technology, Talent and Tolerance. Canada ranks 11th. Richard Florida, *Flight of the Creative Class*, 2007.



fig. 3.28 (above) Downtown Toronto, or roughly the site area of the combined three largest mall property owners in the Windsor/Quebec corridor. www.spatialwiki.com

Ownership

Of the 100 malls in this study, 78 are owned by a total of only 10 different companies. More than a third (36) are controlled by just two owners; Ivanhoe Cambridge (21) and Cadillac Fairview (15). The top five owners combine to control a majority of 55 malls, including nearly all of the 'A', 'destination' and 'superregional' malls in the corridor. This presents a considerable advantage from a development perspective, particularly at such a large scale. Dealing with so few owners-- whether buying the properties in a development trust or attempting to convince the owners to intensify the properties themselves, while also dealing in areas with few bi-laws or special interest groups-- could potentially lead to much faster, less compromising developments than could exist in historical downtowns. In fact, it is possible that working with all 100 mall sites could involve fewer concerned parties than a single building project in an existing downtown.

Ivanhoe Cambridge's 21 sites combine for approximately 5.4 km² of site area. Cadillac Fairview's 15 sites-- including a number of superregional malls-- combine for approximately 6.0 km². Morguard, the next largest holder of mall properties in the corridor with 7, has approximately 1.9km² of site area. These three owners alone have over 13km² of land, approximately equal to downtown Toronto (bordered on the west by Bathurst Street, on the north by Bloor, on the east by the Don Valley Parkway, and on the south by the Gardiner Expressway).

Purchasing such large quantities of mall properties is not unheard of; in 2004, General Growth acquired Rouse Co. in a \$12.6 billion deal for 150 properties, including 37 regional malls. Many other similar deals and mergers have taken place in the last decade.

"By almost any measure the international landscape is not at all flat. On the contrary, our world is amazingly 'spiky'. In terms of both sheer economic horsepower and cutting-edge innovation, surprisingly few regions truly matter in today's global economy. What's more, the tallest peaks- the cities and regions that drive the world economy- are growing even higher, while the valleys mostly languish." - Richard Florida.²⁹

Spiking The Corridor

These demographic factors, when combined, form spikes at each node where the baseline width represents site size, or volumetric capacity for growth. The height of each spike is representative of a combination of 7 different contributing demographic factors; the taller the spike, the more potentially valuable the node. Spikes with the greatest area therefore have the most demographic value and the most space for concentrated intensification. These sites will attract the densest and largest clusters of inhabitation.

The notion of 'spikiness' is borrowed from Richard Florida's book, "The Flight of the Creative Class", in which he maps a number of important global factors as spikes of concentration, distributed within various global economic megaregions. Contrary to Thomas Friedman's assertion that globalization has 'flattened' the world³⁰, Florida argues that it has instead concentrated development in increasingly competitive regions. The Great Lakes Megaregion is one such 'spike', and the following set of maps and diagrams attempts to break down the Windsor/Quebec corridor to illustrate the region's constituent 'spikiness' at the local scale.

These data sets allow for a categorization of regional mall sites according to site size, distance from the expressway, a set of seven different demographic factors, ownership, and various combinations thereof to test ideas against the proposed developmental framework.

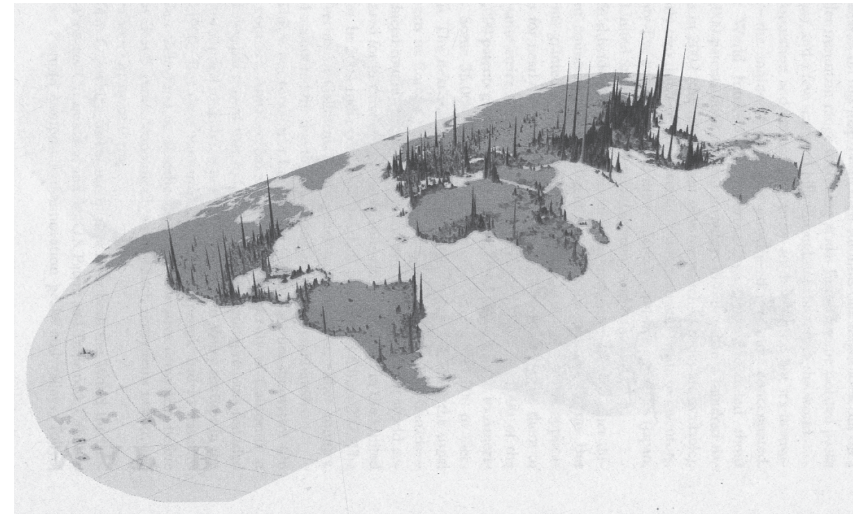


fig. 3.29 (above) and fig 3.30 (below) Mappings of various global factors show a spike in intensity and concentration around various megaregions. Richard Florida, Flight of the Creative Class, 2007.

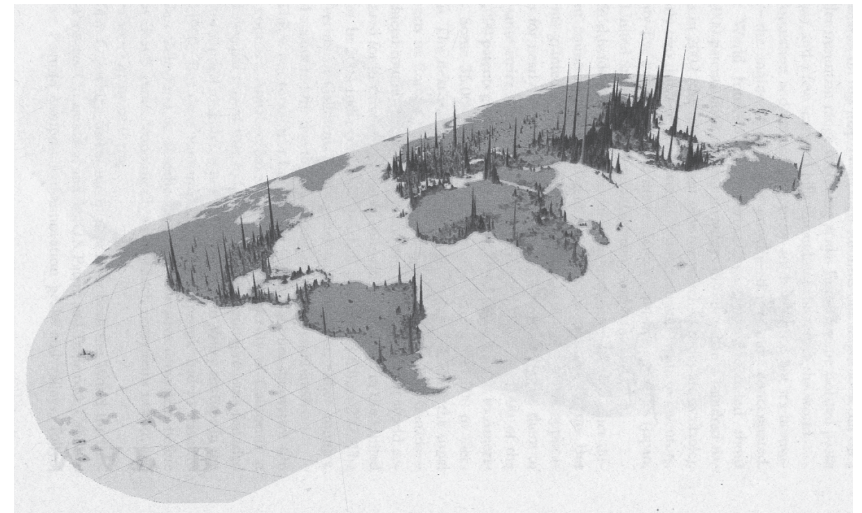




fig 3.31 Population Density
 "With 3.5 persons per square kilometre, Canada is one of the countries with the lowest population densities in the world. Census metropolitan areas (CMAs) with the highest population densities—Toronto (866), Montréal (854), Vancouver (735), Kitchener (546), Hamilton (505), and Victoria (475)—were located close to United States border."³¹

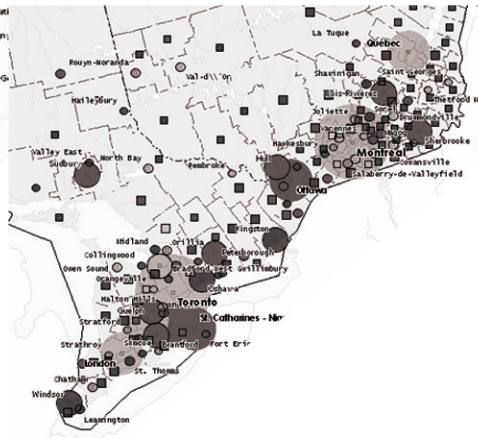


fig 3.32 Index of Centrality
 "While the size of the market determines the amount of service activity within a city, it may have more service activity than indicated by the size of the market, and this surplus of facilities is called "centrality". A high index value of centrality implies that the city is serving an extensive region outside the city, as well as the urban market itself. Conversely, a deficiency of service facilities suggests that the city's external role is quite limited, or that it may even import goods and service from nearby centres. Centrality implies an extensive and well-populated service area."³²



fig 3.33 Foreign Born
 "The majority of the foreign-born population (86.8%) lived in three provinces: Ontario, Quebec and British Columbia. As well, these three provinces received 85.8% of all newcomers who arrived in Canada since 2001. In fact, Ontario and British Columbia were home to a higher proportion of foreign-born and recent immigrants than their proportion of the Canadian population. In 2006, 38.5% of the total population in Canada lived in Ontario, of which, the province had over one-half (54.9%) of the foreign-born population and one-half (52.3%) of the recent immigrants."³³

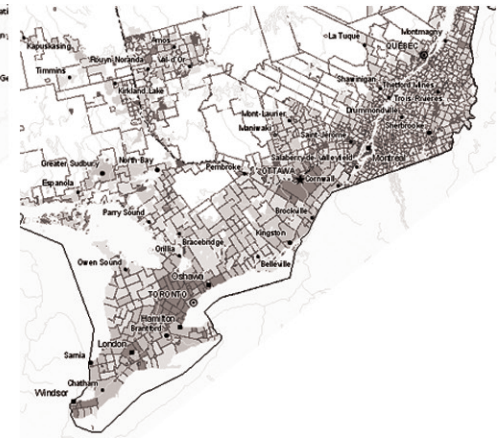


fig 3.34 Median Income
 "The median total income of individuals in Canada was \$22 120 in 2000. Median total income for individuals has been increasing since 1997, when it was \$20 464 nationally after adjusting for inflation."³⁴

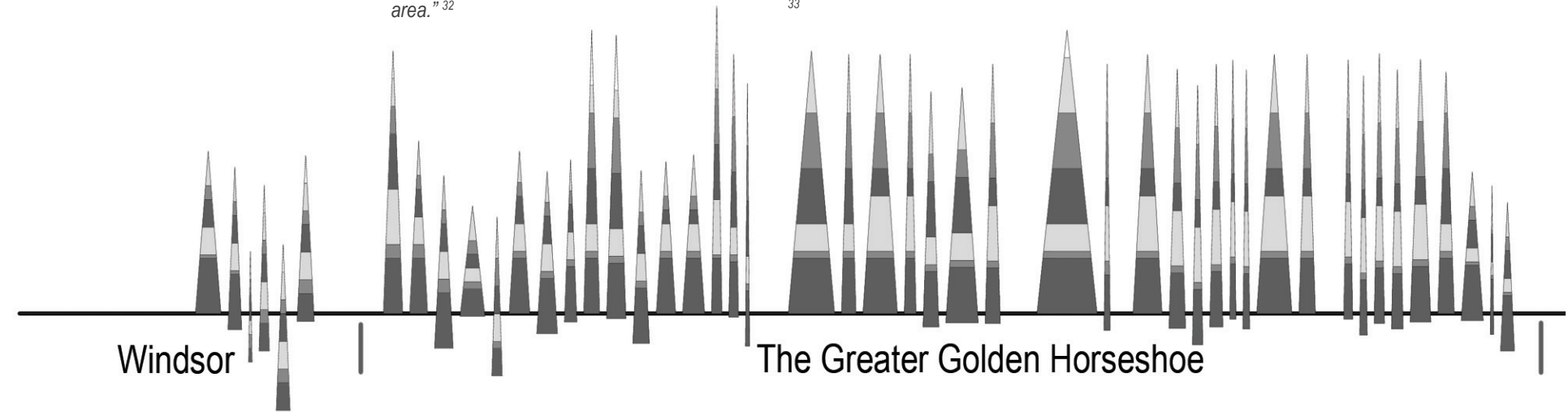




fig 3.35 Average Dwelling Value

"The average value of a dwelling in Canada was \$162 709 according to the 2001 Census, compared to the 1996 Census average of \$147 877, an increase of 10%. All provinces and territories have experienced a rise in housing values, particularly in Alberta and Ontario, markedly in Calgary, Ottawa and Toronto."³⁵



fig 3.36 University Education

"In 2001, the proportion of the population (individuals aged 15 and older) with non-university post-secondary credentials had more than doubled since 1971 to 36%. This, added to the 15% with university qualifications, meant that more than one-half (51%) of all Canadians aged 15 and over had post-secondary qualifications in 2001."³⁶

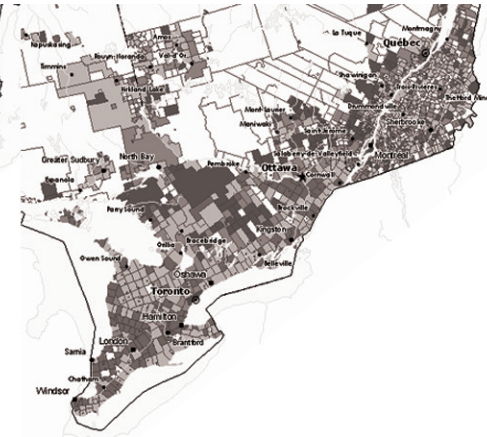


fig 3.37 Overall Quality of Life

"Overall quality of life is a composite assessment of the quality of the social, economic and physical environments. Eleven domains (or aspects of life) have been used to assess the external conditions of overall quality of life. The eleven domains were categorized into the three environments of overall quality of life. The quality of each domain was assessed by several indicators, which were then combined to create a quality of life index. Only communities (census subdivisions) with data for all indicators have been mapped."³⁷

fig 3.38 Spiking The Line (bottom)

A diagram of each mall on the corridor reduced to show three elements; the site size (represented by the width of the base of each spike) the proximity to the highway backbone (represented by the offset distance of the base of each spike from the line) and the seven demographic figures as shown above (represented by the height of each spike and shaded to show each factor individually).

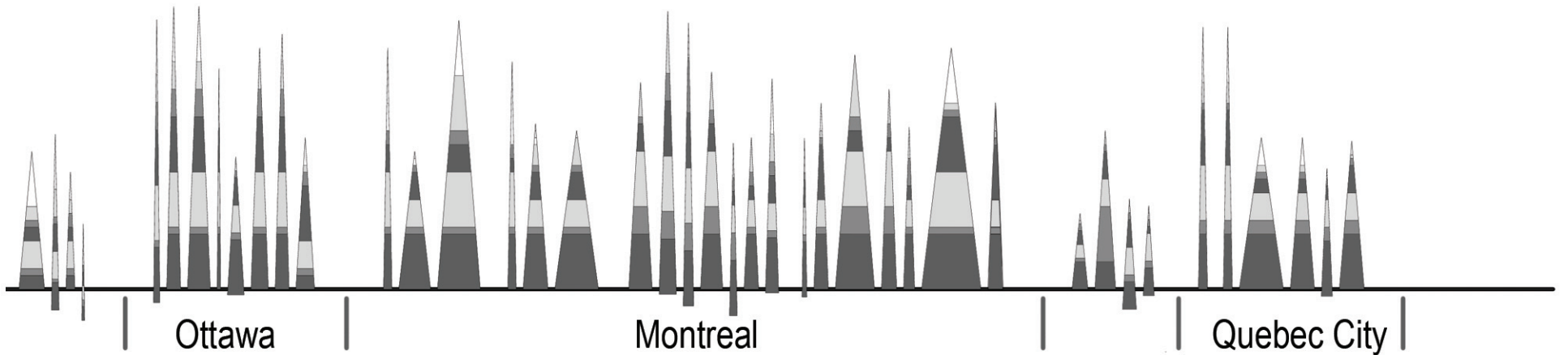
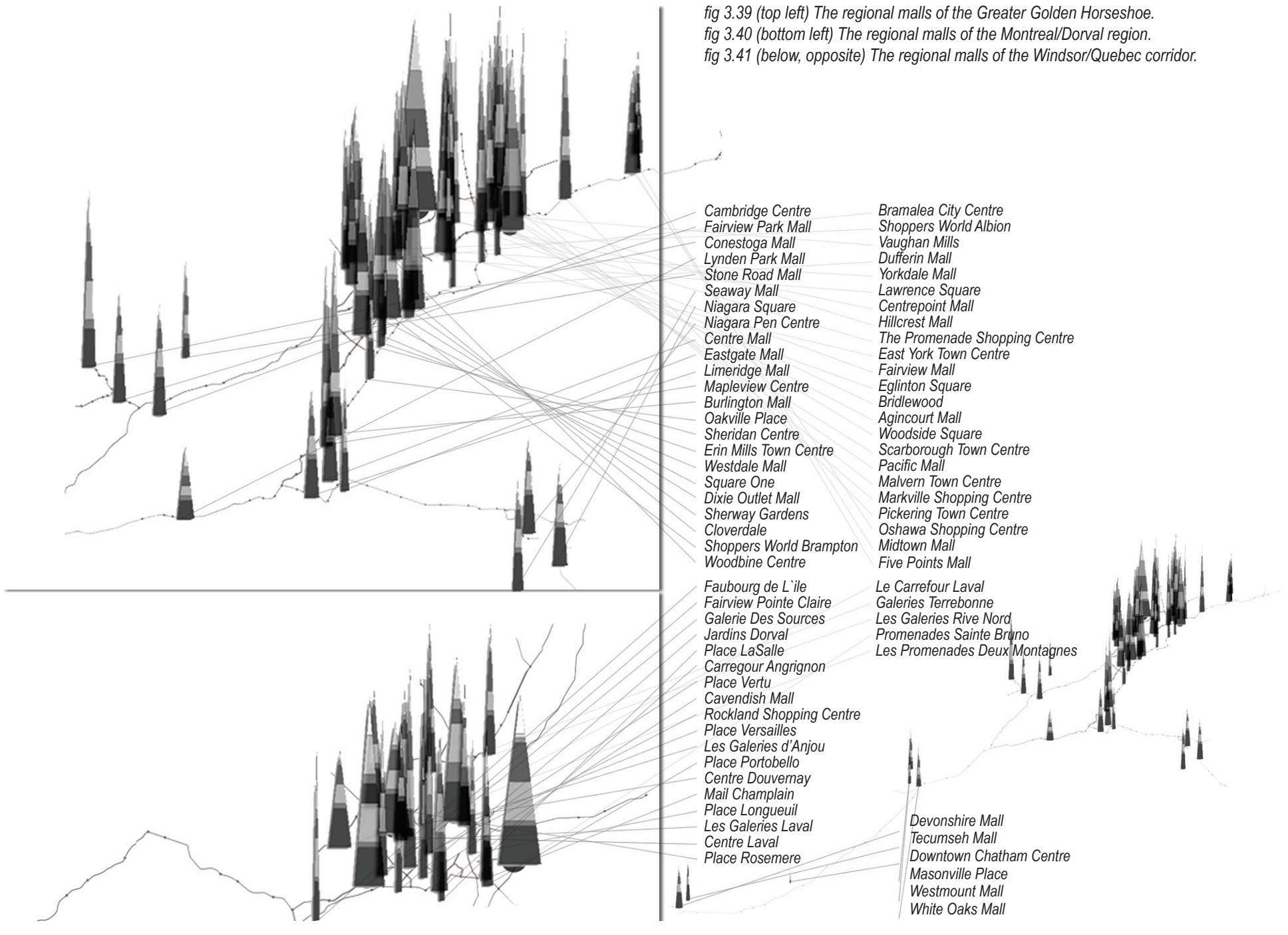
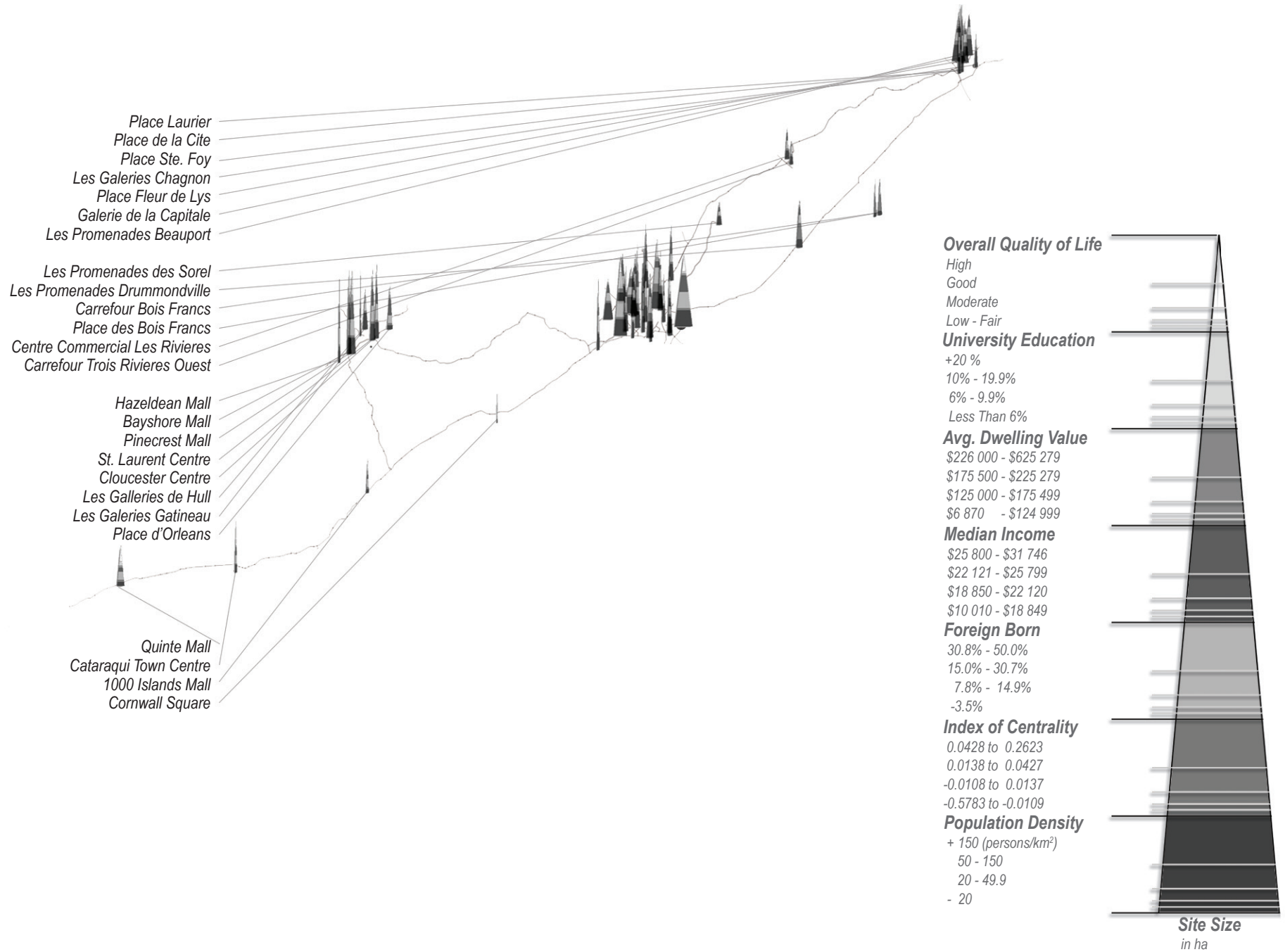


fig 3.39 (top left) The regional malls of the Greater Golden Horseshoe.

fig 3.40 (bottom left) The regional malls of the Montreal/Dorval region.

fig 3.41 (below, opposite) The regional malls of the Windsor/Quebec corridor.





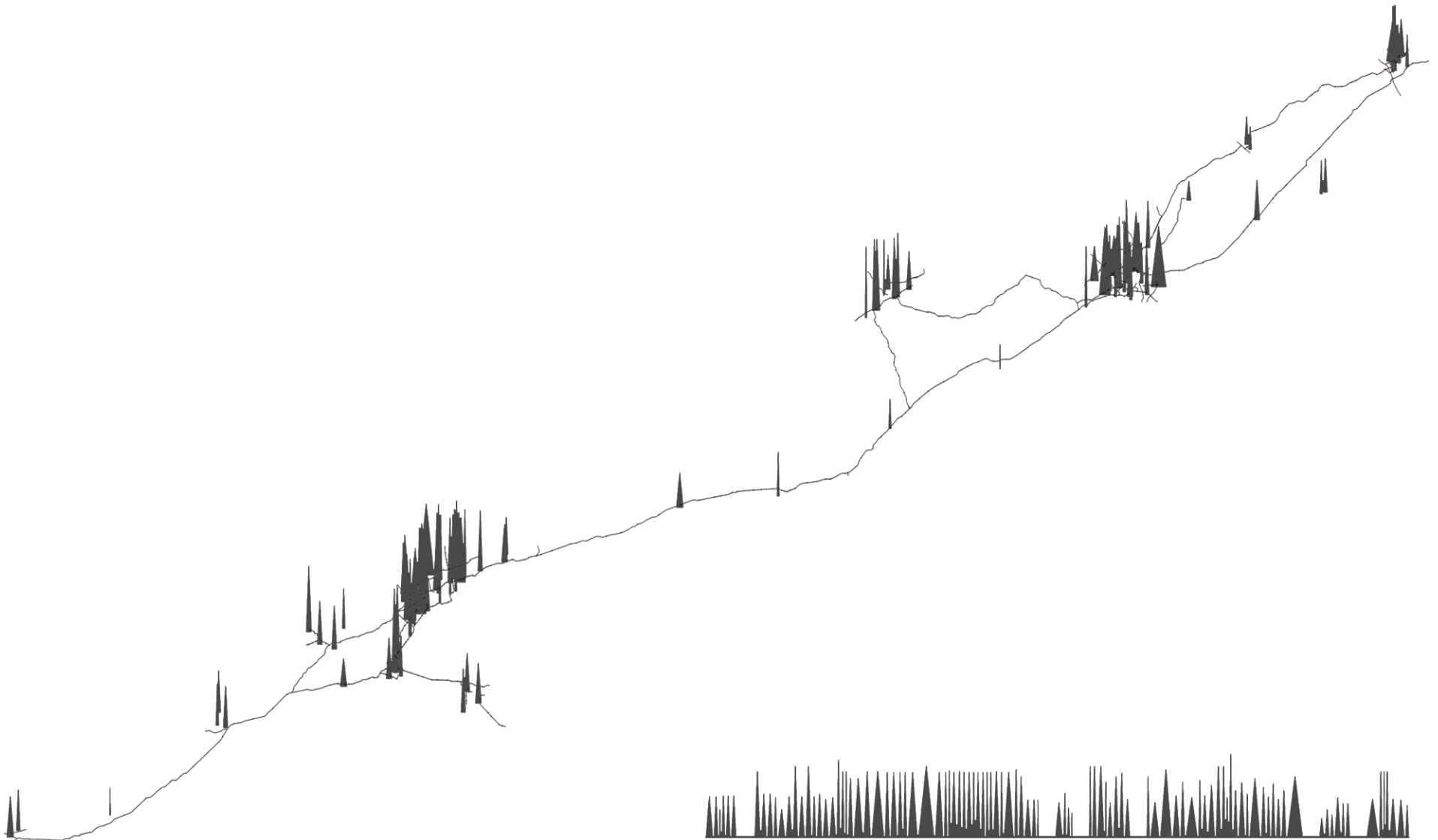


fig 3.42 (above) A demographic study of the regional malls of the Windsor/Quebec corridor, mapped onto the highway backbone and abstracted onto a single line.

fig 3.43 (below) Malls with site area greater than 10ha.

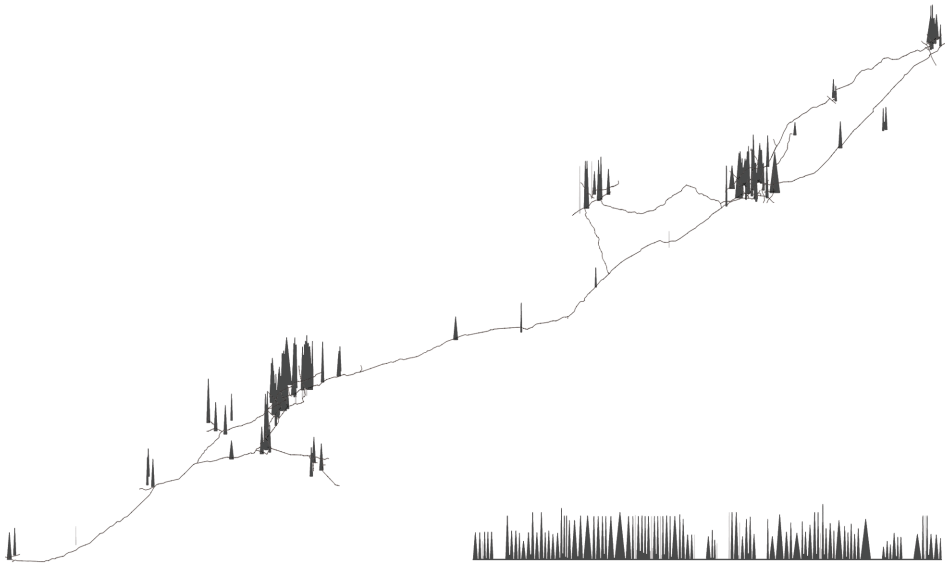


fig 3.44 (below) Malls with site area greater than 20ha.

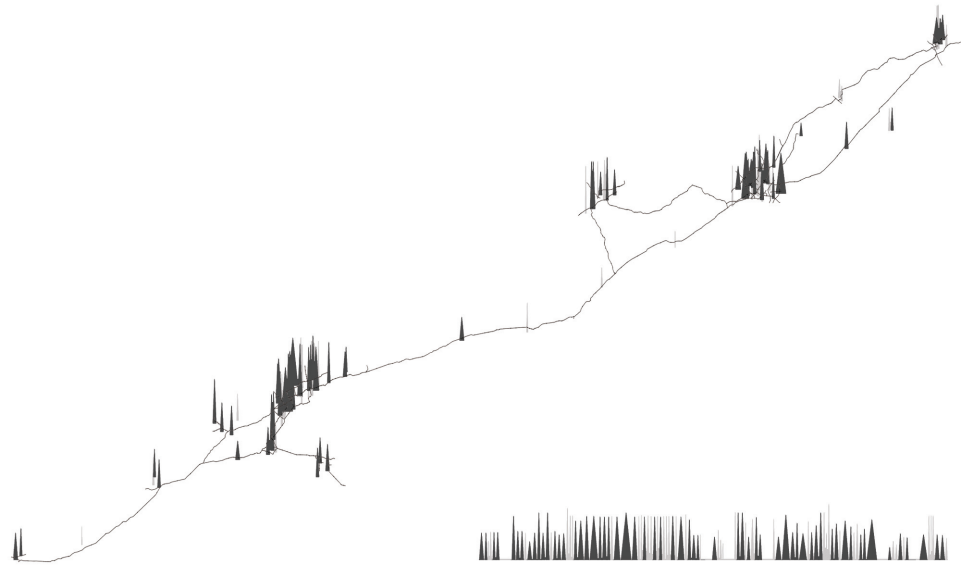


fig 3.45 (below) Malls with site area greater than 30ha.

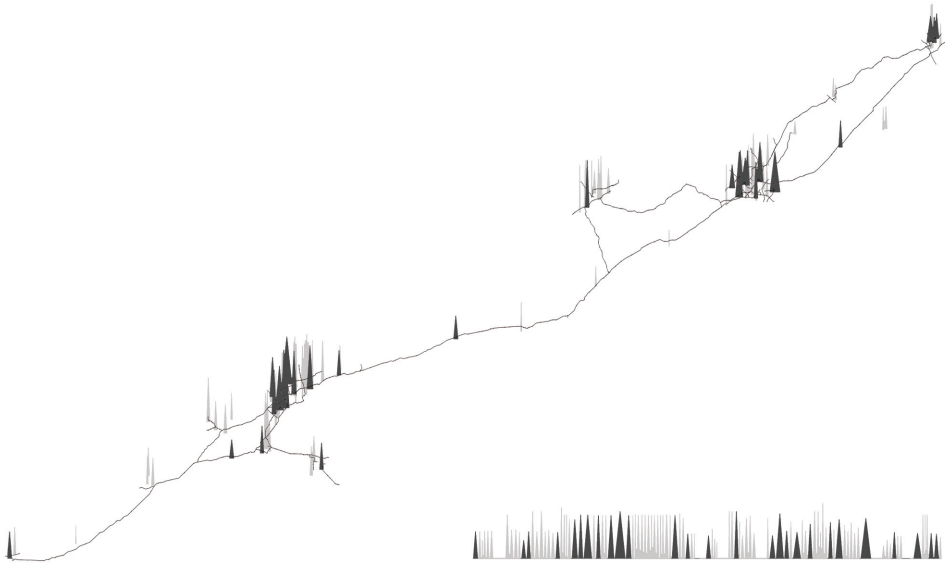


fig 3.46 (below) Malls with site area greater than 40ha.

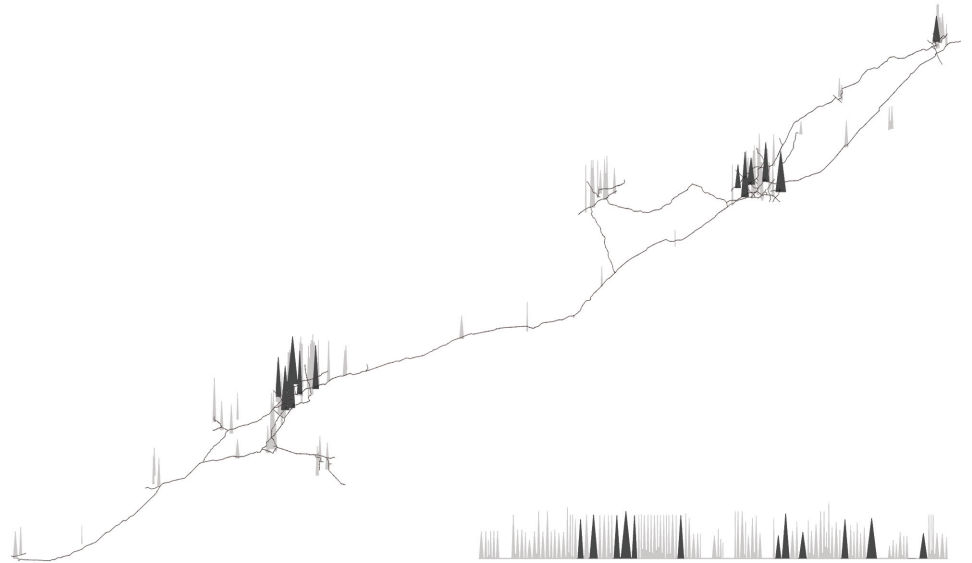


fig 3.47 (below) Malls within 3km of the expressway.

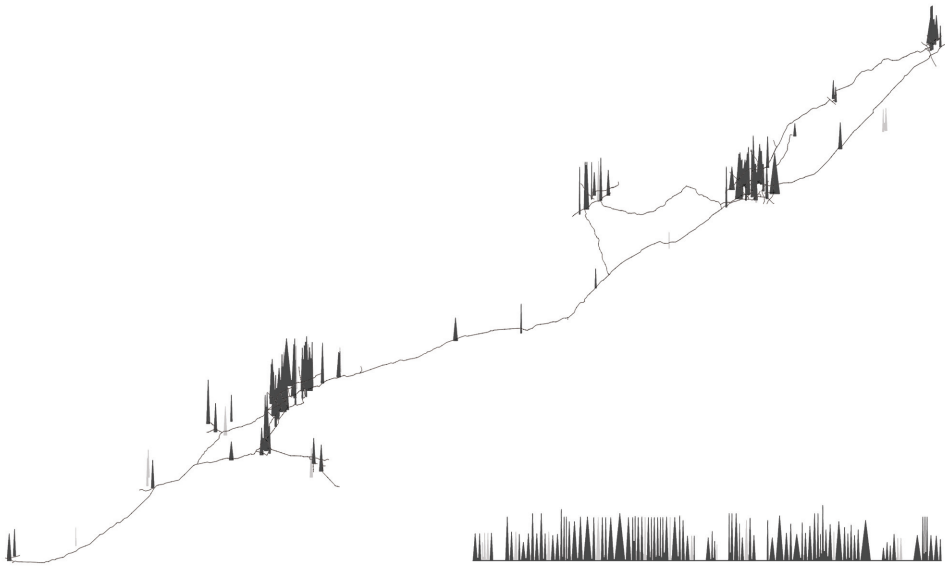


fig 3.48 (below) Malls within 2km of the expressway.

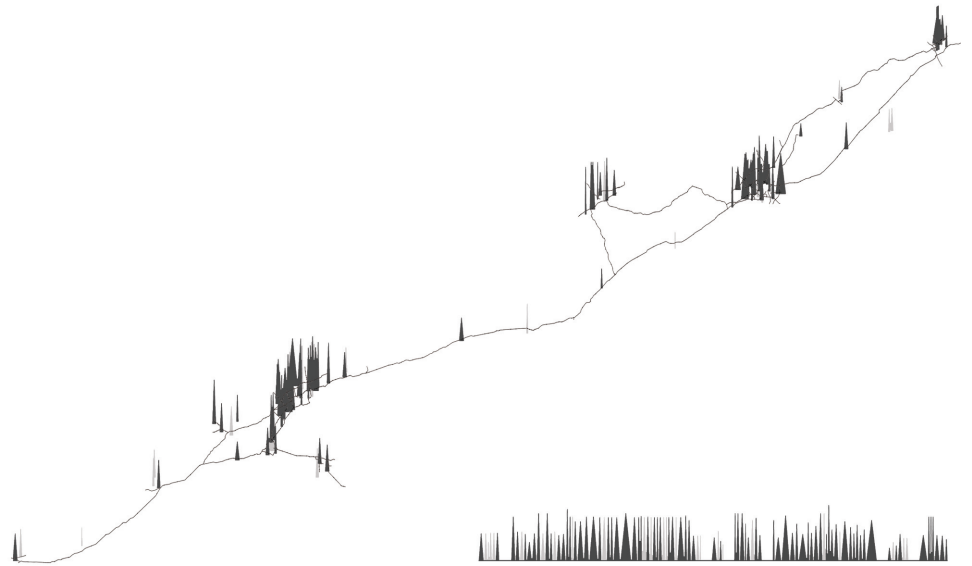


fig 3.49 (below) Malls within 1km of the expressway.

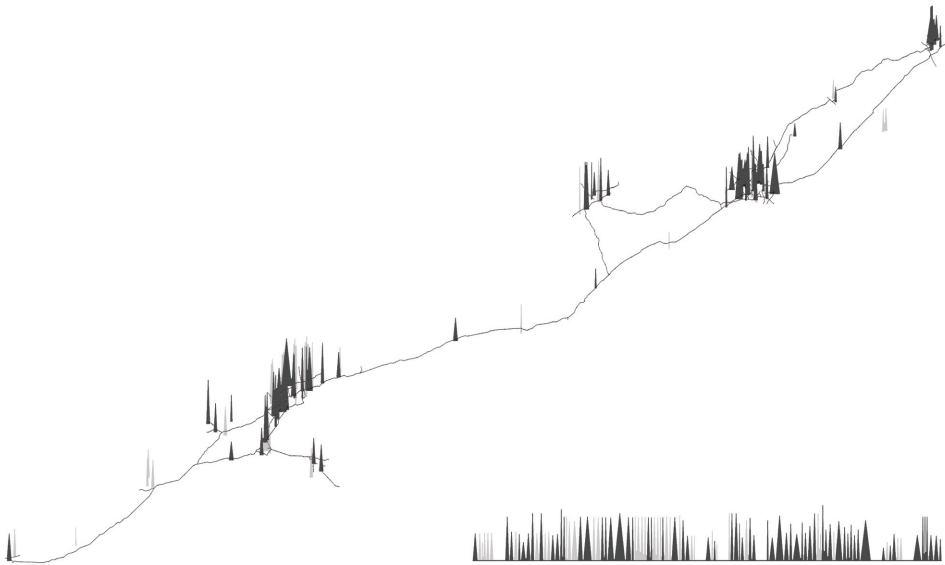


fig 3.50 (below) Malls adjacent to the expressway.

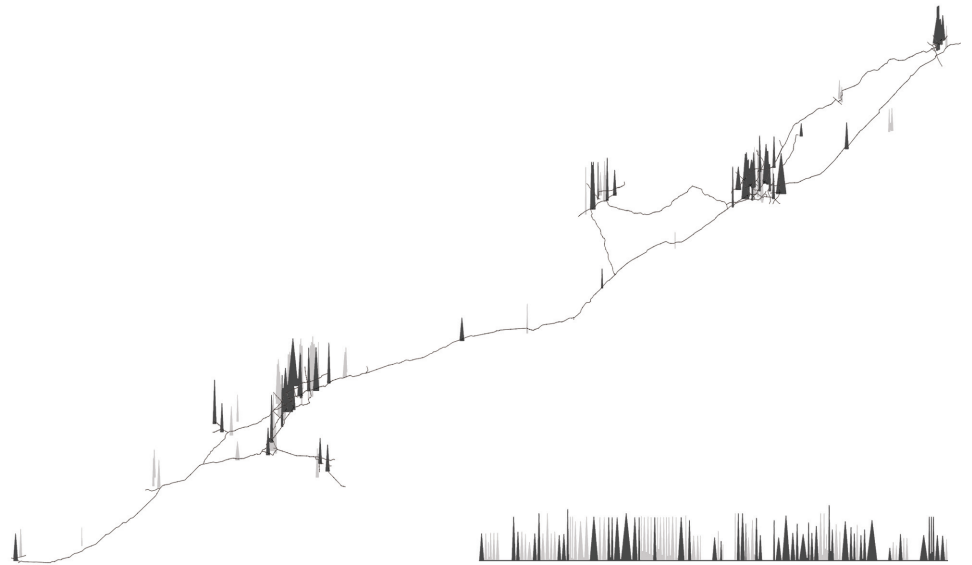


fig 3.51 (below) Malls within a population density of 150 persons per kilometer or more.

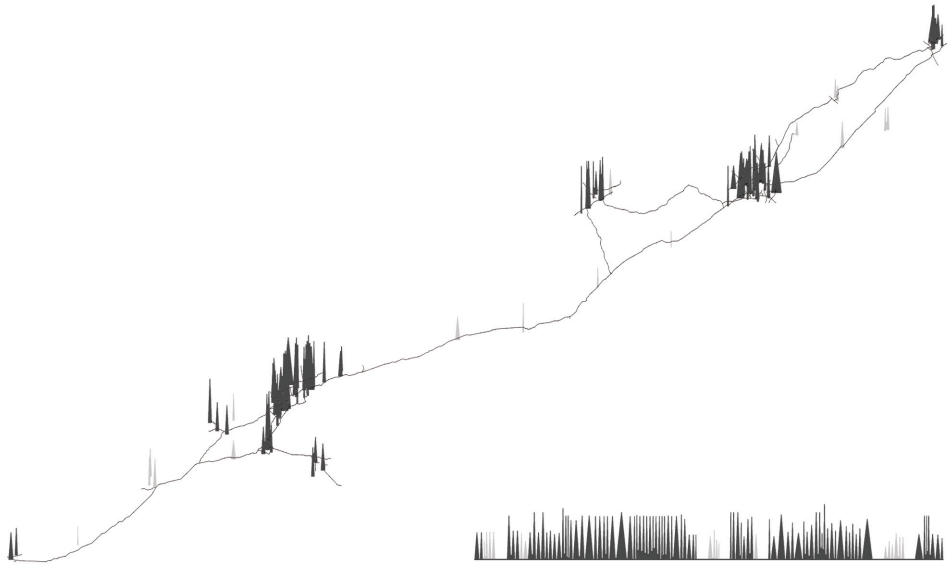


fig 3.52 (below) Malls within a population where between 30% - 50% are foreign born.

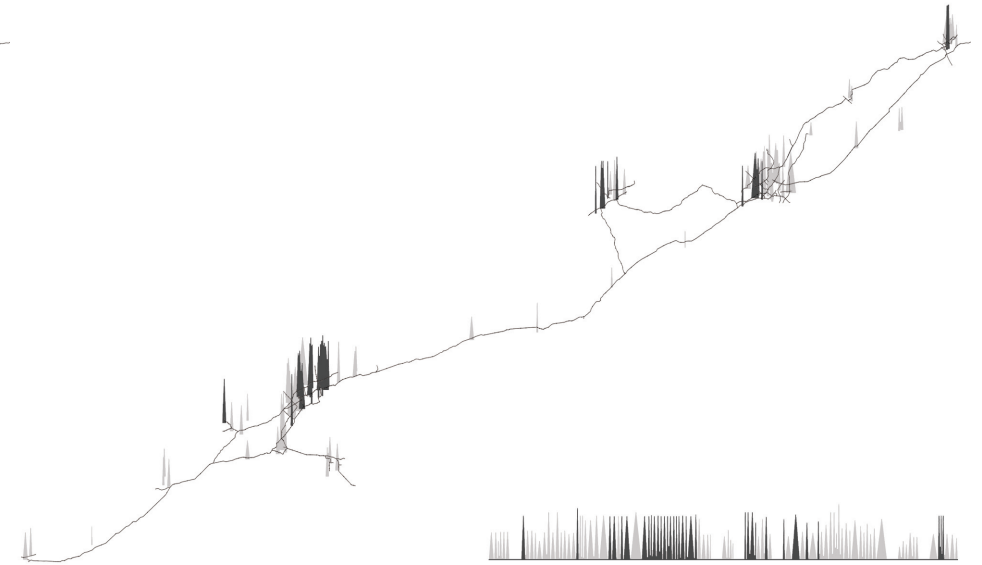


fig 3.53 (below) Malls within a population where over 20% hold a university degree.

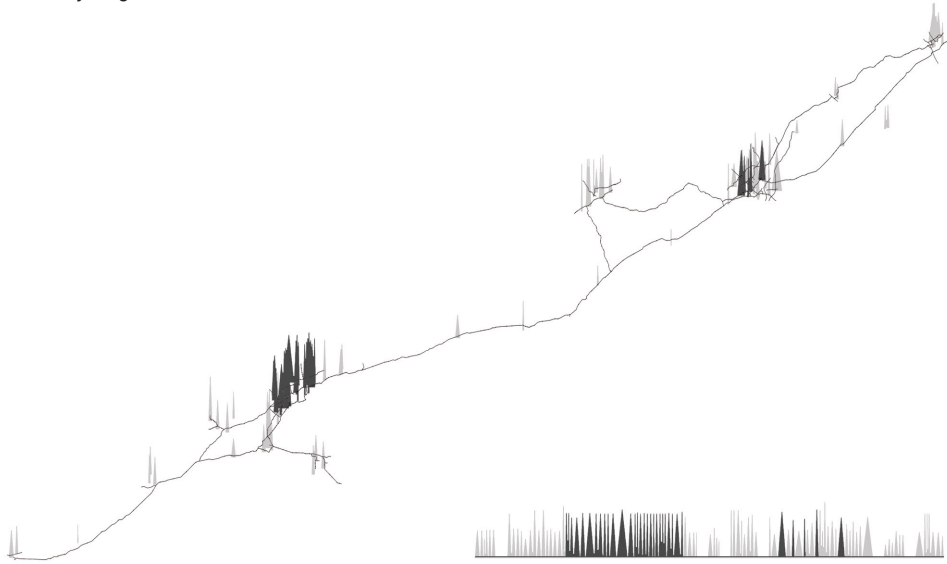


fig 3.54 (below) Malls within a population that average a top-half score in all accounted for demographic categories.

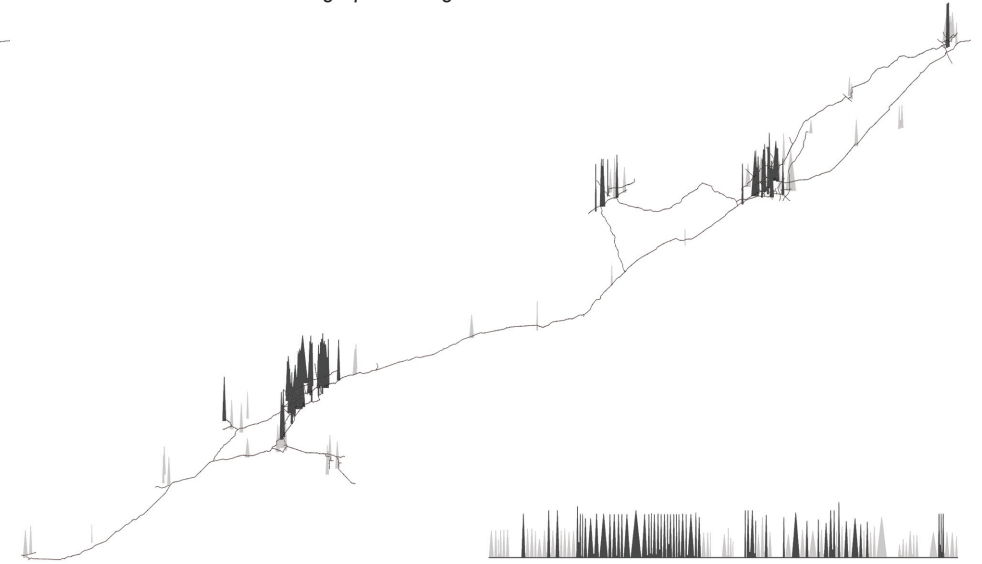


fig 3.55 (below) Malls owned by Ivanhoe Cambridge.

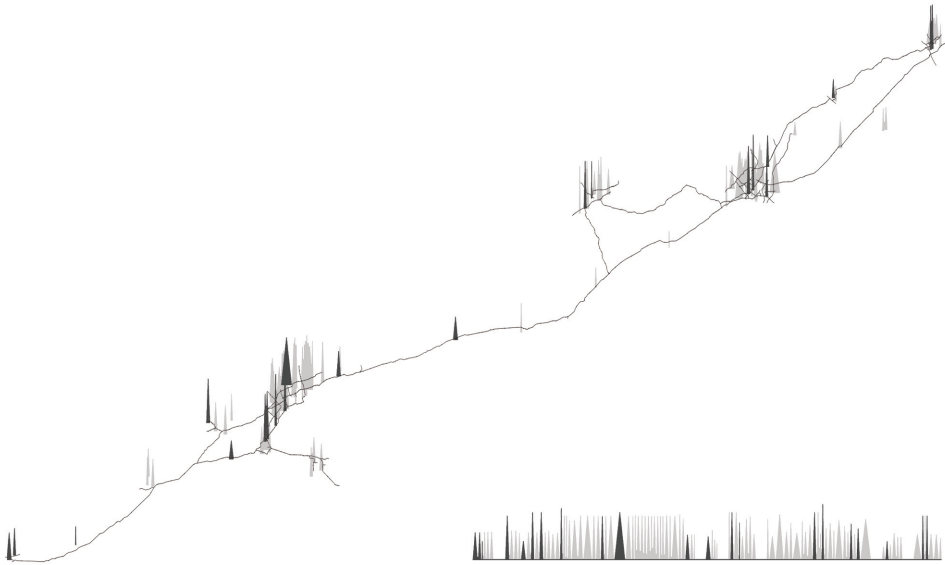


fig 3.56 (below) Malls owned by Ivanhoe Cambridge and Cadillac Fairview.

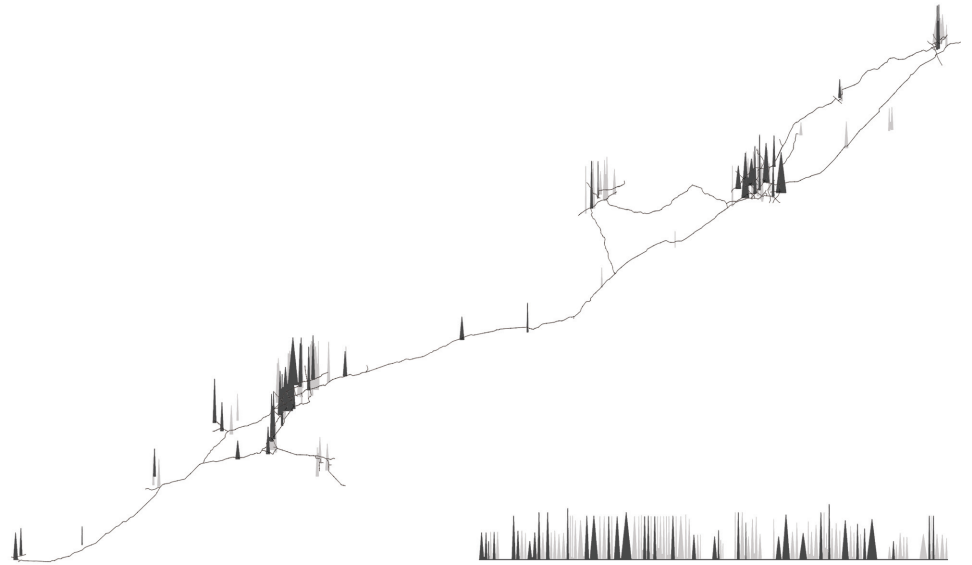


fig 3.57 (below) Malls owned by Ivanhoe Cambridge, Cadillac Fairview and Morguard, totalling over 13km² of site area.

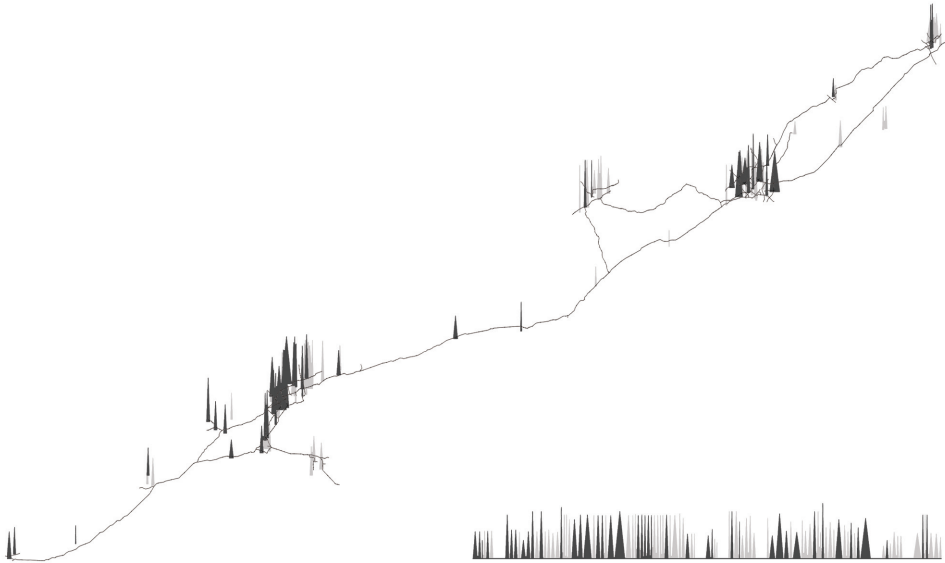
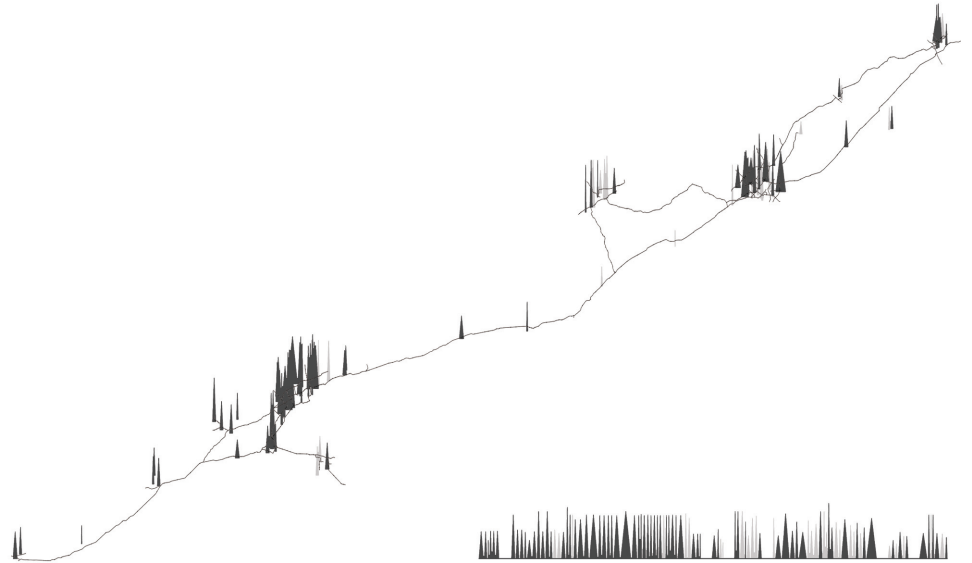


fig 3.58 (below) Malls owned by the top 10 property holders in the region.



Demographic Conclusions

The preceding diagrams are intended to give an impression of the overall demographic situation of malls within the Windsor/Quebec corridor. By providing data sets delineating each mall's site area size and proximity to the expressway in combination with these important demographic factors, arguments can be made for which malls are appropriate for which scale of development.

For example, one such argument could be that only large sites of over 25ha with immediate adjacency to the expressway should be targeted. Larger sites potentially provide a critical mass for inhabitation while such close proximity to the highway would eliminate the need for a secondary transit network to exist.

Another possible argument could be made for developing only those mall site falling within high paying areas that are highly educated and attract a high percentage of foreign born residents. It would be safe to assume these sites would be attractive to educated, working age immigrants; the type of person the region will need to attract after 2030.

A number of other sets of factors can be used to make arguments for and against development of specific sites, at particular scales, and connected via a more or less complex network of infrastructural systems. There is no single 'best case scenario' that can be given here; any final position requires the input of many professional disciplines, from architects to planners, engineers and economists. What is presented here is simply a starting point; a framework for a new regional plan to operate within.

Clearly, the largest sites surrounded by the densest, wealthiest populations are located within the four largest cities of the corridor; Toronto, Montreal, Quebec City and Ottawa. The most rural areas tend to have smaller mall sites and lower demographic scores, though they do best their metropolitan counterparts in centrality and overall quality of life, making them potentially no less appropriate for development. Of course, each site has its own set of problems and opportunities that must be analyzed accordingly. From there, sites can begin to be classified, grouped, and planned in order to achieve environmentally and economically sustainable integration within an overall vision for the megaregion.

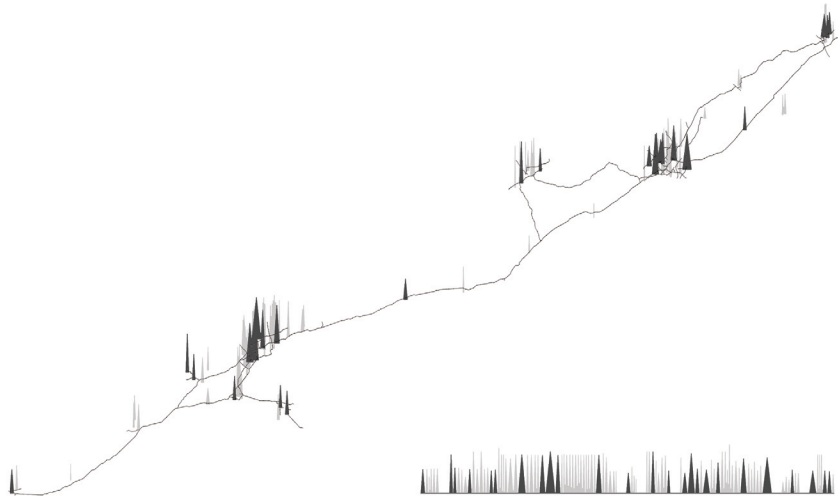


fig 3.59 (above) Malls over 25ha with an immediate adjacency to the highway.

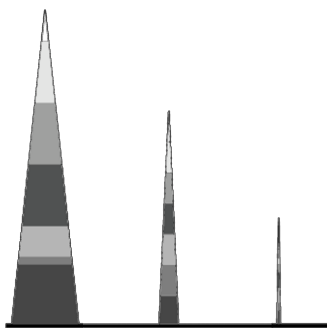


fig 3.60 (above) On the left, the largest mall in the region, Vaughan Mills. On the right, the smallest; Cornwall Square. In the middle, the 'average' mall; 25ha, average scores in each demographic factor.

Sources:

1. Wall (2005, 190).
2. Gruen (1960, 11).
3. Gruen (1960, 19-24).
4. Gruen's first fully realized enclosed shopping mall was Southdale Shopping Center in the Minneapolis suburb of Edina in 1956. At a cost of \$20 million, the center contained 72 stores over 2 floors totaling 810,000 square feet, with 5200 parking spaces, 2 department stores and a garden court. Hardwick (2004, 144).
5. Wall (2005, 23)
6. Aldo Rossi, Tadao Ando, Frank Gehry and Renzo Piano, among others, have all designed large shopping centres. Project on the City (2001, 393). Gehry even worked for Victor Gruen Associates on a number of malls over many years. Crawford (1999,53). However, only two major architects have really made careers out of retail design; Victor Gruen and Jon Jerde. Retail accounted for 65% of Gruen's total works, 87% of Jerde's. Project on the City (2001, 743).
7. Wall (2005, 10).
8. *ibid.*
9. Gruen (1960, 117)
10. Herman (2001, 468).
11. Gruen (1960, 31).
12. Gruen (1960, 30).
13. *ibid.*
14. Gruen (1960, 31).
15. Vaughan Mills, in the rapidly sprawling GTA suburb of Vaughan, was, in 2004, the first mall built in Canada in 14 years. <http://jobboomcc.canoe.ca/News/2004/10/27/1225741-sun.html> Accessed 4-Feb 2009.
16. Wall (2005, 188).
17. Gruen (1960, 38).
18. Wall (2005, 188)
19. A notion held, at the time, by Cedric Price, Jean Gottman, Constantinos Doxiados, and others. Wall (2005, 188).
20. Wall (2005, 189).
21. *ibid.*
22. Wall (2005, 190).
23. This number does not include malls that are located in the dense downtowns of major cities- the Toronto Eaton Centre for example- where there is little or no room for further densification.
24. Statistical Pocket Book of Bangladesh, http://www.bbs.gov.bd/dataindex/pby/pk_book_08.pdf Accessed 14-August 2009.
25. 3.7 million between 2001 and 2031 pro-rates to 2.6 million remaining between 2010 and 2031.
26. Place de la Cite in Quebec City has a smaller site, but is immediately adjacent to both Place Laurier and Place Ste. Foy, and would be part of a development spanning all three sites.
27. These images are based on the most up to date aerial photos available at the time of production. In some cases, new development may have taken place and as such these representations cannot be guaranteed to be 100% accurate in all cases. Likewise, all data within the table is based upon measurements taken from aerial views and checked against data made available by the mall developers when available.
28. Florida (2007, XXII).
29. Florida (2007, XVIII).
30. Florida (2007, XIV).
31. The Atlas of Canada <http://atlas.nrcan.gc.ca/> Accessed 12-October 2009.
32. *ibid.*
33. *ibid.*
34. *ibid.*
35. *ibid.*
36. *ibid.*
37. *ibid.*



fig 4.1 (above) Southdale Centre, Victor Gruen Associates, 1956.

"Most people report that shopping is fun and exciting, and they like seeing new products in the stores. The reality is that shopping is America's No. 1 pastime and most people shop because it's enjoyable to them." - Dr. Donald Black.¹

Cultural History And Morphology

Introduction

Any proposal for a regional growth strategy must consider the existing cultural, economic and morphological conditions present at its potential development sites.

Here, where a single, immediately recognizable typology has been selected, it is important to examine its cultural significance; past present and future. In this way, not only can it be established whether or not the regional mall is a desirable place for people to live, it is also possible to trace a path through the established popular zeitgeist in order to illustrate less tangible effects of the type on contemporary life.

This includes factors such as whether the mall is a significant contributor to cultural evolution and how it has helped shape attitudes of consumption, recreation, entertainment, leisure and communication over the decades. These factors all lead to an understanding of the regional shopping centre as an established form of urbanism which is being absorbed and intensified by this proposal rather than replaced. The aim of this section therefore is to illustrate that there is a legitimate cultural value to be extracted from the mall; an urban lineage that should be followed through on rather than abandoned.

However, there are many critics of the shopping mall from many different disciplines; writers, filmmakers, architects and urbanists among them. Alex Wall writes that 'until recently, architects have mostly remembered Gruen as a villain'². Margaret Crawford remarks that the mall employs 'tricks' to control consumer flow through 'numbingly repetitive corridors of

shops³, and lists novelist and essayist Joan Didion, *The Mall of America* writer William Kowinski and *Dawn of the Dead* director George Romero among those who characterize mall patrons as 'sedated', 'disoriented' and 'numb'⁴. Crawford also notes that urban critic Ada Louise Huxtable has portrayed prominent mall architect Jon Jerde as '*dangerous to the "real" city, a huckster marketing simulation and shopping as genuine urban experience*'⁵. Huxtable also portrays mall architecture as '*packaging or playacting, as disengagement from reality*'⁶, while urban critic Mike Davis called the Jerde project 'CityWalk' '*probably the most insidious kind of theme park*'⁷.

Aside from often harsh criticism, architects also tend to demonstrate a general apathy toward retail design. Daniel Herman notes that there is '*a widely held belief that shopping is a trivial pursuit for any self-respecting architect*'⁸, a claim backed by the fact that even the two most influential retail architects of the last century-- Victor Gruen and Jon Jerde-- have both stated a complete disinterest in shopping^{9,10}. Stanley Marcus, of the high-end Neiman Marcus department store chain, expressed disappointment with the architects he hired; '*the truth of the matter was that none of [the high architects] had much of a feeling for stores. They had never done stores. Some of them never did learn it*'¹¹. This lack of enthusiasm for retail and the dearth of hands-on experience with the type from 'high' architects¹² suggests that the shopping mall may be misunderstood or underestimated by many in the profession, even as some have begun to embrace it¹³.

This section examines the cultural history of the mall through three eras separated by three 'effects' that malls have had on patrons. The first two of these effects were intentional, and are named for the architects who developed them; Victor Gruen and Jon Jerde. Here, these effects are explored as they relate to the architect's intention to create an urbanism, rather than the commonly held view that they exist only to separate the unwittingly pliant shopper from his/her money¹⁴. The third, while also intentional to a degree, exists beyond the architect's purview, and as such has been named after the theory of Mimetics, which is also known as cultural evolution.

"To succeed with shopping, high architecture must exhibit more than a passing fancy for iconography. As with Daniel Burnham, Victor Gruen, and Jon Jerde, good shopping architecture requires engagement, invention, and repetition. Until they recognize this, high architects will remain on the sidelines of the tawdry but mesmerizing spectacle of shopping architecture." - Daniel Herman¹⁵.

The Gruen Transfer



fig 4.2 (above, left) A textbook example of pre-modern American shop signage.

fig 4.3 (above, right) Lederer de Paris, Manhattan. Victor Gruen, 1939. Extending the public space of the street into the store area.

fig 4.4 (below) Grayson's "Victory store", San Francisco. Victor Gruen, 1943. Facade as billboard.



The *Gruen Transfer* is considered to be the moment when, “a destination buyer with a specific purchase in mind is transformed into an impulse shopper, a crucial point immediately visible in the shift from a determined stride to an erratic and meandering gait.”¹⁶ The shopper is said to “break down under a barrage of excessive, narrow-spectrum stimulation and continual interruption of attention. The unconsciously bewildered shopper, rendered docile, cannot help but drift into the prepared pathways and patterns of externally induced consumer activity, unfocused yet exquisitely suggestible to gentle but firm environmental cues¹⁷.”

Whether such opinions give too much credit to the supposedly nefarious intentions of the typology or too little credit to consumer savvy is a matter for debate. Of course, malls are designed to be profitable for both the developer and its tenants, but there is no reason this has to be seen as an inherently negative way to create public space¹⁸. Gruen himself ‘argued that this ‘manipulation’ was more complex than sheer consumption-engineering; the shop window, and especially arcade spaces, were part of the theatre of the street: window shopping was as intrinsic to urban culture as sitting on a stoop or chatting on a corner’¹⁹.

Architect Alex Wall negotiates between these two polemics by suggesting that the shopper is a ‘willing victim’²⁰. He notes that what Gruen really did was simply perfect the art of capturing the attention of passersby²¹. His architecture was intended not to distract so much as to engage people’s attention through lighting and theatrics. The real Gruen Transfer-- as a shift in how urban space is experienced-- is the moment at which the importance of establishing ‘place’ is superseded by the importance of grabbing-- and holding-- one’s attention. How he accomplished this, and why it became such an integral part of North American culture, is best understood by examining the evolution of Gruen’s work.

“By affording opportunities for social life and recreation in a protected pedestrian environment, by incorporating civic and educational facilities, shopping centers can fill an existing void. They can provide the needed place and opportunity for participation in modern community life that the ancient Greek Agora, the Medieval Market Place and our own Town Squares provided in the past” - Victor Gruen²².

Victor Gruen, Mall Maker

If ever an architectural typology has been associated with a single architect, it is the shopping mall with Victor Gruen. He is widely credited with its invention, and his firm specialized in the regional mall for many years, building a great number of them.

In Vienna, prior to the second World War, Gruen was an architect by day and a performer in local coffeehouses by night,²³ a lifestyle he continued after fleeing Europe for New York in 1938²⁴. His experience in the performing arts would eventually lend itself to a number of innovations in retail design, and was ultimately a major contributing force behind the evolution of what would one day be the American shopping mall²⁵. Gruen's passion for avant-garde theatre²⁶ matched up well with retail design, which at that point had transitioned to a marketplace where *'the active exchange of bargaining was replaced [due to the fixed prices of department stores] by the invitation to look, turning the shopper into a passive spectator'*²⁷; a climate in which the idea of 'display' began to take on increased importance²⁸.

In this light, one of the first modernist developments in retail was to design clear, clean signage²⁹. It was reasonably assumed that a store front should operate as a billboard for the store itself, and that clear, bright signage and tasteful, stylized design would accomplish this in the best possible way³⁰. This is an idea that has persisted and has permeated many other aspects of contemporary culture³¹.

Next, Gruen and his peers turned their attention to the question of threshold. In order to engage the public and lure them toward the shop itself, arcades were implemented to draw the store entrance back, blurring the line between street and store³²; this encouraged lingering and window shopping, as ordinary items were surrounded by elaborate and exotic 'sets' to make them appear more desirable³³.

After tiring of the limited scope of work offered by high-end New York shops, Gruen began to seek out bigger, bolder and more ambitious opportunities. In 1941 Gruen moved to Los Angeles and began working for Grayson's, a national department store³⁴.

The New York shops Gruen designed catered very much to the pedestrian, while the Los Angeles department store was almost exclusively intended for those with automobiles. After the war³⁵, and following many years of department store work³⁶, Gruen would attempt to reconcile both of these cultural conditions with the shopping centre, where he would test more ambitious ideas of urbanism.



fig 4.5 (above) Milliron's department store, Los Angeles. Victor Gruen, 1947. Car ramps crisscross the entire front facade to catch the attention of the car driving public.

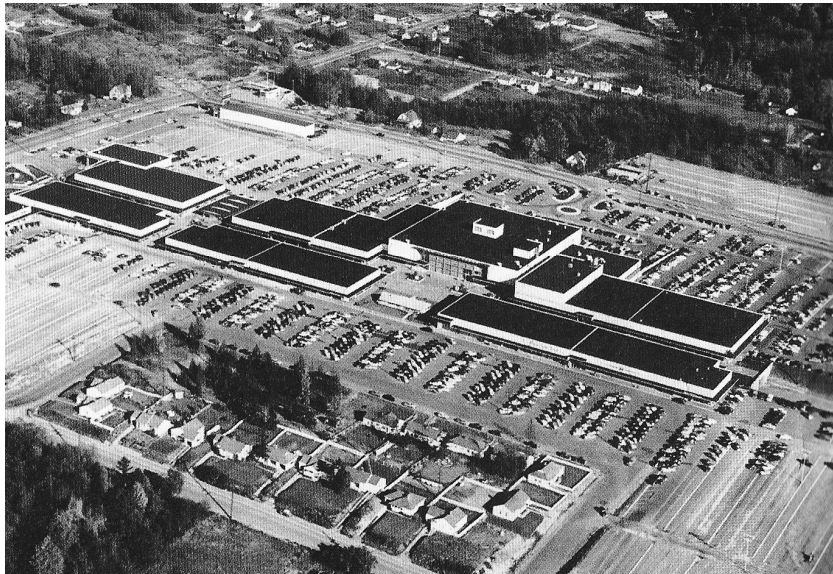


fig 4.6 (above) Northgate, Seattle. John Graham, 1950. A precursor to the regional shopping mall.

fig 4.7 (below) Southdale Shopping Centre, Minneapolis. Victor Gruen, 1956.



Gruen saw the shopping centre as a *'centre of cultural activities and recreation'*³⁷. He felt that the shopping centre should combine a number of public and communal functions and be *'the one important meeting place of the community.'*³⁸ To Gruen, the shopping centre was far more than a place for suburbanites to conveniently consume; it was the new downtown--the suburban core-- and a new form of urbanism that could help reign in suburban sprawl, relieve traffic congestion and rectify urban disarray³⁹.

Gruen had decided that downtown retail was too inconvenient for suburbanites with cars and that strips were too unfriendly to pedestrians⁴⁰. The shopping centre was the natural solution⁴¹. It brought people from decentralized neighbourhoods together in one location to interact at an urban scale. Questions of authenticity aside, the shopping centre was a shared cultural experience for millions of people in the suburbs who otherwise lacked a real sense of community. Gruen's sense for the theatrical lent itself to a recreation of the downtown where none existed, though this would not truly take effect until his most important typological innovation came to fruition; the enclosed shopping centre⁴².

"By enclosing the open spaces and controlling the temperature, Gruen created a completely inverted building type, which severed all perceptual connections with the mall's surroundings. Inside, the commercial potential of enormous spaces was realized in theatrical 'sets' where 'retail drama' could occur." Margaret Crawford⁴³.

The Enclosed Shopping Centre

Gruen's first proposal for an enclosed shopping mall was the Montclair in Houston in 1950⁴⁴, but the true progenitor of the regional shopping mall was the Southdale Shopping Centre, built in the Minneapolis suburb of Edina in 1956⁴⁵. Southdale was a huge success, and many others would follow. The shopping centre came to true prominence as downtowns continued to falter; the mall was clean, new, easy to get to and safe.

By turning inward, the shopping mall removed itself from any and all surrounding context and created a consistent, utopian environment of recontextualized, idealized urban conditions. 'Repackaging' the city in this way eventually allowed malls to act as legitimate community centres⁴⁶, despite the virtualization of the environment itself. This ability to concentrate and focus a disassociated public is a remarkable asset, particularly now. People are more transient and mobile than ever⁴⁷, but malls remain a focal point where people spend a significant portion of their time⁴⁸.

Victor Gruen's contribution to retail design is unquestionable. His role as an urbanist, and whether his work ultimately had a positive or negative effect, is less clear. However, Gruen's shopping mall had a profound effect on North American culture, negotiating territory that was complimentary to both highway culture and the need for pedestrian-oriented centres. People continue to be attracted to malls, and the experience continues to be compelling. The Gruen Transfer has persisted, engaging the attention of the public through dramatic environmental theatrics. At the same time, shopping malls have infiltrated the downtown and suburban malls have attracted concentrated development, blurring the line between 'authentic' city centre and 'recreated' city centre.

"Recreating a "second" nature [via climate control in the enclosed mall] was only the first step; the next was to reproduce the single element missing in suburbia-- the city. The enclosed mall compressed and intensified space. Glass-enclosed elevators and zigzagging escalators added dynamic vertical and diagonal movement to the basic horizontal plan of the mall. Architects manipulated space and light to achieve the density and bustle of a city downtown-- to create essentially a fantasy urbanism devoid of the city's negative aspects; weather, traffic, and poor people." Margaret Crawford⁴⁹.



fig 4.8 (above) Scarborough Town Centre as of August 2009; under extensive renovations but completely open for business; a real-time recreation of urban environments.



fig 4.9 (above) CityWalk, Universal City, California. Jon Jerde Partnership, 2000.

"Whereas the Gruen Transfer produced a new dawn of shopping by introducing an abstract minimal context, its successor paradigm, the Jerde Transfer, has brought shopping to an environmental climax by taking the entire discarded repertoire of architecture and returning it as farce. In the Jerde Transfer architecture no longer aims to intimidate the subject, but to subjugate the consumer." - Daniel Herman⁵⁰

The Jerde Transfer

Daniel Herman writes of the Jerde Transfer as a post-modern version of the Gruen Transfer. This is appropriate in that Jerde essentially followed Gruen as America's preeminent shopping centre architect.

Like Gruen, Jerde claims to have no interest in the act of shopping itself, but rather the theatre that surrounds it⁵¹. Where Gruen wanted to direct the attention of patrons toward his 'sets' in order to advertise a product and make a sale, Jerde's architecture seeks that attention in order to fill the senses of participants with stimuli in an attempt to entertain⁵². If the real Gruen Transfer is the moment when the importance of place is superseded by the importance of holding one's attention, then the real Jerde Transfer is the moment that attention is fed content; no longer is the regional mall simply a physical recreation of the city centre, but a performance of one as well.

The Jerde Partnership has become very successful at proliferating this kind of entertainment-urbanism around the world, just as Gruen expanded his Venturian semiotic-urbanism to every corner of America⁵³. After a decade of building traditional regional malls, Jerde decided he had to do something different⁵⁴; by the 1970's it became clear that the post-war economy that had been the foundation for the regional mall had begun to break down⁵⁵. The retail landscape was fracturing, market cycles were increasingly unstable and new regional malls were no longer a guaranteed success as they once were⁵⁶. The surprising success of downtown shopping and entertainment venues like James Rouse's Faneuil Hall in Boston and Jerde's own Horton Plaza in San Diego paved the way for more traditional malls to diversify their functionality and amplify experiences in order to compete with these new 'festival marketplaces'⁵⁷. Once again, the downtown and the suburban mall were becoming more alike.

“Gruen and Jerde’s consistent success at mall design is based on the same paradoxical talent; their ability to simultaneously satisfy a set of seemingly contradictory requirements. First, and fundamentally, they must adhere to the rigid formulas that govern a mall’s profitability. At the same time, however, they need to generate continual innovation, in order to stay at the forefront of the constantly changing state-of-the-art mall. These are minimal requirements; what has made Gruen and Jerde legendary was the addition of yet a third element to the mall: a communicable mood of sociability. Tapping into popular desires and their own cravings for urbanity, they learned how to orchestrate communal pleasure” - Margaret Crawford⁵⁸.

The Jerde Formula

Beginning where the Gruen Formula ends, Jerde adds three steps of his own to transfer what was a retail experience into an entertainment experience; amplification, bombardment and entertainment⁵⁹. Jerde uses retail as ‘the bait to draw people’⁶⁰, but amplifies its effect in any way possible. He then distorts the scale, orientation, organization and even the ornamentation of the architecture to bombard the patron three-dimensionally⁶¹; a spatial version of Gruen’s ‘machine for display’ and ‘stage sets for selling’. Jerde then adds ‘communal experiences’ by means of entertainment; movies, theme restaurants, light shows and water features⁶². This is Jerde’s urbanism, one that has become common in many malls. While Gruen created signage and displays that were static elements-- backdrops lending themselves to an essentially flat form of urbanism-- Jerde attempts to immerse the public within a similar kind of virtualized space.

Jerde’s projects juxtapose ‘shopping with a spectacle of images and themes designed to communicate, entertain and stimulate’⁶³. However, the relationship between how content is provided and how it is consumed has changed drastically over the last few years. While the result of all of Gruen’s and Jerde’s good intentions may never have resulted in a truly authentic urbanism, it didn’t matter because their virtualized substitutes were so popular with the public. In the 21st century though, it is no longer enough to grab one’s attention and overload the senses with content. Another evolution is now needed.

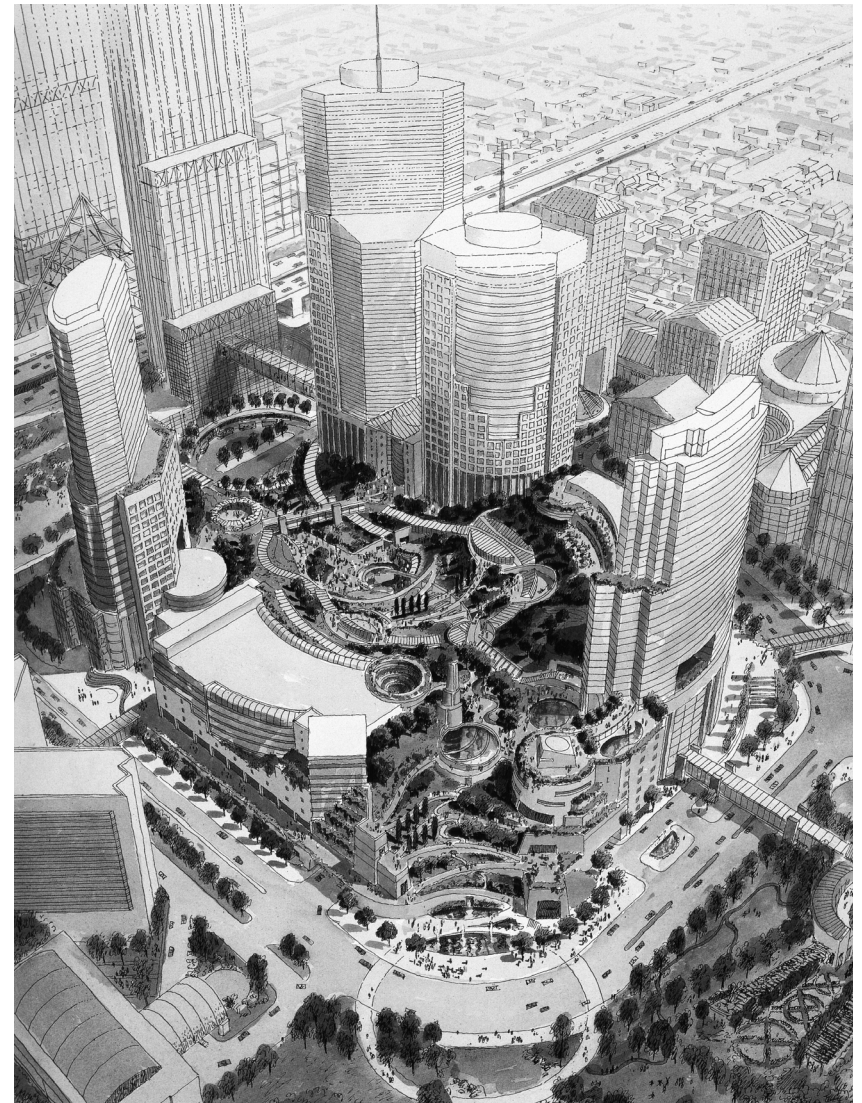


fig 4.10 (above) Rinku Masterplan and Town Block III, Osaka, Japan. Jon Jerde Partnership 1989, unbuilt.



fig 4.11 (above) A lineup of shopping carts outside of Shoppers World Brampton.

"...memes should be regarded as living structures, not just metaphorically but technically, When you plant a fertile meme in my mind you literally parasitize my brain, turning it into a vehicle for the meme's propagation in just the way that a virus may parasitize the genetic mechanism of a host cell. And this isn't just a way of talking- the meme for, say, 'belief in life after death' is actually realized physically, millions of times over, as a structure in the nervous systems of individual men the world over"
- N.K. Humphrey⁶⁴

The Memetic Transfer

Gruen wanted shoppers' attention. Jerde wanted their attention overwhelmed with content. But there exists today a much more sophisticated relationship between the two. New technologies have brought new expectations from consumers, who are no longer strictly consumers but rather participants in a virtual culture of instantaneous reciprocity; one that finally begins to produce a genuine, though less tangible, urbanism through constant connectivity.

In Richard Dawkins' book *The Selfish Gene* is an essay titled "Memes: the new replicators". Dawkins is an evolutionary biologist who popularized the idea that genes were largely responsible for the process of natural selection, but in this particular essay he explores cultural rather than genetic transmission, a phenomenon Dawkins calls a "meme"⁶⁵. A meme accounts for cultural changes that cannot be attributed to genetic evolution; fashions, ceremonies, customs, art and architecture, engineering and technology, etc.⁶⁶. These are things that *"all evolve in historical time in a way that looks like highly speeded up genetic evolution, but has really nothing to do with genetic evolution"*⁶⁷. Other examples of memes, according to Dawkins, are *"tunes, ideas, catch-phrases, clothes fashions, ways of making pots or of building arches."*⁶⁸.

Therefore, if the Gruen Transfer is the moment at which attention becomes more critical to one's experience than place, and the Jerde Transfer is the moment at which that attention is bombarded with amplified stimuli in order to entertain, then it can be said that the Memetic Transfer is the moment at which that stimuli is vetted, negotiated and passed along by the participant, individually or collectively, for the purpose of cultural evolution.

Gruen's theatre was in his stage sets; Jerde's through what might be called special effects. But in the Memetic theatre, everyone is watching everyone else perform; involved to whatever degree one chooses to be. Inherent in this is what might be called a truly urban experience, and it has been happening in malls for years.

What the mall does, as well as any other space-- and particularly impressively given the nature of its suburban environment-- is bring together a great variety of people for a great variety of purposes. Even allowing only for considerations involving commerce, patrons of shopping centres are engaged with music, fashion, film, food, drink, technology, hobby, recreation and so on. Add in many of the 'extras' or 'anomalies' found in malls such as theme parks, skating rinks, schools, medical offices and various special events, and there is little doubt that the shopping mall is an incredibly diverse typology capable of nearly limitless permutations of cultural interaction. Therefore, the regional shopping mall is already an embryonic city-centre; at the typological level it does not need to be re-thought in order to function as such.

The mall's diversity extends to its patrons; everyone spends time at the mall. Though there are legitimate concerns that certain 'less desirable' demographics are often chased from malls by overly protective owners⁶⁹, and while most malls have a specific average or ideal customer⁷⁰, males and females of all ages and races, income levels and social standing visit the mall, and while mall developments are skewed toward their surrounding demographics, super regional malls amalgamate the variety of mall patrons even further by drawing from larger, more diverse catchment areas.

Bringing together such a vast cross-section of humanity helps accelerate memetic evolution by making cultural connections between people who normally do not spend time together⁷¹. This diversity is key to the propagation of what Dawkins refers to as 'mutually-assisting memes'. Mutually assisting memes are those which, when associated with each other, assist the survival of each of the participating memes⁷². The result is a proliferation that could not have been achieved individually.

Margaret Crawford refers to this as the marketing principal known as 'adjacent attraction'⁷³, where commodities are recontextualized and 'associations can resonate infinitely.'⁷⁴

In a memetic, evolving, and accelerating culture, perhaps the mall's greatest asset is its adaptability. The morphology of the regional mall can be defined as 'plug and play'⁷⁵, originally a computing term which here means that new content (most commonly in the form of chain retail) can be plugged into the existing mall framework without disruption to the rest of the mall.



fig 4.12 (above) A skating rink inside West Edmonton Mall.



fig 4.13 (above) A simulated beach inside West Edmonton Mall.



fig 4.14 (above) A roller coaster inside West Edmonton Mall.



fig 4.15 (above) Scarborough Town Centre, under construction, summer 2009.

Conceived by Gruen as an economic solution to bringing large-scale retail to the suburbs, the shopping centre combines multiple retail clients in one space, each connected and yet still relatively autonomous. This unique construct allows for an unforeseen benefit.

By dividing the mall into its constituent pieces, it can be altered and upgraded piecemeal with a speed and functional finesse that is impossible for other typologies. When an outlet becomes obsolete, it is shuttered without hindering the functionality of even its immediate neighbors. Shortly thereafter, it opens with a new tenant, completely transformed.

In theory-- and often in practice⁷⁶-- a shopping mall can undergo a complete transformation without ever interrupting its day-to-day operations. This places the mall in a unique position to handle contemporary cultural demands⁷⁷. Because it is possible to plug in different content quickly and with little interruption, the mall not only avoids operational downtime altogether but also allows content to move through and be replaced so effortlessly that there is no real threat of irrelevancy, no matter how accelerated the associated memes. While the mall is still at the mercy of changing trends in retail, there are many cases where malls have moved beyond both retail and entertainment to accommodate tenants of nearly every type imaginable⁷⁸. This needs to continue if malls are to outlive retail migration to online and big box venues and take on a more meaningful role in cultural evolution.

"Killing the mall, paradoxically, has allowed it to become what Gruen once intended it to be - a city centre. Death has allowed the mall to fulfill its original promise." Daniel Herman⁷⁹.

The Decline and Fall of the Regional Mall

As recently as 2005, shopping centres were a relatively booming business for real-estate investment trusts (REITs). While smaller, neighbourhood shopping centres were struggling under pressure from big box retailers⁸⁰, regional malls saw vacancy rates drop and rents remain relatively consistent⁸¹. During the middle part of this decade, retail was the strongest commercial real estate sector, as rising housing values and low interest rates fueled high consumer confidence⁸². Investment money flooded into commercial REITs, with huge portfolios of mall properties being purchased at a premium⁸³.

But even during this time there were signs of weakness. The regional mall had long ago reached market saturation and new malls are now simply not being built. Only three enclosed malls have been built in the United States since 2005, with no new malls in 2008 and only one planned for 2009⁸⁴. In fact, one of the only companies committed to new development, Mills Corp., struggled and found itself earning well below expectations while running into debt⁸⁵. Existing mall properties have been consolidated over the last decade, with the 10 largest REITs in America controlling 47% of all malls, including nearly all of the nation's 200 top-performing 'A' properties and the majority of 'B' properties⁸⁶. According to some analysts, about 20% of malls are 'D' malls which need to be closed and up to a third of all malls are obsolete or nearly so⁸⁷.

Lower tier malls have been losing significant ground to big box value centres⁸⁸, and in general the regional mall-- born to serve a post-war middle class that has been shrinking ever since-- has been falling out of favour with recent trends in retail. Specifically, both luxury and discount retailing have been thriving in the form of boutique, big box and online shopping, leaving the regional malls to search for a niche⁸⁹. Middle class department stores such as Sears are expected by many to reposition themselves through either standalone outlets (big box) or upmarket boutiques⁹⁰. T Eaton Co. Ltd filed for bankruptcy protection in 1997, closing 25% of its stores⁹¹, and many traditional mall anchors will be faced with these kinds of issues going forward. It is well understood that if a mall anchor leaves or dies, the mall dies with it. This puts the regional mall in a precarious situation even during a good economy.

Chain retailers are no less prone to the effects of these trends. The Gap, considered the 'ultimate 90's brand'⁹², has been struggling for nearly a decade after sales rose more than sixfold throughout the 90's⁹³. Other middle class chain retailers have taken to standalone outlets in big box value centres or increasing their web presence, migrating away from regional malls⁹⁴, which had often forced out under-performing 'mom and pop' stores to make room for them⁹⁵.



fig 4.16 (above) The parking lot of a dead mall. Daniel Herman, "Mall", 2001.



fig 4.17 (above) An abandoned JC Penny department store. Daniel Herman, "Mall", 2001.

fig 4.18 (below) Honeydale mall in etobicoke. A dying neighbourhood centre in the shadow of Cloverdale regional mall. www.deadmalls.com



"It's the same old story: too many stores, outdated retailing concepts, obsolescent malls, changing consumer and demographic patterns, faltering suburban districts, and encroachment by new electronic formats. 'There's a lot of trash out there'. Many cavernous old malls are dinosaurs that can't compete with the convenience of drive-up value retailers in power centres or strips." - Emerging Trends In Real Estate 1998.⁹⁶

Current Conditions

All of these problems existed for the mall well before the recent American credit crisis, which seriously damaged the one advantage retail developers had been depending on; irrepressible consumer confidence. The fifth largest holder of shopping centre properties in America, Centro Properties Group, saw its share price drop 90% in just two days in late 2007, and commercial real estate values have dropped across the board⁹⁷. This has left owners in the impossible position of having to refinance large debts taken on in the preceding boom, but with no buyers coming forward in the commercial securities market⁹⁸.

At the same time, consumer spending is down dramatically, many mid-level chain retailers are going out of business, and vacancy rates are soaring⁹⁹. Dying regional malls are being replaced with open-air shopping centres, but this appears to be less of a permanent fix than another cycle that will again lead to obsolescence¹⁰⁰.

In Canada, the situation appears less grim. While all the same factors have affected Canadian retailers over the last decade-- and though many stores in Canadian malls are American owned-- a more conservative banking tradition has led to fewer drastic results. However, many smaller and older malls are still dying, and the long term trends leading consumers away from regional shopping malls and toward big box and online retailing cannot be ignored.

Morphology

The regional shopping centre is defined by Victor Gruen as follows:

“A regional shopping centre is generally designed to serve a trade population of from 150,000 to 400,000 people. The size of this type of center may range from 300,000 sq. ft. to over 1,000,000 sq. ft. Department stores are the dominant tenants, and normally occupy about one-third to one-half of the total area. The function of such a center is to create complete comparison shopping facilities with a strong attraction for customers living as much as 10 to 15 miles from the site, depending, of course, upon existing competitive facilities, access routes, etc.”¹⁰¹

The regional shopping centre-- in order to qualify as one-- consists of at least two department stores and over 100 retail outlets total. Among those outlets is commonly a food court, while recreation, dining and entertainment venues have become very common; particularly chain restaurants and movie theatres.

There are generally considered to be two morphological types-- known as the barbell and the cluster, respectively-- but there are very few practical differences to set them apart from one another. Therefore, for the purposes of this thesis, the regional mall will be considered a single typological formula, with the understanding that each mall is itself a variation on this formula. These variations account for the minor differences between a ‘barbell’ and a ‘cluster’ mall, as well as for specific ‘mutations’ of the formula that allow for ‘anomalies’ such as an indoor skating rink or a roller coaster.

Gruen defines the anchor tenant as:

“The key or principal tenant - department store, junior department store or supermarket depending on the size of the development - is the primary traffic generator which attracts customers to the shopping centre. While it is possible for a centre to operate without such a tenant, the realization of a maximum return on the investment requires the presence of such a major tenant.”¹⁰²

Despite Gruen’s qualifier that it is possible to operate a centre without an anchor tenant, very few malls have ever made this an economically viable reality. In the Windsor/Quebec corridor, only Pacific Mall in Markham operates without a true anchor, but as ‘North America’s largest indoor Asian mall’¹⁰³, its operations are vastly different from a traditional regional mall.

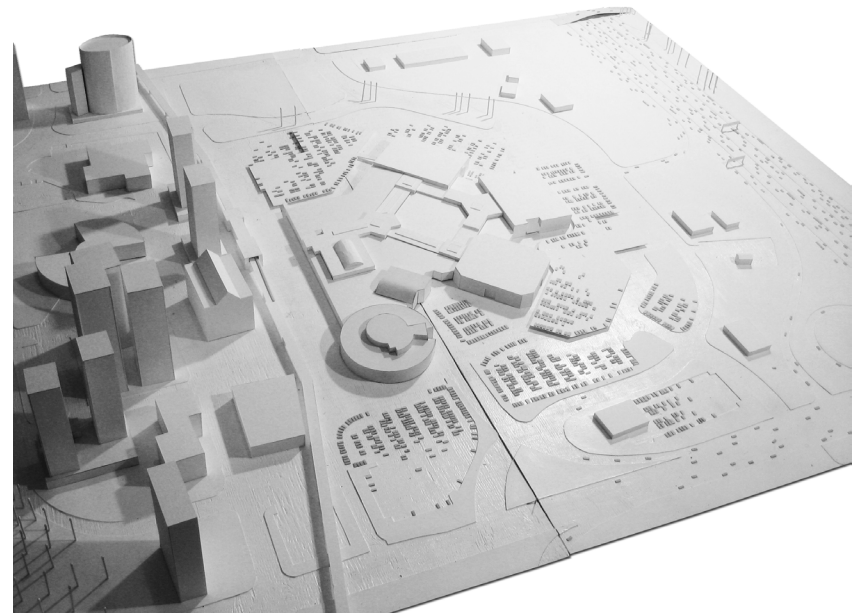
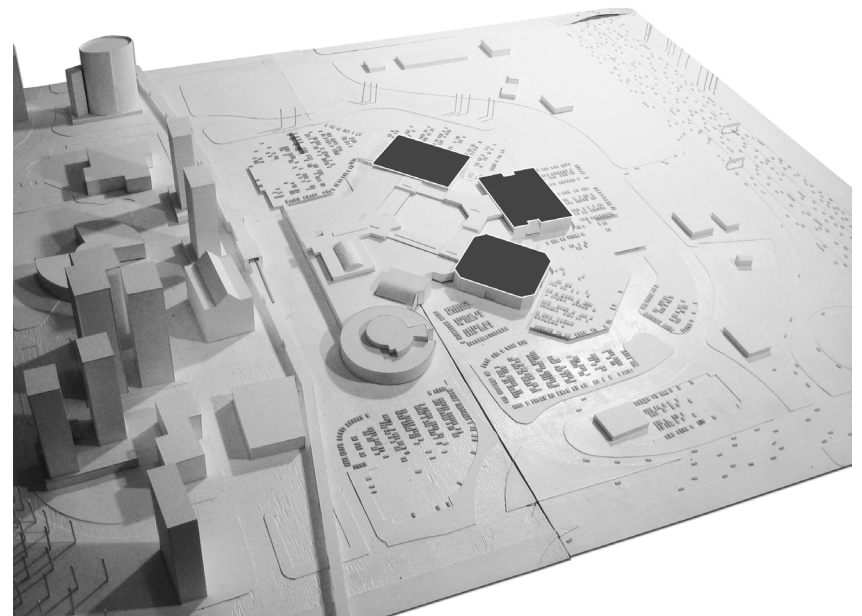


fig 4.19 (above) The Scarborough Town Centre; regional/superregional mall.

fig 4.20 (below) The Scarborough Town Centre, with anchor tenants highlighted. Clockwise from top; The Bay, Wal-Mart, and Sears.



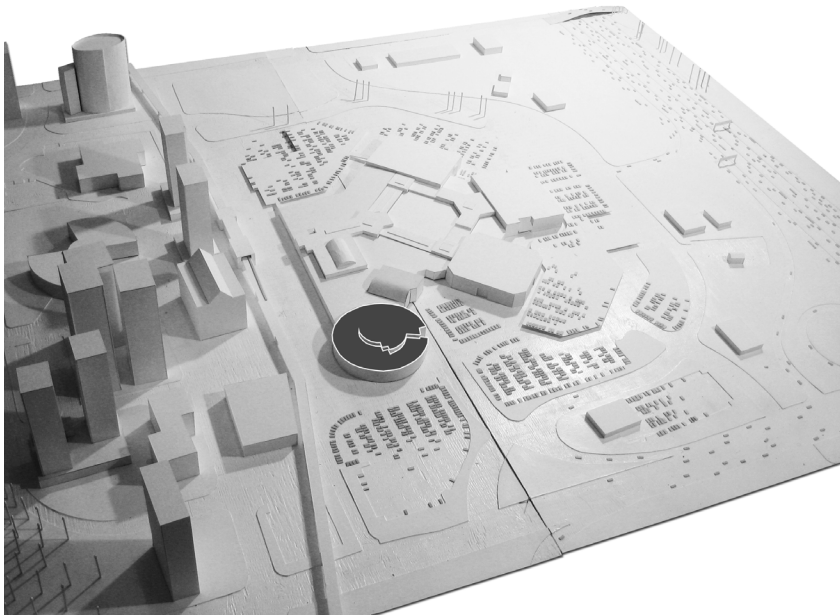
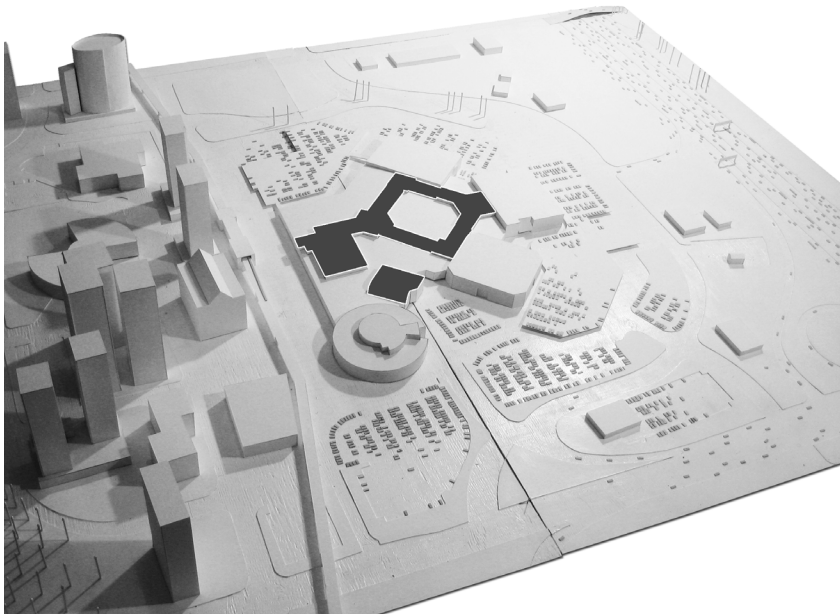


fig 4.21 (above) The Scarborough Town Centre, with entertainment anchor highlighted; a large cinema complex.

fig 4.22 (below) The Scarborough Town Centre, with concourse highlighted.



Also common in many malls are what might be called ‘entertainment anchors’. That is, a venue of a similar size and drawing power to a department store anchor that is not strictly retail in nature. The most common form of this is the movie theatre, but large-scale themed restaurants or video arcades-- at one time-- are other examples.

Linking these anchors is the mall concourse. Concourses almost always employ skylights to bring natural light into the mall interior and are usually generous enough to contain sitting areas for weary patrons as well as kiosks, defined by Gruen as:

“A very small, free standing building used for sale of such small items as newspapers, candy, etc. usually located in the central mall.”¹⁰⁴

Finally, filling the gaps between concourse and anchor are the chain outlets, the occupancy of which can be nearly anything-- usually retail, but not always-- from fashion to electronics to banks, doctor’s offices, schools and travel agencies. These retail outlets fall into two categories: primary stores and secondary stores. Primary stores are *“usually a store that belongs to part of a large regional or national chain. A primary store usually will construct its own format storefront when it moves into a mall. You can find primary stores in most thriving malls”¹⁰⁵*. Secondary stores are *“stores that moves into an existing retail space in a mall, they usually aren’t a chain store, but more of a mom and pop location. These stores use existing storefronts, and usually are filling space in an otherwise dead mall.”¹⁰⁶*

Department store anchors typically build their own buildings to their own specifications, and are accessible via exterior entrances facing the parking lot and interior entrances off the mall concourse. Anchors are commonly 2-stories even when the rest of the mall is single-story and they are almost always located at extreme ends of the concourse. In the case of a barbell design, this means an anchor at both ends of a linear concourse. In a cluster design, anchors are located at the endpoints of various axes. Department store anchors have dedicated loading and unloading zones, which are commonly able to accommodate two full-sized transport trucks. These loading bays are usually well hidden and away from any entrances or public thoroughfares.

Chain stores generally lease already-built space and follow stricter regulations for signage, display and operations to ensure a certain degree of cohesion within the styles, themes and aesthetics of the overall mall. They are accessible to the public only via the mall concourse and back onto service corridors, rendering the majority of the exterior facade blank and used only as a back-of-house. Merchandise is delivered and removed through these 'backdoors', though at a smaller scale than the department stores; rather than a full loading dock, smaller delivery trucks simply pull up behind a store and unload at ground level. Larger and multi-level malls often have larger, shared areas for delivery.

External to the mall itself are commonly outparcel developments; these are standalone or multi-tenant box outlets ranging from chain restaurants to furniture stores, but still located on the mall premises. They are often too large to fit within the mall's chain retail sections, but too small to be anchors and are attracted by the economic advantages of repeatable, formulaic buildings of a proven size and style.

Parking is also a key component of any regional mall, and it is because of the need for vast expanses of parking that malls have so much real-estate to service potential redevelopment. Malls in denser areas may have dedicated parking structures-- particularly if they are connected to metropolitan mass-transit-- but most suburban regional malls rely solely on surface parking.

Due to the central locations of regional malls, many already act as local and regional transit hubs. Rail and bus lines often use mall sites not only as stops along the way, but as nodal interchanges for switching lines/modes. The ample parking at mall sites also makes them attractive centres for public transit, particularly in a region so devoted to the car. Malls are often the end of the line for passenger rail lines that extend into the suburbs; in Toronto, both Yorkdale Mall and Scarborough Town Centre are important in this capacity. Also, larger regional malls are often departure points for inter-regional transit; Scarborough Town Centre and Square One in Mississauga both cater to buses from other metropolitan areas outside Toronto. Nearly all regional malls play a critical role in local transit, with city and regional bus lines moving between historical downtown and mall, and sometimes even directly connecting malls to each other¹⁰⁷.

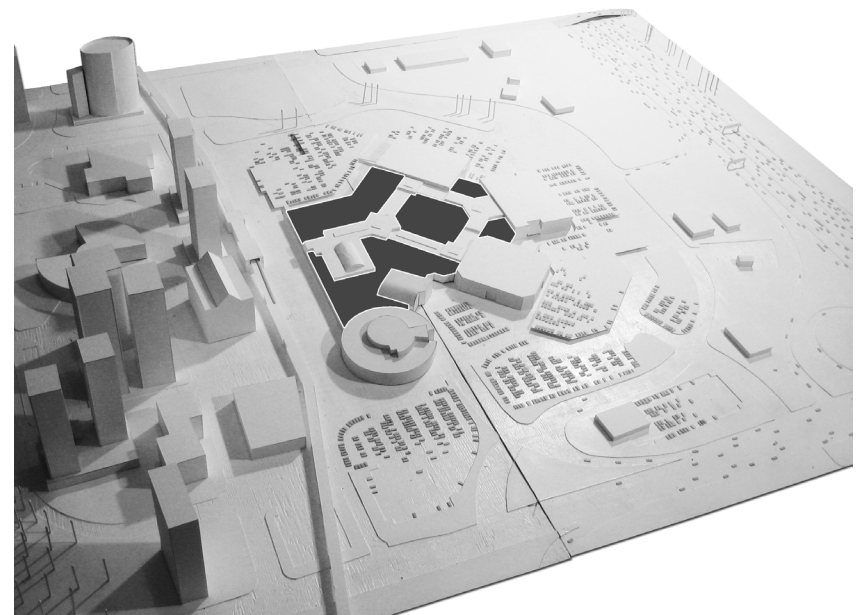
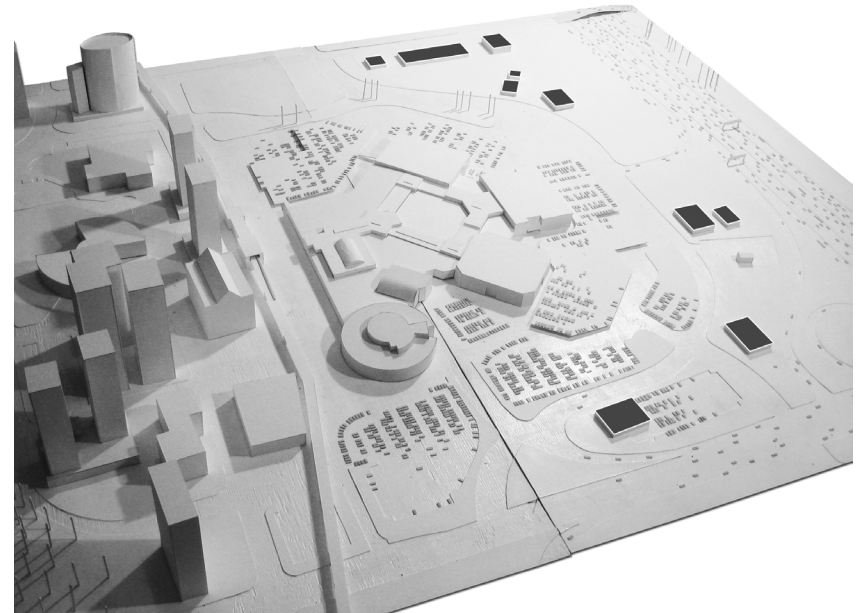
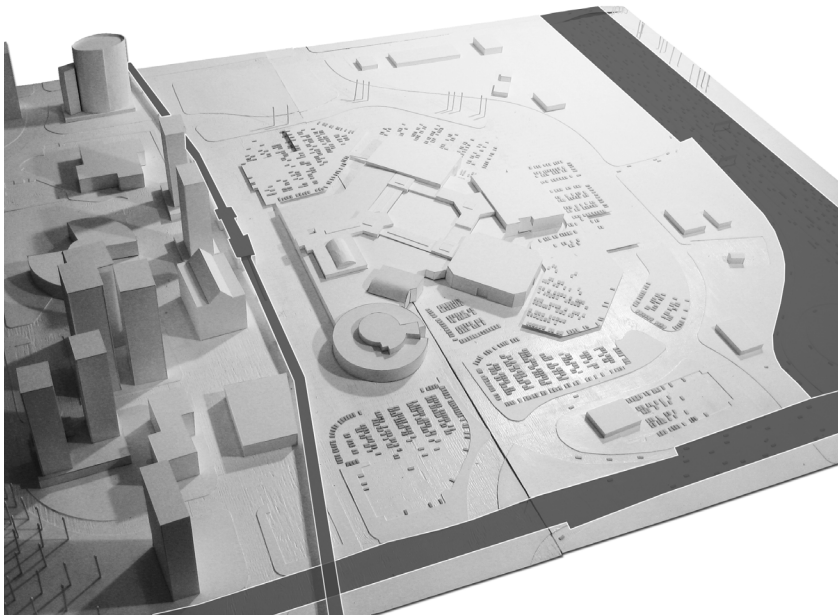


fig 4.23 (above) The Scarborough Town Centre, with chain store sections highlighted.

fig 4.24 (below) The Scarborough Town Centre, with outparcel stores highlighted.

fig 4.25 (opposite, top) The Scarborough Town Centre, with 401 highway, McCowan road and the Scarborough LRT line highlighted.





Summary

The combination of cheap, available land, destination retail and integrated public transit has already attracted densification around most regional malls in the corridor. This may be in the form of only one or two mid to high rise apartment blocks, or in cases like Scarborough Town Centre and Square One, entire high density neighbourhoods arcing around the mall property.

Rich cultural history and a broad public appeal have already positioned regional malls as centres for social activity and recreation, and the physical nature of the type lends itself to new, emergent trends and technologies that are driving the urban experience of people in the new millennium.

While some claim that the mall is dying, and retail trends point to an eventual extinction even for malls that are currently thriving, the mall has the potential to live on as a post-retail urban centre due to its strategic location and the flexibility of its design.

The kind of growth being proposed by this thesis is already taking place at regional mall sites and it will continue to do so. All of the ingredients for the regional mall as megaregional centre are already in place. All that is needed is a strategy to tie together and intensify this existing framework that meets or exceeds the goals of the current growth plan to deliver a more sustainable and competitive region.

Sources:

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3. Crawford (1992, 14).
4. Crawford (1992, 14).
5. Crawford (1999, 45).
6. Anderton (1999, 10).
7. *ibid.*
8. Herman (2001, 392).
9. "I had no desire to be a store designer; to my mind that was not architecture. There were hardly any architects engaged in the store field at the time; stores were designed by draftsmen who did not need degrees in architecture." - Victor Gruen Hardwick (2004, 20).
10. Herman (2001, 403).
11. Herman (2001, 395).
12. Herman notes that of the 21 pritzker prize winners, only 8 'appear to have worked on more than one building dedicated to shopping.' Herman (2001, 393).
13. Herman (2001, 391).
14. Crawford, Wall, Herman and others all characterize the Gruen Transfer in this way.
15. Herman (2001, 397).
16. Crawford (1992, 14).
17. Herman (2001, 404).
18. In fact, nearly all spaces, public or otherwise, have been commodified to a degree. Museum projects which high profile architects fight over often forcefully push participants through a gift shop before allowing them to leave. This is a much greater transgression than anything committed by a regional mall. Airport shops, with a captive consumer base, generate sales per square foot that are many times higher than even the most successful shopping mall. Leong (2001, 178). Why the shopping mall has drawn the wrath of designers in such a way seems to be because there perception of malls as anti-urban and architecturally inferior.
19. Wall (2005, 23).
20. *ibid.*
21. *ibid.*
22. Gruen (1960, 24).
23. Hardwick (2004, 10).
24. In Vienna, the Jewish Gruen (then Gruenbaum) had completed seven store designs by 1938 (along with a handful of other projects), when he fled Europe for America to escape Nazism. Drawn to retail more by opportunity and chance than by any desire or particular skill, Gruen had nevertheless begun to assert himself as a top retail designer when his move to New York forced him to start over. Hardwick (2004, 13).
25. In his "Political Cabaret", Gruen took control of stage lighting, display elements, mood, etc. and he also worked the audience as an emcee. Hardwick (2004, 10).
26. Gruen believed there should be no line separating performer and audience, and no division made between entertainment and politics. Retail allowed him some freedom to experiment with these ideas architecturally. Hardwick (2004, 10).
27. Crawford (1992, 17).
28. In New York, Gruen worked primarily on Fifth Avenue in a very clean, modern style. Gruen and others began to develop what was called a 'machine for display' in the spirit of Le Corbusier's 'machine for living'. Rather than a 'machine for selling' or a 'machine for shopping', the idea of a 'machine for display' emphasizes early on a compulsion for Gruen to visualize the experience of shopping as a means of getting the attention of passers-by. Hardwick (2004, 18).
29. Older stores had often treated their facades as a display space in only the most utilitarian of ways, listing goods and services in a haphazard manner. Hardwick (2004, 29).
30. "The functions of the exterior are to serve as advertising poster." - Victor Gruen Hardwick (2004, 41).
31. One example would be the innovation of having a store's merchandise acting as a billboard for itself. This is very common today in apparel, particularly that marketed at teenagers.
32. Beginning simply with glazed frontage displaying merchandise on the street, Gruen experimented by drawing the store entrance further and further back into the footprint of the building, providing more and more arcade space to engage and draw in the customer. Enticing passersby off the street, arcades placed shoppers physically and mentally closer to a sale without forcing them to cross any threshold or commit to entering the store proper. Gruen was successfully demonstrating that the value of diverting the attention of potential customers toward one's shop was more important than maximizing the selling area. Hardwick (2004, 30).
33. Crawford (1992, 15).
34. This move proved lucrative for everyone involved; during the war years, women's salaries escalated, giving them more disposable income, and department stores jumped at this new opportunity for more revenue. Hardwick (2004, 51). Regional and national department stores were therefore expanding and even extending store hours to accommodate the working woman's schedule. Hardwick (2004, 58).
35. The second world war was somewhat responsible for a number of advances in retail. In addition to propagating chain stores and extending operating hours to accommodate working women, store design itself became limited due to material shortages. This led to architects, Gruen particularly, "literally building stage sets for selling until the war was over." Hardwick (2004, 60). But perhaps the most important shift at this time was the integration of cultural identity with the act of shopping. Though during the great depression the consumer had been encouraged to help his/her country by shopping, this notion really began to escalate during the war as the government promoted shopping as a patriotic act, while retailers began to spend considerable effort crafting their image and supporting propaganda as a sales tactic
- During this time there were also a number of changes to the American lifestyle. Most of these changes can be attributed to the proliferation of the car. Americans were more transient and more mobile than ever thanks to both the automobile and the lifestyle disruption caused by the war, and national chain stores with familiar brands were therefore ideally suited to capitalize on this changing culture Hardwick (2004, 61).
36. Gruen split with Grayson's after 8 years. Hardwick (2004, 72). Following the war, with very little money going into new retail development, Gruen's practice began to struggle. (Hardwick (2004, 91). In 1947 however, he landed a commission for a new Milliron's department store in suburban Los Angeles. Gruen's design was, in retrospect, suburban to an almost hostile degree with sweeping car ramps across an entire facade of the building leading to parking on the roof (complete with a rooftop restaurant providing what was actually described as a "refreshing" view of the surrounding parking lot). Hardwick (2004, 97). This was something of a precursor to the present day box store, and once Gruen realized how anti-urban projects like this are in reality, he switched his focus to the shopping centre.
37. Hardwick (2004, 80).
38. *ibid.*
39. *ibid.*
40. Hardwick (2004, 112).

41. However, it was a challenge to get investors interested in shopping centre developments, which were an unproven commodity at the time. The general consensus was that such developments were far too big and futuristic (i.e. unrealistic), and no one was willing to take such a big chance on faith. Hardwick (2004, 115). Gruen could not convince the national department stores to take on development duties themselves either. The only retailers large enough to try on their own without outside investors were department stores, but even they felt at the time that such a big move to the suburbs was too risky. During this period, department stores were, in fact, barely solvent, often having to borrow money just to continue operations through the lean summer months, and then making that money back during the holidays (along with whatever profits they could muster). Hardwick (2004, 123). This didn't leave department stores with deep development pockets. Gruen would eventually discover that the key was to convince the multiple retailers to join together in one centre, sharing cost and risk Hardwick (2004, 124).

42. Crawford (1992, 21).

43. *ibid.*

44. Hardwick (2004, 144).

45. *ibid.* At a cost of \$20 million, the centre contained 72 stores over 2 floors totaling 810,000 square feet, with 5200 parking spaces, 2 department stores and a garden court

46. Crawford (1992, 23).

47. MVRDV (2005, 26).

48. The typical mall visit went from 20 minutes in 1960 to nearly three hours in 1992. Crawford (1992, 14).

49. Crawford (1992, 22).

50. Herman (2001, 403).

51. *ibid.*

52. Herman (2001, 407).

53. "The entertainment companies were the right clients, because entertainment at least implies some kind of dent in your perceptual state, or your conscious state, not stores selling underpants." -Jon Jerde Herman (2001, 407).

54. Crawford (1999, 49).

55. *ibid.*

56. *ibid.*

57. *ibid.*

58. Crawford (1999, 45).

59. Herman (2001, 406).

60. Herman (2001, 407).

61. *ibid.*

62. *ibid.* GONE

63. Crawford (1999, 50).

63. Dawkins (1976, 207).

64. Dawkins (1976, 206).

65. Dawkins (1976, 204).

66. Dawkins (1976, 206).

67. Dawkins (1976, 204).

68. Dawkins (1976, 206).

69. This, however, is also the case in many spaces considered far more 'public' than the mall. The Supreme Court of the United States has upheld mall's rights to be defined as a private space, however, "Justice Thurgood Marshall's dissenting opinion argued that since the mall had assumed the role of a traditional town square, as its sponsors continually boasted, it must also assume its public responsibilities." Crawford (1992, 22).

70. Southdale's average customer, for example, is a 40.3 year old female with an income of \$33,000 per year living in a household of 1.7 people. Crawford (1992, 10).

71. For example, a fashion forward college aged student wearing a certain new pair of jeans can be observed and therefore imitated by a group of high school students. Those teenagers can then be seen by grade-schoolers, who can pick up on the meme and imitate it from there. Those youngsters are therefore more 'evolved' in the meme of fashionable blue jeans by the time they reach adulthood, and are by that time passing down more advanced information to their impressionable imitators.

72. Dawkins examines the organized church as an example, where architecture, ritual, law, music, art and written tradition⁸ have a combined effect and greater chance of survival than any single meme would have on its own. In the middle ages, stories from the bible were carved pictorially into architecture, allowing the meme or message of the church to reach a much wider public by including the illiterate. Dawkins (1976, 212).

73. This is also known as cross-marketing. Creating a cross-marketed 'brand' is more powerful and profitable than a single, autonomous product or service, and merchandising that brand within the context of the mall via the many media-- a multi-modal network-- presents a stronger and more memorable message. In a shopping mall, one can go to the theatre to see a film, walk across the concourse to pick up the DVD tie-in, the soundtrack, the t-shirt, the poster, the branded lunch box and the videogame. And while this may seem like soulless consumerism at its worst, the conceptual weight behind it, harnessed intelligently, presents numerous possibilities. The speed with which the mall is able to push through such disposable trends can be seen as either good or bad, depending on one's opinion, but because of the mall's economic dependence on anticipating the changing habits of its users, it is capable of changing more quickly and efficiently than nearly any other typology.

74. Crawford (1992, 15)

75. "Plug and Play, sometimes, abbreviated PnP, is a catchy phrase used to describe devices that work with a computer system as soon as they are connected. The user does not have to manually install drivers for the device or even tell the computer that a new device has been added. Instead the computer automatically recognizes the device, loads new drivers for the hardware if needed, and begins to work with the newly connected device." <http://www.techterms.com/definition/plugandplay> Accessed 12-August 2008.

76. Scarborough Town Centre is currently undergoing extensive remodeling but remains open to the public.

77. The world is changing at a rate far too fast for most architecture to keep up; witness the example of OMA's design for Universal Headquarters, which would never be built for the simple reason that nothing could be implemented fast enough before all the various factors involved shifted again and sent everyone back to the drawing board⁹. This happens all the time. Projects are budgeted, designed and built for conditions that change during the years it takes to complete a project, and by the time many buildings open, they are already obsolete. Content (2004, 118).

78. "The mall's encyclopedic agglomeration of activities requires only the addition of housing, already present in other urban mall megastructures, to become fully inhabitable, a world complete in itself." - Margaret Crawford. Crawford (1992, 6).

79. Herman (2001, 473).

80. Retail REITs Must Broaden Their Focus. www.realestatejournal.com. Accessed 7-March 2008.

81. In fact, during the recession following 9/11, "unlike its office and apartment cousins, sluggish employment growth, higher oil prices and a lackluster stock market do not seem to undermine the faith that retailers have in the American consumer" Mall Rents Fall But Strip-Mall Rates Rise. www.realestatejournal.com. Accessed 7-March 2008.

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93. *ibid.* *The Gap is something of the canary to the regional mall's coal mine. The Gap smartly segmented its own market share during its boom period, adding the upscale Banana Republic and the discount Old Navy to its portfolio. The result was predictable; 'aspiration' shoppers fled the Gap to buy luxury items at Banana Republic while bargain hunting for their basic needs at Old Navy. But the Gap itself was left with few customers.*
94. "Companies expecting to open the most number of stores (in 1996) will do so outside the confines of regional shopping centres." Herman (2001, 465).
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106. *ibid.*
107. *Grand River Transit, for example, connects Cambridge Centre, Fairview Park and Conestoga mall within the same local bus system.*

New design developments create a synthesis among energy, manufacturing, computing, and materials that promises to revolutionize movement. From short-distance personal travel to supersonic global tourism and the transport of massive payloads, our new economies of movement are reconfiguring the urban and colonizing what remains of the natural terrain.

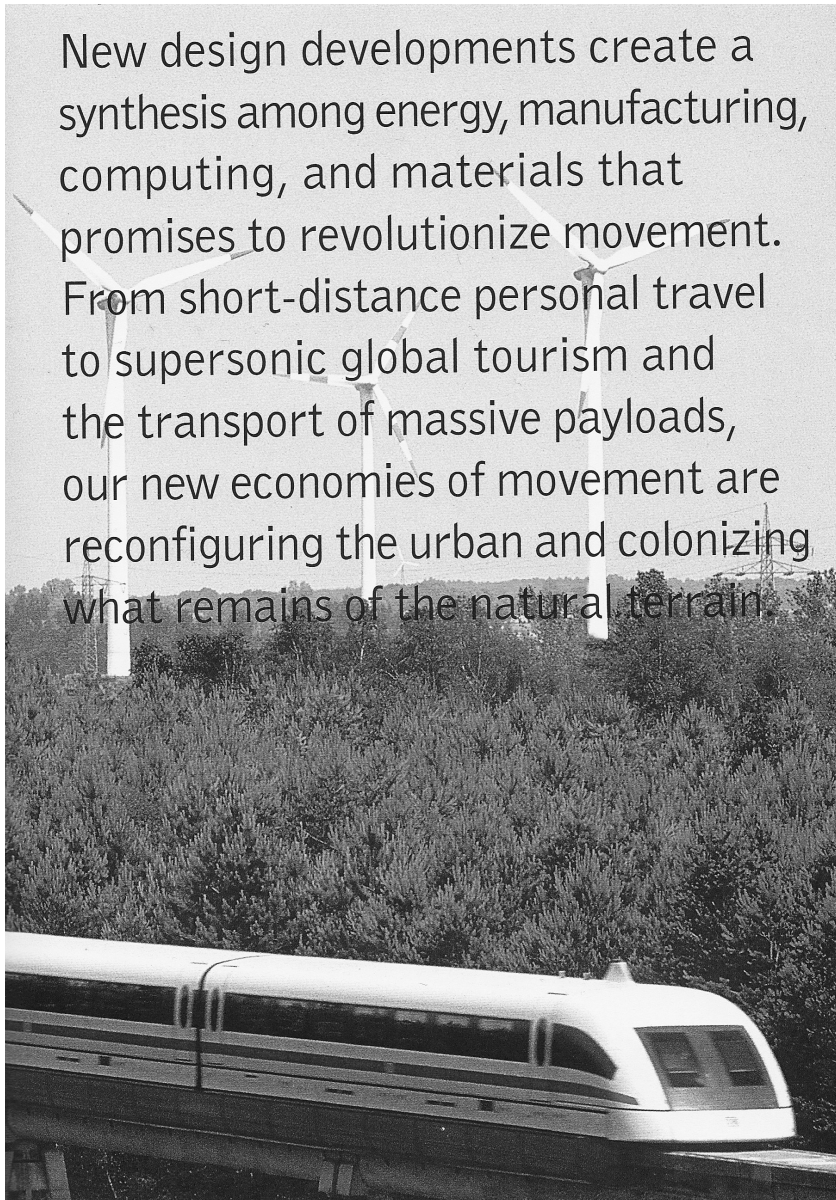


fig 5.1 (above) An image from the book 'Massive Change' promising a synergistic future between transit, power and information. Bruce Mau, 2004.

"As a planning concept, it (the regional shopping centre) is a formula of the new order to come within our entire urban pattern, and in this term I include not what we usually refer to as cities but the entire sprawling fabric of suburbs and metropolitan towns. As a planning concept ... it is the forerunner of the nuclear or cluster or, as some people call it, the cellular approach for regional planning." Victor Gruen¹.

Operations And Development

The Distributed Metropolis

Victor Gruen envisioned the shopping centre as something more than just a source of profit for developers and retailers: his regional malls were designed to be suburban centres, and his ultimate aim was to create a new order for American urbanism. From the very beginning, Gruen had positioned the shopping centre as a cultural and physical nexus point for a de-centralized, infrastructurally networked America. If the national highway system was to be the transit infrastructure in the modern world, the mall was surely the primary point of public interaction; a repeatable yet variable element negotiating the space between higher order networks and local neighbourhoods.

In the Windsor/Quebec corridor, 100 malls are connected via a single infrastructural backbone. This allows an opportunity for much greater efficiencies in rerouting growth and increasing infrastructural bandwidths than exists elsewhere in North America.

These malls and the highway system form the two highest order, primary elements for a new megaregional growth plan. Both are presented here as highly successful but underrealized in their existing form, with potential that has yet to be fully explored. Both have reached or exceeded their capacity as uni-modal phenomena; the 401 is the busiest highway in North America and the regional mall has reached market saturation, even as the region continues to grow. Such growth, regardless of where it is directed, will continue to burden these higher orders; new residents will still be drawn to malls, and they will further congest the highway network. At the same time, it remains unlikely that new highways or new malls will be built,

exacerbating the situation. Both the highway and the mall will need to be transformed, diversified and intensified, regardless of where and how growth in the region takes place. It is therefore both a reasonable and efficient solution to concentrate growth on and around mall sites while loading traffic directly onto the highway corridor.

Satisfying Places to Grow

The growth plan presented here is highly compatible with the goals of Places to Grow's existing Growth Plan for the Greater Golden Horseshoe. These directives are intended to;

"Direct growth to built-up areas where the capacity exists to best accommodate the expected population and employment growth, while providing strict criteria for settlement area boundary expansions.

Promote transit supportive densities and a healthy mix of residential and employment land uses.

Preserve employment areas for future economic opportunities.

Identify and support a transportation network that links urban growth centres through an extensive multi-modal system anchored by efficient public transit, together with highway systems for moving people and goods.

Plan for community infrastructure to support growth.

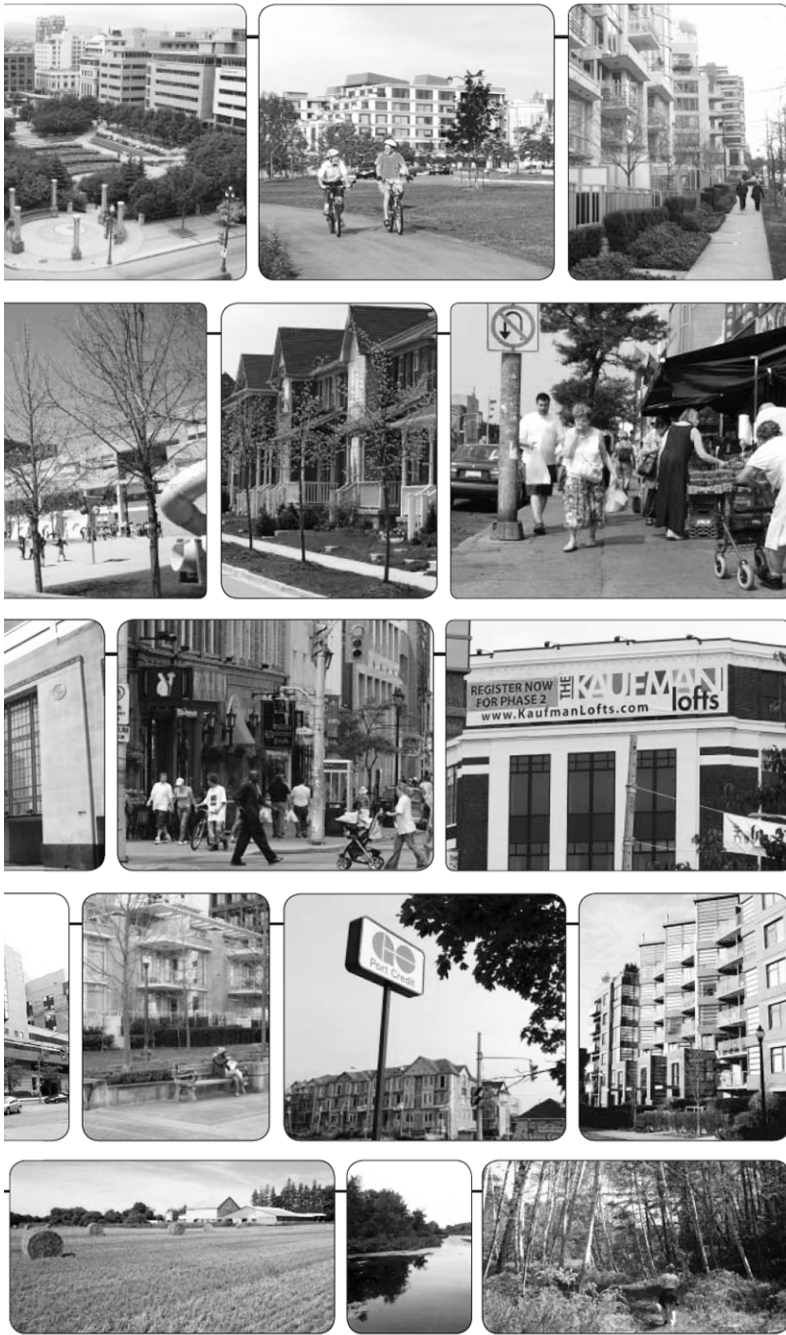
Ensure sustainable water and wastewater services are available to support future growth.

Identify natural systems and prime agricultural areas, and enhance the conservation of these valuable resources.

Support the protection and conservation of water, energy, air, and cultural heritage, as well as integrated approaches to waste management."²

A plan which concentrates development at distributed sites along the highway network is quite capable of satisfying all of these conditions, generally in a more complete manner than Places to Grow itself; this is mostly owing to the fact that Places to Grow allows for considerable suburban sprawl that is incompatible with its own goals.





Places to Grow targets three types of areas for growth; the urban growth centre, brownfield/greyfield sites and intensification corridors. As indicated above a fourth area, suburban sprawl, must also be considered an integral part of the growth plan, as it accounts for a significantly higher percentage of expected growth in the region than all three other types combined. In order to truly conserve natural systems, provide transit supportive densities and allow for economically sustainable infrastructure to support new growth, further suburban development must be halted altogether. Such anti-suburban policies, however, are known to create one particularly unpleasant side-effect; inflated housing values³. It is anti-competitive for a region to have high housing prices relative to income, which in turn often stalls economic growth. An affordable mix of units in attractive, high density developments built fast enough to keep pace with growth could mitigate this problem. Provided these developments create ample units at every income level, the increasing cost of suburban homes that price out many people and render them undesirable to others could actually have a positive overall effect, drawing more people to the centres, lowering per capita infrastructure costs, reducing the infrastructural deficit, and freeing up funds that can then be reinvested in other areas.

As discussed earlier, historic downtowns are also less than ideal places to concentrate growth. Most have neither the physical or infrastructural capacity to allow for sprawl-eliminating densities or new high speed transit and information networks.

Regional shopping mall sites are often set within similar conditions as brownfield/greyfield sites and intensification corridors. Though few are disused or vacant, they are commonly next to industrial and commercial areas which are, and regional malls almost exclusively locate themselves either adjacent to the highway or on major arterial roads. They are highly connected to one another while remaining central to local populations and form a higher order that is also fully integrated into the existing urban and suburban fabric of the region.

To produce a framework for a new megaregional growth plan from these existing conditions, two sets of operations must be carried out. First, the infrastructure of the corridor must be diversified and amplified to carry increased capacities and integrate systems for greatly improved efficiencies. Second, mall sites must be categorized to perform at the regional level and the mall itself must be explored as an urban and economic phenomenon from which future development can be projected.

fig 5.2 (left, opposite) A collage of images from Places To Grow's Key Growth Planning Principles intended to show 'good urban design, complete communities, revitalized downtowns, efficient use of land and infrastructure' and to 'curb urban sprawl and protect farmland and natural areas'. Notably absent in these images is any form of suburban development. Ministry of Energy and Infrastructure, 2008.

Amplifying Infrastructural Bandwidth

In its current state, the 401 and other regional highways are uni-modal, low bandwidth systems that have been overloaded but remain undercooked; if properly developed they can not only relieve traffic congestion but also take on the responsibility of being the region's highest order network for transit, shipping, power and information.

By diversifying itself into a multi-modal transit system, the highway network can provide alternatives to the car, allowing users to get around the congestion, delays, accidents and construction that are a daily part of life in the region. This means that any new mode must at the very least have its own right-of-way and ideally it should be a completely separated from road traffic.

High Speed Rail

High-speed rail lines are one possible option, but also present a number of setbacks. Besides being potentially too expensive, high-speed rail is also slower and of lower bandwidth than the 401. While the trains attain a top speed that is greater than vehicular traffic, the frequent stops needed for the system to be useful at the regional level would eradicate any advantage for commuters. High-speed rail lines would also require either significant reconstruction of all highway interchanges or slow and lengthy diverted routes to circumvent them.

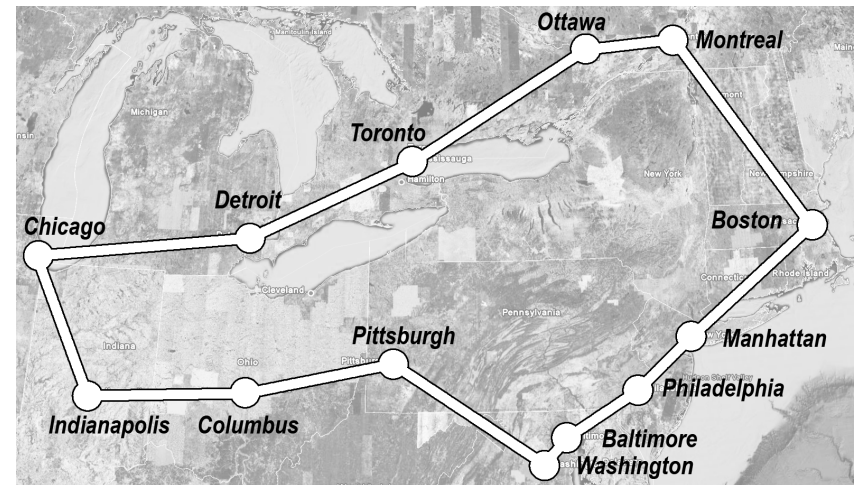
However, high-speed rail should be considered for inter-megaregional transit. Because the Windsor/Quebec corridor is close to both the American Great Lakes and Northeast megaregions, a maglev system similar to those operating in Germany and China could reach speeds of over 400 km/h and connect the major metropolitan centres of various megaregions⁴. In some cases, taking such a train would be faster than flying⁵, and the system would help consolidate other modes while providing a highest order of ground-level transit.

Within the Windsor/Quebec corridor a high speed maglev system would likely stop only in Toronto, Ottawa and Montreal, but it would be invaluable in connecting other centres in the Great Lakes Megaregion such as Detroit, Chicago, Indianapolis, Columbus, and Pittsburgh, as well as metropolitan centres in the Northeast megaregion like Washington, Baltimore, Philadelphia, Manhattan and Boston. This would result in a continuous loop servicing both megaregions and their over 100 million inhabitants⁶.



fig 5.3 (above) The Shanghai Maglev train. www.aboutshanghai.com

fig 5.4 (below) A diagram showing a potential 'loop' for a high-speed inter-megaregional maglev train system.

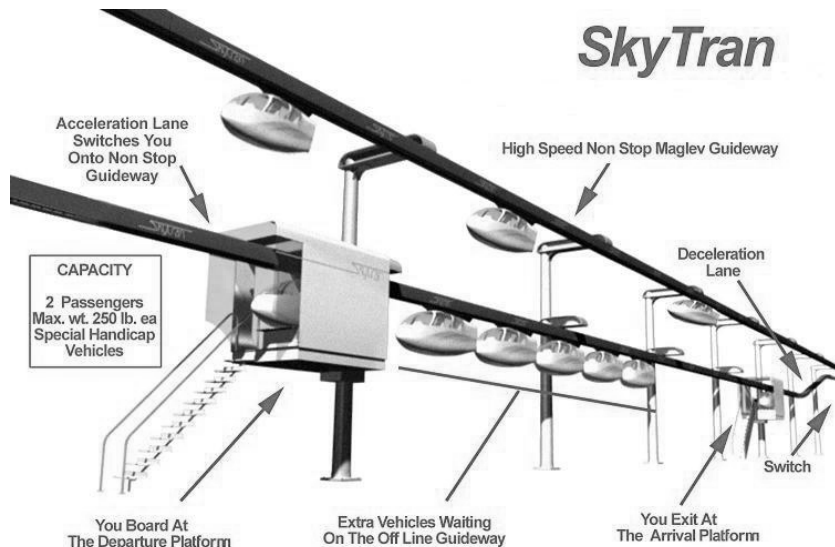


A New Mode of Personal Transit



fig 5.5 (above) An image of a SkyTran system passing through a downtown. Unimodal Inc., 2009.

fig 5.6 (below) A diagram showing how SkyTran operates. Unimodal Inc., 2009.



In order for any new public transit option to be adopted, it must outperform all existing systems, including private vehicle ownership. This is nearly impossible to do in the GGH, where the car is the only universally viable mode. However, In the Windsor/Quebec corridor, with future development concentrated in specific, distributed nodes, the task becomes easier.

Along the corridor, the highest order transit-- the 400 highways-- effectively becomes the only order of transit. The transit network in this case needs to be only as extensive as the highway system itself.

There must be a set of minimum goals for any new mode. First, it must move people faster than the current highway; not only must the top speed be greater than vehicular traffic, but the commuter must maintain continual, high speed movement from departure to arrival points. This means no waiting for trains, no stops in-between and the ability to re-route passengers through construction or other delays. Second, the system must have the capacity to replace the standard car completely; if a traveler has to drive in order to reach the nearest transit terminal, the temptation just to continue driving to the destination point will persist as it does today. Therefore, the system will need to be a hybrid between public and personal transit, and capable of downloading passengers seamlessly onto lower order transit networks. Finally, the system must be easy to use and completely translatable for present day vehicle users. The experience must be comfortable, pleasant, inexpensive and environmentally friendly.

SkyTran

The SkyTran system will be used as a precedent for such a system. The currently in-development form of personal rapid transit is described on the SkyTran website as follows:

"SkyTran is a new transportation system, currently under development at NASA Ames Research and other locations. Light-weight vehicles ride above ground traffic on a one-foot-wide magnetic levitation (maglev) micro freeway called a guideway.

Like other personal rapid transit (PRT) systems, SkyTran is available on-demand and rides nonstop to your destination. Riders find vehicles at boarding platforms above sidewalks or attached to the sides of buildings. Their vehicles merge up to the high-speed (100 MPH) guideway under computer control, travel non-stop to their destination and exit to an arrival platform. Guideways have overpasses and underpasses like a freeway: no intersections. Computer control, separation from vehicles on other guideways and the ground and automatic brakes inside the guideway, unaffected by rain or snow, make SkyTran much safer than cars.

To start your SkyTran trip, just walk down the hall to a building-attached boarding platform, or climb up to one above the sidewalk and step into a waiting vehicle. Put on your seat belt, speak or touch-select your destination, pay with a wireless token, and you're off! During the 100-MPH ride (or 150-MPH between towns), you can talk on the phone, read, surf the Web, or even doze off with perfect safety. Once you step out onto the arrival platform, there is no need to worry about your vehicle, which will join others waiting in line above the sidewalk for the next rider."

The basic principle behind the SkyTran system is ideal for the Windsor/Quebec corridor. Regardless of the eventual level of on-site intensification, having high speed individual rail cars connecting all mall sites across the region would be a valuable and efficient high order of public transit. Such a system would drive development density at and around mall sites, further solidifying their identity as regional centres. While an argument could be made that a SkyTran-like system could just as easily connect all of the various historical downtowns, the result would be slower, result in longer trips and reinforce the suburban population's reliance on their car. While it might still make sense to implement SkyTran in downtown areas as an alternative to streetcars or additional subway lines, the historical downtown is simply obsolete in a regional context and should not be the focal point of regional transit⁸.

However, several adjustments must be made to the SkyTran model for it to be a truly successful carrier in the Windsor/Quebec corridor. Because of the flexibility of the system, and the different needs of travelers, it will be possible and necessary to provide more than just a single type of car. The two-person cars shown by SkyTran are incompatible with many passengers' needs; people with families require more seats, people transporting goods need storage space, etc. Therefore there should be a variety of available car types, from a commuter module similar to what SkyTran shows to family sized compartments that are capable of replacing the carrying capacity of the automobile.



fig 5.7 (above) A rendering of a SkyTran car and station stop. Unimodal Inc, 2009.

fig 5.8 (below, opposite) An image showing a sustainable future city. Popular Science, 2009.



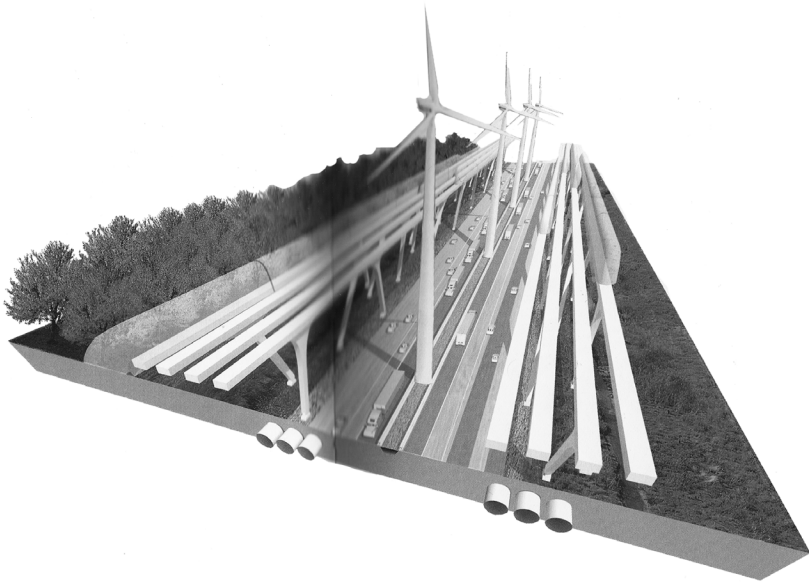


fig 5.9 (above) *The highway as the primary conduit of regional urbanism.* RVTR, "The Post-Carbon Highway", 2009.



It should also be possible to download the car itself onto local transit networks. This means that once the car arrives at the station point, it can simply detach from the maglev line and drive away. This would not be difficult to engineer, as the cars could easily run on electricity (with batteries being charged as they travel the maglev line) and manual control could be handed over to the passenger at the transition point.

This would require that the system be a public/private hybrid, with public users stopping at the transit station while private vehicle owners are able to drive locally. One advantage of this would be that an increased demand for car ownership would stimulate the lagging manufacturing industry. Considering the recent problems experienced by the automotive industry and the region's reliance on it, this could have a hugely positive effect⁹. Public users, meanwhile, are connected directly to the local public transit infrastructure intersecting most mall sites.

A new public/private transit system along the 401 corridor would begin to rebalance traffic distribution, alleviating congestion and providing a desirable alternative for commuters. Hopefully it would pull a larger percentage of bad drivers off the highway-- people who don't like driving on the 401 in the first place-- and reduce accidents proportionally. A SkyTran-like system will operate at more than double the speed of road traffic (up to 150 mp/h or nearly 250 km/h¹⁰) and be safe and comfortable even during the bad weather frequently experienced in the region. It will improve air quality, reduce emissions, and enhance the quality of life of residents by providing more time for productivity and leisure.

SkyTran is also very cost efficient, partially due to the relatively linear line it would follow, but also because it is inexpensive to build and operate. Skytran estimates a capital cost of only \$10 million per mile (\$6.2 million per km), compared with \$65 million for LRT and \$100 million for subway lines¹¹. At an estimated 1600 km¹² of total track, the cost comes to just under \$10 billion dollars. For such a far-reaching transit network, this is a very affordable sum. Of course, the real cost is much higher when accounting for multiple lanes, heavier and larger cars and the other tweaks outlined in this section. Even so, the system is scalable and therefore costs can be deferred in accordance with demand.

A Dedicated Freight Line

The goals of a new passenger transit system also apply to the question of freight; it is important to seek alternative means of shipping goods that reduce the impact on the environment, alleviate congestion, prevent accidents and speed up delivery. Ideally, passenger and freight traffic would be separated, operating independently at different speeds and capacities. At a minimum, the highway will evolve in this manner to dedicate two lanes to freight traffic and two lanes to commuter traffic in each direction, expanding where necessary, with both modes recombining at interchanges as they are downloaded to lower-order road networks.

Because the proposed new transit systems will have alleviated highway congestion, it will be possible to isolate freight traffic in this way, which will improve safety for both cars and trucks and allow for an increased speed limit to be applied to commuter lanes.

This can only be part of the solution, however, as it improves safety and bandwidth to a degree but does not offer significantly greater speeds or a reduction in pollution. Freight within the Windsor/Quebec corridor needs a new, dedicated line of transmission.

One option is to piggyback a new freight line onto one of the new passenger lines, sharing some of the cost. This would not work with the SkyTran system, as those savings would be lost when fitting out the structural system to carry the necessary additional weight. Integration within the inter-regional high speed rail line is a more promising solution; though it wouldn't be an extensive enough network to service the region on its own, it would have the added benefit of seamlessly connecting to other major shipping destinations within the Great Lakes and Northeast megaregions.

Borrowing conceptually from both the SkyTran system as well as traditional freight infrastructures, a high speed freight line could work in tandem with trucks at the regional and local levels. Shipping containers would be trucked via the highway to the major access points-- Toronto, Ottawa and Montreal-- where they would then be uploaded to the high speed line and sent to another major centre to be picked up by another truck for local delivery.

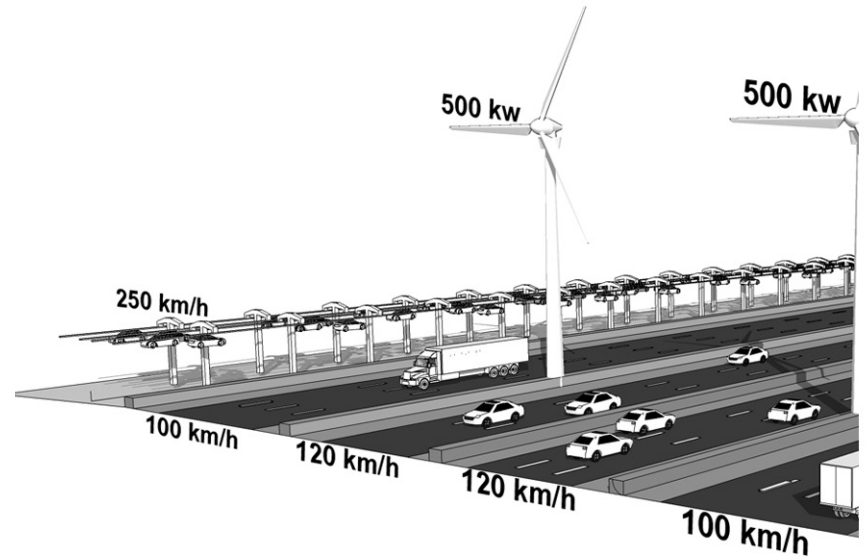
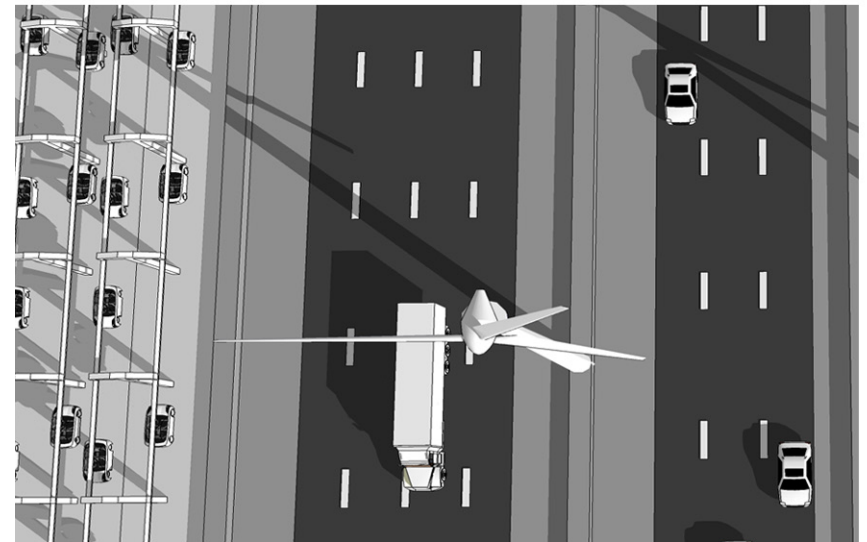
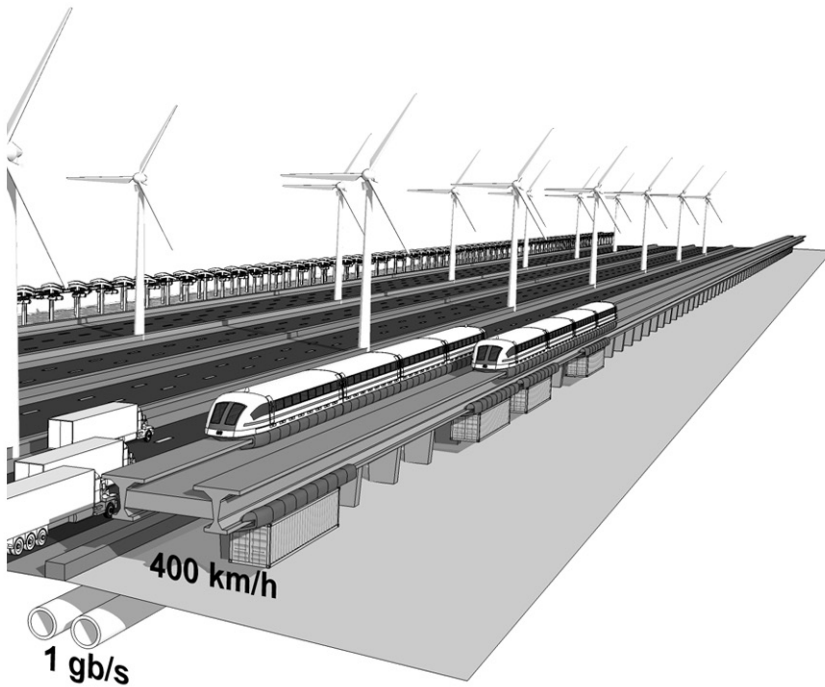


fig 5.10 (above) An intensified highway backbone showing various speeds and bandwidths of infrastructural systems.

fig 5.11 (below) Plan view.

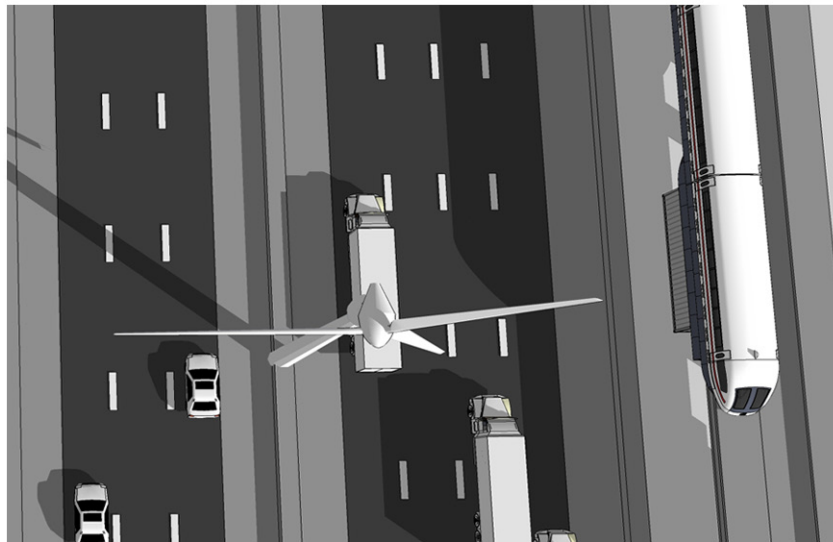


Power and Information



Similar strategies can be applied to other necessities. Relatively small wind turbines generating 500 kw¹³ and spaced every 100 m along the corridor single-file would create 8000 megawatts of electricity, roughly half of the province of Ontario's current demand¹⁴. Where the highway expands due to greater traffic loads around more populous areas, the bandwidth of the array can be doubled as shown in fig 5.6. In this way the highway itself indicates the capacity of additional infrastructural systems, widening to create greater capacities in more densely inhabited zones. Because the energy produced by this array is distributed linearly along the backbone, it never needs to be shipped further than the nearest node; 'line loss' would be minimal. Because the highway is, for the most part, several hundred feet away from inhabited areas, the potential negative effects (health and noise concerns) would be mitigated¹⁵.

Similarly, there is an opportunity to completely revolutionize the information infrastructure of the entire region by laying extremely high-bandwidth cable. At a minimum of 100 mb/s (and ideally 1 gb/s), that cable can effectively plug directly into each mall site, where, if development is concentrated, there will be no loss of speed due to 'last mile' conditions. Since areas too far from the nodes will have to continue to use a much slower connection, these mall centres will become increasingly attractive to both residents and businesses (not just from surrounding areas but from around the world) as emerging technologies continue to demand higher and higher levels of connectivity.



Summary and Precedent

As a methodology for increasing efficiency and driving development to specifically directed sites, the operations presented here find precedent in the RVTR proposal for the 'post-carbon highway', which presents a 'retooling' of the 401 highway in order to 'accommodate different vehicle types and speeds, in effect becoming a network of parallel, cooperative modes of mobility.'¹⁶ While cross sections through a section of highway for each project reveal a number of similarities, (fig 5.2 and fig 5.6) they begin to differ substantially in how they download from the backbone onto local networks.

This thesis utilizes regional mall sites as the primary nodal points of public interaction, inhabitation and transit, while RVTR proposes 'multimodal transfer interchanges' built on and over existing highway interchanges and providing modal transfer and logistic support for freight and passenger traffic as well as 'extensive commercial and community infrastructure programs.'¹⁷ These interchanges have the advantage of always being directly on the highway as opposed to many malls, which are slightly removed along arterial connections. This frequent shift away from the line is partly what necessitates the Skytran system, as it is able to exit and travel along arterial roads with a minimal footprint to an off-line delivery point. The advantage of the mall centre is that most sites plug directly into existing public transit systems, while all mall sites provide ample parking to multi-modal users.

Similarly, the RVTR system has the advantage of stacking commercial and community program in-line with shipping infrastructure. This would suggest that goods could be delivered directly to retail outlets located at interchanges in a fast and cost effective way. Delivering goods to off-line mall sites requires some additional time and cost, but would have the advantage of working within an existing, proven retail concept that people are comfortable with and already visit regularly.

51 of the 100 malls in this study are immediately adjacent to the highway, and therefore are able to share the advantages of both proposals.

While RVTR's scheme builds directly onto the highway right-of-way owned by the province--presumably making it very easy to zone and develop the interchanges-- the relatively few mall owners in the region also make developing at regional mall sites a simplified undertaking compared to traditional city planning.

Partnering densely developed regional mall sites with a bandwidth intensified corridor of infrastructural systems produces a distributed, megaregionally scaled metropolis that operates within the boundaries of two universally accepted, existing elements. It transforms regional growth without requiring any unwanted social engineering or particularly drastic lifestyle changes, and it is compatible with both the goals of the existing growth plan as well as the market forces that are driving development in the region.

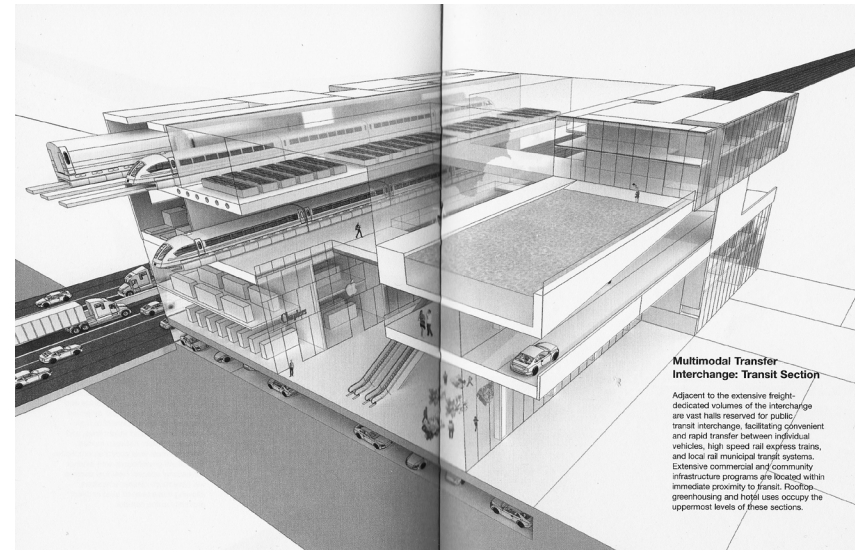


fig 5.12 (above) The Multimodal Transfer Interchange. RVTR, "The Post-Carbon Highway", 2009.

Mall Operations

The 401 is an amalgamating force and an economic equalizer; as a shipping infrastructure it allows major manufacturing to take up residence in any mid-size or larger city along its spine. When combined with adjacent and nearby regional mall sites it also has the potential to distribute growth and regional programs in a similar manner. The nature of the Greater Golden Horseshoe pushes major cultural, entertainment and sporting venues to Toronto's downtown; the only place where critical mass exists. This in turn hinders the possibility that 'complete communities' can develop, as smaller cities simply cannot compete with Toronto for that type of venue.

Shifting the plan's focus to the Windsor/Quebec corridor, however, more potential exists. By distributing regional activities along the corridor, more people are within closer range of more things, and from any one location destination points branch off at very high speeds in both directions; no longer is there a single centre with daily clogged arteries.

Complementary Communities

Changing the language of 'complete communities' to 'complimentary communities' denotes a philosophical shift where individual municipalities share regional programmatic responsibilities. Rather than attempt to develop each centre as an autonomous and complete city, each node should provide for all local necessities while specializing itself relative to others for larger scale goals. Individual sites can be categorized and can operate in sub-sets which may be clustered or distributed depending on their function.

While all sites will have a provision for a certain amount of residential, retail and commercial space, it is still possible to take on a regional identity outside of those basic requirements that contributes to the social, cultural or economic status of the megaregion as a whole. These specialized functions diversify development at each site and compel inhabitants to take full advantage of new transit options in order to experience what each site has to offer. This will foster a sense of local identity by preventing homogenous development across all sites, offering a greater range of living options and lifestyle choices than might otherwise be expected. Following are a number of classifications for these networked sub-sets.

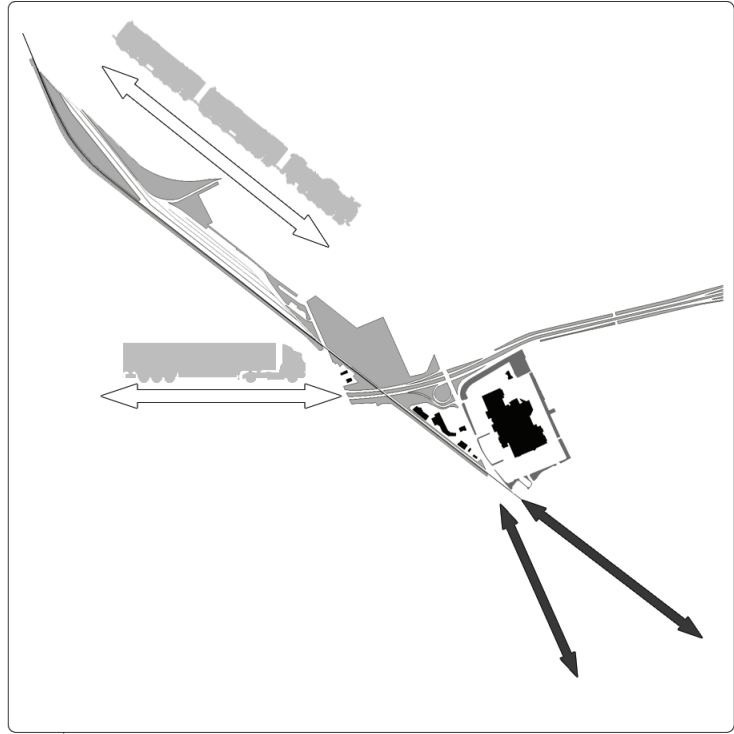
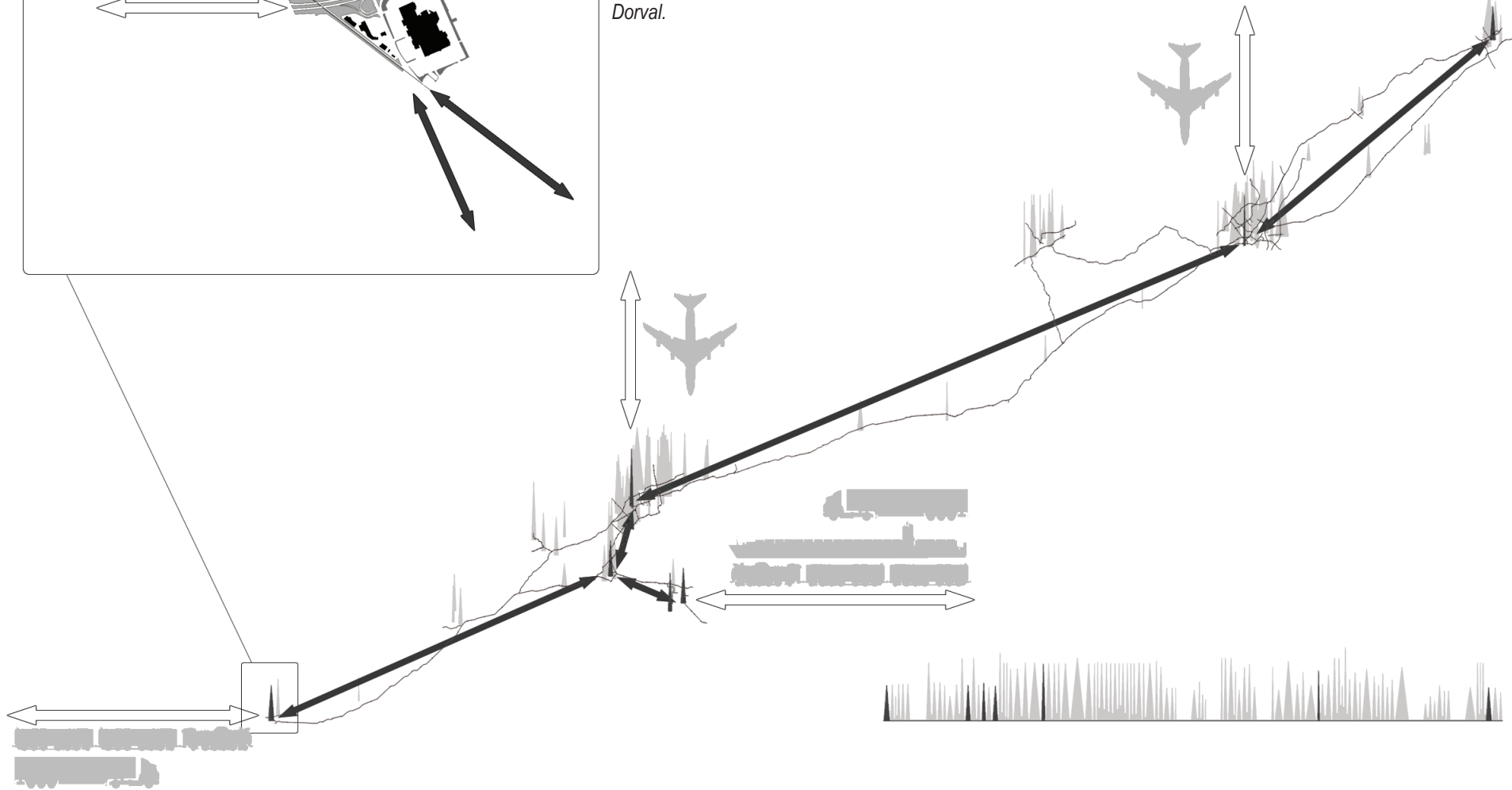


fig 5.13 Special Economic Zones and Major Shipping

These sites will operate under different trade laws than the rest of the region to boost investment from the commercial and financial sectors, draw duty-free retail traffic, and drive import/export business in a globalized region. Malls near major shipping routes or international borders are ideally suited for this role, particularly at the Windsor/Detroit border and Niagara Falls. Sites near major international airports will also function in this capacity¹⁸.

Devonshire Mall in Windsor (left) is adjacent to the rail line that leads to the Michigan Central Railway Tunnel and 3.4 km (via expressway) from the road leading to Ambassador Bridge, which is accountable for a large percentage of the \$900 million dollars in daily trade crossing the Ontario/US border. The mall and surrounding supporting areas act as a strategic redistribution point and modal interchange between regional and international shipping infrastructures.

Other malls positioned to perform in a similar capacity are Niagara Square in Niagara Falls, Seaway Mall in Welland, Centre Mall in Hamilton, Place Fleur de Lys in Quebec City, Woodbine Centre in Malton and Les Jardins Dorval in Dorval.



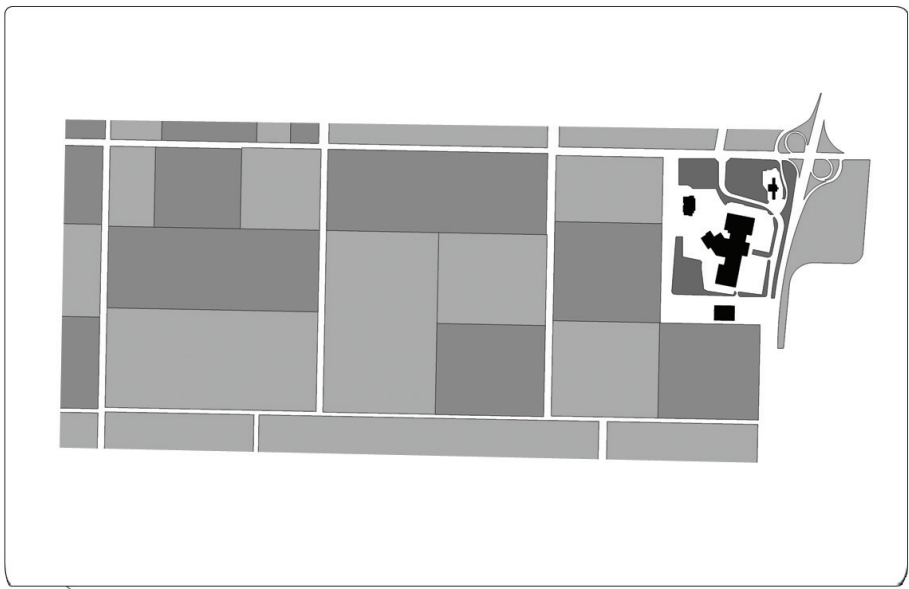
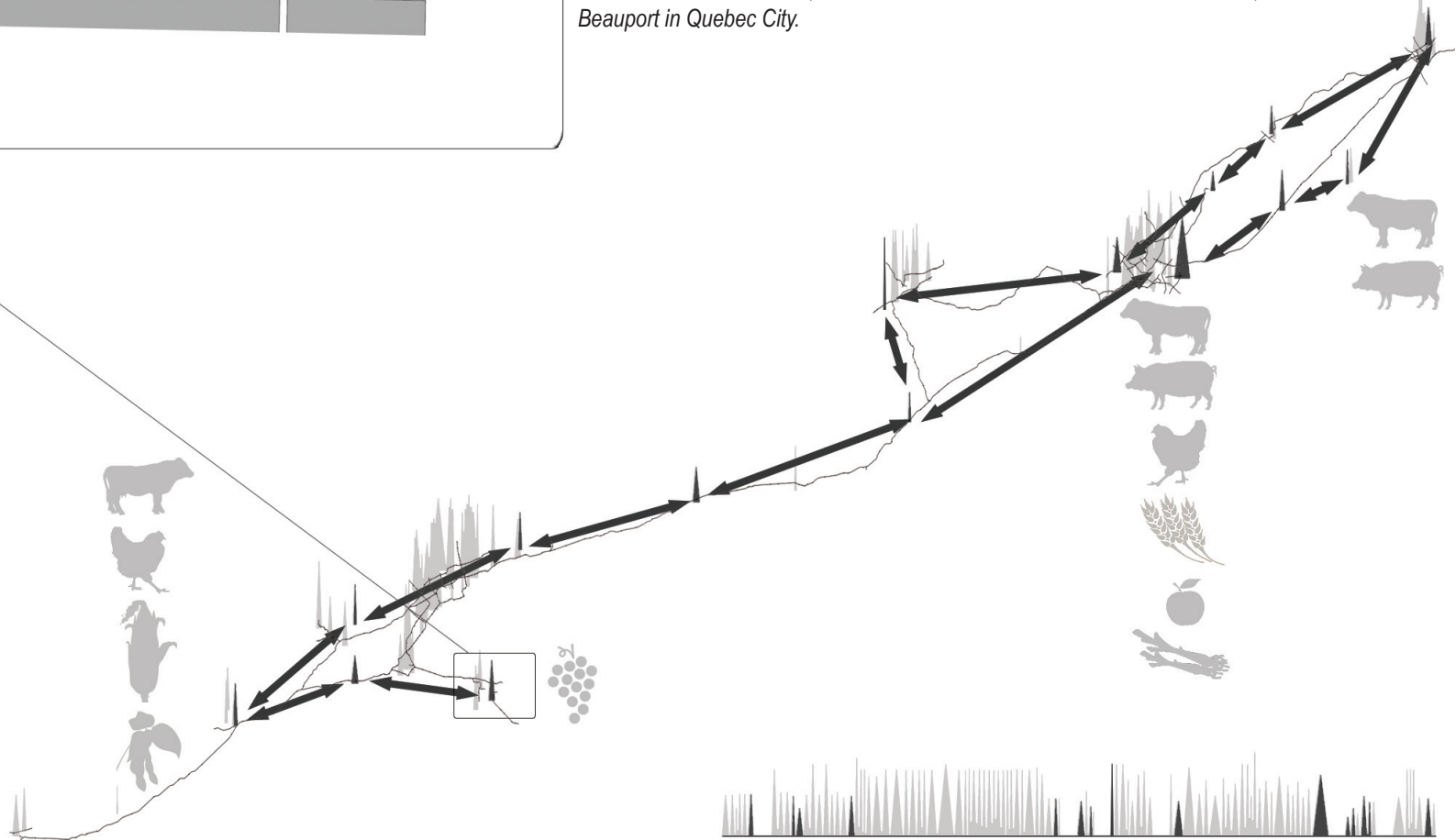


fig 5.14 Agricultural Zones and Food Distribution

These sites are malls and supporting areas that are adjacent to large rural regions and will specialize in the production and distribution of local, fresh food for the corridor. This allows farm produce direct access to the distribution network of the corridor at numerous regional access points rather than centralized terminals¹⁹.

Niagara Square in Niagara Falls (left) backs onto the vast farmlands of the Niagara region and is fronted by the QEW expressway, which links directly to the Greater Toronto Area and the other highways in the network.

Other malls positioned to perform in a similar capacity are White Oaks Mall in London, Lynden Park in Brantford, Stone Road Mall in Guelph, Five Points Mall in Oshawa, Quinte Mall in Belleville, 1000 Islands Mall in Brockville, Les Promenades Sainte Bruno in Sainte-Hubert, Les Promenades Deux Montagnes, Les Promenades des Sorel, Les Promenades Drummondville, Le Grande Place de Bois Francs in Victoriaville, Centre Commercial Les Rivières in Trois Rivières, and Les Promenades Beauport in Quebec City.



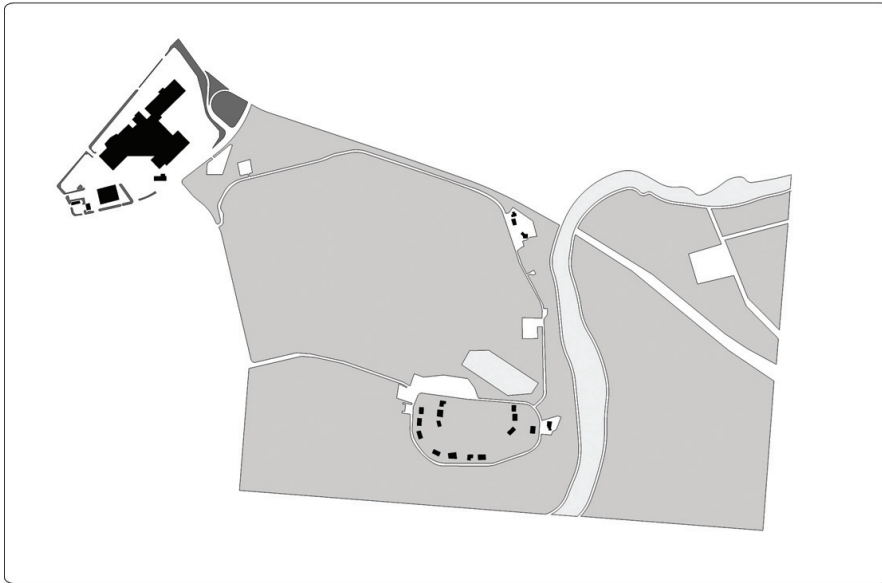
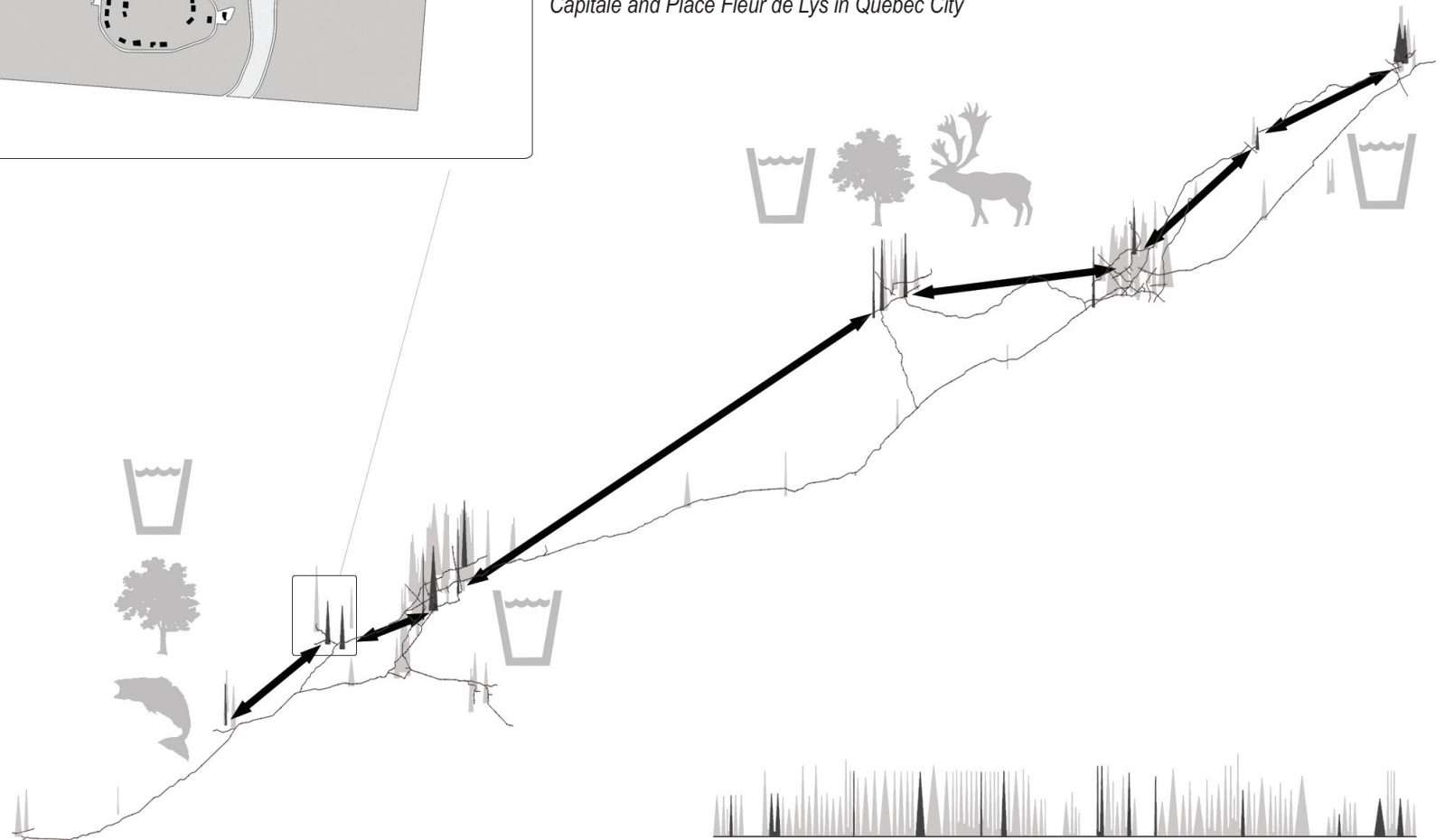


fig 5.15 Conservation Zones and Natural Spaces

These sites are malls and supporting areas that are adjacent to conservation areas and freshwater and wildlife protection zones. They will assist in providing clean water to the region and protecting other natural resources, as well as opening up substantial parklands and natural areas to inhabitants with an immediate proximity to the backbone²⁰.

Fairview Park Mall in Kitchener (left) is located next to the 300 km-long Grand River watershed, which also snakes past Cambridge Centre Mall (located about 10 km to the southeast). Both malls are adjacent to public trails and recreation areas as well.

Other malls positioned to perform in a similar capacity are Westmount Mall in London, Westdale Mall in Mississauga, Sherway Gardens in Etobicoke, East York Town Centre, Markville Centre in Markham, Hazeldean Mall in Kanata, Bayshore Mall and Gloucester Centre in Ottawa, Faubourg de L'île in Pincourt, Les Galeries Terrebonne, Le Carrefour Trois Rivieres Ouest, and Galerie de la Capitale and Place Fleur de Lys in Quebec City



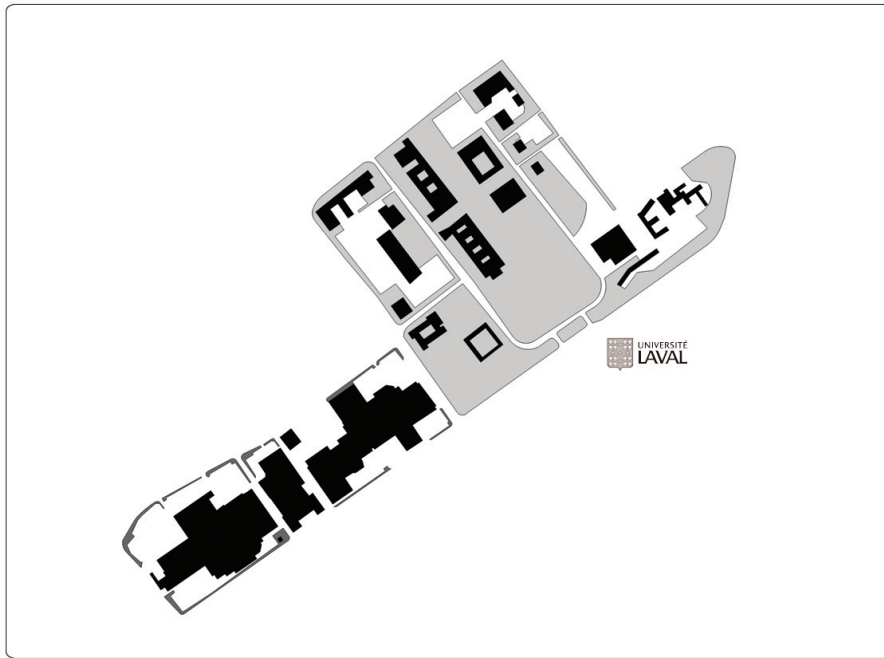
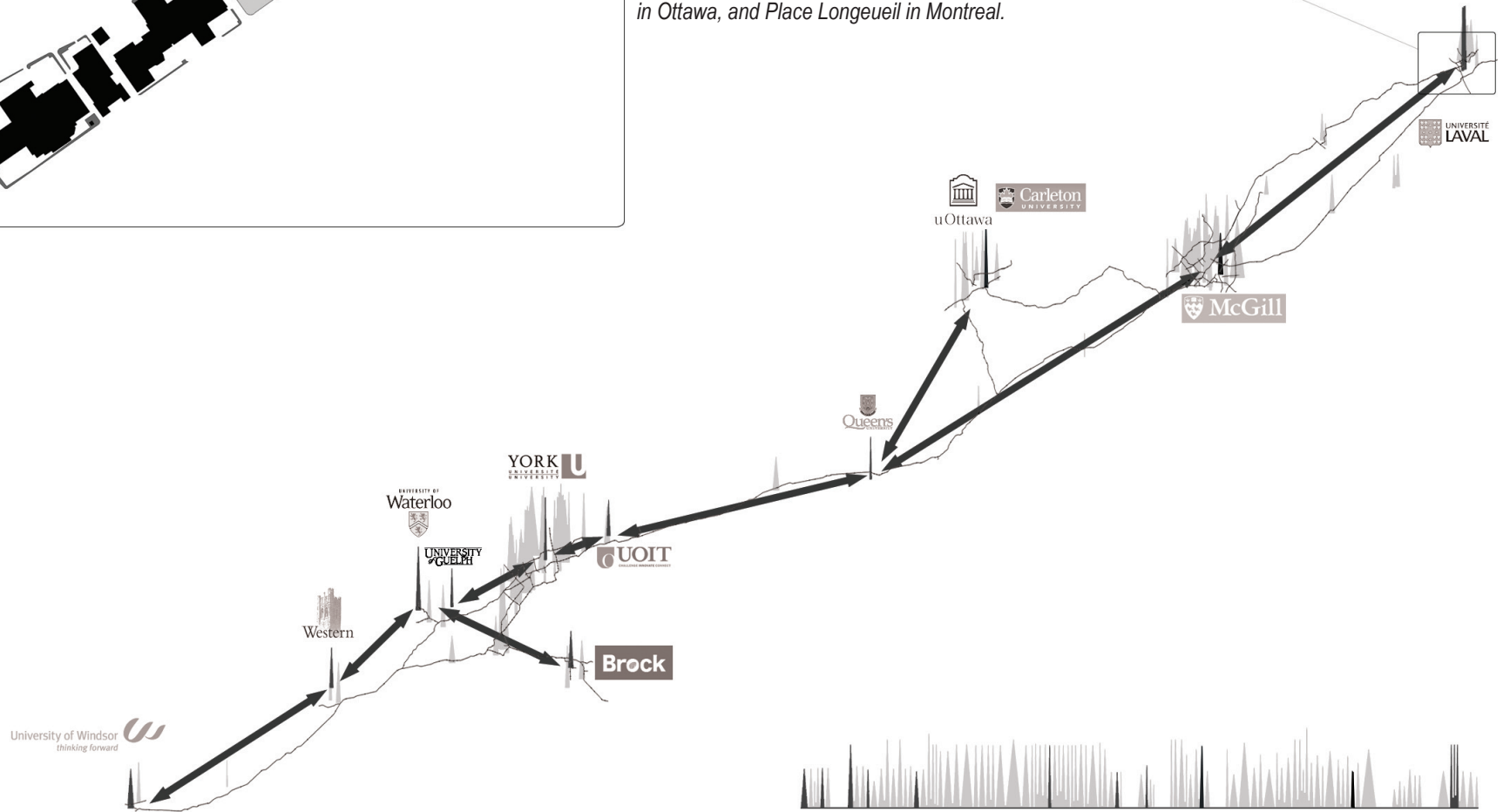


fig 5.16 Research and Education Zones

These sites are malls and supporting areas that are adjacent to major research and education centres, particularly the region's network of universities. They serve to concentrate the knowledge based economic activity of the region and link its various institutions to promote better communication and resource sharing in an effort to attract creative minds from around the world.

Place Laurier, Place de la Cité and Place Ste. Foy in Quebec City (left) are all located adjacent to Université Laval. The high speed transit and information systems linking mall sites are particularly advantageous to university students and faculty who can share resources at world class speeds, effortlessly attend lectures held at other institutions and collaborate on projects seamlessly.

Other malls positioned to perform in a similar capacity are Devonshire Mall in Windsor, Masonville Mall in London, Conestoga Mall in Waterloo, Stone Road Mall in Guelph, Niagara Pen Centre, Five Points Mall in Oshawa, Cataraqui Town Centre in Kingston, Centrepoint Mall in Thornhill, St. Laurent Centre in Ottawa, and Place Longueuil in Montreal.



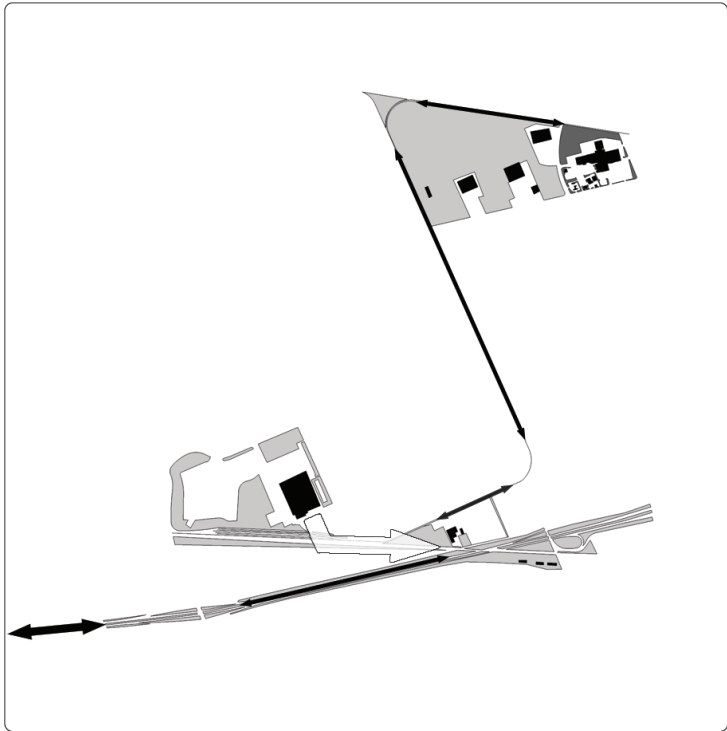
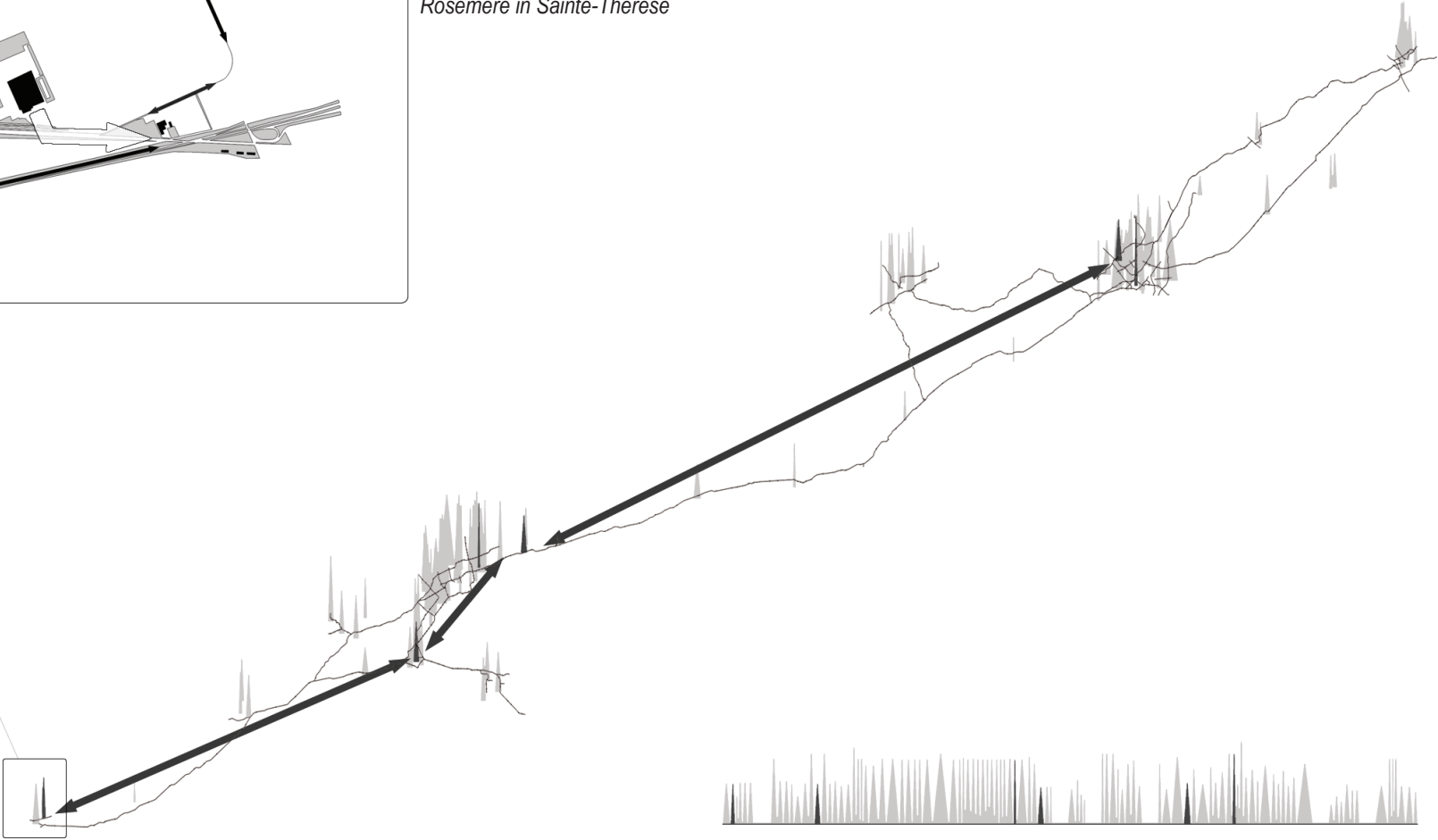


fig 5.17 Manufacturing Zones

These sites are malls and supporting areas that are adjacent to major manufacturing sectors, particular the automobile industry where plants have been repurposed to mass produce fixtures for the newly implemented transit infrastructures with just-in-time delivery.

Tecumseh Mall in Windsor (left) is located near a disused automotive asseby plant and shipping yard, which will be used to produce rail cars for the new personal transit system. New cars will roll out of the factory and directly onto the transit line, ready for use minutes after leaving the assembly floor and produced on demand so that the system is never under or over supplied. Other sites will manufacture for other modes or operate as maintenance and service centres.

Other malls positioned to perform in a similar capacity are Centre Mall in Hamilton, Woodside Square in Scarborough, Oshawa Shopping Centre, Cavendish Mall in Cote-Sainte Luc, Les Promenades Deux Montagnes, and Place Rosemere in Sainte-Therese



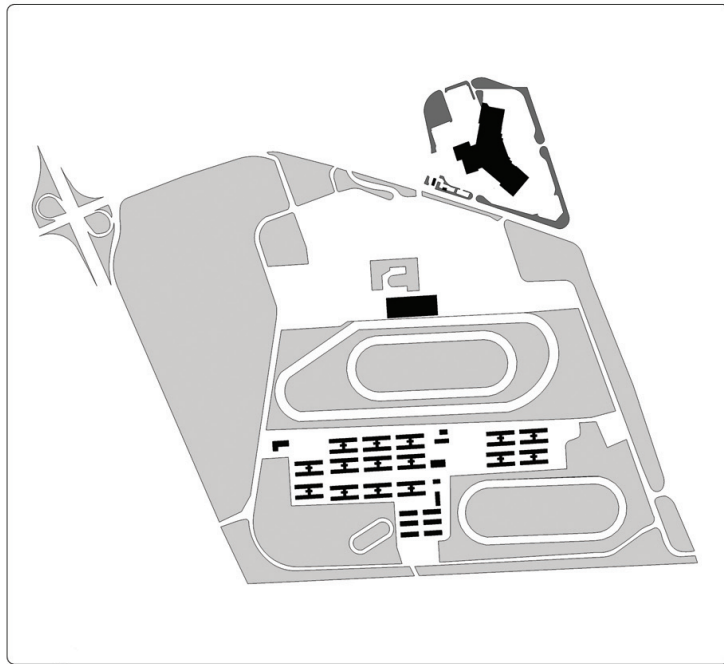


fig 5.18 Major Cultural and Entertainment Zones

These sites are be malls and supporting areas that are adjacent to regional cultural, sporting and entertainment attractions, such as theme parks or the downtown areas of the major metropolitan areas in the corridor.

Woodbine Centre in Malton (left) is located across from Woodbine Racetrack and Slots, and has already begun to specialize in this capacity, branding itself as Woodbine Centre and Fantasy Fair and claiming 'shopping's not the only attraction'.

Other malls positioned to perform in a similar capacity are Niagara Pen Centre, Oakville Place, Vaughan Mills, Yorkdal Mall in Toronto, Dufferin Mall in Toronto, Les Galeries de Hull, Rockland Mall in Montreal, Place Longueuil and Place Fleur de Lys in Quebec City.

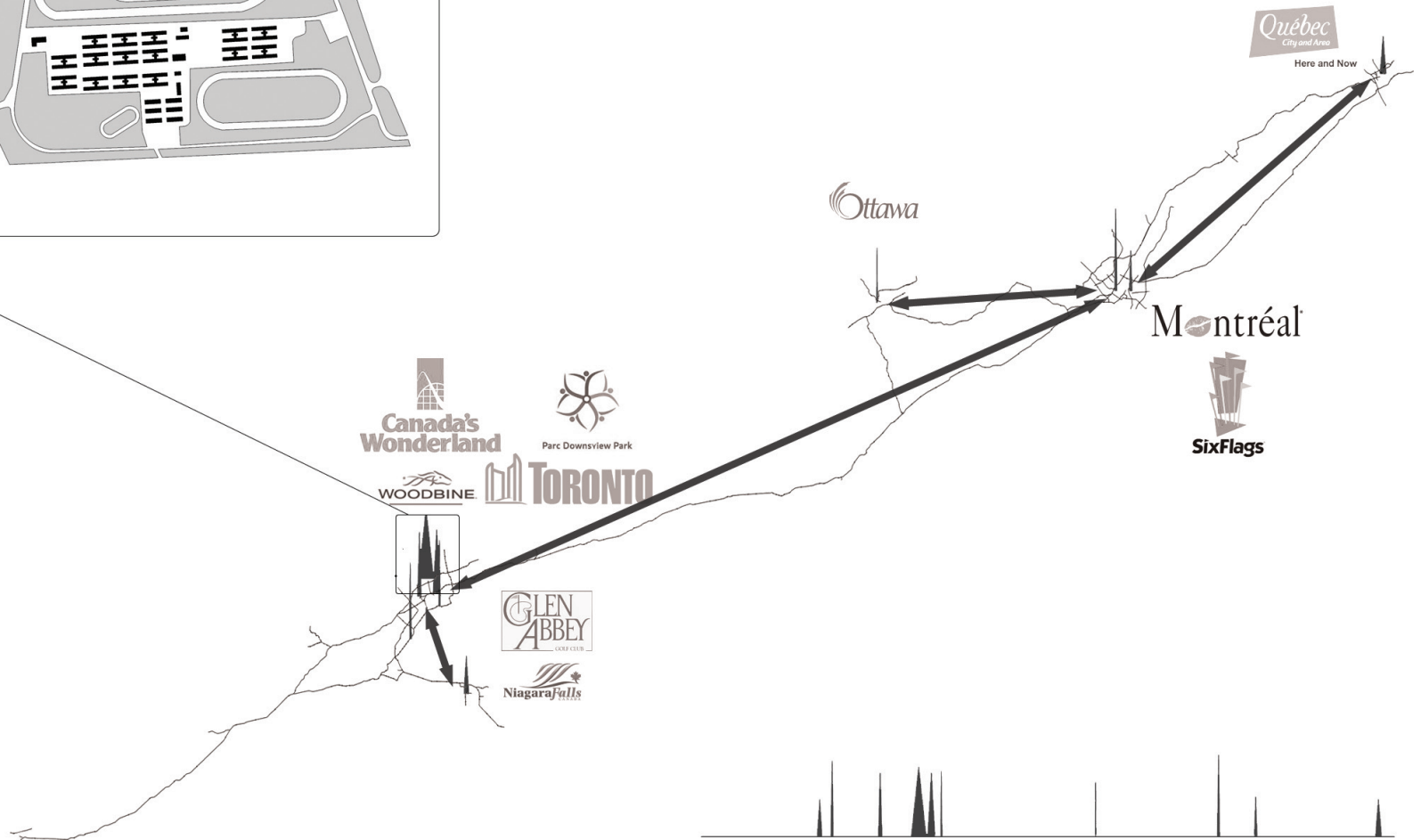
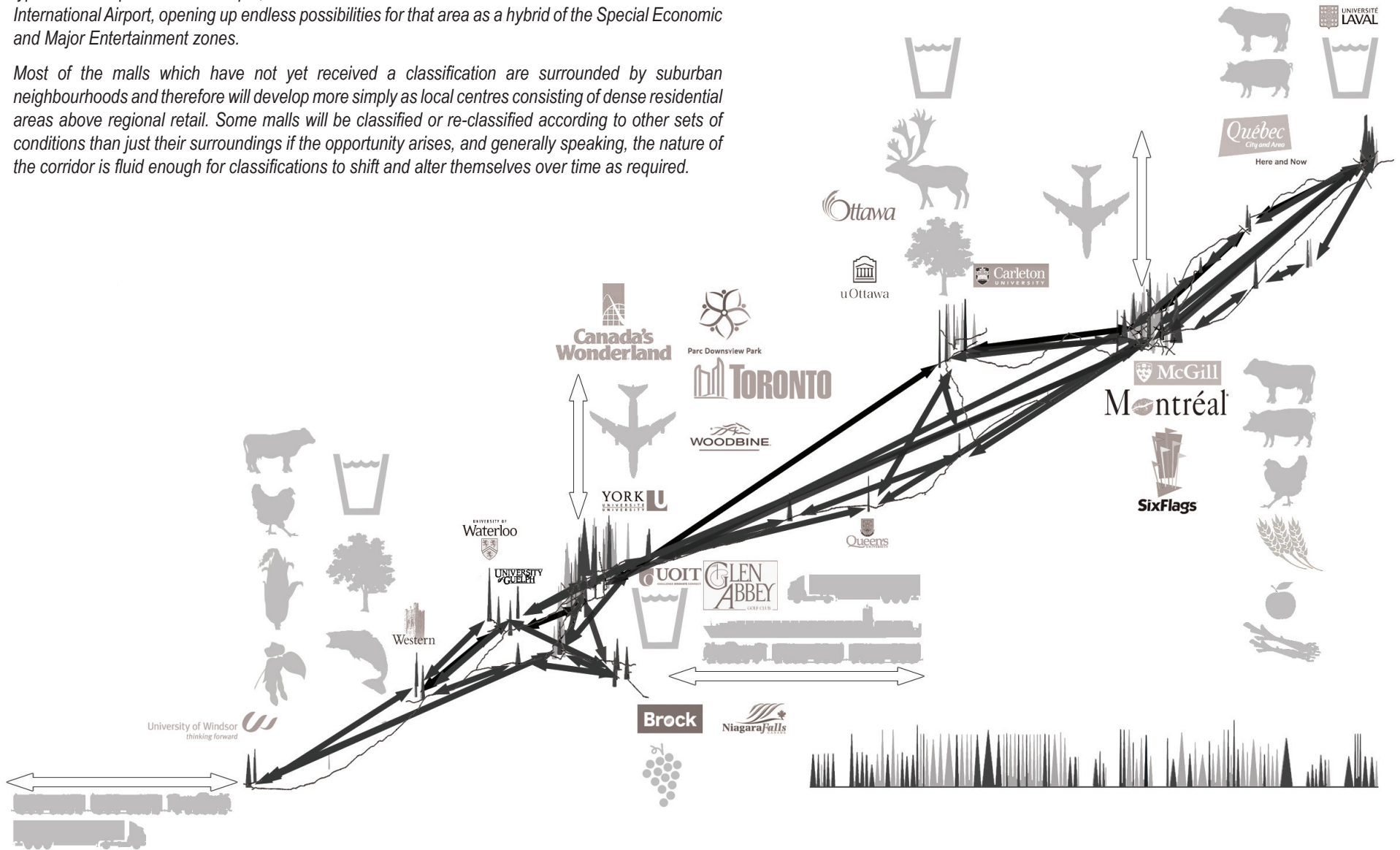


fig 5.19 Complementary Networks

Each of the above site classifications forms a sub-network which still manages to link most or all of the major geographic areas of the corridor. These sub-networks integrate into the overall megaregional plan to operate individually and collectively. Many mall sites are hybrids; falling under two or more classifications. These sites have the potential to mutate in unique ways and drive entirely different types of development. For example, Woodbine Centre is near both Woodbine Racetrack and Pearson International Airport, opening up endless possibilities for that area as a hybrid of the Special Economic and Major Entertainment zones.

Most of the malls which have not yet received a classification are surrounded by suburban neighbourhoods and therefore will develop more simply as local centres consisting of dense residential areas above regional retail. Some malls will be classified or re-classified according to other sets of conditions than just their surroundings if the opportunity arises, and generally speaking, the nature of the corridor is fluid enough for classifications to shift and alter themselves over time as required.



Scarborough Town Centre

Scarborough Town Centre (STC) is a larger than average super-regional shopping centre, with mall and parking covering 26 ha, but with an extended site area of over 50 ha. It is immediately adjacent to a 14 lane stretch of the 401 and has an existing LRT line pass through on-site, with a major bus terminal underneath. There are over 20 high-rise residential buildings within a 1 km radius, showing that the site is already attracting significant density.

STC has a gross leasable area of just over 1.3 million sq. ft., 750,000 of which is contained within the anchors of Sears, Wal-Mart and The Bay²². In total, STC offers over 220 shops and services, with 5,708 parking stalls and a weekly traffic of approximately 423,000 visitors per week²³. STC has a trade area of over 900,000 people who earn an average annual household income of \$67,228²⁴.

Scarborough Town Centre first opened in May of 1973 as a 130-store mall servicing a population of 200,000²⁵. The original STC was a Y-shaped mall, featuring a primary court with a built-in turntable floor, two secondary courts and was anchored by Eaton's, Simpson's, and Miracle Food Mart²⁶. It underwent phased additions in 1979 (of 240,000 sq.ft., and adding a new Bay department store anchor) and 1999 (of 177,000 sq.ft.)²⁷. This last addition focused on entertainment tenants, with the introduction of an 'experiential' area²⁸ containing a 2-level Indigo bookstore, an HMV music store and a 12-screen Famous Players Colliseum²⁹. In 1985, the LRT line opened, linking STC to the TTC transit system, and the mall now describes itself as "east-end Toronto's most important transport hub. In addition to the LRT station. Scarborough Town Centre is a busy terminus for a significant number of TTC bus routes, as well as GO Transit."³⁰ From 2000-2008, Scarborough Town Centre saw most of its new retail development occur as outparcel and big box tenants on the north and east ends of the site. Major interior renovations are currently underway, begun in 2008 and to be completed in 2010 at a total of \$60 million³¹. Phases 1 and 2 were designed by Bregman & Hamann, while phase 3 was designed by Pellow & Associates, with the approximate cost of phases 1 and 2 estimated at \$50 million combined³².

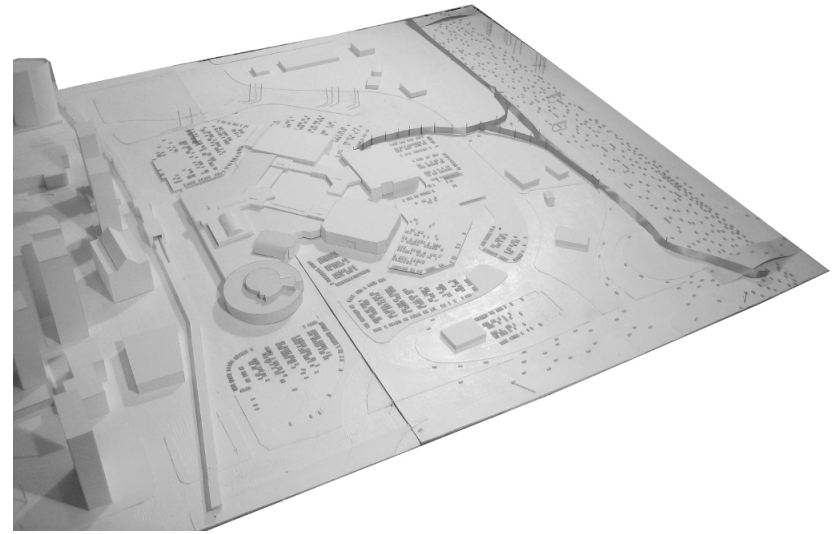
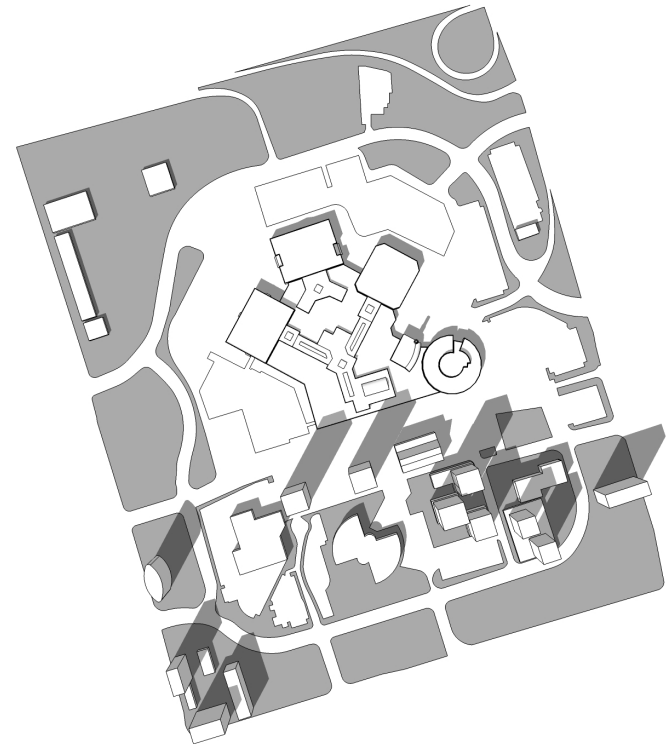


fig 5.20 (above) A model of Scarborough Town Centre as it exists, with provision for new transit.

fig 5.21 (below) Plan view.



Parameters

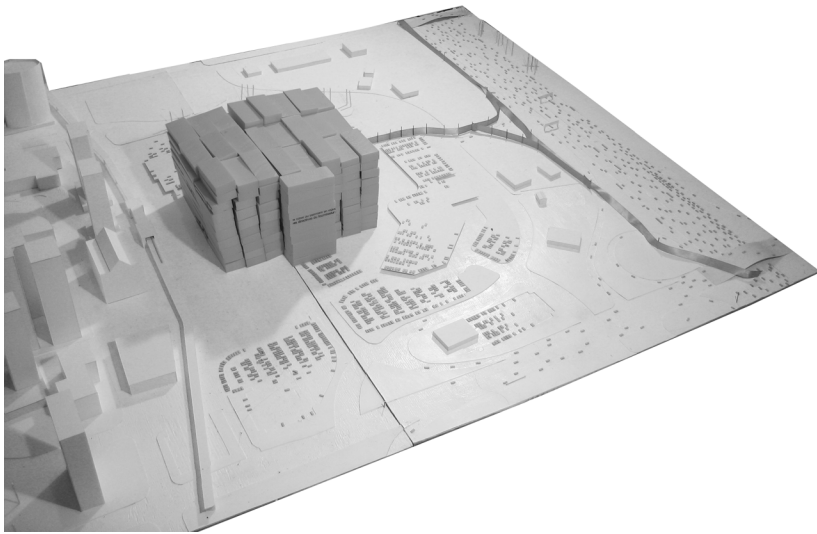
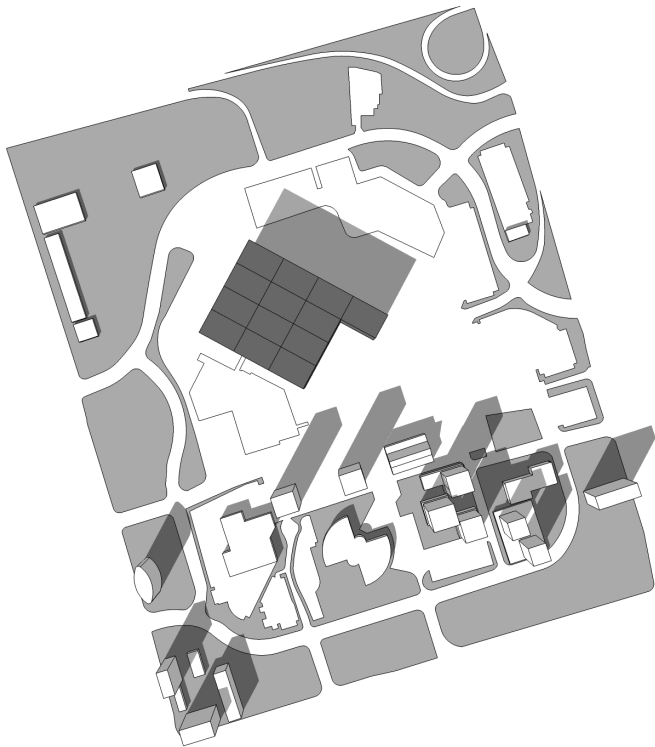


fig 5.22 (above) A model of STC showing a mass representing 20,000 people at 30 stories.

fig 5.23 (below) Plan view.



Using the figures discussed earlier as a reference point for capacity (pp 42,43)-- 1 million, or 40% of the remaining projections of Places to Grow across all 100 mall sites-- the approximately 50 hectares of Scarborough Town Centre translates to 20,000 people. These new residents, arriving over the next 21 years, must be contained within the mall site and any identified adjacent properties. They are demonstrated here in basic units of 120 m² gross floor area per 2.5 people, arranged in a double loaded configuration of 20 units per level in buildings 30 stories high, which is roughly average for high-rise buildings around the STC. These images are intended to illustrate a series of conditions upon which a framework for development can be extrapolated, conditions which are generic to most or all malls in the region. This is not a specific master plan for Scarborough Town Centre, nor does it represent a specific architecture for the site; it is likely, given it's size, location and surroundings, that STC has the capacity for larger than average densities in taller than average buildings.

Scarborough Town Centre is an ideal site to reference as it combines many of the most desirable and common factors for development outlined in this thesis. It is expressway adjacent, as are 50 other malls in the corridor. Its immediate site area-- the mall itself and surrounding parking lots-- is 26 ha, or approximately equivalent to the average mall in this study. The surrounding, affiliated box store developments and highway easements bring the total site area to just over 50 ha. Like the vast majority of malls, STC is in an area where the population density is above 150 persons per kilometer. It has a high population of foreign born and educated persons, and is owned by Oxford Properties, one of the top-5 mall owners in the Windsor/Quebec corridor. STC is already highly integrated into existing public transit systems and it has attracted significant development density already. There are civic and government buildings nearby; Scarborough Town Centre is a legitimate city centre.

In fig 5.22 and 5.23, the projected growth of 20,000 people is represented as a single mass sitting on the current mall site, as a reference point.

Fig 5.26 and 5.27 represent a condition where only empty or unused lands are developed. Here, an empty lot to the west of the mall and property adjacent to the highway is able to accommodate just over half of the total required development for the site, 10,500 people. In fig 5.28 and 5.29, two parking lot areas are chosen for development which eliminate roughly 200 surface parking spaces while adding 3,000 inhabitants. However, as new transit systems are intended to ease reliance on the automobile, it can be assumed that some parking areas can be slotted for redevelopment. These 200 spaces represent less than 4% of the parking capacity of STC, and are located in secondary lots that are rarely full.

Nearly all malls have significant empty space surrounding them, and just as many have secondary parking lots that see little traffic. The amount of available open space surrounding STC is certainly more than at many mall sites; still, there exists a significant capacity for development without having to alter any existing element of malls or their surroundings whatsoever. This kind of growth is likely to happen at sites on its own; there are already a number of high rise residential buildings to the south of STC, for example.

For the rest of this section, it will be assumed that these sites are developed as shown. Other conditions will be demonstrated in addition to the 13,500 inhabitants already accounted for here.

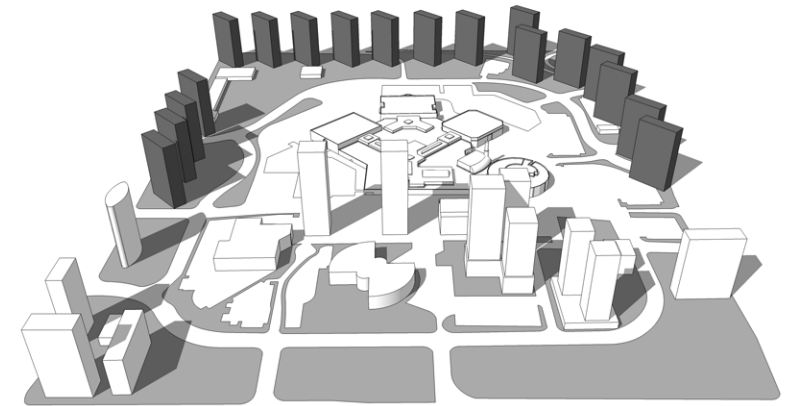
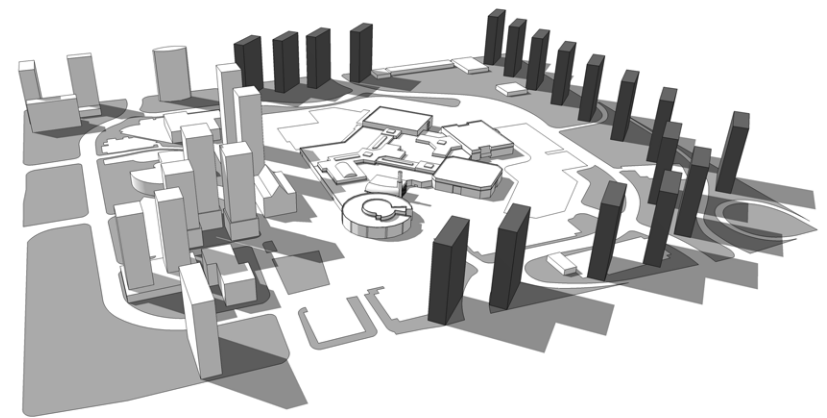


fig 5.24 (above, top) Perspective image of STC, projecting development on unused lands and fig 5.25 (above, bottom) secondary parking lots. Shadows represent fall equinox conditions, mid-afternoon of September 21st.

fig 5.26 (opposite, top) Model perspective and fig 5.27 (opposite, bottom) plan view of STC, developing only on presently empty lands surrounding the site. This accounts for just over half of the required capacity; 10,500 people.

fig 5.28 (opposite right, top) Model perspective and fig 5.29 (opposite right, bottom) plan view of STC, adding development at two strategically selected parking lot sites. Total capacity; 13,500.

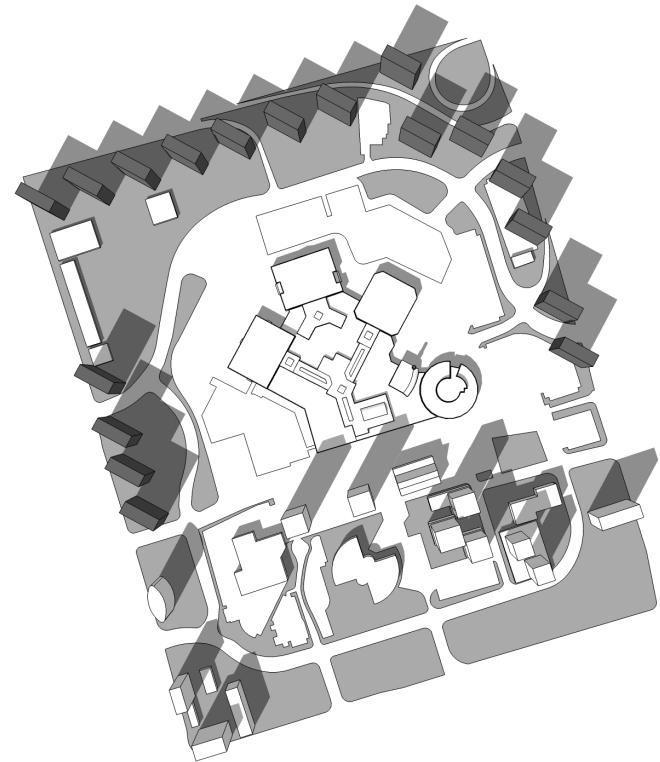
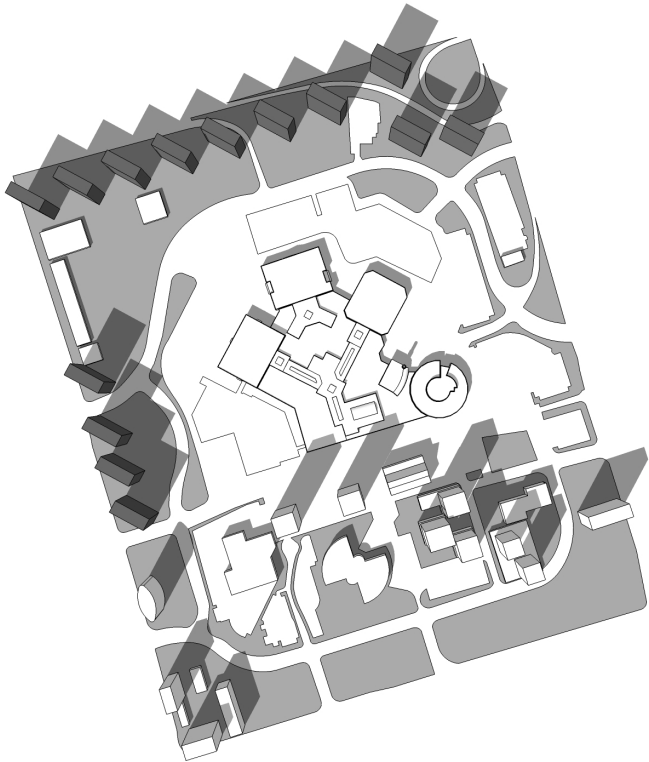
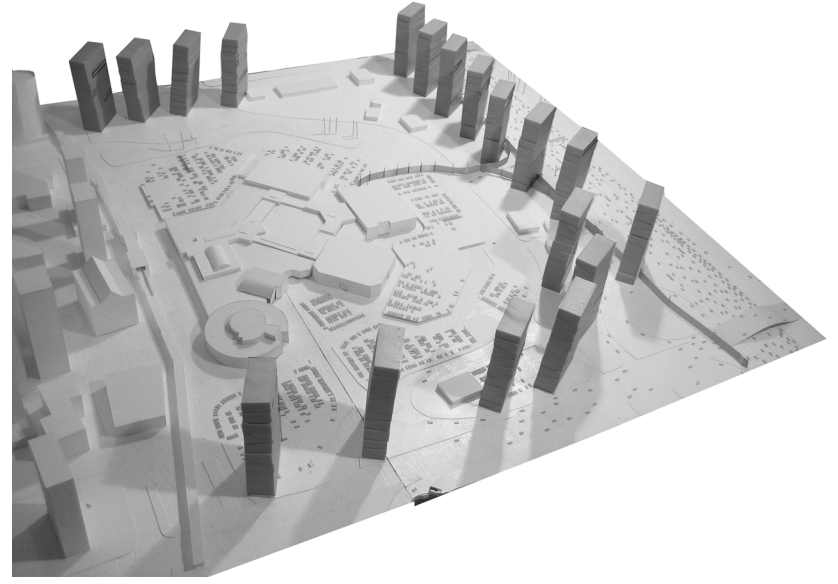
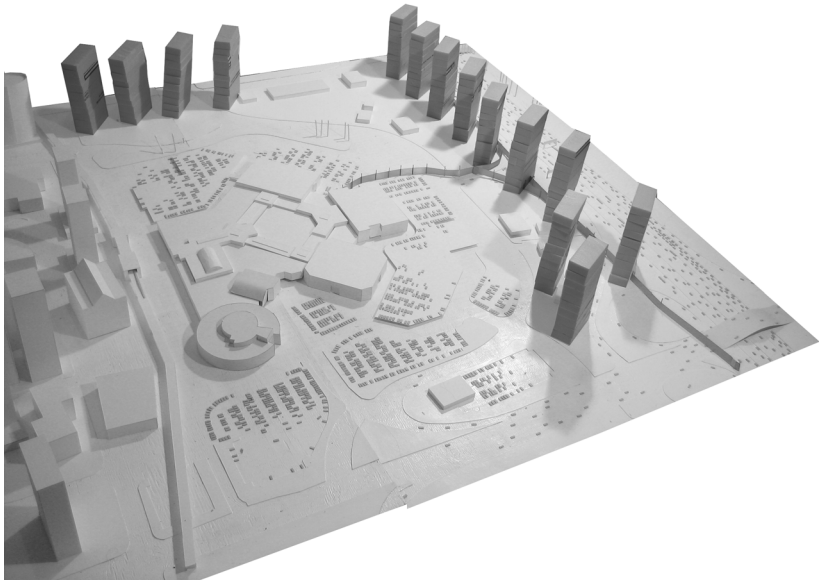


Fig 5.30 through 5.35 represent a condition where chain store vacancies in malls rise significantly. This is likely to be common in the future, as larger chain stores migrate to drive-up value centres and smaller chain stores push their business online and into boutique retail. Boarded up or empty storefronts are a sign of dying malls, and they are unpleasant for consumers. In the event of an unavoidable rise in vacancies, therefore, mall operators may choose to close down an area, moving remaining tenants to other parts of the mall in order to keep those areas consistently full. The empty area left behind can then be redeveloped with different program; a direct injection of people and post-retail functionality into a 'dead' part of the mall.

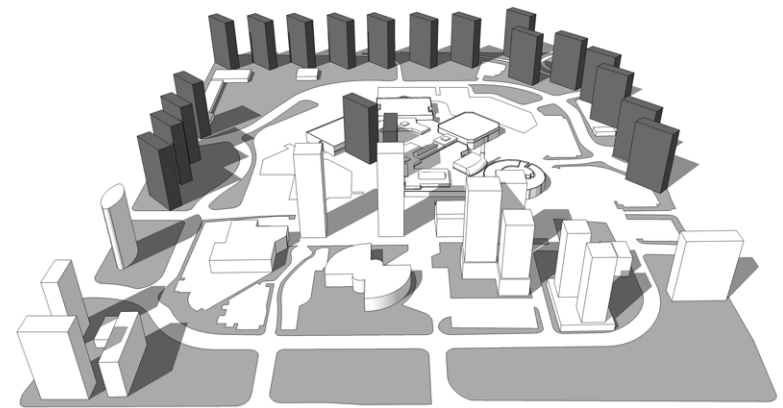
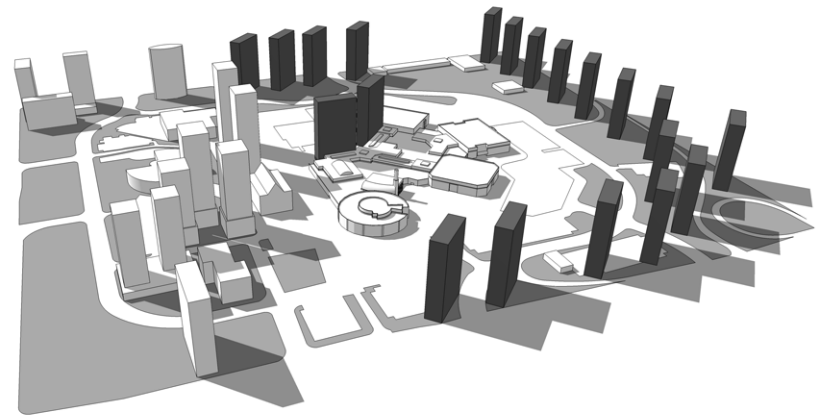


fig 5.30 (above, top) and fig 5.31 (above, bottom) Perspective images of STC, projecting development of 15,000 people.

fig 5.32 (opposite, top) Model perspective and fig 5.33 (opposite, bottom) plan view of STC, identifying a section of chain stores for redevelopment.

fig 5.34 (opposite right, top) Model perspective and fig 5.35 (opposite right, bottom) plan view of STC, adding development at former chain store section of the mall.

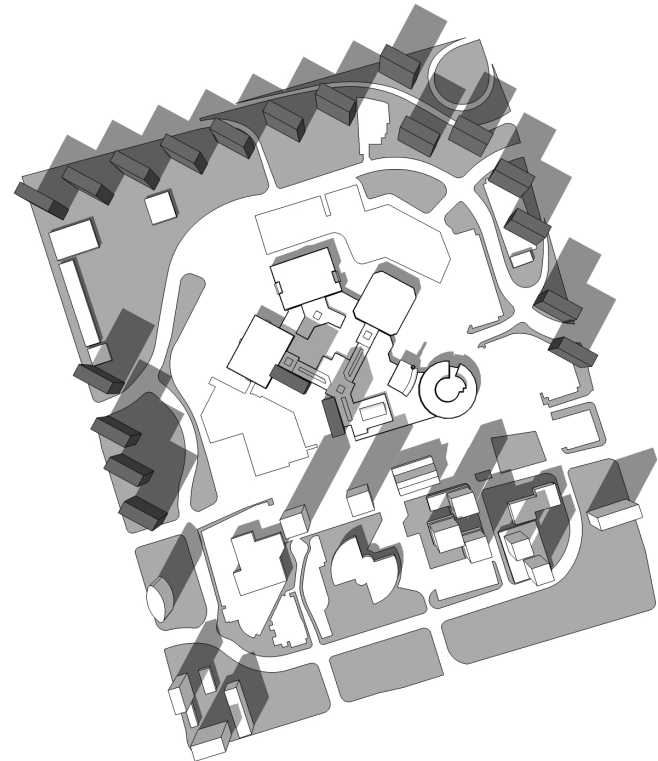
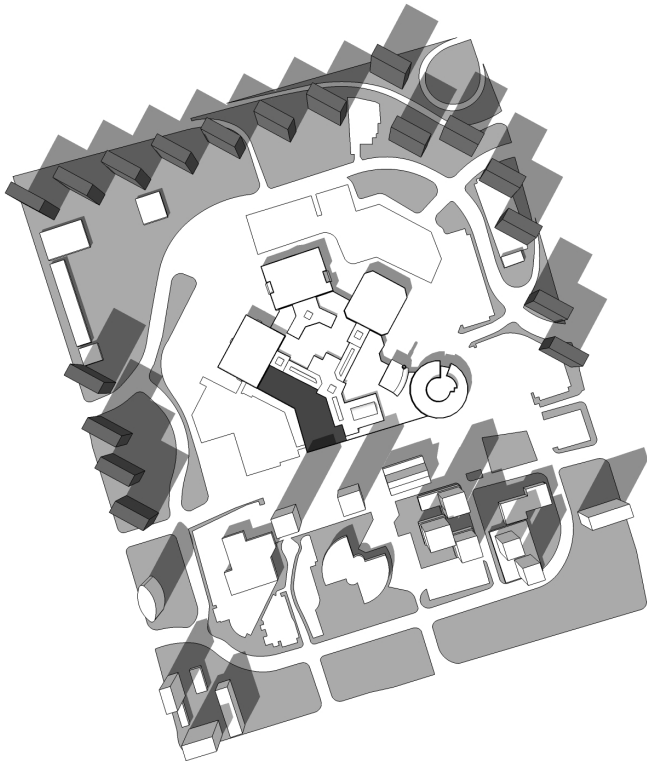
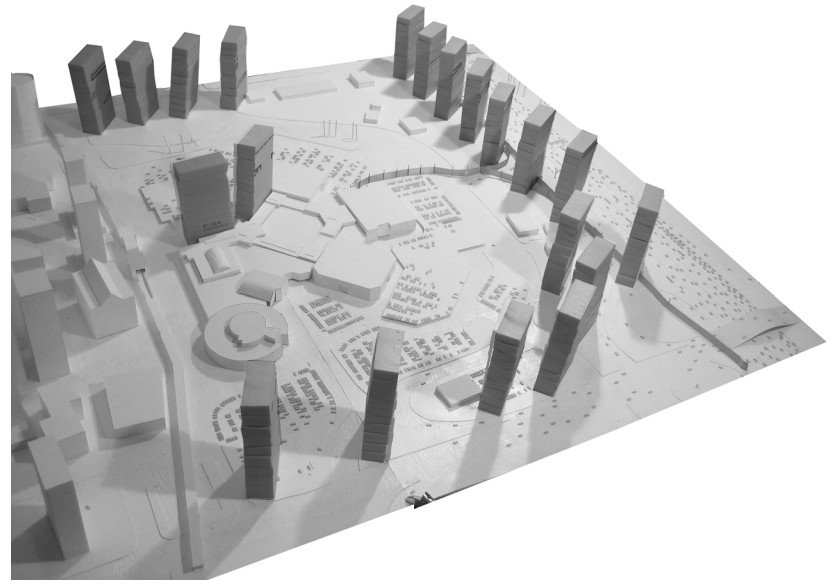
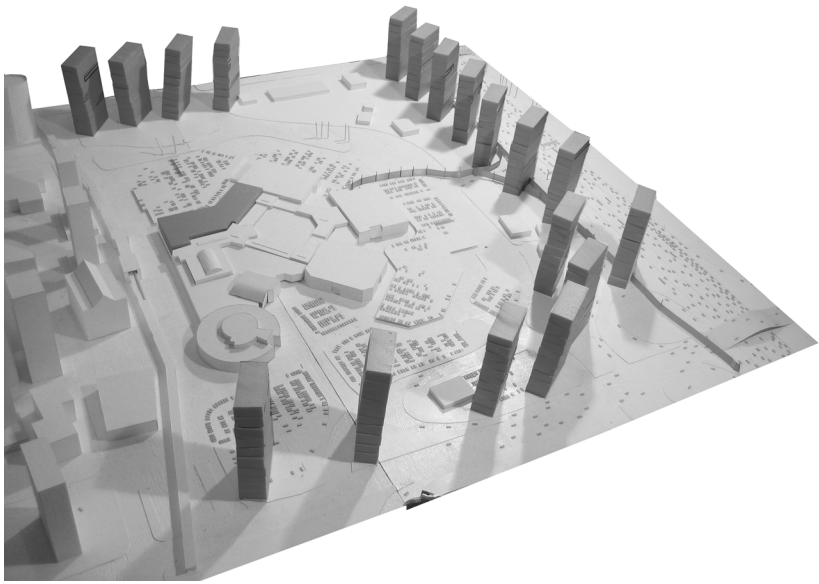


Fig 5.36 through 5.41 represent a condition where chain stores in malls lose all viability. In this case, the chain store sections of the mall are replaced with residential development, with the anchor tenants remaining as a ground level 'big box' complex. This is a likely scenario if chain retail fails at about the same time department stores re-position themselves as value retailers. Scarborough Town Centre already features a Wal-Mart, which is more commonly seen in big box developments.

The images shown here represent the full development capacity for the site of 20,000 people.

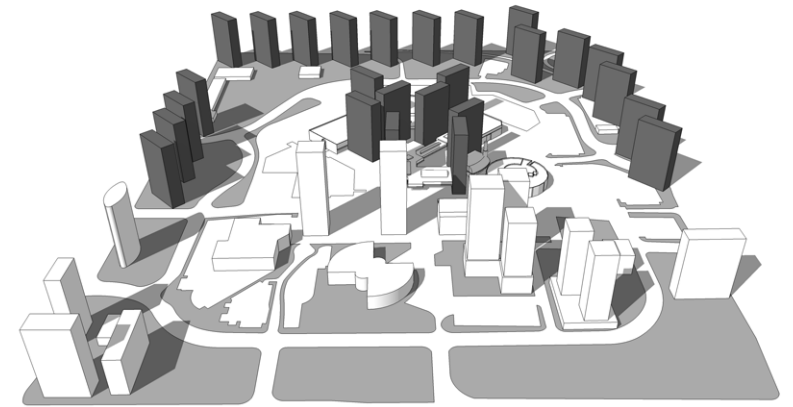
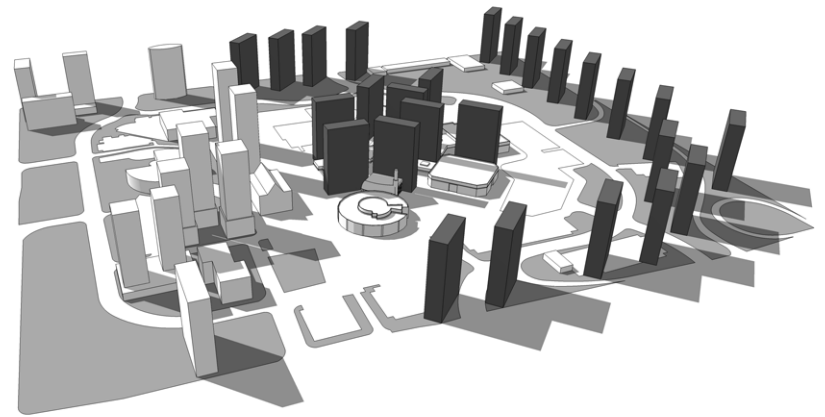


fig 5.36 (above, top) and fig 5.37 (above, bottom) Perspective images of STC, projecting development of 20,000 people.

fig 5.38 (opposite, top) Model perspective and fig 5.39 (opposite, bottom) plan view of STC, identifying all sections of chain retail for redevelopment.

fig 5.40 (opposite right, top) Model perspective and fig 5.41 (opposite right, bottom) plan view of STC, adding development at all former chain retail sections of the mall.

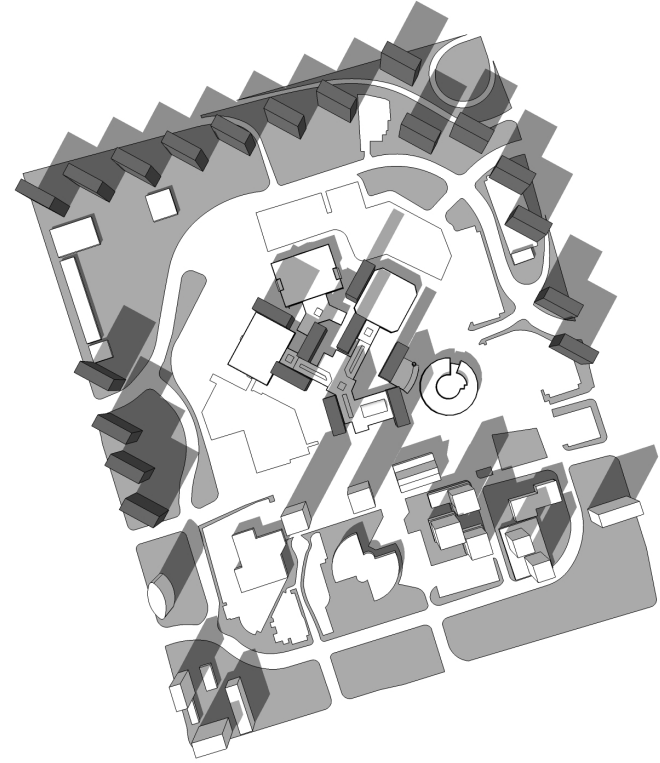
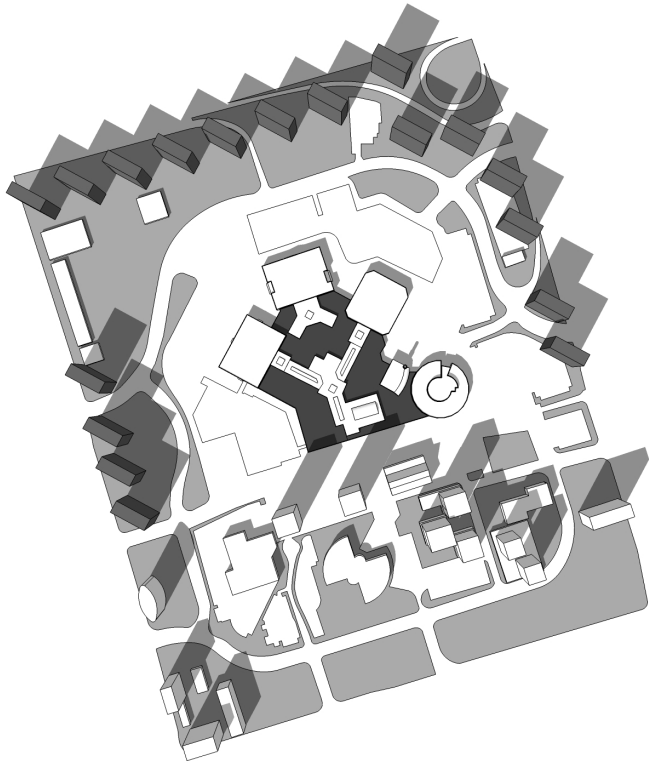
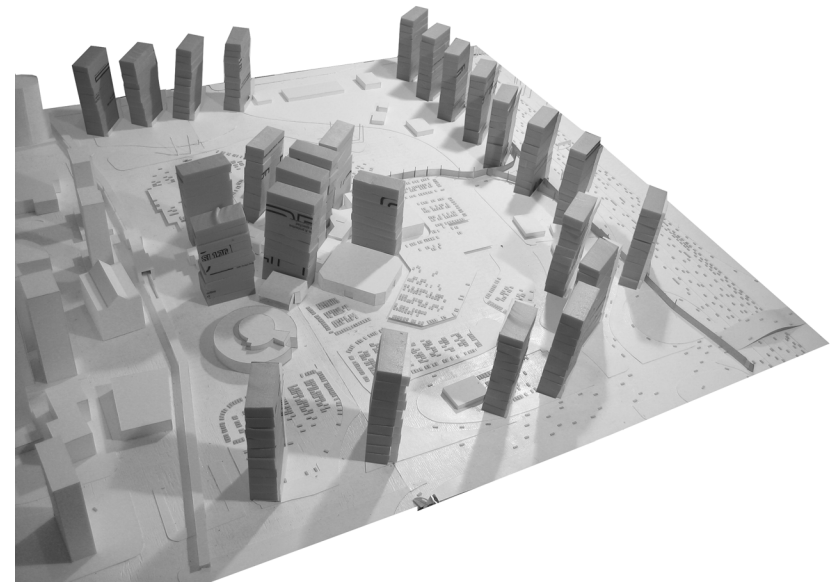
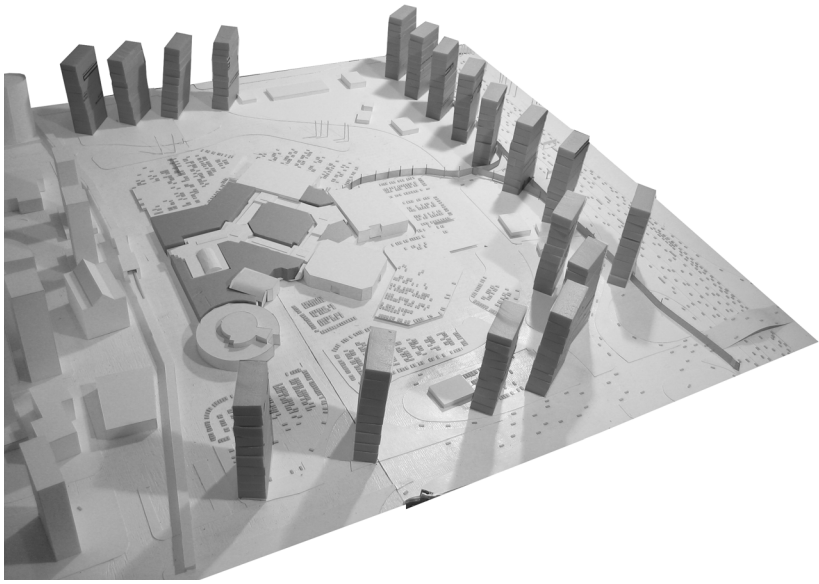


Fig 5.42 through 5.47 represent a condition where a major department store vacates the mall. This could happen in a number of ways on a number of different timelines. Department stores could continue to lose business to value centres, boutique and online retailing and simply go out of business. This could happen relatively quickly, or it could be a generational shift as baby-boomers-- who are many mid-range department store's target demographic-- begin to die-off. As mentioned previously, a mid-range chain like Sears is likely, in the future, to specialize either as a value or boutique retailer, abandoning middle class status, and, likely, the mall.

Malls which lose an anchor are often ticketed for extinction. If this happens and there is no replacement anchor found, it would be prudent to redevelop the vacated store with a post-retail anchor. A large residential development would provide a built-in customer base for the rest of the mall, with podium program continuing the evolution of the anchor from retail, to entertainment (the theatre) to civic or public uses.

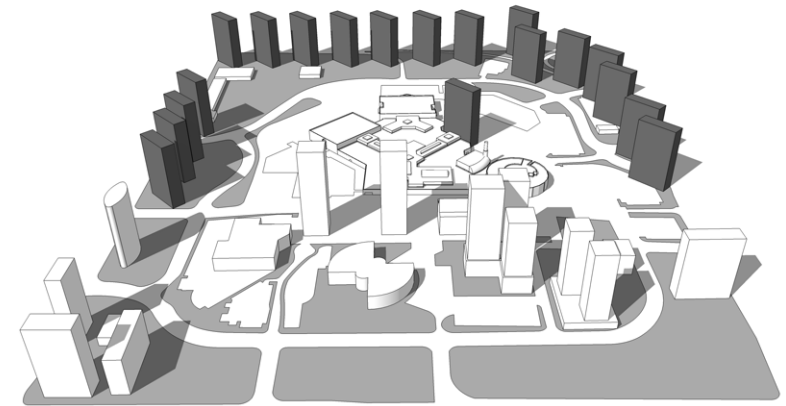
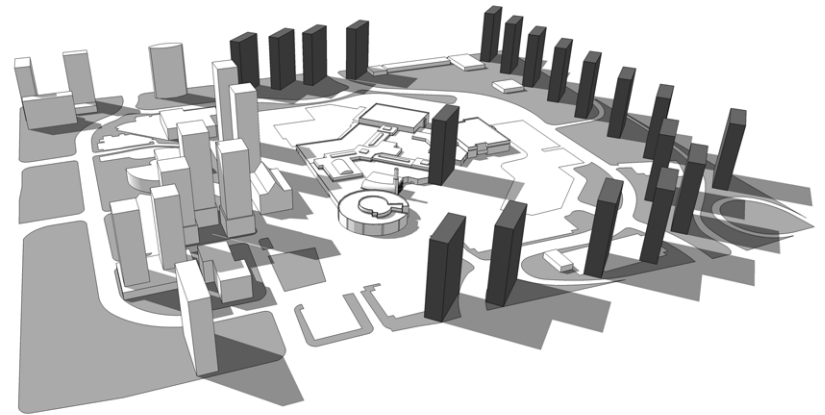


fig 5.42 (above, top) and fig 5.43 (above, bottom) Perspective images of STC, projecting development of 14,250.

fig 5.44 (opposite, top) Model perspective and fig 5.45 (opposite, bottom) plan view of STC, identifying the Sears department store for redevelopment.

fig 5.46 (opposite right, top) Model perspective and fig 5.47 (opposite right, bottom) plan view of STC, adding development at former Sears department store.

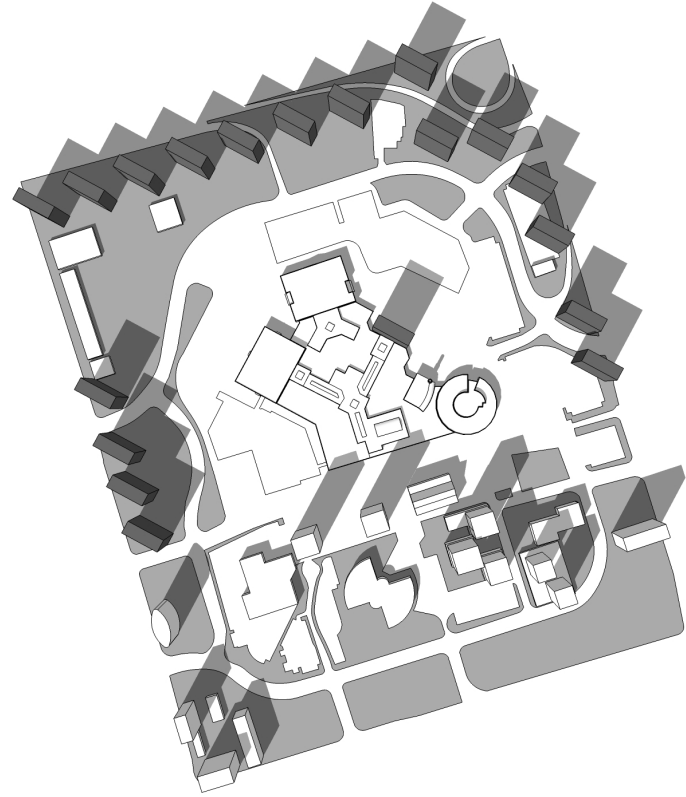
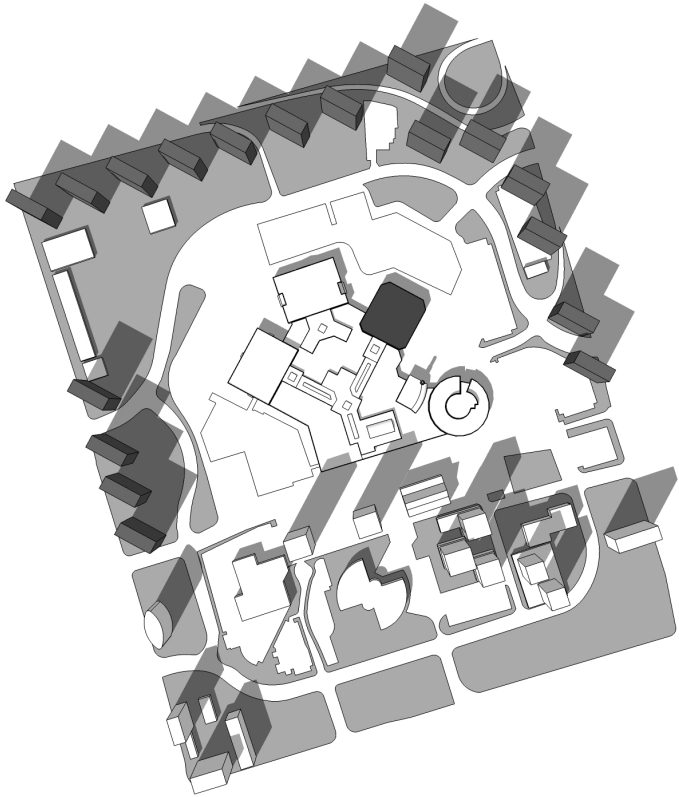
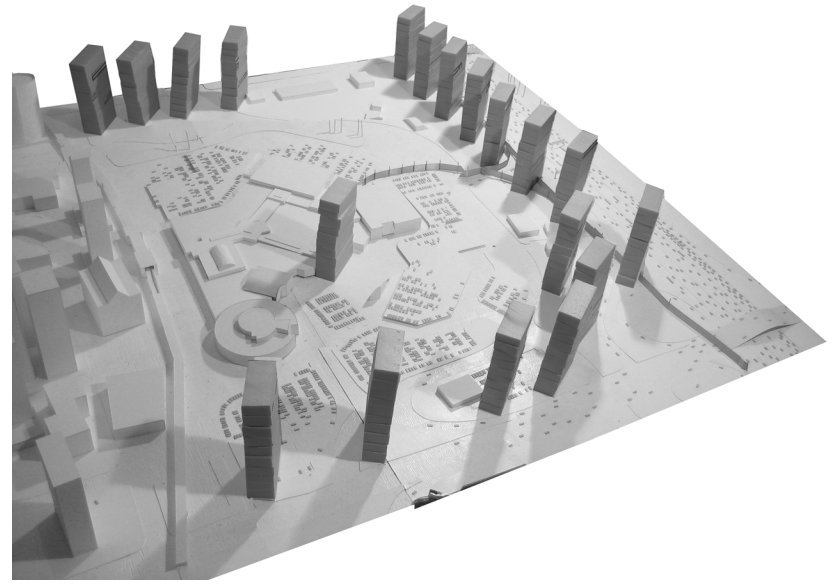
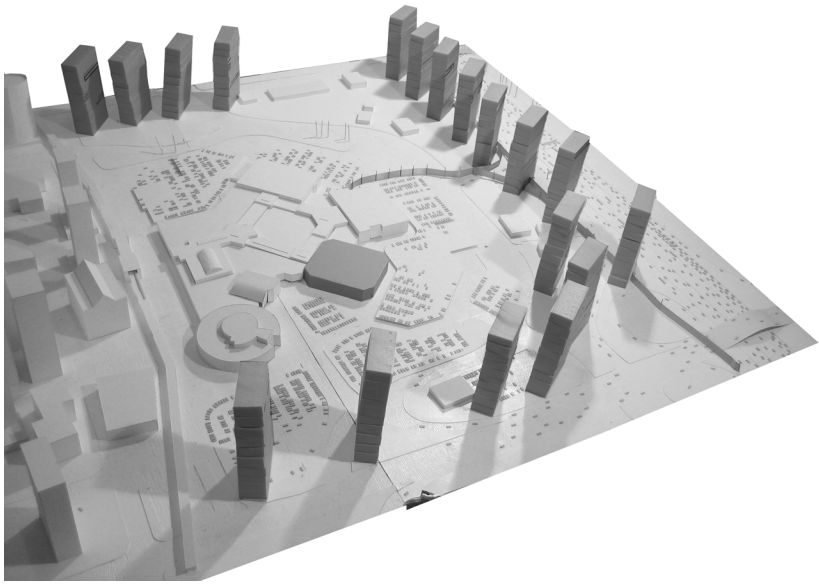


Fig 5.48 through 5.53 represent a condition where major department stores in malls lose all viability. In this case, they are redeveloped as high density residential and the concourse is removed to create a main street condition. Chain and boutique retail remain in an open-air shopping centre, with the form of the concourse remaining as a street accessible to either pedestrians or both pedestrians and automobiles.

The images shown here represent the full development capacity for the site of 20,000 people.

Summary

Each mall will undoubtedly experience unique opportunities and constraints while developing over the next two decades, just as many will face the same challenges of other malls; ones that are endemic to the typology itself. It is important to allow enough flexibility for these changes to happen in organic and interesting ways, not only to allow each mall to continue to operate as development occurs but also to avoid conditions which are too generic or encourage development that is formulaic and uninteresting.

The goals of this thesis, as a megaregional plan, can be summarized as follows:

To implement an efficient, cost-effective highest order infrastructural backbone for the Windsor/Quebec corridor capable of delivering transit, energy and information to regional centres in an environmentally and economically sustainable manner. This includes new emission-free public and private transit options that run along the highway backbone at very high speeds, connect directly into all available existing local, regional and international transit networks, and drive development at the 100 linked mall sites. It also includes a means of generating clean energy along the corridor that is distributed and strategically intensified to efficiently deliver power to the region, and a globally-competitive high speed information infrastructure that will attract emerging industries and highly skilled workers from around the world.

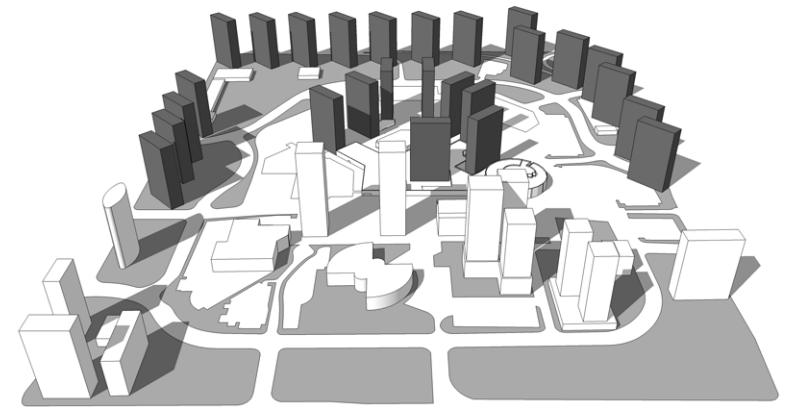
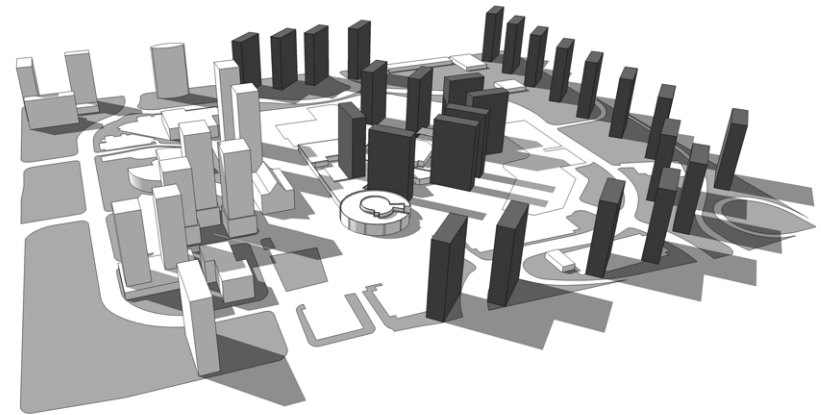
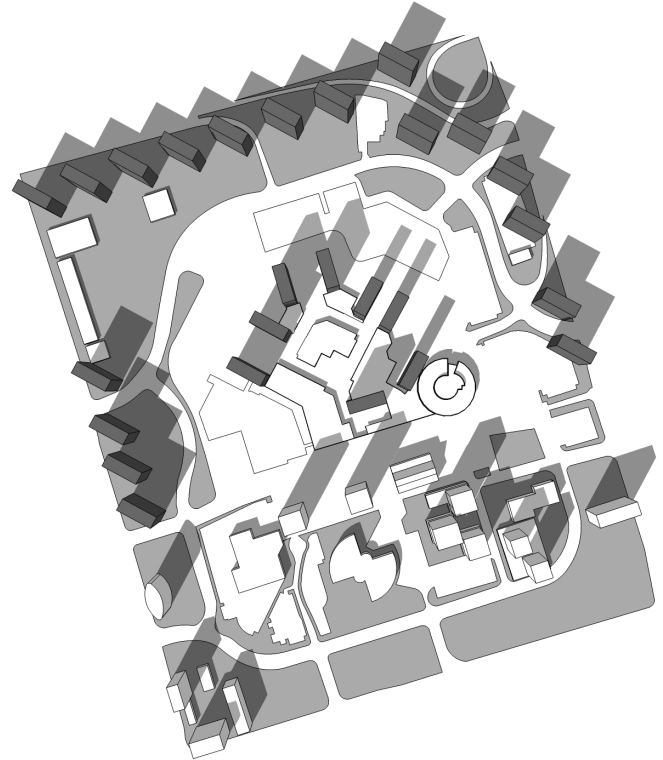
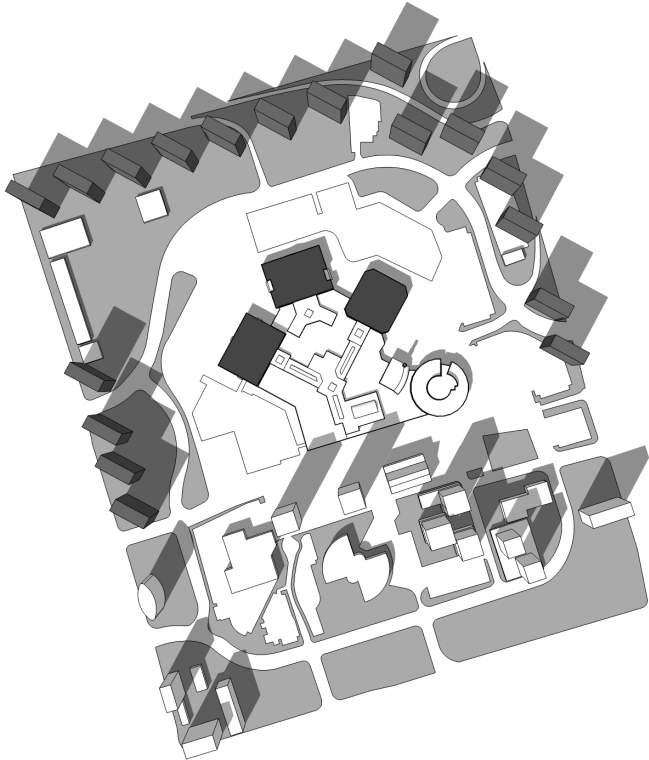
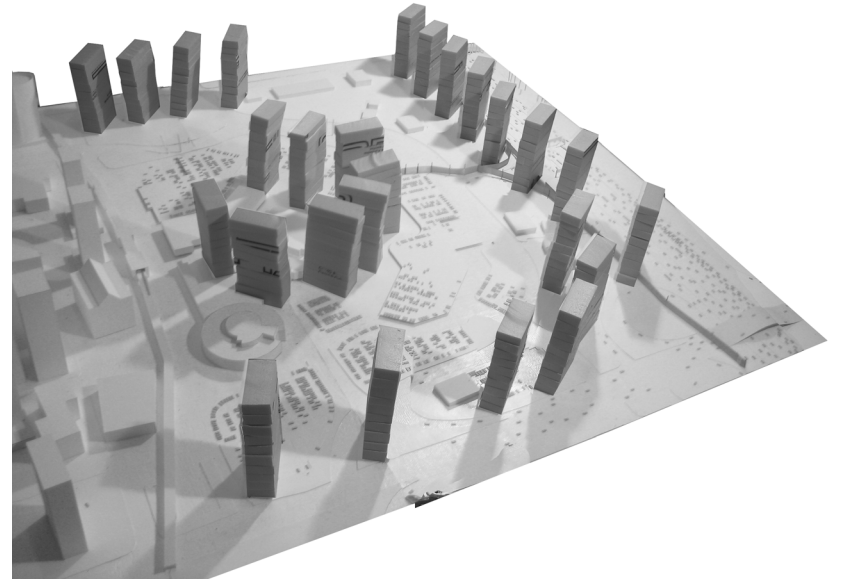
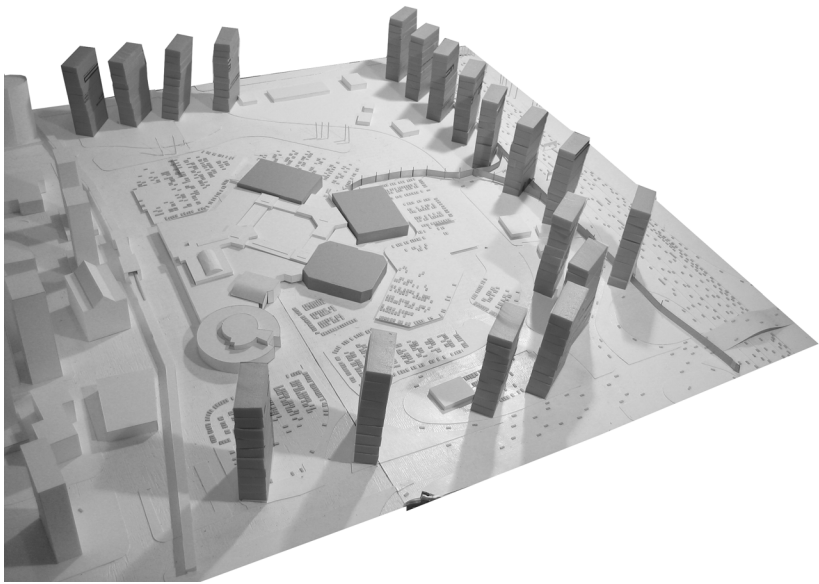


fig 5.48 (above, top) and fig 5.49 (above, bottom) Perspective images of STC, projecting development of 20,000.

fig 5.50 (opposite, top) Model perspective and fig 5.51 (opposite, bottom) plan view of STC, identifying all three department store anchors for redevelopment.

fig 5.52 (opposite right, top) Model perspective and fig 5.53 (opposite right, bottom) plan view of STC, adding development at each anchor, removing concourse.



To eliminate suburban sprawl through strategic, intensified development strategies. This plan identifies 100 sites to act as nodal points for the region, tightly containing development in a linearly distributed system of core-only urbanism. These nodal points are to contain, on-site, 40% of the expected growth for the Greater Golden Horseshoe between 2010 and 2031, or roughly 1 million people. The remaining 60% is directed to brownfield/greyfield sites surrounding malls and intensification corridors where malls are linked to the expressway via arterial roads. These sites will also be developed at high densities and held as closely to the mall as possible in order to deliver all infrastructural systems 'the last mile'.

To reverse the existing infrastructural deficit. This is accomplished by eliminating suburban sprawl, and therefore the inefficient infrastructural systems that need to be built to service it. Also, the new infrastructural backbone, despite requiring a substantial capital investment, will operate in a much more cost-effective manner than systems do today. Wind turbines will produce cheap energy which can be delivered without 'line-loss', maglev lines-- which contain no moving parts and operate with very little energy-- will substantially reduce maintenance and operational costs.

To create complimentary communities which promote local identity and preserve natural systems and agricultural traditions in the region. By categorizing sites into sub-networks charged with carrying out a specific megaregional function and by identifying and incorporating local features and attractions into any new development, each mall can establish an identity that operates at both the local and regional levels.

To deliver a region that, by 2031, is positioned to be competitive internationally for talent, business and investment, offering the highest quality of life possible in an affordable, appealing and exciting way. The Great Lakes and Northeast megaregions are flush with world-class universities, which, when linked via high speed transit and information systems, will create an unrivaled climate for research and development. Refreshing the automotive industry by repurposing disused factories to produce new maglev cars will boost the manufacturing sector and help keep the economy diverse. Identifying certain mall sites as special economic zones will attract international investment. Positioning others as major cultural and recreational centres will drive tourism.

Ultimately, this is a megaregional plan that is intended to perpetuate smart, sustainable growth into the foreseeable future; one that continually strives to improve the region's international reputation and the daily lives of its inhabitants. It is meant to transition the region toward a faster, better, more connected future without abandoning existing systems or drastically altering the identity of the urban environment. Most of all, it is a plan that responds to and facilitates an historic moment of change happening worldwide; from fossil fuels to clean energy, from disconnected and slow communication to constant, instantaneous connectivity, from archaic transportation networks to ultra-high-speed, sustainable mobility and from decentralized, dissociative sprawl to concentrated, clustered, free and integrated urbanism.

Toward Implementation

The next step, toward implementation, is to reconcile the planned infrastructural backbone with the mall sites at the urban scale. This is both to connect the two elements as a working system as well as to act as the genesis point for new development. At its most simple, this reconciliation takes the form of the transit station, where local transit modes will meet the new, higher-order modes in what might be called 'transit anchors'. These transit anchors will in some cases be located at failed or failing retail or entertainment anchors within the mall itself, or built as newly connected pieces adjacent to the mall concourse. Here, in the centre of mall sites-- and the activity contained within-- lies the connection point between all local transit systems and the new and existing higher-order transit options that are currently peripheral to mall sites. In Scarborough Town Centre, for example, the 401 highway passes the site to the north, while the LRT and bus terminals locate themselves to the south; some 650 meters apart. In the new transit anchor, these multi-modal transit options are all accessed from the same place; one that is also connected to the regional retail and community amenity offered by the mall itself.

Beyond the transit station there exists an opportunity to establish individual sites' identities consistent with the theory of 'complementary communities'. Transit anchors should therefore be developed to serve each mall's regional focus.

Both special economic zones and agricultural zones are positioned to develop additional market or retail programme. In the case of agricultural zones, this is likely to take the form of the 'farmer's market', integrated into the multi-modal transit station and mall. From there, produce can be shipped along the backbone at high speeds to secondary marketplaces all over the region. This is the advantage inherent in the vertical integration of local and regional transit with the regional marketplace; at a single location, local goods-- in this case, fresh produce-- can be brought in from surrounding areas where they can be sold directly or uploaded and redistributed in a highly efficient manner.

Likewise, malls within the special economic zone have an opportunity to intensify their entire retail climate; with major international shipping plugged directly into these sites and available under more competitive and consumer friendly laws (potentially), the marketplace takes on a more compelling identity as smaller niche importers, wholesalers and retailers are able to be competitive. Increased activity in these areas will lead to a less sanitized and restricted retail philosophy, and malls within the zone will more accurately reflect an authentic urban experience similar to traditional marketplaces.

Research and education zones allow for amenity such as libraries, research materials and shared computing resources to take form around their respective transit anchors. While it may be an inconvenience in some cases to move materials slightly off-campus to mall sites, it would be an incredible asset to have those resources available to the entire region. Materials that are shared between universities-- books, for example-- will be available from any connected university in a matter of hours, rather than days; thanks to the high speed transit options available, a book could be ordered from Universite Laval in Quebec City by a student attending the University of Windsor, with that book arriving on the same day. In this way, students are no longer limited by the resources available at their specific institution.

Similarly, joint projects between universities for expensive and specialized equipment, rare books, and other highly sensitive resources could be located at transit anchors so that thousands of students, professors, technicians and professionals are all within a short commute of all such resources in the region. In time, malls within research and education zones will attract investment and intensification that is complimentary to these resources; research and technology companies will want to relocate or provide on-site satellite offices, as the specialized infrastructural investments they need-- as well as the talent pool they need to draw from-- are located right at these mall sites.

A final example of how this kind of transit anchor development can begin to occur is the major cultural and entertainment zones. Here, the trajectory of development is perhaps the most difficult to project and the most open-ended; the simplest form being a hotel (or hotels), built into the transit anchor and serving the adjacent attraction. The mall site itself can become an extension of the venue; it can already be said that perhaps Vaughan Mills and nearby Canada's Wonderland are more alike than they are different. Both offer significant retail and entertainment amenity; one simply began life as a theme park while the other was built as a shopping mall.

Regardless of whether the cultural amenity is a theme park, a sporting venue, a theatre or a museum, incorporating such function directly into the transit anchor will allow patrons to be immersed in these activities from the moment they arrive. The primary attractor (a professional sporting team, for example) will support secondary development (community playing fields, instructional facilities, sporting goods and memorabilia stores, etc) attractive to both the enthusiast and casual participant.

This is the potential of such a system; a major infrastructural investment, combined with strategically selected sites-- each seeded with a complementary regional focus through the transit anchor-- allows for concentrated, highly connected and purposeful development. It improves the global economic competitiveness of the corridor and the quality of life of over half the Canadian population while transitioning a highly industrialized region into an environmentally sustainable one within the span of a single generation.

Sources:

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4. Shanghai Maglev Official Website <http://www.smtdc.com/en/gycf3.asp> Accessed 11-November 2009.
5. Taking into account time spent in the airport.
6. America 2050 Infrastructure (2006, 11)
7. SkyTran - The Future of Travel. www.skytran.net Accessed 6-June 2009.
8. *The inconvenience and relative unpopularity of Via passenger rail in the region is a testament to this.*
9. *The manufacturing and delivery process can be completely integrated into the transit system, as suggested in the following section. Tecumseh mall in Windsor is located in the heart of the automotive sector of that city; the cars could be manufactured in a facility there, rolling off the assembly line and directly onto the transit line. This would replicate the 'just in time' delivery philosophy of the auto industry, but in an even more efficient way.*
10. SkyTran - The Future of Travel. www.skytran.net Accessed 6-June 2009.
11. *ibid.*
12. *Estimate based on the 820 km of the 401, 150 km for the 403, 300 km from Montreal to Quebec City, 100 km to Ottawa, and 100 km for additional lines around each of the GTA and the Montreal/Laval metropolitan region.*
13. *This would require blades that are approximately 40 m, which would probably be a reasonable expectation for a highway adjacent array. Blades of approx 60 m could produce 1 megawatt each, which would cover 100% of Ontario's current energy demands. Wind Energy Basics http://www.awea.org/faq/wwt_basics.html Accessed 1-Nov 2009.*
14. Ministry of Energy and Infrastructure <http://www.mei.gov.on.ca/en/> Accessed 1-Nov 2009.
15. *As would some of the rampant 'NIMBY-ism' that surrounds many proposals for wind farms in the region.*
16. Thun (2009, 183).
17. Thun (2009, 207).
18. *Diagram indicates major international shipment points; rail and truck traffic via Windsor/Detroit and Niagara Falls, Ships via the St. Lawrence, and Pearson and Dorval International airports.*
19. *Diagram indicates major agricultural production from various areas; beef/dairy, poultry, corn and soy from southwestern Ontario <http://www.growourfarms.ca/Profile/whatwegrow.aspx> Accessed 11-November 2009. Wine from St. Chatherine's, beef/dairy, swine, poultry, grain, fruits and vegetables from the Montreal region and beef and swine from eastern Quebec <http://www.gouv.qc.ca/portail/quebec/pgs/commun/portrait/geographie/climat/occupationterritoire/?lang=en> Accessed 11-November 2009.*
20. *Diagram indicates the priorities of important conservation areas in the region; drinking water, forestry and fish habitats in the Grand Valley <http://www.grandriver.ca/> Accessed 11-November 2009. Drinking water, forestry and wildlife in the Rideau Valley <http://www.rvca.ca/about/index.html> Accessed 11-November 2009. Also, various other freshwater sources.*
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23. *ibid.*
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