

Corridor Urbanism

A new pattern of sustainable
growth management

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Executive summary

This document addresses one of the most important challenges facing cities today – the rapidly rising cost of land driving up housing prices – and its relationship to community and regional planning.

- **Key points include:**
 - Housing prices are our new big challenge to the sustainability of our cities.
 - Since construction costs are similar in most regions, expensive housing is the result of expensive land.
 - As with all goods, price is set by supply and demand. Constraints on land supply have caused demand to outstrip supply – causing a significant and sustained increase in land costs.
 - The rise is far beyond that considered normal through a business cycle, and this opportunity for large and fast returns on investment has attracted significant external investment and speculation – unnaturally accelerating land (and housing) costs.
 - The key for planning is maintaining enough land on the market to maintain a relatively balanced sale to inventory ratio – and that amount in reality is far greater than normally planned for. Currently, the practice is to just supply land sufficient for projected growth in a community plan.
 - Planners have constrained land supply to avoid “sprawl”, but they have used an historical and outdated model of growth geometry – the town centre model.
 - The town centre model is an archetypal historical pattern, but it is not a useful model for planning for aggressive growth in a modern city.
- In reality, modern cities are serviced and function in corridors – and a corridor that is roughly 1km wide centred on a mixed-use, transit-oriented street is a highly sustainable model of urban development – a “corridor urbanism.”
- A regional growth management pattern that uses corridors organized into a starfish (hub and spoke) or spider web geometry allows for significant land availability while still meeting sustainability objectives such as transit-oriented neighbourhoods, efficient infrastructure, preservation of natural and agricultural land throughout a city, and the linking of key nodes throughout a region.
- There are several types of corridors that can be used – major urban high-density ones, medium density, mixed use neighbourhood ones, and smaller and quieter residentially-oriented ones.
- Communities can retrofit their plans into corridor urbanism by connecting current town centre areas, redefining other major streets and connecting to current developments and communities on the edge of the metro area.
- Corridor urbanism outperforms the town centre model on managing land and housing costs, transit-orientation, walkability, access to green space, and neighbourhood diversity.

Housing –the new sustainability.

- **The (environmental) sustainability chapter**
 - In the 1990s, the sustainable development movement emerged and came to dominate the planning discussion for the next 15 years.
 - The majority of the sustainability discussion focused on the environment, even though it professed to address social and economic considerations as well.
 - Many of the environmental issues are now addressed in planning and development policies and regulations—explicitly and implicitly including:
 - Densification, mixed uses and complete communities are the norm for planning policy.
 - Active transportation is a high priority.
 - Many cities have climate change plans.
 - The building code now mandates high levels of energy efficiency.
 - Water conservation is the norm.
 - Recycling is the norm.
 - Environmental area preservation is required.
 - Many cities have food strategies.
 - Innovative infrastructure is common.
 - And many others.
- **The social sustainability chapter**
 - Housing costs are the new threat to the sustainability of many communities.
 - The new primary challenge to most desirable urban areas is housing costs. Many Canadian cities are now entirely unaffordable to its current residents, and that impact on future generations is incalculable.
 - Housing costs may destroy many communities that are currently enjoying the illusion of success.
 - As such, for the next decades, housing affordability and its core role in maintaining the social and economic health of communities is “the new sustainability.”

Land costs drive housing prices

- **The cost profile of housing**

- The cost of any home, embodies several core costs:
 1. The cost of the construction of the building, including labour and materials costs.
 2. The costs imposed by the municipality and other levels of government.
 3. The cost of money.
 4. The cost of land

- **Construction costs**

- The construction costs of a building will go up or down depending on price changes for labour and materials. However, these costs are generally the same across large regions, even continents, and as such, while they impact the cost of housing, they do so at roughly the same rate in most regions.
- In short, it costs roughly the same to construct a home in any community and as such, the differential in costs between communities is not the cost of construction.

- **Government costs**

- Governments impose a wide range of costs on housing – and these differ between jurisdictions – affecting housing costs accordingly.
- For local governments, the costs of DCCs, CACs, application fees, etc... can have an impact on housing costs, but it is not the primary driver of major housing price challenges and only impacts them a relatively small percentage compared to other costs.

- **The cost of money**

- The cost of borrowing money will impact both the developer / builder and the purchaser, but again, it is a cost that is roughly equal across most regions at any point in time.
- While low interests rates support increased housing prices and rates and amounts of borrowing, it doesn't account for a differential in housing costs between inexpensive and hyper expensive housing markets.
- While low interests rates may increase prices, because the actual cost to the purchaser remains attainable, interest rates do not create “unaffordable” housing problems.

- **Land costs**

- The primary driver of the difference between an affordable and unaffordable market is the cost of land.
- “Lot value” in a small rural town can easily be one tenth of what it is in a successful urban area today.
- All jurisdictions with inflated housing costs have inflated land costs – and as such, the focus in the next decades on the sustainability of communities needs to be on keeping land prices from escalating.

What drives land prices?

- **Supply and demand determines price**
 - As everyone knows from “economics 101”, the difference between supply and demand drives the price of any good, including land. Where demand exceeds supply, prices rise, and vice versa.
- **Land price escalation**
 - There are three types of land price escalation:
 1. A natural market change that roughly mirrors other cost-of-living changes, largely matching the general rate of inflation;
 2. A localized temporary increase slightly above the rate of inflation, due to a temporary misalignment between supply and demand. This situation resolves itself relatively quickly and does not attract the attention and capital of the larger national or global investment and development community; and
 3. A significant price escalation that triggers the attention of a much larger (even global) pool of capital that comes into the market and changes the demand level for land significantly – and correspondingly its price.
- **Policy responses**
 - The first two types of land price increases are normal and do not generally cause a crisis of housing prices, because the levels of demand they represent and the associated price increases are localized and moderate. As such, while community plans need to ensure there is sufficient land available in a community, fluctuations of this type should be considered normal and not a major stimulus for policy change.
 - The type of land value increase that planners must guard against at all costs is the third type, because of its potentially catastrophic impacts on a community’s housing costs – and thereby its long term health and viability.

Market and process impacts

- **Price inelasticity**

- The final point often missed in consideration of land supply in planning communities is the issue of the elasticity of land prices.
- In a seller's market, land has a very low level of price elasticity. Raising prices may not negatively impact demand to any great extent.
- The reason for this inelasticity is because:
 - Developers need to buy land in order to make a living; but,
 - Land owners rarely "have to sell" with the same level of urgency.
- As such, the supply – demand profile in land is more acute than many goods.
- If a land owner doesn't need to sell but many developers need to buy, the land owner can bid up the land value or simply sit on it and watch its value increase, thereby reaping a significant financial reward with no effort or risk.

- **The realtor and appraisal factor**

- The escalated land prices are then locked-in through the appraisal process, and further escalated through the realtor sales process of predicting further price rises and always pushing the market for the next step up the price ladder.
 - Appraisers use reference "comparables" of surrounding prices to estimate the value of land – and thereby support price escalation.
 - Realtors are optimistic by nature and the force of thousands of realtors steadily drive prices up wherever possible; and
- The outcome of this process is that many forces increase the cost of housing and there are few forces that will stop it. And the entire process is initially triggered by a misalignment between the supply and demand for land.

Land price escalation

- **When land is no longer utilitarian**
 - When land is priced in a manner reasonable to the longer term market trends of an area, “land is just land.” The only people buying land want that land primarily for its utilitarian value – as a location to farm or build buildings for residential, commercial or other utilitarian uses.
 - However, when prices begin to escalate rapidly, land ceases to just be land, and it becomes an investment product that offers high-returns similar to stocks/equities for some investors, or worse, a high-probability lottery ticket for others.
 - This process changes the nature and size of the investor pool who are interested in buying land. The new investor profile includes anyone and everyone looking for high, short-term returns on investment.
 - This process changes the land market to include a much larger pool of investors who are not really interested in land for its utilitarian uses, and this process significantly changes the “demand profile” at a rapid rate.
- **Land price escalation impacts**
 - When a larger pool of capital and development capacity finds a new market with rapidly escalating prices, the nature of the land market changes to a highly speculative one, looking for fast returns, and when all these patterns occur:
 - It drives up land prices and therefore drives up housing prices
 - It pushes out smaller local developers and investors which in turn, reduces the overall housing supply, leaving only larger developers with deep pockets and large portfolios able to provide the majority housing;
 - It shifts the housing supply toward very large projects because larger developers don’t generally do smaller projects (lower marginal returns on time and resources);
 - It thereby further increases the risk to housing supply because larger projects are always more risky, due to their high overhead and the large number of units that come into the market at the same time per phase; and
 - Since large developers have large project portfolios, they are more comfortable stopping a project if it looks risky and shifting capital to another project in the portfolio, as opposed to smaller developers who are more deeply committed and must try to make it work, thereby maintaining supply.

Land supply and the threshold of land price escalation

- **What is the threshold for significant price escalation?**
 - It is very difficult to determine a threshold between supply and demand that triggers significant supply escalations, however some factors can be considered.
- **Active listings to sales ratios**
 - CMHC and realtors closely track the difference between the inventory of land or homes on the market, and the number or pace of completed sales. This is called the “active listings to sales ratio.”
 - The rule of thumb for this ratio is that if the ratio is between 15-20% (eg: there are 5-6 times the number of units on the market than sell in any given unit of time), then the prices will remain relatively stable.
 - For instance:
 - If there are 9 units on the market for every sale (eg: 10%), then we move into a buyers market, and prices are likely to be reduced over time.
 - If we have less than 5 units on the market for every sale, then we move into a sellers market and prices begin to escalate.
- **Land supply requirements**
 - If the housing market has clearly established a threshold for price escalation, then the logical conclusion is that planners must ensure in an Official Community Plan, that there is enough land available in the plan to supply several times more units that are expected in the time covered by the plan (eg: an OCP covers a 10yr supply).
- **Planning land supply**
 - The planning processes and plans that determine land supply in a community are “official community plans” in BC (OCP). These plans are intended to ensure land supply is adequate for the next 10 years of demand. However, as is clearly documented in market statistics, we need density equivalent to many more times the project demand to maintain a balanced market.
 - The primary challenge in current methodologies is that existing zoning capacity is calculated and planners assume that all land zoned or proposed in the OCP can or will redevelop to a higher density. This methodology is inaccurate because it does not take into account the cost per unit of the land, the willingness of any given land owner to sell, the age of the buildings in the area (since we don’t tear down buildings younger than 50 years very often) and the implications to how much additional density it takes to actually trigger redevelopment, based on a “cost of land per door” reality.

The question of land supply, sustainability and regional geometry

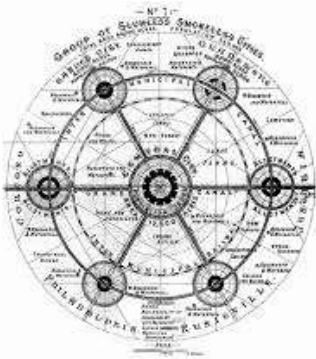
◦ Land supply and sprawl

- One of the biggest targets of the sustainable community movement, and now the healthy communities movement, is sprawl.
- The current tone of the debate in professional planning has been to view the supply of large areas of land to the market as promoting sprawl.
- Interestingly, a large supply of land does not mean sprawl, unless the geometry of that land supply and its zoning creates the conditions of sprawl. Land supply and sprawl are not synonymous.
- This perception is linked to development patterns in many cities where large areas of greenfield land are approved for single family developments with occasional schools and shopping centres – all linked by highways – known as “suburbia.” These areas then exhibit “sprawl performance” – socially, economically and environmentally.
- In reality, “sprawl performance” is more linked to land use patterns than to the extent of development.

◦ Constraining land supply

- In an attempt to mitigate sprawl, many communities have enacted regional growth plans, growth boundaries and other municipal land supply constraints.
- The intent behind these plans has been noble, but the outcomes in any region of high development demand has been mixed – with a widespread result of rapidly increasing house prices (Metro Vancouver, Portland, San Francisco, others).
- Demand in all these regions has forced growth to leap over greenbelts and extend far into the region – moving from municipality to municipality – out into areas where land is more affordable.
- People are prepared to sacrifice time and money in commuting to have a home that meets their family’s needs – and thus demand pushes development past the idealistic growth management areas.
- In many of these areas, central cities congratulate themselves on their growth management controls – but when one looks at a region, “sprawl” continues rampantly outside their city boundaries - because cities are not in control of demand.

Dominant geometry in planning history



- **History of the town centre model**

- The history of the town centre model goes back millennia. Until the growth of global cities, smaller towns have been the primary urban settlement unit for humans. Towns would be established at the intersection of roads with other roads, rivers, waterfronts or other key features. In these towns, most business would occur, linked with many surrounding rural areas – as they were the focus point for most all commerce. As such, the concept of a village centre is archetypal.
- When planners began to promote the concept of complete urban neighbourhoods, we defaulted to this archetypal image, and we call these idealist place ideas, “urban villages.”

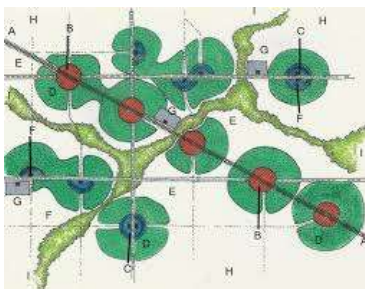
- **The Garden City**

- During the late industrial revolution, massive urban housing was required as rural areas in Europe and North America emptied into cities to be part of the new industrial economy.
- The practice of City Planning was created at this time to house this new urban population in humane ways. Both private and public interests envisioned ideal new towns and began building examples of them as close to their ideals as possible.
- The most famous of these is Ebenezer Howard’s concept of the Garden City – a complete new city or community created in a circular format outside a major metro industrial area, linked with it by transportation.
- In reality, almost no Garden Cities were built, because they envisioned a major employment base at their centre. As we have seen over the past century, it is rare that a whole new employment base will be set up outside a city. Instead, the Garden City became the Garden Suburb – housing workers who commuted into the city for work.
- The perverse paradox of the Garden City (then and today) was that while it purported to be a great urbanist move, it actually became the mother of sprawl.

Early sustainable community geometry

- **Calthorpe / Smartgrowth and New Urbanism in the 1980s.**

- This Garden City concept was revived in the 1980s by Peter Calthorpe in his concept of Transit Oriented Developments (TOD), and promoted by the Smartgrowth and New Urbanism movements.
- Unfortunately, as with the Garden City concept, few were ever built or successful, for the same reasons, that businesses need urban environments and large populations of customers and workers don't move to rural areas en masse.
- The positive outcome of the TOD movement was that it recognized that these new towns were likely to be "suburbs" of a major city and Calthorpe argued that they should be linked with transit.



- **Growth boundaries**

- The Smartgrowth movement took root in the 70s and 80s in the rust belt of the USA, promoting the redevelopment of the declining and often empty swaths of land within cities, in response to the emerging practice of "leapfrog" development, establishing new suburbs far outside the urban employment centres.
- Smartgrowth had a different impact in many areas of Canada because Canadian cities did not have thousands of acres of largely abandoned land in their centres. The rationale for growth boundaries then unnecessarily constrained land and caused price escalation in Canadian cities, without the corresponding benefits seen by American cities.
- The geometry of all of these models envisioned a core centre around which a sequence of different land use areas would be located – and the DNA of growth management thus became one of a necklace of largely "circular" town centre areas.
- The growth boundaries seen in many communities also often resemble a circular or ovoid geometry, at some radius from a "centre" area.

The problem with sustainability performance and the town centre model

- **The town centre model drives up housing prices**
 - The town centre model limits the actual land availability for absorbing growth to a fraction of the total area envisioned in a plan – and thereby drives up land prices, and therefore housing prices.
- **The town centre model limits the % of a community that is walkable and transit-oriented.**
 - The reality of a town centre model is that it actually underperforms in terms of the % of the population that is actually within a 400m walking distance of mixed uses and frequent transit service.
 - Only those residents within the confines of the town centre are in a walkable / transit oriented environment.
 - The much larger percentage of the community is therefore in a non-walkable / non-transit oriented environment and therefore has sprawl performance.
- **The town centre model actually creates sprawl**
 - A further perverse impact of the town centre model is that the increase in land availability and land costs, drives developers outside the municipality – which can truly exacerbate sprawl performance.
 - All buyers in a growing city have to determine their tradeoff point – between the cost of more expensive homes in the urban core, versus the (financial / social) cost of commuting.
 - The average for larger Canadian cities is 30 minutes or more per commuting trip – a statistic which infers a widely held tolerance for commuting. <https://www.thinkinsure.ca/insurance-help-centre/commuting-times-and-facts-in-canada.html>
 - Current calculations of the this cost tradeoff in the Lower Mainland result in the equilibrium in cost being far outside Vancouver’s core areas. <https://censusmapper.ca/maps/111#11/49.2853/-123.1210>
 - A 30 minute commute, which ostensibly matches an average person’s tolerance and optimizes their cost/benefit calculation on quality of life, can easily cover 20-30km outside the city – putting viable new developments far past adjacent municipalities into the region.
 - As such, overly constrained land supply in an urban area for densification drives the majority of both developers and residents to choose to live outside these planned urban cores.
 - When this reality is accepted in city planning, then the threats and problems with the constrained town centre model are evident.

The problem with phasing of growth and scale of a perceived “centre”

- **The planned (contrived) centre**
 - Before the advent of automobiles, cities had many natural forces that caused a concentration of population and business into a single centre.
 - Since the emergence of the widespread of land use zoning in urban planning in the early, mid 1900s in North America, the concept of a “primary or secondary higher density centre” has become one increasingly of ideology more than pragmatism.
 - This is particularly true since the widespread integration of advanced communication technology into business and life. This will be much further exacerbated as online retail shopping continues to undermine a core reason for why urban cores exist.
- **Growth rates and land consumption**
 - Growth occurs in different rates in different communities. The problem with a planning model that has all primary or larger scale business uses concentrated into a single centre, is that this centre then either remains empty because the demand in any period of time is not matched with that centre (use, cost, etc...) or in alternative, that centre fills up, triggering the need to start a new one elsewhere.
 - While a highly planned and controlled model pleases the minds of planners, it does not reflect the constant churn of business and the market.
- Of greater importance is the scale of development that occurs based on varying growth rates for different uses.
- In large and rapidly growing cities, large projects can be built and absorbed by the market in a timeframe that supports financing constraints.
- In a smaller city, the ability to absorb growth occurs in much smaller amounts, and as such, no one can afford to build large projects, because the market cannot absorb that much capacity in a time that supports financing constraints. Paying the financing costs on significant inventory over time erodes the profit and makes the project unfinanceable.
- As such, the models used in planning must be both calibrated to the realistic total scale of development that is possible, as well as the pace of development, and plan to be able to handle many different sizes of projects.
- While urban planners like to feel they are stewards of a long term vision for a “great city” and therefore feel they have a right or even a responsibility to ignore market cycles, the reality of this approach can result in many unintended consequences, including a chronic problematic mismatch of land availability to respond to market needs, and a mental and regulatory model of a city that is incompatible with the actual reality of how that city will evolve.

The evolution of “the centre”

◦ A typology of centres

- There is a typology used in planning for various types of “centres.” While each town envisions these slightly differently, they typically include:
 - **A Central Business District**
 - The primary commercial office centre of a larger metro area, with larger or head offices of companies, government offices, and extensive professional firms, as well as some urban shopping areas.
 - **Large Retail Shopping Centres**
 - Areas with large concentrations of retail space, often associated with malls, large strip centres, or large format retail centres.
 - **Secondary Commercial Districts**
 - Areas that have a diversity of commercial / retail services in smaller secondary and mixed use areas.
 - **Neighbourhood Centres**
 - Smaller commercial areas (retail, office, services) surrounded by primarily larger residential areas.
 - **Light Industrial Centres**
 - Areas that have a concentration of light industrial uses, which in reality offer a diversity of industrial, office, service and retail elements.
 - **Others**
 - There are other types of centres as well, unique to each community, but the above are the primary types.

◦ The centre begins to change

- While zoning often still maintains the historical (and now hypothetical) structure of this typology of centres, and we continue to call some location “downtown”, even if it doesn’t actually perform like a true downtown, natural market forces are constantly changing the structure and function of centres.
- In the past several decades, the patterns of movement no longer support the simple belief in a “centre”, especially in new growing areas. While we do move to places of employment, shopping and education, those locations are not “in a single centre.”
- In fact, the opposite is now the pattern. Commuting pattern tracking show that in many metro areas (incl Metro Vancouver), that people are commuting in all directions, and many are not commuting into major metro centres, but rather working in their own community.
<http://vancouver.sun.com/news/staff-blogs/interactive-map-shows-metro-vancouver-commuting-patterns>
- As such, the concept of “the centre” should no longer be assumed to be valid as a core planning typology – certainly not one that we build an entire metro’s future growth plan around.
- The new approach needs to be one of multiple centres of different types that support the new structure of our economy, movements and lifestyle.

Forces changing the nature of the city centre

- **The eroding city centre**

- There are many forces undermining the concept of a major city centre, and creating new needs and patterns, including:

- **Outsourcing, land costs and decentralized companies**

- In the past several decades, the increase in commercial and housing land costs, combined with changes in corporate theory, structure and management have resulted in many companies now being decentralized. They no longer automatically locate in a region's CBD – but rather may have offices in many cities, be structured to have many more consultants or contractors rather than in-house departments, and permit telecommuting. In some cases, the decentralization is global in scope.

- **Traffic congestion and travel costs**

- The costs of commuting are a visible issue today and in the context of decentralized companies, many companies are changing in response to the risk of losing staff who have to commute too far.

- **Communication technology**

- Communication technology has rapidly diversified and expanded globally in the past two decades, and as such, everyone's smart phone now offers multiple options for communicating with teams, clients or suppliers anywhere, anytime.
- Online education has also expanded rapidly, changing the nature of post-secondary education's relationship to urban space.
- This technology has now changed the core assumption that to do business or learn, we must be in the same physical space – and thereby, it has deeply changed our relationship to "a city centre."

- **Online shopping**

- The need to access major areas with many stores has been one of the cornerstones of urban patterns and planning since the earliest settlements emerged around markets and places of trade.
- Today, with intense competition and the rise of online shopping, the nature of what a "shopping centre" means is evolving fast.

Forces changing the nature of the city centre

- **Climate emission reduction practices**
 - The new focus across the planet on reducing emissions is changing how we plan and live in cities.
 - The majority of emissions come from transportation and buildings. Low emission buildings is mostly a building code issue, but transportation is a regional, land use and growth planning issue.
 - While the automobile sector is rapidly changing to new fuels and increasing efficiency, we will need a major modal shift to walking, cycling and transit if we are to achieve our global emission reduction targets. This means that our regions and cities need to be planned first and foremost about limiting the need for needing to move any significant distance to live our lives.
- **“Living first” policies**
 - The change in concepts for urban centres in the past several decades has reversed trends in the 20th century to focus a downtown or CBD primarily on employment.
 - The widescale introduction of residential into urban cores reflects a significant change in the presumption of the land use pattern of “a centre.” What used to be the employment centre, is now just a denser version of every other urban or neighbourhood village – with a full range of land uses.
- **Urban villages and complete neighbourhoods**
 - The rise of the concept of “urban villages” and “complete neighbourhoods” now dominates planning theory and practice. We are trying to make all areas of our cities “complete” – offering places to live, work, play, shop, learn, and pray.
- **Market preferences (Boomers / Millennials)**
 - One of the final most powerful forces driving many of the above patterns is the market preferences of the two most influential demographic groups in North America:
 - The Boomers wanting to downsize and retire close to amenities and healthcare; and
 - The Millennials wanting to live close to where they work, have flexible work/live patterns, and live close to urban amenities.
 - These major demographic groups’ new desires are changing the whole nature of what “a city centre” actually is.

The new normal: multiple-centre functionality

- **The new normal**

- The new normal is one of a much more granular structure to a city – a city of many small centres of many types, surrounded by a wide variety and density of housing, green space and recreation – all connected by convenient transit, along great urban streets.
- The natural growth rates of any city are different, as its topography, and as such, this pattern of multiple centres will express itself differently over time.

- **Multi-centre functionality**

- In order for this new “multi-centre” urban form to function effectively and meet our future sustainable city requirements, it needs to have several characteristics:
 - Daily needs are met within a walkable or short transportation distance – at a neighbourhood scale;
 - Strong transit links with a much larger regional pattern of centres to allow everyone to effectively travel in many directions, but all on transit;
 - “Great streets” anchoring these corridors and centres;
 - Efficient servicing infrastructure that allows a natural rate of growth in all land use types to evolve, without facing expensive retrofit costs;
 - Access to greenspace and food-lands in close proximity to where people live and work to support healthy communities; and
 - Others.

- **Planning models need to change**

- In order to achieve this new pattern of sustainable city function and growth, the planning models need to change from the outdated ones focused around a primary centre, to an entirely new multi-centre city that includes:
 - A city structured first and foremost around a linear network of major great streets with convenient transit and regionally-sized infrastructure mains;
 - A focus on mixed use planning at all locations along these corridors, creating a ubiquitous presence of mixed use, walkable areas;
 - The preservation of swaths of natural and agricultural lands alongside these corridors, reaching into all areas of a city (not just at its edge);
 - Various types of “centres” along these corridors that provide special clusters of types of uses when necessary such as industrial areas, major shopping centres, special office centres (mini CBDs), education centres, and others;
 - Controls on growth outside of these corridors to ensure the walkability and efficiency of transit and infrastructure holds, as well as the preservation of greenspace alongside these corridors.
- The conclusion of this analysis is that the future of cities does not revolve around one or a few primary cores, but rather it becomes a network of centres, evolving under market forces over time, all structured around complete neighbourhood areas well-linked with infrastructure – and the “distance from a theoretical primary centre” no longer matters.

The reality of “gentle infill”

- **The fallacy of gentle infill**

- A key issue in absorbing growth without a presumed “sprawl” into greenfield sites on the edge of cities, has been a discussion and pursuit of a concept of infill. The challenge with generic infill is that the neighborhood often reacts negatively to big changes to densify their area. As such, planners have defaulted to a concept of “gentle infill”, presuming that additional density can be added in architectural forms that don’t look much different from the low density neighborhoods they are in.
- The reality of the concept of gentle infill is that it proposes to absorb growth in existing neighbourhoods by converting single family homes to homes with suites, duplexes, tri/four plexes, multi-unit sites with carriage houses, and adding small townhouse projects, all roughly within the physical scale of existing single family homes (eg: under 2.5 -3 storeys).
- There is nothing wrong with this concept and its important that all areas allow for it, however, its effectiveness in absorbing major amounts of growth needs to be examined – and for that, we need to look at a generic example of how it would work.



The reality of gentle infill

◦ Example:

- Redevelop a SF home with a suite (4 inhabitants at \$600,000) is demolished and redeveloped into a fourplex (1,500 sqft/unit with a resulting 10 inhabitants):
 - 2 years to obtain approvals, design, construct, sell and occupy the building.
 - Net population gain
 - 6 residents over 2 years = 3 people per year of growth absorption.
 - Cost of land per new unit = \$150,000.
 - Typical cost to build (bldg., prof fees, city charges, financing costs) for a mid range building is about \$300/sqft for 2018.
 - Cost of construction per unit = \$450,000.
 - Total cost for new unit = **\$600,000**
 - Minimum 15% profit required to obtain bank construction financing = \$90,000 / unit
 - Final price of unit = **\$690,000.**

◦ Conclusions:

- \$690,000 for a new 1,500 sqft unit is not “affordable or attainable housing” for most households, because with a 10-15% downpayment of \$100,000, the resulting \$600,000 mortgage will cost around \$3,000/mo to service at reasonable interest rates.
- The net growth absorbed is small – 3 people/yr.
 - For a 100,000 person city growing at 1%, it would take over 300 of these per year to absorb growth.
 - As such, much larger projects are required to absorb growth, which requires larger sites – which require major land assembly and large disruptions to neighbourhoods, or new greenfield sites on the edge of a community.
- Gentle infill policies are excellent to have in a city, but they cannot be relied upon to provide enough attainable housing for any growing city.
- As such, plans and policies must include expansions into greenfield areas. The question then is how to do this while creating a city that meets sustainable development objectives.

Summary:

The tragic paradox of the town centre model of growth management

- **Town centre models create problems**

- The tragedy of the town centre model of city planning that focuses growth into a pattern of “circular/ovoid” town centres connected by transportation lines, is that while it endeavoured to create a new model of a sustainable city, it actually created the opposite:
 - It unnecessarily limited land supply and thereby severely limited the potential to allow housing supply to match demand - not just for a short business cycle or short delay in getting new units built in time to respond to a new rise in demand, but rather a prolonged shortage over decades;
 - The limited land supply drove up land costs – and due to continued zoning-based land constraints, it started a long term escalation in price;
 - The rapid escalation in land prices turned land into a “speculation equity,” largely divorced from its utilitarian function, and the scale of price rise attracted major global capital to come and compete for land - driving up prices further;
 - The rise in land costs then drove up housing costs (and concurrent low interest rates and poor land sales controls allowed that rise to be significant);
 - The hope that gentle infill could absorb the rising growth allowed planners to not actually deal with the fact that most of the growth now occurred in ex-urban areas of the region – increasingly far away from the so-called “regional centre”;
- Inflexible and idealistic zoning codes continued to try to enforce a hypothetical “regional centre” and thereby not only further drove up prices, but also increased transportation problems and corresponding emissions;
- The rise in housing costs in the city further pushed demand to the edges, increasing growth in areas not served by infrastructure or transit;
- Major social problems emerged from these land and housing price problems (housing insecurity, etc...);
- Greenspace was lost everywhere, most people now live outside of walkable and transit-oriented neighbourhoods;
- Traffic congestion is a major negative force; and
- Governments are struggling with the challenges of having to build social housing and expand infrastructure in all directions, requiring major retrofits of existing systems.

Responding to demand

- **Working with demand**

- Planners and communities cannot change “demand” but they can change how they respond:
 - They can acknowledge demand but refuse to respond to it, constraining land supply, driving up land and housing costs, and pushing growth outside their jurisdiction; or
 - They can work with the demand and find a way to ensure there is enough land to absorb it in a way that delivers affordable housing and employment space, and meets sustainability objectives.

- **We need a new model**

- The tragic paradox is because we chose the wrong geometry for growth management (the town centre model), we presumed that adding land supply automatically created sprawl (because of this geometry mistake), and therefore we limited land supply into our idealistic geometry and thereby set in motion market forces that threaten to destroy our cities, and thereby created the very sprawl we were trying to avoid, along with a host of other problems.
- And thus, we now need to develop a new model of spatial growth geometry and management that both responds to demand and delivers a sustainable city.

The problem: the geometry of growth management

- **A circular/ovoid (town centre) geometry**

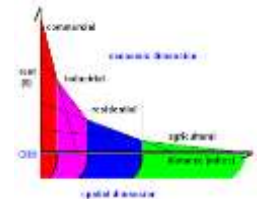
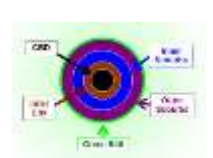
- When we address land supply and a “circular” geometry within an existing urban area, we are limited by the area within that circular or ovoid area.
- The urban planning assumption is that we would have the highest density in the centre, and it would decline in a roughly 360 degree pattern around that “high centre.”
- This idea is based on historical urban geography models of city evolution – but in a contemporary city, it is one that only occurs based on city planning controls (eg: it is contrived based on a mental model of how things should be).

- **The land constraints and control problem**

- The problem with this model In a growing market (where land supply really matters) is:
 - A significant percentage of the land or development within that town centre circle will be too new or old(heritage) to demolish and redevelop;
 - Another significant percentage may be of an age that would support redevelopment, but the owners have no interest in selling due to many factors (they live there, they own businesses there, they have good investments in the older properties, etc...)
 - The remaining small percentage of sites that are realistically available for redevelopment then face intense competitive demand for them – which drives up land value fast (and thereby housing and commercial building prices)
 - More importantly, a town centre model puts the control for an their city growth agenda in the hands of these few land owners – or speculators.

- **A rectangular (corridor) geometry**

- When we rethink the geometry of areas where we can absorb / support growth in a rectangular or “corridor” model, then a significant amount of additional land becomes available.
- If the urban densification distance from a central shopping / transit node is expected to be 400m, then if that central point is stretched out into a corridor, the net total area of land included in a rectangular corridor is many times that of a circular model of town centre.



Growth geometry: The starfish vs the sanddollar

- **The geometry of regional growth**
 - The question of sustainable regional development and land supply is one of the geometry of how the region is laid out, not one of pure land supply.
- **The Amoeba or Sand Dollar model**
 - If growth is allowed to occur in all directions around with little thought to transit-orientation, protection of key natural and agricultural areas, infrastructure, and the linkages between land uses, then sprawl is often the result.
 - If growth is constrained into a few town centres or “urban core areas”, then land is severely constrained, putting pressure on land and house prices.
 - The perverse paradox is that even if all this growth occurs within a regional growth boundary, most of it cannot be easily serviced with transit, few people live within a complete neighbourhood, and infrastructure expansion remains a challenge, because it’s going in all directions. High land prices also trigger leapfrog development farther out into the region and to neighbouring communities, worsening the sprawl problem, not preventing it.
- **The Starfish or Spider Web model**
 - If growth in a region is structured along transit corridors that radiate out from a perceived centre, and then form new centres and connect to other corridors, then a significant amount of land supply can be provided within a core structure of transit-oriented and complete community neighbourhoods, including the preservation of greenspace throughout.
 - All world cities with high sustainability performance have large networks of transit connections and bedroom communities reaching far out around them – up to 1.5 hour transit trips (eg: over 50km) are not uncommon in these cities.
 - Over time, a “starfish” geometry will need to evolve into a spider web geometry, where additional corridors are created connecting the primary starfish arms over time.
 - In retrofitting for corridor urbanism, the spider web geometry will be employed immediately in working with the existing city grid or pattern.

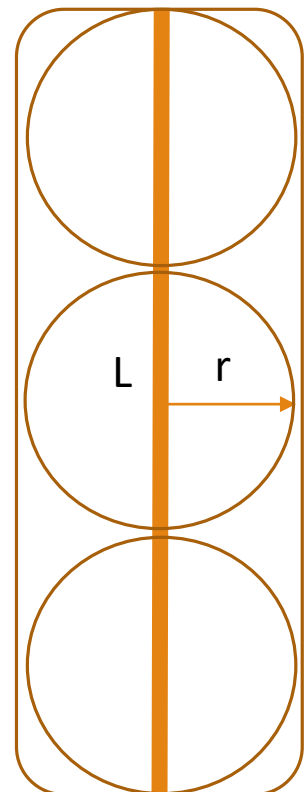
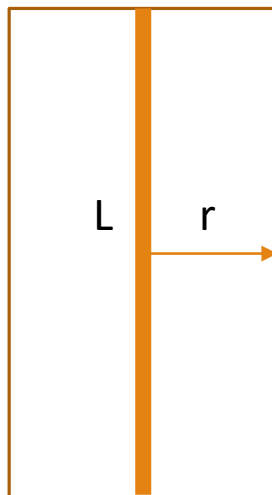
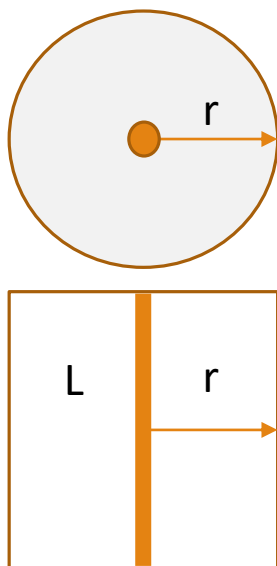
Land availability comparison

- **Total area of land available**

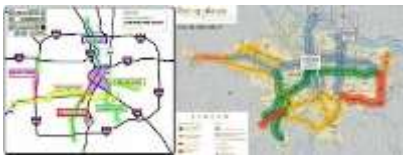
- The math logic of this geometric comparison is simple:
 - If the centre is constrained to a small locus, the land available is the area of a circle:
 - If $r = 400\text{m}$, total area $\sim 500,000\text{sqm}$
 - If the land has a rectangular or corridor geometry, the amount of land available is significantly more, within the same footprint:
 - If $r = 400$ and $L = 800\text{m}$ ($\sim 6\text{-}8$ blocks), total area = $800 \times 800\text{m} \sim 640,000\text{sqm}$ (25% more).
 - If L is longer (eg: a corridor), the land area is significantly greater.

- **Evolving into corridors (with many centres)**

- The immediate response to the circle vs rectangle diagram is to note that in real life, “town centres” are never based on a single point (eg: a single intersection), but in reality extend over several blocks – becoming an ovoid shape – but in concept, it is anchored psychologically in a circle.
- This observation then triggers an interesting question. If our “town centres” are actually “mini-corridors” – then why do we limit their length to whatever we extent we do?



Corridor Urbanism – a better model



- **A new regional growth geometry**
 - The core problem outlined previously was in the geometry we presumed was the best one to use to respond to providing new land or density to absorb growth pressures. As such, we need a new geometry.
 - The new geometry is not a circular/ovoid town center one, but rather one of urban corridors centred along a typology of great streets, that links all areas of the region through controlled and managed growth corridors.
- **An introduction to Corridor Urbanism.**
 - Corridor urbanism is a planning pattern that restructures an urban city and region into corridors first and centres second.
 - The region becomes a network of great mixed use streets of various character, that link all areas of the city in a highly efficient transit and infrastructure pattern.
- **Corridors can be structured in a starfish or spider web pattern extending out from the centre**
 - These can be easily connected existing or future planned major centres / destination areas.
 - The “historical centre” become less important as the corridors become the urban fabric – with everything linked along a transit backbone.

Analogy note:

The author was trying to describe this thinking to his mother over dinner – and summarized it as: *“we focused on making dinner buns when we should have been making baguettes.”*

Corridor Urbanism



- **Special centres / land use areas can occupy sections of the corridor as needed / or exist now**
 - These can be shopping centres, industrial, institutions, etc...
- **All residents / workers live in a walkable community**
 - Everyone lives within a 4-500m distance of the main central blvd (with transit and mixed uses) as well as within several hundred m of the green space on corridors' edges.
 - Because the corridor is mixed use and has density, the corridor can extend a long distance away from the proposed "centre" or key destination while still remaining mixed use / transit friendly.
- **Natural / agricultural land is both preserved and accessible**
 - The land between these corridors is retained and preserved- giving everyone easy access to agricultural and natural landscapes.
 - The corridors can snake around sensitive areas which can be incorporated into the green areas.
- **A typology of corridors can be created**
 - All are based on a core structure of a swath of development reaching out from a general urban centre area at various widths – up to 1km wide with a central main blvd.
 - Smaller versions not a full 1km wide can be created as needed – especially for redevelopment of existing areas.

Three types of corridors



1) Major, higher density urban mixed use corridor

- This type of corridor is associated with the primary urban areas – with extensive commercial (retail / office / high density housing)
- This type of street is intended to be a major urban space – allowing it to accommodate many different modes effectively, along with infrastructure, and the primary business backbone of the area. It will likely have a wider profile than other streets, with the intent of being a major urban boulevard – not dissimilar in some cases to those of major boulevards in the world’s great cities.

2) Community mixed use urban corridor

- This type of corridor is a medium density mixed use corridor for all secondary and tertiary mixed use/commercial areas. These can have many different sub areas (incl industrial).
- The street in this type of corridor will be “neighbourhood focused” – not as large as the primary urban corridors but still able to handle significant loads of modes. It’s dimensions are probably slightly narrower than the primary commercial street, but it will still serve an important urban infrastructure and commercial space.

3) Residential primary corridor

- This type of corridor focuses on primarily residential uses, appropriate to more residential areas adjacent and intersecting with the other corridor types. Some local-servicing mixed use can be encouraged. Schools and parks are also excellent fits for this type of corridor.
- This street in this type of corridor can have a lower level of commercial activity and be more of a ‘main residential neighbourhood’ street – linking to nearby community mixed use or major primary street corridors.

Great Streets and Corridor Urbanism

- **Great Streets – the backbone of corridor urbanism**
 - With cornerstone of corridor urbanism being a central transit-oriented mixed-use, medium density corridor, the centre piece of this concept then must be a great street.
 - Much has been written on great streets that does not need repeating here, but we can identify some characteristics:
 - Comfortably accommodate all modes (vehicles, trucks, transit, cyclists, pedestrians, electric scooters, etc...);
 - Have a great commercial / active sidewalk space;
 - Attractive design, furnishing, materials and landscaping;
 - Serve as a major public space; and
 - Others.
 - These central streets would be the focus for municipal investment in creating a great public realm.
- **Secondary streets**
 - The streets that parallel the primary central street can offer many different functions and experiences, including:
 - Accommodate excess traffic during peak hours;
 - Have significant traffic calming where needed; and
 - Others.
- **Bypass streets**
 - The primary central street will have a very high level of use in a corridor urbanism network, and during peak hours, bypass routes may be needed.
 - In a corridor urbanism model, the roads on the outer edge of the corridor, between the development and the natural areas, offer a great opportunity for a bypass street to manage overloading of the primary central street.
 - In an edge condition, there are fewer needs for intersections and lights, thereby allowing for more efficient traffic flow, if needed.

Extending corridors connect the region and absorb growth

◦ **Managing demand regionally**

- Cities cannot control the level of demand they face. They can only respond to it – more or less effectively.
- In order to plan to keep a relatively balanced housing market, a significant amount of land needs to be available to the market – several times more than the predicted level of actual demand. As discussed earlier, the geometry of corridor urbanism is a far more sustainable model than one only focused on town centres.
- However, corridor urbanism also offers a mechanism for connecting a larger region in a transit-oriented manner as growth occurs.

◦ **Edge developments**

- All growing cities see significant interest and/or development in areas on the edges of a city for development. In addition, growing cities need new government infrastructure (hospitals, etc...) and governments typically purchase land on the edge because large parcels are available at an affordable price (thinking just like developers).

◦ **Breaks or connections with the edge**

- The town centre model decries such developments because in a town centre model, these edge developments create “sprawl performance” – primary bedroom neighbourhoods generating significant traffic loading in and out of the town centres where planners have located the shopping and employment.
- The corridor urbanism model can be structured into a network that effectively connects all edge areas and allows employment, shopping and amenities to be focused along these corridors – access with shorter commutes, and serviced by much more effective transit, cycling and pedestrian infrastructure.
- Where a senior government decides to install a new major employment or service centre outside the network, a corridor urbanism model can simply add another arm in its plan and connect it into the larger network. A town centre model either has to ignore this new destination or try to build an entire new town centre around it – which is rarely feasible or pursued.

Summary comparison – town centre model vs corridor urbanism model

| City planning issues | Town centre model | Corridor urbanist model |
|---|---|--|
| <p>Mixed use complete living environments</p> | <ul style="list-style-type: none"> Limits mixed use areas to the town centres and occasional small (purposefully limited) neighbourhood centres. | <ul style="list-style-type: none"> Everyone along that corridor can/has the potential of living in a mixed use complete area because much of the corridor has “town centre” characteristics. |
| <p>Access to transit / active transportation</p> | <ul style="list-style-type: none"> A large amount of the area does not have density high enough to support regular transit – and a significant amount of the area is too far away to walk to transit = sprawl transportation pattern for all except those who live and work on the few transit lines with high frequency service. The lines also may not go to the destinations desired because the overall land pattern is spread out and lower density, except in a few areas. | <ul style="list-style-type: none"> Everyone along the corridor has walkable access to the highest frequency transit – and it has the highest probability of going to a destination they want to go to. |
| <p>Access to green space</p> | <ul style="list-style-type: none"> Limited parks exist as areas densify (due to their original low density) – greatly reducing the nearby access to green space per capita.. | <ul style="list-style-type: none"> Everyone lives or works within a few hundred meters of the natural areas along either side of the main corridor, in addition to park spaces that can be integrated into the corridor. The transit will also help people access all the parks along the corridor. |

Comparison continued

| City planning issues | Town centre model | Corridor urbanist model |
|--|--|--|
| <p>Availability of land</p> | <ul style="list-style-type: none"> The availability of land for development is limited to the town centres – and only a few land owners control the price / availability for the whole city future development plan. | <ul style="list-style-type: none"> There is significantly more land available for increasing density / mixed use along the whole corridor, rather than a limited few sites just in a proposed centre. |
| <p>Housing costs</p> | <ul style="list-style-type: none"> The main variable factor in housing costs is the cost of land. Limited land rapidly drives up the costs of the developable land and reduces the number of developers (removes the smaller ones) who can afford to buy land and build. Increased unit costs then drive up the price of housing in the whole neighbourhood through the land appraisal process (which use comparables). | <ul style="list-style-type: none"> Housing costs do not escalate rapidly because of the much greater supply of land and the fact that there are many sizes of developers who can afford to develop – not just the largest companies with the deepest pockets. |
| <p>Cost of commercial land (and corresponding business feasibility)</p> | <ul style="list-style-type: none"> The limited commercial areas also are driven up in cost significantly – increasing overhead and decreasing business viability. And competitiveness. | <ul style="list-style-type: none"> Commercial land is more affordable and a much greater range of commercial can be provided along a corridor rather than just a few sites in a centre. |
| <p>Infrastructure investment</p> | <ul style="list-style-type: none"> The infrastructure required to grow in all directions spreads limited infrastructure budgets across large areas, and causes upgrades to be required in many areas to increase trunk line capacity . | <ul style="list-style-type: none"> All infrastructure investment is structured in a linear fashion, with very large mains in the central blvd and smaller off shoots to the side – allowing effective infrastructure phasing. |

Retrofitting for corridor urbanism.

- **Connecting town centres**

- The first step in retrofitting a community plan into a corridor urbanism network, is to look to connect existing town centres in the plan with corridors. These town centres are often linked with major streets already and it makes it easy to link them conceptually with a major corridor.

- **Enhancing other major corridors**

- The next step is to identify other major corridors within the urban fabric that can be one of the types of corridor.
- Structuring these corridors to provide a highly efficient urban transit network is of key importance.

- **Identifying new starfish arms into the region**

- The next step is to consider the directions that the “starfish arms” will extend out from the current urban area into the region – and how they can be linked into a spiderweb pattern for efficient transit and infrastructure patterns in the future.
- Concurrent with this step is the identification of key natural and agricultural areas that will be planned to be preserved in perpetuity between the corridors – to maintain compact urban areas, protect agricultural land, keep natural areas accessible to urban areas, and others.

- **Connecting growth areas and towns in the region.**

- A key guide in determining where the corridors should extend is a plan to link external areas where new projects may have developed on the edge of the metro area, or where existing edge communities exist.
- The corridors also need to find their way through the surrounding terrain in a manner that respects natural systems, key agricultural areas and ensures an appropriate growth capacity.

Planning for growth in corridors

- **Planning for growth cycles in different land uses**
 - Because growth will occur in accordance with business cycles of demand and competitive supply, corridors will extend in phases that reflect the pace of that market demand – current and projected.
 - Corridors should be planned to create somewhat “complete” sections as they grow – so functioning neighbourhoods are created.
 - The existing land parcelization should also be considered because the scale of available parcels will also impact the scale of investment and development planning.
 - Another issue is that of land speculation, where a land owner / buyer purchases land along a future corridor and holds out for land value rise. This occurs in any community plan where new areas of higher density are planned or expected. In order to keep land value in check, the growth needs to be allowed to leap over a piece of land that is not for sale or overly expensive – so long as infrastructure costs are appropriately covered by these developments.
- **Planning the phasing of growth with infrastructure.**
 - All new developments along an extending corridor require infrastructure, and the planning of infrastructure extensions needs to be addressed – through Phased Development Agreements where the private sector is paying for some or all of it, as well as through Capital Plans and infrastructure plans within the municipality.